



## **Coworking, a Way to Achieve Sustainable Mobility? Designing an Interdisciplinary Research Project**

Patricia Lejoux, Aurore Flipo, Nathalie Ortar, Nicolas Ovtracht, Stéphanie Souche-Lecorvec, Razvan Stanica

### **► To cite this version:**

Patricia Lejoux, Aurore Flipo, Nathalie Ortar, Nicolas Ovtracht, Stéphanie Souche-Lecorvec, et al.. Coworking, a Way to Achieve Sustainable Mobility? Designing an Interdisciplinary Research Project. Sustainability, 2019, 11 (24), pp.7161. <10.3390/su11247161>. <hal-02419717>

**HAL Id: hal-02419717**

**<https://hal.science/hal-02419717v1>**

Submitted on 23 Nov 2023

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



HAL Authorization

Article

# Coworking, a Way to Achieve Sustainable Mobility? Designing an Interdisciplinary Research Project

Patricia Lejoux <sup>1,\*</sup>, Aurore Flipo <sup>1</sup> , Nathalie Ortar <sup>1</sup> , Nicolas Ovtracht <sup>2</sup>,  
Stéphanie Souche-Lecorvec <sup>3</sup> and Razvan Stanica <sup>4</sup>

- <sup>1</sup> Univ Lyon, ENTPE, LAET (Transport, Urban planning, Economics Laboratory), F-69518 Vaulx-en-Velin CEDEX, France; aurore.flipo@entpe.fr (A.F.); nathalie.ortar@entpe.fr (N.O.)  
<sup>2</sup> Univ Lyon, CNRS, LAET (Transport, Urban planning, Economics Laboratory), F-69007 Lyon, France; nicolas.ovtracht@laet.ish-lyon.cnrs.fr  
<sup>3</sup> Univ Lyon, Univ Lyon 2, LAET (Transport, Urban planning, Economics Laboratory), F-69007 Lyon, France; stephanie.souche@univ-lyon2.fr  
<sup>4</sup> Univ Lyon, INSA-INRIA, CITI Lab, F-69603 Villeurbanne CEDEX, France; razvan.stanica@insa-lyon.fr  
 \* Correspondence: patricia.lejoux@entpe.fr

Received: 3 August 2019; Accepted: 11 December 2019; Published: 13 December 2019



**Abstract:** Sustainable mobility has been one of the central paradigms of research in the field of transport and mobility for several decades. However, the implications of adopting the concept of “sustainable mobility” for the conduct of interdisciplinary research has been little discussed within the relevant research community. Research in the field of transport and mobility has nevertheless been the setting for major debates in recent years on the question of interdisciplinarity, or even transdisciplinarity, with the emergence of mobility studies as opposed to transportation studies. The objective of this paper is to show, empirically, how researchers who are specialised in mobility and transport issues, but who belong to different disciplines (anthropology, computer science, economics, geomatics, sociology and urban planning) have sought to build an interdisciplinary research project—which is currently ongoing—around the links between the development of coworking, which is a new way of organising work, mobility and sustainability. This paper sets out to highlight cross-fertilisation between disciplines, the issues raised, and the difficulties encountered. As such, it provides an account that is as faithful as possible to our experience of conducting interdisciplinary research in the area of sustainable mobility.

**Keywords:** mobilities; mobility studies; transport; transportation studies; interdisciplinary; coworking

## 1. Introduction

For several decades, research on transport and mobility has addressed the economic, environmental and social issues associated with mobility, and it has made the concept of “sustainable mobility” one of its central paradigms [1–5]. For Morency [6], a sustainable transport system is: “[...] [A] system that will come with reasonable costs, that will operate efficiently, and that will offer all populations a choice between different transport alternatives. So, one of the characteristics this system needs to have is the ability to limit polluting emissions, waste, etc., so as to try and ensure that the planet’s ability to absorb all of this is not exceeded.” The adoption of this concept has helped revitalise theoretical frameworks by departing from the traditional approaches developed in the contexts of transport engineering and transport economics. By looking not only at the contribution of mobility to economic growth, but also its impact on the environment and social inequalities, approaches based on the concept of “sustainable mobility” have helped to undermine the view that individuals are purely rational and that their behaviour can be explained solely by their desire to maximise their utility. They

