*Auto*mobility Beyond Car: Introducing a New Coordinate System for Transforming Urban Mobility

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ABSTRACT

How is the future of *automobility* imagined today? What has structured such *imaginary*? And what levers can steer its evolution towards a Post-Car World? These very three questions form the foundational motivations of this thesis.

First, through a historical overview, I explore and analyze a selected corpus of verbal and visual discourses that have contributed to how we think of car, how we think of a transition from it, and interrelatedly how it is placed in our cities. An oppositional relation against walking seems to majorly explain the changing position of car. The comfort, speed, and privacy of car have been put against the effort, slowness and sociability of walking. By tracing the shifting values of these qualities, I detect and depict the evolution of car-pedestrian imaginaries.

Second, two series of encounters with urban actors–urban experts and inhabitants– were conducted. (1) Interviewing eight urban experts (active practitioners in the field of urbanism), I quest for their assessment of the current "weak signs" of transition from car in urban space, their vision for its future in various urban forms, as well as the perks and perils of emerging technologies, as mobility's "wild cards". The transversal analysis of the interviews, using the theory-generating methodology (Bogner and Menz 2009), results in a set of extracted themes, common threads, visionary strategies, as well as contextualized tools. (2) In a Focus Group composed of eight inhabitants of the territory of *Arc Lemanique* Lausanne-Geneva area, the participants discussed various post-car scenarios that we had developed over the course of two Teaching Units held at EPFL's school of Architecture. The analysis of the transcribed discussions revealed some of the salient motivations and impediments towards a post-car world. Cross-referencing the participants' lifestyles with their expressed views indicates a dissociation of inhabitants' daily practice of car mobility from their ideal of a mobile lifestyle. Considering the role of urban projects as a mediator, I confront the experts' representations, ideas and references with the discourses of the inhabitants. As city is increasingly to be approached as a "work without author", urban project (scenarios, visions, plans) becomes a *dispositif* of exchange and discussion, animating a process in which imaginations, assumptions, desires, and insights are exchanged, becoming the telltale of imaginaries rather than prescription for cities and territories.

Third, I propose three conceptual axes along which the questions of post-car mobility, are reformulated. Such reformulation, I discuss, not only can act upon the imaginaries, but also have

implications for urban projects. The notions of *Effort*, *Agility*, and *Vehicular Units* are presented and shown that together can create a "coordinate system" in which mobility discourses go beyond the previously mentioned polarities of car-pedestrian, towards values that set in-between, in order to reinvent the "auto" mobility for a more sustainable future. I present each axis in extent, situate them within the context of their emergence, and argue for their relevance and potentials.

Finally, I argue for broadening the development of these three notions into cogent and cohesive analytical forces to constitute major axes of transformation capable of engendering new sets of understandings and discourses – new imaginaries.

Keywords
automobility, car mobility, post-car world, imaginary, futures, *effort*, *agility*, *vehicular unit*.

RÉSUMÉ

Comment l'avenir de *l'automobilité* est-il imaginé aujourd'hui? Qu'est-ce qui a structuré un tel imaginaire? Et quels leviers peuvent orienter son évolution vers un monde post-car? Ces trois questions constituent les motivations fondamentales de cette thèse.

Tout d'abord, à travers une étude historique, j'explore et j'analyse un corpus de discours verbaux et visuels qui ont contribué à la façon dont nous concevons l'automobile, comment nous envisageons une transition à partir de celle-ci et quelle place elle occupe dans nos villes. Le changement de statut de la voiture semble dépendre pour beaucoup de l'évolution de l'opposition entre la voiture et la marche. Le confort, la vitesse et l'intimité de la voiture ont été mis en opposition avec l'effort, la lenteur et la sociabilité de la marche. En retraçant les oppositions de valeurs liés à ces qualités, je détecte et décris l'évolution des imaginaires piétons et automobiles.

Deuxièmement, j'ai organisé deux séries de rencontres avec des acteurs de la ville – des experts et des habitants. (1) En interrogeant huit experts (des professionnels actifs dans le domaine de l'urbanisme), je cherche à connaître leur appréhension des "signaux faibles" relatifs à la transition de l'automobile dans l'espace urbain, leur vision de l' avenir de différentes formes urbaines, ainsi que les avantages et les risques des technologies émergentes, en tant que "wild cards" de la mobilité. L'analyse transversale des entretiens, basée sur la méthodologie de la « génération théorique » (Bogner et Menz 2009), permet d'identifier un ensemble de thèmes, de fils communs, de stratégies visionnaires et d'outils spécifiques. (2) Dans le cadre d'un Focus Groupe composé de huit habitants du territoire de l'Arc Lémanique Lausanne-Genève, les participants ont discuté de différents scénarios post-car que nous avons développés au cours de deux Unités d'Enseignement de la Section d'Architecture de l'EPFL. L'analyse des leur discours a permis de relever certaines des motivations et des obstacles les plus saillants face à la perspective d'un monde post-car. En croisant les modes de vie des participants avec leurs opinions exprimées, on constate une dissociation entre leur pratique quotidienne de la mobilité automobile et leur style de vie mobile idéal. Considérant le rôle de médiation des projets urbains, je confronte les représentations, les idées et les références des experts aux discours des habitants. Si la ville se doit d'être abordée de plus en plus comme une "œuvre sans auteur", le projet urbain (scénarios, visions, plans) devient un dispositif d'échange et de discussion, animant un processus d'échange d'imaginaires, d'hypothèses, de désirs et d'intuitions, devenant le révélateur de l'imaginaire plutôt que un instrument de prescription pour les villes et les territoires.

Troisièmement, je propose trois axes conceptuels sur lesquels s'articulent les questions de la mobilité post-car. Je fais l'hypothèse qu'une telle reformulation peut non seulement agir sur les imaginaires, mais aussi avoir des implications pour les projets urbains. Les trois notions *d'Effort*, *d'Agilité* et d'*Unités Véhiculaires* sont présentées. Ensemble, elles créent un "système de coordonnées" dans lequel les discours sur la mobilité dépasse les anciennes polarités qui opposaient voiture-piéton analysées précédemment, vers des valeurs qui se situent au delà, afin de réinventer la "auto" mobilité pour un avenir plus durable. Je présente chaque axe dans son étendue, je les situe dans le contexte de leur émergence, et je mets en avant leur pertinence et leur potentiel.

Enfin, je plaide pour le développement de ces trois notions comme catégories analytiques fortes et cohésives (ou transversales) pour constituer un cadre conceptuel majeur de transformation, capable d'engendrer de nouvelles appréhensions et de nouveaux discours - de nouveaux imaginaires.

Mots clés
automobilité, voiture, mobilité, post-car, imaginaire, futures, *effort*, *agilité*, *unité véhiculaire*.

To my parents

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"Humble Sea Squirt, rudimentary animal with a basic nervous system, swims around the ocean in his juvenile life. At some point through life it implants itself in a rock. The first this it does after implanting in a rock, which it never leaves, is to digest its own brain and nervous system for food. When you don't need to move, you don't need the luxury of that brain!"

Daniel Wolpert (2011).
Neuroscientist and engineer, professor in University of Cambridge

1. INTRODUCTION

We live in a mobile world with increasingly mobile individuals, as the per capita mobility is steadily growing not only in developed countries but also in developing ones (Schäfer et al. 2009). In Switzerland, more than 129 billion person-kilometrs distance was covered in 2015, on road and by rail, 74.4% of which was accounted for private motorized transport that is 23km per day per person (FOS 2017). Car, statistically, is still the most predominant means of transport in Switzerland and in the world.

However, "more than ever, the ways that people move in the next few decades will have implications for energy use, global politics, and in general the future of life upon earth." (Dennis and Urry 2009:109). In this context, the clear dominance of cars in terrestrial transport makes them the single most source of energy use (Urry 2004) and the most fatal one, as well. Transportation is the fastest growing source of energy-related greenhouse gas emissions, and within this sector, motorized transport is the main component (Schäfer et al. 2009).

During the last few decades the negative externalities of car mobility have been repeatedly acknowledged and have dominated the discourses on mobility and urbanity. Critiques on car are as old as the car itself, however they have been varying in their strength and their focal point. Changing from the safety issues during the first decades of car, to the spatial and social concerns beginning in the late 50s, which triggered the theorizations and consideration of the notion of Public Space. This was followed by energy concerns during the oil crisis in 1970s and awareness on ecological externalities of car that is being more pressing than ever today, mobilizing global political action. Today, the environmental concerns, on one hand, and urban comfort and quality of urban life on the other, dominate the discourses against car and guide the strategies of shift. While the increasing ecological consciousness has been a substantive factor in pushing the trends to reduce car-use, other structural factors around the culture of urbanism were as forceful. Car-reduction measures, "road diet" policies, and pedestrianisations, together with revival of public transport in the past few decades have launched and reinforced a notable shift in mobility practices.

Several indicators such as reduction in car ownership per household, increasing modal share of alternatives to car (walking, public transport, cycling), as well as increasing lack of interest in obtaining driving license suggest a transition from car and raises the question on its future. In Switzerland for example, although marginally, the overall household car ownership –in all territories– decreased comparing to a decade ago

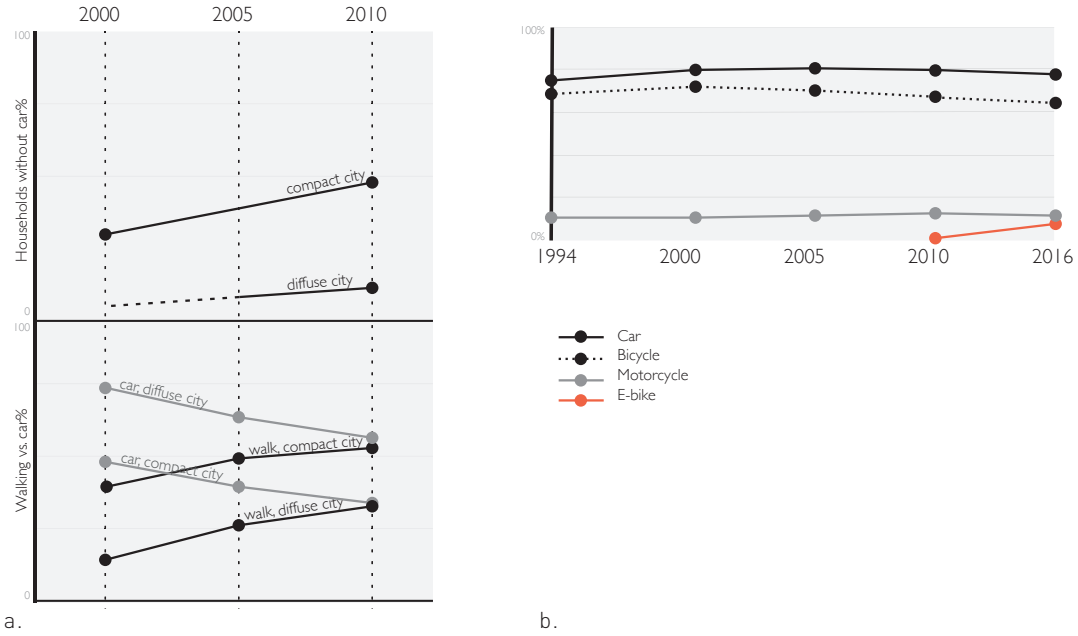


Fig 1. a) Evolution of modal share of walking versus car mobility in canton Geneva, in city and in the larger territories (MRMT 2010), b) Evolution of household vehicle ownership in Switzerland, share of households with one or more vehicles in the respective categories (FSO 2017).

(FOS 2017). This is while in cities, for example in Lausanne and Geneva, the trend is bolder, and families are increasingly abandoning cars in favor of pedestrian metrics and public transport (Fig 1). Questioning the future of car, supposes a rupture in the self-expansive perpetuating *Automobility* that places car at the center of interrelated systems of industries, cultures, and economies. Urry's conceptualization of the "system of automobility" explains its specific character of domination and its stability due to restructurings of time and space that generates the need for more cars. Nevertheless, the possibility of tipping the car system – through a series of interdependent changes – into a "post-car" and to provoke a shift beyond automobility is not excluded. (Urry 2004).

Post-Car World: an interdisciplinary inquiry into future

This thesis is a subset of the project *Post-Car World, A Trans-Disciplinary Multi-Dimensional Simulation,* which has sought to be a broad inquiry into the future of mobility through the role of car. Post-Car World is directed by Professor Jacques Lévy and brings together different disciplines and institutions. It is organized between EPFL, ETH, and USI. The initial observation motivating the PCW has been the above-mentioned emergence of contradictory new trends, attesting a loss of interest for the car in many fringes of the population in the developed world, and confirming a limited but visible movement from car particularly in the big metropolises. Post-Car World, therefore, is grounded in the assumption that these "weak signals of change" in mobility practices might be symptomatic of a thorough transition from car towards alternative systems. In *Futures Studies,* "weak signals" are understood as noisy, early indicators of change in trends and systems, sometimes still too incomplete to permit an accurate estimation of their impact, that can nevertheless constitute informational material for enabling anticipatory action (Mendonça et al. 2004; Hiltunen 2008).

To investigate the week signs of change in practices of mobility, simulating the future to better understand the present, PCW proposed three subprojects: A) "Inhabitants Expectations", B) "Transport Supply", and C) "Territorial Configurations". In parallel, the three subprojects have been progressing since Fall 2013, the results of which have been presented as scientific publications, and PhD theses. In the following, after a brief pass over the objectives of subproject A and B, I'll describe the contribution of this thesis to subproject C.

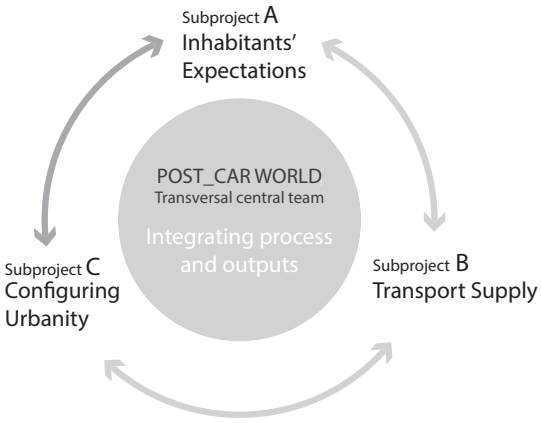


Fig 2. Post-car world organization of subprojects and tasks.

A) Inhabitants expectations[1]**,** takes the expectations of ordinary actors as a key indicator of the future trends in a democratic society. This has been done through a series of biographical interviews with inhabitants of major Swiss agglomerations, questioning their practices, preferences and mobility aspirations for the future. **B) Transport supply**[2], carries out an inquiry into innovations in terms of new transport supply, how to design an emerging continuity of movement when the pedestrian becomes the central piece of the system. **C) Territorial configurations**[3], within which the current research thesis is conducted, focuses on the urban implications of a post-car world. This is accomplished, by (1) looking into the urban projects and urban visions, evaluating the existing imaginations of a post-car world, and (2) scenario development, configuring various spatial and social consequences of the hypothesis of a radical reduction in car mobility. Sub-project C, therefore, scrutinizes on the possibility of the inversion of the urban paradigm, and whether the infrastructures that have supported the networked social and urban practices (practices freed from the constraint of distance) could contribute to establishing a new spatial platform for cities.

Although the question applies to different urban forms, by taking the territory of *Arc Lemanique* in Switzerland – the segment between two major cities of Geneva and Lausanne– as the reference territory for developing scenarios, Sub project C has opted to address the low-density urbanity rather than focusing on urban centers. This is because first, the instruments of car reduction, in terms of urban projects, regulations, and infrastructures supporting alternative means of mobility are much less developed in the in-between territories. Second, the above-mentioned trends, although existing, but are much more modest in such territories comparing to cities. Therefore, by focusing

[1] Led by Rico Maggi (IRE, USI), Jacques Lévy (Chôros, EPFL), Vincent Kaufmann (LaSur, EPFL), Jerôme Chenal (CEAT, EPFL).

[2] Led by Kay Axhausen (IVT, ETH) and Michel Bierlaire (TRANSP-OR, EPFL).

[3] Led by Elena Cogato-Lanza (Lab-U, EPFL), Monique Ruzicka-Rossier (Chôros, EPFL).

on the emblematic territories of automobility, we aimed to sketch out the territorial reconfigurations for a **hypothetical** post-automobility.

Within such composition, the current thesis, while engaged in scenario development, specifically focuses on the **imaginations** of the post-car world, both from the disciplinary perspective of the urban projects, configuring the spaces of the future, as well as the inhabitants' points of view. In that, it assumes a transversal role between sub-projects and the disciplines, investigating the overarching theme of ***imaginary***. More specifically the thesis focuses on the imaginary of car as it has been shaped through its oppositional relation to the pedestrian. Looking into how car and pedestrian were constantly pitted against each other in their fight over time and space in the city, as well as in the theories, projects, and representations of the city. Therefore, sketching the basis of PCW implies confrontation with this century-long opposition, questioning the place of the pedestrian where its opposition with car is not setting the basis of reflections and projects of mobility.

Images and "imaginaries" of Post-Car World

Car has been repeatedly acknowledged as more than just a means of transportation, representing the symbolic realms of autonomy, status, and excitement (Flink 1976; Miller 2001; Wollen and Kerr 2002; Sheller and Urry 2000; Conley and McLaren 2009). Its has been described and communicated as "magical objects laden with symbolic meanings" (Conley and McLaren 2009), consumed in image if not in usage (Barthes 1957), with one simple function that is moving and many complicated ends such as appearance and comfort (Le Corbusier 1923:108). The rich imagery of car explains its dominance beyond the utilitarian imperatives of travel, and beyond its unbeatable flexibility, which is marked also by strong coerciveness.

Overtaking the pedestrian, car, as the protagonist and the core element of spatial urban visions during the last century, has generated dynamic and sometimes contradictory *imaginaries* – characterized both by extreme mechanization of urban landscapes or by an intimate relation with nature, considered as the instrument for democratization of movement or privatization of public space, immensely flexible and wholly coerceive. The qualities and attributes of its experience and its environments were defined and established in comparison and in contrast with what was before the pedestrian city. Hence, its dynamic imaginaries, for the most part, correspond to the changing values and qualities with which car and its antagonist, pedestrian, have been associated.

In a systemic approach to the problem of car, as proposed by Sheller and Urry (Sheller and Urry 2000), within the complex amalgam of interlocking elements constituting the *automobility*, a considerable place is attributed to the imagery of car, its symbolic meanings and the sign-values accompanying it. In a more general perspective, meanings constitute an indispensable dimension of mobility. Tim Cresswell (Cresswell 2006) explains any (physical) mobility as a combination of movement in space, the way it is practiced, and the meanings associated with it. Such triad suggests that the meanings of mobility influence and are influenced by spaces on one hand and spatialities (practices) on the other. In this direction, we can hypothesize that a transition in the meanings and representations of car can contribute to breaking with the car cycle, and therefore, an inquiry into the future of mobility must involve questioning the transitions in imaginaries of car.

Employing the term *imaginary* –borrowed from French[4] and defining its constituting elements (in Chapter 2) this research attempts at probing imaginaries of transition from car. Looking into the discourses of urban experts (their representations, ideas, references), and confronting it with the discourses of the inhabitants, it discusses the role of urban projects as the mediator in between. As city is increasingly to be approached as a "work without author", the participatory planning is becoming mainstream. Urban project, therefore, becomes a *dispositif* of exchange and discussion, animating a process in which imaginations, assumptions, desires, and insights are exchanged, becoming the telltale of imaginaries rather than prescription for cities and territories. Therefore, focusing on urban project (scenarios, visions, plans) I aim at establishing a link between expert and popular imaginary, with the ultimate objective of identifying levers of action to impact the imaginary.

Research questions

Within such framework, starting from the hypothesis that the contraposition of car against the pedestrian has all along marked the imaginary of car and that it has been a dynamic and unstable opposition with shifting values and changing significations associated with each side, this research sets to identify emerging imaginaries of post-car and its renewed relations to the city, mobility, and the pedestrian. By looking into projects and projections of the urban actors – experts in the field of urbanism and inha-

[4] I will explain, in length, in Chapter 2 that in philosophy and social sciences *l'imaginaire* appears as a recent subject of scrutiny and reflection. While the adjective "imaginaire" in French literature is recurrent since at least 16th century, the exploration of the concept, as a dimension of society –as a noun– has flourished during the last few decades (Legros 2006). In English, however, despite the publications and theoretical reflections on the subject (e.g. translation of Castoriadis 1987; Taylor 2003) *"imaginary"* lacks an entry as a noun in most dictionaries, and the use of the term is less recurrent.

bitants of the referenced territory – it attempts to provide some answers to the following questions:

- To what extend urban experts are accounting for the limited but visible transition from car-dominated systems towards alternative models in which the individual-motorized mobility is not central? Are the above-mentioned new practices in mobility considered as symptoms of a thorough transition from car?

- Accounting for the changing context of cities (social and spatial), what are the new frameworks of the urban project and urban action that can support a transition from car? What are the new collective imperatives and values?

I will, therefore, question the place envisioned for the car in the city of future. This question applies to different urban forms, urban centers but also and more importantly the territories of dispersion, where the physical constraints of distance and time have traditionally enforced car use. Identifying the perceived hurdles towards a post-car perspective, I question what does "post" imply, in terms of content, concepts and methods of the project?

Further, from the point of view of the inhabitants, what are the links between mobility, urbanity and public space and where does car stand? What are the imagined constraints and advantages of PCW? The response to the above-mentioned questions inevitably involves a historical approach.

To grasp the dynamic character of the imaginary of (post) car today, it is essential to look backward on its evolutive trajectory and question how its indeterminate boundaries have been formed and reformed in the past. Deconstructing the oppositions in the discourses and the representations of car/pedestrian through the history of car, I detect emerging qualities, over and above the traditional oppositions such as speed and slowness. I propose that by opportunistically seizing upon these early signs within urban projects, proposing new theoretical frameworks, we can contribute significantly to tipping the car system into a post-car.

Methodology and structure

The structure of this dissertation follows and reflects the adopted methodologies. Simultaneously, as I describe the methodology of the research, I also chart the structure of the document. Following this introduction, **Chapter 2** proposes a literature review of the three parallel themes, "About car", "Walking", and the notion of "Imaginary".

These will come together in the last part, sketching elements of the imaginary of car and pedestrian. ***About Car***, reviews the state of the art on car, its impacts, and its related concepts transversally within transport and urban studies and sociology of mobility. The second section, "Walking: retrospect and prospect" proposes a review of walking as a subject of scientific study and its centrality in sciences and writing of the city. It examines a historical perspective into the meanings associated with the pedestrian through its two moments of revival: first, with the arrival of train and second with critiques of car. The third section presents a literature review on the notion of *imaginary***.** It presents the challenge to construct a scientific research on the grounds of a notion that proves to be, implicit, or unintended force that nevertheless has strong agency in shaping social and geographic worlds. Building upon a selected literature it identifies interrelated elements of imaginary, proposing an interpretive framework for imaginary within mobility studies. This is followed by a perliminary investigation on representations, images, and imaginaries of car and pedestrian during the last century, which sets the basis for a historical overview in the next chapter.

1- Historical Overview

Chapter 3 adopts a historical approach based on a visual corpus and a selective bibliographic corpus between different disciplines that have reflected and contributed to the city/mobility relation. Motivated by the initial investigation that attested the antagonism of car and pedestrian in the imagery, discourses and projects along the twentieth century, this chapter reconstructs the history of such oppositions. The first part looks into an array of materials, from how car was represented in public debates, to how it was theorized within urban projects and urban texts, and traces the opposing components in the discourses. While car and pedestrian were constantly theorized as antagonists, values and qualities associated with each side have constantly shifted. The second part probes these shifts, meanings, values, qualities that have been confronted with each other, and how they have transformed through the time. The objective is to identify and synthesize the corpus of influential foundational publications, which have considerably impacted the profession of urbanism, going through different cycles of dynamic imaginaries. The outcomes demonstrate how matters go from competition, humiliation and mockery in early discourses on public order and right of way, to systematic division in urban projects and urban visions of the functional city, and hence how the issue has led to the generation of strong spatial consequences. The contention endures beyond critiques of functionalism, and the discourses turn into a language of revolt and guerilla warfare, involving the pedestrian's attempt to win back the street.

The last section, presents a collateral finding of the research that explains the emergence of the notion of public space as a corollary of critiques of car. Looking into the early writings where the question of urban public space is put forward, its coincidence with the critiques of car and spaces produced by car comes to light. The notion of public space, characterized as space of pedestrian, today becomes a central theme of the urban debates, animating and guiding the urban projects.

2- Futures

Chapter 4 looks into the future by the means of two series encounters with urban actors: 1) a series of semi-structured interviews with urban experts, 2) a Focus Group organized with the inhabitants on the basis of the developed post-car scenarios addressing their territory of residence.

a) Imaginaries: Urban Experts

Attempting to detect and depict the professional imaginaries of post-car, its presence and strength within the urban frameworks, I conducted a series of semi-structured interviews with experts in the field of urbanism. In this regard, my purposive sampling consists of a selected number of experts within the referenced geographic boundaries of PCW project, and based on their professional affinity with the theme of post-car, attested by their projects.

To do so, I adopt the theory-generating expert interview methodology, based on Bogner, Littig, Menz (2009) methods. Aiming at confronting the theme of future, this research concerns issues about which knowledge is uncertain by nature. Therefore, rather than "objective" matters and concrete facts, interviews attempt to "make an analytic reconstruction of the subjective dimension of expert knowledge" (Bogner and Menz 2009). This knowledge is essentially of action and experience and is derived from experts' practices. The interviews, therefore, were designed to focus on urban projects often developed by experts themselves, whose approach involved a reduction in car mobility or significantly contributed to it, as any project contains an idea of future, and therefore implies taking a position with respect to the future. A general interview guideline was prepared in four principal axes: Present Condition, Future Vision, Beyond Compact City, and Transformations of Car. Interviews, presented in the form of a continuous narrative, provide an inventory, containing experiences of cities, ideas and projections in transition from car.

The analysis of the data, following Littig (2013) expert interview guideline, consists of iterations of reading of the transcriptions, accompanied by concept extraction for each individual interview. This was followed by a transversal analysis, that is, comparison

of concepts and keywords, creating a catalogue of items, from which I extract the common themes and threads. The last part presents the result of this analysis as a series of emerging themes while establishing links to the academic discourse and the existing literature.

b) Imaginaries: Inhabited territories
By the means of a pedagogical tool, a Teaching Unit for the master students in architecture at the Swiss Federal Institute of Technology (EPFL), we have experimented the potentials of scenarios – narratives recounting different futures of the territory – as a platform for exchange and dialogue with inhabitants, proposing hypothetical futures, activating shared imaginations, in order to seize and to discuss in a novel way their future expectations.

The Teaching Unit, conducted by sub-project C, explored a radical variant of PCW, that is the hypothesis of urbanity completely without private cars, both in cities and the extended territories between them. The exercise was developed on the territory of the *Arc Lemanique* in Switzerland. The projects generated during two semesters, which consisted of scenarios narrating new ways of inhabiting the territory and re-using the landscape after the car, were presented to a group of inhabitants in the form of a Focus Group. The goal was to establish an assessment of the relation between inhabitants and the perspective of a post-car urbanism. This encounter was the occasion to discuss with the inhabitants, from different geographies and different life styles within the same territory, about their ideas, ideals, projections of the future, and concerns regarding their spaces of everyday life and mobility. The scenarios served as an inventory of ideas and situations helping the participants to choose bits and pieces from each scenario and construct their own visions and express their ideals. The outcomes of the Focus Group consist of a series of extracted observations specifically about the ways in which the future and its possibilities are discussed, how they relate to the today's lifestyles, and what we can learn from such observations.

In the second part of **Chapter 4**, going through a presentation of the referenced territory, and the dynamics of the Teaching Unit, five scenarios of complete eradication of car are presented. This is followed by a report on the unfolding of Focus Group session and the reception of the scenarios by the inhabitants. Proposing radical transformations of a territory to its inhabitants who know the territory in terms of distances, centralities, places of working and dwelling, sparked engaged discussions and informed projections of their practices into future.
Recognizing in experts' interviews and their referenced projects tendencies to go beyond

the established polarities in urban and mobility discourses, the search for gradations in qualities, concepts and their descriptions, corresponds to the nuanced experiences of the inhabitants and their practices. Confronting the two inquiries provides the basis for the proposals in the **Chapter 5**, which attempt to sketch out a theoretical framework for going beyond the previous dualities such as speed and slowness that have guided significantly the discourses on mobility and during the century of car, towards new "auto"mobility after the car. Chapter 5 I introduce new mobility coordinates: *Effort*, *Agility*, and *Plurality of Vehicular Units*. In three respective sections I explain 1) how each one of them overtakes an established duality, 2) the context within which they have emerged, and 3) argue for their relevance and potentials.

2. THEORETICAL BACKGROUND

2.1. About Car

"What can be studied is always a relationship or an infinite regress of relationships. Never a 'thing'."
Bateson, 1978 cited in Graham and Marvin (2002)

"No self-respecting petrolhead wants to drive in a city. [...] Cities are dreadful. It's hard to tinker with or even clean a car in a city. Forget driving the car."
jamieduff1981, Pistonheads.com forum (2016)

European by birth and American by adoption (Flink 1976), the rare and luxury horseless carriage (Jackson 1987) soon became a dominant mode of transportation and a dominant force of social change (Webber 1973), transforming even habits of thought and language (Flink 1976). It radically (and irreversibly?) modified the spatial configuration of cities, as well as the entire surface of the earth. Though most of the world is not covered by roads, it is fragmented by them, with only 7% of land patches created by roads being greater than 100 km2 (Ibisch et al. 2016). Today, cars are the most used vehicles around the world. The global number of cars exceeded 1 billion in 2010, and it is estimated to double by 2050 (OECD 2013). There is just a bit less than a car per person in United States (78 vehicles car per 100person), and half a car per person in Switzerland and in general in OECD countries on average (Fig 1).

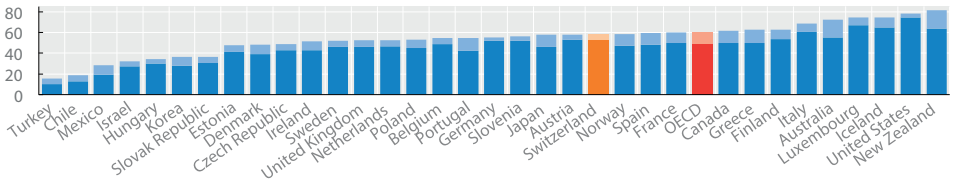


Fig 1. Motor vehicle ownership in OECD countriees, 2013
(Data from EUROSTAT, World Road Statistics, UNECE and national sources).

Yet, we have been expecting *"The Death of Motoring?"* (Nieuwenhuis and Wells 1998), "*The Great Inversion*" (Ehrenhalt 2012), or "*the post-car system*" since already long time. *The beginning of the end of the car*[1] was announced in 1970s, underlining the car's' agony clogging and devastating streets, poison in the air and noise in the cities (Dahl 1972:5). The slow but unstoppable collapse of car system was considered to be the inevitable future. While the twentieth century witnessed the decisive triumph of car as

[1] Der Anfang vom Ende der Autos (Dahl 1972).

principal means of personal mobility and the fervent development of its infrastructure, reorganizing spatially and socially the city, that very triumph generated critiques of the car and quests for alternatives. However, despite the longtime discussions and critiques on the impact of car on city and environment, car mobility constantly increased throughout the century and it was not until very recently that the upward trend of motorization and car ownership began to bend or stabilize in some developed countries. Several indicators, such as a reduction of car ownership, increasing lack of interest in obtaining driving license, or increasing modal shares of public transport, during the first decade of the century, brought up questions on the future of car.

Car Dependency: Rise and Fall

Transformed from a luxury product for a limited elite into massified *People's Automobile*, the zealous development of car was accompanied by the transformation of cities and countryside all along. In 1950s, following three stages of automobility in United States, car was already approached as a problem (Flink 1972). The first stage, from the introduction of the motor vehicle to the opening of the Ford Highland Park plant in 1910, was characterized by the rapid development of an attitudinal and institutional context that made the domination of American civilization by the automobile inevitable. The second stage involved mass idolization of the motorcar and a mass accommodation to automobility that transformed American institutions and life ways. In late 1950s, it first became apparent that automobility was no longer a historically progressive force for change. Since then the motorcar increasingly has been conceived of as a major social problem.

While during thirties car was dreamt by many Americans, to be able to go out on one of those Robert Moses Parkways or to the Jones Beach, by the end of the second world war it was nothing but a traffic nightmare[2]. This, however, did not stop the cities' transformations in increasingly adopting the car. The self-expansive system of car mobility, creating barriers that only car itself can overcome (Sauvy 1968), transformed territories and lifestyles, and resulted in what was termed as *Car Dependence*, for which urbanists have sought remedies since 1980s (Newman and Kenworthy 1989; Newman, Kenworthy, and Vintila 1995; Newman and Kenworthy 1999; Newman and Kenworthy 2006; Dupuy 1999; Héran 2001).

Addressing the issues of viability and sustainability, urban professionals and researchers set the reduction of dependence on automobile as one major goal of urban design, especially in city centers. Newman and Kenworthy, based on data gathered from cit-

[2] Quoted by Robert A. Stern in *New York: A Documentary Film, City of Tomorrow (1929–1941),* A film by Burns (2003).

ies around the world, emphasized on the urban intensity (residents and jobs) as the main determinant of car dependency with fundamental threshold of around 35 people per hectare. They suggested that below the threshold of intensity of urban activity, the physical constraints of distance and time enforce car use as the norm (Newman and Kenworthy 2006). Therefore new approaches to urban design opted for sufficient density to create self-sufficient local centers with an emphasis on pedestrian movements (e.g. Calthorpe 1993). Héran (2001) distinguishes between two definitions of automobile dependence. Explaining that while for Newman and Kenworthy the dependency is applied to the cities, speaking of car-dependent cities in North America or Australia for example, for Dupuy (1999) dependency is defined with reference to car system and the individual users within this system. In the latter perspective in order to reduce the dependency one must act upon the system rather than its symptoms, the city form being one of them. Dupuy's approach therefore, differs from that of new urbanism and advocates restrictions on the car system, such as restrictive parking policy, lower speeds, and other strategies to reduce the efficiency of the automotive system. Héran extends Dupuy's approach and explains the dependence on a mode as the lack of possible mode choice. "We could be dependent on walking, if landed in a desert where there is no other possibility of the movement". The lack of optionality in this sense could be described as being captive of a mode. In 1970s, Héran explains, we used to talk about "captives of public transport[3]", today we can speak of "car captives", or "spaces of car captivity" to describe the territories that are not accessible other than by motorized vehicle.

Newman and Kenworthy in their latest publication in 2015 announce the end of automobile dependence in cities, including in some developing contexts. Asserting that the downturn of car use was materialized around the turn of the century and the first signs of change in car use trend appeared within the last decades of the twentieth century, as the car vkt, (vehicle-kilometers-traveled), stabilizes in Canadian and European cities and slows down in American and Australian cities (Fig. 2).

While the rise of automobile dependence along the twentieth century is often associated with the drops in levels of habitat density and public transport services, it is impossible to root down its relative fall to any one single reason. Concomitant interrelated factors, to which we will come back recurrently in this thesis, are at work. The *weak signals of change* in mobility practices are the consequences of strong evolutions in urban paradigm, the theories, principles and concepts in urbanism, urban policies, as well as modal shift strategies since early 1980s (Pharoah and Apel 1995) and restrictions on car use. On the one hand discouraging the car, imposing constraints on its use, on the other hand, improving the quality and reliability of alternatives; public

[3] *Les captifs des transports en commun*

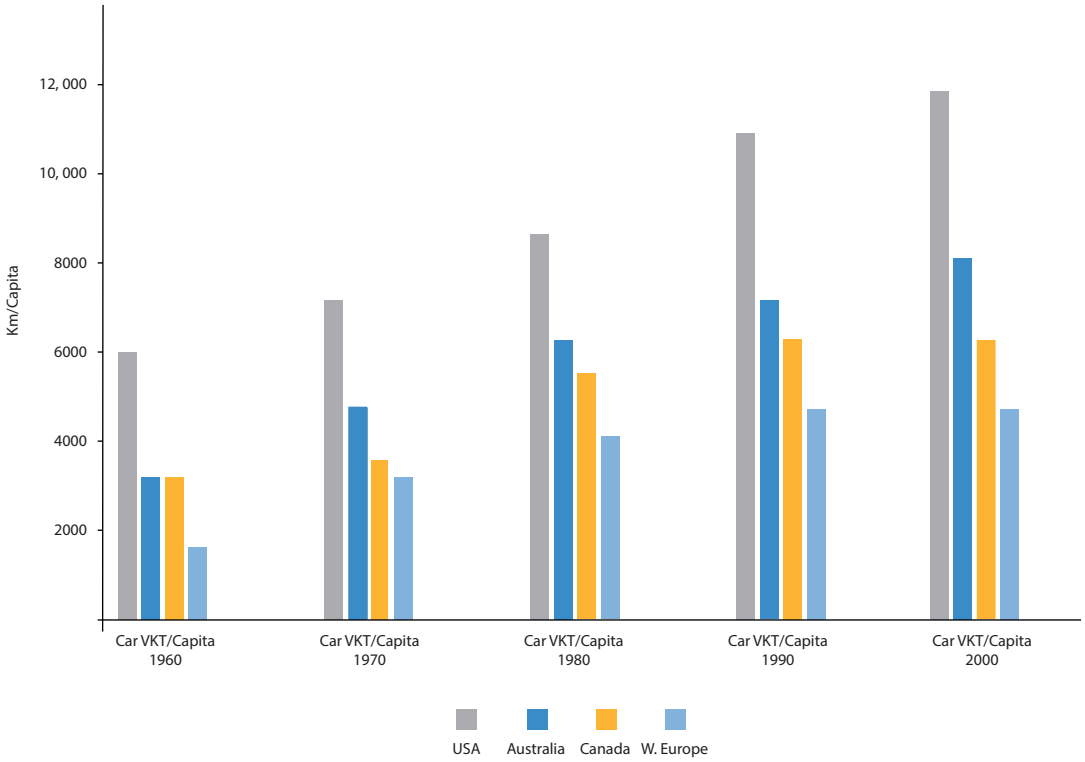


Fig 2. Car VKT (Vehicle-Kilometers Traveled) per Capita 1960-2000
While between 1980 to 1990 the growth of vkt in U.S cities was 2,200 kilometer, it came down to 1,000 kilometers between 1990 to 2000, with San Francisco, Los Angeles, and Phoenix showing no growth at all (Newman and Kenworthy 2015:3).

transport, pedestrian and cycling amenities. Moreover, reducing the demand for the movement through new urban schemes, distancing from modern functionalist planning (Gratz and Mintz 2000). These varied processes, together with new technologies and emergence of mobile devices have inevitably contributed to a change (transition) in lifestyles and values, bringing up a shift, technically less dependence on car but also a shift from the old "love affaire" with it. "It has become a bit passé to polish one's car on a Sunday morning" (Fournier, Eckhardt, and Bardhi 2012). According to Le Figaro, "the car has fallen from its pedestal in the eyes of European motorists" (Guinot 2013). This transition, we should keep in mind, is happening within the context of another profound evolution that is the emergence of mobile life-styles, people whose daily life is extended over a large territory, commuting long distances for work reasons or family or couple dynamics, polytypic lifestyles (Stock 2006)– are more reluctant to use the car.

The observation of slower rates of growth, or reduction, in various measures of car use marks a transition in mobility practices (Goodwin and Dender 2013). Kuhnimhof et al. (2012), for example, investigated the travel behavior of young adults in six countries (France, Germany, Great Britain, Japan, Norway, and the USA) and compiled a body of evidence for changes in mobility patterns over the past few decades. The findings indicate that since the turn of the millennium, access to cars, measured in terms of drivers' licenses and household car ownership, has decreased in most studied countries –especially for men. At the University of Michigan, researchers found that in 2010 only 61% of 18-year-old Americans had licenses, while this used to represent 86% of 18-year-old Americans in 1970s– both men and women. The ownership of the private car is less and less associated with unlimited spatial mobility, and as an essential requirement of modern lifestyles. The digital options for transportation allow for a general safeguarding of mobility without the direct need for private vehicles. The private car –once the status symbol and instrument of demonstrative consumerism– has now strong competitors like smart phones, computers, and even travelling itself (Canzler and Knie 2016; Lyons 2015). Meanwhile, the automobile industries adopt new business plans, enter car-sharing markets and consider innovations (Shaheen and Cohen 2016) in accordance with "new cultures of mobility" (Sheller 2011).

Autonomy and Mobility

While car mobility, its measures, requirements, and its consequences occupied immediately the urban discourse, re-structuring urban paradigm and the urban space, it took longer for the social sciences to embrace car as a genuine component to be considered in the analysis of the urban. Sheller and Urry (2000), in their seminal article *The City and the Car* argue that sociology had generally ignored the motorcar and its

consequences on the social life for very long time. Although the basis of sociology was founded in the modern city, yet its view of urban life, according to Sheller and Urry, had failed to consider properly the multiple impacts of the automobile in transforming time-space of modern urban and suburban dwellers. Aiming to address this absence, in this article, Sheller and Urry proposed a manifesto of *Automobility*.

Prior to Sheller and Urry, the term was coined and employed by Burnham (1961) and was re-currently used in car related literature. Burnham (1961) described *automobility* as "the combined impact of the motor vehicle, the automobile industry, and the highway system, as well as the emotional connotations of such impact." Sheller and Urry (2000) examined automobility as the system of production, consumption, circulation, location and sociality engendered by the motor car, a complex amalgam of interlocking machines, social practices and ways of dwelling, a system of self-expansive privately owned and mobilized 'steel-and-petroleum' car. Characterized by an intense coercive freedom, it coerces people into flexibility, forcing them to juggle fragments of time to deal with the temporal and spatial constraints that itself generates.

Sheller and Urry highlighted a double sense of "auto" that, on the one hand, refers reflexively to the humanist self, such as the meaning of "auto" in the notion of autobiography –suggestive of required autonomy of individualist society– and on the other hand, occurs in conjunction with objects or machines that possess a capacity for movement as expressed by terms such as automatic, automaton, and especially automobile. Through this double resonance of autonomous humans and autonomous machines, emerges the capacity for autonomous movement along the paths, lanes, streets and route ways (Urry 2004). Therefore, it can be understood as the combination of notions of *autonomy* and *mobility*. So far, since more than a century, the material and symbolic artifact that brings together these two notions has been the private car (Böhm et al. 2006).

Six component of *Automobility* according to Urry (2004) have been identified as (1) The quintessential manufactured object produced by iconic industries of 20th –century capitalism. (2) The major item of individual consumption that provides status to its owner/user through enriched by sign values such as speed, security, freedom, etc. (3) An intricate powerful interlink of car industry with multiple other industries such as oil industry, road building, roadside services, car sales. (4) The predominant global means of mobility mobility that subordinates other modes such as walking, cycling, trains and so on. (5) Fueled by potent potent literary and artistic images and symbols, it constitutes the dominant culture of the good life. (6) The single most important cause of environmental resource-use.

Through analysis and deconstruction of the general characteristics of car system and their dynamic interdependence, Urry (2004) introduced possibilities of 'tipping points' (Gladwell 2002) that can flip the mobility into a post-car system. Asserting that the current car-system could not be disrupted by linear changes but only by a set of inter-dependent changes occurring in a certain order that might move, or tip, the system into a new path. Seeking the seeds of change, therefore, involves technical-economic transformations, as well as political and social ones. The tipping points for Urry include: (1) new generation of cars emerging with new fuel systems and new materials changing 'car' bodies, as a disruption from 'steel and petroleum' car and the industries involved. (2) the information technology and galaxy of internet, increasingly hybridizing the vehicles and the trips, that facilitate the de-privatization of car, and (3) a change in urban and transport policies that move from predict-and-provide paradigm to demand-reduction strategies which entail both land-use and urban planning renewal and the behavior change of the individuals(Dennis and Urry 2013).

Transitions

A systemic approach to automobility has been criticized by some scholars, with the argument that, to refer to automobility as a system is to convey the impression of something *autopoietic*, that is something that reproduces and maintains itself without external forces. This perspective tends to underestimate the collective human agency in the production of automobility (Böhm et al. 2006). In contrast, speaking of *regime* of automobility brings out the relations of power that make this system possible, to avoid "the sense of closure in the notion of system, where its internal relations, feedback mechanisms, create a closed loop reproducing its logics relentlessly." Arguing that other modes and regimes of automobility are possible, Böhm et. al (2006) explore autonomy in various senses including within information technology.

In this perspective a transition in automobility can be envisioned and evaluated as a part of general "socio-technical transitions to sustainable development" as proposed by Geels (2011), combining new theories of large scale systems with empirical studies of transitions in different domains such as energy, transport, and food, to tackle contemporary environmental problems. Geels' multi-level perspective (MLP) takes transitions as non-linear processes resulting from the interplay of developments at three analytical levels: niches (the locus for radical innovations), socio-technical regimes (the locus of established practices and associated rules that stabilize existing systems), and an exogenous socio-technical landscape. The regime level is of primary interest, because transitions are defined as shifts from one regime to another regime. The niche and landscape levels can be seen as "derived concepts", because they are defined in relation to the

Fig 3. Diagrammatic representation of a new vehicle system (Dennis and Urry 2013:65).

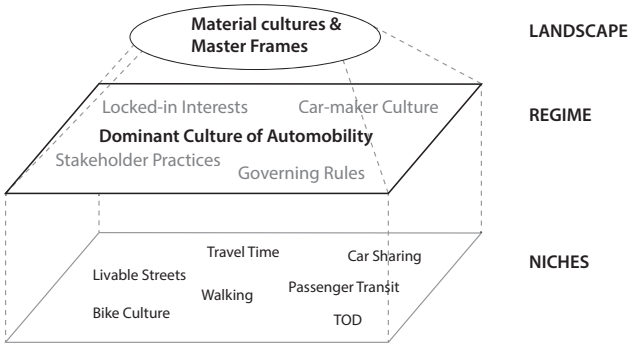


Fig 4. Transitions in mobility, representation of dominant cultural structure for mobility (Sheller 2011).

regime, namely as practices or technologies that deviate substantially from the existing regime, and as external environment that influences interactions between niche(s) and regime (Geels 2011). "*Automobility in Transition? A Socio-Technical Analysis of Sustainable Transport*" (Geels et al. 2011) investigates stability and change in contemporary transport systems through the lens of multi-level perspective. Acknowledging the existence of extensive niche level changes, it questions how fast a transition will take place and what path it will take. Scrutinizing in patterns of transitions in past, identifying openings and resistances, ruptures and continuities. Sheller's contribution to the book for example identifies the increasing rates of walking and cycling in the cities and the new cultures of urbanism as niche level changes that have to overcome the established regimes of automobility and car industry (Fig 4). Further, Geels et al. (2011) propose dynamics of change within different axes such as alternative fuel systems, potentials of information services, and intermodality.

End of the Car or Not?

The phenomenon often described as "Peak Car" observes the fact that travel by car had ceased to grow much or had even declined in the last years. "Peak car" holds this to be due to saturation in car use. *Traffic in Towns*, known as Buchanan report, that was a study of long-term problems of traffic in urban areas for UK Ministry of Transport in 1963, foresaw a saturation and a slower trend of growth in number of cars from the year 2000 after few decades of blistering growth (Buchanan 1963:26). The saturation hypothesis, however, even precedes Buchanan report by large in car history. In 1920s, already in United States saturation was feared by car industry, having about 80% of the world's cars and a ratio of 5.3 people per car –a number that decreased to 44 for France and United Kingdom by the same time. Within this period, in the specialized automobile journals like *Horseless Age,* it was discussed that automobility had stopped being a progressive force for change and that saturation was possible. On the one hand, due to a spatial saturation of roads, and on the other hand, for a saturation of the market for new cars in 1925, anticipating the economical crisis (Flink 1976:70).

The current peak, likewise, has been looked upon with skepticism. Many link the car decline to the economic recession and expect its growth as economy recovers. *Department for Transport* in UK, for example, rejected the "peak car" hypothesis in 2011 and predicted a return to traffic growth in the National Road Traffic Forecasts (fig: NRTF), asserting that the road traffic volumes in England are likely to grow by almost 50% over the next 25 years. In fact, some more recent indications might approve of such perspective and signal a steady or growing presence of car. For example, according to

the latest data[4] from 2016, in United States a growth in VMT (Vehicle Mile Travel) is observed (Dutzik 2016).

However, one should take into account that this last episode of growth in car mobility in United States coincides with the collapse of oil prices. Since late 2014, "it has never been cheaper to buy an expensive car, it hasn't been cheaper to fuel it in more than a decade, and it has been many years since as many people have been in as good an economic position to afford the high costs of automobility as they are today"(Dutzik 2016). The trends, however, vary depending on their geographic context. Even within Switzerland according to the latest data from *Federal Statistical Office* (OSF 2015) discrepancies are visible in car mobility rate and ownership between cities and larger territories as well as between different geographic regions. Despite the inflations of kilometers traveled by car, and considering the favorable environment for car mobility in terms of costs within the last few years, the question of changing status of car continues to be relevant, and occupies mobilities research and urban visions.

[4] According to U.S department of Transportation report on federal highway administration (2% growth between October 2015 to October 2016): https://www.fhwa.dot.gov/policyinformation/travel_monitoring/tvt.cfm.

2.2. Walking; Retrospect and Prospect

"Pedestrians comprise the greater part of humanity. Moreover–its better part. It is they who built cities. One should note that automobile itself was invented by pedestrians

God, oh God, Thou who in reality art dead, where did Thou, who dost not exist, leave the pedestrian!"

Ilf and Petrov, The Golden Calf, 1931 cited in "Urban Space for Pedestrians" (Pushkarev and Zupan 1975)

Walking has recently attracted increasing scientific interest within different disciplines, in sociological studies, urban literature, cultural and anthropological research, as well as in health and well-being; from walk as an essential part of the urban way of life and as a significant social activity (Joseph 1998; Demerath and Levinger 2003; Thomas 2007), walk as experience of the world, its techniques and its rhythms (de Certeau 1984; Ingold and Vergunst 2008; Edensor 2010), and technologies and gadgets facilitating it (Michael 2000; Ingold 2004) to assessment of the environmental determinants of walking (Saelens, Sallis, and Frank 2003; Saelens and Handy 2008; Ewing and Cervero 2010), as a moment of bodily exercise and an opportunity to tackle inactivity in urban lifestyles, or as a cultural and aesthetic practice (Davila 2007; Careri 2006). The increasing centrality of walk and the figure of pedestrian in different disciplines and specifically in mobility and urban discourses could be considered as a second revival of walk –the first one being in the beginning of nineteenth century to which we will come back shortly. This second revival, however, follows the critiques of car in the second half of the twentieth century, from spatial and social point of view, and later within discourses of sustainable city and 'soft' mobility, as a response to energetic and environmental imperatives calling for an urgency to reduce cars. Studies on walking, therefore, go beyond one particular discipline; they vary from manuscripts in praise of walking to walkability "projects", and to more technical approaches to pedestrian traffic and flows.