have allowed researchers to distance themselves from a definition of mobility as a simple demand derived from activities and from an explanation of mobility behaviour that is based solely on trade-offs between financial and time costs [1]. However, the implications of adopting the concept of “sustainable mobility” for the conduct of interdisciplinary research has been little discussed within the transport and mobility research community. Under the pressure of strong social demand, scientific debates have focused more on ways of applying this concept than on studying it. In the field of transportation studies, the work has consisted of examining the advantages and limitations of the different ways of implementing sustainable mobility. In some cases, reviving a technocentric vision of mobility [7,8], they have focused on transport policies that promote a modal shift towards public transport and active modes (reallocating space to public transport, parking controls, road pricing, speed reduction, etc.), urban planning policies that result in a reduction in the distances travelled (densification, mixed-use development, Transit Oriented Development, etc.), technological innovations (improvement of the performance of internal combustion engine vehicles, use of electric, autonomous or shared vehicles), the development of digital technology to reduce travel needs (teleworking, e-commerce) or optimise travel (smart mobility). In the field of mobility studies, research has highlighted the need to take into account the complexity of social behaviours in order to achieve a transition to more sustainable mobility practices: “It can get us beyond the idea that transport “consumers” need to stop driving cars and start taking the bus or riding bikes. There is a recognition that the underlying social organisation of mobility needs to be changed in other ways” [9] (p. 18). Only a few researchers have recently undertaken a reflexive examination of the implications of this concept for interdisciplinarity by drawing attention to the low level of consideration given to socio-political issues (class, gender, ethnicity, etc.) and its very normative nature [10]. They highlight the lack of a critical perspective in research on sustainable mobility and the need to (re-)embed mobility issues within political economy [7,11].

While interdisciplinarity appears to be an inherent feature of this field, which is built around a single research topic, the nature of disciplinary cross-fertilisation (between the engineering sciences, the human and social sciences and the digital sciences, etc.) and the intensity of this cross-fertilisation (multidisciplinary, interdisciplinary, transdisciplinary) [12] have evolved over time. This issue of the nature of interdisciplinarity in the field of transport and mobility research has assumed great importance in recent years as a result of the emergence of the field of mobility studies and the repositioning it has imposed on transport studies. By encouraging all human and social sciences to take up the “new mobilities paradigm” [13], the ambition of mobility studies is to create a “postdisciplinary” [13] (p. 214) or “transdisciplinary” [14] (p. 791) field. Employing innovative concepts and methods, it attempts to bring together disciplines as diverse as anthropology, cultural studies, geography, migration studies, science and technology studies, sociology of tourism, and transport studies: “[...] [W]hat mobilities research does is to break down disciplinary silos and thereby enable us to begin to see the connections across topics and scales [...]” [14] (p. 803). While not all the human and social sciences seem willing to see themselves as part of this paradigm [15], transportation studies have been greatly influenced by the emergence of mobility studies, due to the similarity of the research issues and the way the concept of mobility gained ascendancy over that of transport during the 1990s and 2000s. For example, this has led transport geography to engage in a reflexive examination not only of its place within the humanities and social sciences, but also as a sub-discipline within geography [16,17]. Traditionally closer to transport engineering and transport economics, with which it shares positivist assumptions and methods of data collection and modelling, transport geography has entered into a dialogue with mobility studies. This has resulted in an acknowledgement of their mutual contributions [18–23], and the identification of topics for reflection that could be conducive to interdisciplinarity: The different ways of understanding travel, a better understanding of the methodologies used and the contribution of this body of research to public action [22].

This brief overview of research developments in the field of transport and mobility, due to the adoption of the “sustainable mobility” paradigm and interdisciplinarity, raises questions about the possibilities of developing an interdisciplinary approach to sustainable mobility. How does the

adoption of the concept of sustainable mobility affect the nature of interdisciplinarity in the field of transport and mobility research? Which disciplines and methods should be used to understand it? What cross-fertilisation should be set up? The objective of this paper is to contribute to this thought process. It shows, empirically, how researchers who are specialised in mobility and transport issues, but who belong to different disciplines (anthropology, computer science, economics, geomatics, sociology and urban planning) have sought to build an interdisciplinary research project around the issue of sustainable mobility. This project aims to explore the links between the development of a new way of organising work - coworking -, mobility and sustainability. Coworking spaces, which first appeared in San Francisco in 2005, have spread rapidly throughout the world and represent a new way of organising work based on the sharing of a workspace and a network of workers that encourages collaboration [24]. Within the category of “third places” [25] coworking spaces differentiate themselves through their collaborative dimension. They advocate for inventing new methods of working, which are often less formal, based on exchange, collaboration and co-creativity. In France, the creation of coworking spaces goes hand in hand with a very proactive discourse on the part of the public authorities, who encourage, and even financially support, their development. Their number has increased significantly in recent years: There are currently 1800 coworking spaces in France [26]. The main justification for this support is presumed (but not proven) beneficial effects of coworking in terms of sustainable mobility. By offering workers the opportunity to work close to home, coworking spaces are expected to reduce the negative impacts of commuting (congestion, pollution, etc.) and promote a better work-life balance. According to the French Ministry of Territorial Cohesion, coworking would cut down travel time by one hour and ten minutes per teleworking day; which would represent 5 billion m<sup>3</sup> of CO<sub>2</sub> annually [26]. ADEME, the French Environment and Energy Management Agency, for example, has identified coworking spaces as “immobility solutions” that have the ability to encourage mobility with a “reduced environmental footprint”. Indeed, both mobility plans and coworking are seen as a way of resolving home-to-work mobility problems [27]. The objective of the COWORKWORLDS project is to examine the evidence for the sustainability of coworking in terms of mobility in different geographical contexts. Through the study of this interdisciplinary project, the paper helps to draw attention to cross-fertilisation between disciplines, the issues raised, and the difficulties encountered. As such, it provides an original record that is as faithful as possible to our experience of the practice of interdisciplinary research on sustainable mobility, with its strengths and limitations.