On Pedestrian

Pedestrian as we know it, is the one who travels on foot, from latin origin *pedestr*, *pedester*, literally, going on foot, from *ped* or *pes* for foot. As an adjective, however, it means "lacking inspiration or excitement; dull" (Oxford Dictionary), "commonplace and unimaginative," to be pedestrian was to be drab or dull, ordinary and unoriginal as if plodding along on foot rather than speeding on horseback or by coach" (Merriam Webster). To live a pedestrian lifestyle is, therefore, to live a monotonous, uneventful, unremarkable one. However, although the *peons*, *pions*, pawns have always been at the bottom of a hierarchical system, and "have long dreamed of escaping the humiliation of having to use their own body to move in space," (Lévy 2008), the rise of pedestrianism at the end of the eighteenth century gave another status to the walker. Jarvis (1997) through a lexical ethymological research into different eighteenth and nineteenth century dictionaries investigates the long recorded history, and the persistence of the pejorative metaphorical sense of 'pedestrian'. From previous terminology to designate walking, like *pedestrious*, that specifically emphasized walking as opposed to flying (wingless creature), or *pedestrianize* that was *to tread* or *to step over*, pedestrian emerges with suggestive semantic values as *one who makes a journey on foot; one distinguished for his powers of walking*[5] and marks a culturally significant development, when social and ideological meanings of walking were contested and redefined.

In the early Romantic period, the figure of pedestrian, previously associated with poverty and suspected as criminal, was revived and assumed the character of a voluntary, pleasurable activity. Anne Wallace's *Walking, Literature, and English Culture* (1995), a cultural history of walking in nineteenth-century England, explores the place of walks in literature and in culture in the context of changes in transportation, agriculture, and aesthetics. Asserting that as travel in general becomes physically easier, and less expensive, therefore more people travel. At the same time the availability of an increasing range of options in conveyance, encouraged comparisons of these different modes, as speeds increased and costs decreased, the mass of people could afford more often other means and they were no more confined to that circle of a day's walk.

"[...] And as walking became a matter of choice, it became a possible positive choice: since the common person need not travel by walking, so walking travellers need not necessarily to be poor. Thus, as awareness of process became regarded as advantageous, 'economic necessity' became only one possible reading (although still sometimes a correct one) in a field of peripatetic meanings that included 'aesthetic choice'. (Wallace 1995:62)

This is simply true also in the context of contemporary cities; cars are status symbols,

[5] Appearing in a dictionary produced by H.J. Todd in 1818 (Jarvis 1997:2)

where walking (or public transport) is difficult, unpleasant, and therefore, not a choice for those who can afford to travel otherwise. Although Jarvis sees at work other dynamics and criticizes Wallace for a purely materialistic explanation for the rise of the status of walk. In his book *Romantic Writing and Pedestrian Travel*, Jarvis, proposes that besides the transport revolution, there existed also an element of deliberate social nonconformism, of oppositionality, in the self-levelling expeditions of most early pedestrians (Jarvis 1997:27). This was the moment for athletic pedestrianism in Britain [6]as well as the rapid growth of recreational walking. Pedestrianism as sport was also further practiced in United States, *becaming American's favorite spectator sport*[7].

In this period, walking rapidly became a voluntary, pleasurable activity: *travel without the travail,* as it had traditionally connoted, emerging as a literary motif in writings of authors and poets such as William Wordsworth, Henry David Thoreau, Robert, Louis Stevenson (Wallace 1995; Solnit 2001). The pejorative metaphorical sense of pedestrian, however, endures through decades–perhaps gets reinforced by the car culture and appears in the dictionaries to this day–though much less commonly used in the second revival of *pedestrian,* in the post-automobile era.

Mind Body Well-being

The Romantics acknowledged the confluence of *body*, *mind*, and *place* in the act of walking, enabling observation and re-establishing the contact with both the physical world and inner self. So did the Greek philosophers and particularly within the Aristotelian tradition in the Lyceum he founded that was known as the peripatos— referring to the act of walking or a covered place for walking— and its members as peripatetikoi[8] for they were required to walk beside Aristotle as he lectured pacing to and fro, discussing philosophical questions in a covered ambulatory (Macauley 2000). Further, among others, Jean Jacques Rousseau, the Genevan philosopher, writer, and composer of the 18th century, has extensively written about the importance of his walks in his intellectual endeavors:

"Jamais je n'ai tant pensé, tant existé, tant vécu, tant été moi, si j'ose ainsi dire, que dans ceux que j'ai faits seul et à pied. La marche a quelque chose qui anime et avive mes idées."

Walking, therefore, leads a mental and aesthetic life that is both distinct from, and continuous with, its bodily one (Jarvis 1997:4). The stimulated mind-body relation through

[6] Pedestrianism was a 18th and 19th-century form of competitive walking over great distances

[7] See the book: Pedestrianism: when watching people walk was America's favorite spectator sport (Algeo 2014)

[8] From peripatein, meaning "to walk up and down"

walking –suggesting an intimacy between wandering and wondering– has been also the subject of more recent studies (Netz et al. 2007; Oppezzo and Schwartz 2014). Experiments demonstrate that exercise and particularly walking boost creative ideation. Walking is an easy-to-implement strategy to increase appropriate novel idea generation. "When there is a premium on generating new ideas in the workday, it should be beneficial to incorporate walks" concludes a research on the *Journal of Experimental Psychology* (Oppezzo and Schwartz 2014).

The sanitary effects of walking have been acknowledged since long. Rousseau, for example, underlines its health consequences along with numerous other pleasures he counts in his *Confessions*[9]. In 1980, "The Magic of Walking" suggested walking as a health emergency for the Americans, *a good medicine, heart-saver, non-dieting diet, and an antidote to tension* and in order to cope with the *syndrome of wheel and chair*. Walking is re-discovered as the most natural position for the body. "The body is built poorly for sitting, only a little better for standing, but it is unrivaled for walking" (Sussman and Goode 1980:25–39). Therefore, re-discovering those legs became even more remarkable than the invention of wheel.

Acknowledging the common historical origins and interests of city planning and public health, in early 2000s, researches increasingly underlined the disconnection between the two fields. Hence, a series of works emphasized the importance of reconnecting planning and health. For example, a 2001 Institute of Medicine report titled *Rebuilding the Unity of Health and the Environment* emphasized that the "environment" should be understood as the interplay between ecological (biological), physical (natural and built), social, political, aesthetic, and economic environments (Corburn 2004). In the same period, the first Walk21, an international conference on walking, in London in 2000 marked an important step in bringing walking into cities' discourse, discussing it also from the point of view of health.

This new perspective brought to surface reflections and publications on walking and its necessity for physical well being, shaping a new interdisciplinary field of research. Over a decade ago the notion of *active mobility* was raised within health, well-being and behavioral science and has engendered cross disciplinary research with mobilities

[9] *Combien de plaisirs différents on rassemble par cette agréable manière de voyager! sans compter la santé qui s'affermit, l'humeur qui s'égaye. J'ai toujours vu ceux qui voyageaient dans de bonnes voitures bien douces, rêveurs, tristes, grondants ou souffrants; et les piétons toujours gais, légers, et contents de tout. Combien le coeur rit quand on approche du gîte! Combien un repas grossier paraît savoureux! avec quel plaisir on se repose à table! Quel bon sommeil on fait dans un mauvais lit! Quand on ne veut qu'arriver, on peut courir en chaise de poste; mais quand on veut voyager, il faut aller à pied.* ***Emile (1762): "Les voyages à pied".***

studies, urban and transport planning. Active mobility, that is walking and cycling or other means relying essentially on physical activity and metabolic energy as opposed to motorized and carbon-dependent means (Forum Vies Mobiles 2015), regards the daily commutes as an opportunity for physical activity, advocating and creating an alliance between transportation, public space and public health. Since then many studies have focused on empirical investigations on the relations between city built environment and physical activity (e.g. Pikora and Miller 2001; Saelens, Sallis, and Frank 2003; Saelens et al. 2003; Ewing et al. 2008; Ewing and Cervero 2010). In general land use diversity and density are found to be positive correlates of active transport. Aesthetic attributes, convenience of facilities for walking (sidewalks, trails); accessibility of destinations (stores, parks); and perceptions about traffic and busy roads were found to be associated with walking for particular purposes. Attributes associated with walking for exercise were different from those associated with walking to get to and from places.

Walking and the City

Being on foot is central to the urban life. The reflections and the associations between city and walking have occupied a great part of nineteenth century literature. Baudelaire's spectator walker, *who lends his soul to the crowd amid the ebb and flow of the city's movement* became the subject of interest along the twentieth century for urban philosophers such as Benjamin, and still today dominates our representations of the city. Benjamin in his 1938 essay "The Paris of the Second Empire in Baudelaire" links the Baudelairean figure of the flâneur to Haussmann's changes of Paris. Asserting that to understand Baudelaire's lyric, one needs to understand Haussmannization of Paris. Cutting of new streets through old quarters, Haussmann created promenades, parks, gardens, and squares specifically destined to the public, and established the elements of a system that even today characterizes the Parisian space. However, the system of circulation, accompanied by water system (and sewage) and that of green spaces also served as an instrument of control against the rebels and their barricades in the city (Choay 1975). While Haussmann's Paris has been criticized as a panoptical, rationalist utopia (Lombardo 2002:71), it provided the grounds for a perfectly walkable city, a public city with tree-lined promenades and open spaces that are no more exclusively in residential quarters, linking train stations between them and to the center and unifying the key buildings and monuments of the city enabling the 'pleasures of being in the crowd' as described by Baudelaire and walking as a plural activity. Isaac Joseph (1998), the French sociologist, describes walking as a concerted activity, even when it is done in solitude. He underlines that apart from those who have succumbed to the intuitions of walking, such as Kant, Park, Gibson, but also de Quincey , Baudelaire, and Benjamin, urban policies and discourses on cities in general had not paid due attention

to the man "as a locomotive being"[10]. Walking, for Joseph, is a "technique of the body" (Marcel Mauss), total social phenomenon par excellence for an apprehension of urban landscapes as public things (Joseph 1998:18). The social aspect of walking has been repeatedly acknowledged, making of it the "instrument of composition of the city" and a means for the pedestrian to anchor himself to the city (Thomas 2007).

Walking puts the urban dwellers in direct contact with the environment. Attention to (understanding of) the environment is one of the main characteristics of walking. This is due to its pace and pausability (Conley 2012), as well as the direct sensorial interaction of the body with the surroundings (Thomas 2007). Walking in the city provides a situation of co-presence, and it obliges pedestrians to negotiate their respective actions (Joseph 1998:46). Hence, ahead of the physical and psychological benefits of walking, such as stress relief and boost of creativity, social benefits of walk have been advocated, underlining the capacity of the pedestrian for the social interactions and the significant roles pedestrians play in generating social and urban life (Demerath and Levinger 2003).

Today, public space is understood and characterized by this co-presence and its efficiency is based on interactions between those who, provisionally, inhabit it. Public space is often taken to be the corporeal space of the city; the pedestrian realm, where the interaction is mostly about the body management and *flâneur* is the main figure. Pedestrian metrics are considered to be 'the characteristic metric of public space' (Lévy 2014) and walkability as an indicator of urbanity.

"The urban is defined as the place where people walk around, find themselves standing before and inside piles of objects, experience the intertwining of the threads of activities until they become unrecognisable, entangle situations in such a way that they engender unexpected situations. The definition of this space contains a null vector (virtually); the cancellation of distance haunts the occupants of urban space." (Lefebvre 2003:39)

In *The Practice of Everyday Life* Michel De Certeau (1984) writes about walking as a distinct way of experiencing the city. The corporeality of moving about the city, according to De Certeau makes the city. This making, he clarifies, is a production, a poïesis[11] scattered over areas defined and occupied by systems of production. He compares the experience– as a form of knowledge– of walking with that of looking at it from above. Taking the reader to the summit of the World Trade Center, out of the city's grasp, De Certeau proposes an all-encompassing yet detached and distanced stance

[10] *L'homme comme être de locomotion*

[11] "To make", "to generate" to "create" the root of the modern "poetry"

towards the city of New York. He then replaces this vertical view with the horizontal of the pdestrian, the ordinary practitioners of the city who *compose a manifold story that has neither author nor spectator simply by moving about the city* (1984:93). De Certeau juxtaposes these two different visions in line with his dual reading of everyday practices: the imposed orders on one hand and the creative tactics of re-inventing the everyday on the other. He finds a voluptuous pleasure in ascending above the city and "seeing the whole," but this almost erotic joy, the 'zenithal orgasm' (Lévy 2012) loses face further along the chapter as De Certeau contrasts it with the experience of walking in the city. The pedestrian in the city for De Certeau is as blind as that of lovers in each other's arms. A thorough understanding that results from embracing the space rather than a totalizing distant view. Walking as an essential instrument of understanding and theorizing landscape was proposed by Lucius Burckhardt (2015) who founded the science of strollology "promenadology" in 1970s and further developed it to a planning and design discipline.

Pedestrian behaviors have been studied both from the standpoint of how they navigate through urban space and in terms of their interactions. Erwing Goffman (1972) William H. Whyte (1980) and Jane Jacobs (1961) are considered among the early scholars who initiated such studies and thereupon contributed to the early theorizations of the public space to which I will come back extensively in chapter three. As mentioned before, despite the historic alliance of city and pedestrian, pedestrian suffered a period of negation when it lost face to the allures of private car during the twentieth century. In their classic and pioneer study on *Urban Space for Pedestrian* published by MIT press on 1975, authors assert that "just as the automobile has held dominance over the pedestrian in most of the world's cities, so has been in the planning profession –very little notice has been taken of the pedestrian and his needs." (Pushkarev and Zupan 1975). The book, therefore, building upon some precedents from 1960s and early 1970s covers a range of studies on pedestrian movements, behavior and requirements in urban centers and pioneers the above-mentioned body of research that focuses on how space can encourage and accommodate the walks.

As cities, including Swiss cities like Geneva and Lausanne, experience an observable rise of walking in their modal share coupled with measures of public transport and households increasingly abandon their cars in favor of pedestrian metrics. This trend, turns out to be much more modest when it comes to territories in between cities. Walkability in low-density urbanity and in the contemporary fragmentary urban condition remains a challenge. "Considerations for pedestrians in the cities" wrote Jane Jacobs, "are inseparable from considerations for city diversity, vitality and concentration of

use." She reminded that "in the absence of city diversity and in large settlements people are probably better off in cars than on foot" (Jacobs 1961:348). While a *Zwicschenstadt* landscape could perfectly host an aesthetic promenade, it cannot easily accommodate the commuter pedestrian that has to integrate into a larger system of mobility.

The relation between characteristics of physical space and the willingness to walk has been the focus of a considerable body of research starting from the beginning of this century (e.g. Ewing and Cervero 2001; Saelens et al. 2003; Saelens and Handy 2008). The results of these studies, focusing on walkable neighborhoods, as opposed to car-dependent ones, confirm the positive correlation of walking with density as well as land-use diversity. Therefore, the walkability in larger territories remains a challenge that has been addressed recently within renewed approaches to lower densities (Brès 2015) that attempt to propose alternatives to all-car mobility by introducing active modes and defining their interface with the road and the network of public transport.

This overview already demonstrates that the "weak signs of change" in mobility practices have been accompanied and coincided with the strong scientific recognition and professional investment on the theme of walking, on how it ties the individual to the place and how they mutually transform each other within what I referred to as the second revival of walk.

2.3. *Imaginaire*: Movements, Modes, and Meanings

"De même que une société est incapable de faire ce dont ses membres ne rêvent pas, elle ne peut cesser de faire ce qui fait partie de leur rêves."

Holton, 1973 cited in Debarbieux (2013)

The *imaginary* as laboratory of political inventions (Ross 2015:17) is often characterized by ambivalence and its development is therefore fueled by contradictory forces. Writing on the *imaginary* dimension of the networked city, Antoine Picon (2014) demonstrates such ambivalence by showing how networks evoke both an ideal of domination, and the possibility of an individual and collective emancipation. Likewise, the powerful imagery of the car, as ubiquitous as the car itself, has been contradictory throughout its history. Oscillating between polarities, the car has been praised for the democratization of movement, and denounced for privatization of public space. It has been described as the "immensely flexible, that is wholly coercive" (Urry 2004). And, while put together with church as a promoter of good morals, "bringing the family together as a unit in their pursuit of pleasure", it was also accused of "endangering the home," and becoming a "house of prostitution on wheels" (Flink 1976:158). *Four wheels of fortune*, *insolent chariot*, *iron cage of modernity* or *Frankenstein-created monster*, the car has been portrayed in many ways, which have contributed to the multiple imaginaries of the car world.

In the following I will first look into the literature around the concept of the *imaginary*, as a dimension of society, as developed by scholars during the last few decades, extracting a multi-layered definition on the basis of which further discussions will be built. Furthermore, I propose an interpretive framework for the imaginary within the field of mobilities, *the imaginary dimension of mobility*. Finally, I propose a rapid overview of the representations of the car through its history and the literature that analyzes the same, showing that the transitions in the meanings and representations of the car recount the missing pieces of the same story already covered in the transition from the car (2.1) and the revival of the pedestrian (2.2).

The *imaginary* and its agency for change

In philosophy and in the social sciences, *l'imaginaire* appears as a recent subject of scrutiny and reflection. While the adjective 'imaginaire' in French literature has been recurrent since at least 16th century, the exploration of the concept, as a dimension of society – as a noun – only really flourished over the last few decades (Legros 2006). In

English, however, despite the publications and theoretical reflections on the subject (e.g. translation of Castoriadis 1987; Taylor 2003) 'the imaginary' lacks an entry as a noun in most dictionaries, including the Merriam-Webster online dictionary, which defines it as 'existing only in the imagination', or 'lacking factual reality'. Therefore, 'imaginary' as an adjective is defined in opposition to 'real', while as a noun it finds its counterpoint in 'rational.'

L'imaginaire was developed by Gilbert Durand in 1960s as the substrate of mental life and a constitutive dimension of humanity (Durand 1960). Durand argues for the importance of physical perceptions in the formation of mental images, and insists on the strength of symbols and the centrality of images. He credits the encounter of new technologies of the twentieth century in terms of production and diffusion of images, the "visual civilization", with the long philosophical and scientific tradition of devaluing imagery as uncertain and ambiguous, for finally making the shift in philosophical thoughts and traditions – so far utterly dependent on verbal and textual communication – and giving rise to the science and philosophy of *l'imaginaire*. Which Durand inventories and eventually classifies as "the 'museum' of all the images, past and possible, produced and to be produced" and by virtue of this exhaustiveness enables the study of the procedures of their production, their transmission and their reception (Durand, 1993: 3). In this sense, the imaginary is not simply what is imaginable for a subjectivity, but also the repertoire of items (images-figures, discourses) that constitutes the imaginable.

Furthermore, the imaginary has been discussed through its collective dimension. The concept of the social imaginary has occupied a particular place in social sciences since the works of Cornelius Castoriadis in 1975 on the *L'institution imaginaire de la société (Imaginary Institution of Society, 1987)*. Prolonging and contributing to the works of existentialist philosopher Jean-Paul Sartre, Jacques Lacan and Gilbert Durand on *l'imaginaire*, Castoriadis explores the nature of the "social imaginary" that according to him emerges in precise historic conditions. L'i*maginaire* that Castoriadis speaks of is not "image of", rather, it is an incessant and essentially indeterminate (social-historical and psychic) creation of figures/forms/images, only from which a question of "something" can derive, for example "equality" or "nationality" (Debarbieux 2015). Castoriadis takes *l'imaginaire* as the anonymous, collective, unmotivated force that constitutes the significations from which arise symbolic structures and specific articulations of the society.

The translation of Castoriadis' work into English in 1987 gave rise to series of English publications. In 'Modern Social Imaginaries', Charles Taylor describes the social imagi-

nary as the way a group of people "imagine" their social existence. How they fit together with others, how things go on between them and their fellows, the expectations that are normally met, and the deeper normative notions and images that underlay these expectations' (Taylor 2003:21). He distinguishes between social imaginary and social theory, since the former is often not expressed in theoretical terms, but is carried in images, stories and legends, and more importantly it is what enables common practices and a widely shared sense of legitimacy. Paul Ricoeur compares and contrasts these collective representations, which we might call social imaginaries, to that of 'mentalities' as developed by Durkheim and Weltanschauungen (or 'worldviews') as used in German schools of psychology. He emphasizes the relation between representations and social practices, from which he extends out to the idea of social capacities and capabilities (Ricoeur 2005:135).

Social imaginary as such relates in particular to the spatio-temporal anchoring of a society: "configuring its past, its heritage, its territoriality, as well as its projects and its actions." Some scholars, therefore, discuss a derivative notion that is the *Geographic Imaginary*, the geographic (spatial) expression of the social imaginary. Bernard Debarbieux in *Dictionnaire de la géographie et de l'espace des sociétés* defines it as "the interrelated sets of mental images that confer meaning and coherence to spaces and spatialities[12]. It concerns, on the one hand, geographic knowledges produced by professionals of the discipline through images, representations, and discourses, and on the other hand, knowledges, mindsets, motivations of "geographic subjects/actors," pertaining to the individual. *Geographic Imaginary*, in the second sense, is how individuals conceive their environment, how they inhabit it and act upon it. It contributes to spatial conceptions, perceptions and practices (Debarbieux 2013). Tim Cresswell (2006) to whom we will refer in the section on imaginaries of mobility, also writes about the agency of geographic "imaginations", asserting that: "Geographical imaginations are not simply colorful mental maps confined to the world of ideas, rather they are active participants in the world of action. They inform judges, doctors, factory managers, photographers, government officials, lawyers, airport planners, and all manner of other people giving them the ability to mold the world we live in. They escape the bonds of individual dreams and aspirations and become social. They become political." (Cresswell 2006:21)

For example, in his book, "*La Ville des Réseaux: Un Imaginaire Politique*", Picon (2014) delves into imaginaries of cities and how they have been shaped, since at least two centuries by the networks that run through the cities. While a vast body of literature has

[12] Translated from "L'ensembles des "images mentales" reliées entre elles qui confèrent une signification et une cohérence à des espaces et des spatialités. L'imaginaire contribuent à organiser les conceptions, les perceptions et les pratiques spatiales."

been devoted to technical and social aspects of networks, Picon argues that the imaginary in which their conception and their use are rooted remains much less explored (Picon 2014:9). Therefore, through two key moments in the history of cities – first the forceful advent of networks in Haussmanian Paris in 19th century, and then the digital transformations of the city today – he examines these imaginaries. On the one hand, he looks into the imaginary of policy makers and administrative decision-makers and designers, on the other hand, into the alternative collective representations developed by the users, underlining a tension between the two. He emphasizes the importance of regulations in networks in shaping the experiences of their users and therefore creating shared meanings as constitutive components of the networks, since without them the aggregate of grids and roads, as demonstrates Picon, do not make up a network. One common threat within the above-mentioned conceptions is the capacities for action, "the ability to mold the world we live in." Taking the imagination as a social practice, central to all forms of agency (Appadurai 1996:31), linking it to the associated capabilities and possibilities. In this perspective, it is the dynamic process of imagination that constantly pushes forward the boundaries of the possible.

Building upon the selected literature, three aspects of imaginary can be underlined. The first aspect (as developed by Durand) takes the imaginary as the ensemble of visual representations –*representations imagées* – and emphasizes the centrality of "produced images" in the construction of mental images, striving to unveil these constitutive and mythical images and their interrelations. The second aspect features the pluralistic character of the notion of imaginary, distinguishing it from mental models, as the common understanding of a collectivity of their shared social and material existence. Formed and informed by narratives and a universe of images (Picon 2014), this strain of research, for example, explores shared imaginaries of a collectivity. While Picon regroups and analyses '*imaginaire des politiques et decideurs*', and Yves Chalas looks into urbanists' new frameworks and referents of urban planning and urban action in '*imaginaire amenageur*' (Chalas 2004). The third aspect however links the collective imaginary to the collective capacities for action and therefore raises the question of agency. The binomial imaginary/action is consistently recognized by different authors (Ricoeur 2005; Appadurai 1996; Cresswell 2006) as imaging that precedes action.

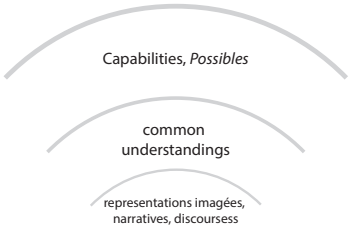


Fig 5. Three interrelated layers of imaginary.

In this perspective, the three aspects are interrelated and could constitute progressive layers of a complex system of the imaginary. Therefore, the imaginary proves to be implicit, unintended or unmotivated, as put by Castoriadis, a force that nevertheless has strong agency in shaping social and geographic worlds.

Imaginary dimension of mobility

Mobility, as developed by Tim Cresswell (2006), is the combination of 1) physical movement, that is the going from A to B, 2) how it is practiced, and 3) the meanings associated with it. Any inquiry into the future of mobilities, therefore, inevitably should meet these three interrelational moments. Physical movement is in fact displacements in space and the way displacement is practiced relays on transport infrastructures. The interrelation the two has been widely acknowledged (Wiel 1996; 1999; Newman and Kenworthy 1989; Dupuy 1999; Héran 2001). "The histories of cities have mirrored the histories of their transportation systems" (Webber 1973) and their futures, likewise, have been often sought through the future transport technologies. The practices of mobility on the one hand and the spatial configuration of the city on the other, are described as the mutual feedback of spaces and spatialities by Lévy (2014) in conceptualizing the notion of *inhabiting*[13]. Acknowledging this interrelation, territorial visions and spatial projects seek to encourage certain types of mobility practices through new configurations and spatial rearrangements. That includes, for example, the body of work on spatial characteristics of walkable neighborhoods. Yet, less attention has been devoted to the third component of mobility as conceptualized by Cresswell, that is *meanings*.

Cresswell distinguishes between *movement* and *mobility*, taking the former to be mere displacement in the abstract space, devoid of meaning, history and ideology, while the latter is when motivations, strategies, and social implications of movement are taken into account. Cresswell considers the movement to be the dynamic equivalent of *location* and mobility as dynamic equivalent of *place*, referring to geographical theory and philosophy, in which place is considered as meaningful segments of space, a center of meaning, that we become attached to it, we fight over it and exclude people from it. We experience it. While the same cannot be said of location. Hence, he emphasizes on the meanings of mobility as one of its constitutive components. The meanings are associated with mobilities through representations, turning an empirical reality, that is moving from A to B that can be measured, analyzed and modeled by engineers, and

[13] Lévy defines Inhabiting as a successful encounter between space and spatialities. This occurs when the various spatialities and the multiple spaces that constitute a society are made compatible and take advantage of each other in a 'dialogic' interaction. Spatiality encompasses any kind of action coping with locations or the arrangement of distances (Lévy 2014).

Fig 6. Man in a Toledo parked at the edge of the Grand Canyon,
Arizona, 1902 , (Peters 2006).

transport planners - into notions like “freedom”, or “transgression” (Cresswell 2006:3).

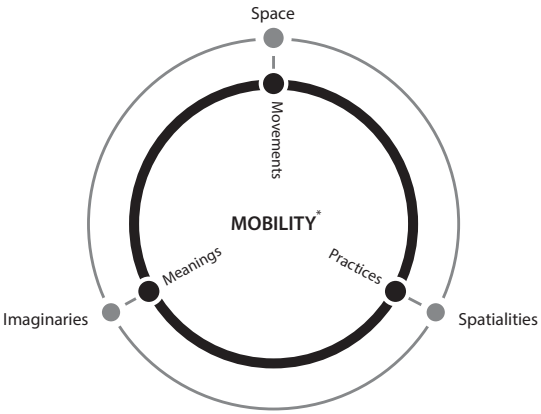


Fig 7. Mobility, adapted from Cresswell (2006).

A clear example of such association of meanings is the extended array of meanings associated with the car. The image of the car, the quintessential possessed object of the twentieth century (Urry 2004), was promoted and established as the technology opening the way to “the freedom of all outdoors” (Ford advertisement 1949) through its promoting discourses and the accompanying iconography. As vividly suggests a photo from 1902 (Fig 6) that shows a man behind a Toledo wheel on the edge of the Grand Canyon, with no road in sight, nor any other sign of human civilization. “How he got there is not clear, but the scene conveys an air of normality. It suggests that he simply got in his car and drove there, right to the edge, where he could look out over the vast canyon. His elevated gaze expresses control, power and individuality” (Peters 2006). However, Peters argues and demonstrates, in his book *Time, Innovation and Mobilities* that the presented flexibility and freedom of the car, considered as an inherent characteristic of a single technology, is rather the result of numerous interconnected innovations, complex processes of work and investment in road buildings, sign systems, maps, gas stations, standardizations, road food, motels and auto camps that brought together made the car’s outreach possible (Peters 2006:73).

The meanings, therefore, are given to mobility through images, stories, legends and diverse arrays of mediums, but similarly, representations of mobility are based on the ways in which mobility is practiced and embodied. Thus, the material conditions, spaces and infrastructures of mobility equally produce and change meanings. We have seen, for example, in the section on walking, how the advent of the train contributed to a shift in meanings and values associated with the pedestrian. With increasing speeds and

decreasing costs, the mass of people could afford more often to travel longer distances, which allowed walking to be perceived more as a choice rather than as an obligation and the walker was relieved from the status of the suspicious vagabond.
The imaginary dimension of mobility has activated researches on imaginations of 'elsewhere' and meanings of travels and their transformations in modern times. The study of the symbolic meanings of polarities of mobility and immobility and their significations, and the identities related to them (e.g. Barrère and Martuccelli 2007), has been done with limited recourse to the practices of mobility, specifically everyday commutes and their implication for urban projects and mobility schemes. Some more recent studies, however, propose to fill this gap by empirical studies and qualitative evaluation of representations related to everyday practices, providing an analysis of mobility practices with an interpretation of imaginaries link to them (e.g. Feildel, Bailleul, and Laffont 2014; Vincent-Geslin and Ravalet 2015).

As discussed in the previous section, the imaginary should be considered as an ensemble that includes and is nourished by the *representations imagées* – the images "of"– but it is not limited to them. Furthermore, when it comes to the geographic imaginary and the imaginary of mobility, it is strongly connected to spaces and spatialities (see fig.). Accordingly it is possible to distinguish between the research on the imaginary of car mobility and large part of the body of the literature on the images and representations of the car, which has been a central subject in cultural studies during the last decades. Mobilization of this triad (spaces, practices, and imaginaries) and specifically the link between imaginary of mobility and urban project (discourses, schemes, and spaces) is the focus of this research. But prior to that we will take a rapid overview of the representations of the car and their transitions that contribute to the factors that motivated post-car world research.

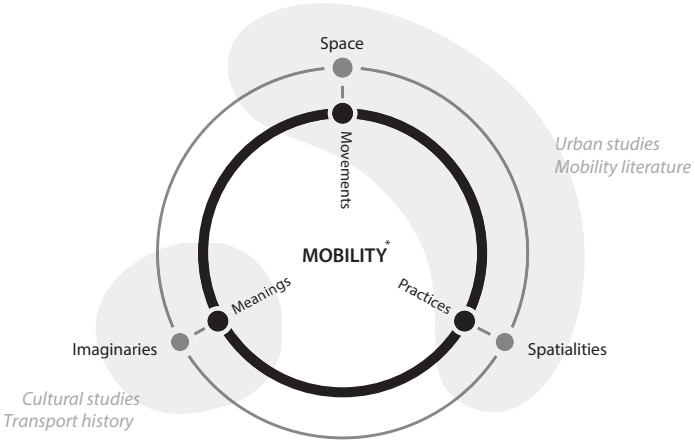


Fig 8. Two rarely communicating domains.

Images of the car and imaginaries of a post-car world

The emergence of the car and its proliferation coincided with what Gilbert Durand (1994) calls "visual civilization," referring to the new technologies of the twentieth century in terms of production and diffusion of images, and that perhaps led to the creation of the most represented, imaged and imagined object of the century. In Europe, the image of the car was widespread even before its proliferation as a material object[14]. While still a luxury product restricted to a minority, it was already mediated and consumed as an image. Roland Barthes has been widely quoted in his comparing the car – writing about the new Citroen – with "the great Gothic cathedrals; the supreme creation of an era, conceived with passion by unknown artists, and consumed in image if not in usage by a whole population" (Barthes 1957).

Cars have had high visibility in the social landscape and cultural imaginary over the last century (Featherstone 2004). Inevitably, any twentieth-century art form delineates cars to some extent. From literary expressions at the very emergence of the car, like the writings of Marcel Proust or Virginia Woolf, to the marvels of the new technology, to the tales of popular culture and car hype, reinforcing ideas of speed and singularity – literature, cinema, fine art and even music (see Widmer 1990) have contributed to saturating the public imaginary with the car.

The beauty of speed was hailed by artists at the beginning of the twentieth century, especially the Futurists, and so was the car. "The contemporary automobile", wrote Marinetti in the Futurist manifesto, "was more beautiful than Nike, the ancient Greek Winged Victory of Samothrace," therefore the motor vehicle became not only a functional means of transport but also an artwork in itself. Together with the obsessions of artists with speed, as in the works of artists like Giacomo Balla and Umberto Boccioni, there was also a fascination for the mechanical parts and the anatomy of the car, as with Picabia, Duchamp and Fernand Leger, who stripped the car down as Renaissance artists had done with the human body (Wollen and Kerr 2002:27–30).

Within urban and architectural discourses the car was immediately taken as an object of fascination, the ultimate product of modernity, compared with the Greek temples (Le Corbusier 2008:106–107). Architects had also begun to design visionary motor vehicles, such Jeanneret and Le Corbusier's 'Voiture minimum;' Norman Bel Geddes's streamlined cars of the early 1930s and Buckminster Fuller's 1933 Dymaxion car. "By definition there could be no modern architecture before there was a machine aesthetic" (Smithson 1974:34), reinforcing each other's image, modern buildings appear as the backdrop of car advertisements and cars appear in the foreground of architectural presentations,

[14] In 1961, only one in eight French people possessed a car (Ross 1996:28).

redefining architectural space. Therefore, beyond an image, the car became the new standard of space measurement in the design of the house and in the planning of the new city (Wright 1932:55), replacing the previous centrality of the human body and generating a variety of strong future visions and urban utopias, imagining various spatial as well as social consequences. Killing the street (Le Corbusier 1930), disappearance of the city (Wright 1930), and community without propinquity (Webber 1964) shared one aspect and that was the dismissal of the street as the social territory of the city to leave room for free circulation of the motor-car.

Furthermore, car infrastructure came to be the unifying factor, the comprehensible and legible identity of the cities, as "traditionally some unchanging large-scale thing - the Acropolis, the River, the Canal or some unique configuration of the ground was the thing that made the whole community structure comprehensible and assured identity of the parts within the whole," the Urban Motorway provided the answer to the most obvious challenge of the city: the lack of comprehensibility and identity. Thus the motorway was lifted from an ameliorative traffic function to a unifying identity for the city (Smithson 1974). The strong presence of car infrastructure was considered as a monumental presence of modernity, reinventing the city landscape and the city experience.

The centrality of the car in the experience of the city renewed the tools and redefined the perspective of the urban discipline. Kevin Lynch, who had already established a novel link between architecture, urbanism and psychology[15], proposed in 1964 together with Donald Appleyard and John Myer *The View From the Road*. The book displaces the habitual point of view on the landscape and proposes a detailed and multi faceted analysis of the experience of the car occupant in relation to the surrounding landscape in motion. This meticulous and detailed analysis of the perception of highway travel influenced and inspired further works, and opened up new cultures of urban project and analysis. It heavily inspired and influenced Robert Venturi, Denise Scott Brown and Steven Izenour's analysis of roadside architecture and evolution of American landscape in *Learning From Las Vegas* (1977), which went on to become one of the most-read books expressing a critique of architecture and cities.

Despite the massive presence of the car in popular culture, its significance in reconfiguring the urban discipline, as well as its tangible impact in urban space, scholarly interest in its history and representations took much longer to spark. Until the 1960s, writes Flink in *Car Culture* (1976), most automotive history had been written by and for the automobile buff, often uncritical, esoteric, and antiquarian, high priced cof-

[15] The Image of the City, MIT Press, 1960.

fee-table picture books. Therefore, most analytical writings on the cultural history of the car appear as a retrospective analysis after its early criticism. Eventually, however, an increasing interest within different disciplines, cultural studies, political and social history, literature scholars, history of transport and cities and finally sociology was created, leading to the massing of a vast and rich literature on the car, on its influence on everyday life, and the representations and significances of the same.

Kristin Ross (1996) in a cultural history of France, devotes one chapter to the mythical images of the "central vehicle of all twentieth-century modernization," the automobile. She analyses the same across a range of discursive and material spaces, from Chris Marker's Joli Mai to many of Tati's movies, Baudrillard's writings on speed and mobility without effort (Baudrillard 1978), right up to Sagan's and de Beauvoir's novels. "It was a revolution that permeated every aspect of everyday life [...], the automobile created a new subjectivity whose circumference, unlike that of domestic subjectivity, is nowhere and everywhere (Ross 1996:53)." Ross examines different aspects of this new everydayness with recourse to the works of Barthes, Lefebvre, and Debord who began at the time to conceptualize "everyday life".

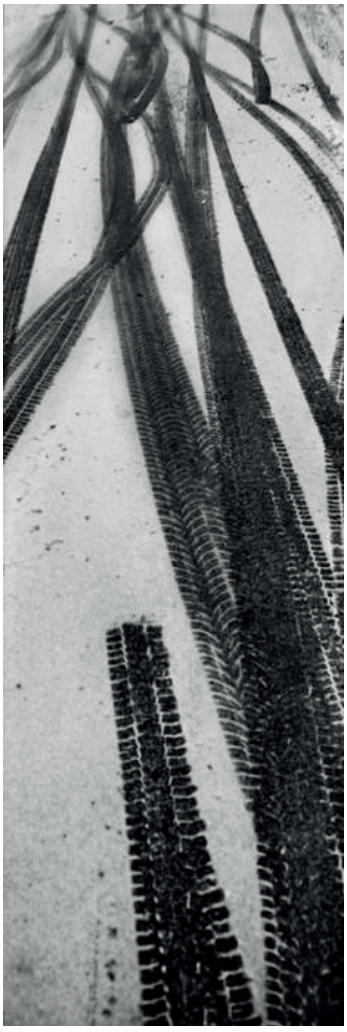
A cultural analysis of the motorcar in Germany was proposed by Sachs (1992). *For Love of the Automobile; Looking Back into the History of Our Desires,* is a cultural analysis that examines the history of the automobile from the late 1880s, questioning the nature of dreams and desires embedded in modern culture. Illustrating the text with a rich array of cartoons, advertisements, newspaper stories and propaganda, the book explores Germany's love affair with the automobile. Sachs (1992:13) underlines that "the history of the automobile must be equally a history of the environment and behavior."

A reversal in representations often referred to as disenchantment with the car began in 1960s in cinema, advertisements and fine arts, as an apocalyptic tone was creeping into the artists' interpretation of the car culture in the 1960s. Ross (1996) traces a transition, taking the examples of Jacques Tati or Godard movies, in the representation of the car from early moving pictures where the car is depicted as a fabulous item on an endless road moving towards a vanishing point, to the 1960s when these myths had been substantially eroded and the car had become an everyday object, just another element in an endless row of vehicles stuck in a traffic jam.

The recurrent example, that is often referred to as cinema's disenchantment with the car, is Godard's 1967 movie *Le Week-end*. Its interminable, exasperating single shot of a traffic jam and the two characters unconcerned with the bodies splattered across the

Fig 9. $8^{1/2}$, Federico Fellini, 1963.

Fig 10. Car landscapes, 1960.
©Josef Koudelka, Magnum Photos.



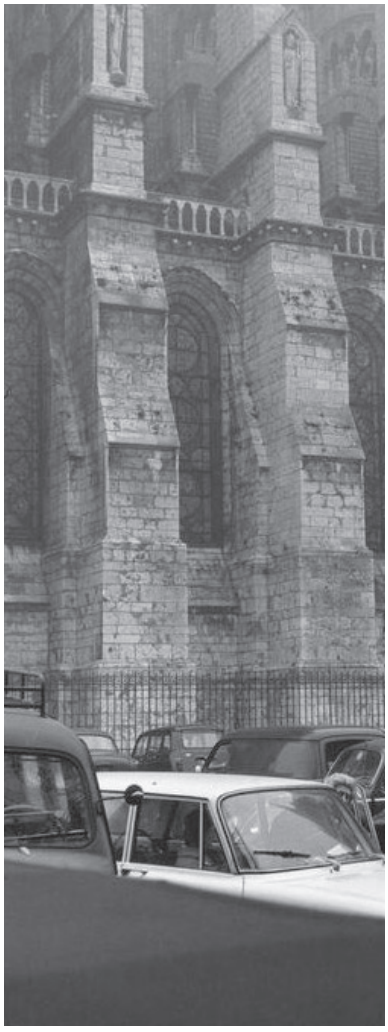


Fig 11. Before the Cathedral, 1968.
©Henri Cartie-Bresson, Magnum Photos.

Fig12. Walkmobile or Gehzeug was developed by the Austrian civil engineer Hermann Knoflacher in 1975 to allow a pedestrian to approximate the amount of space taken by a motorist (Zardini and Borasi 2009).

Fig 13. A car driver's stroll, Lucius Burckhardt, 1993. ©Bertram Weisshaar
Part of the seminar "Perception & Traffic" led by Lucius Burckhardt and Helmut Holzapfel in 1991.

Fig 14. Dromomania, ©Elinor Whidden, 2012.

road as they drive by, worried only as to how much this accident will have delayed them on their way. The "gridlocked hell of jammed traffic, the ennui of commuting, exhaust fumes and bloody highway accidents" (Inglis 2004) show-cased in *Le Week-end* follows, in fact, the reality of 12,000 road deaths in France in 1967, 130 killed and 800 injuries in each weekend carnage (Wollen and Kerr 2002:80). In the same vein, many other image productions of this period – verbal or visual – depicted the downsides or the consequences of the car. *The Southern Highway* by Julio Cortázar[16], for example, which according to critics was Godard's inspiration for *Le week-end* (Franco 1999), narrates a return to Paris via the southern highway on a Sunday afternoon in an interminable traffic jam. The same theme is repeated for example in Fellini's 8 ½ with the static images of the traffic that constitute the nightmare of the protagonist in the opening scene of the movie.

The car, therefore, rather than a source of inspiration, also became the object of contention in the works of artists, echoing the on-going "freeway misery". Along with the critical representations of car in the works of artists such as Wolf Vostell, Andy Warhol, Pipilotti Rist, walking re-emerged as an artistic practice with artists like Richard Long and Francis Alÿs. The walking artists and theorists proposed an inversion in relation to the experience of the landscape as in Lucius Burckhardt's *Car Drivers' Stroll, Kassel* (1993) in which a group of pedestrian stroll with the car's windshield. This approach further becomes a strong subversive force against the car, for example in Elinor Whidden's work where she walks through the car landscapes while carrying pieces of car as relics of car culture.

The waning love affair with the car, according to Sachs (1992), came to light as it became more and more associated with intrusion, and the renunciation of the car came to be valorized as a symbol of social superiority. However, such an account of the emergence, hype, and decline of the car and its imagery traces out a linear story. This narrative must have ended somewhere around when the fascination with the car as an object and as an image ended, or when it ceased to be the omnipresent plot device in novels and movies. However, the imaginary of the car, as mentioned above, is fueled by multiple contradictory forces, both in production of spaces and within the discourses that frame them. Some argue that disenchantment with the car has been rather academic (Miller 2001:8), an elite representation of the state of the facts and that popular culture did not experience the same kind of reversal of attitude. The 1977 book of *The War against the Automobile* called the emerging hostility towards the car as "a snobbish contempt for the masses." While critiques of the car were labeled by their opponents as "snobbish" and "elitist," Venturi and Scott Brown's *Learning from Las Vegas*, for example, has been

[16] La autopista del Sur, 1966.

Fig 15. Josef Muller-Brockmann, Automobile Club de Suisse.

often accused of being populist for their praise of the American roadside landscape as it was and as the common taste (Valéry 2011). In this perspective, the current shift from the car, the departure point of this research, has followed the overlapping temporalities of car urbanism, its enthusiasts and its critics in urban discourses as well as in popular movements.

3. CAR VERSUS PEDESTRIAN

Opposing Imaginaries

The advent of car transformed the urban scene into a battleground, which sees the car and pedestrian pitted against each other in their fight over time and space. In the following, looking into an array of materials, from how the car has been represented in public debates to how it has been theorized within urban projects and urban writings, I will first trace this contraposition, looking into both visual and verbal discourses. Postulating reasons for supporting one side or the other, I will show how matters go from competition, humiliation and mockery in early discourses on public order and right of way, to systematic division in urban projects and urban visions of the functional city, and hence how the issue has led to the generation of strong spatial consequences. The contention endures beyond critiques of functionalism, and the discourses turn into a language of revolt, revolution and guerilla warfare, involving the pedestrian's attempt to win back the street.

The second part questions what imaginaries have been confronted with each other via such contention over space, and how they have transformed through time. While car and pedestrian have constantly been represented and discussed as opposites, values and qualities associated with each side have changed and shifted surprisingly. In closing in on the core of the contraposition and its shifting values, I demonstrate the instability and dynamic character of these values and qualities, and further present early attempts seeking to go beyond the same contraposition by promoting intermediates and hybrids lying in-between car and pedestrian.

The last section, presents a collateral finding of the research demonstrating that the anti-car discourses triggered and significantly contributed to the emergence of the notion of public space.

3.1. Fight for Space

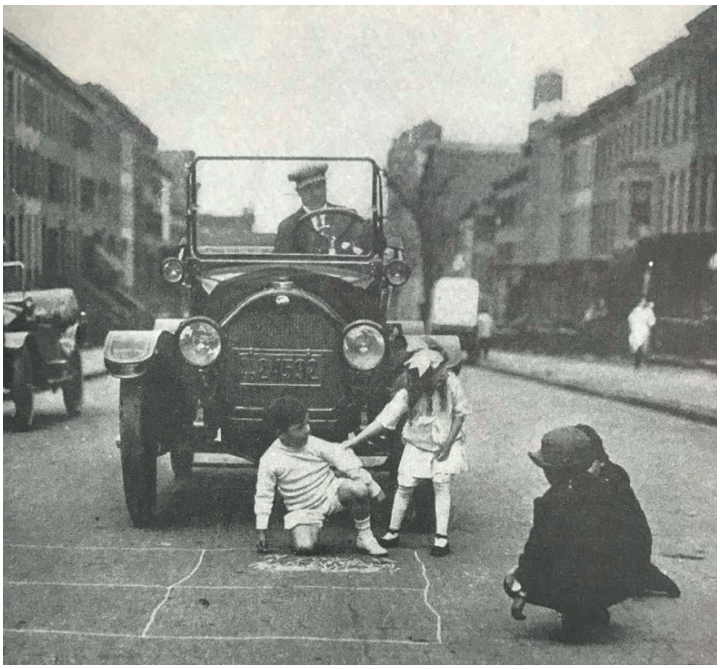
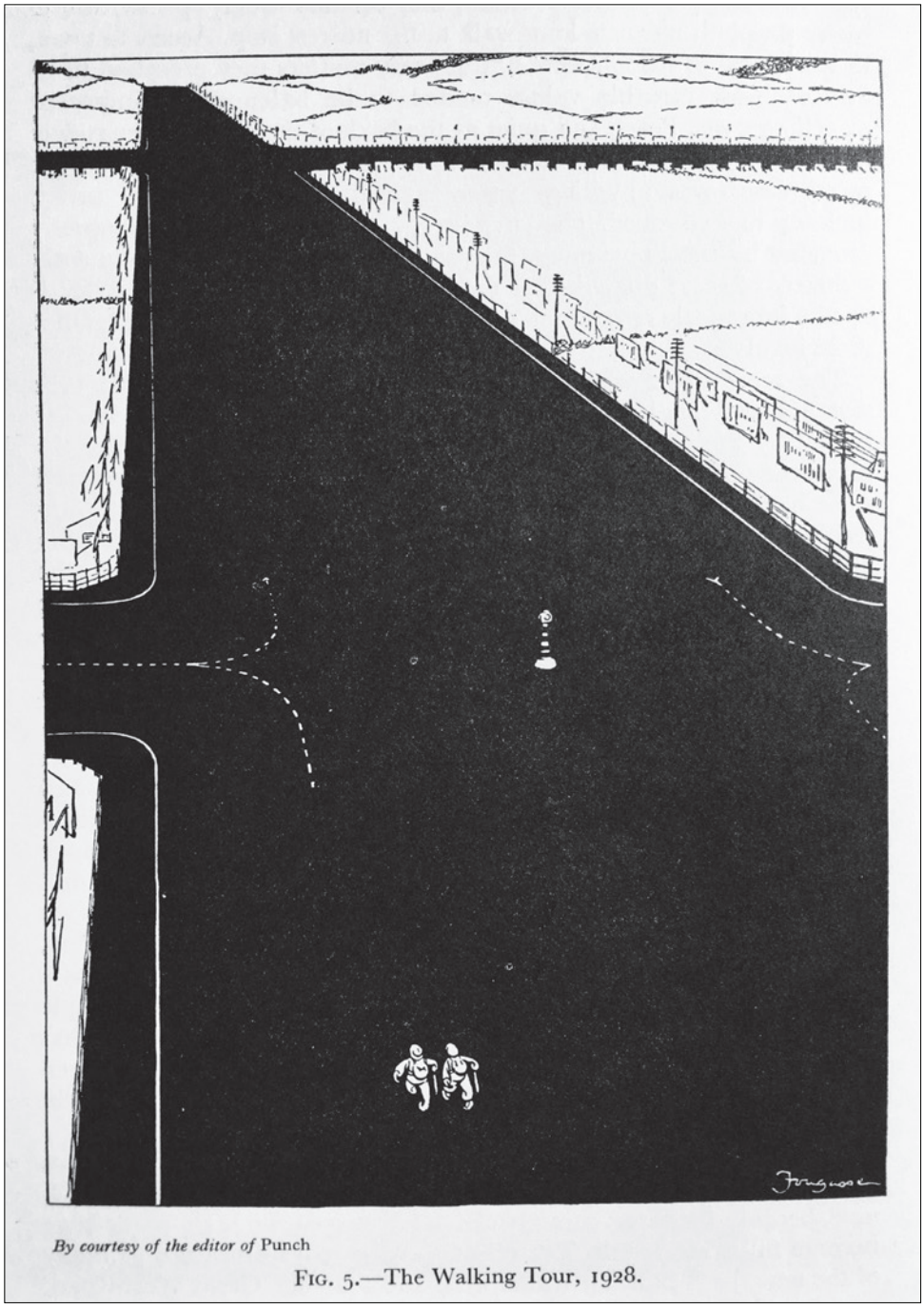


Fig 1. Sharing space with cars, 1916 (Wells 2014).



By courtesy of the editor of Punch

FIG. 5.—The Walking Tour, 1928.

Fig 2. Walking tour, 1928 (Buchanan 1958).

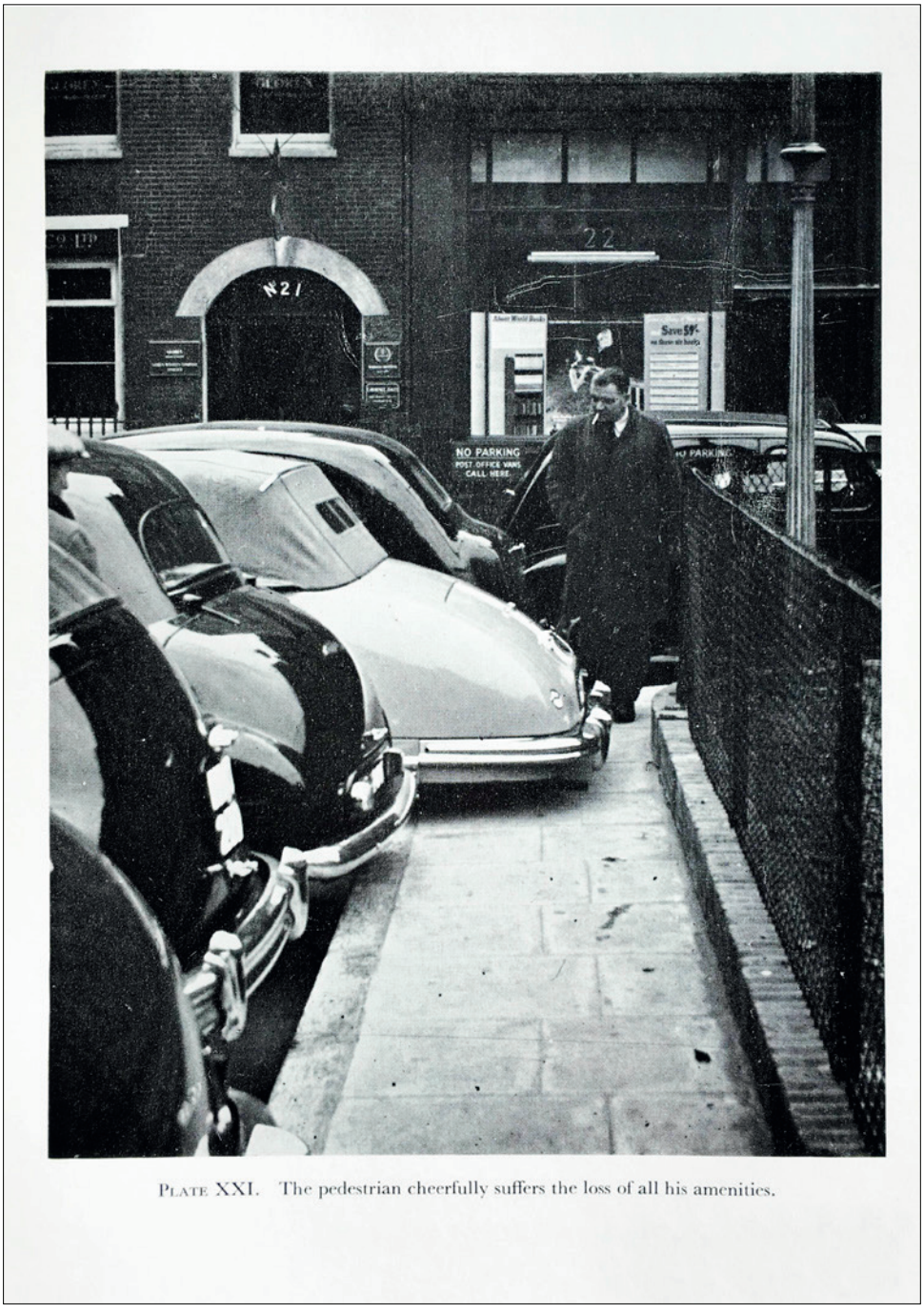


PLATE XXI. The pedestrian cheerfully suffers the loss of all his amenities.

Fig 3. The pedestrian cheerfully suffers the loss of all his amenities (Buchanan 1958).

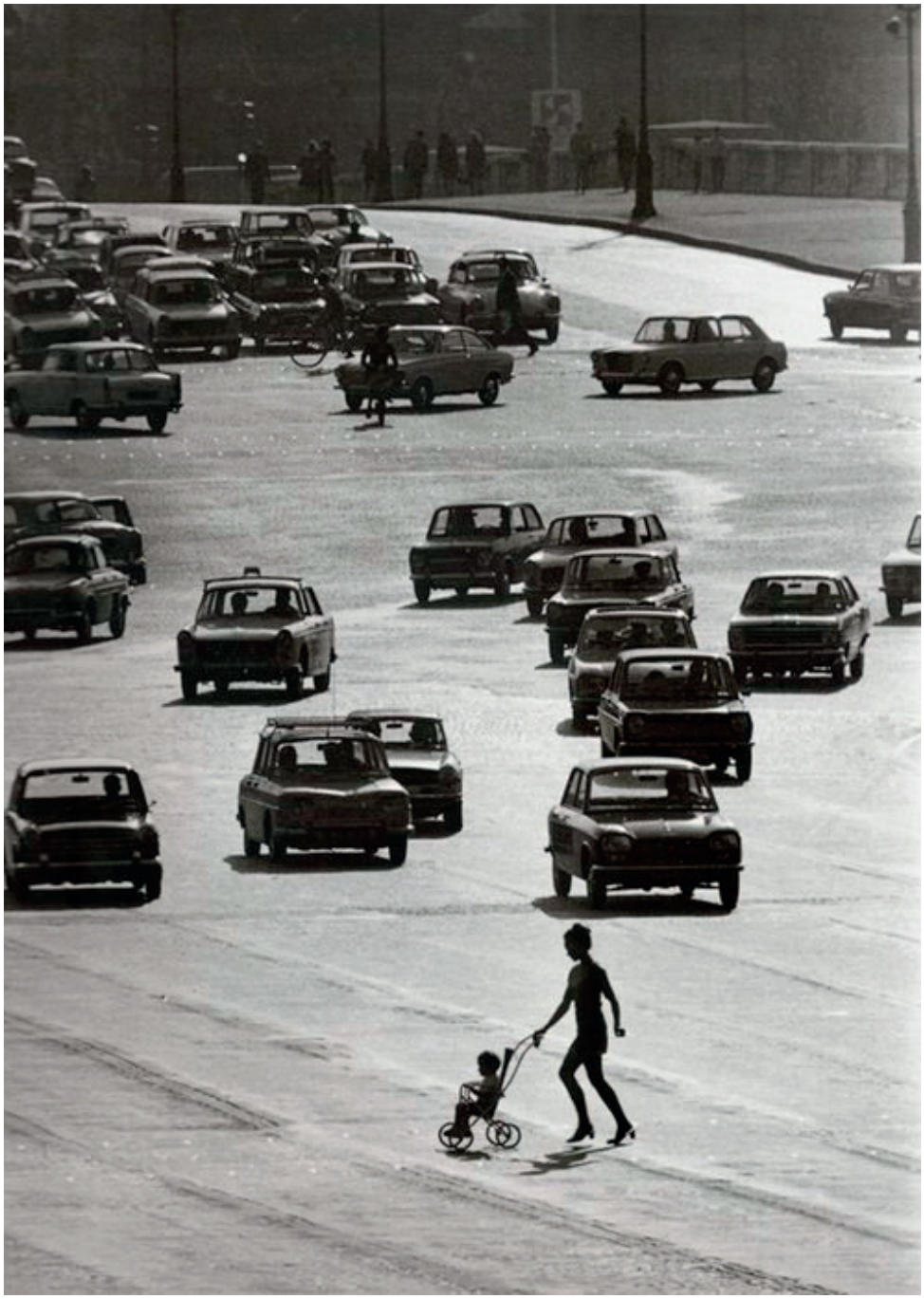


Fig 4. La meute (The pack), Paris, ©Robert Doisneau, 1959.

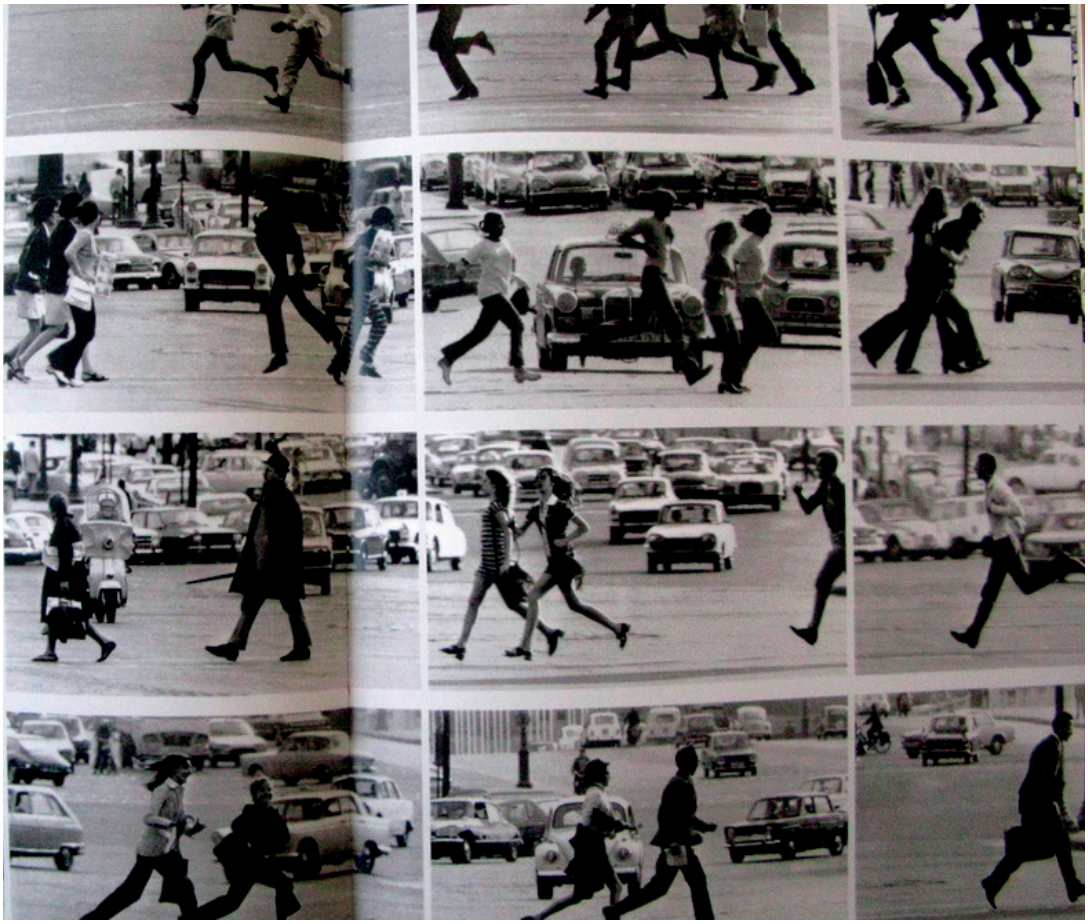


Fig 5. Paris, ©Robert Doisneau, 1959.

Fig 6. Les pieds passant, Paris, ©Robert Doisneau, 1960.

Fig 7. The banks of the Seine, Paris ©Robert Doisneau, 1954.

Fig 8. Place de Concord, Paris, ©Willy Ronis, 1952.

Fig 9. Spaces of car (Buchanan 1963).

Fig 10. What a "triumph" from "The Pedestrian Revolution" (Breines and Dean 1974).

Fig 11. a) The pedestrian's predicament, New York Tribune 1925 (Pushkarev and Zupan 1975), b) The nightmare of gridlocks, Domenica del Corriere, 1962.

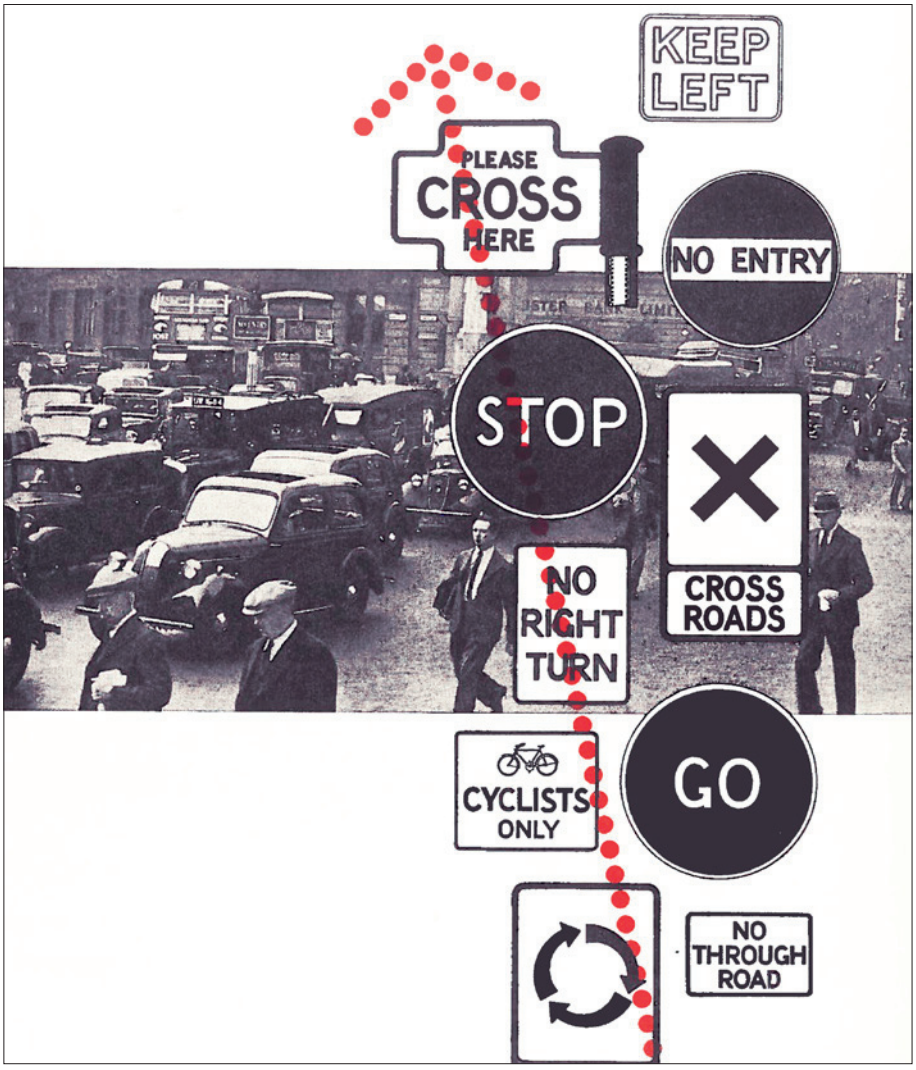


Fig 12. Humanization of urban life against the oppressions of mechanization, CIAM (Tyrwhitt, Sert, and Rogers 1952).

Fig 13. Banks of Rôhn, Lyon ©Ferdinando Scianna, Magnum photos.

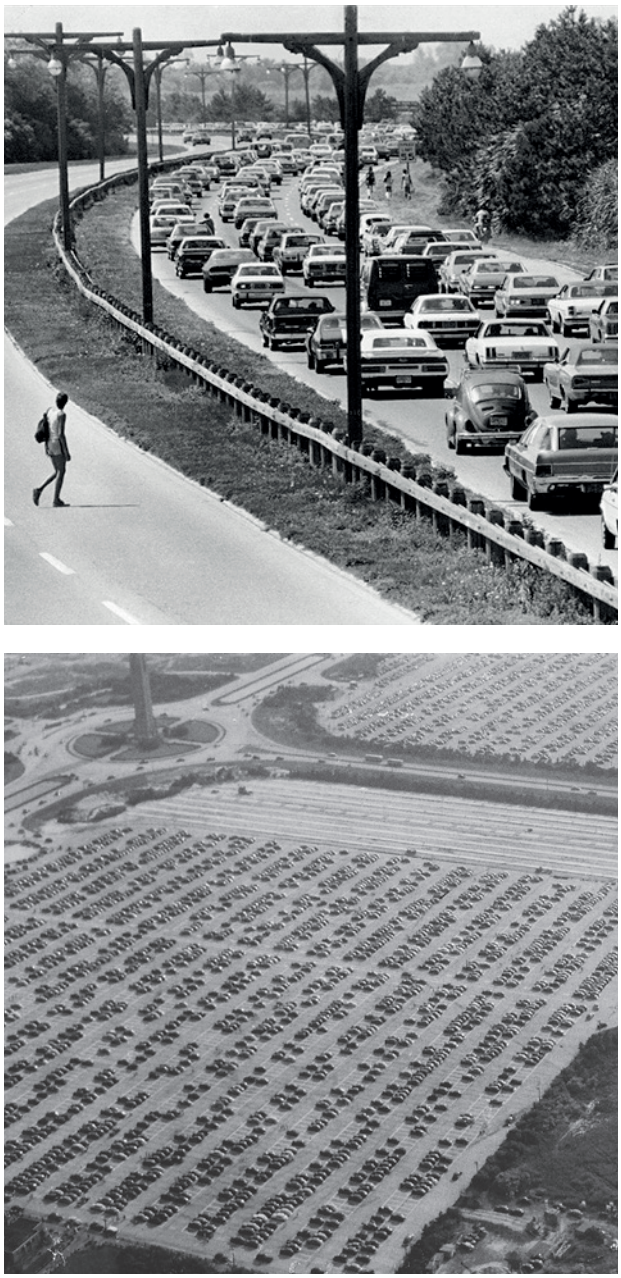


Fig 14. The way to Jones Beach, ©Donald Norkett, Newsday, 1960s.

Fig 15. Picnic on the highway, Car-free Sunday, 1973 ©N/A.

Fig 16. Roundabout of Maladière, Lausanne, Car-free Sunday, 1973 ©ASL.

Fig 17. Autoloze zondag, Netherlands, 1973.

Fig 18. Autoloze zondag, Netherlands, 1973.

Fig 19. Elevado Costa e Silva known as Minhocão (big worm), São Paolo ©Christopher Pillitz.

Fig 20. Home, Ursula Meier, 2008.

Fig 21. People on the Champs-Élysées, Car-free day
©Philippe Wojazer/Reuters, ©Guardian, 2016.

Fig 22. Lausanne-marathon © City of Lausannne, 2016.

Fig 23. Car-free day, Amsterdam © Hans Van Rijnberk, 2009.

In 1912, Michael Freiherr von Pidoll, an Austrian government official, in Vienna published a "Call to Protest," in which he claimed the public's **right to the street**:

"Where does the motorist get the right 'to master' as he boasts the street? It in no way belongs to him, but to the population as a whole. Whence his right to hound the people's footsteps and dictate to them a behavior that he is justified in demanding only on his own private paths? The public street is not meant for express traffic; it belongs to the milieu of the city. … Should, perhaps, the public streets be kept 'free of people'?"[1]

Already prior to the proliferation of car, as attested by Pidol's writing, tension started forming between the car and the pedestrian. The automobile became a menace to the pedestrians and pedestrians were seen as "annoying street accessories." Pidol was one of the early observers to attack the car as a fundamental threat to city streets. While his question "should *the public streets be kept "free of people"* was posed rhetorically, in many places though the answer would soon be yes.

"*City streets and squares are more than mere thoroughfares,[...] rather, they belong to the whole layout of the city, the milieu in which the personal, social, and economic life of the city in no small part takes place; and they satisfy city dwellers' indispensable need to go for a stroll.*"

Anti-automobile campaigns called motorists 'road hogs' or 'speed demons' and cars 'juggernauts' or 'death cars'. However, the epithet that persisted, that became established and eventually influenced the safety policies of the cities, was the one given to the pedestrians as 'jaywalkers'. A jay at the time was an unsophisticated person, a hayseed, out of place in the city, 'jay,' the Oxford English Dictionary suggests, was a common insult in American slang. To jaywalk was to cross the street in an unsafe way, the way a country dweller unfamiliar with city traffic might. The term was also controversial. The New York Times, in 1915, called the term 'jaywalker' shameful and 'highly shocking.' It rang of a pejorative class term, one used by wealthier drivers to refer to the carless. The attempts to turn the 'jaywalking' label against those who promoted it, calling them 'jay-driver' failed immediately. As 'motorists could be called tyrannical, or selfish, but a car's power, modernity, and worldly sophistication made its owner anything but a jay.' (Norton 2011:78).

The situation was depicted by NY magistrate in 1924 as "*a deadly competition between pedestrian and motorist for the use of those strips of territory we call streets—a conflict*

[1] Michael Freiherr von Pidoll, Der heutige Automobilismus. Ein Protest und Weckruf (Automobilism today: A call to protest), Vienna, 1912 quoted in in Sachs (1992:15).

deadly to the wayfarer, with the victory going to the motorist"[2]. The competition, therefore, was formulated as that of **jaywalkers** against **joyriders**, over the city space, to change the course of future transformations in the city. The transformations that, as Peter Norton describes in his book, *Fighting Traffic: The Dawn of the Motor Age in the American City*, required not only a physical change but also a social one. "It was not an evolution", he writes, "but a bloody and sometimes violent revolution." While pedestrians campaigned in moral terms, fighting for 'justice,' automotive interest groups legitimized their claim to the streets by invoking 'freedom', a rhetorical stance of particular power in the United States. Bifurcating the world into **walkers** and **riders**, captivity and freedom, the car was advertised as the 'freedom of all outdoors', outreaching the wilderness, and representing progress. Hailing freedom, and contesting any restrictive measures on cars hogtying the automobile, safety campaigns encouraged the pedestrian to 'obey'.

Fig 24. a) Obey, an American Automobile Association poster, 1927,
b) Hog-Tying the Automobile, from Motorists journal, 1924 (Norton 2008).

Moreover, the visions and theories of car urbanism during the first half of the century, hence, defined themselves as an opposition to what was before a walking city and characteristics associated with it. "The man seated in his automobile affects him everywhere he goes" wrote Frank Lloyd Wright in *Disappearing City* (Wright 1932:82). This man, proposed Wright, rather than "the man standing on his legs" must be the new standard for the measurement of space, re-shaping the city and architecture, and freeing the city from its space relations, as exemplified in Wright's urban vision, the Broadacre city. The walkable city, thus, disappears into a scattered urbanity imagined by Wright as it does in Radiant city with the death of the street, although fundamentally different from each other in their spatial arrangements and the organization of their flows. The *functional city,* as declared in the Charter of Athens, acknowledged walking as a natural and healthy activity to be preserved, but to be preserved through its own networks, so that the motor vehicle could circulate unhindered without any pedestrians around, and pedestrians will never have to meet a vehicle (Hass-Klau 2015:35). There-

[2] From *Nation Roused against Motor Killings*, New York Times, Nov. 23, 1924 quoted in Norton (2011:21).

fore, the figure of pedestrians was wiped out from the idea and ideals of the Modern city. Lewis Mumford in his *Highway and the City* (1963) held cars responsible for "the end of the pedestrian" in the twentieth century. "The car reduced the status of the walker by making walkers throughout society, and walking within the city more and more irrelevant" (Amato 2004:240).

In 1930 Edward Bassett, known as the father of American zoning, proposed the name 'freeway' for new car infrastructures, asserting that freeway connotes freedom for motoring, freeing it from grade intersections and from private entranceways, stores, and factories, sidewalks and more importantly freed from pedestrians (Schneider 1971:52). Despite the fervent development of freeways, however, the car system reached its limits, in a "suicidal streak" (Gruen 1974). On the limits of freedom associated with car mobility, Mumford warned:

"*Perhaps the only thing that could bring Americans to their senses would be the clear demonstration of the fact that their highway program will, eventually, wipe out the very area of freedom that the private motor car promised to retain for them.*" (1963:176)

With the critics of functionalism however, as we know, there started a reverse attitude that tended to re-evaluate walking as the main component of the city. This new trend however, maintains, nonetheless, the oppositional rhetoric towards the car in its plea for the pedestrian. Adolf Abel[3]

, for example, who was a strong advocate for pedestrianization, wrote in 1942 his article, *The Return of Traffic Space to the Pedestrian* that intensified the discussions on pedestrianization in Germany. In his plan for the city of Munich in 1946 one of the main features was the strict separation of the pedestrian network from that of motor traffic. With a central square behind the town hall, with five pedestrian axes stretching out that lead through courtyards and were complemented by streets, squares and arcades. The facades of shops and entrances of the houses would open to the yards and squares and not to the traffic routes. Abel sustained that the separation of the different modes was the only way the city could survive. He used Venice as an example of physical separation of transportation modes and took that as the secret of its success (Hass-Klau 2015:27–36).

The CIAM 8 held in Hoddesdon, England, officially marking a transition from functional city, was focused on the notion of human scale and the figure of pedestrian; it

[3] German architect and urban planner, the author of *Regeneration der Städte* (1950).

acknowledged "the right of the individual over the tyranny of mechanical tools." The core of the city, the center, was discussed as a civic landscape, and secure from traffic, to provide opportunities for spontaneous manifestations of social life (Tyrwhitt 1952). This approach is taken further by Gruen in his book *The Heart of Our Cities* (1964), where he suggests a rebirth of the heart with an emphasis on pedestrianism, criticizing utopian schemes of the past trying to adapt the human settlement to the automobile, like Jellicoe's Motopia (1961) or Wright's Broadacre City, as "misdirected" of what by "only by the greatest stretch of imagination could be called a city." In a later article in 1974, on the city of Vienna, Gruen takes the contraposition discourse further with an analogy of the car as an animal from which man has to protect himself and his habitat. The metaphor of the animal versus human is employed repeatedly in descriptions of the car and the car driver, described as a hybrid (Urry 2004), lying somewhere between man and animal, between body and machine, the way the Italian futurists hailed the driver as a modern centaur. Victor Gruen takes the same metaphor to discuss the place and policies of the car in the city. Considering the automobile as a descendent of the mule, the donkey, the horse, and its wild forefathers. In his essay on 1974, he proposes to forget for a moment that the automobile is man's creation and consider it as a zoological phenomenon: What is the nature of this animal?

"Big, heavy, powerful and capable of high speed but only on smooth surfaces. Extremely noisy, it produces noise, which, in areas where big herds are present, can make it impossible for the humans to talk or think. It has a ravenous appetite. It consumes large quantities of fossil fuels, the supply of which might become scarce in the future. Its hunger for space can never be satisfied, the more pastures and stables one provides for it the more it craves for. It eats up oxygen at an alarming rate, and its breath poisons the air. It kills and maims humans and is even inclined to destroy the members of its own race. It has a high and constantly increasing birth rate! Happily or tragically, it has a suicidal streak. The greater their herds become, the smaller becomes their ability to move or to exist. Thus, if the birth rate is not controlled, the race is doomed to final extinction."

Gruen, therefore, joins the cause of the early contesters of the car, defending pedestrians' rights and space: "Up to now people, especially those who belong to the 'Highway Establishment,' have maintained that instead of taming the automobile, we should tame men. Men are being taught and trained to perform tricks like walking on 'Green' and stopping at 'Red', waiting patiently behind the fences and chains and crossing only in places, which look like zebras. Human dwelling space and places of human activity must necessarily be confined to the lands left over between the pasturelands and the stables of the automotive hordes. The idea that man should be cowed into submission to

the 'animunculus' seems bizarre, yet it is one which is blindly followed wherever large herds of automobiles appear." Acknowledging that so far the pedestrian has been defeated, Gruen proposes to "tame" the car: "if we want to protect man from this species, we will have to tame and domesticate it. Free it from poison and fence it to its reserved pastures, where it can move without endangering human interests. Otherwise it will destroy itself by suicide, but only after having destroyed our cities and countryside." Taking his zoological analogy further Gruen suggests that man was always obliged to defend his settlements against wild beasts and human enemies. Historically man applied the technique of surrounding cities by concentric rings of defense lines, the outer ones to slow down invasion and the innermost one to be impenetrable. A similar technique should prove effective in slowing down and keeping out the invasion of the motorcar herds. The system will protect major areas of human activity, and especially the core of the city from intrusion. Therefore Gruen proposes a sort of environmental oasis surrounded by the loop road system (Gruen 1974).

Gruen's earlier projects, like the plan for Fort Worth, Texas (1955), hold the same approach of separation of spaces. Fort Worth has been very influential and inspired many projects, as well as authors and urban theorists in the formulation of the contraposition, as for example Kenneth Schneider, who portrays a conflict between Autokind vs. Mankind (1971), introducing the *tyrannus mobilitis* and the rise of autocracy, looking into measures of oppression of mankind, and finally proposes strategies for his victory with several stages of revolution against autocracy. The process is described as a struggle in which man has to re-capture his sovereignty. War and revolution vocabulary, such as resistance, revolt, guerrilla warfare became increasingly common in urban discourses between the 60s and 70s. Schneider, employing war terminology, underlines that the aggressive tyranny of car, enjoys a quisling[4] like support from the conservative tradition of Mankind itself. In his proposed strategies for victory, however, Schneider, repeatedly refers to Gruen's earlier projects and publications.

Pedestrianized areas and car-free centers as proposed by Gruen were described by Buchanan (1958) – the author of the forthcoming famous and influential report for the UK ministry of transport– as *putting the pig out of the parlor*. A pig in the parlor – instead of the barnyard refers to the right thing in the wrong place. In *Mixed Blessings*, Sir Colin Buchanan, evaluates different aspects of motorization, both benefits and drawbacks - as the title of the book suggests - from a social, economic, and spatial point of view, and already then alerts to the necessities of the growing car system in England. Using photographic material and cartoon illustrations, in the book he demonstrates the existing conflict over space. Buchanan underlines congestion as a problem that has

[4] A quisling is a person who collaborates with an enemy occupying force.

only captured the public imagination in two aspects: the delay it causes for the vehicles, and the parking difficulties for drivers. "Pedestrians seem to have been bludgeoned into accepting the loss of all their amenities, noise and smell are tolerated, there is no deep concern about accidents, and certainly no one bothers about minor by-products such as the impossibility of appreciating street architecture." (Buchanan 1958:90)
Jane Jacobs (1961), however, takes another position, underlying a common trend in projects and in urban schemes, Jacobs warns that to depict the impasse in cities as a war between automobiles and pedestrians is an oversimplification of the matter:

"*Today, those in despair at the war between those potential allies, automobiles and cities, are apt to depict the impasse as a war between automobiles and pedestrians [...] It is fashionable to suppose that the solution lies in designating certain places for pedestrians, and certain others for vehicles...To think of city traffic problems in oversimplified terms of pedestrians vs. car, and to fix on the segregation of each as a principle goal is to go to the problem from the wrong end*." (Jacobs 1961:344)

The contraposition however, as formulated in 20th century, goes beyond the mere physical confrontations in urban space. While, the pedestrian is acknowledged as the foundational force of the city, where we find the linguistic root of citizen, civil, civic (civitas), the car represents the ultimate mobility. Sheller and Urry (2000) underline traditions of theorizing the urban, like the Chicago School or theories of civil society, that have contributed to the perception of mobility as inimical to civility and citizenship. Therefore, considering mobility as countering the city, and landscapes of mobility as non-places, dissociating forms of *habitabilité* to that of *viabilité*, as did Ildefonso Cerdà (Cerdà 1979) even prior to the car. Jean Baudrillard, the French sociologist, in his *Le Système des Objets*, that is an analysis essentially confined to the private realm of the household, adds an addendum on the private car. In this chapter, Baudrillard pairs and compares the domestic sphere and the motor car, analyzing their systemic bipolarity, he asserts that together with the other duality, that of work and leisure, they frame the entirety of everyday experience (Baudrillard 1978:72); the four functions that constituted the Modern city and its projects.

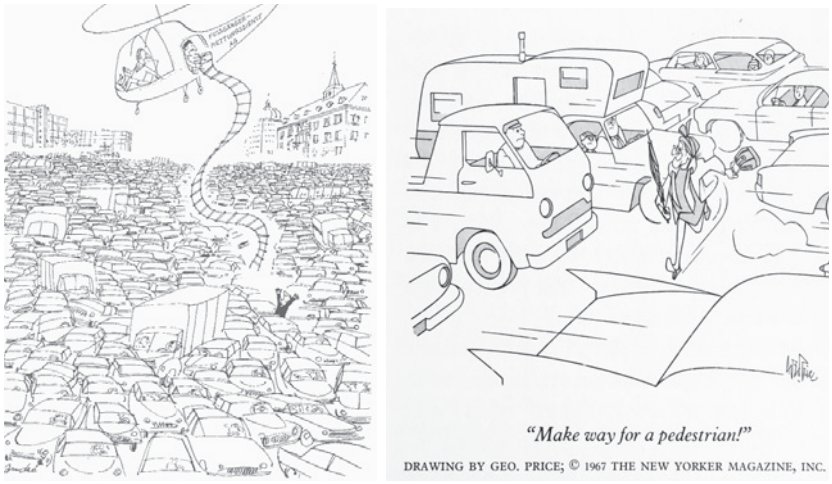


Fig 25.Guerrilla warfare in "The Pedestrian Revoltion" (Breines and Dean 1974).

3.2. Shifting values; Dynamic imaginaries

The staging of the contraposition from the early emergence of car shows the constant struggle over space between car and pedestrian. The contraposition in space was formulated as the opposition of body against machine, slowness against speed, the social qualities of walking against the efficiency of car mobility, and the burden of traveling on foot as opposed to the effortless movement of the car. However, the qualities associated with the two sides have constantly shifted, corresponding to the context of the cities, accompanying infrastructures, the new systems of values, contributing to the dynamic imaginaries of mobility that as discussed in the previous chapter are geographically and temporally anchored and therefore, evolve with the evolutions of the cities. In the following, I will go through such evolutions in meanings and associations, in particular looking into how dualities of *active* versus *passive*, *speed* versus *slowness*, and pedestrian *body* versus *machine* have led and conditioned urban policies.

Active versus Passive: the experience of mobility

Compared to the passive traveler in a train, seen as a spectator of the passing-by landscape, distanced and without perspective, driving a car was an active way of travelling, constituting a new engagement with the surrounding environment and in its heading towards a vanishing point. This perception of car as engaged, active travel, characteristic of the early times, contrasts with the *inactivity* of the experience of car as described by Appleyard and Lynch. Analyzing the noble passivity of the car occupant and the distance of the same from their surroundings, *View from the Road* sets a framework for discussing the road (highway) experience, watching the unfolding "drama" of the road for which the new paradigm of urban design had to prepare and had therefore to adjust and mobilize its design tools and knowledge (Lynch and Appleyard 1966).

Such *inactivity* as quality specific to the "inattentive audience" of the road corresponded to the ideal of "effortless" travel, explaining the magic side of car as 'travel' in its meaning of "labor, toil, or painful effort" (indeed facilitating the avoidance of the same), etymologically deriving from *travailen*, from old French travail meaning; originating from *tripalium* that was an instrument of torture. Baudrillard (1978) describes the mobility without human effort of cars as a kind of unreal happiness, a suspension of existence. Hence, comfort of car travel was repeatedly advertised by car industry with allusions to the comfort of one's home, living room, or armchair[5].

In more recent approaches, however, the sedentary life-style of car mobility, correlating

[5] Living room on wheel (ad for Ford 1949); They're as solid as a rock, as reliable as time, as comfortable as your favorite armchair (ad for Ford Cortina 1982).

with inactivity and obesity has become heavily criticized. The notion of active mobility that qualifies walking and cycling as active modes of transport, through an active use of body and metabolic energy, is today consistently encouraged through public policies and urban projects and constitutes an important theme of interdisciplinary research, whose aim is to tackle the problem of inactivity in adults and its health-related consequences, especially in car-dependent environments.

At the same time, other practices are emerging. Daily physical activities are today measured, registered, and even shared through social networks by individuals, using fitness trackers, smartphones, and other accessories. In recent years running and jogging have become genuine trends in many cities, increasingly supported by mobile applications, coinciding with the emergence of the notion of Quantified Self (Till 2014; Rooksby et al. 2014), and sporting communities and social networks. Likewise, the number of organized urban sporting events has increased in recent decades. In the United States, for example, the number of people who participate in and finish a running event has increased fourfold between 1990 and 2013. These trends confirm an increasing interest in bringing sports to the city, increasing value of physical effort as opposed to a comfort defined in sedentary terms.

This urban culture of fitness and sport is also indebted to the late twentieth century shoe industry, that scientifically and technologically not only worked on comfort, performance and well-being of the foot, but also took style seriously. The shoe industries therefore came to care for and highlight the foot and its specialized activities in a society that had increasingly minimized walking, and had even considered not having to walk both a goal and an achievement. While until 1960s sports shoes were confined to basketball and tennis courts, things started to change particularly when the co-founders of Nike, Bill Bowerman and Phil Knight, in 1964 started their brand with the determination to produce a shoe for fitness and high athletic performance and take it into everyday life. Their productions mutated back and forth between sport and fitness, serving health, comfort, casual attire, and even fashion. In fact, what started as a quality athletic shoe was redesigned for all other sports, along with jogging, training, and walking, certainly bearing witness to a growing activity for the health conscious. (Amato 2004:310)

Jogging a best-seller co-authored by Bowerman in 1966 together with a cardiologist W.E.

Harris, spread the word to Europe and launched a trend[6]. In 1980s there were already a lot of competition with fashion companies that began to look at Nike athletics shoes as a fashion item, and athletic shoes, thereafter, took on the guise of "working sculptures" that had entered everyday life. The ancient Greek Winged Victory of Samothrace, whose beauty was once compared to a racing car in Marinetti's Manifesto of Futurism in 1909, came to inspire and symbolize footwear and walking.

The notion of active today, in urban and mobility vocabulary can go even beyond the physical activity and refer to the active use of travel time. A trip on public transport offers the possibility of an active use of time, working, reading or socializing and is often contrasted with driving, whose time in daily commutes is often considered as a waste. Quantified in Switzerland for the year 2010, the time spent in traffic congestion was estimated as a waste of 34.5 million hours equating the cost of 1.25 billion Swiss Francs (Bierlaire and Baehler 2017).

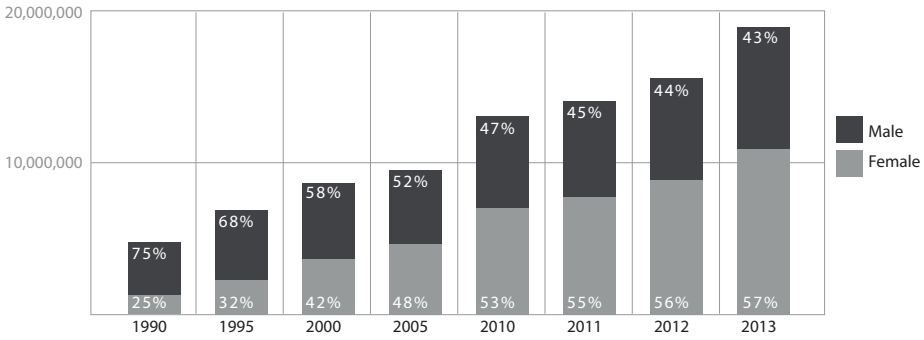


Fig 26. Running event finishers between 1990-2013
data from http://www.runningusa.org/statistics.

Speed versus Slowness: spacetime of mobility

It is said that cars brought back "the romance of travel" which some romantic walkers claimed had been lost in the aftermath of the train (Peters 2006:73). While the very first generation of car travelers appreciated the car for its slowness, enabling them "to enjoy the landscape at ease," it's speed was soon the car's distinctive quality, contrasting it with the walking man. The car was seen as providing him freedom. The speed of travel (slowness itself being a speed) has been one of the determining elements of politics of mobility (Cresswell 2010), generating public debates and academic interest. During the

[6] About the impact of the book in Europe see the video on ina.fr – introducing *jogging* as a sport imported from the United States that is becoming fashionable in France that can be practiced at any age, taking some precautions. Accompanied by interviews with people jogging, from the Paris-Versailles under the Eiffel Tower http://www.ina.fr/video/DVC7808229101/le-jogging-video.html

Fig 27. Winged Nike of Samothrace, 190 BC, Louvre Museum. ©Marie-Lan Nguyen.

20th century, *la règne de la vitesse*[7], the pedestrian was looked down upon as the slowest of all species, as "the biped creature so ill-constructed for speed […], dragging himself along with difficulty on the surface of the terrestrial crust," and the advent of car was considered to be what finally enabled man to overcome this deplorable condition (Moos 2009). The car offered "the freedom of all outdoors" (Ford brochure, 1949). Through proliferation of the car the earth became accessible.

The speed gains, curiously, primarily resulted in accessing more space rather than in saving time. The horizon did not come closer, it moved further away, resulting in further segregation of functions. Speed, then, as a criterion of comparison between pedestrian and car mobility, as the basis of an absolute measuring unit, significantly influenced functionalist planning during the twentieth century (e.g. urban expressways, bypass highways, etc.). Speed consumes distance: the faster the mode of transport the more space it requires. A car travelling at 40 km/h requires over three times as much space as a car travelling at 10 km/h (Whitelegg 1993). This could explain why the car's dominance was first questioned through spatial concerns, rather than concerns for ecological urban design or other urban planning concerns. The car was criticized for its colonization of the space of everyday life, for the physically invasive character of the car as an object, and for the intrusiveness of its accompanying infrastructure. Observations of the "pedestrian cheerfully suffering the loss of all his amenities" (Buchanan 1958) led to critiques of car in the second half of the century. Revolts against the "*dictature du movement*" (Virilio 1977) and critiques of acceleration and high-speed infrastructure, arguing that accelerations are restrictions of freedom, coincided with the oil crisis (1973) and triggered discourses on the virtues and even the necessity of slowing down. Ivan Illich (1974), proposed that desirable social relations are possible only where speed is restrained, emphasizing the relation between low energy use and increased social equality and environmental quality. Thus, walking and cycling were re-framed as desirable, slow, self-powered transit.

"High speed is the critical factor which makes transportation socially destructive. A true choice among political systems and of desirable social relations is possible only where speed is restrained. Participatory democracy demands low energy technology, and free people must travel the road to productive social relations at the speed of a bicycle."

Illich calculates the "effective speed" of the car, which is limited by the investment of time needed to own a car and keep it mobile. Taking the distance travelled by an average American by car per year, and dividing it by the overall time spent on the car (including the time for parking, as well as earning the money for it) he concludes that

[7] From *'La règne de la vitesse'*, Philippe Girardet, Mercure de France (1923) quoted in Le Corbusier's *Urbanisme* (2011:182).

1,600 hours invested yields 7,500 miles, that is less than five mph. Therefore, he shows, the effective speed of car is slower than getting around by bicycle. The concept of effective speed can be traced back to the 1850s. The first person to draw attention to the idea behind the 'effective speed' argument was probably Henry David Thoreau in his book *Walden*, published in 1854. In Walden, Thoreau argues, "the swiftest traveler is he who goes afoot" (Peters 2006:73).
Today "effective speed" is a common concept in the analysis of mobility, and it is also proposed as a metric to guiding change in travel behavior and transport policy. Along similar lines, "social speed" describes the average speed of a vehicle after hidden time costs are considered, suggesting that since the time spent in the vehicle should be divided by the number of people, if more people are travelling with the same vehicle the social speed increases (Tranter and May 2005). In this case the social speed of a car with five passengers is higher than a car with only one. The increase in social speed involves the acceleration of public transport.

While speed limits for safety reasons date back to the very first cars in the nineteenth century, anticipated by locomotive acts in Britain regulating the use of mechanically propelled vehicles to four mph (and then gradually increasing the limit to 14mph in 1896, 20mph in 1903, and later on the laws were repealed)- from 1970s-80s slowness was re-introduced as an urban and social strategy. 'Slower' modes and their attributes became an important value in modal shift strategies and urban projects. Sustainability was sought through soft mobility, promoting, valorizing, and encouraging slowness: slow zones, familial zones, *zone de rencontre*, by slowing traffic and road diet technics. For example, in 1987 traffic experts in the Austrian city of Graz – one of the first cities to apply extensive speed limits throughout the city – predicted a 25 percent increase in motor vehicles by the year 2010. The prognosis led to radical change in future transport policies and yielded the *Gentle Mobility plan*. Reduction of speed, then, was one among several strategies to avoid traffic congestions, pollution, and a decrease in the quality of life in coming years[8]. Hence, slowness here, unlike the current *slow city movement,* refers directly to the absolute speed of the vehicles and flows in the city.

Slow city, which was initiated around the same time in Italy as a reaction to speedy "modern" technological advancement and acceleration of communications, promotes slowness as a general attitude to life, as a "lifestyle choice" (Carp 2012). Slow cities, *CittàSlow* or *città lente,* a spinoff from the Slow Food movement, emphasize the communitarian character of demographically controlled small cities, and its international charter makes no reference to absolute speeds of the city. The charter does, however, propose that slow cities should consider plans for safe traffic, "favoring alternative

[8] see Gentle Mobility; The Graz Model of Success, 2011.

mobility over private transportation and…the integration of traffic with public means of transportation and pedestrian areas." (*Cittàslow* International Charter 2014). The introduction of speed limits creates slow zones, defining the conditions of encounters between the different modes of mobility. Retreating from the dominance of the car, *zone de rencontre* tries to balance the priorities of different vehiculs on the road.

Despite the growing *CittàSlow* network around the world, as well as an increasing number of projects for slow zones in cities, and future visions for major cities like Paris and Madrid to apply strict speed limits to the entire city (see O'Sullivan 2016; Peyrach' 2015) – 'Slowness' itself receives several critiques today. Some challenge the very concept of slow city as not being socially sustainable or equitable. Arguing that by promoting the development of small towns (of 50,000 inhabitants or less), CittàSlow represents the interests of a particular spatial-cultural constituency, favoring a localized form of capital, creating enclaves of interest, rather than offering plausible models for more general social transformation (Tomlinson 2007:147). Moreover, in terms of the reduction of absolute speed, interventions such as the creation of bike lanes and speed limits for cars are generally perceived to contribute to gentrification, creating an outside and inside, and merely shifting the boundaries of the problem.

Body versus Machine: beyond antagonism

In the above-mentioned fight for space the vulnerable body of the pedestrian was confronted against the prestige of the machine that was, according to Le Corbusier, setting the standards of perfection. The human body lost its claim to set the standard of space and rule the pace of the movement. Although it comes back to the discourses of the city along what I have referred to as the revival of walking and in response to car space. For instance, the body is central to the Situationists' *dérive*. Furthermore, the concern for human scale design occupies urban discourses and urban projects.

Seeking solutions to motorization problems, however, was not confined to spatial reorganizations such as the creation of pedestrian precincts, the construction of freeways, and proposals for pedways, it also engaged in developing innovative solutions as alternatives to cars in cities. With the conviction that "people will use automobiles as long as nothing better is available" (Gruen 1964) a series of explorations started proposing new innovative possibilities for the future to outdate the car and to "give even more delight and convenience to the user than the car."

Fig 28. Electric scooters for the pedestrian precincts (Breines and Dean 1974).

Fig 29. Witkar, Carsharing system in Amsterdam, 1968 ©Joost Evers.

Fig 30. Singolettea, personal vehicle to combat car congestion, (Domenica del Corriere, 1962).

Brian Richards, architect and transport expert who had contributed to team 10 and worked both in Europe and United States, starting from 1966 published several books on movement in cities (Richards 1966; Richards 1976; Richards 1990). Introducing intra-city solutions, from very basic and practical ideas like the use of battery operated electric scooters that for use in car-parks of large factories, to automatic people movers, mini-cars, private or shared, already in use in central Paris in 1959 (Richards 1966:75). Given the considerable amount of studies and experiments on mechanical means of moving people prior to the mass motorization era, many started to re-employ the historical transport schemes like moving walkways that were previously used in *Exposition Universelle* in Paris in 1900. Among many transport systems imagined, moving walkways were a promising recurrent scheme. Applied mostly within transportation hubs and shopping malls, it was also imagined to be a viable transport means for intra-city movements, especially within new developments. Moving walkways were thought not only as an aid to pedestrian movements but also as capable of providing a new experience, offering a view over the city at a different speed, though not necessarily faster than that of pedestrians. In an inventory of transport systems proposed by Richards (1976) the average speed of pedestrians (4.8 km/h) was interestingly higher than that of pedestrian conveyor (3km/h). However, given the fact that they could be walked on, a speed advantage could not be excluded. The effortless, immobile walk of the pedestrian conveyors was supposed to offer another vision of the city without any regrets for the car, where the city becomes a permanent *Exposition Universelle* (Rouillard 2013).

The idea of small city cars attempting to resolve the spatial constraints of the motor car emerged already in the beginning of the century. Microcars, or cyclecars, tried to fill the gap between bicycle and car. In 1974 Witkar (White Car) the Dutch car sharing system, a two seater car plus room for a child and packages was launched by Luud Schimmelpennink, who had previously tried to introduce the principle of free white bicycles in cities. The system functioned between 1974 and 1986 but the project never got beyond the duly limited demonstration phase (Richards 1976). Other utopian imaginaries of the time were focused on the idea of augmented pedestrian and ecstatic mobility. From *l'Oeuf electrique* (1942) and *Singolette* (1962), to more practical reinvestment of existing technologies as proposed by Richards, they were all struggles to achieve new vehiculs for transport in cities, hoping that, as Buchanan (1963) put it, "we are not at the end of our ingenuity for that matter," attempting to blur the polarities of car and pedestrian. However, while the in-between metrics were being introduced, their context of application was restricted to the pedestrianized areas, precincts, malls, and in general areas where cars were excluded.

Commensurability of pedestrian and car, was also the objective of Erwing Goffman in introducing the notion of "*vehicular unit*". Goffman, sociologist and interested in interaction order and behavior in public, tended to consider car/pedestrian as two commensurable modalities of transport within the spectrum of all the variety of existing means of transport. In his book *Relations in public* (1972), he considers the pedestrian as a "vehicular unit", to be able to sketch out the similarities and differences between car and foot traffic that can be objectively measured and compared.

A vehicular unit, Goffman explained, is a shell of some kind controlled (usually from within) by a human. "Vehicular units vary according to the thickness of their skins. There are trains, and cars, all of which have thick skins, being guided by men who are well hidden and in some ways well protected. There are buggies, open cars, sedan chairs, rickshaws, and bicycles [...], which leave the navigator relatively exposed. Viewed in this perspective, the individual himself can be considered a pilot encased in a soft and exposing shell, namely his clothes and skin" (Goffman 1972:7). Thus, the shell for Goffman is the most characteristic feature of any vehicular unit that defines the distance and provides a protection from the immediate environment and from the other vehicular units within it. He contrasts the soft skin of pedestrian with the car's hard iron shell. "The more protective the shell, the more, on the whole, the unit is restricted to simple movements", that explains the immense flexibility of a pedestrian compared to a car and a car's relative maneuverability, according to Goffman, compared to a ship for example. Goffman focuses further on pedestrian, as a "participation unit," that constitutes the fundamental unit of public life. Therein lies the origins of theoretical reflections and formulation of the concept of public space. We will discuss, in the next chapter, the emergence of the notion of public space, in parts, as a corollary to car space, its observations and its critics.

3.3. Emergence of Public Space

The problem with motorcar, as discussed above, was first and foremost a problem of space. When the car was already a serious social and spatial problem, to which many books and publications were dedicated, ecological alerts on air pollution and health related consequences of the car had not yet received significant attention[9]. Equally it was not until 1970s that the oil crisis sparked public concerns over the car's use of energy. I infer, therefore, that the early critiques of car were begun by the advocators of (public) space and through social and spatial concerns rather than from ecological or energetic standpoints. The space produced by car and the observation of the loss of pedestrian amenities led to a quest for the qualities of urban space and critiques of the proliferation of fast roads. I would argue, in the following, that these observations triggered the theoretical reflections on the notion of public space and its elaboration within urban discourses.