## 2. The Construction of an Interdisciplinary Research Project on Sustainable Mobility

The findings presented in this paper are based on work undertaken as part of an ongoing research project which is being funded by the French National Research Agency for a 36-month period. Known as COWORKWORLDS, it sets out to study the sustainability and spatiality of coworkers’ mobility practices in different geographical contexts (metropolitan areas, medium-sized cities, peri-urban and rural areas), based on an interdisciplinary approach. The project’s key hypothesis is that the sustainability of coworkers’ mobility practices depends on their economic situation (job type, income level, career, etc.), their social position (social category, household type, etc.) and the spatial context (location, residential trajectory). These practices, thus, depend on the job and residential markets, working practices, transportation infrastructures, and social aspirations. The aim of the project is to identify the diversity of these factors and their impact on sustainable mobility based on knowledge of coworkers’ mobility practices, an understanding of the choices that lead to their adoption and a consideration of the spatialities they create. In order to study the sustainability and spatiality of coworkers’ mobility practices, the project developed a methodology that combines qualitative and quantitative methods:

- A database of coworking spaces in the Auvergne-Rhône-Alpes region of France was created, and mapping was performed.
- A qualitative survey was conducted among the creators of coworking spaces. The aim was to better understand their locational strategy and how they take sustainable mobility issues into

account. It was also a way to collect first-hand information about coworkers' profiles and their mobility practices.

- A questionnaire survey about coworkers' working and mobility practices was carried out. The purpose was to collect information about the subjects' socio-economic characteristics (age, gender, place of residence, level of income, etc.) and their working practices (one or several workplaces, coworking space attendance, occupation, etc.) and travelling (daily mobility, business trips, etc.).
- The subjects were observed in two coworking spaces, one in the centre of a metropolis and the other in a small town. The objective was to better understand what coworkers do in coworking spaces in order to improve our understanding of what coworking involves.
- A qualitative survey of coworkers is being conducted. The aim is to place the choice of coworking in a wider context by exploring the workers' professional, family and housing pathways and their attitudes towards sustainable mobility.
- The final step will be devoted to collecting GPS mobility traces for a week by installing an application on coworkers' mobile phones. The aim of this is to consider the spatialities that shape the coworkers' mobility practices with regard to urban sustainability

While, as we have seen, the debates on interdisciplinarity in the field of transport and mobility research have been the subject of numerous publications, no work has been carried out that explains how to implement in practice such interdisciplinarity in the field of sustainable mobility. Based on the limited work that addresses this issue in other research fields [12,28,29], in the COWORKWORLDS project, we have identified three components that are conducive to interdisciplinarity:

- Defining a common research goal which required cross-fertilisation between disciplines and methods from both transportation studies and mobility studies;
- Inclusion within the organisation of the project of a specific task focused on achieving interdisciplinarity; and
- The existence of relationships of trust between researchers from different disciplines.

The project is marked first and foremost by a common focus on research, namely the sustainability of coworkers' mobility practices. Indeed, it was deemed essential to set up a team that could develop a variety of approaches (spatial, social and economic) and methods (qualitative and quantitative). The aim was not only to collect information about coworkers' travel behaviour, but also to take into account attitudes and norms, both of which are important [30]. The COWORKWORLDS project, thus, harnesses the expertise of researchers in the disciplines of anthropology, computer science, economics, geomatics, sociology and urban planning. It provides an opportunity for these researchers to bring their diversity of approaches into play: Planners and geomaticians have developed a spatial approach, the first using qualitative methods and the second, quantitative ones; sociologists have drawn the team members' attention to the contribution of urban sociology and used their methodological skills to obtain real-life accounts; economists have provided their expertise in statistical analysis and knowledge of transport policy. The researchers have applied a variety of methodologies: Descriptive statistics and econometric processing, spatial analysis, digital trace collection and analysis, semi-structured interviews and participant observation. To encourage cross-fertilisation between disciplines and methods, each task in the project has involved researchers from different disciplines and used a variety of methods.

When the project was organised, a specific task was created whose purpose was to develop an interdisciplinary approach. This consisted, for example, of identifying the current state of knowledge at the beginning of the project by asking each researcher to present the contributions of their discipline and to explain them. It also included the organisation of regular meetings to which all the researchers were invited, irrespective of how closely the agenda touched on their work.

Finally, relationships of trust gradually developed between researchers from different disciplinary horizons. These were facilitated by the fact that they share a common focus on research—both its mobility and transport. In addition, many of the researchers belonged to the same laboratory. Although



they had never all worked together, a certain amount of collaboration had already taken place they were all involved in the same research seminar, which was interdisciplinary by its very nature. The COWORKWORLDS project represented an opportunity to implement this cross-fertilisation between different disciplinary approaches.