The notion of public space – urban space as the quintessential social space of the city, considered as a public good and an asset to the democratic society – is a new concept in urbanism. Writings on public space are surprisingly recent. Public space remains relatively peripheral to the otherwise foundational works on urban action by Ildefons Cerdà in the late 19th century (Lévy 2014). However, while the use of the term is rather recent the idea and the function is perhaps as old as big cities. Thierry Paquot (2009) in a genealogy of public space, traces the concept in urban discourses, noting its absence in encyclopedic publications in urbanism of 1960s and 1970s, noting that from 1980s, professionals (architects, urbanists, politicians, sociologists, …) increasingly employ the term "public space" often as a synonym of road networks and streets (Paquot 2009:86). Finally, the *dictionnaire de l'urbanisme et de l'aménagement* edited by Merlin, Pierre et Françoise Choay (1988) contains an entry for "espace public" :

"The concept of public space, although relatively recent in urbanism, is not always rigorously defined [...]. As composition of open spaces, or exteriors, within public domain, public space is defined in opposition to public buildings. It includes both mineral spaces (streets, squares, boulevards, covered passages) as well as green, planted

[9] When mentioned for example in Buchanan's report for UK Ministry of transport, *Traffic in Town* (1963) in which the adverse environmental effects of car such as air and noise pollution and visual intrusion were explicitly pointed out, was responded in a government publication of Ministry of Transport four years later that 'no identifiable hazard to health exists from air pollution by motor vehicles' (Hass-Klau 1990). Contemporary observers agreed upon the fact that automobile exhausts were indeed an issue of secondary importance compared with other problems of automobilism (Dupuis 2004:119).

spaces (parks, public gardens, squares, cemeteries ...)."[10]

While these examples attest the absence of the term in French literature, the same could be said about the English body of publications and discourses, as the early uses of the expression are mostly bound to the administrative and legislative documentations and the use and regulations of the space (fig 31).

Lofland in her book, *The Public Realm, Exploring City's Quintessential Social Territory,* explains such pervasive absence with a lack of interest in exploring the urban space from a social standpoint as an inherited culture of considering urban space as devoid of meaningful and worthwhile social interactions. "While it is almost commonplace for a social scientist to proclaim that life in the public realm is thoroughly social, such was not always the case." She argues that up until very recently, echoing the ideas of the scholars of the beginning of the twentieth century, the urban realm and the relations within it were considered as incidental, formal and therefore "empty of content" and "asocial" as a defense strategy against the "stimulus overload" of metropolis (Simmel 1903; Wirth 1938). Today, however, a few decades from its emergence, public space is a common entry in urban projects, generating strong rhetoric in public discourses as well as attracting increasing scientific interest in various fields from urban to political sciences.

Looking into the early writings where the question of urban public space is put forward, its coincidence with critiques of the car and spaces produced by car comes to light. These vary from the urban and social perspectives of the critique of capitalism and consumption culture to which car industry contributed heavily. In the 60s a universal longing for the qualities of traditional urban space led to a critique of the car and its colonization of everyday life, the importance of the urban space, characterized by human presence was highlighted. As if, simply, once something is missed, the former presence of its significance is grasped more clearly.

One of the earliest efforts to discuss the issue of urban public space in the transformed circumstances of modern architecture after the war, was CIAM 8 on *The Heart of the City* in 1951 (Mumford 2002:215), where the sociability of the pre-car city is recognized as its main function and reclaimed:

[10] My translation from "D'usage assez récent en urbanisme, la notion d'espace public n'y fait cependant pas toujours l'objet d'une définition rigoureuse[...] En tant que composé d'espaces ouverts, ou extérieurs, l'espace public s'oppose, au sein du domaine public, aux édifices publics. Mais il comporte aussi bien des espaces minéraux (rues, places, boulevards, passages couverts) que des espaces verts (parcs, jardins publics, squares, cimetières…) ou des espaces plantés (mails, cours…)."

"*Is it really possible to recreate today the age-old sociability that has been a time-honoured function of the city?* (Tyrwhitt 1952)

Further, the Situationists' theses on traffic, likewise denounce the *massive and parasitical existence of the private automobile* as a threat to the city itself, asserting that its extreme concentration in the cities has led to the negation of the city's function (Debord 1959). Echoing the views of Debord, Lefebvre argues that the construction of highways through cities and the enlargement of existing streets to meet the needs of increased motor traffic have resulted in the disintegration of city life and the disappearance of its communal forms, such as public parks, market-places, etc. Criticizing the space at the disposal of private cars and its costs for the society collectively – Lefebvre, in *La Production de l'espace* (1974), underlines that the space of the pedestrian is dying out because it has no surplus value.

"*There are two ways in which urban space tends to be sliced up, degraded and eventually destroyed by a contradictory process: the proliferation of fast roads and of places to park and car garages, and their corollary, a reduction of tree-lined streets, green spaces, and parks and gardens. The contradiction lies, then, in the clash between a consumption of space, which produces surplus value, and one, which produces only enjoyment — and is therefore 'unproductive'. It is a clash, in other words, between capitalist 'utilizers' and community 'users'. […] Non-productive consumption of space attracts no investment because all it produces is pleasure*" (Lefebvre 1992:359).

In the United States, and in the aftermath of congress vote for the highway program (1957) in "The Highway and the City", Lewis Mumford (1963) criticized the highway program, underlying how the motorcar had so far destroyed the city and that though in compensation provided the accessibility to the countryside, which by the way, thanks to the extended highway system, did not exist anymore. While pointing out the very paradox of accessibility of wilderness, Mumford emphasizes the losses of the city, suffering the increasing presence of "multi-level interchanges, expressways, parking lots, and parking garages in the very heart of the city, butchering up precious urban space." The article argues for a re-visiting of the transportation policies and programs and a re-planning of the inner city for pedestrian circulation, not only to give life to the blighted urban cores and to save the city from the car but also simply to increase its efficiency.

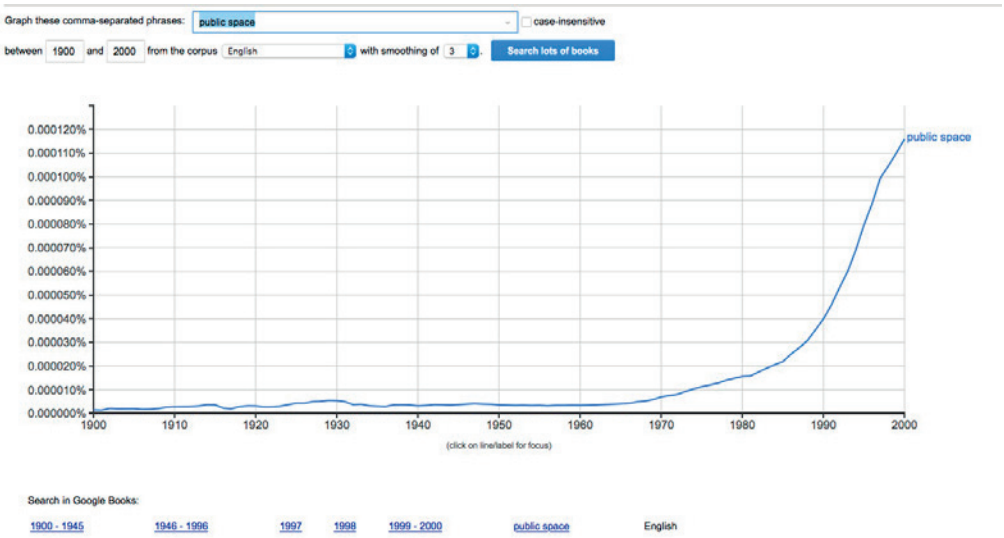


Fig 31. The Google Labs N-gram Viewer is a tool capable of examining the frequency of words or phrases in books over time, searching through over 5.2 million books. (Michel et al. 2010).

The graph above shows the results for the term "public space" between 1900-2000. The use of the term significantly increases from 1960s onward. Moreover, N-gram provides the possibility to look into the corresponding publications in different time periods and extracting the word or the phrase in its context. With an inspection into the entries prior to 1950s one notice that the early uses of the term is mostly bound to administrative and legislative documentations and the use and regulations of the space.

As for example in Public Utilities Reports in 1928: "the certainty of procuring public space in a big-crop-year may give the beneficiary a decided advantage in arranging purchases and may discourage purchases by others." Or in Public and Local Acts of the Legislature of the State of Michigan in 1936: "In every dwelling hereafter erected every room shall have at least 1 window opening directly upon the street or a public alley or other public space at least 16 feet in width, or upon a yard or court of the dimensions specified in this article."

Both Jane Jacobs (1961) and Mumford advocated for the city and the pedestrian against the automobiles, although perhaps referring to different kinds of cities. Jacobs warns of the erosion of cities by cars, while interestingly, as I already mentioned, she does not argue for the eradication of cars or separating them from the pedestrian space, but for the attrition of automobiles by cities. *"Attrition as one aspect of stimulating diversity and intensifying city use would decrease the need for the car simultaneously."* Therefore, she points out to the virtuous circle of reducing the number of cars, which actually intensifies city use and reduces the need for the car in the first place. Prior to her book, in an early essay, that originally appeared in *Fortune* Magazine (1958), and that was later reprinted in *The Exploding Metropolis* (1958), she argued for necessity of *Downtown for People*. The essay contains the seminal ideas of her future book that fundamentally challenged the theory and practice of urban planning and design.

We can credit Jane Jacobs as one of the pioneers in the systematic study of the public space, bringing the attention to the street and underlying its social value. Jacobs explicitly describes the social life of city sidewalks and highlights its characterizing point as being "public". And that only 'reformers' with profound misunderstandings on what city is, want its streets empty of loiterers and strollers. As the point of the cities, she explains is that they bring together people who do not know each other in an intimate, private social fashion and in most cases do not care to do so (Jacobs 1961:55). Such observations of Jacobs of the mingling of different social groups, "intricate ballet" in the urban public space and her descriptions of such fleeting encounters and their qualities became very influential and came to be the reference and inspiration of the seminal work of Mark Granovetter, *The Strength of Weak Ties* (1973). Granovetter's idea of weak ties has been applied in many contexts and cited widely in different domains of marketing, information science, or politics, but most importantly has influenced the theories of public space as the "World of Strangers" where weak ties matter (Lofland 1973).

The other pioneer in attributing social values to the city is Erwing Goffman. Although he does not explicitly join the cause against the car, it is in contrast with the formal realm of the road traffic that Goffman succeeds in delineating the particular social occasion of pedestrianism, and eloquently demonstrating what occurs between two strangers passing on the street as thoroughly social. Starting his observations with traffic codes as one of the ground rules that provide the normative bases of public order, Goffman distinguishes between walking and road traffic that, according to him, has often the single purpose of getting from one point to another. Goffman underlines that a walk, on the contrary, is often multi-purpose, "individuals who are vehicular units will often be functioning in other ways, too, for example, as shoppers, conversational-

ists, and so forth, and the social order sustained by walkers provides a basis for all of these activities, not merely that of moving from point to point" making the case for pedestrian as "participation unit". (Goffman 1972:8–19).

Thereby, while the strong social character of urban space was acknowledged and valued, the attempts to re-instate the pedestrian in the city – reclaiming their space from car's presence – also held tight to these social values, argued for, and theorized the nature, functions and necessity of public space. Therefore, the notion of public space, characterized as space of pedestrian became central to urban discourses and animated urban projects. Thereafter, public space appears in publications on urbanism as well as in interdisciplinary reflections on cities. These publications, differ in their scope and in how they discern the subject; from lamenting the dead public space as it becomes "a function of motion and losing any independent experiential meaning of its own" (Sennett 1977:12), to setting theoretical grounds and identifying the characteristics and attributes of public space through history (Lofland 1973; Lofland 1998), as well as to analysis and proposal of criterions and rules of thumb for a human centered approach to projects of urban public spaces (Gehl 2011[11]; Whyte 1980; Whyte 1988).It is important, nevertheless, to note the relevance and influence of publications in political theory such as Arendt's notion of polis as space of appearance; "where I appear to others as others appear to me, where men exist [...] to make their appearance explicitly" (Arendt 1958:198), as well as the context of social movements of this period in reinforcing the idea of public space as corporeal space of citizenship, and space of the pedestrian.

[11] Gehl's life between buildings was first published on 1971 and translated to English on 1987

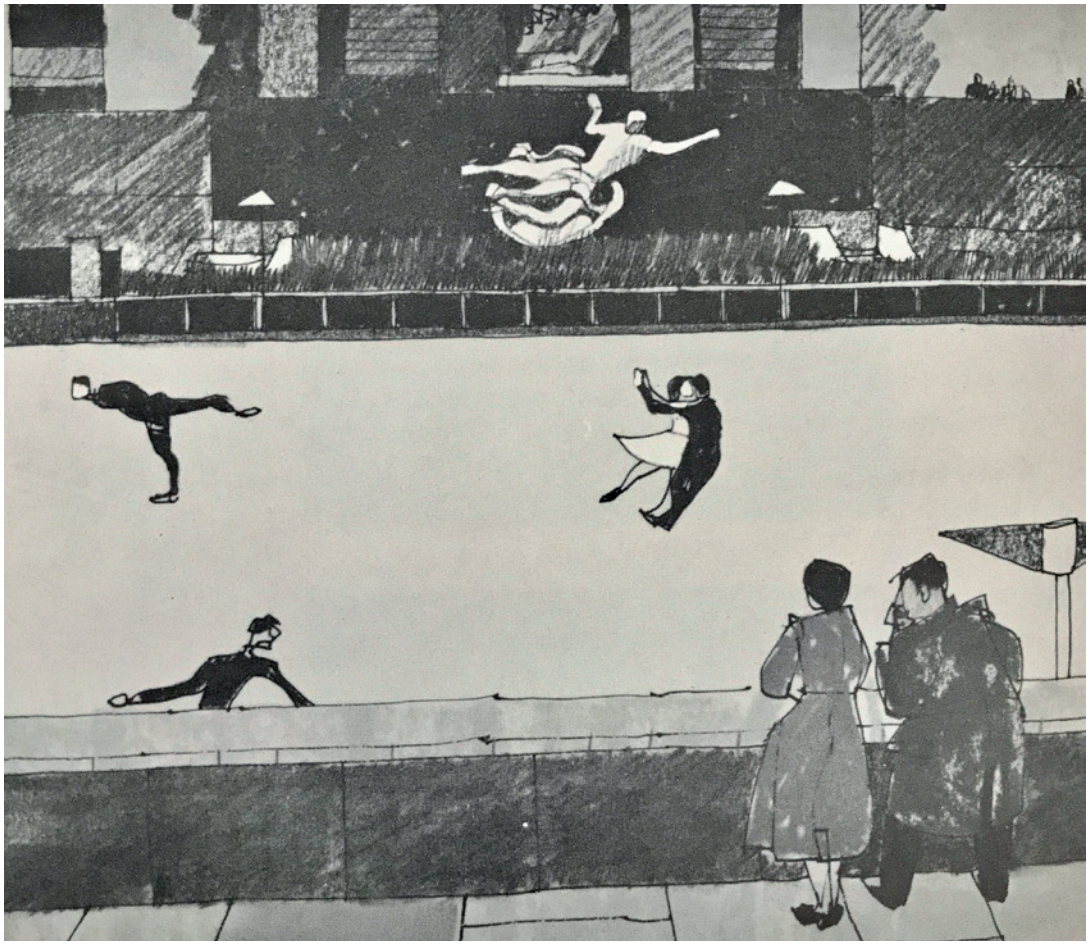


Fig 32. The Exploding Metropolis itself, published in 1957, brings together six articles, on different aspects of the American Metropolis, besides Jacobs' Downtown for People it includes: Urban sprawl, The enduring Slums, and The city and the car, etc. The ensemble of articles, as well, exemplifies the encounter of problems with car and attention to quality of urban space culminating in theorization of public space. Jacobs' article is illustrated by Gordon Cullen's drawings from the pedestrian eyelevel, sketching the overlooked strength of the existing American Cities (Whyte et al. 1958).

4. URBAN FUTURES

The Temptation of the Impossible

"Our forecasts are extremely limited, as limited are, in a pluralist society, the individual and collective capabilities to coordinate the actions of the different subjects that contribute to the city construction, transformation and modification. Who builds 'scenarios' is a disenchanted person that has no certainty and, for this reason, only proposes possible lines of reasoning."

Bernardo Secchi, 1996

This chapter is an exploration of *possibles*, responding to our research questions on imaginaries of possible post-car worlds, the future of car in the city, and more importantly the future direction of the current transition in mobilities. Questioning with urban actors, experts and inhabitants, their projections and preferences, this chapter attempts to picture possible paths and levers of action towards post-car world. This is an attempt to delineate the *possibles* by looking into projects and projections of the actors.

To do so, I adopt a twofold approach: 1) conducting semi-structured interviews with experts in the field of urbanism, and 2) developing future scenarios, working on a specific territory in Switzerland and using them as the primary material of an exchange with the inhabitants of the territory. The interview with experts contribute to the research on imaginary and in particular the professional imaginary within the discipline of urbanism. Imaginary as such was the subject of Chalas's book "L'imaginaire aménageur en mutation" who defined it as "the current and open set of representations, meanings, prevailing or recurring ideas, referents and references, orientations, etc., implicit or explicit, contradictory but also complementary, which seem to structure the planning practices." (Chalas et al. 2004:15). Chalas presents the frameworks of the urban action, through a collection of articles by urban professionals, accounting for changing context of cities (social and geographical), new collective imperatives and values, facing the uncertainties of the beginning of the century. Inspired by Chalas's approach, attempting to detect and depict the professional imaginaries, I have conducted eight interviews that I will discuss in the following section. The interviews were designed to focus on urban projects often developed by experts themselves, whose approach involves a reduction in car mobility or significantly contributes to it. Projects through their "operation of conceptualization" as described by Viganò (2016) "reformulate thought and gaze, and our imagination concerning contemporary [and future] territories". Etymologically any *project* contains an idea of future, and therefore implies taking a position with respect to the future.

Further, for the exchange with inhabitants, we (together with students in architecture at EPFL) developed a series of scenarios. Scenario could be described as a type of project that takes higher risks in dealing with uncertainties, and therefore looks further into the future and aims at identification and understanding of key drivers of change in order to develop strategies accordingly. We invited eight inhabitants and discussed with them the developed scenarios. Proposing radical transformations of a territory to its inhabitants that know the territory in terms of distances, centralities, places of working and dwelling, sparked engaging discussions and informed projections of their practices into future, marked by individual values that had to dialogue with collective aspirations.

4.1. Futures: Urban Experts

Who is the expert? And why is it relevant to refer to the expert's knowledge in an inquiry into futures? If expert is the one who possesses an "institutionalized authority to construct reality" then expert knowledge is likely "to become hegemonial within a field of practice" and therefore, "to be influential in structuring the conditions of action" and shape the future. However, "such strong disciplinarity and the distinction between expert and layperson, an apt representation of the form of knowledge production dominant in modernity, has been contested with emergence of new forms of knowledge production". More recent analyses of societal change convincingly show that new forms of knowledge production are loosening the link between expert knowledge and professional role and weakening the distinction between expert and non-expert, taking away the exclusivity of the relevance of the expert knowledge (Meuser and Nagel 2009:18). This transformation becomes more evident in the urban domain where urban action from its exclusivity to the urban expert, commissioned by the public authority, is transferred to a more plural body of actors. The term 'urbanism' that used to mean 'urban way of life' in twentieth century English, has turned to be a synonym of 're-invention of urban planning' where the experts are becoming actors among other actors (Lévy 2015).

This plurality of urban actors motivates and structures the post-car world research. Nevertheless, the urban experts, besides being an actor among others, dispose, due to their disciplinary competence and knowledge, an extended repertoire of references: images, forms, elements, with which I defined the notion of imaginary in Chapter 2. Hence, in search of imaginaries of post-car world, urban experts' perception of possibles constitute a primary material for the research.

Experts Interviews as a research methodology

The use of expert interviews has long been popular, especially in social research. However, the literature on expert interview is quite recent. It was launched in 1990s and was further reinforced and gained a new momentum more recently within different research methodologies. The focus of the literature lies primarily on issues like who is an expert, the differences between the various forms of expert interviews, their classification and their role in research design, as well as the specifics on interaction methods of interviewing in comparison to other qualitative interview forms (Bogner, Littig, and Menz 2009).

There is considerable variation in the concepts of the expert interview employed in

the methodological literature on the subject. However, a recurrent and widely accepted approach is the one developed by Bogner and Menz (2009) that distinguishes between three major types of interviews; 1) exploratory, 2) systematizing, and 3) theory-generating expert interviews. In the following, I briefly describe the three typologies –based on Bogner and Menz– and then explain further where the interviews in my research situate and why. The first type of expert interview is *exploratory* expert interview that functions as an exploratory tool in both quantitative and qualitative research. In this perspective, the interviews provide initial orientations of the research. That is helping the researcher at the early stages of the research to develop the problem statement or structure the research design as well as to generate hypotheses.

The *systematizing* expert interview aims at gaining access to exclusive knowledge of the experts. The expert provides knowledge on "objective" matters that is not otherwise available to the researcher. The systematizing expert interview is perhaps the most common type of expert interview method. They should be based on a fairly elaborated topic guide if they serve as semi-structured and qualitative interviews. However, they could be used in Standardized surveys. This kind of expert interview attempts for systematic information and, unlike exploratory interviews, is important that the data be comparable in relation to the subject matter.

The third type is the *theory-generating* interview. In this case the expert does not serve as the catalyst of the research process. "The essence of the theory-generating interview is that its goal is the communicative opening up and analytic reconstruction of the subjective dimension of expert knowledge." While exploratory and systematizing interviews are used when the research involves different actors, and aims at reflecting different points of views from different positions involved, the theory-generating interviews are often used where interviewees are selected within the same disciplinary group or sharing a common background or function. This makes generalizations about specific groups possible. Thus, theory-generating interview lends itself better to the ambitions and goals of the present research and so the literature around it served as a guideline in the process of preparation, conduction, and analysis of the interviews.

Aiming at confronting the theme of future, this research concerns with issues that are uncertain and imperfect by nature. Therefore, rather than "objective" matters and concrete facts, interviews that I conducted attempt to *make an analytic reconstruction of the subjective dimension of expert knowledge*. This knowledge that is essentially of action and experience, is derived from experts' practice. The goal of the interviews is to detect frameworks and common references in order to approach –get closer–

to what I described earlier in the section on the topic of imaginary as the common understandings. Rather than expecting to extract data and statistics, the interviews are conversations in the search of the experts' convictions, doubts, and worldviews. The more objective facts (trends, statistics, estimations and projects), however, provide the basis, the ground on which the interviews unfolded.

In this regard, my purposive sampling[1] consists of a selected number of experts in the field of urbanism, whose professional experience confirms a transition from car-oriented approaches and have been innovative and forward-looking in proposing alternative future territories. Since the very question of PCW project was initially raised within the context of change, where already weak signs indicate a *desamour* with car and emergence of new practices, the choice of experts was limited to such context and bound geographically to city-territory in its forms, structures, and diversities in Europe.

Interview guidelines

Interviews were prepared as semi-structured, that is with a basic open interview guide containing main questions, and accompanied with some interjecting ones. The open-ended format was supposed to prompt respondents to think, express values and provide answers in their own words and thereby allow the ideas to be brought up depending on the specific responses of each interviewee. Hence, despite having a common guide for all the interviews the outcomes vary in the length and depth of discussions on different themes depending on the position and the take of the interviewee.

As mentioned above, the selection of experts was based on their professional affinity with the theme of post-car, attested by their projects. Nevertheless, the context of the PCW project, its aims, its questions and premises were already communicated with the experts in an exchange prior to the interview. The small number of selected participants meant that I could afford to explore the rich details of their discourses within the backdrop of their activities, that is their professional background and the referenced projects. The following questions served as the general guidelines during the interviews. The secondary and interjection questions were prepared separately for each occasion, regarding and referring to each expert's projects.

Present Condition

Is a Post-car World possible? Do you perceive a **transition** from car? If so, where do you think it is going? What **evolutions** in transport is expectable today?

[1] Purposive sampling (also known as judgment, or selective sampling) is a sampling technique in which researcher relies on his or her own judgment when choosing members of population to participate in the study. Purposive sampling is a non-probability sampling method (Marshall 1996).

Future Vision

Are the "weak" changes in practices symptomatic of a greater change towards **post-car** city?

What are the **projects** to move towards such horizon? (What disciplinary tools, strategies and tactics?)

What are the main resisting **hurdles**?

Beyond Compact City

What are the perspectives for a sustainable mobility in **lower densities**, outside compact city centers, that are today heavily dependent on the car?

Transformations of Car

How the **new car** is going to impact urban mobility as it transforms to be ecological, electric, driverless, etc.?

Methodological conversations

In this section, I will first present a summary of each interview to get a sense of the whole - looking into the entire body of data before getting into particular pieces. Making the summaries is one step into the process of data analysis. Beginning by transcriptions, I followed many analytic circles of readings, extracting the general summaries. Then I identified categories and keywords –inspired by Creswell (2012) data analysis spiral and Littig (2013) expert interview guideline– creating a catalogue of items, from which I extract the common themes, proposing an analytic reading of the interviews. As mentioned before, the interview guidelines were designed to refer to examples of urban projects. Therefore, along with the analysis of interviews I also present some of the interviewees' projects , their context and their characteristics. The projects are presented in a separate format, so that it does not interfere with the reading of the interviews, and maintains its autonomy as a series of relevant projects and at the same time serves for a better comprehension of the interview.

1. Alfred Peter	Atelier Alfred Peter Paysagistes, Caluire-et-Cuire, Lyon, France.
2. Federico Parolotto	Mobility in Chain, Milan, Italy.
3. Alexander Schmidt	Institute of City Planning and Urban Design, Duisburg-Essen, Germany.
4. Bernard Reichen	Reichen et Robert & Associés, Paris, France.
5. Thomas Sieverts	S.K.A.T., Architekten und Stadtplaner, Munich, Germany
6. Paul Lecroart	Institut d'aménagement et d'urbanisme de la région d'Île-de-France, Paris, France.
7. Juile Imholz	Paysagestion, Lausanne, Switzerland.
8. Thierry Chanard	GEA Vallotton et Chanard, Lausanne, Switzerland.

Table 1. Interviews.

Appointment no.1
Alfred Peter, Atelier Alfred Peter Paysagistes, Caluire-et-Cuire, Lyon, France.

1. According to Alfred Peter, Europe today is facing a crisis that is characterized by the absence of the future, absence of aspirations and new pathways. This lies primarily in the fact that Europe, compared to many parts of the world experiences a situation of perfection in general quality of life as well as when it comes to mobility questions and city planning. This gives rise to a certain protectionism vis-à-vis of the external worlds. Therefore, there is an urgent need to re-invent futures, find inspirations and horizons. "In this perspective PCW is an exemplary project, a tentative to re-invent the future." Regarding mobility, for example, the alternative systems to car are already here, many PCWs exist already depending on lifestyles. In many instances, here we have the privilege to leave the car in the garage, consider that as a real luxury. This is not the case in the emerging countries where the attitudes towards car are different; car is still synonymous with freedom.

Here in Europe we can start to think of the end of the car system, for we have succeeded in creating the alternatives, already since a few decades that are extremely strong and are getting strength and sophistication in mutualizing their efforts. Car is still statistically important, but it is also possible to do so many things without the car. "I live without a car and if we want to go anywhere right now, we could. Just pick a destination. We have a variety of choice how to get there with prices that have never been this cheap. There are very rare destinations where we really need a car. In other words, many post-car worlds already exist." He concludes that car as a personal object is finished, and since Europe has become an example that the world looks up to, not only in mobility related policies but more broadly in sustainable development, then we can expect a change elsewhere as well. "Having said that, we need to recognize that despite the strength of alternative systems in Europe we are still far from entering a completely new phase, beginning of a new story. Since the investments on public transport have paradoxically continued in parallel with investments in car infrastructures."

2. But what can we do to move forward from this point? Switzerland can obviously serve as a model in its extension of public transport network and its public service. In other cases, the spatial and economic constraints on car like congestion and congestion charge discourage the use of car. But what shall we do in the absence of such constraints, within smaller cities where there is no congestion to act against car itself, where there is plenty of space and therefore it is not very easy to argue against car? Peter takes the example of a project for the city of Belfort.

Fig 1. Optymo network in Belfort, north-east France, combines bike and car sharing with public transport system in a unique urban and suburban network that was created in 2007 and completed in 2013-14-16. With a single Optymo card, and a post-payment system, it reaches 102 municipalities by means of buses, bicycle services and free-floating car sharing. ©Optymo network.

"We needed to invent a credible story to compete with private car in the city of cars!" In this context the alternative should be attractive, easy and logical. The efforts of arbitration between one mode and the other should be reduced to minimum, and the small decisions of the trip regarding the price or trajectory should be facilitated. In Belfort the OPTYMO system proposes a single transport card, which integrates bus, bicycle, as well as car renting. Car is not excluded there to compete with private car, both for long and short distances, and time periods, from mini vans to convertible car to fit every occasion.

"The car arrived by invasion, but the excesses of yesterday could be the great places of tomorrow. Today I am interested in Highways, we are working on the Strasbourg highway, and that of Grenoble; I dream of working on the one in Mexico City. These excessive projects have literally exploded the cities, but by re-inventing the history we can make it. This process started already with reconquering the waterfronts and transforming them into public spaces. It was done first in a festive way and then definitive, for example the case of *les berges du Rhône* in Lyon. Today it is time to go further in this domain, targeting the big infrastructural axes." Peter takes the example of *périphérique* in Paris, as "the worst Parisian invention". Not only for the congestion it holds or for the pollution it generates, but also simply for the barrier it creates, the inside and outside that it delineates. As long as this mental fortress exists, it would be impossible to have an egalitarian project for Paris. There were debates on covering it, but why not eliminating it? While before it was not imaginable, today with the new practices and the obtained experiences it does not seem that far. Reversibility is possible, even happening in the extreme city of Detroit as car and its industry disappear, the public transport re-emerges with private investment and the quantities of spaces liberated, the brownfields make up a heritage with a potential for creative spaces and companies. That is a new story that is at its beginning.

Another important aspect, according to Peter is that the important changes do not necessarily come with big investments and big infrastructures. For example, moving towards a generalized speed limit of 30 km/h in the city, without necessarily accompanying it with physical urban projects, can bring up a whole new series of practices and rebalance the street use between the modes. By a systematic reasoning, instead of zones of speed limit, within a specific neighborhood or a particular road, it should be a generalized principle with the exception of few major axes that keep the speed limit at 50 and not more. Strasbourg had the intention to move in this direction but a referendum rejected the initiative. Peter suggests that the rejection was the response to the wrong question. The framing matters. The Strasbourgeois rejected that

Fig 2. Banks of River Rôhn, Lyon, France, Recovered from parking use ©IN SITU.

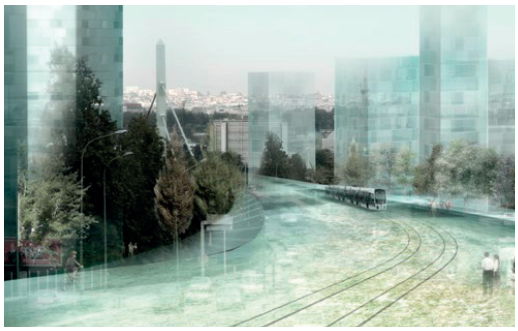


Fig 3. proposal by MVRDV to transform the Périphérique into a tramline and promenade. ©Le moniteur d'architecture AMC, Le Grand Pari(s) (2008).

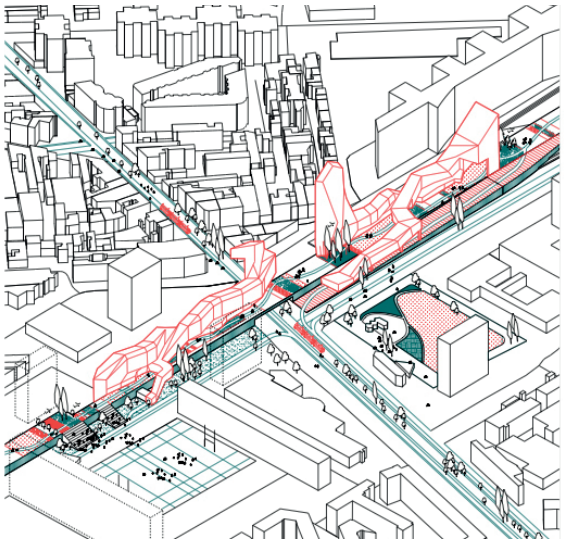


Fig 4. FGP+TER's proposal transforms the Périphérique into a monumental circular park with 35,000 to 50,000 housing units, freeing it from all its daily car commutes.
©Le moniteur d'architecture AMC, Le Grand Pari(s) (2008).

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Fig 5. Cheonggyecheon, Seoul, South Korea.
Cheonggyecheon stream and park in Seoul was previously a highway with 170,000 vehicles per day. In 2006, following discussions on its renovation or removal was transformed into a 6 kilometer linear par in the center of the city, very close to the Central Business District, extracting the stream that was originally covered by the highway project in 1960s. Cheonggyecheon has become in a few years one of the most visited places in the city and in the country. It has served as a model and inspiration for the other highway reconversion in Seoul, the Sky Garden. ©Farzaneh Bahrami.

Fig 6. Sky Garden, Seoul, South Korea
The 983-meter-long park used to be an urban highway passing just next to the main train station of the city. It now features 50 families of plants displayed in 645 tree pots, and is connected to various destinations, hotels, station, etc. by new bridges. ©Ossip Van Duivebbode.

the entire city applies the speed limit of 30km/h. According to Peter, asking "are you for or against that the street in front of your house become 30km/h?" would have brought a completely different result.

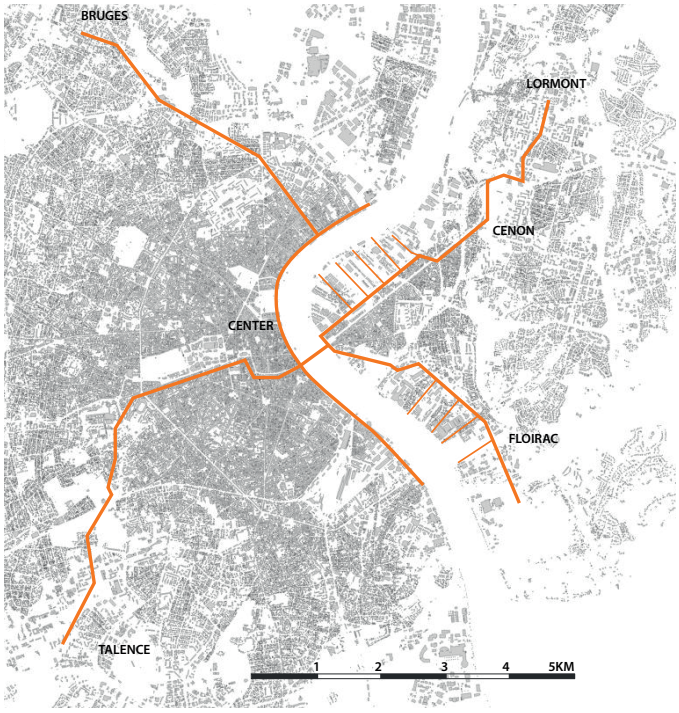
It is important to change massively the balance between the car and other modes, and to do so it is necessary to pass through many phases of experimentation, before a definitive change in the space and infrastructure. Many trials should precede the actual spatial reconfiguration, projects that leave a possiblity for a step backward and are flexible, as is the case of riverbanks in Strasbourg. "The carving in the stone should come at last, but very last step of definitive projects, when we have some certainty on the new usages that could emerge." In that perspective, the financial struggles in cities and the economic crisis could be considered as an opportunity - a blessing- since we are far from the temptations of heavy infrastructural projects. This is, however, contradictory with how commissions and contracts of urban projects work, as the planner is paid a percentage of the cost, this type of discreet and prudent interventions are not encouraged.

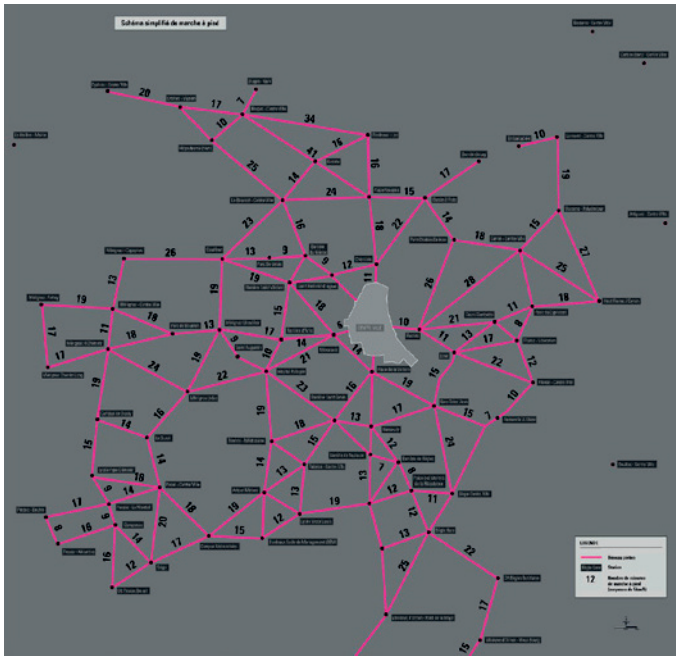
3. Distancing from compact cities, regarding the challenge of walkability and car dependence, Peter refers to the very neighborhood where his office is situated, where we met. *Caluire-et-Cuire*, in the north banlieue of Lyon, "La ville intermédiaire, this is not the problematic French banlieue, neither a luxury one. It is the real city!" Aggregate of individual houses and apartments, as well as big commercial zones, *Caluire-et-Cuire* is well served with public transport (metro, tram, and buses) equipped with bike sharing and electric cars and charging stations, accompanied by cycling routes and pedestrian paths. Peter takes the example of a pedestrian trail of 7 kilometers long in *Caluire-et-Cuire* that can be the prototype of what is a pedestrian road outside the compact city with maps of the neighborhood to communicate it and make it all imaginable. This pedestrian promenade recycles an old elevated rail track and therefore it has a privileged view over the surrounding and it never crosses a street and receives all sorts of *promeneurs*, kids, joggers, and dog walkers. However, it is not an important mobility axis, as it does not link employment hubs or important destinations. It remains recreational. But it would have worked as an important mobility axis, if it was connecting significant poles.

Peter insists on imageability of the pedestrian axis. The walkability project is easy in the city centers but in the more banal areas it becomes a real challenge. However, it is an essential imperative of the urban projects to reflect on what could be a pedestrian road outside dense city centers, to reduce the center-periphery dichotomy, by extending beyond the city center and becoming a true transport axis. Alfred Peter's office has elaborated a vision for walkability at the scale of agglomeration in Bordeaux, proposing

the *Schéma Directeur Piétons* for Bordeaux Métropole. "It is the first time we attack the subject at this scale." As every policy need to be communicated boldly and showcased in a comprehensible way, the scheme is called *X Bordelais*, to make it easily understandable. The project faces the challenge of boosting and promoting walkability in a relatively low urban density with relative performance of competing modes (public transport in urban areas, cars in the first and second rings), within a territory that inherits decades of specializations in territories and has increased travel distances. This type of projects could be a model to be repeated also in the contexts - countries- where walking is still a sign of constraint and absence of alternatives for the walker.

Reflections on future are marked by today's ecological concerns. However, ecology is becoming a sort of repentance of the sinners, which works well with Judeo-Christian culture. "We have renamed our atelier as Laboratory of Festive Ecology, two words that are rarely brought together! I believe a vision based on the feeling of guilt will never work. We should question ourselves and rethink what would be ecology in the collective pleasure of present, *jouissance collective du present*. An example of such fresh approach to ecology for Peter is a medical center in Strasbourg that in collaboration with the municipality proposes maps and trajectories of walks as prescriptions for the patients; a remedy based on progress of the self that changes mentalities, displaces the reference points, a medication with zero costs.





The X itineraries constitute main network and become the emblem of the recovered place of the pedestrian in the city.A more diffused network extends in between the main axes and connects the small centralities of the territory.

X Bordelais
Plan Piéton Bordeaux 2015

Atelier Alfred Peter Paysagistes

Targeting 738,607 potential pedestrians of Bordeaux the plan aims to push forward the city in its sustainable ambitions towards post-carbon city.

The city of Bordeaux, Bordeaux Métropole, the department of Gironde, the region of Aquitaine and the state services, were brought together in 2011 to launch the "Grenelle des Mobilitiés" which aimed to provide answers to the politically urgent questions of congestion in the Bordeaux metropolis. It provided the basis for co-production of reflections and brought together the representatives of the main metropolitan authorities (local authorities, the state authorities, employers, trade unions, associations and experts, etc.). It produced a final report as well as a charter of mobility, that is a collective doctrine based on a consensual analysis of the situation and the structuring principles of a 20-year mobility model. This "shared horizon" facilitates the convergence of the actions of the various partners.

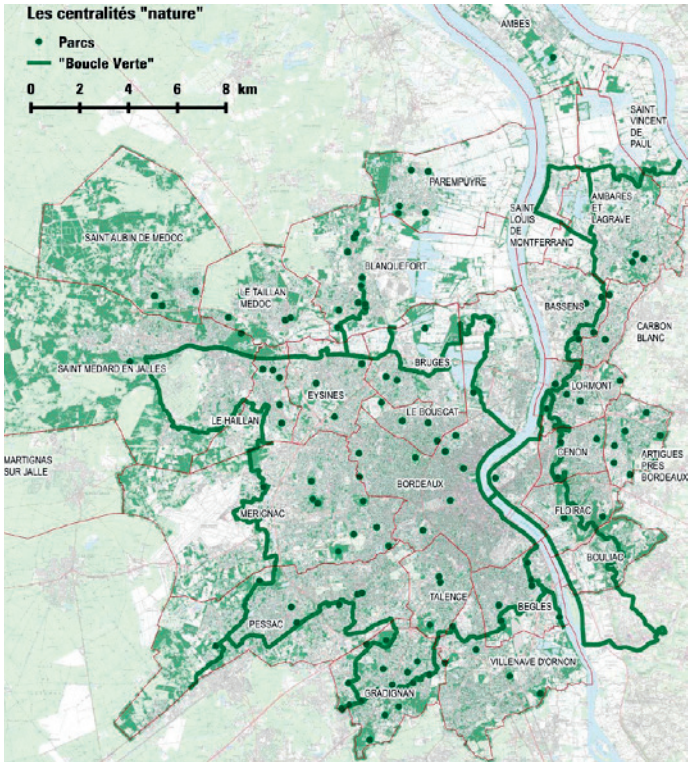
The Grenelle of Mobility organized by a'urba (Agence d'urbanisme de Bordeaux métropole Aquitaine) sketched out in 2012 a philosophy of public actions in terms of "post-tram" mobility for Bordeaux, and explores other possibilities including the development of walking as a fundamental component of the mobility. PDU of Bordeaux (Plan Deplacement Urban) is perhaps one of the first ones in France to have introduced the principle of equilibrium "50/50" of space division between pedestrian and motorized means. Peter's Pedestrian Plan is proposed in such context.

Framing walkability as a societal, economical, as well as public health issues this pedestrian plan addresses the question of walkability and challenges of the pedestrian road in lower density areas. Stating that "after the reconquest of the center, the new "front" for the walkability is now the extended territories in the first ring".

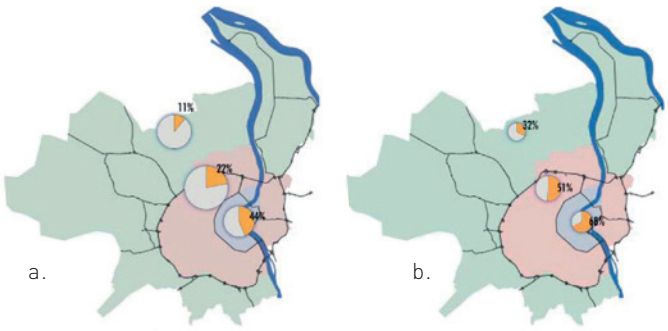
Connecting the city center to its periphery, through almost always traffic-free routes, the trajectory is too long to be employed recurrently (6km= 70 minutes), but it could constitute fragments of other multimodal journeys. Moreover, it is the perfect scale to shape a sportive axis; 6km would be 35 minutes of running at the pace of 10 km/h and 25 minutes of rolling at 15 km/h. While in the centre the pedestrian road capitalized on the historic segments and is characterized by commerces, in order to keep the road an intriguing pedestrian axis it is essential to think of a program. Offering diversified services to attract different groups, enabling encounters, the programs includes fitness facilities, water fountains and meeting areas, playgrounds, benches, etc.

In terms of image, the network reconstitutes the historical pedestrianizations of the hypercentre, along with river Garonne and the reconquest of the waterfront. Further, the proposed network changes its scale and attacks the exterior circle of the city with four intermunicipal itineraries.

The X itineraries constitute the magistral network and become the emblem of the recovered place of the pedestrian in the city and give the general directions and aspirations to walk. These major axes are supported and complemented by a more diffused network that extends in between the main axes and connects the small centralities of the intra-ring road territory. The green spaces, parks and squares within the city are integrated to the network and are linked to the emblematic and unifying green ring surrounding the city which attracts mostly the leisurely walks. There is an emphasis on the information and communication, both by imageability of the main axes and by neighborhood maps that communicate the destinations and the distances in walking time, demonstrating that walking is often a credible option (15 - 30 minutes). This could be taken further by real time information on walking possibilities instead of waiting for the tram by online applications, walkways along the tram line and encouragements for school pedibus.



Green centralitis and green corridors are integrated into the plan.



Share of walking in different territories a) all distances b) distances under one kilometer.
from: enquêtes ménages déplacements 2009.

"Schéma directeur piétons de Bordeaux Métropole, 2015,
©Aterlier Alfred Peter Paysagistes Aterlier

Appointment no.2
Federico Parolotto, Mobility in Chain, Milan, Italy.

1. Federico Parolotto confirms that in European context and in general in Western developed countries, there is a reasonable certainty that the pattern of use of the automobile is changing. A series of objective facts attest that the car as a possessed object to identify oneself with is giving its place to other objects such as smartphones, and its status is changing to an experience or a service of mobility. However, this is not about a systemic change in mobility. "We are not at the beginning of a process that will bring us a rapid transformation. On the contrary, I believe that a process of slow change is starting. A slow transition that progressively brings up the erosion of automobile, that is a significant reduction in individual motorized transport but not a sudden and systemic change in its use."

2. Underlining a link between mobility and distribution of land-use and the city form, Parolotto, insists that moving relates to the context in which movement takes place. However, today the discourse of change is very much centered on the new and emerging technologies. But how are these technologies susceptible to bring up change? Parolotto argues that connectivity of smartphone is radically changing the experience of mobility from a passive experience to a much more conscious and active one, both in individual and collective transport, changing from mere users to conscious agents of mobility, and this has an undeniable impact. The mobile technologies have boosted ridesharing and other peer-to-peer systems like Uber which at the end, reinforce car mobility, providing alternatives to driving or car ownership but not necessarily to the car. In this regard, the real "change" is unlikely to emerge from here. Although it has an important impact on optimizations for example, but it won't change radically the mobility and the configuration of the city decisively.

Regarding the future of car, Parolotto– who has also collaborated with the car industry in Audi's urban future initiative[2], is very skeptical about the eventual consequences of driver-less car in cities. Referring to Robin Chase (2014), transportation entrepreneur and co-founder of Zipcar, he acknowledges that driver-less car might simply result in more cars and more trips, considering that the autonomous car after dropping off the passengers either roams around or makes a trip to probably a remote parking area. The number of trips generated is only expected to rise, changing our challenge from dealing with "single-occupancy vehicles" right now, to "zero-occupancy vehicles" in the future. Moreover, the autonomous car might increase the attractivity of the private car

[2] http://audi-urban-future-initiative.com/

by liberating the driver from the task of driving and therefore leave a quality time for the passenger to work or conduct other activities. Given the fact that our mode choice depends considerably on our arbitrations on the value of travel time, this might be a threat and a serious rival to the public transport.
Therefore, he concludes, "paradoxically, within both types of technological evolutions I do not see a systemic distancing from car." Nevertheless, Parolotto underlines that driver-less car could have a great potential to provide a low-cost and flexible public transport in the lower densities.

Apart from technological perspectives, a new generation of urban infrastructure is emerging: *Reti Sottili*, light or subtle networks that are superimposing on the existing city, as did the car infrastructure in the last century by reconfiguring urban flows. These "fine networks" are spreading and reshaping our practices, specifically walking and cycling.

The revision of the phases of traffic lights at the crossroads, for example, aimed at recalculating waiting times for pedestrians along specific routes could become the key to transforming the road environment into a territory that is not merely dominated by cars. The road becomes a platform where different paths overlap and intricate. This concept marks an indispensable difference between the world of "fine networks" and that of traditional transport network: the former operates at quasi virtual level, allowing the emergence of relationships and following the connections of non-invasive motion management operations while the latter always relies on creating or modifying infrastructures, thus shifting from a substantially manipulation of time, to a physical modification of space. Therefore, the idea of fine networks is to intervene on the space of the cities, often so dense and disrupted by the over-infrastructurization in the past decades, while working on an invisible layer. This is done by acting on time and benefiting from the latest technologies such as the data that our digital society provides. Such interventions are becoming an integral part of the response to the needs of sustainable travel, which is the bet of mobility in the coming years. However, besides the manipulation of time, Parolotto asserts that there is also an emergency to rethink the distribution of urban surface between modes.

Concluding on the pedestrian space in the city, Parolotto underlines that rather than pedestrianization of isolated zones (pedestrian precincts, or even zone 30), the imperative for the cities today, is to improve pedestrian axis within important hierarchies of roads and not marginal small tertiary ones. Parolotto takes the example of Paris and banks of the Seine, which was a sort of (one-way) highway–Pompidou's legacy– and its recovery

for the pedestrians and soft modes will have strong long-term impact on reconfiguration of flows and rebalancing the modes in the entire city.

3. Saying that cities are achieving the end of car dependence and questioning the situation beyond cities, brings us to the vast theme of what is "city" and what kind of geographic or social nebula could be called city? Shall we consider the semantic dimension of the "city," or shall we for example take into account the transport dynamics and the commuter sheds? Whatever we call it, certainly in its denser segments, the revival of public transport and also walking and cycling are already changing a lot the practices of mobility. But the territories of dispersion, like in the north of Milan, which remains heavily car dependent. The very low level of density makes public transport unsustainable in terms of frequency of service and the diffusion of Origin-Destination points, and therefore, car remains hardly contestable in such territories. Parolotto mentions a recent competition project in which they participated together with Foster and Partners' team on a development outside Copenhagen. While today Copenhagen is one of the forerunners of transition from car, the situation changes as soon as you move outside the city boundaries. Even the future projections of the modal share for the area do not foresee a significant change from the current balance between cars, public transport, and bicycles. As if that type of the territory brings up necessarily an invariable that is the use of the automobile.