While the characteristics of this project appear to be favourable to the practice of interdisciplinarity, this is never a given [12]. It is on the basis of the questions raised by contact between the disciplines and methods that its extent can truly be assessed. These questions are presented in the following section, based on the notes taken during the meetings which prepared the response to the call for projects, then during its implementation, as well as in the context of the research seminars.

### 3. Results

#### 3.1. *How Can We Define Mobility?*

One of the first questions we were faced with when we began this interdisciplinary project was what definition of mobility to use. Researchers in economics, geomatics and computer science, whose approaches are more rooted in transport studies, see mobility as moving from point A to point B [20]. Their aim is to quantify trips, to characterise them using a number of indicators (purpose, distance, duration, frequency, transport mode, financial cost, etc.) and to identify the individual determinants of this demand. Naturally, the modalities used to quantify and characterise these trips vary from one discipline to another, particularly between the economists and the computer scientists. In the context of the project, the researchers in these fields consider the mobility of coworkers on the basis of their daily trips, whether for work or other purposes. Researchers who are specialised in spatial and urban planning see mobility first and foremost as spatial. It is a means of understanding the interactions between locations in geographical space, across different spatial and temporal scales (daily mobility, long journeys, residential mobility and migration) [31]. They are, therefore, interested not only in the daily movements of coworkers, but also in their business trips or their choices in terms of residential mobility, or even migration. Moreover, the interactions in question can be physical, through real movements, or virtual, through the practice of teleworking, of which coworking is one form. Finally, researchers in sociology and anthropology, who are closer to the field of mobility studies, examine mobility through its social and spatial dimensions. Their objective is to understand mobility practices, how they are built and interrelate with residential and professional mobility in order to understand how the patterns and practices of daily life are interrelated and erode and reinforce each other [32]. Within the framework of the project, this essentially involves using the life history method to follow the residential, professional and family trajectories of coworkers in order to better understand how they came to adopt coworking, and to highlight the norms and values behind those choices, as well as the constraints that inform them. This method, usually used by sociologists and ethnologists, aims to identify the changes in people's mobility practices that take place throughout their lives, as well as the factors that affect them by describing their occupational, family and housing histories. Analysing this biographical material leads to a better understanding of the changes they have undergone and the factors that are significant in their life story.

In view of the diversity of these approaches, how should mobility be defined in the context of our project? Since the aim is to increase interdisciplinarity, it was decided to adopt a broad definition of mobility, where the different disciplinary approaches are considered in a continuum [22,33]. The mobility practices of the studied coworkers include their daily work-related and non-work-related travel, business trips, residential mobility and life-cycle migration, as well as virtual mobility, i.e., activities carried out at a distance during coworking. This broad definition shows that the links between coworking and mobility can have different meanings. For example, our first results highlight the fact that in metropolitan areas, coworking is often associated with daily mobility issues (choice of transportation mode, changes in travel behaviour, etc.), whereas in rural areas it is more related to life-cycle migration factors (a way of bringing about a certain residential outcome, a lifestyle choice, etc.).

These elements have implications both for research and public action. On the one hand, they are an example of cross-fertilisation between transportation and mobility studies by helping to highlight the different ways of understanding movement [22]. On the other hand, they show that local development policies, as well as transport policies, affect coworking, which can be considered as a new way to attract inhabitants and economic activities to rural areas.

### 3.2. *How Can We Define Sustainability?*

The second question that was raised when the different disciplinary approaches came into contact was how to define sustainability. One of the first areas of discussion involved the environmental, economic and social dimensions of sustainability. Regardless of their discipline, all the researchers involved in the project thought that coworkers' mobility practices have an environmental impact. One of the challenges for the project is to examine the evidence for the environmental sustainability of coworking in different geographical contexts, as coworking could reduce the environmental impact of work-related travel by reducing the distances travelled or by increasing the use of less polluting modes of transportation. In this regard, our preliminary findings point up that rural areas – usually associated with car dependency – can also implement environmentally friendly mobility solutions. For example, some coworking spaces located in these areas offer shared mobility solutions (electric bicycles or cars, cargo bikes, etc.). However, in some cases, the results also highlight the disparity between pro-environmental attitudes and car-based travel behaviour [30].