"There are of course already many strategies of transition compared to the existing situation, acting upon other measures than mobility itself, for example, trying to modify the land-use, and reduce the distances". In terms of transport solutions however, Parolotto mentions three different lines of action in lower densities. 1) Referring to Paul Mees, in his book *Transport for Suburbia, Beyond Automobile Age,* on the feasibility of an extensive capillary network that tackles the challenge of unsustainability of service in low density through coordinated system of public transport and *horaire cadencé* that can increase the ridership rather than increasing the frequency of the service like the case of Zurich area, which is not easily imaginable everywhere. 2) Through a combination of Micro and Macro mobility, that is reinforcing the public transport in a polycentric region and covering the last few kilometers with a system of light vehicles that guarantees a diffused accessibility, which constitutes the final component of the trip, in combination with public transport, as proposed in Grand Paris vision by Finn Gipel and Giulia Anni's team, whose mobility plan was proposed by Systematica office in Milan. 3) Finally, the very old but also newly tested idea that proposes dynamic public transport in low-density based on the demand. In its more recent versions it consists of small bus systems that re-route their trajectory depending on the received

demands through mobile applications–that is a sort of public Uber. Nevertheless, so far, given the high cost of man-work on the system and low frequency of trips (6-10 persons per hour) the service that was supposed to revolutionize the future of mobility in Helsinki ceased to serve after almost two years due to economic unsustainability and high costs for the city.

4.According to Parolotto it is very likely that a driver-less connected car, once it becomes cheaper than an idle driver, makes the thorough change in lower densities. While it seems rather a threat for the city, it might bring up an unprecedented opportunity for a systemic change in territories, that historically, public transport has not survived its practical and economic constraints. In the end, Parolotto refers to Milan's PUMS[3] to which he has contributed as an expert. The document, he explains, foresees the future transformations of city in relation to mobility, going through various cost-benefit analyses elaborated in collaboration with economic communities and determines the future direction of infrastructural developments. It encourages specifically three main levers of action that consists of three types of treatment of the urban surface; investment in surface public transport, implementation of the light networks of soft mobility and revising the parking spaces through an integrated system of dynamic pricing.

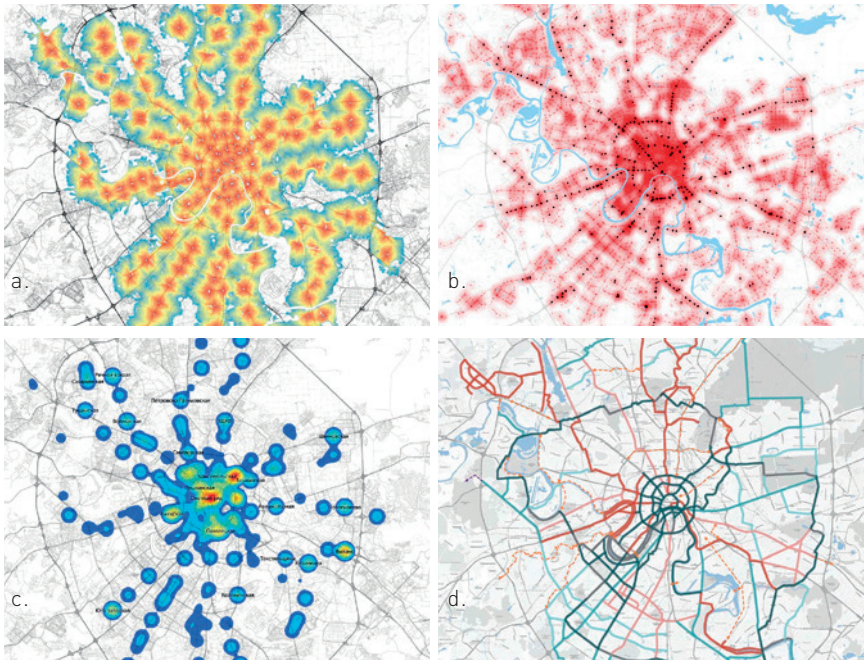
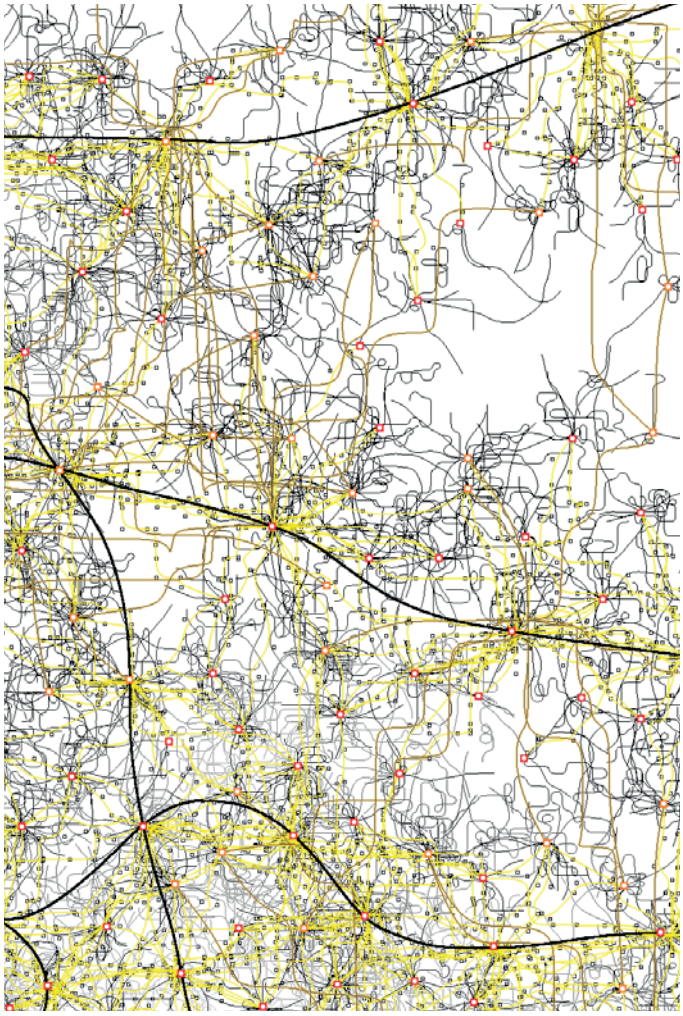


Fig 7. Moscow 2020 analysis for the Moscow Pedestrian and Bicycle Masterplan.
a) bicycle isochrone accessiblity at metro stations, b)density of pedestrian crossings, c) density of use of metro stations, d) map of cycling network 2020. ©MIC.

[3] Piano Urbano della Mobilità Sostenibile.



System of diffused mobility, individual and semi-collective micro-mobility system connects the light city to large scale corridors of mobility.

Local centers in the form of convenience stores(Eco-stations), conceiving together new forms of mobility and public space.

Grand Paris, Metropole Douce

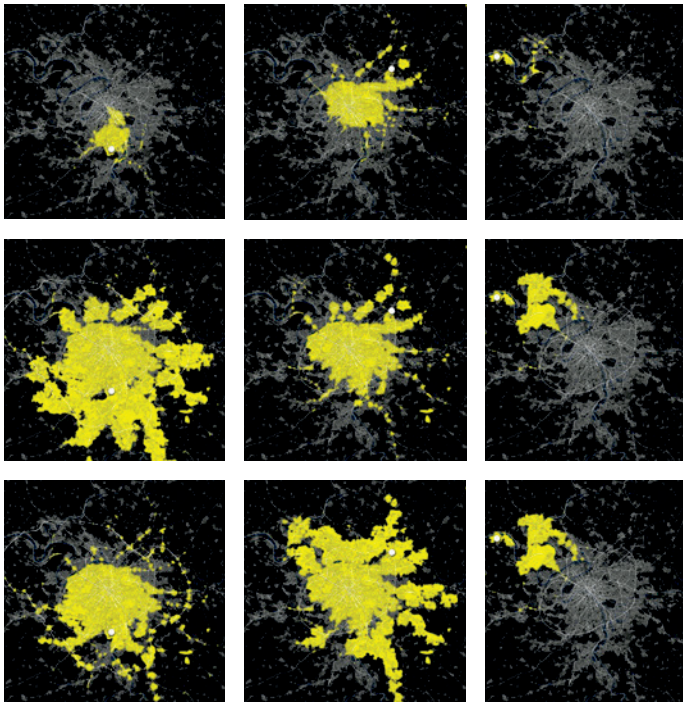
LIN Architects, Geipel, Andi, and Laboratory for integrative architecture and urbanism.

The project, Grand Paris Metropole Douce is a part of a new generation of urban projects that "take distance from the dismissal of urban spaces of low density and propose a reversal of view, betting on the sustainability of territories of generalized urbanity" (Masboungi, 2015; 144). It aims at linking the global metropolis to the local context.

The project is proposed in the framework of the Grand Paris, an initiative launched by the French government in 2007 to respond to the challenges of Paris by a new global plan for the Paris metropolitan region. Grand Paris Metropole Douce, highlights the missing relation of the Paris city with its surroundings, the extended territories which it defines as "Light City". Consisting of well-spaced housing, medium-sized businesses, schools, urban gardens, and a flexible network of local services, the light city constitutes a sort of nourishing layer for the metropolitan area, allowing it to breathe. Therefore the project proposes to maintain the lower density territory as an area of natural permeability, while developing conditions of osmosis among dense poles and their outlying areas in terms of transportation, productive activities and recreation.

In this perspective, existing centers are reinforced and low-density is transformed by densification of public services. The zones of single-family houses are to be transformed, by creation of micro centers to break up the monofunctional landscape. Moving from monofunctional areas of food production or the residential areas towards creating heterogeneity that features a residential component, water retention solutions, food and energy production together. These multifunctional landscapes are characterized by coexistence of different programs. In this perspective, agricultural zones for example are traversed by market streets.

The mobility in larger territories is a complex issue as it is pushed to its spatial and temporal limits. In LIN's vision, the mobility concept which is developed by the Milan-based office, systematica (where Parolotto used to be a project manager before founding MIC), is based on a complementary system of macro-mobility and micro-mobility. Asserting that "reaching every point in a given territory with equal efficiency in a homogenous geography is not a desirable urban objective," (p. 51) the project envisions a more personalized system of transport for lower densities while reassuring reliable, effective, and rapid transit network between high density poles. The challenge therefore, is to provide personalisation of transport in light city while breaking away from dependency on private cars. This is envisaged by an extensive network of public transport (macro-mobility) that is completed in the last segments of the travel by a gradual system of micro-mobility. "Ensuring a network of public transport through a network of small stations located near train stations, the service of light vehicles rental, small electric cars, scooters, and bicycles, depending on the distance, can cover missing segments and guarantee a certain autonomy to various poles".



Accessibility in 45 minutes in three stages in three different geographies, 1) before the implementation of the scheme, 2) with the introduction of marco-mobility, 3) completed with micro-mobility.
The extension of accessed geographies differ significantly from one point to the other, highlighting the idea that homogenous accessibility is not a desirable urban objective.

Transformation of agricultural landscape.

Appointment no.3
Alexander Schmidt, Institute of City Planning and Urban Design, Duisburg-Essen, Germany.

1. For Alexander Schmidt, the perspective of a car-less city is not a realistic one, especially when it comes to Ruhr region in Germany. However, he admits that an extremely slow trend is observable which goes towards less cars in the region. While currently the private car constitutes more than 50% of the modal split, a horizon of 25-25-25-25 for walking, cycling, car, and public transport is being planned. This entails a drastic reduction in car mobility. Given the importance of car industry in Germany, Schmidt excludes the possibility of a post-car future, but admits its necessity and relevance as a guiding image.

2. The expected change relies very much on new mobile technologies like *Moovel* that is widely used in Germany, providing and picturing the transport options, trajectories and time estimations[4]. Moreover, new urban infrastructures can provide a new support for the alternative mobility and encouraging other alternative modes. An imperative for us in the discipline of urban planning, and within reflections on the territory is to successfully combine walking and cycling with the next scale of mobility, that is trains and public transport, and smoothing the interaction between these two scales through Mobility Hubs.

One of Schmidt's ongoing projects is a mobility concept for the whole region, and it simply consists of making an inventory of elements of intermodality in Ruhr region, and an analysis of their dynamic inter-relations. To recognize and reinforce these elements and to underline the fragilities, weaknesses, and what hinders the transition towards an integrated intermodality.

A fundamental hurdle in this process, according to Schmidt, is the car oriented mentality, distinguishing this region from other German parts like Bavaria or Berlin area. Consequently, municipal policies that depend on popular vote remain very conservative in this regard. However, the mentality is a reflection of the geographic space as well. In German, the two words for Behavior (Verhalten) and Situation on site (Verhälnisse) are from the same root and reflect each other. Therefore, it is essential to propose a project for both: mobility behavior (mentalities) and mobility infrastructure. “We need

[4] Moovel is a journey planning application in Germany that is connected to the public transport services like DB and other mobility services such as Car2Go. It manages bookings and payments as well as proposing various options for a given trip: https://www.moovel.com/de/en/app

transformation in the head of the people but to get there we need also transformations in our infrastructures, to provide the necessary infrastructure for change." Another important challenge for multi-modality in the Ruhr region is its fragmentation, political and administrative, and therefore non-unified transport providers complicate ticketing systems, correspondence, etc. Last but not least, obstacles in the planning process and for a transition from car, according to Schmidt, is the slow administrative and decision-making process in Germany, struggling with over regulation. Every single decision and its implementation takes very long, and has to be solicited by so many administrative entities before being effective. "Sometimes, I would like to have a King here! There is no king but if you have the chance to do and to decide for the survival of the region... sometimes it is very difficult to ask everybody!"

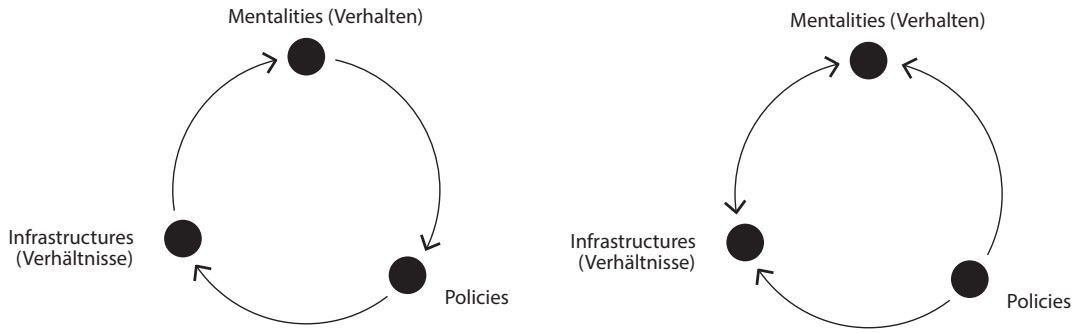


Fig 8. Vicious circle of car-oriented mentality - Policies in two directions.

3. The lower densities are dependent on cars, but so are the cities. If the share of car is 58% in the region, it is 53% in the city of Essen. The situation, however, changes from one city to the other, as the next city, Münster[5] (90 km from Essen) is very bike friendly, simply because historically they have developed the biking infrastructure. As mentioned above, the ultimate solution is to combine the walking and cycling with public transport. In the extended territories like Ruhr, bicycle has great potentials. Cycling is the quickest mode for distances less than 10 kilometers. Public transport is

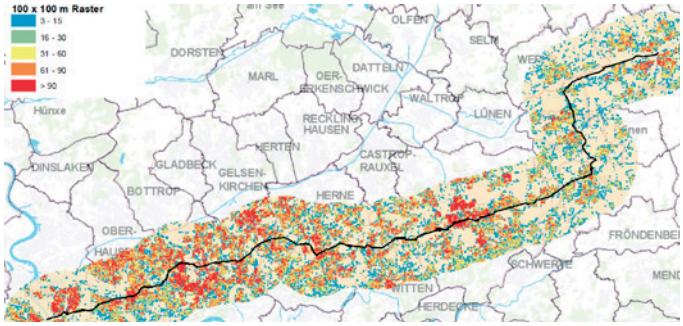
[5] Münster is best known in mobility discussions for its iconic 'waste of space' image from 1991, which demonstrates the disproportionate amount of road space used by single-occupancy cars. The image of Münster, which preceded by similar logic advertisement of London Transport from 1950s, has inspired many similar demonstrations and has been replicated in different contexts, including for example a performance organized by the Mayor of Strasbourg in 1980s which led to Strasbourg tram project.

only faster when it runs very frequently which is not the case here, and cars are only faster when they use a motorway. Therefore, a large-scale cycle way, which punctually connects to public transport can perfectly replace the car commutes, especially the ones between closer cities. It is healthier, more ecological and even more practical, especially in the perspective of widespread electric bike. “With one electric bicycle per person we can completely get rid of all cars: Post-car World!” This is partly envisioned in the project RS1 Radschnellweg, explains Schmidt that RS1 passes just behind the university campus in Essen, crossing through the city, it extends to the whole region. The track has been a dismissed industrial railroad, which is being converted to high-speed cycle paths. RS1 is being implemented to reduce congestion on the A40 the parallel highway, which is perhaps one of the most congested ones in Germany or maybe in Europe. The irony is that they are at the same time adding a lane to the A40 (mentality!), although reserved for the electric car and recharging stations. In general, this type of regional radschnellweg is being developed in many other parts of Germany and can provide a real alternative in mobility.

Another project by Schmidt’s team aims at reusing the roads liberated from replacing the open sewer canal of Emscher with underground sewage system and re-naturing the river itself. This network of small roads has a great potential for mobility of the region. The old river Emscher will be a blue river again, after 100 years. “So, it is a huge area where there are a lot of big and small roads, maintenance roads which will be open to public in few years”. The proposal consists of putting together a team of economic and social science experts to estimate the benefits of such re-use of the territory to general public. “From one day to another there are 400 kilometers that can be activated and integrated to the mobility network of the region. This won't provide only a leisure and Sunday activity attractions, but a commuter axis. With light vehicles, pedestrians and bicycles, as well as light self-driving public transport (buses) to link the northern part to the south part, to install mobility hubs and to steer around the mobility system by this kind of light transport.”

Fig 9. Aerial view of the (from the left) "Rhein-Herne-Kanal", the "Emscher" and the highway A40.

The river Emscher-at the heart of the Ruhr region- as a result of coal mining in the region became an open sewer canal, whose shores, right in the middle of the urban agglomeration, were places to avoid rather than to stroll. The regeneration and renaturation of Emscher today is of the largest infrastructure projects in Europe and a task of immense dimensions through which the river will be transformed back from being an open sewer to a natural river. In this regard an underground channel system is going to convey the wastewater instead. This will liberate many small and secondary roads which were fenced and used to be undesired previously. This liberated new network of fine roads provides the opportunity to rethink the active mobility in the region. ©Christian K. Feld



1.6 million inhabitants live in the catchment area of the RS1, as well as around 430,000 employees, covering approximately 150,000 students within 24 educational institutions.

Running largely along disused railroad tracks, it never intersects with cars. 4m wide, and equipped with flyovers and tunnels with a footpath that runs parallel to it.

RS1 Radschnellweg
Ruhr Bicycle Superhighway

Ruhr region in Germany has been reinventing itself in many ways since IBA Emscher park (1989-1999) transforming from its industrial past with growing ecological, urban and social problems to dynamic context for new developments. Despite many transformations towards a more sustainable urban system within past few decades the region remains still very car dependent.

Radschnellweg Ruhr (RS1) aims to bring about change in mobility practices within the region. RS1 is a hundred-kilometer bicycle superhighway connecting the ten cities of Ruhr Valley. Its objective is to provide a nationwide pioneer and an important component of the future mobility of the Ruhr.

Arguing that the existing offer for leisure cycling in the Ruhr metropolitan area won't necessarily respond to the everyday traffic and commuters' needs and expectations, RS1 passes through the core cities, connecting important transport hubs and forms the backbone of the regional cycling concept adopted by the Regional Association of the Ruhr (RVR) in 2011. Hence, in addition to its importance for everyday mobility, it simultaneously enhances the tourist attractiveness of the region.

RS1 runs from the west to the east on the main axis of the traffic demand and has the potential to relieve the two overloaded east-west axes, the A40 and B1 as well as the railroad route from Duisburg to Hamm. The local bike and cycling routes are linked to the RS1. It is estimated that the implementation of the axis will take 50,000 cars off the highways and therefore reduces significantly the congestion and as a result saves 400,000 car kilometers each day, with an associated annual reduction of 16,000 tones of CO_2 emissions.

The rapid road is to be a new type of infrastructure clearly visible to cyclists through a continuous formal language independent of the location. However, while

respecting a coherent and uniform identity, the design project clearly distinguishes the characteristics of different segments of the road, in the city center and within larger landscapes: Distinguishing the design for urban areas, for metropolitan region, landscape zones. The construction of resting stations is based on the route situation on the ground. The first stretch of RS1 was opened in November 2015 between the cities of Mülheim an der Ruhr and Essen.

The project takes the increasing spread of e-bikes as an opportunity for mobility to be seized by providing fast-track routes. E-bicycles are experiencing a rapid growth, from 150,000 bikes sold in 2009 in Germany to 350,000 in 2013 with the expectation to achieve 1 million by 2020. Electric bike can make a significant contribution to mobility in everyday traffic by increasing the average traveled distances from 5 to 15 kilometers. Longer distances can be traveled more directly, more comfortably and more quickly, thus creating new target groups for cycling.

It was ideated in 2010 when the autobahn A40 was closed to motorists and opened to cyclists and pedestrians over the sixty kilometers from Duisburg to Dortmund for a day. Three million people were on their feet and on the wheels. Hence the Radschnellweg Ruhr project was born, which mmediately reached a consensus of popular opinions as well as professional and administrative ones.

Ruhr 2010 European Capital of Culture Still-Leben (Still Life)
A40-B1

From:
Machbarkeitsstudie Radschnellweg Ruhr
Endbericht, Projektträger: Regionalverband Ruhr

Workshop zum Innovationsbank,
Radschnellweg Ruhr , 2015

http://www.rs1.ruhr

Fig 10. Passing through various landscapes RS1 connects major cities of the region.
©geoportal.ruhr


E03
E04
200m

Appointment no.4
Bernard Reichen, Reichen et Robert & Associés, Paris, France.

1. Is it possible to invent the future with the tools and mind frames of the past? Isn't every attempt to imagine future threatened by this mistake? Bernard Reichen begins the discussion with serious doubts about how we can know, estimate, and foresee the future. However, that does not mean that we cannot act upon it, according to Reichen. Referring to Michel Serre in his book Rameaux (2007), he quotes "it is the evolution that creates the conditions of the evolutions", Reichen continues "fortunately or unfortunately we are inheritors of Modern Movement that strongly modeled and formed the space especially between the two wars that was then transformed with the post-war reality. The car urbanity that was envisioned froze the system in a way that quickly became archaic." The question is, if it is possible to produce a model on the basis of its exact opposite? To expect a post-car world in the context of space inherited by car-world does not seem plausible. "While in the 70s space was transforming faster than the society, today it is the contrary. Rupture with the past –*tabula rasa*– was the principle idea of the Modernist urbanism and today it is completely different." Today the society evolves faster than space. Our future expectations are marked by the preoccupations inherited from the precedent system, ecological aspirations, air quality, and energy resources and environmental issues. Therefore, projects for future attempt to foster individual well-being and respond to collective fears, like climate change.

Urban projects today are judged and evaluated more by their externalities and unintended consequences than their principal objectives. Urbanism has become a systemic science, "any system to have a chance of survival must incorporate in its conception its principles of corrections." as put by Bernardo Secchi. Hence, it is necessary to foresee all the possible corrections of every single action. In this regard, we should find the reversible *dispositifs* that hold to certain values, which are coherent and often in line with the objectives of the end of *all-car*.

2. One simple fact is that car is no more the guiding principle of urban projects. It is not easy since the street grid of Cerda or other 19th century cities, although were not conceived as automobile infrastructure but are very identifiable with it. It is therefore important to avoid orthogonal grid on one hand since it is very assimilable to the car space. On the other hand, Reichen adds *"Urbanisme des Modes de Vie*[6]*"* –proposed around 15 years ago by Francois Ascher and others, should not be considered as an

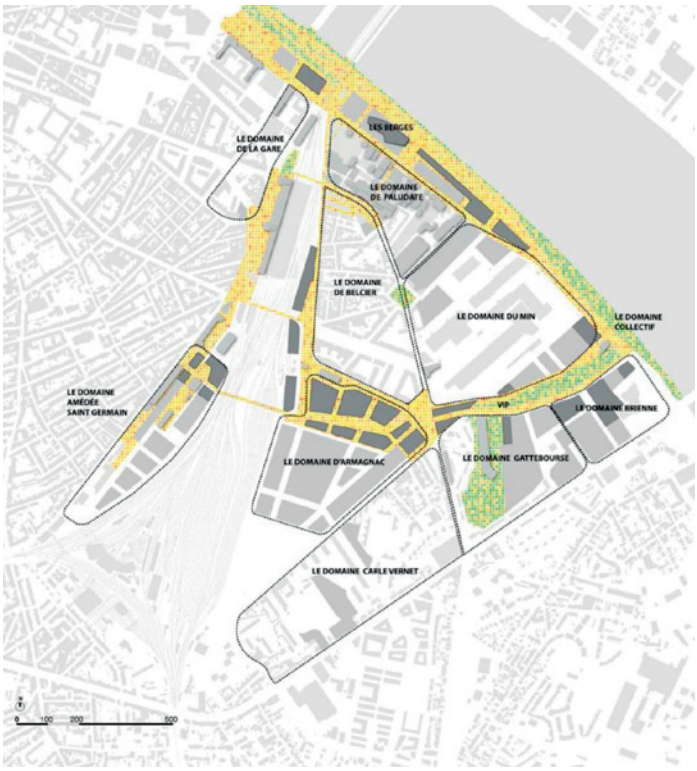
[6] see *Un Urbanisme des Modes de Vie* (Bourdin, Masboungi, and Collectif 2004) the title could be translated to English as Urbanism of lifestyles or Urbanism of practices.

opposition to the urbanism of "tracé"[7]. "Urbanism of lifestyles", asserts Reichen, "is not the absence of urbanism. I have always defended the urbanism of *tracé*, especially in the context of a European City, where the urban corridors, *les tracés*, have embodied the urban culture and constitute the urban heritage. It is crucial, therefore, to re-invent the sense of *tracé*."

In this regard, two types of urban projects are contributing to this process of re-inventing the *tracé*: 1) In the last few decades with the re-emergence of tramways in European cities new corridors have emerged, along with new centralities and new urban forms, associated with a service and a practice. The linearity of the tram's trajectory becomes the site of sociability, with the new speed that sets the rhythms, 19km/h, the quotidian time is mastered in a regular and regulated way. Moreover, tramways have been the occasion to beautify the city, with which a link is created between life styles, practices and sociability of the city, aesthetic concerns, speeds and rhythms of the city. 2) Another type of emerging urban projects are the *magisterial pathways* (*les parcours magistraux*) for walking and cycling, major routes that are not as pedestrian streets used to be in 1970s –which were simply streets where cars were banned. These major pedestrian roads go through the entire city and connect its most important hubs. At another scale, it is also being done in Germany- throughout the whole region. German radwege takes a completely different sense, different frequency of use, therefore different maintenance and usage principle compared to the urban one at the scale of 5 to 10 kilometers. But neither should be closed on itself, they should always constitute an ensemble of paths, going from one tension point to the other. Reichen takes the examples of some of their projects like that of Nantes, combining tramway and the *magisterial pathways,* or the project in Morocco, where they have implemented a 14-kilometer pedestrian pathway that assembles major public equipment, including train station and holds together the major public spaces, so that walking becomes the foundation of the city rather than merely an alternative to the car. A new time-space should be envisioned for the entire city, rather than creating slow zones. He underlines, in this new time-space we will be less obsessed with speeds, as we are going to be masters of our times.

3. In the dispersed city, nevertheless, recourse to the car is inevitable. In this context, it is the evolutions of car itself, which might bring up the change. While at the same time many attempts are underway to reduce the car dependence in these territories, like creating the poles of intensity around the transport stations and transport hubs, a network of urban constellations, les liens et les lieux, as well as pathways in territorial scale, like the ones in Germany, contribute to this endeavor.

[7] Referring to compositional urbanism based on the main corridors in the urban fabric, tracé literary meaning line, layout, trace, footprint, route.



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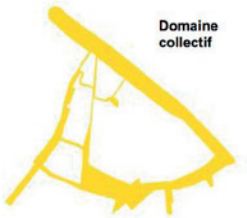
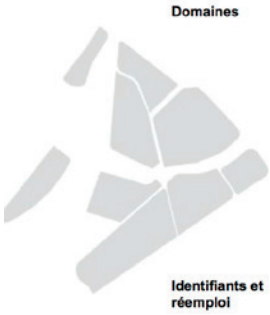
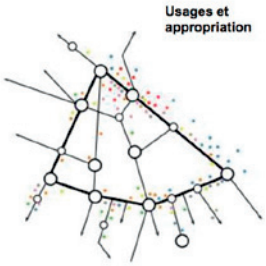
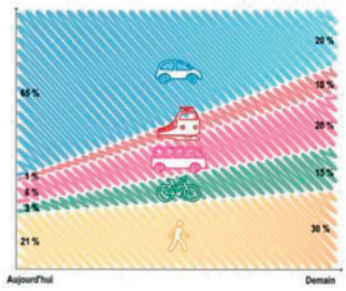






VIP RING (Vélos-Intermodalité-Piétons)
Bordeaux Saint-Jean Belcier

The project is the laureate of a competition in the context of Bordeaux Euratlantique in 2011. It organizes the district along the theme of mobility. "Few kilometers long, a VIP ring (bicycles, intermodal, pedestrians) brings together different areas defined by the project and connects the main equipments and places of public life of the future district of Saint-Jean Belcier. Most importantly provides simple access to the train station. This "ring" that a pedestrian travels in half an hour would double the accessible territory within 30 minutes. While being a transport axis, and conceived as a park, it structures the landscape and constitutes in itself an ecological system. It aimed at reducing the modal share of car by increasing other modes.



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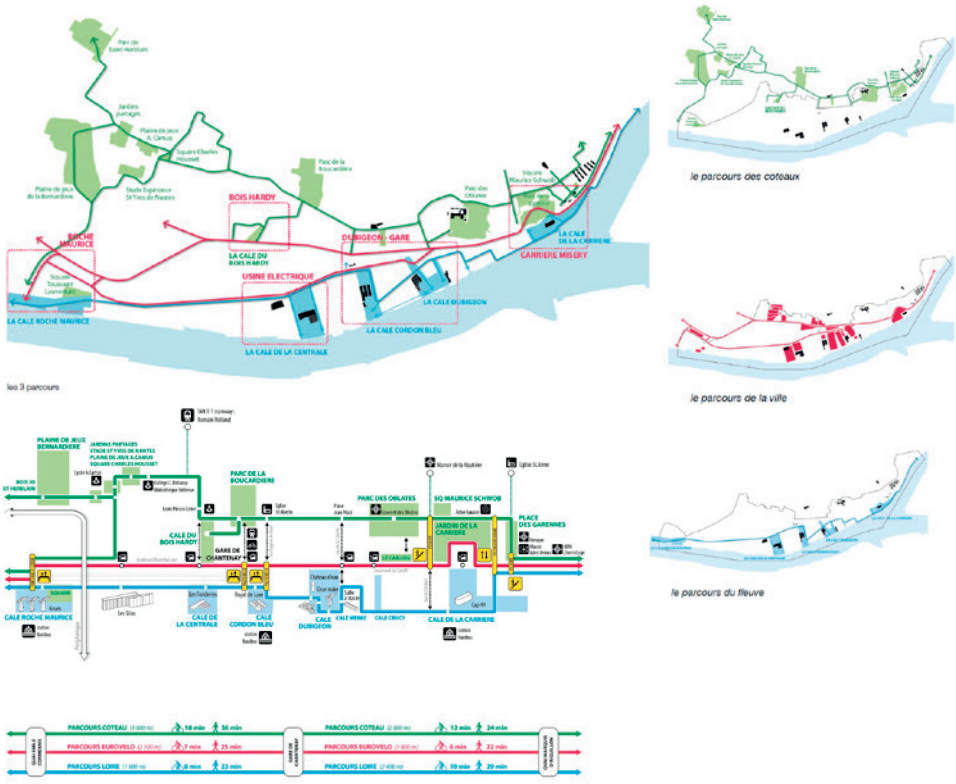

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Le Bas-Chantenay
Nantes

The Bas-Chantenay, is a particular geography with the industrial heritage and many emblematic places and elements to be valued. The project takes into account the context, "three images and three imaginaries, the hill, the river Loire, and the industry, mark the future of the territory." Three pathways are proposed that are also connected to one another by roads, stairs, alleys, and lifts, connecting the up to the bottom. The green pathway connects the existing parks and puts together 21 hectars of green spaces. The topography, rather than being an impediment to the attractivity of the soft modes can encourage "sportive pathways".

4. About car, Reichen sees a full future ahead, assuming that it will manage to be clean and ecological (electric and renewable sources) and in case it figures out how to solve its main challenges; road congestion and parking problem (both problems of space). Meanwhile, if the true price of car is applied - as is to some degree the case in Paris and London, car will become too expensive to be a viable quotidian solution and therefore the alternatives will be taken seriously.

Parking strategies could be a key point in moving beyond car. The parking should be dissociated from the functions–getting rid of regulations of certain number of parking spaces per residential or office units– and instead having a number of available mutualized parking places. Once we have dissociated the parking from the functions, the prices will increase inevitably. There we need to dissociate the car from its owner. This would be the second step. We will then move towards effective and generalized car sharing and different forms of rentals. Lesser cars on the road will permit getting rid of a part of car infrastructure and thereby we can move towards replacing the car system with something else. Hence, one starting point is re-conceptualizing the parking spaces and its functions.

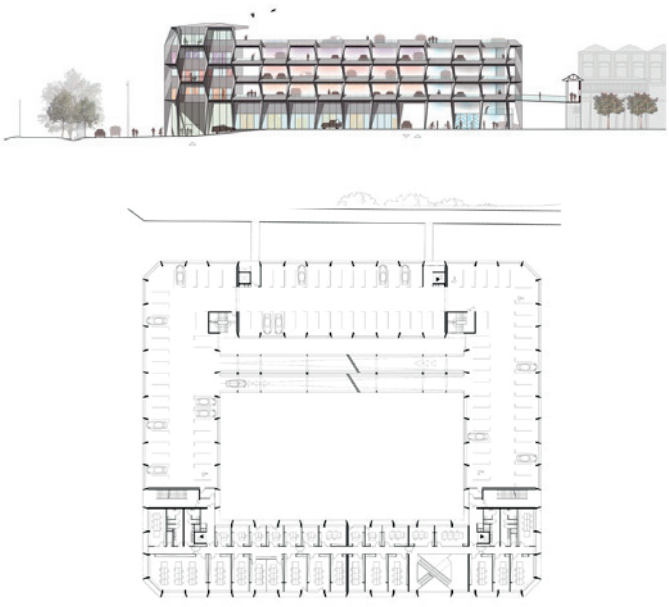


Fig 11. Mutualized use and reversible structure of the parking in L'Union neighborhood, Lile, France. ©TANK Architects.

Insisting on the principle of reversibility of urban projects (the principle of correction) Reichen takes the example of a parking building as a part of an urban project by their office *Reichen et Robert & Associés*, in Union neighborhood north-east of the city of Lille in France. The mutualized parking is in an office building where the parking itself hosts the transformation of car use and the transformation of the practices of inhabitants, a parking complex with a conciergerie and other services like mail delivery, bicycle facilities, etc. with the goal that one day this parking space will be easily transformed to something else: "The competition brief imposed us a certain number of parking places, to which we have responded. However by placing the cars in the second floor, we have maintained an active facade and by proposing a metal intermediate floor we envision to change the space from parking to something else in the future. The day that we decide to remove the cars, we have a magnificent volume to be used for any other function. We have responded to the competition brief by saying that we respect the expected numbers for the moment, but the future is going to be different and then we need a flexible space to eliminate this parking. This is what I mean by the principle of precaution that assumes the period of transition and ensures a system of evolution that is not closed on itself."

About driverless-car, Reichen asserts that sooner or later it will work but it is not evident and it will not work within the current model of individual car– in other words, it won't be car as we know it today, just not driven by human being, it will probably make a whole new model, a new logic. Therefore in urban scenarios it is possible to leave that aside, if car manages to solve its problem of congestion and parking then it will be integrated within urban schemes.

Appointment no.5
Thomas Sieverts, S.K.A.T., Architekten und Stadtplaner, Munich, Germany

1. Sieverts traces back the transition to 1960s when social scientists reacted to the technical utopias and the conception of the city as a technical machine and advocated the city as a living space. Technical utopias of the time promoted and ideated the strong separation of traffic means to increase functionality and efficiency. The reactions and critiques, however, did not bring up tangible consequences in the immediate future, for political weakness of such discourses facing strong forces conducting car urbanism especially in Germany with a strong car industry.

This imbalance in power relation continues to this day, although the critiques and the focus on health and ecology have gained weight. While urban schemes and contributions of urban professionals is an important factor, but the determining one is the political force and engagement.

2. In envisioning a post-car society, according to Sieverts, an important place should be assigned to the emerging technologies that can influence not only the mobility but also the demand for mobility. For example, the possibility of working from home could bring new dynamics to the cities and create a new type of settledness. Moreover, mobile technologies transform the experience of mobility. Another factor that will doubtlessly have an impact on future of mobility is the electrification of vehicles. Sieverts treats the argument as an open question to which it is very hard to have an answer. Electrification is on its way, and probably very close and if it is based on renewable energy then many arguments against car mobility–from ecological and energetic standpoint– are not valid anymore. "Energy might not be the question any more, it might be a historical phase, but car remains a problem! If we have electric cars, easy to drive with no fuel problem, it will grow exponentially I am afraid... the situation would be worse than now." Sieverts pictures a dystopian image of the city of future populated densely with small electric cars or driverless-cars as a horrific image in which the mixed use is drastically reduced in the street and therefore many achievements of urbanism since 1960s are renounced. An alarming threat in the emergence of such vehicles, according to Sieverts, is the separation of spaces and specializations of roads, which as we have experienced, depredates the existence and quality of public space. The canalization and separation as the modern experience of the city shows it is not the solution.

Therefore framing the discourse of car mobility as an ecological and energetic problem is perhaps a mistake and is already old fashioned and outdated. If once the car was

criticized from a spatial point of view, then the debate was skewed towards ecological and energetic one, what is next debate? "To think of a post-car period we might need to think of future framing of the problem."

3. Regarding lower densities, Sieverts, asserts that more than 50% of urban populations live in this kind of environment. While there is a recent migration to the city from countryside –which was not expected – there is also a counter movement that is purely economic. Munich or other big cities become so expensive so that people have to move to suburbs. In the Metropolitan areas, suburbs will thrive. Sieverts acknowledges that car dependency has been a major problem in such territories ever since. However transformations are underway. In Germany for example, single family houses in many regions are now becoming obsolete, people do not want to live there and therefore the new urban question is how to re-use such spaces, how to convert them to something else? There are ideas to densify, insert social institutions, convert them to retirement homes, or turn them to shared flats. There are many ideas that could transform how the territory functions and therefore change the mobility dynamics. In a sense, what needs to be done in the lower densities, in the territories of dispersed urbanity of residential zones, industries and agricultural fields is to re-invent the notion of village. The old village has died out by the transformation of agriculture. As the figure of farmer disappears and gives place to agricultural entrepreneurs, the village needs new meanings and new sociabilities. A kind of centrality could be created around co-working spaces where the inhabitants of the lower densities work a few days per week and where the enterprises and small businesses flourish. The center could provide other services to the inhabitants such as kindergarten and community center. The micro-centers as such could be the backbones of a systematic and equitable decentralization, as technically and in terms of energy and food production de-centralization seems a viable future scenario.

In terms of mobility there are unexploited traditional solutions like bicycle for example, and its potentials when it is mixed with public transport, ride-and-park and multimodality could bring up real change in territories with lower densities. To exploit all the potentials of the bicycle for example one must study patterns of use. Sieverts explains that in a visit for a housing project in an exemplary bicycle-oriented neighborhood in Vienna, he had noticed that families had more than a bike per person, in fact they had different bicycles for different occasions and contexts, almost like shoes. He underlines the transformations in bicycle itself opens many opportunities, e-bikes, accessories, trolleys. Hence it is mandatory to think of its easy combination with public transport. Promoting bicycles and multimodality might seem conventional and not very futuristic but the truth is, we have not yet exploited their capacities. The ideas are there but not

fully implemented and we have 20-30 years to go with these ideas. Sieverts points out that even bicycles should be developed in a way to respect and promote mixed use rather than creating barriers in the space.

4. The schemes for driverless-car, according to Sieverts, can only be helpful if they can integrate in the mixed urban space and cohabit with the other means. While there is a strong possibility, according to him, that once more the temptations of efficiency result in separation and segregation of modes and spaces. Finally, Sieverts highlights that any excessive solution could easily become a threat rather than a remedy, including the idea of working from distance, as people should not be isolated. "There, we must find a healthy balance between things, we need to find a moderate measure."

Appointment no.6
Paul Lecroart, IAU îdF, Paris, France.

1. Paul Lecroart seizes the transition very clearly through a benchmarking project he has been conducting around the world since a few years, on the re-conversion and re-use of the urban highways. The trend is becoming more widespread and every time the results reconfirm the same story of the evaporation of traffic. He takes the example of the the first expressway that was reconverted to a boulevard, which was Harbor Drive in Portland (Oregon), starting at the end of 1960s. Although the transformation was also due to an alternative highway that was under construction at that time, still it remains a pioneer and an innovative project.

Today instead of the Harbor Drive highway there exists an urban avenue, redesigned with many amenities with much less vehicular traffic. "What is interesting here is that as soon as we take an alternative way, opening up to new experiences, at a certain point there is a click! And then, we change completely the orientation of urban policies." This is what has happened in the case of Portland where they have relocated the budget for the development of the highway network on study and implementation of a system of tram. Portland, moreover, is one of the first, and perhaps one of the few cities in United States to have urban growth boundary, and one of the first cities to re-populate the center. However despite anti-sprawl policies and innovative transport solutions since a long time, the modal share of car is still very high. The objective of the city is to evolve from 60% today towards 25% in the horizon of 2040. "Very often we see that these objectives determine the actions, setting goals and establishing a machinery to achieve them."

2. Through different examples Lecroart demonstrates the same principles. Gearing and multiplying the alternative mobility supply and in parallel reducing the demand for motorized mobility, eliminating parking spaces or increasing the price, accompanied with events such as no-driving days each week, prove to be effective in bringing up new practices. Paris has been debating the transformation of many of its high-speed axes. Lecroart takes the example of the controversies on the fate of an avenue in Paris. Neuilly Boulevard with 150,000 cars per day–almost an urban highway–has been discussed since 1980s. Neuilly Boulevard is a very mixed road with different functions, offices, shops, residential buildings and therefore many pedestrians suffer a very low quality of public space due to the massive presence of cars. "The idea to transform the axis to an underground passage, fortunately, has not been possible due to financial problems." A strong requalification with the reduction of cars is necessary there. "We need to realize

Fig 12. Portland (Oregon), Harbor Drive, 2.5 km, 25,000 vehicles per day, 1960. ©City of Portland archives.

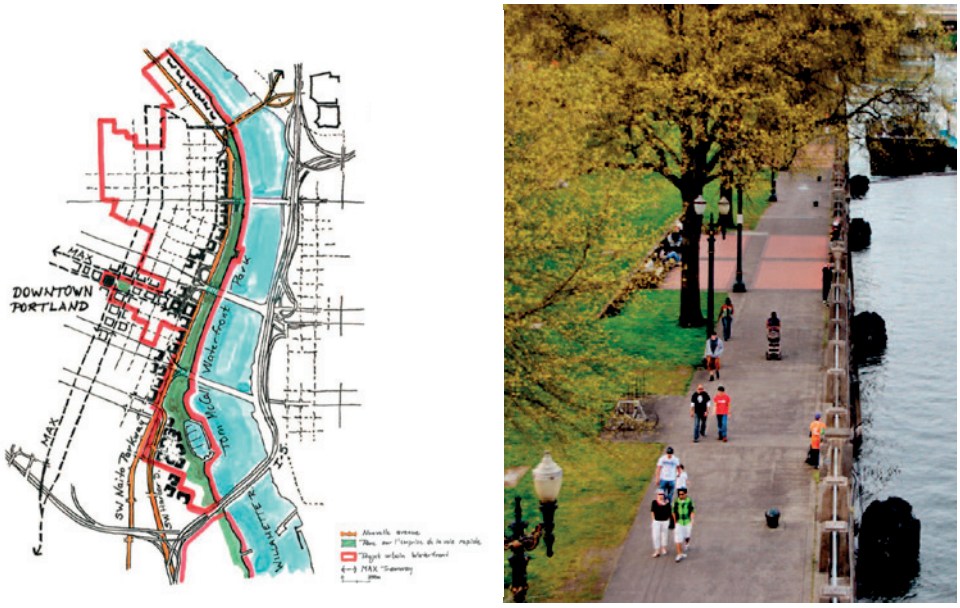


Fig 13. Portland (Oregon), Harbor promenade. ©Paul Lecroart.

that urban issues should be prioritized over circulation issues."
Another ongoing controversy in Paris is the pedestrianization of the riverbanks that is closed to vehicular traffic since 2016. Proposed and implemented by the Mayor, it has been heavily criticized by many of the neighboring municipalities, drivers, and even mobility experts. Called "the kingdom of the rare strollers" by a local journal (Parisien, 22 feb), it is argued that it has caused congestion, noise and air pollution in the neighboring areas and roads like Saint-Germain Boulevard. Lecroart acknowledges that the project has been done in a brutal way, without *concertation* with other actors. However, couple of months is too soon to judge the real impact on the overall traffic. "Given the 340 km of expressways in the Ile-de-France, these examples are far from being the only axes that could disappear." The question should be attacked at a larger scale. Reflections exist on the circular boulevard of La Defense and many others.

3. About Parisian Region in a general perspective, Lecroart asserts that the trend confirms a distance from car dependency. The Parisian lifestyle –that is living without car– is already extending beyond city center. There is a considerable overall reduction in car mobility since at least 15 years even in the *Boulevard Périphérique* that seems to be always more congested. The radial road axes from exterior to Paris, likewise, have lesser degree of circulation. Inside the city more space is dedicated to the public transport, therefore, despite the reduction in the total number of cars the traffic is not necessarily more fluid. This transition towards "Parisian lifestyle" is expected to extend even further with the construction of 200 kilometers of *Grand Paris Express* that is going to encircle the outer periphery.

At the same time, the region is facing another phenomenon that is a division between its two worlds, the two cities that oppose and confront each other: the inner city and the outer one that is more car-oriented. The divergence became very clear in recent voting occasions and it is stronger than the first trend of already mentioned emerging practices. However, Parisian peripheries do not have exactly the same dynamics. While for the Western periphery car is a lifestyle choice, for the eastern periphery car is an obligation. They need it since they are too far from the alternatives and the type of employment for them is more scattered and less concentrated. Within such double dynamics, reinforcing the first trend is susceptible to act upon the second and erode or reduce the divergence. "Working on walkable periphery is an emergency." Lecroart adds "we need at the same time strong actions in the city center, since we lack space! There is no space for more cars." We know that the same level of mobility is feasible without cars and that cohabitation demands mobilizing our resources, investing more on walking, cycling, public transport and shared vehicles." In this direction Lecroart refers to a simulation study by University of Leeds that takes the active mobility to its extreme accounting for almost all the individual mobility in 2030 and 80% of all mobility.

Fig 14. Parc Rives de Seine. ©Ville de Paris, www.paris.fr/rivesdeseine

Vision 2030
Walking and cycling in 2030

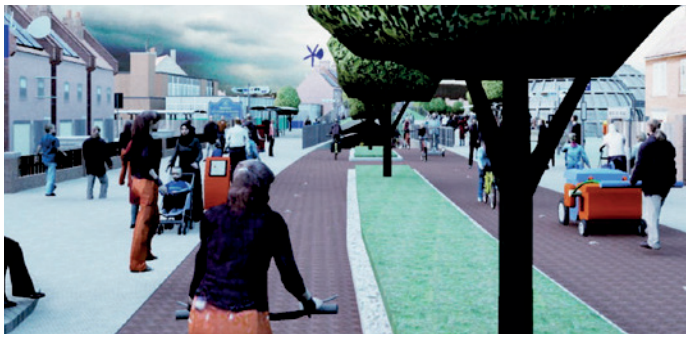
Institute for Transport Studies, University of Leeds, United Kingdom

The project explores the potential role of walking and cycling in the urban future. The aim was to explore the extent to which these modes could replace the current dependence on motorized transport. The visions sought to go beyond just small scale changes and to explore the potential for more radical changes. It has been developed in three stages, where the last one, the more radical one imagines 2030 with the modal share of car reduced to 5% and walking increased to 40%, all terrtories included.

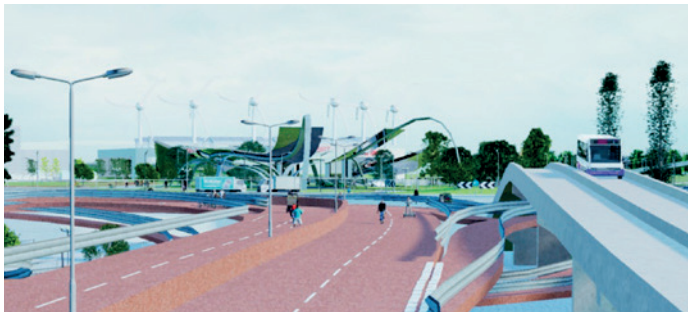
"The methodological approach for devising visions is informed by work on 'utopian thinking': a key concept underlying this approach is one of viewing the future in social constructivist terms (i.e. the future is what 'we', as a society, make it) rather than considering the future as something that can be 'scientifically' predicted by the extrapolation of current trends."

The scenarios have been developed for a medium sized city of around 250,000 inhabitants. The images depict different urban environments where dependence on motor vehicles has been reduced, varying from a typical Vistorian street, edge of town as well as suburban and infrastructural landscapes. The aim has been to, above all, open up debate as to how far walking and cycling could meet urban transport needs, given particular background scenarios, with a view of creating more sustainable urban transport in a relatively short time period (Tight et al. 2011).

Vision three, Vistorian street.



Vision three, Edge of town.



Vision three, Infrastructural landscape.

	Current situation (2006)[a] (%)	2030 Vision One (%)	2030 Vision Two (%)	2030 Vision Three (%)
Walk	28	32	37	40
Cycle	1	13	23	40
Public transport	12	25	35	15
Car	59	30	5	5

[a] Source: National Travel Survey, 2006.

Mode split for the current situation and the three 2030 visions.

Appointment no. 7
Juile Imholz, Paysagestion, Lausanne, Switzerland.

1. Imholz describes the transition as a long process of re-adjusting habits on the one hand, and developing new spatial supports on the other. While previous generations established their lifestyle habits around car and without much ecological and energy concerns, new generations today are already sensitive to such issues at school and this has doubtlessly had an impact on their lifestyle choices. They have different ways of communication and use of technologies and therefore, new ways of getting around as well. Hence, car sharing or other exchanges between users themselves are gaining increasing importance. More mobility provided by not very expensive air travels for example- a weekend in Ibiza- changes completely the practices of mobility of the younger generation, creating a new cartography of everyday life and therefore necessitates a different territorial planning.

New typologies of spaces should support and accompany the new ways of inhabiting the territory. The change cannot be imposed but it needs spatial support. For example it is not enough to have a panel indicating the 30km/h speed limit, the road itself should be re-thought to give space to the bicycles. "To do so, we need to think and work together, the landscape designer, urbanist, civil engineer, or mobility expert, projecting the future together." That is what Paysagestion aspires. Imholz describes their agenda, as thinking of landscape as the basis and support for life, for people on the move. Therefore. Inevitably a landscape project reflects upon mobility questions.

2. "We have many projects at the scale of agglomeration, and we have always prioritized walking and public transport, trying to give walking incentives, without eliminating the car." She takes the example of *Traversé de Vetroz* in Valais, Switzerland, where the old village, which had the cantonal road as its limit, has expanded in the agricultural plain on the other side of the road. This new low density urbanization consisting of individual housings, public services and schools is completely cut from the old village center with the 14000 cars per day that separate the two sides. The picturesque village on the hillside with magnificent vineyards and cellars remains a touristic village and very disconnected from daily lives of the inhabitants on the plain. The project envisions to sew together the two sides, bringing continuity and permeability by proposing the squares (des places) that play the role of the moderator and reduce the speeds, discharging the flow of the cars in alternative roads, but also proposing spaces of exchange for public transport and train stations to reduce the flow. This sparks a

paradigm shift at the cantonal level that supports the project and highlights it as a pilot project in agglomeration to incite such transitions, proposing a new arrangement of flows and priorities, instead of privileging the passage of cars, creating shared spaces between different users. Moving from the big artery roads to more urban streets, and urban squares.

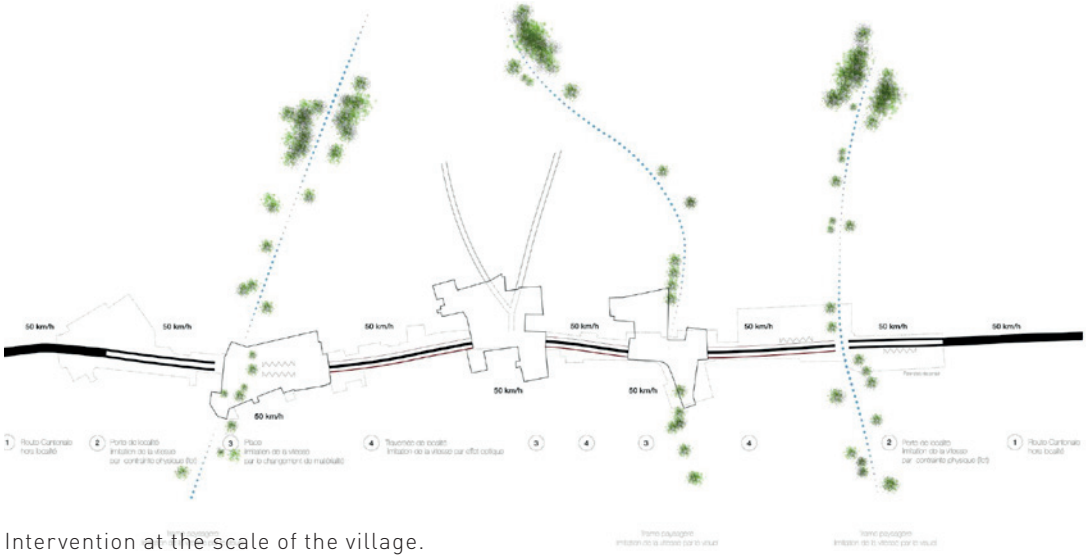
Moreover, Imholz underlines the necessity of alternative pathways, greenways as the support for soft mobility and as necessary spaces in dense active cities to provide another rhythm. These pathways should be connected and should constitute a network on their own, connecting destinations, offering alternative itineraries and the possibility for the inhabitants of dense and busy cities to access calm and green places in a fast and easy way. This is partly what *Paysagestion*, responsible for landscape planning of agglomeration project for Fribourg, has proposed. "Apparently we are going to live more and more in cities, it is essential therefore to think of projects and spaces to increase, and/or keep the quality of life in cities, alternative reserved spaces to breath, like Central Park in New York (seen as an axis of mobility along 4 kilometers). Having these kinds of spaces in the city, we need less to go out. An important question and challenge, however, is often financing such projects. "Paradoxically, it is sometimes easier to find the budget for a tunnel or a highway than for soft infrastructures"

3. "Territorial planning in the low density areas and the densification of the villa zones is at the core of our tasks in the office, it was also the theme of the last forum of *bâtir et planifier* (construction and planning) in the general assembly of SIA – *La société suisse des ingénieurs et des architectes* – questioning the future of these territories, how to densify, and with what kind of spatial apparatus. A first step is to densify, providing more services, then it is important for the people living there to reach the exchange zones as soon as possible, even if car is indispensable for the first part of their trip. This means parkings and intermodal platforms are needed."

4. Imholz does not consider driverless-car as a pertinent question to the problems of today, since prior to that there are other urgent questions in terms of how we move around today. It is essential, for example, to understand and integrate today's existing modes, the vehicles we use, and their impact on our lifestyles. Mentioning that the next forum of *bâtir et planifier* is going to be on urban health, she underlines that how we move around impacts strongly different aspects of urban health. Evidently there will be the question of walkability, design, and planning to encourage walking and physical activity. "We have so far underestimated the impact of space and territorial development on health. There are more and more people with obesity in the cities, we

walk less and less, sometimes as a consequence of public transport, a new metro line for example." She adds, "I think we should also take into consideration the younger generations' increasing use of small vehicles. I find them super cool, and I tell myself that is the future, this is going to flourish, but at the same time, I am also concerned about its impact on physical activity, what if we cease to walk?" Imholz goes on to express the same concern about the increasing rate of electric bicycles used especially in cities with strong topography like Lausanne. "It is a great alternative to car, but what about physical effort?" She develops a reflection on the speed of movement, underlining that we seek speed even within slow and "soft" modes. "New emerging vehicles are probably going to influence the future of the planning and design of the urban space. We should face the question how to integrate them in the urban flows." Referring to rollers, skateboarders, different types of cyclists, Imholz argues for the necessity of their integration in the design thinking. "It is not only the car and the pedestrian that we need to take into consideration. Other modes are taking increasing importance in number and practice and their integration is not very evident and easy."

"We always think that there should be a sense of sharing in the space, a respect that enables cohabiting the space. This could be facilitated by the spatial configuration." She raises the question of various new vehicles that have great potentials for the future of mobility, however, they are not yet integrated into the reflections of designers on public space and mobility. Taking the example of an on-going project in Sion promenade, a trail that is supposed to welcome the diversity of movements, Imholz asserts "we realized that it is impossible to integrate the fast cyclists in the same promenade. For those who want to speed up, it is difficult to negotiate with pedestrians. They prefer to ride on the cantonal road with an easier cohabitation with cars rather than with trolleys and pedestrians." In this regard it is not about the means of transport, wheeled, or pedestrian, or motorized, it is rather a question of speed that determines the cohabitations. "A certain speed has its own behavior, changing speed is changing perception of space as well as the behavior of the individual."



Intervention at the scale of the village.

Place des Commerces

Place Centrale

© Paysagestion

Traversée de Vetroz
Ossatures paysagères

Redevelopment of the T9 cantonal road through Vétroz aims at reinforcing the urban character of the village, reducing the number of vehicles as well as their speeds in order to improve the transversal permeability. The public space is re-allocated for the different users, pedestrians and cyclists.

Appointment no. 8
Thierry Chanard, Urbanist, GEA vallotton et chanard, Lausanne, Switzerland.

1. For Thierry Chanard the transition in mobility is and should be a slow process. Since its context is the city, with its historical background, it implies transformation of habits of its inhabitants, neither can be achieved in short term. Chanard refers to the Modern period and the attempts of fast and abrupt change as a failure from which we have to learn. The transformations, however, are underway, in the city and in practices. Comparing the younger generations, with that of his own, Chanard believes that obsessions with car are finished, and car is no more a social status. "We do not ride our car, as we walk our dogs." Mobility is becoming banal, achieved through various modalities, and its cockpit is moved to our smartphones.

2. Future of mobility, according to Chanard, is inevitably distancing from individual mobility. "We need to share, individualized mobility will disappear perforce." In European countries and in general in industrialized countries mobility is going to intensify and therefore the supply should be intensified as well, and this is simply impossible and incompatible with the individual transport. In this direction, the conventional public transport by itself won't be enough and won't respond to the dispersed demand in the territory. Therefore major public transport with high frequency should be coupled with means of transport that cover the diffusion in the territory.

"In terms of public transport", explains Chanard, "Switzerland is working on significantly increasing the railway supply." But this won't be the only axis of change. In this direction since 1998 Chanard has initiated a project that was finally industrialized and utilized for the first time in 2017 in Strasbourg. The project is a new vehicle, between a car and shuttle bus, it is conceived to be adaptable both to very urban streets and eventually intra-urban roads. 'Cristal' is an alternative mobility system that in the modality of shuttle can transport upto 65-70 people in four vehicles, while a single vehicle could serve as an individual service on the model of free-floating car sharing. "We have to move away from individual private transport, however, occasional individual demands are perhaps inevitable." This demand should be taken into consideration by a compact vehicle that consumes less space both by its physical features and its speed in the city. "While most mobility projects approach mobility in longitudinal axis, I think a transversal approach is crucial. 'Cristal' is an attempt in this direction." Therefore, we need to question seriously how the vehicle impacts its surroundings and how it cohabits with soft modes, in order to guarantee a level of comfort for the users and an urban comfort

in general. These considerations re-qualify the streets as they become traversable. The requalification of urban spaces occupies a considerable part of urban policies; reflecting and projecting the future of urban space that will face a densification. "What can we do to have quality despite the densification? This is an obligatory question that we need to answer regarding future cities at least in Switzerland."

Chanard presents 'Cristal' as an "urban" project and not merely a mobility device, since in its conception different measures of the context and use have been considered, its interaction with other modes and with the existing transport supply. It is therefore a tool, among others, to accompany the cities towards a more complete mobility. It can adapt to different contexts, in compact cities, as a complementary service to the structuring supply of public transport. But also beyond city centers. "I had imagined it within individual housing zones outside big cities where a capillary service is needed. But, for example, *CarPostal*[8] is very interested in it specifically for remote villages that are badly served by big buses. It could serve as a transport on demand or serve as transport for goods during the night.

In many cases, however, the problem with new technological innovations is the critical mass. Innovations and new systems that are likely to push the transition towards a complete mobility in the city have difficulty in convincing a collectivity to take a prospective approach, accepting to be the step 0.1 of a longer process and in a global vision. History of mobility is full of examples; car sharing was launched in 70s but did not take off until very recently, same about electric cars. It is not about revolutionizing things (meaning changing from one day to the other) it is rather about its evolution and a vision for that. This should be assumed in urban policies. Rather than short terms legislators, we need visionary politicians. It is easier to take a photo with a fancy technological innovation than to embark on a long-term future vision. And then there is also the question of financing the projects.

More generally, regarding the strategies to move from car mobility (individual private transport) and at the same time to increase and intensify mobility, a primary matter for Chanard is to rethink parking spaces. "Over the years, I have come to the conclusion that to rationalize the mobility in city, we need to earn space on public domain which we can gain by eliminating the on-street parking. We earn a lot of space by taking out car parks. We can enlarge the sidewalks, make terraces, intensify the green space, we can do a lot, just by eliminating parkings. For me this is the primary material when

[8] CarPostal is a subsidiary company of the Swiss Post, which provides regional and rural bus services throughout Switzerland, and also in France and Liechtenstein: it evolved as a motorized successor to the stagecoaches that previously carried passengers and mail in Switzerland.

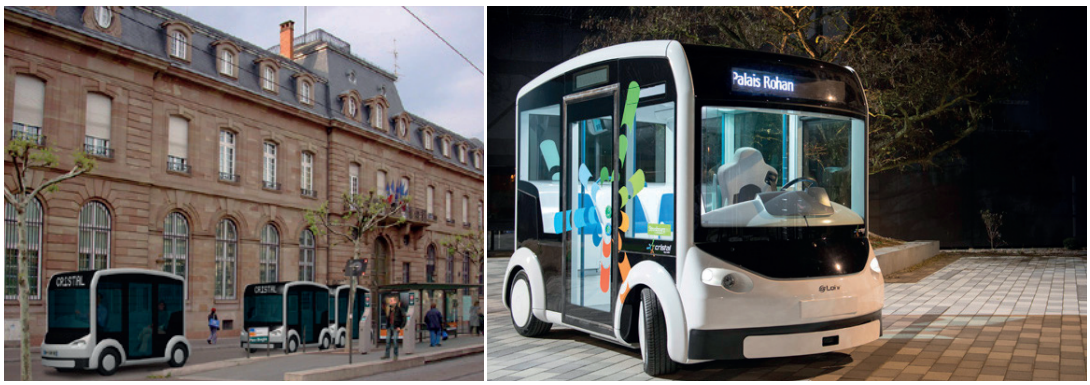


Fig 15. Initiated in 1998 the Cristal project (Cellule de Recherche Industrielle en Systèmes de Transports Automatisés Légers) is a new concept for compact and autonomous electric vehicles for passenger transport. It can be alternatively a means of individual movement (free-floating car-sharing model), as well as semi-collective (shuttle mode), organized by local operator.

The mobility system offered by Cristal is a link between the various modes of travel (car, public transport and soft modes) offering a new public mobility service to overcome identified gaps, existing in public transport, depending on the evolving travel needs of inter and intra-urban areas.

reflecting about the quality of urban spaces"

3. Consideration for future of mobility in larger territories is already a part of Chanard's reflections on the vehicle of the future. However, he acknowledges that these territories require visions and projects. Chanard believes that individual housing is comparable to the attitude towards private car. "Being a passionate car driver, which is in complete contradiction with my profession" says Chanard, "I do respect those whose personal preference is individual housing as those who prefer to drive." Nevertheless, he explains that as attitudes towards private car have changed, so would the urge to live in individual houses. "We arrive to a mindset –evolving little by little– where today we understand that we can live without a car, we will also realize that we are able to live otherwise than being fenced by a wall of hedge." Moving towards more collective lifestyles is the direction that the Swiss Germans are taking. They make sort of *Siedlung*, where you have your own space but in a more compact way. Instead of land parcels of 1000 m2, it would be a 300 m2 for example. It is a densification by insinuation; this goes together with a cultural shift and behavior transformations.

Chanard takes the example of a MEP project (Mandat etude parallèle) in Geneva where he was an expert, regarding the future of a zone of individual houses, *quartier du Point du Jour*, in Geneva. The study looked into the densification of the area through participatory approaches, rather than concrete material solutions, working on creating consensus with the inhabitants. The participatory process adopted a mixed method, proposing three alternative/competing projects, based on which discussions took place. The projects served as occasions for inhabitants to express themselves, exemplifying their preferences and values. The main lesson from this experience for Chanard was that there is no final urban image that we should seek or support. "There are some invariants, that we can fix, and within this frame we should respect the freedom and flexibility of different actors. Therefore, through a non-deterministic approach we can progressively move towards a more dense and diverse landscape. The approach must be evolutive and reversible, and envisioned through phases. The urban image of the future is unknown and it is ok to be unknown." In a nutshell, while the low density zones are transforming in their intensity and level of services, they should also benefit from new generations of shared and public transport, which corresponds to the dispersed demands of such territories.

4. The new generation of transport does not simply imply a shift towards electric cars and intelligent roads. Clean and communicating cars won't respond to the urgent need of space. Intelligent roads with cars of 4 to 5 meters-long, the required safety distance

between them, and 1.5 passengers per car in average, will still lead to congested roads. What is urgent is to collectivize the mobility demand and to share the vehicles. This can be facilitated probably by driverless-cars, if they serve as a service on the move. Like older services that used to exist in small, dispersed villages, the bakery used to come with its small van, selling breads from one village to the other, instead of everyone else taking their cars - that they didn't have- to the bakery. Chanard explains that they are working on automation of 'Cristal', because everyone wants it automatized, "but that is not the point. It is the service that matters. It could be driven or be automatized."

Chanard explains that he is a part of a group of experts reflecting on the societal changes that robo-mobility could imply. Assuming that new automated vehicles could engender social changes and behavior transformations comparable to that of smart phone. Launched by the ministry of transport, the program that continues for several years attempts to study and imagine future: Questioning the integration of innovative technologies in the city, services it provides, constraints it imposes, public space it generates and modifications it will make on our way and level of being mobile. This implies a gradual evolution. "We need to begin from the beginning and continue step by step. Such technologies are exciting for the politicians, but they need to be integrated to the urban system. We need multi-disciplinary teams and experts that envision the integration. Unless the project is like Masdar, with PRT (Personal Rapid Transit) in a planned city situated in a desert where you can control everything from scratch. The PRT providers are very strong in what they provide in Masdar and other contexts but I am not sure if Masdar is the experience to be repeated, and this kind of solution remains very marginal, and is by no means a generalizable response to the question of mobility of tomorrow."

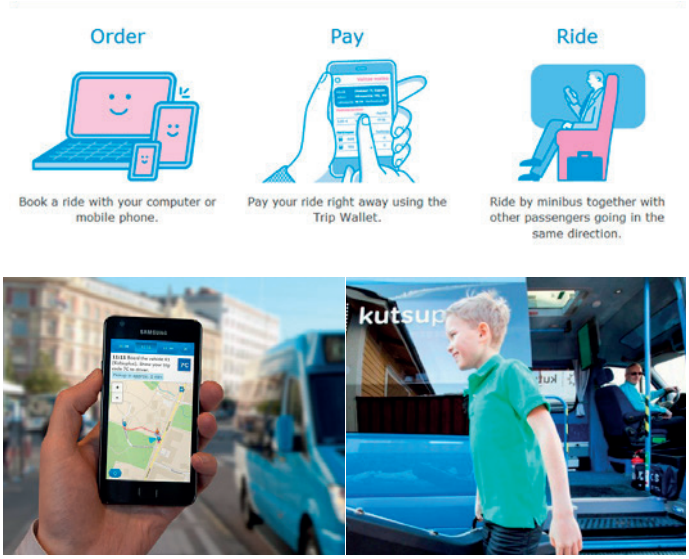
Kutsuplus
Helsinki

Finland's capital, Helsinki had previously announced plans to transform its existing public transport network into a comprehensive, point-to-point "mobility on demand" system by 2025 – one that could essentially render private cars obsolete. The system targeted to compete with the private car ownership not merely on cost, but on convenience and ease of use in the growing Helsinki region.

The transport studies in Helsinki had concluded that the traditional public transport has not been at its best, as the origin and destination points of journeys tend to be scattered over a large area and it is, therefore, rather difficult to provide a good level of service with a traditional fixed route and fixed schedule. Within this background Helsinki Regional Transport Authority initiated its ambitious project called Kutsuplus in 2011, launched with field trials with test passengers in 2012, and public service from 2013.

Kutsuplus ("call plus" in Finnish) was an on demand transport service, consisting of a small group of mini-buses, with an intelligent management system. Passengers enter their route on a mobile interface, and an algorithm calculates which is the nearest mini-bus, and the price of the trip and the estimated travel time. If the passenger accepts, the bus will change its route to pick him up and drive him to the destination. After calling a bus, Kutsuplus passenger had to walk to the closest bus stop to wait for the pick up. The principle being that this possible detour does not cause too much time lost to the users already present in the vehicle. This system was compared to Uber while controlled and subsidized by the municipality, therefore a public and collective Uber.

Kutsuplus came very close to delivering the best of two worlds of public transport and private cars. As passengers could choose the starting and ending points of the trip and whether to share a journey or take a private trip. The cost was higher than normal bus fare and much less than the taxi fare. The price was calculated with the most direct route from the start to the end of the journey, not the actual journey with detours to take or drop other passengers. Ridership grew steadily and in terms of customer satisfaction, according to the surveys, the system was doing very well. The growth rates matched what the researchers had projected with eventually 21,000 registered users.



Order and select trip interfaceKutsuplus.fi

However, despite the enthusiasm of passengers the service was stopped by the end of 2015, deeming its elevated costs for the city had to subsidize almost 80 per cent of the scheme. Therefore the Kutsuplus' ambition to change effectively the mobility patterns not merely for relatively compact central Helsinki, but in the lower-density municipalities of Espoo and Vantaa did not work out. The empty rides of solitary passengers, although very comfortable and efficient for the passenger, it was not economically bearable for the city. The final report blames the limited operating vehicles as the main cause of the high cost per trip, asserting that in order to be profitable the system needed large investments.

Kutsuplus Final Report, Helsinki Regional Transport Authority (HSL), 2016.
The future resident of Helsinki will not own a car, Helsinkitimes.fl, 04 JULY 2014.

	Is a Post-car World possible?	Perceived Hurdles towards PCW
1	Many PCWs exist already, but we are very far from entering a completely new phase.	Contradictory processes, investments in car infrastructures, wrong framings in communication with inhabitants
2	We are going towards sharing and optimizing the use, and therefore reducing largely the number of cars but not a systemic change from car	Deeply embedded system
3	There is no no-car city in the horizon, just a very very very slow reduction in car use	Political and administrative fragmentation in Ruhr, Fragmentation of providers of different systems of transport across the region, Slow pace of decision making, Paradoxes in strategies Car-based mentalities
4	To replace a model with its opposite is not plausible	Thinking of future with mentalities and instruments of past. The challenge to deal with the material and cultural heritage of car
5	It started long time ago and it is being taken finally seriously.	Lack of political power, Wrong framings of the problem
6	A far horizon.	Paradoxical processes in new developments, administrative fragmentation. Restricted scales of intervention.
7	Towards reduction but probably not eradication.	Cultural habits, underestimation of the impact of space and territorial development on health, underestimation of the urgency to act upon it.
8	An inevitable future if we want to combine more intense mobilities with quality of life.	The problem of sectorisation of transport providers rather than working together towards a complete cohesive system. The challenge of integrating new systems, lack of long term visions, and therefore problem of critical mass in the early phases of innovative solutions.

Table 2. Is a Post-car world possible?

	Strategies of transitions from car	Tools
1	**Rebalancing** the modes **Experimentations** **Walkablity** in larger territories Creative ecological and health attitudes in urban project Facilitating alternatives; use, payments, choice, etc.	**Reconquering spaces** of car Low-budget, **ephemeral**, reversible projects Metropolitan scale axes of **walking**. **Imageable** networks of walking Micro-centralities in lower densities Integrated systems beyond individual/collective alternatives
2	**Redistributing** space Redistributing time **Macro+Micro** mobilities New generation of diffused public transport	Superimposition of **soft networks**; physical and immaterial support **Reconquering** mobility axes for pedestrian **Parking** strategies, dynamic pricing, Investing in surface **public transport** and its complementary models, providing diffused point to point access
3	Having projects for changing **mentalities** **Active** modes+public transport Accelerating the project processes Facilitating intermodality	***Verhalten /Verhälnisse*** Bicycle superhighways Each person, one **e-bike** Mobility hubs Working on interfaces of different modes
4	**Reversibility**, assuming the period of transition in urban projects **Pedestrian**: city foundation not an alternative New **time-space** for city	Reversible spaces and functions Re-inventing the sense of ***Tracé*** **Tram**, **parcours magistreaux, bicycle** **Parking** as a lever of action
5	**Decentralization** Reducing the **demand** for mobility Towards shared **public space** Healthy **commutes**	Reinventing the **village** **Co-working** spaces, **community** spaces Avoiding canalization of flow in the street Exploiting the potentials of traditional solutions like bicycle
6	Towards more **equitable** spaces, More space for **public life** Increasing mobility supply Log-term visions Large scale visions	**Walkable peripheries** **Reconverting** car spaces and car axes Eliminating **parking** places New **regulations** for parking strategies More spaces for public transport
7	Providing more **space** for active modes Porous and permeable networks Sharing the space Re-thinking co-habitation of vehicles	Alternative mobility axes, green pathways Softening and eliminating the infrastructural barriers Intervening on physical space
8	Urban **comfort** Quality of **public space** despite **intensification** of mobility Earn **space** on public domain Evolutive and **reversible** approach Long-term visions Proposing real alternative – considering individual needs	**Collectivizing** the use Rethink **parking** spaces **Hybrid** individual/collective vehicles Hybrid public/private Low impact, **small shared vehicles** Intensifying public transport + complementary diffused systems New services of public transport

Table 3. Towards Post-car

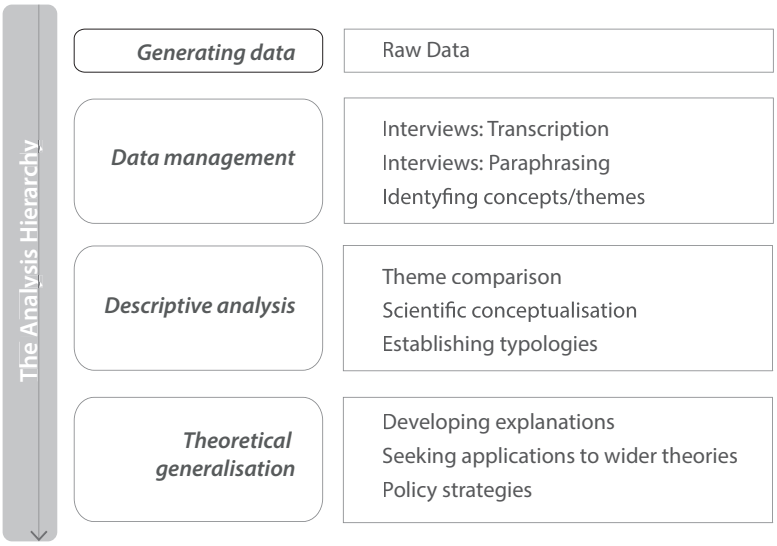


Fig 16. Expert interviews methodology, adapted from Littig, (2013).

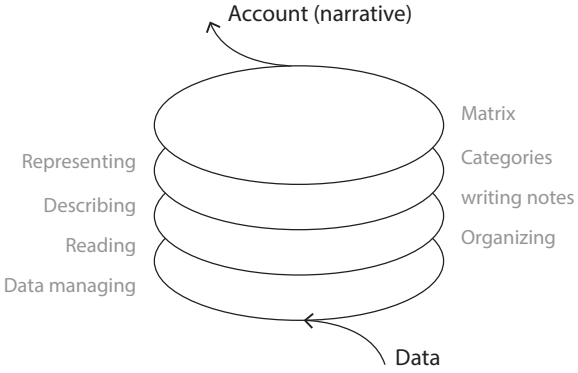


Fig 17. Adapted from Creswell's spiral (2012).

Analysis and Outcomes

The presented summary of interviews should contribute to the research on imaginaries of post-car world, and particularly to the assessment of its presence and strength within the discourses of urban professionals. In this section, I present the analysis of the interviews, going back to our initial research questions and to evaluate to what extent urban experts account for the limited but visible transition from car. What sorts of tactics and strategies support such a transformation? What are the perceived hurdles towards such perspective?

I began with transcribing the audio records, covering the thematically relevant passages, and the general lines of discussion, rather than word by word reflection of the whole recording, which is the typical way of working with biographical interviews (Meuser and Nagel 2009:35). To proceed with the analysis of the transcribed interviews, I have been inspired by and followed two series of guidelines, one explaining how to analyze, specifically, expert interview (Figure 16), and the other more generally addressing interview analysis in qualitative research (Figure 17). I have gone through iterations of reading, which were accompanied by concept extraction for each individual interview, followed by a transversal analysis, that is, comparison of concepts and keywords that while similar in nature might have been expressed by different terminology or phraseology. In the following, I present the result of this analysis, establishing links to the academic discourse and the existing literature. The concluding remarks will provide the basis for the proposals in the next chapter.

- Post-car World?

Transition in mobilities by most of the interviewees is described as a long and a very ***slow process***. Not only by the observation that it has been a long time since the very first critics on the car in 1960s that triggered the change, but also taking into account the perspective of future in terms of prevalence of car, its share in practices, its space in the cities. While in general the interviewees diagnose the slowness as a problem for which they propose accelerators as remedies, Chanard and Imholz take it as a condition for ***evolution***; the right pace is necessary when dealing with city as a historic entity. Reichen makes another observation, underlining that while in 60s and 70s space transformed faster than society, today societal change beats the physical space, as cities, ***inheriting the Modern*** experience, and experiencing ***economical struggles***, transform more cautiously towards their future. It is, therefore, the practices, their plurality, and their many actors that gradually shape the space.

The slow pace of transition was explained by series of reasons. Lack of ***political power*** to

pursue more boldly the objectives of moving away from car was mentioned recurrently. The ***contradiction*** in policies and processes was another one. As Alexandre Schmidt explains, the construction of bicycle superhighway is envisioned together with the extra lane to the highway that is supposed to alleviate the traffic. Another hump on the road, according to the interviewees, is the ***slow decision-makings*** in the democratic processes as well as the territorial and administrative fragmentation, which impedes more effective, larger scale visions and actions. An example of the pertinence of scale of intervention –that requires more unified entities of action– is given by Lecroart as he evaluates the Paris attempts to pedestrianize the banks of Seine, despite the existing critics and discontent, as punctual and ineffective given the hundreds of kilometers of fast roads within Ile-de-France.

Mentalities and ***cultural heritage*** of the past have been evoked several times as obstacles for a smooth transition, while placing hope for change on the younger generations, with a different conception of the world, communications and mobility. However the close connection and the mutual influence of the infrastructures and the formation of habits has also been underlined. Practices unfold in spaces and are encouraged by them while at the same time shape those spaces. Schmidt's ***Verhalten*** and ***Verhälnisse*** proposes an etymological explanation of this interrelation. This is very close to Lévy's (2014) multiple feedback of spatialities and spaces. I will develop further on this mutual inter-relation of practices and their dependence and influence on spaces in cities in the next chapter, discussing the spaces of effort.

- The problem with car: Framing matters

The response to the question of place of car in the city of future relies essentially on how one frames the problem of car today. This includes the controversies regarding the perspective of electric car and its impacts on cities. Electric cars are finally being taken seriously in policies and within car industry with a delay of more than one hundred years from the early twentieth to the attempts in 1960s and onward. The most recent instances have been Volvo announcing its shift from 2019 to produce either a hybrid — combining an electric motor with a small gasoline engine — or a pure electric vehicle (Alix 2017) and France's announcement by the Minister of Ecological and Solidary Transition, Nicolas Hulot, of the country's ban on petrol and diesel vehicles by 2040 (Boudet 2017). Although these are considered as important steps in pursuing the ecological agenda of cities, some of the experts, however, fear a return to car dominance, as the political will to reduce cars in the cities might drop. Sieverts alarms that currently, mistakenly, many discourses for car reduction are supported and formulated by ***air pollution*** and ***energetic*** concerns, obscuring its ***urban*** and ***social*** concerns.

The electrification, however, according to the interviewees not only is unlikely to resolve the problem; it might, moreover, deviate and change the course of discourses that are finally gaining strength in restricting cars. Chanard points out astutely "il faut appeler un chat un chat" the problem of the gridlocks is not the combustion engine of the cars, it is with the number of cars, as it has been since 1960s. Jane Jacobs, despite all her critics on the spaces of the car and the deliberate actions against Moses' plans for car development, writes about city and car as potential allies, if used at right doses. Picturing the mess of pre-car street life in big and intense cities in the horse-and-buggy days, Jacobs describes the London of Ebenezer Howard and highlights how unsurprising was the fact that Howard regarded city streets as unfit for human beings. Jacobs describes the arrival of automotive engines as "an excellent instrument for abetting city intensity", liberating the cities from horses, since "fewer engines than horses can do a given amount of work". But as Jacobs explains "we went awry by replacing, in effect, each horse on the crowded city streets with half a dozen or so mechanized vehicles, instead of using each mechanized vehicle to replace half a dozen or so horses." (Jacobs, 1961: 343). Thus, the pressing question would be how should the passage towards new electric vehicles be strategized? And what are the implications for the urban project?

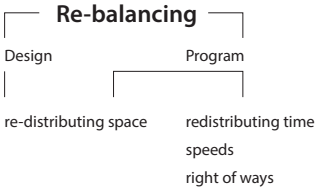
Framing of the problem matters, and so does framing of the solutions, when it comes to collective decision-makings, prompting practices, and creating new trends through new imaginaries. Alfred Peter brings this up by taking the example of the referendum in Strasbourg, explaining that according to him "wrong" question was asked during the referendum. After the pioneering work of Tversky and Kahneman (1981), we know that people respond to a particular question in different ways depending on how it is asked. The framing, therefore, is significant concern in empirical sociological research as well as within urban projects and their communication programs.

- Re-balancing (changer les rapports de force)
The other theme that stands out within the discourses of nearly all interviewees is the necessity to rebalance the street, with the conviction that the cities are too far colonized by car even after many years of shift strategies. This is the main common message in the discourses and a fundamental objective within the cited projects.

However, the proposed methods to achieve this goal vary from physical interventions for reconquering space to new programs for changing functions, right of ways, and speeds. A commonly cited lever of action for ***redistributing space*** is parking. ***Eliminating parking*** places appears as a promising strategy with the double effect of constraining car use, meanwhile liberating space for other modes and uses. This process has already

been at work since the recovery of major plazas and public squares in European cities that by 50s were officially used as parking places. Nevertheless, the proposal today to eliminate parking is taking it to another level, by eradicating the on-street parkings, proposing programs for parking complexes as well as acting upon laws and regulations regarding parking spaces.

Redistrubtion of time has been discussed since early literature on sustainable transport and attempts for modal shift strategies. Whitelegg (1997) takes the example of distribution of time at crossroads where for pedestrians to reach the other side within the given time is only possible if they start to run immediately. He describes the traffic engineering and infrastructure planning as "the theft of time in some shape or form and its redistribution to wealthier groups" (Whitelegg 1997:133). In the interviews, the redistribution of time is, on the one hand, imagined by advantaging pedestrians in the traffic light phasing and therefore reducing pedestrian's time behind the traffic lights, comparable to the strategies of prioritizing bicycles by setting the green waves on bicycle's average speed and, on the other hand, by proposing generalized speed limits for cars rather than limiting them to isolated axes or neighborhoods. "Speed distributions", explains Peters, "are in fact distribution of time, space, and risk among various traffic participants" (Peters 2006: 137). The experience of Modern city with sectorization of traffic and separation of functions generates a strong conviction for the necessity of shared platforms, and the continuity of the walking surface as a basis on which the relations with and between other modes should be built. In this regard, even the cohabitation of bicycles with pedestrian has been raised by some of the experts, opening the question of speeds of co-habitation, conflict of soft modes and the interaction between different vehicular units.

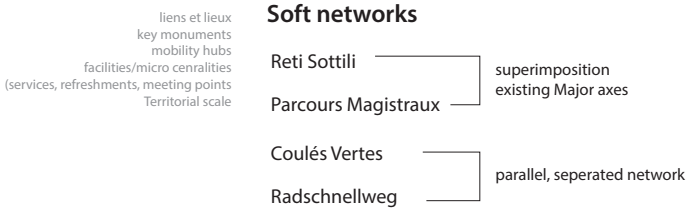


- Soft networks

Using different expressions (in different languages), speaking of different geographic contexts, experts describe the (re)emergence of a generation of urban project that is likely to shape fundamentally the movements in cities as well as the configuration of the public space. *Reti sottili (fine networks), Parcours magistraux (major pathways), Coulées vertes (green flows/ways), Radscnellweg (cycle-superhighway)* vary in their strategies of implementation, from immaterial arrangements of the flows, speeds and priorities, to design interventions and space remodelling. They provide alternative spaces of flow, superimposed on the existing street network or recuperating the space of a dismissed

railway, brownfields or greenfields around and inside the cities. The characteristic that makes them bear the possibility of a considerable change compared to the existing promenades is their continuity and connectivity, and most importantly their scale of intervention, the rhizomatic space that superimposes the city. Linking key places, intersecting with different levels of ***mobility hubs***, and containing service stations, they extend beyond the city centers.

Soft infrastructures, in their variations, as described by interviewees, target differently the flows and the final objectives formulated by each expert vary slightly from one to the other. The *Radscnellweg,* spanning over 100km, is a bicycle highway that includes all along a six-meter walking path and it is expected to attract a lot of e-bikers commuting between the 10 major cities that it connects. The ambition of *Parcours magistraux* is to make the pedestrian the foundation of the city rather than developing the path as an alternative to car. It takes advantage of the density and diversity of the center to establish a path that continues further and generates urbanity by intensifying the use and by introducing activities along the path, attempting to overcome the center-periphery divide and the paradox of public space in lower densities. It introduces walking street that is not the typical ones in historic centers, although its success and its specificities remain an open question and an object of constant experimentation and research. *Coulées vertes* focus more specifically on the natural capital inside and outside cities. Capitalizing on the existing greens and perspective of its expansion along these networks is an evident aspect for most experts. Taking their references from historical examples of promenades of Paris or other open spaces that provides axes of mobility besides being buffer spaces in the cities. Clustering these seemingly different ideas could emerge a collective discourse.



- Diffused mobility and territories of dispersion

Territories of dispersion are characterized by discontinuity of services and extended distances between destinations. Such diffusion in the territory requires inevitably diffused mobility, which explains the adaptability of such urbanity to and its dependence on the automobile. In a general perspective, provision of strong alternatives to car in such territories is considered by experts as a pressing question in terms of just territories and equalities, reformulating the previous conception of freedom associated with car to "freedom from car" as a privilege and as a right.

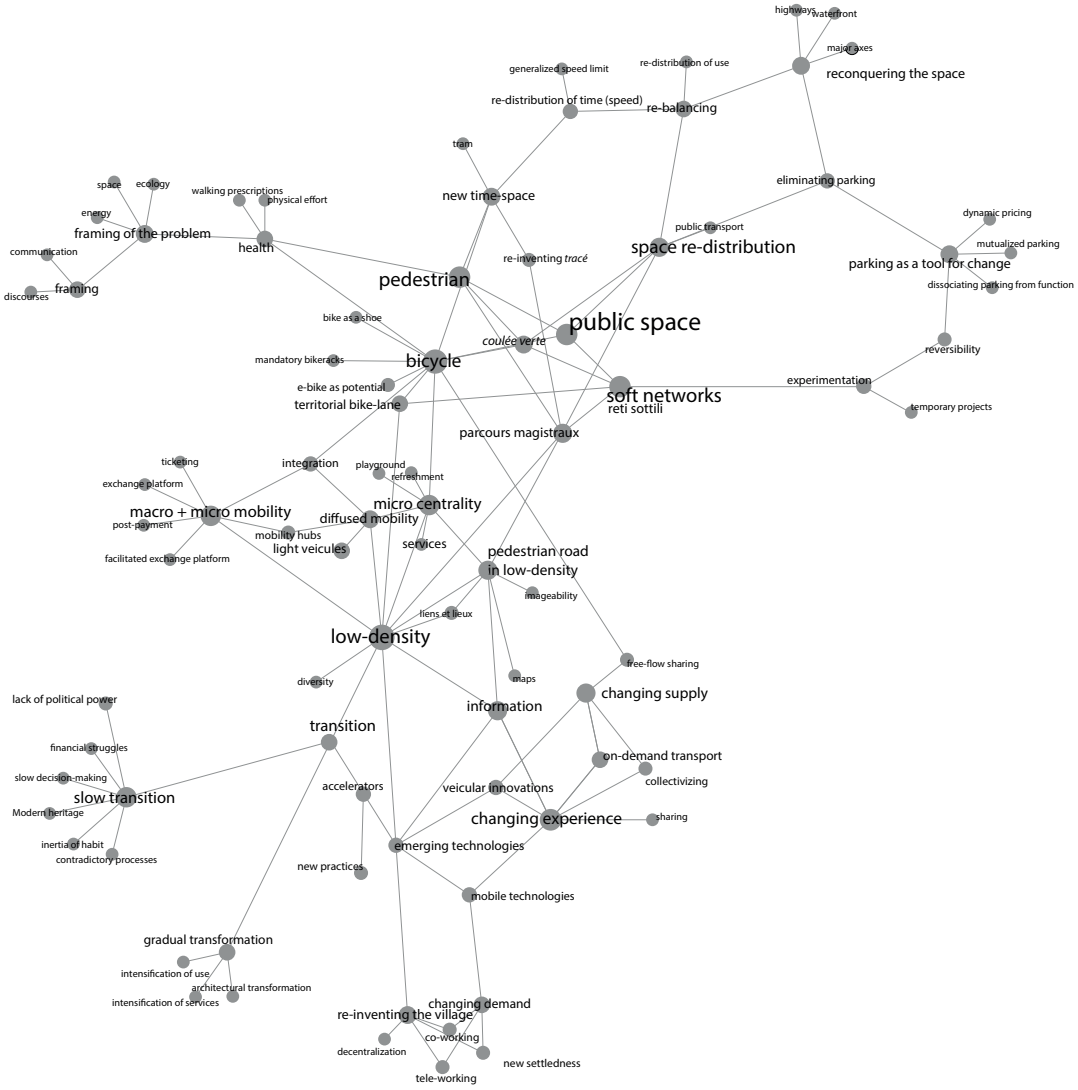


Fig 18. Keywords and their interconnections within the discourses of the experts.

Within this background some of the experts see the technological advances as a potential perspective that can provide a more ecologically sustainable system of diffused mobility as an alternative to the private car, that is door-to-door services or systems of covering last kilometers. Such perspective unfolds in various levels, from already existing ***mobile applications*** that encourage and facilitate ride-sharing to ***vehicular innovations*** and emergence of new services providing ***on-demand transport*** –whether individual or collective, autonomous or not– on an affordable and reliable daily basis.

Apart from technological perspectives, there exist future visions that seek and bet on sustainability of such urbanity through renewing territorial organization, capitalizing on existing and emerging practices that aspire change. This approach takes the potentials for active mobility and seeks to emancipate ***micro mobility*** combining it with armatures of public transport. The support for such diffused mobility should be disseminated in the territory in the form of service stations, small ***mobility hubs***, recharging points for electric devices along the equipped diffused networks. It takes seriously the 'project' of walkablity outside the compact city and therefore redefines the street in such territories.

Another level of reflection focuses on the patterns of inhabiting, community building and ***new settledness*** in order to act upon the demand for mobility. In the perspective of an organized decentralization, new proximities emerge in the form of community centers, ***co-working*** places, cooperatives mobile goods and services that reduce the daily mobility. Moreover, architectural innovations and new typologies of individual housing could contribute to new urban forms, more diverse and more intense. Moreover, sectorial policies and territorial ***fragmentation*** was underlined by the experts as impediments to the efficiency and the right scale of the urban interventions and projects. Although small ***scale*** interventions, local tactics, and neighborhood transformations have proved to be effective in triggering the beginning of a process of change, as "short-term actions could make long-term change" (Lydon and Garcia 2015), but the solution to some local problems are only to be sought in a larger scale.

- Beyond Oppositions

Finally, within the discourses of the experts the emphasis on sharing considers blurring of the conventional dualities of collective-individual, public-private in transport. This entails proposal for new hybrids in public transport that provides also individual and personalized services, with the conviction that most trips should be collectivized but inevitably there are some individual needs. Therefore the private-individual vehicle versus collective-public does not constitute a unique binary within the

discourses. Moreover, visions for shared spaces integrate walking in all levels of urban mobility and rather than envisioning enclosed separated spaces for the pedestrian. This implies new measures and new qualities, rethinking the time-space of the city rather than dissecting it into slow zones and fast corridors.

In the next section, I present the second encounter which is with inhabitants and consists of the discussions around our developed scenarios for Arc Lemanic. Further, I propose concluding remarks of this chapter in which I will come back to the outcomes of the interviews.

4.2. Futures: Inhabited Territories

"There is no thought without u-topia, without an exploration of the possible, of the elsewhere. There is no thought without reference to practice –the practice of inhabiting and use."
Lefebvre (2003: 182)

"That ordinary individuals have great power to shape the urban space and this power comes to them first of all from the idea they have of the desirable city" (Lévy and Ourednik 2011). Following this line, inquiry into possible urban futures can be informed by an inquiry into the desires of its individuals. Although, when it comes to future, this ideal is often constrained by limitations of today. Inquiry into inhabitants' expectations in terms of mobility and lifestyles is marked by such constraints. By the means of a pedagogical tool, a teaching unit, we have experimented the potentials of scenarios – narratives recounting different futures of the territory– as a platform for exchange and dialogue with inhabitants, proposing hypothetical futures, activating shared imaginations, in order to seize and to discuss, in a novel way, their future expectations.

The teaching unit, proposed to the master students in architecture during two semesters, explored a radical variant of Post-car world, that is the hypothesis of urbanity completely without private cars, both in cities and in the extended territories between them. The exercise was developed on the territory of the *Arc Lemanique* in Switzerland. The results of two semesters, scenarios narrating new ways of inhabiting the territory and re-using the landscape after the car, were presented to a group of inhabitants in the form of a focus group coordinated by sub-project A, Monique Ruzicka and Jade Rudler. The focus group was designed as an interdisciplinary tool between subproject C (developing the scenarios and reflecting upon space) and subproject A (interviewing the inhabitants and scrutinizing practices and "expectations"). The goal was to establish an assessment of the relation between inhabitants and the perspective of a post-car urbanism. This encounter was the occasion to discuss with the inhabitants, from different geographies and different life styles within the same territory, about their ideas, ideals, projections of the future, questions and concerns regarding their spaces of everyday life and mobility.

	Human Mobility	Human Mobility & Freight
High Density Areas	V1	V2
All Areas	V3	V4

Fig 19. Four variants of post-car world.

In this section after briefly introducing the teaching unit and its pedagogical objectives, as well as the context of the study, the territory and its main challenges facing the future, I will present the scenarios, which served as the basis for the exchange with the inhabitants. Further, I will go through the process of the focus group, presenting the profile of the participants, providing an overview of the session. Finally I will provide an analytical reading, drawing inferences on inhabitants' questions, comments, doubts, and hesitations. I attempt to extract generalizations and common themes and concerns, while taking into account the inhabitants' current mobility profiles.

Scenarios

Scenario building, as a distinctive method for making futures, is employed by many of the world's leading companies, as well as, cities, governments, institutions, and scientific scholars to link the present to the future. Scenario involves depiction of a future image, with detailed economical or societal characterizations in the light of the known facts and trends. Compared to the forecasts and single-valued predictions, dealing with the inherent uncertainty of the long-term future, scenarios provide a range of possible futures. While it is often referred to as a method to address the future and discuss it through a series of hypotheses, it can also function as a pragmatic methodology for identification of future orientations and policies. That is through "backcasting conducted within scenario workshops to determine the conditions and events that need to occur so that the scenario in question will be realized" (Urry 2016:97).

The question of mobility, specifically car mobility and its future in relation to energy resources, lifestyles, and territorial organizations has already motivated many scenario buildings in various domains. In a prospective approach, for example Kaufmann and Ravalet (2017) proposed three scenarios for future of mobility in France, in which rather than an extrapolation of the established patterns of the long-term past in order to depict the long-term future, they set out a projection of the existing weak signals and possible trends, while imagining the society that will accompany such trends. Consequently, with "scientific use of imagination" (Ginzburg 1986 cited in Viganò 2016:202), they proposed three distinct mobile worlds.

The first scenario, *widespread high mobility*, hypothesizes that the increase in the long-distance commutes continues and makes France a metropolis whose cities are the neighborhoods. In this first scenario, people move on a daily basis to work and leisure, throughout the country, and co-presence remains the foundation of social relations. The second scenario, *the age of remote communication and mobile goods*, assumes that current trends towards increased mobility are only a transitional phase before

telecommunication massively substitutes the mobility. It extends the observations of the disenchantment of the automobile especially among young people, and relies on literature on the implications of the development of domestic 3D printers. The third scenario, *the quality of local living*, starts from the idea that proximity will become highly valued, as well as slowness. Compared to the current trends, it constitutes a double break in relation to the rise of mobilities and in relation to the rise of telecommunications. This scenario corresponds to the *Local Life* scenario of John Urry in *Post-petroleum* (Urry 2014), where he specifically addresses the question of energy in the perspective of rarefaction of oil.

Scenario building is also gaining its place in projects for cities and the territories. The construction of scenario is when the project presents itself as a coherent sequence of hypotheses, investigating the possible lines of evolution of given phenomena, following diverging trajectories and developing contrasting images (Viganò 2016:201–214). A relevant example is the mobility scenarios developed for the "diffuse city" of the Veneto Region in Italy (Viganò, Fabian, and Secchi 2016). Dealing with the greatest challenge of this kind of territory, which is a project for sustainable mobility, they propose two main scenarios: *No Car* and *CO2 Neutral*. The first scenario envisions a complete phasing out of the private car, replacing it with an efficient public transport system, and evaluates the spatial consequences of this hypothesis. The second scenario examines the possibility that the road network becomes a tool of environmental restoration: that is to compensate for its own CO2 emissions through a network of forest and facilities for renewable energy production.

The high cost of car mobility and its high rate of use in the territory (78% of total commutes) as well as the evident negative externalities, such as air pollution facilitate the justification of the no-car scenario. Without cars, the "sponge" formed by secondary roads could accommodate a tramway network for the transport of persons and goods. The minor sponge[9], in which unpaved roads still play an important part, could be turned into an extended network of bicycle paths but also open to microbuses. Moreover, in making an analysis of the territory and dividing it into different accessibility

[9] Isotropy versus hierarchy in the territories of dispersion, and in this project, is depicted with the images of *pipes* versus *sponges*. Highways, expressways, and ringroads are pipes that are strategically indifferent to the context they cross. While the model of sponge proposes an analogy with the motion of a fluid within a porous fabric, hence refers to the road network characterized by permeability and porosity that unlike large mobility infrastructures, establish a programmatic relationship of continous exchange with its context. However, they underline that pipes and sponges should not be constructed as opposing options that impose a choice for the development of the territory, rather their relationship and compatiblity should be studied as drives towards hierarchization, and *the project of isotropy* (Fabian 2016).

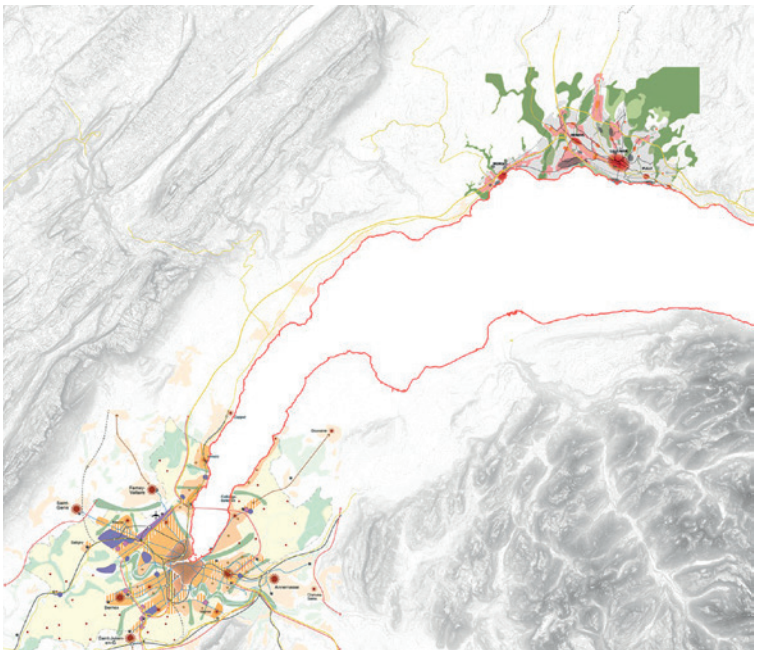


Fig 20. The difference between the main cities and their respective agglomeration projects, Geneva 2030 and PALM (Projet d'agglomération Lausanne-Morges) and what extends in between the two. ©Teaching Unit, Territoire et Paysage, EPFL, 2014-2016.

zones, great potentials of the railway was revealed, which could be incentivized and developed to work in combination with active modes (Vigano, Fabian, and Secchi 2016). The scenarios developed during the teaching unit benefited greatly from a constant dialogue with these precedents.