For the planners, anthropologists and sociologists, an important challenge for the project is also to evaluate the social and economic sustainability of coworkers' mobility practices. Many studies in the social sciences show that the adoption of environmentally sustainable mobility practices is facilitated by the objective advantages enjoyed by the most affluent segments of the population, examples being the possibility of living in the city centre, flexible working hours and sizeable financial resources [7,11,34]. If, for example, coworkers' mobility practices prove to be more environmentally sustainable, is this not ultimately because they belong to this creative [35], urban, mobile, skilled and connected class? In this case, does encouraging coworking because of its virtuous effects on the environment not amount to promoting a mobility solution that can only benefit the most affluent categories of the population and heighten social inequalities? Various methods were applied to identify the socio-economic profile of coworkers. These included those used by the planners, anthropologists and sociologists (semi-structured interviews, life histories), and those used by the economists, who included questions on the socio-economic characteristics of coworkers in their questionnaire surveys. The first results of the survey highlight the diversity of coworkers' socio-economic profiles: While they share some characteristics (a high level of education, being self-employed), their income levels are varied. At the same time, some of the low-income workers we interviewed were thinking about stopping coworking on the grounds of its cost.

The second area of discussion related to the meaning of sustainability. Should the sustainability of coworkers' mobility practices be assessed in terms of individuals or in terms of areas? This debate contrasts the approach of anthropologists and sociologists on the one hand, and that of urban planners on the other. With regard to the environmental dimension of sustainability, anthropologists and sociologists focus, for example, on the mobility practices of coworkers (modes of transport used, etc.) and the extent to which these practices are compatible or incompatible with their environmental awareness. Planners, on the other hand, assess whether these mobility practices are in keeping with a degree of spatial proximity that has less impact on the environment. With respect to the economic and social dimensions, anthropologists and sociologists will, for example, study the residential and professional mobility associated with the adoption of coworking to see whether they belong to upward paths, and whether they are endured or chosen and by whom. Planners, for their part, will analyse the contribution of such residential and professional mobility to the economic and demographic vitality of the areas in question, as a result of the creation of economic activities and the influx of new inhabitants. These different approaches raise the question of the purpose of sustainable mobility, in view of the

fact that the spatial and individual outcomes of sustainable mobility often seem contradictory. In some cases, the mobility associated with coworking may have positive effects on an area (sustainable urban or rural revitalisation), but negative effects on individuals (precarious employment, greater family constraints, car dependency, etc.). The value of the project is to create a dialogue between these approaches, because it is the conjunction of these perspectives that should provide a clearer picture of the complexity of the concept of sustainable mobility. This ties in with the definition of sustainability given by Shove and Walker which includes: “[...] [T]he importance of attending to all requisite elements of practice, to forms of practical know-how, bodily activities, meanings, ideas and understandings, as well as to materials, infrastructures and sociotechnical configurations” [32] (p. 476).

### 3.3. *How Can We Define Coworking?*

The third question raised by the development of an interdisciplinary approach concerns the definition of coworkers, and more broadly of coworking. Should we focus on coworking spaces or coworking practices? Planners, economists, and geomaticians tend to favour a spatial approach, centred on the coworking spaces. This ties in directly with mobility concerns. The aim is to see whether or not working in another workplace, located near their home, can help coworkers reorganise their mobility, and what effects coworking can have on sustainability. This approach is in line with research in the field of transport and mobility on the links between ICTs and mobility (homeworking and telecentres, etc.). The social approach, which examines coworking practices, appeals more to anthropologists and sociologists, and even computer scientists who are interested in coworkers' practices with regard to digital technology. The aim is to understand who these coworkers are, why they have adopted coworking, what this new way of organising work consists of and to place their mobility practices and sustainability within this context. Faced with the diversity of definitions found in the literature and the vagueness of the concept of coworking in practice (possibility of coworking in associations, the subsidiaries of large real estate groups, cafés, hotels, business centres, etc.), we decided to first identify coworking spaces, then to focus on the coworkers working in them. This led us to favour the spatial approach, and to develop a definition of coworking spaces. In the context of the project, these are defined as third places [25] that are in an intermediary position between the home and the traditional workplace, whose main role is to provide users with a workspace that includes shared services, such as meeting rooms and printers, and to encourage interaction and collaboration. This definition has allowed us to identify the coworking spaces in the studied area (Auvergne-Rhône-Alpes): Of the 164 locations claiming to be coworking spaces (cafés, hotels, etc.), 122 were selected and then mapped in order to analyse their geographical contexts. However, the anthropologists and sociologists subsequently suggested that it would be worthwhile to refine this definition, by looking more closely at what coworking encompasses in terms of exchange and collaboration. It was, therefore, decided to add two participant observations, which were not initially a planned part of the project, carried out over a period of six months in two coworking spaces, one located in the centre of a metropolis and the other in a small town.

### 3.4. *How Can We Combine the Different Methods?*

The researchers also discussed combining the methods used by different disciplines. The first issue concerned the conduct of the questionnaire survey, which aims to collect information on coworkers' socio-economic characteristics and work and travel habits. One of the major challenges in obtaining a sufficient number of questionnaires for the survey to be usable. As it was clear from the literature that online co-worker surveys had low response rates, the economists initially opted for a telephone survey, the idea is to outsource the conduct of the survey to a private firm. This firm was tasked with contacting coworking space managers to obtain coworkers' telephone numbers in order to interview them for the survey. Such methods are quite commonly employed by transport economists who often use service providers to obtain sufficiently large samples. However, on the basis of the first qualitative surveys conducted among coworking space managers, the planners and sociologists expressed reservations



about the possibilities of conducting these telephone surveys. As coworking spaces receive a great many calls, from students and journalists, for example, their managers are strongly committed to protecting their coworkers from disturbance. This made them reluctant to give their clients' telephone numbers to a survey company. After discussions between the economists, the planners and the sociologists, it was finally agreed to use more traditional methods. The researchers contacted the coworking spaces directly and gave them the opportunity to participate in a questionnaire survey. Once their agreement was obtained, they personally administered the questionnaire to the coworkers by visiting the coworking spaces. This method made it possible to attain the required number of completed questionnaires—360 were obtained between November 2018 and March 2019 at coworking spaces registered in our database. However, the method proved costly and time-consuming, due to the need to recruit an additional person to administer the survey.

The second issue related to combining the qualitative surveys of coworkers conducted by the anthropologists and sociologists and the collection of digital traces by the computer scientists and geomaticians. The aim of the qualitative surveys was to reconstruct the residential, professional and family paths of coworkers using the life history method and to elucidate the values and representations that underlie their mobility practices. The collection of digital traces aimed to collect the GPS trace, and therefore, the movements, of coworkers over a week by means of an application installed on their smartphone. This method is increasingly used in the field of transport and mobility studies. However, while it collects all movements, it provides little information on their characteristics (purpose, etc.), which is needed in order to interpret the traces, or their time variability. This explains the value of combining this method with semi-structured interviews. Two concerns were raised when the methods were considered side-by-side. The first was identifying the information to be obtained during the interviews in order to interpret the traces. Many discussions were necessary between the anthropologists, sociologists, planners, computer scientists, and geomaticians in order for them to gain an understanding of each other's methods. These discussions reached the conclusion that a series of tests are necessary to identify the information that is required, and these tests are currently in progress. The second concern was the order in which the surveys should be conducted. Should the process begin with the semi-structured interviews or collection of the digital traces? The first solution that was considered was to start by collecting the digital traces, so that at the end of the interview, they could be presented to the respondents in order to elicit their reactions. However, after several attempts at drafting the interview guidelines, it proved difficult to reconcile the objectives of the two methods. Furthermore, contacting coworkers with a proposal to participate in a survey protocol that was deemed to be intrusive could result in a large number of refusals. It was, therefore, decided to do this in two phases: First, conducting the life story interview with the coworkers, and asking them at the end if they would agree to be part of a digital trace collection operation, then conducting the digital trace collection and recontacting the respondents by telephone to elicit the missing information needed to interpret the traces.

#### 4. Discussion

Our presentation of the questions raised by the implementation of this research project has suggested three avenues for reflection when attempting to develop interdisciplinary approaches to sustainability in the field of transport and mobility.

The first relates to the importance of defining the terms used by researchers from different disciplines. The key role of language in the practice of interdisciplinary research has already been underscored, particularly in the context of dialogue between the natural sciences and the human and social sciences [36]. However, initially one might think that this recommendation does not apply to a narrower field of research, such as transport and mobility. In this field, those involved in research deal with (almost) the same topics, and adopt an approach that claims to be interdisciplinary. However, the questions raised in the COWORKWORLDS project show that, depending on the discipline, the concepts commonly used in this field, such as mobility or sustainability, do not have the same meaning

and need to be explained in order to avoid ambiguities or misunderstandings. This stems from the fact that there is little agreement on the exact meaning of sustainable mobility in the context of research on transport and mobility [5]. It highlights the need not only to define the concept of sustainable mobility as such, but also how to conduct research into it. This need to define terms seems particularly important when research in transport and mobility is concerned with the practical application of interdisciplinarity and is open to other disciplinary fields, such as the digital sciences. Furthermore, working on a common definition of sustainable mobility can help to further the dialogue that has been initiated between transport and mobility studies [18–23].

The second avenue for reflection concerns time management when developing interdisciplinary approaches. At the collective level, implementing these approaches requires more time than traditional research: Time to explain the concepts and methods used by each discipline, time for negotiation, time for coordination, time to discuss the results and the strategy for exploiting them, etc. However, the current funding mechanisms for research projects may not yet make sufficient allowance for this additional time, despite strong calls for the pursuit of interdisciplinary research. In the field of research on transport and mobility, projects are generally funded for a period of 12, 24 or 36 months. These periods are quite short in view of this need for additional time for interdisciplinary work, especially when projects involve time-consuming qualitative methods. How can this reflexive attitude be maintained throughout the project when it is necessary, at the same time, to implement the different survey phases, engage in communication activities in connection with the project, write reports and disseminate the results within the academic sphere and among the social and economic community? At the individual level, the implementation of these interdisciplinary approaches also requires researchers to make an additional time investment. Interdisciplinarity is about being able to understand each other and needs clear objectives on all sides [29]. It requires a reflexive examination of one's own disciplinary practices, an effort to familiarise oneself with the concepts and methods of other disciplines, availability to participate in projects that are not necessarily central to one's own research. However, in a system where researchers' publications and career evaluations are still discipline-based, the question of return on investment may arise. The problem of the recognition of interdisciplinary publications in some disciplines is a case in point: While in some disciplines these publications will be counted, in others, where the journals are strongly focused and ranked, they will not. Under these circumstances, why should a researcher spend time on such publications?