ON THE ROAD: Towards a post-car Leman City

The teaching unit, *Territoire et Paysage*, introduces students to a large scale project and its requirements, that is to understand a context, to be able to formulate hypotheses in continuity with the territory's potentials and to determine spatial principles, develop concepts and communicate and represent them efficiently. Two semesters between 2014-2016 have been the occasions to address the questions related to the post-car world research, to explore the future of urban space with the assumption that the trends of reduction of use and enthusiasm for car could accelerate, culminating in the total elimination of car. This radical hypothesis prompts a reversion of the perspective upon urban space. It calls for urban re-configurations and identification of adaptive re-use potentials.

What would happen to the vast amount of territories currently dedicated to cars? What potential reuses could be imagined of the square meters of roads and cubic meters of buildings that would otherwise be under-utilized, if not merely abandoned? What future can be imagined for the forms of territory that have been shaped through the century of car? What will be the new forms and dimensions of public space? These questions framed the activity of course, taking the territory of *Arc Lemanique,* between two cities of Lausanne and Geneva as a case study. *Arc Lemanique* is an area whose economic vitality depends on its attractiveness in terms of quality of life and job opportunities. If car traffic was a decisive factor for its development, it is now an obstacle, given the counterproductive effects and daily traffic jams.

In this region while a tendency to reduce car mobility in two cities of Lausanne and Geneva already exists, in the in-between spaces the issue remains unaddressed. In two cities, as shown by a national mobility survey[10], families are increasingly abandoning cars, with an 11% increase of car-less households during the last decade; four families out of ten now move around without a private car. However, in the extended territories between the two cities, stretching to the Jura mountains with mixed urban and agricultural landscapes, individual houses, farms and small villages, this number drops to less than one household out of ten (7% in Vaud and 9% in Geneva in typologies classified as peri-

[10] Micro-recensement Mobilité et Transports; La mobilité des Genevois et des Vaudois, EPFL (Ecole Polytechnique fédérale de Lausanne) Transportation, Center and Observatoire Universitaire de la Mobilité UNIGE (2012).

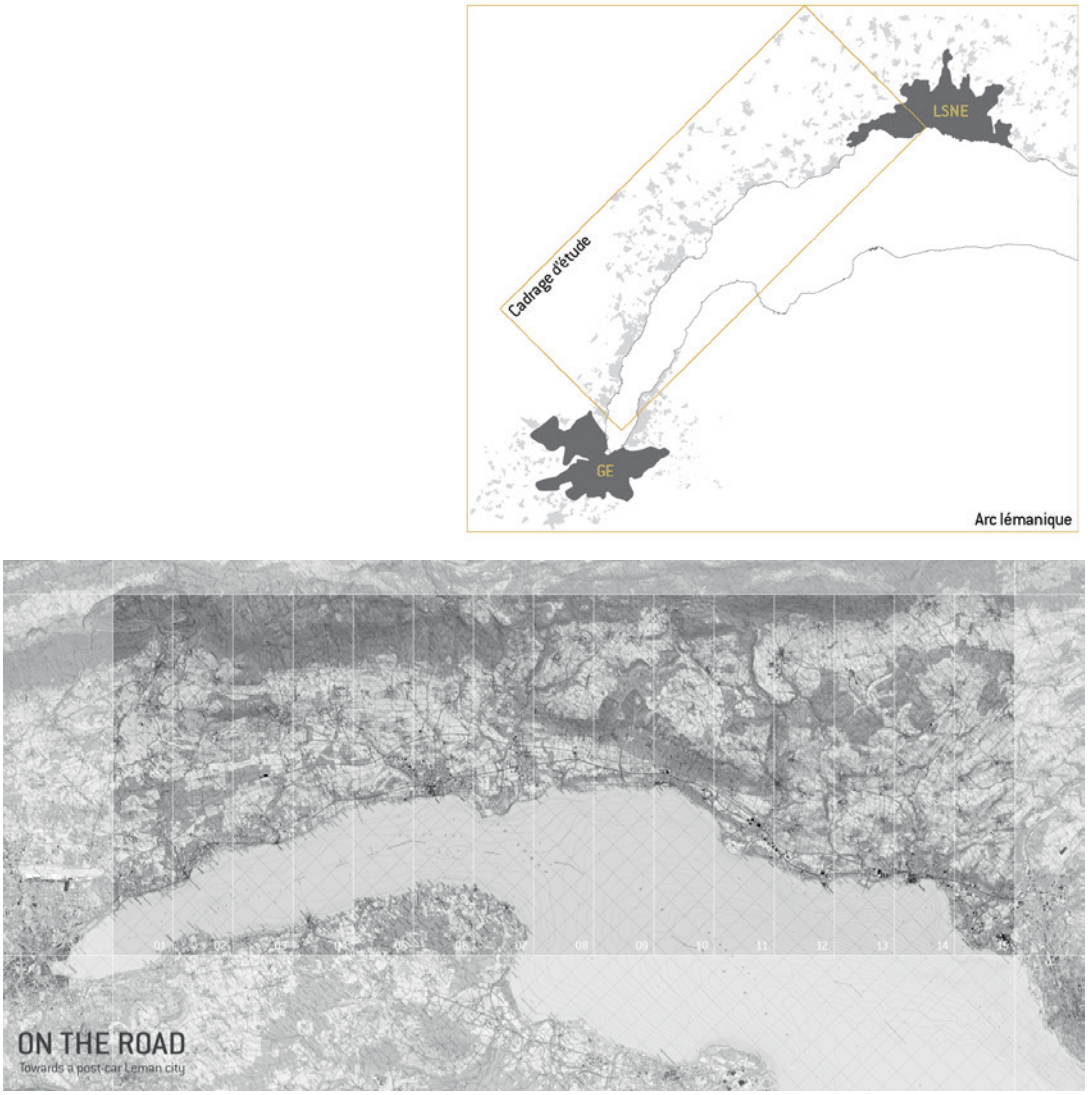


Fig 21. The study frame, Arc Lemanique, between Lausanne and Geneva.
©Teaching Unit, Territoire et Paysage, EPFL, 2014-2016.

urban), while the other families have at least one and often more than one car. This divide is about to grow in the perspective of the two agglomeration projects for Geneva and Lausanne - "Geneva 2030" and "PALM", as both projects, established in two different cantons exclude a 45 km-long strip that separates one from the other. In this regard and consistent with the general policies of the Swiss territory, the two cities are envisioning their densification by means of an endowment of transport infrastructure that, in the long term, should drastically reduce the use of private car within each conurbation. But what about the 45 kilometers in between? What visions and perspectives for its future, especially when it comes to mobility and automobile dependence.

In previous chapters, I have underlined the necessity and emergency of reflections on territories of dispersion in terms of car dependence and in this regard *Arc Lemanique*, despite its relatively extensive network of public transport, is not an exception. The territory is facing another challenge that is the expected demographic growth at the metropolitan scale. With about 900,000 inhabitants (FSO 2010)[11] the *Metropole Lemanique* has experienced accelerated growth of population since 1950s, in both agglomerations and the territory between them, from 300,000 inhabitants to more than 600,000 in the former and from 100,000 to more than 200,000 in the latter. While before 1950s–before the democratization and massive use of private car–the in-between territory's demographic growth was very slow compared to the two cities.

Within such backdrop, the teaching unit proposed a dynamic laboratory of future thinking, benefiting from and exchanging with the other researchers of post-car world team. The identification of the potential for territorial projections demands the knowledge coming from the inhabitants. Such perspective was provided by the subproject A, Alexandre Rigal and Jade Rudler, who presented and discussed the findings of their interviews with the inhabitants of the region. The work of the first year consisted of punctual projects by small groups of students on the portions of the territory, dividing it to the stripes of 3-kilometer wide, extending from the lake to the Jura Mountains, therefore maintaining the typical topographic section for all the projects. The results provided a series of project themes for the reuse of the territory in different scales, architectural elements, as well as landscape infrastructures.

Further, a synthesis and an extension of the projects through their juxtaposition allowed the identification of three general possible concepts of the territorial organization. The three that evoke some twentieth century models of the theory of urbanism that address the question of city form and its relation to the transport systems, and in particular public transport. The three models, *linear city, cellular city, dense city,* ser-

[11] Office fédéral de la statistique : https://www.bfs.admin.ch/bfs/fr/home.html

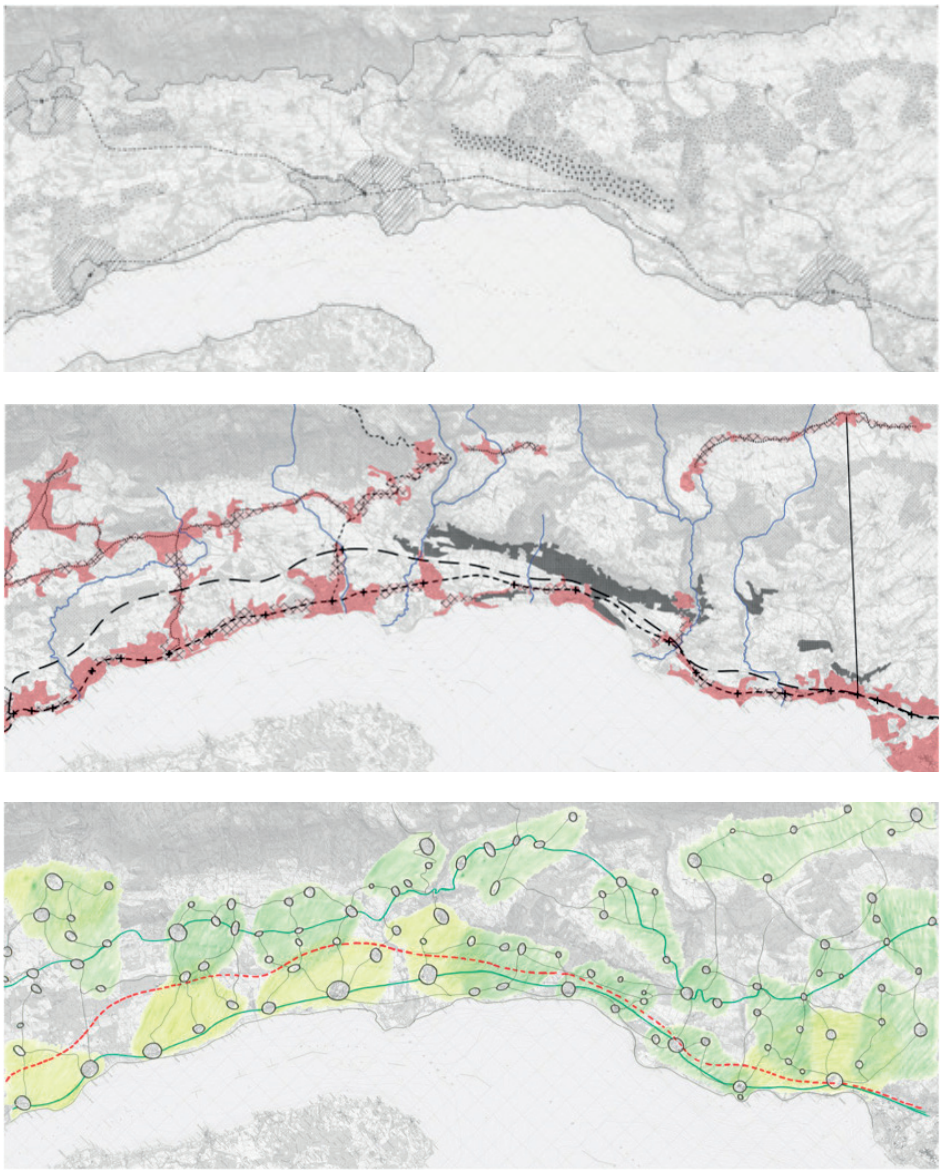
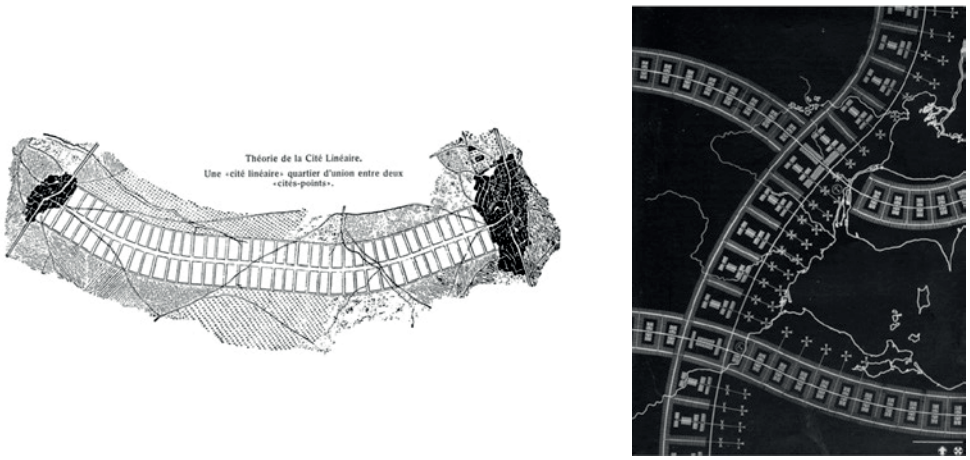


Fig 22. Identification of three general concepts of the territorial organization: Dense city, Linear City, Cellular city. ©Elaboration by TU students 2014-2015.

ved as the departure point in the following year based on which five different scenarios were developed.

Dense City:
1. Conyland (Coppet-Nyon-Gland) If the dispersion was a consequence of the advent of car, post-car world is likely to emerge from concentration around the dense urban poles. This is the main premise of Conyland scenario; accentuating the hierarchies, emphasizing the city-countryside divide, and limiting the boundaries of city growth. The abrupt edges separate the city from agricultural landscape and densified forests. The proposed urban poles remain within the extended limits of walking distance (3kmx3km, maximum half an hour walk). They are served with variety of public transport means, a central tram spine, linear connections of moving walkways, and on demand small vehicles. Freight and agricultural goods are transported through the region using the structure of the former highway (see p. 198-199)

Linear City:
Future city that extends along the spine of public transport, as the main element of territorial organization, was imagined by Soria y Mata (1882) and inspired many urban visions, including Hilberseimer's linear mixity. In the case of *Arc Lemanique,* lake as an important element marking the territory and providing an edge and a powerful linearity provides the grounds for a linear approach. Capitalizing on the already existing infrastructures, highway and railway, different possible post-car worlds are imagined.



a. b.

Fig 23. a) Soria Y Matà (1882) Linear City, b) L. Hilberseimer, Diagram for Detroit area replanning.

2. Sequences Lémaniques displaces the activities around the region and concentrates them along one central spine, the former highway. Recycling the highway as a predominantly private mobility infrastructure, turning it into a multi-functional platform that becomes a continuous *central business district*, punctuated by markets, venues, sport centers, and transport hubs. It becomes the social spine of the territory and offers different possibilities. The green vein -former highway- is accessible from residential settlements by perpendicular, efficient lines of public transport, be it tram, funicular, cable car, moving walkway depending on the distance and the topography (see p. 200-201).

3. Les arches proposes a vision close to the original idea of linear city of development along the railway, but provides a secondary level of transport network with lower density urbanization along it. In this case two linear cities are imagined in two directions, one that extends along the lake, that is taking the existing infrastructure and the other one capitalizes on previously proposed or deactivated lines extending along the Jura side, therefore the two linearities propose two different level of densification around the transport infrastructure (see p. 202-203).

Cellular City:
The permanence and persistence of villages as nodes with a walking distance of 2-3 km between them inspires another vision for a car-less future, as a set of non hierarchical, equivalent cells arranged horizontally. This was inspired by Gloeden's vision of "*Grossstädte"* proposing a city of millions of inhabitants, a voluntary association of cells with no dominant center (Vigano 2013). Gloeden's scheme was already a no-car scenario with small walking distance nucleus and a dense railway and tram network the connections between the cells. Such territorial concept generated two different scenarios:

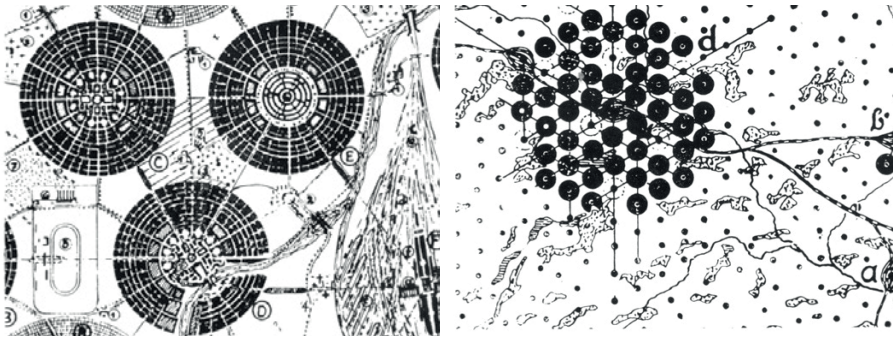


Fig 24. Cellular metropolis diagram, Gloeden, Inflation der Grossstädte (1923).

4. Connections Métropolitaines pictures a metropolis dispersed over the 45km between Lausanne and Geneva, organized around the nucleus of villages that are turned into lively and active neighborhoods. It is a highly connected vision of the territory with a dense and efficient network of tram-train that connects the concentration nodes. The villages are cautiously densified and host variety of cultural, educational and economical activities. Tram-train and bicycle are the mains means of transport, and the inhabitants are highly mobile (see p. 204-205).

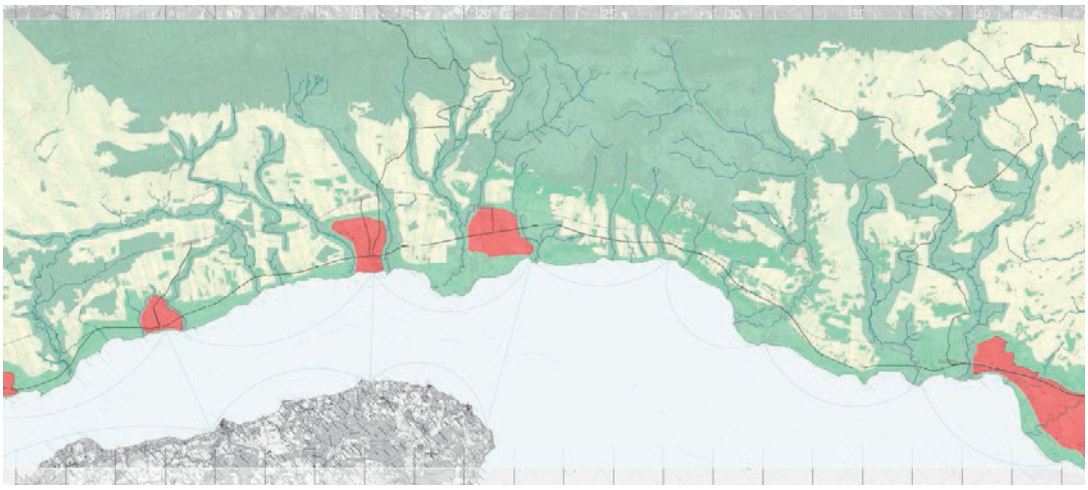
5. Société Horizontal (or Quality of Local Living) proposes radical changes and discontinuity with the current lifestyles, and a significant reduction in daily mobility in terms of distances. While envisioning an important residential mobility, daily commutes are reduced and the everyday life is organized around the limited catchment area of soft and active mobility. Daily commutes are essentially dependent on corporeal energy and small electronic devices to access the shared amenities and public facilities that are situated in the in-between of groups of three to four residential nodes (villages). Goods and services, in contrast are mobile, and telecommunication gains considerable strength. Public transport in the form of on-demand service is available for occasional far distance trips (see p. 206-207).

1. Conyland
Dense City

M. Chappuis vit à Coppet, commune qui fait partie de la métropole que l'on nomme Conyland. Chaque matin, en quittant son appartement-jardin flambant neuf, il passe devant la maison qui était autrefois celle de sa grand-mère. Elle accueille depuis une quinzaine d'années une épicerie fine qui fait le bonheur du quartier. Après dix minutes de marche, il rejoint enfin la gare. Il n'emprunte jamais le même chemin. Le trajet en train pour rejoindre Nyon ne lui prend jamais plus que le temps de finir son jus de fruits. Le paysage que traverse le Connyland Express est très varié : il passe à travers champs, forêts et jardins sans oublier le lac qui l'accompagne tout au long du parcourt. Autant dire qu'on ne s'ennuie jamais ! Arrivé à la gare de Nyon, il prend le tram qui traverse la ville de haut en bas. Il y rencontre son vieil ami Boris. Ce dernier vit au bord du lac à deux pas du bourg historique et travaille aux champs, tout au nord. Il peut charger directement les récoltes sur les trains qui occupent à ce jour le vieux tracé de l'autoroute. Trois arrêts après leur rencontre, c'est déjà le moment de se séparer, trop court pense Chappuis. Il emprunte la longue rue piétonne plutôt que les tapis roulants qui mènent les habitants sur les flancs est-ouest de la ville. Aujourd'hui il fait beau, alors pourquoi ne pas prendre le temps ? Il arrive enfin à son bureau qui longe la dernière rue à l'est. De sa fenêtre, au 7ème et dernier étage, il y a une vue imprenable sur le grand parc arboré et la rivière qui marque les limites de la ville. Plus loin, les jours de temps clair, on peut percevoir la toiture du château de Prangins perdu dans la verdure. On raconte qu'autrefois celui-ci était entouré de villas et de petites maisons pavillonnaires auxquelles on accédait à l'aide d'automobiles. Elles avaient été détruites depuis le la Lex Weber 36 qui interdisait toute construction hors des limites à bâtir. Celle-ci avait pour but premier de redonner place à la nature et de densifier les villes pour pouvoir concilier l'environnement de l'homme avec l'augmentation démographique du siècle dernier.

Abrupt edges constitute the dense city, separating it from the adjacent agricultural lands and reinforced forests.

Nyon densification



Dense urban poles

Transport network, highly connected urban poles

Transformation of Nyon

2. Sequences Lémaniques

Linear City

Vous l'aurez compris, notre intervention pour se diriger vers un monde sans voiture s'attache d'abord à la figure majeure de linéarité de l'arc lémanique. L'autoroute. Nous imaginons celle ci, qui était jusque là une fracture visuelle dans le territoire, comme un lien fort et le point de rencontre entre deux modes de vie différents et accentués par notre intervention (Jura/Lac). Pour cela nous préférerons la définir comme une **Avenue territoriale**.

D'autre part, nous conservons les qualités de vitesse et d'efficacité qu'offrait l'autoroute en remplaçant la voiture par une multiplicité de réseau de train (ungrande vitesse, un desservant localement et des réseaux de métro intermédiaires). Ces réseaux profitant aussi bien aux personnes qu'au transport de marchandise. Nous percevons cette Avenue, une fois émancipée des inconvénients de la voiture, comme un espace attractif et moteur de nouvelles activités. Des activités en relation avec son environnement direct et lointain, ce réseau principal serait soutenu par des réseaux de circulations secondaires (télécabines, lignes de train existantes, réseau de bus..) permettant de relier des villages, des points d'intérêts ou des zones d'activités agricoles et viticoles situés autour de cette avenue.

Ce qui était autoroute devient donc un espace bâti, selon une hiérarchie semblable à une sequence qui se répéterait, alternant les zones propres aux activités urbaines (zone de bureau, place de rencontre, restaurant/ café, magasin..), aux activités industrielles et agricoles, et enfin des zones de détentes plus axées sur le paysage et s'ouvrant plus profondément sur le territoire. Il existe déjà une multitude de bâtiment à proximité de l'autoroute, la plupart trouvait leur utilité/efficacité dans cette proximité, ils seront conservés et reliés à notre système. Certaines infrastructures, qui étaient entièrement dédiées à la voiture, comme les aires d'autoroutes et station de service feront l'objet d'une reconversion programmatique, pour trouver leur juste place dans l'établissement de ces nouvelles séquences.

Signy-avenex

Metro, Tram, Train

Hub Chavannes de Bogis, Train, Cablecar

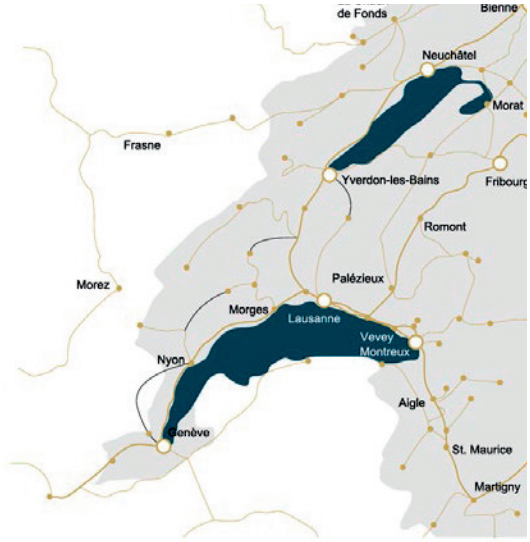
Agriculture, La Côte

Transport hub, re-use and integration of the highway structure into the territory

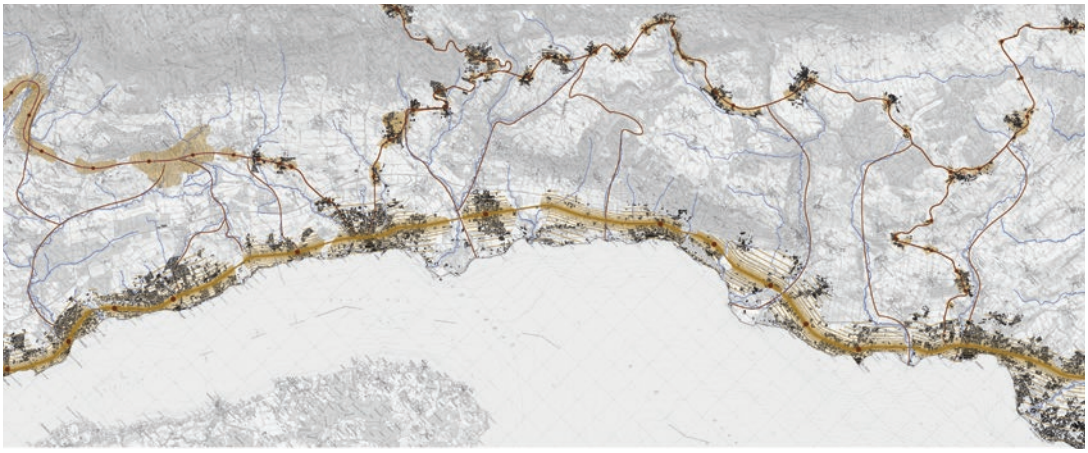
©Elaboration of the schemes, TU students 2015-2016

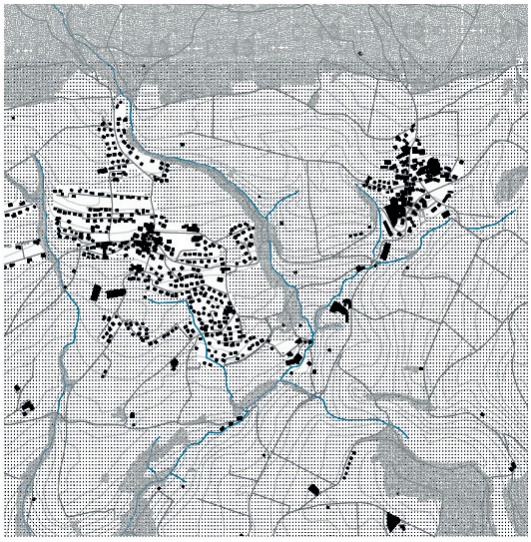
3. Arches Lemaniques
Linear City

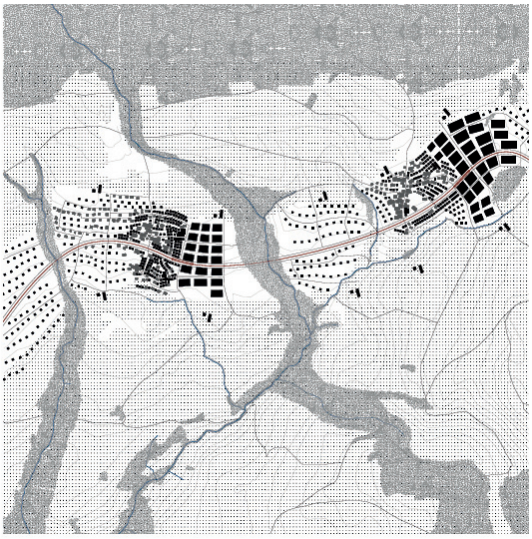
Bonjour, je m'appelle Ludivine, j'habite à Versoix, avant la transformation de la ville on se sentait coupé de Genève et de Nyon. Mon travail dans les assurances me faisait faire beaucoup de déplacement en voitures. Maintenant que les transports sont facilités, je ne suis plus bloquée dans les bouchons. Autre avantage, tout est facilement accessible et animé. Au coeur, proche du tram et du train, on trouve beaucoup d'activités très diverses. Les nombreux bureaux, bars et restaurants qui se dispersent le long des chemins de fer nous suppriment l'impression de ville-dortoir qui existait autrefois sur l'arc lémanique. Bien sûr on trouve toujours des villas et maisons mitoyennes, mais elles sont plus éloignées des transports et profitent ainsi d'une agréable tranquillité tout en étant au maximum à 500 mètres des zones actives, pas besoin de prendre la voiture pour sortir ! Bonjour, je m'appelle Marcel et je se suis agriculteur. J'habite à Bassin, depuis la nouvelle ligne de train, je me déplace plus facilement pour aller voir des amis ou des spectacles dans des villages plus grands. J'apprécie surtout la succession de paysages depuis le train : vieux village, villa, champ et forêt s'alternent. Autre avantage, je n'ai plus besoin de faire de grandes distances pour livrer ma production, que je livre à la zone industrielle, raccordée au village et à la nouvelle gare. Les habitants sont ravis de profiter au maximum de nourriture de la région. Bonjour, je m'appelle Jean-Marc, j'habite aussi Bassin. Je suis banquier et je travaille à Genève. Je dois avouer que dans ma jeunesse, il m'était difficile d'imaginer perdre ma voiture. Mais l'arche lémanique me permet quand même d'avoir ma villa avec une belle vue sur les Alpes tout en rendant confortable le trajet jusqu'à Genève. En hiver, je prends le train, le trajet n'est même pas plus long qu'en voiture à l'époque (faut-dire que sans les bouchons c'est bien plus rapide), alors qu'en été je profite du VTT pour descendre au bord du lac en utilisant les pistes cyclables le long des rivières comme d'un raccourci et promenade matinale avec un café une fois arrivées au croisement avec les chemins de fer de la ville Gland.



Existing and reinforced railway network







Transformation of Bassin

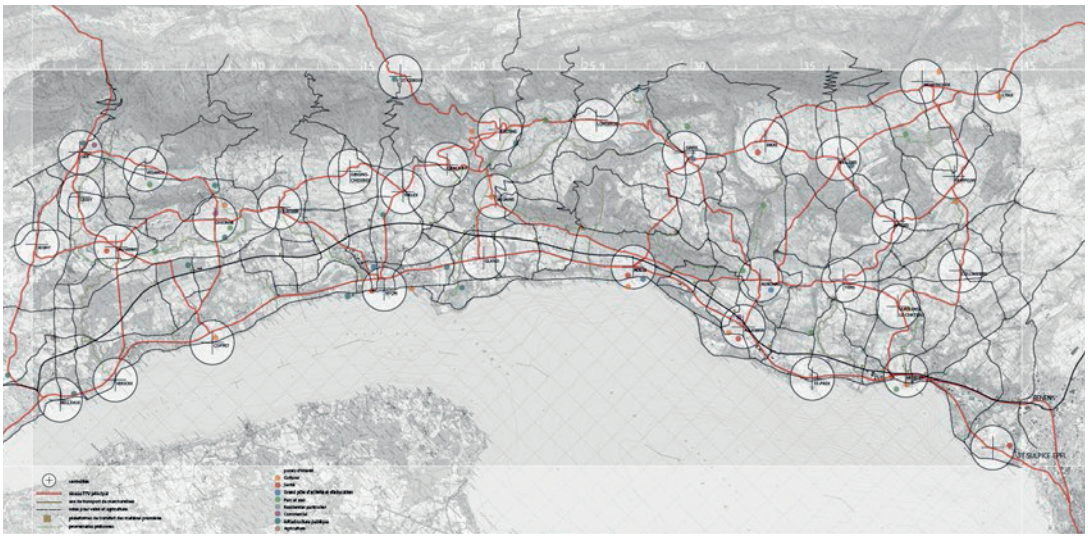
Along the second Arc

4. Connections Métropolitaines
Cellular City

Julie, étudiante à l'EPFL, a du mal à croire sa mère quand elle lui dit qu'elle s'enfermait une heure tous les matins dans une petite boîte en métal pour aller à l'université, alors qu'elle habitait Romanel, au milieu de la zone industrielle. Aujourd'hui, Julie peut tranquillement profiter de la vue sur le Mont Blanc qu'offre Gimel ainsi que la nature devant chez elle. Le matin, elle saute dans le train de 7:38, ou celui de 7:42 quand elle est en retard. En prenant le 4 jusqu'à Vufflens puis le 2, elle arrive à l'EPFL en trente minutes. Elle profite de cette demi-heure de train pour réviser ses cours. Le soir, les canapés du wagon détente lui permettent de se reposer de sa dure journée d'architecte, surtout quand les critiques d'UE ont été fatigantes. Quand elle profite de la douceur des soirées dans les vignes environnantes et qu'elle y croise René et Giselle qui terminent leur marche du soir, elle adore écouter leurs histoires du Gimel d'antan. Ils apprécient tous deux ce qu'est devenu Gimel. Le petit village, autrefois sans activité est devenu un quartier vivant et animé. Et pourtant leur vigne est toujours là, à deux pas. Ce soir, Julie a prévu de retrouver des amis au nouveau bar qui vient d'ouvrir à côté de la rivière. Même si ses amis sont dispersés sur l'arc lémanique, ils se retrouvent facilement et rapidement. Elle aime cette liberté de se déplacer comme elle veut, en train ou en vélo. Elle n'est pas dépendante de ses parents pour rentrer. Elle espère y croiser Fred, un ancien master de l'Unil avec qui elle fait du cheval à Montricher. Il habite Yens et travail à l'Isle dans une maison d'édition. Il ne met que quinze minutes de métro le matin et en été, prend son vélo et redescend le soir en quelques minutes chez lui. Il croise parfois quelques tracteurs chargés de fruits et légumes et très souvent s'arrête pour discuter avec les agriculteurs, espérant obtenir quelques tomates fraichement cueillies. Quand il croise Bertrand, apiculteur de son état, il est sûr d'avoir un pot de miel. Bref, tout le monde est heureux et la seule voiture qu'on puisse trouver est à Divonne, au musée des inventions horribles du 20e siècle.

metro system

Transformation of Gimel



Dispersed metropolis, organization of the neighborhoods (villages) and the transport network

Transformation of Gimel

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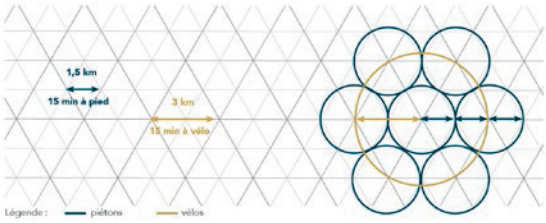
5. Société Horizontal
Cellular City

Eva, Adrien et leurs deux enfants, Enzo et Léna se réveillent aujourd'hui dans leur nouvel appartement du quartier de Signy-Avenex où ils ont déménagé il y a un peu plus d'un mois. Avant, ils habitaient plus proche du quartier de Lausanne, dans le quartier de Chigny mais Eva a voulu changer d'activité, c'est ce qui les a motivés à déménager. L'ensemble de la famille Masserey a déjà pris ses marques dans leur nouveau quartier. Eva a trouvé du travail dans un laboratoire de recherche pas très loin de Duillier, le quartier d'à côté, distant d'environ 3 km. Adrien, lui, poursuit son travail dans la charpenterie car c'est ça qu'il aime. Quant à Léna et Enzo ils ont repris le chemin de l'école sans encombre. Après avoir pris le temps de déjeuner en famille Adrien charge son triporteur pour une réparation puis passe vite au marché itinérant. Il s'arrête devant l'atelier du vieux Christophe qui apparemment a décidé de sortir son établi et travailler dehors par ce doux matin. Lorsqu'ils ont déménagé Adrien a directement sympathisé avec ce bonhomme un peu bourru car il a la même passion du bois. Et le vieux Christophe, qui fait parti de la dernière génération d'avant, celle qui a eu la force de décider de changer de manière de vivre, a toujours pleins d'histoires à raconter sur ce qu'il faisait à l'époque dans l'industrie. C'est Eva qui accompagne les enfants à l'école. En fait, l'école se trouve sur sa route, dans les champs, entre Signy-Avenex et Duillier. En sortant du quartier ils rejoignent d'autres enfants et quelques parents à pied ou à vélo. Elle aime bien emprunter ce chemin car il passe sur un ancien pont d'autoroute, l'un des rares vestiges d'un passé qu'elle n'a pas connu. L'après-midi, Adrien décide de se rendre un moment au terrain de sport. Là-bas il croise par hasard Nicole et Fabrice, deux amis de l'époque où il étudiait le cinéma et habitait le quartier Plainpalais. Maintenant Nicole travaille en tant que monteuse chez elle et Fabrice s'occupe d'un cinéma pas loin entre Crassier et Arnex-sur-Nyon. Ils discutent un moment de leur projet de créer un cinéma itinérant. En fin d'après-midi Adrien rejoint ses enfants à la ferme de Delphine avant de rentrer tous ensemble à Signy-Avenex.

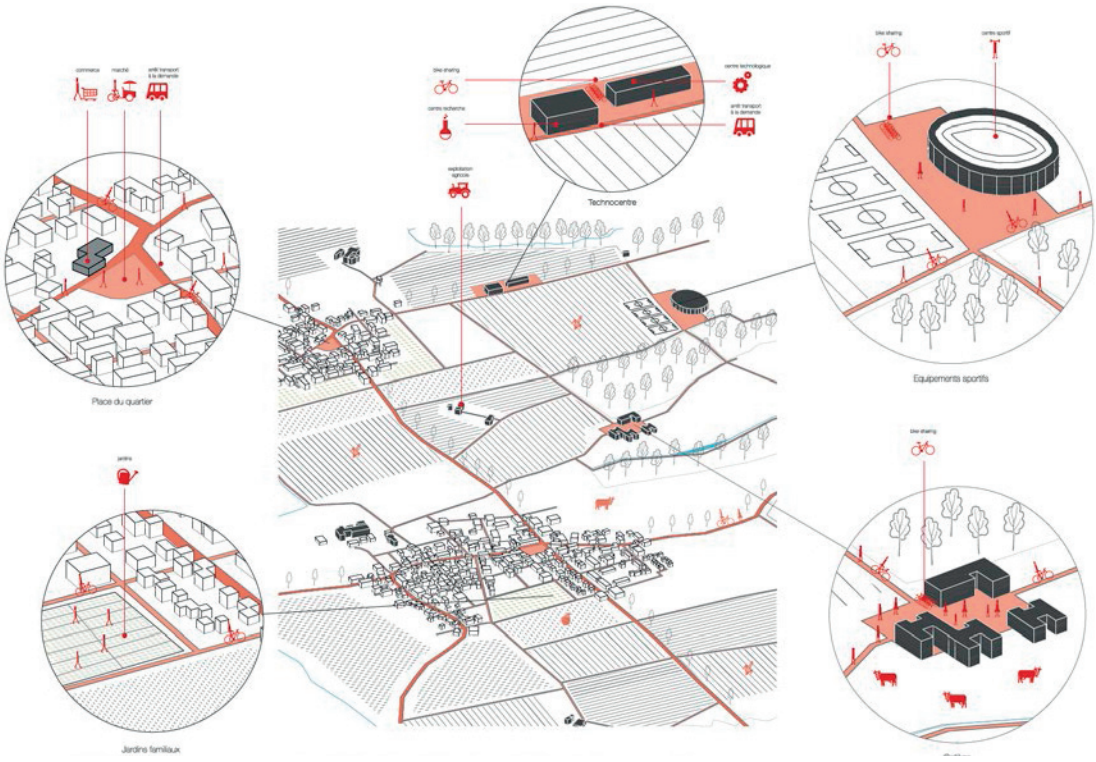
Cities of Nyon and Prangin, before

Nyon and Prangin districts, after



Organization of distances between districts

Organization of districts, walkable measures



System of districts and shared amenities in between

Participant	Transport means	Driving License	Age	Place of residence	Notes:
Jacques	Walking PT*	Yes	65	Lausanne, center	Stopped driving 35 years ago. Walks to destinations until 5-6 km, for longer distances uses PT. Drives only by obligation in EU, U.S or in South America.
Marcel	PT Walking Car	Yes	53	Lausanne center	Walks to the work and uses PT in the city but his car for leisure activities.
Sophie	PT Walking	Yes	26	Lausanne CHUV	A comfortable user of PT.
Virginia	Bicycle E-bicycle	Yes	39	Lausanne Malley	Bicycle, 365/365. She has winter accessories, and access to electric bike at work.
Pascal	Bicycle PT Car sharing	Yes	71	Lausanne Pont Chailly	Bicycle, and sometimes PT. Since very long time he occasionally uses car sharing services even before *Mobility*** existed.
Francoise	Car	Yes	75	Perly Certoux, 3,000 inhabitants	Driving due to inaccessible work destinations.
Anna	Car	Yes	67	Choulex , 1,100 inhabitants	Driving.
Nadine	Car	Yes	45	Villars-sous-Yens , 500 inhabitants	Driving for practical reasons, it takes her 2 kilometers walking to the first bus stop or train station with the frequency of one service per hour.

* Public Transport
***Mobility refers* to *Mobility Carsharing*, most important car sharing company in Switzerland founded in 1997.

Table 4 - Participants in the Focus Group.

Focus Group

The focus group was held at the end of the second semester and replaced a typical evaluation of the students' projects. The session was organized in two parts; first, a presentation of the scenarios by the students, followed by clarification questions and comments of the inhabitants after each presentation, then, a discussion between the participants themselves on their mobility preferences and expectations with reference to the presented scenarios. The discussion was moderated by Monique Ruzicka and Jade Rudler from post-car world sub-project A.

Students presented the main principles of each scenario in a detailed description with the support of images, axonometric representations and maps in terms of spaces and logics of movements. A detailed description of the elements and principles of each scenario was followed by a narrative, recounting a typical day of the inhabitants of the imagined territory. Different characters, their encounters, and the unfolding of their routine elicited various aspects of the lived space and provided more tangible information on inhabitant's social relations and their connections to the landscapes around. The narratives proved to be particularly useful in facilitating the communication and understanding of the scenarios, as the inhabitants during the discussions deliberately and repeatedly referred to different aspects of the proposals by invoking instances of the stories, and what they liked or disliked about each situation.

The original intention of the call for participation, launched among the inhabitants that were previously interviewed by subproject A, was to maximize the variety of lifestyles in terms of place of residence and modes of transport. However, the final selection was constrained by the limited numbers of positive responses. Finally, among the eight participants, three of them conduct fully car-based lifestyles and three others almost never drive. There were two other members who drive occasionally, although do not rely on the car for their daily commutes. Their places of residence vary from city core to lower density neighborhoods of the city and further to small villages of 3000 to 500 inhabitants

The presentations for the inhabitants were regrouped in categories that could facilitate the communication by an emphasis on the lifestyles rather than associations with their original theoretical urban models (*density*, *linear*, *cellular*). This regrouping was done with the aim of emphasizing the palpable experiences such as commuting, living in a city as a form of concentration, rather than having to confront with the urban jargon of the theoretical models. These categories included centralization (scenarios 1 and 2), decentralization (scenarios 3 and 4), and local living (scenario 5). Hence, within centralization group, there are scenarios for density as well as a scenario that borrows

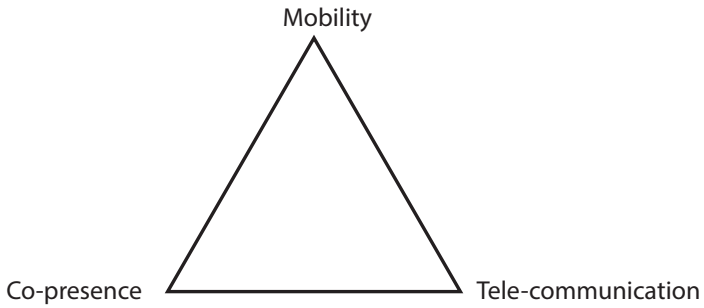


Fig 25. Three modalities of managing distance
Lévy takes distance as a fundamental question in any geographical situation, defines the space by relations of distance and identifies three major ways of managing distance: co-presence (everything is in the same place), mobility (material realities are moved), and telecommunication (where immaterial realities are moved). The city, in this perspective, is the expression of co-presence within a societal scope. While the three modalities can be seen as alternatives to each other, they can also be complementary (Lévy 2013).

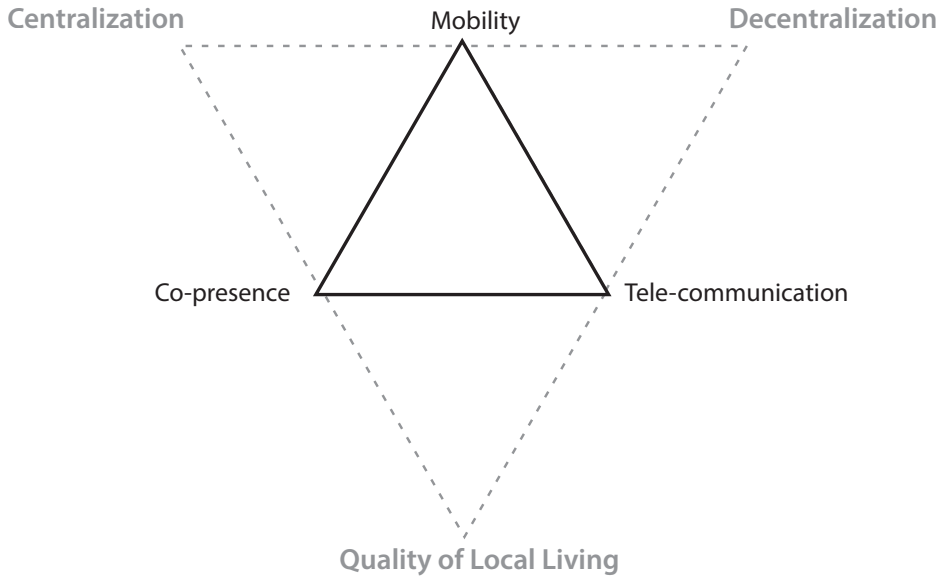


Fig 26. Three modalities of managing distance and the coceptualization of scenarios.

its original theoretical foundation from the linear city, by proposing a centralization of activities around the extension of the highway, transforming it into a central district of the *Métropole lémanique*. Both scenarios for centralization rely strongly on the advantages of co-presence as the foundation of social relations. Beside dense urban poles (1) or central districts (2) they facilitate movement between them and along the territory with a dense supply of railway offering highly developed transport capacities, pre-supposing a commuter society. Referring to the modalities of managing the distance as proposed by Lévy (2013), these scenarios take their strength from mobility and co-presence (Fig 26).

Scenarios for de-centralization include small nucleus of urban settlements scattered over the territory (3) and decentralization in the territory along the existing and proposed lines of railway. Both scenarios provide high mobility and benefit strongly from new possibilities of telecommunication. The last scenario is also a decentralized vision of the territory but differently organized in terms of practices. The absence of dense and strong network of public transport orients the small-size settlements towards more locally rooted lifestyle, shared amenities, and creating new conditions of co-presence while at the same time relying on the means of telecommunication, mobile goods and services. In the next few pages, I will briefly present the reception of scenarios, discussions and questions regarding each.

Reception of scenarios

- Centralization

The scenario (1) that proposes centralized urban poles, when presented to the inhabitants, rather than questions regarding mobility, aroused many questions about the type of habitats, the aggregation of the buildings, and their number of stories. The density and the heights of the buildings were a prevalent preoccupation. The students had to reassure the inhabitants that it is not the question of skyscrapers but rather densities compared to a residential neighborhood in Lausanne, *sous-gare*, behind the train station, with 9 000 à 10 000 hab/km2 with mixes of different types of apartments and houses, sometimes up to 6 or 7 floors. Finally the availability of a vegetable garden, a piece of earth to cultivate, revealed to be important to many:

Pascal "Je trouve bien que les gens aient des potagers au moins sur leurs balcons, sur des petits espaces, mais pour ça il faut qu'il y ai un peu de terre! C'est important."

The other centralization scenario (2) converts the highway from a mono-functional infrastructure into a central district, hosting variety of activities and movements. The

image of a highway that lends itself to the bicycle movement - among other functions - allured immediately the cyclist in the focus group:

Virginia "j'imagine une immense ***voie verte*** qui traversait d'un bout à l'autre, voie séparée du trafic. Plus de temps, inviter à changer nos habitudes, on veut toujours aller plus vite d'un endroit à l'autre. Il faut prendre plus de temps, de manière plus écologique et plus de plaisir"

The highway turning into a continuous bicycle road brought the image of Copenhagen to her mind.The scenario was also appreciated by the inhabitants of small villages as it permits them to live where they live today, while providing easy accessibility to the center of activities, that is the highway. Interestingly another participant who currently lives in the city center asserted that in this case she would probably move to live on the highway itself, on the "green vein" as they started to call it.

- Decentralization
The scenarios (3) and (4) both propose decentralization, tracing the scattered existing villages or extended along the lines of public transport. The decentralization in *Connections Métropolitaines* deploys as a metropolis that is expanded all over the territory but organized and concentrated around the existing nodes of the villages, as neighborhoods. These nodes (neighborhoods) highly and efficiently connected, convinced those who value mobility and demand efficiency of the movement.

Marcel "moi je trouve pas vraiment utopique ce qu'on a vu là. Parce que personnellement, j'utilise beaucoup la voiture, honnêtement, parce que je trouve que les transports publics ne sont pas performants. Si on arrive à les rendre performants, je suis le premier à dire que je peux me passer de la voiture."

Anne "je rejoins beaucoup ça aussi, parce que c'est vraiment la chose qui me retiens complètement de lâcher ma bagnole. Et ce que j'ai retenu dans votre petite histoire qui m'a amusée, c'est: *je loupe mon train mais 4 min après y en a un autre*."

It also raised the question of feasibility given the expected costs of the metro system, questions regarding who pays for the metro and who pays for the car, and what are the hidden costs of car:

Pascal "...maintenant les routes coûtent bien sur cher à la communauté, mais c'est les particuliers qui achètent leur voiture. Sans voiture, c'est la communauté qui doit

financer la construction de toute l'infrastructure, des tapis roulants le metro etc."