The third avenue for reflection relates to the need to carry out further work on the implementation of interdisciplinarity in the field of research on transport and mobility. As we have shown, an increasing number of publications deal with the issue of interdisciplinarity and the need to develop a deeper dialogue between transportation studies and mobility studies [22]. However, so far, little work has been done on how to implement this interdisciplinarity in the field of transport and mobility research. This is the area in which this paper has sought to make a contribution, by describing the experience of the COWORKWORLDS project. It has brought together, with a common research focus, a team of researchers from different disciplines who continue to engage in dialogue within the framework of the project, to combine quantitative and qualitative methods and to provide a multidimensional perspective on mobility and sustainability. However, this first phase of the project was also marked by the need to rapidly implement the various field surveys in order to meet the research deadlines, which left little room for reflexivity. It is undoubtedly in the next phase, when the results will be pooled, that the project will become genuinely interdisciplinary in nature.

**Author Contributions:** Conceptualisation, P.L. and A.F., N.O. (Nathalie Ortar), N.O. (Nicolas Ovtracht), S.S.-L., R.S.; methodology, P.L. and A.F., N.O. (Nathalie Ortar), N.O. (Nicolas Ovtracht), S.S.-L., R.S.; investigation, P.L. and A.F., N.O. (Nathalie Ortar), N.O. (Nicolas Ovtracht), S.S.-L., R.S.; writing—original draft preparation, P.L.; writing—review and editing, P.L. and A.F., N.O. (Nathalie Ortar), N.O. (Nicolas Ovtracht), S.S.-L., R.S.; supervision, P.L.; project administration, P.L.; funding acquisition, P.L.

**Funding:** This research was funded by the French National Research Agency (ANR), grant number ANR-17-CE22-0004. The funders had no role in the design of the study; in the collection, analyses or interpretation of data; in the drafting of the manuscript, nor in the decision to publish the results.

**Conflicts of Interest:** The authors declare no conflict of interest.

## References

- Banister, D. The sustainable mobility paradigm. *Transp. Policy* **2008**, *15*, 73–80. [CrossRef]
- Hickman, R.; Hall, P.; Banister, D. Planning more for sustainable mobility. *J. Transp. Geogr.* **2013**, *33*, 210–219. [CrossRef]
- Low, N.; Gleeson, B. *Making Urban Transport Sustainable*, 1st ed.; Palgrave Macmillan: New York, NY, USA, 2003. [CrossRef]
- May, A.D. Urban transport and sustainability: The key challenges. *Int. J. Sustain. Transp.* **2013**, *7*, 170–185. [CrossRef]
- Bulckaen, J.; Keseru, I.; Macharis, C. Sustainability versus stakeholders preferences: Searching for synergies in urban and regional measures. *Res. Transp. Econ.* **2016**, *55*, 40–49. [CrossRef]
- Mobile Lives Forum. Available online: <http://en.forumviesmobiles.org/video/2013/02/12/sustainable-mobility-definitions-concepts-and-indicators-622> (accessed on 13 September 2019).
- Kęłowski, W.; Bassens, D. All transport problems are essentially mathematical: The uneven resonance of academic transport and mobility knowledge in Brussels. *Urban Geogr.* **2017**. [CrossRef]
- Gössling, S.; Cohen, S. Why sustainable transport policies will fail: EU climate policy in the light of transport taboos. *J. Transp. Geogr.* **2014**, *39*, 197–207. [CrossRef]
- Sheller, M.; Urry, J. Mobilizing the new mobilities paradigm. *Appl. Mobil.* **2016**, *1*, 10–25. [CrossRef]
- Green, J.; Steinbach, R.; Datta, J. The travelling citizen: Emergent discourses of moral mobility in a study of cycling in London. *Sociology* **2012**, *46*, 272–289. [CrossRef]
- Reigner, H.; Brenac, T.; Hernandez, F. *Nouvelles Idéologies Urbaines. Dictionnaire Critique de la Ville Mobile, Verte et Sûre*, 1st ed; Presses Universitaires de Rennes: Rennes, France, 2013.
- Stock, P.; Burton, R.J.F. Defining Terms for Integrated (Multi-Inter-Trans-Disciplinary) Sustainability Research. *Sustainability* **2011**, *3*, 1090–1113. [CrossRef]
- Sheller, M.; Urry, J. The new mobilities paradigm. *Environ. Plan. A* **2006**, *38*, 207–226. [CrossRef]
- Sheller, M. The new mobilities paradigm for a live sociology. *Curr. Sociol. Rev.* **2014**, *62*, 789–811. [CrossRef]
- Ortar, N.; Salzbrunn, M.; Stock, M. *Migrations, Circulations, Mobilités. Nouveaux Enjeux Épistémologiques et Conceptuels à L'épreuve Du terrain*, 1st ed.; PUP: Aix-en-Provence, France, 2018.
- Shaw, J.; Sidaway, J.D. Making links: On (re)engaging with transport and transport geography. *Prog. Hum. Geogr.* **2011**, *35*, 502–520. [CrossRef]
- Schwannen, T. Geographies of transport 1: Reinventing a field? *Prog. Hum. Geogr.* **2016**, *40*, 126–137. [CrossRef]
- Grieco, M.; Urry, J. *Mobilities: New Perspectives on Transport and Society*, 1st ed.; Ashgate: Farnham, UK, 2012.
- Prytherch, D.; Cidell, J. Introduction: Transportation, Mobilities, and Rethinking Urban Geographies of Flow. In *Transport, Mobility and the Production of Urban Space*; Cidell, J., Prytherch, D., Eds.; Routledge: London, UK, 2015; pp. 19–41.
- Cresswell, T. Mobilities I: Catching up. *Prog. Hum. Geogr.* **2011**, *35*, 550–558. [CrossRef]
- Knowles, R.D.; Shaw, J.; Docherty, I. *Transport Geographies: Mobilities, Flows, and Spaces*, 1st ed.; Oxford: Blackwell, UK, 2008.
- Shaw, J.; Hesse, M. Transport, geography and the 'new' mobilities. *Trans. Inst. Br. Geogr.* **2010**, *35*, 305–312. [CrossRef]
- Hall, D. Transport geography and new European realities: A critique. *J. Transp. Geogr.* **2010**, *18*, 1–13. [CrossRef]
- Gandini, A. The rise of coworking spaces: A literature review. *Ephemera* **2015**, *15*, 193–205.
- Oldenburg, R. *The Great Good Place: Cafes, Coffee Shops, Bookstores, Bars, Hair Salons, and Other Hangouts at the Heart of a Community*, 1st ed.; Paragon House: New York, NY, USA, 1989.
- Levy-Wailtz, P. *Faire Ensemble Pour Mieux Vivre Ensemble. Rapport de la Mission Coworking: Territoires, Travail et Numérique*; CGET: Paris, France, 2018.
- Esztergár-Kiss, D.; Tettamanti, T. Stakeholder Engagement in Mobility Planning. In *Autonomous Vehicles and Future Mobility*, 1st ed.; Coppola, P., Esztergár-Kiss, D., Eds.; Elsevier: London, UK, 2019; pp. 113–123. ISBN 9-78012-817-6962.

28. Bark, R.H.; Kragt, M.E.; Robson, B.J. Evaluating an interdisciplinary research project: Lessons learned for organisations, researchers and funders. *Int. J. Proj. Manag.* **2016**, *34*, 1449–1459. [[CrossRef](#)]
29. Sumpf, P.; Büscher, C.; Claudot, P.; Jeuken, Y.; Mnich, C.; Mourik, R.M.; Ortat, N.; Robison, R. *SHAPE ENERGY Reflexive Review of Interdisciplinary Working*; SHAPE ENERGY: Cambridge, UK, 2018.
30. Von Behren, S.; Minster, C.; Magdolen, M.; Chlond, B.; Hunecke, M.; Vortisch, P. Bringing Travel Behavior and Attitudes Together. An Integrated Survey Approach for Clustering Urban Mobility Types. In Proceedings of the 97th Annual Meeting of the Transportation Research Board (TRB 2018), Washington, DC, USA, 7–11 January 2018.
31. Gallez, C.; Kaufmann, V. Aux racines de la mobilité en sciences sociales. In *De L'Histoire des Transports à L'Histoire de la Mobilité*, 2nd ed.; Flonneau, M., Guigueno, V., Eds.; Presses Universitaires de Rennes: Rennes, France, 2009; pp. 41–55.
32. Shove, E.; Walker, G. Governing transitions in the sustainability of everyday life. *Res. Policy* **2010**, *39*, 471–476. [[CrossRef](#)]
33. Cresswell, T. Towards a politics of mobility. *Environ. Plan. D* **2010**, *28*, 17–31. [[CrossRef](#)]
34. Coulangeon, P.; Petev, I. A Case Study of the Carbon Footprint of Individual Transportation Practices in France between 1981 and 2008. In Proceedings of the Annual Meeting of the American Sociological Association, New York, NY, USA, 9 January 2013.
35. Florida, R.L. *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life*, 1st ed.; Basic Books: New York, NY, USA, 2002.
36. Bracken, L.J.; Oughton, E.A. 'What do you mean?' The importance of language in developing interdisciplinary research. *Trans. Ins. Br. Geogr.* **2006**, *31*, 371–382. [[CrossRef](#)]



© 2019 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).