- Proximity and Qualities of Local living

The scenario that provoked the most controversies was the *Société Horizontal*. Is it really possible to reduce one's life to the geographic extension of walking and small vehicles? Could this correspond to the needs of a dynamic modern lifestyle? Is there enough diversity in proposed landscapes? The scenario created a sharp cleavage in the participants. On one hand, there were those who found it a regressive, backward scenario that undermines the values of mobility and deprives its inhabitants from the privileges of connectivity and speed. On the other hand, those who appreciated the slowness, rootedness, calm and quality of time and the space it offers, living with local qualities, associating it with the notion of "vivre ensemble" community, and ecology. The experience of No-car Sundays in 1970s was evoked by one of the participants.

Outcomes: inventory of possible micro futures

In the second part of the focus group, students were asked to leave the room in order to give space of free critique and evaluation to the inhabitants without hesitations and considerations. At the beginning of the session, in a round table, inhabitants introduced themselves and described briefly their mobilities and modes (table 1) and further discussed their preferences and critics about each scenario. As underlined by one of the participants, it was difficult to chose one scenario over the others, but rather, the scenarios served as an inventory of ideas and situations helping the participants to chose bits and pieces from each and construct their own visions and express their ideals. In the following I present an overview of the discussions along the themes and axes that I have extracted. The axes of interpretation and thematization could be more diverse, as each comment could open a discussion from different point of views, such as community building, perception of space, etc. I will limit the themes and observations to the ones I consider relevant to our research questions in post-car world project.

- Ecologically Conscious

While energy was not the departure point of the students' works and was never mentioned as a condition of a post-car future, inhabitants had taken for granted that reflections on post-car are inevitably consequence of rarefaction of fossil fuels. When, for example, students explained the on-demand system of transport for occasional trips in one scenario, it was immediately followed by the comment "donc il y a encore 3 gouttes de pétrole dans le monde!?" showing that they had interpreted the exercise as post-petrol scenarios. Further, another inhabitant points out that even though currently the fuel is unprecedentedly cheap, it is going to be rare and therefore very expensive in the

future and hence the necessity of preparation and reflections on the subject.

While the ecological consciousness can be an asset to the transition from car, as mentioned in previous section according to some of the experts framing the problem of car as an essentially ecological one could be misleading and could negatively influence the future policies in the perspective of the advent of electric car. It is important to note that the discussed ecological concerns provoke a sense of guilt in car drivers in the focus group and brings them to justify their practice but it is not a strong enough motivation for them to switch to no-car lifestyles.

- Arbitrations: towards a post-car world

The scenarios activated strong positions for or against proposed situations. Responses varied from total rejection, to "I would if I have to," and to enthusiasm and approval. Without the reductionist intention of making generalizations, it is fruitful to look into instances where for car drivers of the focus group a shift to post-car seemed imaginable and appealing. It is important to note, that the focus group lacked passionate drivers (joyriders). This could be explained by the fact that, who responded positively to the invitation for the focus group, had already a pre-disposition and an interest in the question. Present drivers mostly explained or "justified" their use of car by constraining, "practical" reasons. In this context, the most important shift provoking factors proved to be the efficiency of public transport, its fee and to a lesser degree the balance between the sociabilities public transport offers and the privacy it secures.

Marcello "Pour moi, sans parler forcément du coût, mais le fait d'avoir du transport public bien dense, toutes les 4 à 5 minutes, ça me parle. Ce qui me dérange maintenant dans les transport public, c'est de devoir sans arrêt attendre. On le loupe c'est un quart d'heure d'attente, après on doit changer de transport, on doit de nouveau attendre [...]. Vous me direz dans la voiture, je suis dans les bouchons je dois attendre, je suis d'accord, mais je fais pas Lausanne-Genève non plus. Je vis rarement des bouchons. C'est le dynamisme des TP qui manque, pour un coût souvent trop élevé . Le cumul des deux il ne m'intéresse pas.

While regardless of the price Marcello finds that in certain occasions public transport is not convenient, Francois, living in a small municipality close to Geneva, is ready to leave his car if the public transport is free of charge. He would have come to the focus group, he says, on train if it was not for the price. The topic of cost of transport today and its relation to the mode choice sparks a passionate discussion. Jacques, who walks as his main means of transport objects: "it is not free either to come by car". Anne who

also drives joins the conversation and backs Francois's argument by adding that it is much more expensive to come by public transport or even to combine car with train

Anne "…Les parkings sont absolument astronomiques à Genève. Vous laissez une voiture dans un parking de la gare, vous payez 20 chf, 30 chf votre journée. C'est extrêmement cher."

Nadine who lives in a small village and drives as well, acknowledges that she does not find public transport expensive, specially given the offers and reductions for kids.

Studies show that the mode choice is not necessarily the outcome of a logical arbitration between different possibilities, their prices and their comparative advantages. Habits for example prove to be a determining factor in everyday mobility (Schlich and Axhausen 2003; Buhler 2015). However, when one sits to discuss the future perspective of his or her mobility, there are arbitrations and compensations at work. For car users of the focus group public transport in many instances seemed either too expensive or not satisfying enough, or both. Two different paths were drawn by the participants to move from car. One that accepts the transport network as it is and makes free ride his condition. This approach compromises the comfort and flexibility of his car to the gratuity of public transport. While the other demands a high performance public transport, reinforced in terms of distribution of the network-where it takes me- and frequency of the service- how much I wait and the overall question of travel time, even if it is going to be more expensive than today. The present condition in this case, given its current cost, is not an attractive option. Therefore, there are strong arbitrations between cost, comfort and travel time when one evaluates objectively the future mobility options.

Another aspect that was brought up was car as private space. None of the car users confirm the private space provided by their car as fundamental for them. About practicality of the space at your disposition to leave your stuff, Francois responded that "on prend un sac à dos, c'est pas un problème!" and Pascal proposed a cargo bike. Another participant (Nadine) elaborates on the individual vs. collective aspect of transport, explaining how she appreciated the public transport as a "moment of socialization" and "moment of pleasure" when she had a broken arm and had to momentarily use public transport, finally "coming out of her bubble"

Nadine "Je me suis cassé le bras l'année passée et j'ai changé de mode. Et je me suis dit: *je sors de ma bulle ! Je ne suis plus dans ma voiture*. Et j'ai vraiment apprécié."

Further, she distinguished between pleasant social moments on train and intrusion of others in one's personal space, for example people are on the phone

Nadine ".. quand on peut pas avoir un petit peu son espace personnel dans un train, ça va pas non plus, parce que là aussi on se sent dépossédé de son temps parce qu'on est gêné par quelqu'un d'autre… Si on pouvait vivre ce rapport au transport d'une autre façon, d'une façon qui reste agréable..."

She concludes her observations questioning how to merge these two sides of the same coin; codes, rules, education.

- Mobile or anchored (fast or slow), this is not the question

The scenarios proposed different levels of mobility, coupling with different territorial configurations and everyday lives, one explicitly reducing the movements and another one proposing a hypermobility. However, the inhabitants were not necessarily always bounded to one or another extremity. Jacques for example, who is a frequent walker and does not drive following a decision he made 35 years ago, appreciated strongly the scenario of local living for its emphasis on active mobility. He was very comfortable with the idea that his daily life and commute would be bounded to the walkable distance which is by the way more extended for him than what is usually considered as walking distance in urban schemes. This radical reduction in daily mobility is very compatible with his current lifestyle. However, Jacques appreciates also the metro network proposed in scenario (4) that implies high mobility level. Although very anchored on daily basis, Jacques is very mobile in a larger scale. Being an independent journalist, he travels long distances often to other continents. What seems to be a contradictory choice selecting the two opposing scenarios is basically an extension of his current lifestyle, predominantly walking on daily basis, and globally mobile between continents and world cities. He is sometimes constrained to drive in cities like Los Angeles or in South American countries, comparing to his experience of public transport in those contexts he is generally very satisfied with Swiss network of public transport.

Among the participants, however, there are also others for whom slowness or speed constitute by itself a value and sometimes a goal. They inevitably diverge strongly when it comes to the scenario of local living (5). A closer look into the enthusiasts versus critics of this scenario reveals that the division between those who advocate less mobility, and those who value it, is not a division between today's car users and no-car lifestyles. Sophie, for example –who is a comfortable public transport user by choice, lives in the city and despite possessing a driving license, does not drive a car– rejects this scenario

as a viable and desirable future. She seeks mobility and believes more mobility equals more possibilities, to which she does not want to renounce. While, Virginia, who rides her bike all over the year, and associates ecological perspective with slowness and quality of life, defends and aspires the image of the future as a communitarian local settlement where mobility in general is radically reduced.

Sophie "… j'ai l'impression que c'est un retour en arrière, je vois pas l'intérêt de réduire la mobilité alors que c'est quelque chose de très important et qui va le devenir de plus en plus."

Virginia "il faut prendre plus de temps, de manière plus écologique et plus de plaisir"

Currently in the pursuit of these qualities and values –speed for one and slowness for the other– they have both opted for no-car lifestyles. Meanwhile, Marcel, who is very multi-modal, as mentioned previously, choses car over public transport when it comes to so many changes from bus to train to bus- and accumulates waiting times. Marcel tactically uses his car to fill what he considers are the gaps of public transport system, maximizing its benefits, he avoids the inconveniences of car. Dissociating the ideal of mobility and speed from car mobility becomes evident in these examples, extending what we know from the literature and from the expert interviews that the increase of several new forms of travel and inexpensive options of recreational mobility is itself a contributing factor to the decline of car.

- Hightech proximity or communitarian village

The scenario of local living (5) as mentioned previously was based on prevalence of telecommunications and co-presence over mobility, reducing significantly the daily commute and mobility related to work. To depict it as a progressive future, students in their presentation emphasized on the potentials of the new technologies, enabling working from distance, systems of mobility on demand, mobile goods and services. However, as it turns out, the inhabitants who found the scenario appealing were not very interested in connectivity and promises of the technology, but rather were impressed by the communitarian aspects, the small size of the settlements and their shared equipment with neighboring ones, the type of "vivre ensemble" it proposed, and the interdependence between the inhabitants. They even criticized the students for not having insisted on this aspect of their project in their story.

Virginie "Je voulais intervenir par rapport aux exemples qu'ils ont donné de ce couple (5), ça aurait pu être illustré dans une gestion communautaire des choses. Pour moi il y a une grande force dans ce modèle, c'est vraiment une vision alternative. … Un exemple aurait pu illustrer comment les habitants s'entraident, comment ils vivent ensemble. [...] L'aspect communautaire n'a pas été illustré dans leur exemple."

Anne "Oui oui, dans ce projet l'aspect du vivre-ensemble, de garder le contact avec la nature, le monde paysan dans lequel on vit en Suisse... ça marche bien."

Pascal "…*je dois demander*, on peut aussi dire *j'ai besoin des autres*. En positif!"

Anna "Oui, on a un système où on dépend les uns des autres".

This ideal scenario as depicted by the inhabitants constitutes a break in relation to both hypermobility trends as well as the rise of telecommunications, giving them up in exchange for the qualities of social ties within the proximity of the place of residence and communitarian organization of everyday life. One can be reminded of visions of voluntary prisoners of architecture and dystopian urban scenarios where a society decides to confine itself in a place (Koolhaas 1972). Anna refers to a radio program called "Babylons" on RTS (Radio Télévision Suisse) that few weeks ago had an emission about people who have re-invented their way of life in Suisse Romande in similar ways:

Anna "ils vont très loin. J'ignorais que ça existait, ça réconforte. C'est remarquable. Bien que ça soit moins relié."

The reshaped picture of the this scenario in fact is very close to that of Kaufmann and Ravalet (2017). It resonates with the idea that the solution to environmental problems of today should not be sought in the advent of the new "green" technologies, the next industrial revolution, but should rather take an alternative course. Bihouix (2014) proposes such a technological recede, advocating a return to low-tech and local, less performing but more economically and technically sustainable. Reflecting upon the future of mobility, Bihouix foresees that the population itself will stop moving far and often and will renounce to the "superfluous" in terms of mobility (Bihouix 2014:192).
Therefore, despite the lag between the presented scenario and the adopted one, it was the former that enabled the imagination of the latter which is a vision of communitarianism around the values of local living and low-tech.

- Have my cake and eat it too

The scenario for decentralization with the metro system (4), satisfies the adepts of mobility, Nadine, however, is unhappy with this scenario since the network fails to cover her place of residence, which is situated between two villages of Yens and St. Prex that are served by train. The students encourage her to move either to St. Prex or Yens and suggest that otherwise she would need to cover a short distance –less than a kilometer to Yens or a few kilometers to St Perx for the nearest metro station. Nadine prefers to stay where she lives. Therefore she rejects the *Connections Metropolitaines* for its insufficient metro grid. However, further, in the discussion she explains that she despises the territories where "everywhere there is something", explaining that she prefers to have contrast between nature and city, and to preserve some places to be alone and feel the wilderness. About the scenario that she denounced shortly before for insufficient infrastructure she says:

Nadine "Ce maillage (4) est intéressant mais il modifie complètement le paysage. Moi je crois que j'ai aussi besoin d'alternance entre ville et campagne et pas que tout se ressemble … quand je survole en avion l'allemagne, je sais pas pourquoi, j'ai l'impression qu'il y a quelque chose partout. Chaque espace est utilisé, ça ça me pèse... …il faut garder des espaces où on est seuls. C'est un luxe!"

Therefore she rejects the landscape of dispersion, and aspires for a territory with sharp distinction between city and nature while at the same time preferring to live between the two.

- Post-car world for no-car lifestyles

The session ends with a discussion on how the participants with a car-free lifestyle perceive the post-car perspective. Already living a without, what would be the concrete effect of such hypothetical situation on their lives. Besides the image of promenades and bike rides without air and noise pollution, a fundamental aspect that was extensively discussed was the gained space for other modes, its use and its potentials. For example, cargo bikes that were not considered very comfortable due to space restrictions can become a credible option. The space changes completely the travel experience, physically and socially as it modifies the relation to others, this is particularly underlined by the cyclist and regarding the social interactions between bike riders which is very restricted when the space is restricted.

4.3. Conclusion

To explore *possibles*, as was the objective of this chapter, I have conducted two series of encounters: the interviews with the experts and the focus group with the inhabitants. The outcomes of the interviews include experts' general assessment of the current urban condition as well as the perspectives of transition in a multitude of dimensions: interpretations of changing practices, positioning on emerging technologies, and typologies of solutions and strategies towards a more ecologically and socially sustainable future. The outcomes of the focus group consisted of a series of observations specifically about the ways in which the future and its possibilities are discussed, how they relate to today's lifestyles, and what we can learn from such observations. In the rest of this chapter, to conclude this endeavor, I propose an analytical reading of the outcomes within the general frame of the 'contemporary city' and its changing mobilities, "not only as its system of transport, but as the whole understanding of the city" (Urry 2009:110).

A radical transition from car is generally looked upon with skepticism by the experts, seen as a very long and very slow process. The post-car world for is interpreted as a longterm guiding image, useful and necessary in orienting urban projects as we now consider and conceive them. Despite some initial hesitation, however, experts, have provided a variety of solutions at different levels and scales of intervention aiming towards this horizon. Inhabitants, on the other hand, with the help of presented scenarios were conveniently capable of projecting themselves into various post-car worlds, declaring their preference for some rather than others, rejecting some features and appreciating others; distinct post-car lifestyles were imagined and discussed.

The methodological conversations provided an assessment of the future. The multiplicity of the point of views underlined the different temporalities of the city and its practices, that superimpose and intersect rather than progressing in a linear time - suggesting that many post-car worlds are already here, they are "just not very evenly distributed." Interviews constitute an inventory of elements, ideas, references, images, and imaginaries of possible transitions and pathways brought together in the schematic representations of each and in the entire ensemble of the interviews. Despite the discrepancies and diversities, there is, interestingly, one center of gravity that balances both the projects and reflections on the future of the city; this is public space. It is worth

remembering that denial of public space was a common feature in the projected visions of early car urbanism

The interviews confirm divers paths towards different post-car cities. These paths, as drawn schematically during the interviews, vary by favoring densification of urban poles, intensifying t-mobility and assuming the no-car scenario as the only possible horizon towards such intensification, versus images of the new village, considerably reducing mobility levels and inventing and encouraging new proximities. What they have in common, however, is the undisputable urgency of giving space to a variety of users, avoiding rigid segregations, rediscovering the street as the quintessential social territory where many urban goods are to be sought and found, including equality. In chapter three I argued that the very emergence of the notion of public space is to some extent a corollary of critics on the car and its spatial consequences. Experts associate the ideal of public space with the presence and measures of the pedestrian. The discourses, however, diverge from the early schemes in their scale of intervention. The cityscape as public space (the place of public presence *par excellence*) characterizes the discourses of today, distinguishing them from pedestrian precincts, which constituted islands protected from traffic.

Furthermore, proposing scenarios of some distant future within a familiar territory, by the dint of their diversity, and the aid of images and narratives, we have been able to explore with the inhabitants possible instances of desired futures, desired forms of inhabiting the territory, with different relations (interactions) with others. In the brief account of the focus group above, it comes to light that the traits and conditions that were generally associated with "quality of life" even for car drivers were not necessarily bound to the use of car and the qualities provided by the car were not considered as inherent to it. Efficiency, extended accessibility, and lower costs justified the car over other means today, hence, the prospect of free public transport, for example, was a convincing image for one of the participants, for others, it was the increased efficiency of the transport systems or other adjustments in people's lifestyles. Exciting and promising as they appear to the already car-free individuals, the different scenarios proposed also appeared imaginable, possible, and acceptable to today's car users.

Discussing the proposed scenarios, contrasting ideals emerged between the adepts of mobility and the advocators of rootedness. These opposing extremes, however, both conveniently imagine a post-car perspective. The contrast, nevertheless, does not seem to be between two contradictory and incompatible situations. It reveals "overlaying scenarios and possibilities of coexistence" (Vigano 2016:213), showing a mutual recogni-

tion between the two positions, given the provision of adequate public policies. The question hence is the ability of the policies, in terms of mobility strategies as well as real estate and land policies, to recognize both desires, not allowing for one to oppress or impede the other. Thus, the questions must be asked: What policies could ensure that the contrast between geographies of connectivity and exchange, versus those of physical proximity and communitarian values, remain a matter of lifestyle choice rather than disadvantage of one over the other? - and likewise - What policies can avoid the emergence of landscapes of inequality and "cities at different speeds" (Donzelot 2004 *villes à trois vitesses*), while establishing a productive exchange between the two ideals?

Finally, another type of contrast came to surface within the focus group; the contradictory contrast between desired landscapes of an individual with preferred lifestyles of her own. I mentioned one of the inhabitants who seeks solitude in the landscape, aspires to live in remote areas far away from "forms of concentration that she does not like," while at the same time defending the preservation of the landscape and sharp contrasts between cities and "nature." What she dislikes, in other words, is the consequence of the way she likes to live as soon as she is not the only one who likes it that way. The contradiction can be explained in terms of incompatible spaces and spatialities. Taking us back to the notion of *inhabiting* (Lévy 2015) discussed in the second chapter according to which the fundamental question for an inhabitant of a political society would be to ask "how can I make the world inhabitable without making it uninhabitable for others, and for me among them? » (Lévy, 2015). This is the core of the question of "living together" for which urban actors, among them inhabitants and urbanists strive to propose, invent, and re-invent answers. The renewed discourses on lower densities and their urbanism (Brès 2015; Vigano, Fabian, and Secchi 2016), as also brought up in the interviews with experts, are attempts in this direction; to reconcile the apparently contradictory forces, proposing new sustainable ways of collective living within diverse, individualized lifestyles.

Distance relations

The question of "how to live together" has been often discussed through the prism of distance, as famously quoted from Roland Barthes "*à quelle distance dois-je me tenir des autres pour construire avec eux une sociabilité sans aliénation?*" (Barthes 1977). The question of "*right distance*" and its regulations, according to Bernardo Secchi (2001), constitutes a crucial theme for the contemporary city and its project. Expanding the *right distance* to physical and metric as well as visual or even symbolic distance, first emerged as a desire within the practices of the society, and then with considerable delay, as a theme of reflection and scrutiny for the urban project. Secchi interprets

desired distance as separation and links it to the search of "sufficient distance from the neighbors" that resulted in the dispersion of the contemporary city. The question of the "right" distance, however, argues Secchi (2001), should be confronted in all scales, and within different aspects of dispersion. From the functions that mutate and migrate from the city, new urban landscapes are formed and in a cumulative process new distances are induced. Increased distances and inaccessible geographies are the unintended consequences of the individual habitat that need reconsiderations and projects. The hostility and lack of comfort in these territories of induced distances highlight the need for rethinking the "right" distance in larger landscapes and common spaces, attesting that the concern for comfort cannot be limited to domestic space of the house and searched in separation from the others. The distance, therefore, should be interpreted not merely as separation, but rather as distance relations and therefore suggestive of communication and interaction, in order to "construct with others a sociability without alienation." The reflections on proximities and distances preceded *Comment vivre ensemble* of Barthes in sociology and anthropology (Goffman 1972; Hall 1969).

The double facet of separation and communication was addressed in the interviews specifically speaking of cohabitation, both on the street and among the temporary inhabitants of public space and in the organization of the territory. Suggesting that there exists a theme of research and a field of experimentation, at the building scale for prototypes of architectural solutions for this separation/communication balance, providing personal space within the collective (accessible and comfortable) landscapes, as well as the personal scale of the individual commuter.

The initial question of Barthes, on "vivre-ensemble" searching an ideal of both personal and collective living, finds an answer in his elaboration of the concept of "*idiorrythmy*[12]" as a way of living. A term he borrows from Greek orthodox monasticism, and the monks of Mount Athos. Barthes interprets the *idiorrhythmy* as the individual rhythm or pace at which each person conducts his life (*chaque sujet y a son rythme propre* p. 20). It is about producing "a *quotidien* ideal that balances the right mixture of elements of companionship and space" (O'Meara 2012:8). While the central problematic, all along, remains the search for the "*distance critique*", he sets out an inquiry into a series of selected religious and literary texts and proposes an assessment of *idiorrhythmy* within spaces of everyday lives of their subjects. The notion of *Idiorhythmy* was adopted by Barthes as an ideal, however, the term with reference to rhythm could lend itself effectively to the research on forms of inhabiting and their interrelated mobilities. As Lefebvre explains in his *Rhythmanalysis* "where there is an interaction between a

[12] Composed of two Greek word, idios (self, proper) and rhuthmos (rhythm). Barthes explains that idiorrhythme is almost a pleonasm since rhuthmos is by definition individual (2002:39).

place, a time, and an expenditure of energy, there is rhythm" (2007: 15). Place, time and expenditure of energy constitute the fundamental axes of debate on mobilities today. The question of rhythm can be traced within the discourses of the experts in the interviews, revealing an emphasis on the city's time-space, considering a prospective transition from car as a shift in the city's time-space, characterized by new cadencies and practices. Recognizing the diversity of mobility preferences, idiorrhythmy implies the co-habitation of different rhythms and various systems of mobility, while optimizing and facilitating of their interfaces.

Hence, the ideal of *Idiorhythmy* can be paralleled with the discourses on mobility, specifically close to that of "freedom of movement", the democratization of which was partly enabled by the motorcar (Sheller and Urry 2000). What distinguishes *Idiorrhythmy* is its inherent attention to the distance "relation" that presupposes a dynamic exchange between self and the outer world, between the mobile subject and its environment, between individual and society. In this sense *Idiorhythmy* is a political project. It is through this dynamic exchange or "relation" with others that the new "auto" mobility could be formulated.

5. NEW MOBILITY COORDINATES

Beyond Oppositions

هین سخن تازه بگو تا دو جهان تازه شود
مولوی دیوان شمس

Speak new words, to renew the World
Rumi, Dīvan-e Shams

In analytic geometry in order to solve a problem, the problem is sometimes transferred from one coordinate system to another, from Cartesian coordinates (x, y, z) to Polar[1], for example. This is not merely a new perspective, looking at the problem from a different angle, it is rather parameterizing differently the problem, changing the system of thought, the way it is described and presented, in other words enabling a new worldview. New worldviews (Weltanschauungen) imply new sets of understandings and discourses; new imaginaries. Accordingly, within the research agenda addressing the imaginaries of car and transitions from it, a *coordinate transformation* could help renew the discourses and thereby act upon the imaginary.

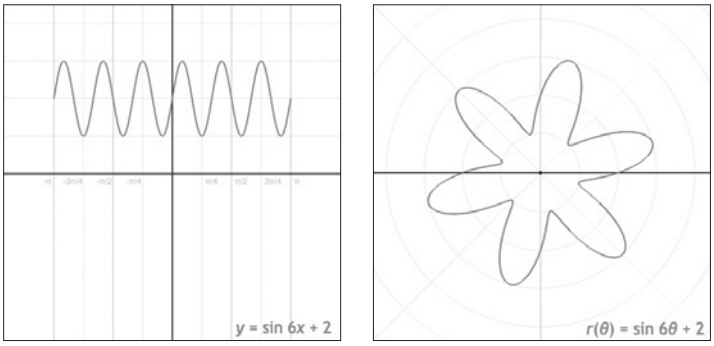


Fig 1. Coordinate transformation from Cartesian coordinate system to Polar coordinate system.

Acting upon imaginary, however, is not completely detached from transformation of space or encouraging new practices, since, as discussed earlier, there exists a strong mutual feedback between them. Concluding this thesis' endeavor on identifying and understanding imaginaries of (post) car, drawing on the inquiries into future, the discussions with the urban actors, both professional projections and inhabitants' insights, and in the light of the historical overview on the projects and discourses during the century of car, in the following, I propose three axes along which the questions of mo-

[1] Cartesian coordinate system can be two or three dimensional and defined as the positions of the perpendicular projections of a point onto the two (or three) axes, as signed distances from the origin. In Polar coordinate system, on the other hand, each point on a plane is determined by a distance from a reference point and an angle from a reference direction.

bility, in particular regarding car mobility, can be reformulated. Such reformulation, or coordinate transformation, I argue, not only can mobilize the imaginaries, but also can have implications for urban projects. The proposed coordinate system is intended to bring about new spaces characterized by the increased "agency" of its inhabitants, going beyond the previously mentioned polarities of car-pedestrian, towards values that set in-between, in order to reinvent the "auto" mobility for a more sustainable future.

The entries that I present here, as I explain further in length, can be already traced within the premises of urban projects, meshed into the discourses of urban experts, and are detectable in everyday practices and urban trends. However, recognizing them as significant themes, I propose that together they can constitute major axes for transformation and bring about significant change, capable of engendering new sets of understandings and discourses –new imaginaries.

The three axes are *Effort*, *Agility*, and *Plurality of Vehicular Units*. In the following I explain 1) how each one of them overtakes an established duality, 2) the context within which they have emerged, and 3) their relevance and potentials. argue for their relevance and potentials.

5.1. Effort, an integral urban experience [2]

Daily physical activities today are measured, registered, and even shared through social networks by individuals, using fitness trackers, smartphones, and other accessories (e.g. health applications, fitbit, iwatch). In this context, physical activity and the notion of effort have obtained increasing significance. This goes against the general premise of urban planning, and, in particular, of transport strategies that assume that people compare different alternatives and make their choices according to the logic of the allocation of scarce resources and the principle of least effort (Lucas, Blumenberg, and Weinberger 2011).

In the following, I will first propose a conceptual exploration of the notion of effort and situate it within mobilities research. Further, I will refer to a set of semi-structured interviews, which has been conducted by post-car world sub-project A, in the Swiss agglomerations of Zurich, Lausanne, and Geneva. After introducing the interview methods and findings, I present the three identified approaches to effort, exemplified by the testimonies from the interviews. I will then discuss the intricacies of how effort is manifested in mobility routines. Finally, I focus on "material design" (Jensen 2016) and explore through situated examples spatial implications and design characteristics that can encourage energy expenditure of the mobile individual, a too often neglected perspective for future of mobility.

Mobilities research and the notion of effort

In Chapter two, on the subject of dynamic imaginaries of car and shifting values associated with it, I have discussed the recent shift from passivity as a quality of car ride towards the active presence of the pedestrian as a value, coinciding with a genuine trend of the increase in urban sports and the rise of the notion of Quantified Self (Rooksby et al. 2014; Till 2014). A simple indicator of such engagement is the increasing number of organized sport activities and events in cities. These trends confirm an increasing interest in bringing sports to the city, increasing value of physical effort as opposed to a comfort defined in sedentary terms. The urban culture of fitness, as I mentioned before, is also indebted to the shoe industry, that by integrating fashion to the comfort and performance blurred the boundaries of sport fields and urban boulevards and encouraged casual physical activity. The trend launched by the best seller book on "jogging" (1979), co-authored by a shoe producer and a cardiologist, has not ceased to boom ever since. However, this is not at odds with the observations that show the increasing rate of obesity in cities, underlying the challenge of inactivity especially in car dependent lifes-

[2] The content of this section has been partly published in the following article: Bahrami, F., & Rigal, A. (2017). Spaces of effort, exploration of an experience of mobility. *Applied Mobilities*, 2(1), 85-99.

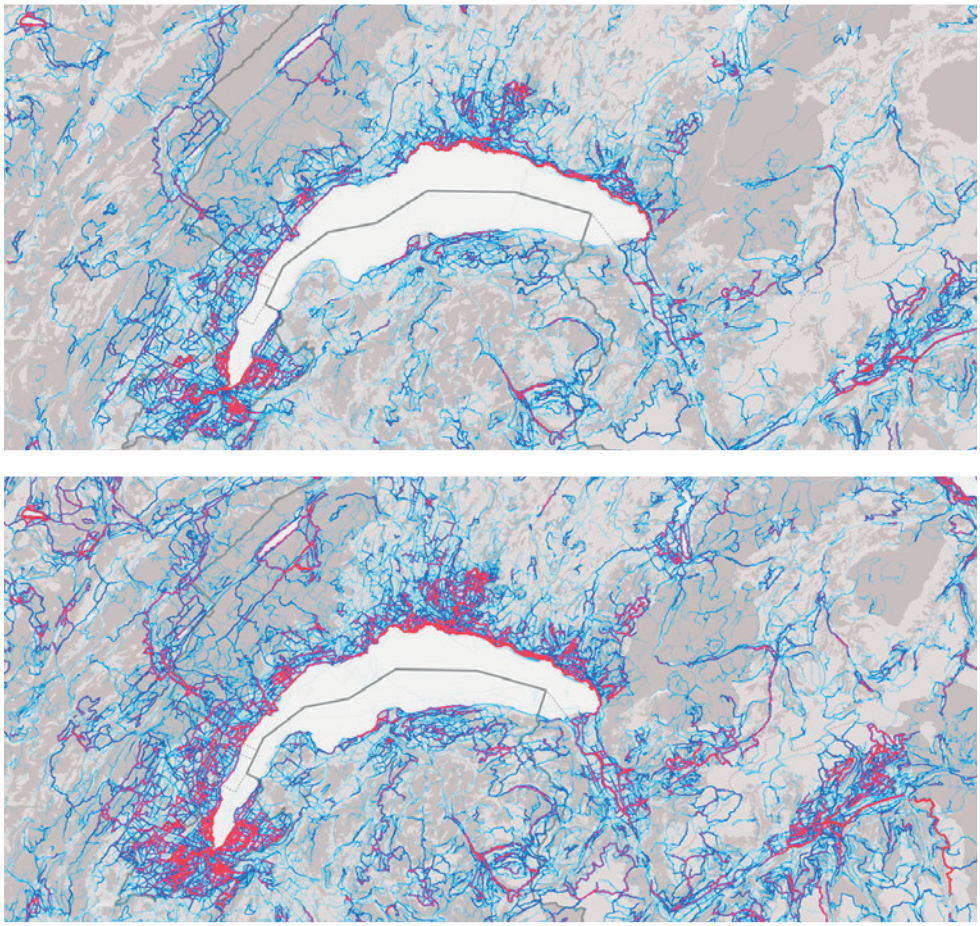


Fig 2. Tracked running in Leman region, 2014 vs. 2015, fromStrava dataset.

tyles. It, rather suggests recognizing and seizing opportunistically upon the existing and increasing value of physical activity as shift-provoking practices that could in fact eventually have an impact on inactive life styles and within larger scale interventions and policies.

Since over a decade the notion of active mobility has been raised within health, well-being, and behavioral science (e.g. Pikora and Miller 2001) that regards the daily commutes as an opportunity for physical activity, advocating and creating an alliance between transportation, public space, and public health. The question of effort and the focus on its practices, however, aims to take the positive attitudes for physical activity as an opportunity for urban transport and in particular in strategies for reducing the car use. This is often neglected in discourses on future of mobility, as for example in their recent work, Newman and Kenworthy (2015) announcing "the end of car dependence" and exploring the different paths toward it, they do not mention the increasing value of physical effort as a potential path.

The individual efforts produced for active mobility are induced and trained by spaces (Lefebvre and Régulier 1985). In other words, spaces can increase the propensity for active mobility, and as a result, its practice encourages active mobility itself in a virtuous circle (Sloterdijk 2014a). Through adapted spaces, the interest in active mobility for the accustomed inhabitant can be developed. Conversely, failing to encourage its practice is to risk diminishing, or even losing the abilities required for doing it (Buhler 2015). Furthermore, while the ecological values alone fail to trigger the shift in inhabitants' practices (Vincent 2008), the encouragement of the intrinsic motivation for physical effort can constitute an effective way to change mobility habits.

Walking and cycling have recently attracted increasing scientific interest within different disciplines, in sociological studies, urban literature, as well as health and well-being. Within the past decade, many studies have focused on empirical investigations on the relations between built environment and active mobility (Ewing and Cervero 2010; Saelens and Handy 2008; Saelens, Sallis, and Frank 2003). In general, their findings – such as land use diversity and density, as positive correlates of active transport – are evaluated and integrated within many urban projects. From the perspective of a more sustainable future, these projects often envision a reduction in car mobility by facilitating and encouraging active mobility. However, the effort that is required for such mobilities –body energy expenditure – is rarely discussed and the diversity of mobility experiences is often undermined. Planners either do not consider this question, or rather aim at reducing the effort required for mobility – to be able to compete with car

(Nixon 2012), and its supposed quality of "effortless" moving and comfort (Kent 2014).

In the 1970s and coinciding with the oil crisis, Ivan Illich (1974) developed a critical approach of comparing bodily or metabolic energy with fuel and other energy resources of mobility. He develops the hypothesis that above a certain threshold, mechanical energy results in new inequalities, while metabolic energy is relatively more equally distributed and gives more autonomy to the individual. Illich promotes the bicycle as a simple technical object that increases the efficiency of metabolic energy. His work is based on hypothetical calculations that can be studied with more precision today with tools to quantify the individual's' effort. Exploration of experience of energy expenditure is also to be extended, based on the unequal effort potential of mobile individuals (Sawchuk 2014). Following the perspective of Illich and other scholars, and in order to have an assessment of the relevance of effort as an integral part of the mobility experience, in collaboration with sub-project A team, we have looked for traces of effort within the discourses of inhabitants using the biographic interviews conducted by sub-project A.

Interviews

Within the post-car world research, sub-project A[3] that had the mission to look into inhabitants' expectations conducted 53 interviews with the inhabitants of the centers and peripheries of three agglomerations of Zurich, Lausanne, and Geneva in Switzerland in 2015. The choice of having inhabitants from different "gradients of urbanity" (Lévy 1994) was to reflect the widest possible range of mobility practices in different urban conditions. According to the federal mobility survey in Switzerland within these three agglomerations, in a consistent but modest trend during the last decades, the share of walking and cycling has increased. I have previously discussed the case of Lausanne and Geneva, for example, in the city centers, that families are increasingly abandoning cars; four families out of ten now move around without a private car and nearly 50% of the trips are carried out by walking. However, in the extended territories between the cities, and as we move further from the centers, the number of car-less families drop, to less than one household per ten in areas classified as peri-urban. However, despite the prevalence of car ownership in these low-density areas, the modal split of walking has increased from 16 to 28% in canton of Geneva and from 21 to 27% in canton of Vaud between 2000 and 2010[4].

[3] The interviews were conducted by Alexandre Rigal in collaboration with Dominique Kühnhauss and Jade Rudler.

[4] Micro-recensement Mobilité et Transports; La mobilité des Genevois et des Vaudois, EPFL (Ecole Polytechnique fédérale de Lausanne) Transportation Center and Observatoire Universitaire de la Mobilité UNIGE (2012).

These semi-directive interviews (Table 1) probe the mobility experiences of these individuals, their daily practices, their attitudes toward active mobility and their projections and aspirations for their future mobility. From the very first interviews, the topic of "effort" emerged and demonstrated its relevance in the experiences of mobility–without any incentive from the interviewers. The analysis of inhabitants' discourses revealed that effort is not always a negative experience; we identified three different approaches to effort that we will discuss in the next section.

Gender	*Women*		*Man*
	16		32
Age	*Under 25*	*25-54*	*54-91*
	12	24	12
Place of Residence	*Urban centers*	*Urban peripheries*	*Small localities*
	24	16	8

Table 1. Interviews.

Effort: a threefold approach

We have identified three complementary approaches to describe the variety of experiences of effort by inhabitants: first is the tendency to minimize effort; second is the distraction from effort, as a strategy to make it more tolerable; and third is the search for motivating and forming effort – entraining effort.

1. Minimizing effort

Man does not like to work – neither muscle work, nor brain work [...] I am almost tempted to say that the habit of working is one of the most striking phenmena of human psychology.
(Ferrero 1894, 177)

Some authors of contemporary discussions on effort (Ferrero 1894; Zipf 1949), both mental and physical, state that effort always tends to be reduced by the individual[5]: it is the "principle of least effort" as formulated by Ferrero (1894). Ferrero was the first to express repulsion for effort in the form of a law that refers to traditional conceptions of labor as punishment, which can refer to the Judeo-Christian[6] or Greek traditions[7], among others. With such a conception of effort we might conclude that it can only be enforced rather than encouraged, and thus, at best, it ought to be minimized. The search for efficient human existence also emerged in modern architecture during the early twentieth century, with the house for minimum existence – *Existenzminimum* – and the exemplary Frankfurt kitchen in Ernst May's social housing project in 1926, designed not only to respect the floor area constraints but also to minimize the number of steps needed to work in the kitchen (Urbanik 2012).

The principle of least effort informed the utility-based models that have been the dominant framework for understanding people's mobility behaviors and modal choices (Lucas, Blumenberg, and Weinberger 2011). Since the car has for decades represented the ideal of "effortless" mobility, attempts to provide and promote alternative systems have had to compete with this ideal. Thus, "modal shift" strategies, beginning in 70s and 80s, were generally very much centered on the limits of acceptable effort; walkable

[5] The French philosopher Guillaume Ferrero put forward the principle of least effort publishing about it for the first time in an article in the "Revue Philosophique de la France et de l'Étranger" in 1894. About 50 years later, this principle was studied by American linguist, George Kingsley Zipf, who wrote *Human Behaviour and the Principle of Least Effort: An Introduction to Human Ecology*, first published in 1949.

[6] "Therefore the Lord God sent him out from the garden of Eden to work the ground from which he was taken" (Genesis 3:23).

[7] The Myth of Sisyphus is one of the variants of a labour acting as painful punishment.

distances, pedestrian pockets (Calthorpe 1993), and preoccupations with the "last mile" problem in transit oriented development.

This approach to effort in mobility can also be traced in the arguments of the inhabitants that we have interviewed. Some of the interviewees have expressed a willingness to minimize their efforts – they spoke of their "laze" when it comes to travel, especially walking.

Valentine "If I'm too lazy to walk, I'll take the bus. It takes the same time. Its just reluctance to walk; laziness!"

Lara "I should confess, I overuse my car, even for short distances of 5 minutes. I am too lazy to walk."

Philippe "When I oversleep or I feel lazy, then I'll drive."

Some of the interviewees even used precisely the phrase adopted by Ferrero – "the least effort":

Anna "No, for me the least effort possible! Because of my general health condition, cycling is not an option for me – it is too demanding. An electric bike is possible though!"

François "I think we are lazy here, look at the Swiss German part, look at people in Bern or I don't know – take the Netherlands, for example. They are cycling all the time, in all weather conditions. I once told a friend of mine 'the weather is bad, are you sure you are taking the bike' she responded in German: 'There is no bad weather, there are only badly dressed people.' And it is true!"

Others even go so far as to wish for "teleportation" technologies – the extreme proposal to reduce the effort exerted for traveling.

Lara "Teleportation – to be able to travel around, from A to B, by just blinking an eye – that would be perfect."

Aymeric "In the distant future teleportation could be the means of transport."

These commentaries clearly express the tendency for "the least effort" in inhabitants' discourses, wishing for mobility without "travel" that etymologically derives from *travailen* from Old French *travail,* meaning; "labor, toil, or painful effort", originating from *tripalium* that was an instrument of torture[8]. However, the least effort approach appears too narrow, and too rigidly categorical, to effectively represent the variety of practices and experiences of mobility. The overgeneralization of the thesis that individuals try to reduce their different costs of travels – money, time, effort – can be criticized. As Metz (2008) strongly questioned the traditional focus on travel time savings in transport economics and transport modeling. We can address the experience of effort following the same critical approach. Time and effort are related as time measure is often needed to apprehend effort experience (Tuan 2001:129)

2. Distracting effort

> *A mile is 2,640 steps to go. Slogging through it, counting each step might seem a long mile, but if the person is interested in what he is seeing, thinking, or talking about with a companion, a mile will be hardly a distance at all.*
> *(Sussman and Goode 1980:80)*

A second way to deal with effort is to divert attention from it. This approach also tends to regard effort as a negative experience, and consists in distracting the inhabitant from the inevitable experience of effort. It accepts the principle of least effort, and suggests tolerating it with entertainment. As it is proposed by Sonia Lavadinho in her work on ludification, or "enchantment of walking" (2011) the experience of walking can be transformed by the provision of new affordances and distractions.

The question of "enchantment" was also at the core of Situationists' derive (Debord 1959), and was present in Henri Lefebvre's reflections (Lefebvre, 1968:154), engendering new approaches to urban projects and influencing contemporary ideas on urban planning and architecture – leading to an exploration of the potential of public spaces in the ludic city (Stevens 2007). In a more pragmatic approach, ludification is at the service of mobility, and by "bringing pleasure to walking, makes inhabitants to walk 10, 15, 30 minutes more than usual without even realizing it" (Lavadinho 2011). Such reflections conceptualize distracting spaces in which effort is not sought or valued, but is better endured. If "the least effort" is obsessed with measures and quantities in order to minimize them, distraction aims at blurring the metrics, forgetting the effort.

Distracting effort was also present in the interviews, when certain qualities of the

[8] From Online Etymology Dictionary, and *Le Trésore de la Langue Francaise*.

environment provide distraction from physical activity. Inhabitants mentioned the scenery compensating for their effort – for example, seeing Mont Blanc, or lakeshore landscapes, or listening to music for distraction or relaxation, and even inventing interactive games with the context:

Marcello "I don't mind the traffic; it is almost like a game for me. I know very well that crossroad down there, the different phases of the traffic light and everything."

Such remarks validate a different approach to effort that we call distracted. Within mobility studies and urban projects this approach to effort is the most common one, especially in terms of creating favorable environments (see Owen et al. 2004; Lavadinho and Winkin 2009). These two visions – the least effort and distracted effort – postulate effort as a negative experience that is to be reduced or concealed. In the next section, we introduce a third way to deal with and conceptualize effort, with evidence from our interviews.

3. Entraining effort

> *The effort is toilsome, but also it is precious, more precious even than the work it produces, because thanks to it, one has drawn out from the self more than it had already. We are raised above ourselves. This effort was impossible without matter, by the resistance matter offer and by the docility with which we endow it. It is at one and the same time obstacle, instrument and stimulus. It experiences our force, keeps the imprint of it, and calls for its intensification.*
>
> *(Bergson 1920:28)*

"Effort as mere strained activity is not what we prize" (Dewey c1913:46). But is there an attractive effort, the type of effort whose experience is positive? A third perspective, one that seems more fruitful in the context of active mobility, links effort to stimulation. The required effort in previous approaches is taken as an obstacle to the achievement of a goal – in this case, in a trip from point A to point B. However, effort can be also considered as a rewarding experience, even perceived as positively stimulating. This type of effort results in the further development of skills that facilitates making more effort. Peter Sloterdijk calls this type of effort "exercise" or "practice", building on a trend of thought that goes back to the exercises historically suggested by the Stoics. Practice is defined as any operation that provides or improves the actor's qualification for the next performance of the same operation, whether it is declared as practice or not (Sloterdijke 2012:4).

To speak of efforts that can be "practiced" as described above, we propose *entraining* effort –borrowing the term from French, entraînant. On the one hand, it implies an engaging and stimulating character, and on the other, it suggests a process of training and improvement of skills, as in the *entraînement* (French) of an athlete. A trained walker or cyclist "is able continually to attune his movements to perturbations in the perceived environment without ever interrupting the flow of action, since that action is itself a process of attention" (Ingold 2000:415). Moreover, in biomusicology entrainment refers to the synchronization of organisms to an externally perceived rhythm, as the walker modulates his effort according to the ground on which he treads. Entrained active mobilities follow a rhythm freed from timetables and measured durations, "generating a sense of autonomous movement and speed" (Urry 2013:113). Entrained body rhythm is in opposition with clock time, following an incorporated rhythm of another kind (Lefebvre and Régulier 1985). The cyclist or the walker does not live in the same "sea of rhythm" (Hall 1984:170) as the conventional commuter. The specificity of the entrained movement is that it allows omitting time during the exertion of effort (Lefebvre and Régulier 1985).

Interviews show that entraining efforts are particularly attractive in the today context of mobility. However, in the case of trained walkers or cyclists who have attained "ease" in practice, it becomes more difficult to trace the notion of effort in their arguments.

Despite the fact that the notion of effort emerged less in conversations with more active or trained inhabitants, we could find expressions of the ease and comfort they had attained in their routine daily activities. Valuing the well-being that results from active mobility, they acknowledge the benefits of it, particularly in terms of the physical fitness that facilitates and enables more active mobility in a virtuous cycle.

Francois "I love walking in Lausanne. When I get there, the first thing to do is to take the steep road *Petit Chêne*. People say 'it is too steep, we'll take the metro,' but I love climbing up it."

Question "So, you walk 20 minutes to the train station, then take the train and afterwards walk for another 15 minutes, is that right?"

Marianne "Exactly. And doing that, you've done your daily sport."

Therefore, for many the commute walking (or cycling) can conveniently replace "fitness" activities. Some of the interviewees, refered to effort even as an attraction in itself.

Denise “I have always been attached to my bike, since I was 17. Once I received a moped as a gift, and I sold it to buy a bike. I used to get bored on the moped – it is boring to simply sit there. I need to move! Since then, I have always had a bike.”

And it is even favored as a means of avoiding other disturbances.

Denise “Biking takes me 15 to 20 minutes. I do not take the most direct road, unless I have an appointment or I am late and really in a hurry. Then it will take me only 8 minutes. Otherwise I prefer the detours.”

By proposing effort as an axis of change, my objective is to underline the benefits of attractive effort and propose strategies to engage them in promoting active mobility. Further, considering the three approaches to effort can inform the design and planning of spaces that not only optimize effort, but also encourage and value effort, cultivating the skills for practicing it (Fig 2). In the following section, some general considerations about effort are presented that we can observe transversally in all three categories.

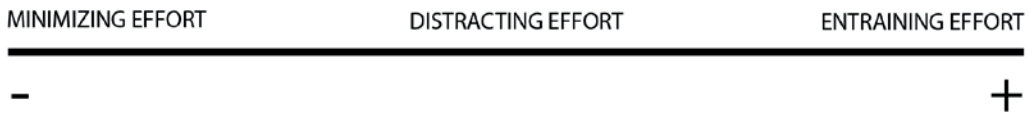


Fig 3. Three approaches to describe effort experiences.

Effort, general considerations

We have seen above that while some interviewees tried to minimize their physical effort as much as possible, others revealed positive attitudes for physical activity and for integrating that in their daily mobility.

- Budget for effort

However, effort seems to be compensatory, in that once having spent a certain effort "budget" in sport activities, one is less likely to opt for active modes of travel. The challenge, therefore, manifests itself in attracting and integrating sportive efforts into mobility practices.

> Question "Do you walk to work?"
> Massimo "No, not really, I already do sports."

- Tolerance

Moreover, effort is subject to limits of tolerable intensity and this varies in different individuals. Time measurement is often used to describe these limits; the maximum time of continuous walking in our interviews –within daily mobility and not considering the recreational walks– was nearly 30 min (one hour of walking round trip). This corresponds to the general idea of the constant travel time-budget of approximately one hour –regardless of the mode– as proposed by Zahavi (Zahavi and Talvitie 1980).

Pierre "I think 30 minutes is the maximum. I am not sure if I would do more. It is like one hour round trip. Given the fact that I have to study and all, there is not so much time left. I think one hour is already a good investment. And more than 30 minutes walk, I don't think so. Same for the bike."

Some individuals develop personal strategies for an economy of effort, as well as dealing with concerns like sweating caused by physical effort. That can inform design of facilities in urban spaces as well as personal devices like comfort predicting technologies.

Dominique "I have plenty of tricks not to get tired. When the road is too steep, I get off my bike and push it. I stop before starting to sweat … I take my time."

Denise "I don't sweat too much, and I dress in layers so that I can take them off as I go. I have my basket. When I arrive not much is left usually. [laughs] I dress in layers, that is my strategy. At the beginning, I like to feel warm a bit, then I take things off, I mean in the winter."

Pierre "Going downhill is fine. It is important not to sweat a lot when we go to work, or not to be disgusting when it rains. Here at work we have showers, and I have a backpack with some clothes in it, so it's fine."

- External triggering

The willingness for the active mobility had increased in a virtuous circle for some of the interviewees; however, it is often started by an external trigger like the price of public transport. As in the case of Pierre, 25 years old student whose initial motivation for switching to walking was a rise in the metro fare, while now he values walking beyond any financial criteria.

Pierre "In fact I've just rediscovered walking and this trajectory – at the beginning it was for financial reasons, when I stopped taking metro, and now it is more to do it. I do it because it makes me feel good. So it takes me 25–30 minutes to walk."

So far, we have shown the complexity of relations to effort, illustrating that exclusively "least effort" approaches can insidiously result in lowering the limits of tolerable and preferable effort. Nevertheless, a quantitative study of durations of bearable efforts, according to the three types explored above, can further inform design and planning of spaces. In urban and architectural projects, often the question of "effort" induced by mobility is neglected. Yet these projects all implicitly involve situations that could engage and develop physical efforts (e.g. slopes, staircases, cobblestones, etc.) –but most often responded with solutions of minimizing effort such as escalators, lifts, moving walkways. However, this is changing through the renewed attention to the physical activity for health concerns[9]. The US government, for example, in early 2000s initiated a national health campaign targeting *100 small step* lifestyle changes to combat obesity. Small Step number 67 advocated the use of staircases instead of escalator usage in public settings (Dolan et al. 2006). This prompted a series of studies on the use of staircases, suggesting that physical improvements, legibility, signage, and even music may increase physical activity and the use of the staircases among building occupants (Kerr et al. 2004; Dolan et al. 2006; Nicoll 2007). There is, therefore, a need for explicit consideration of the experiences of effort inevitably linked to any spatial proposal – even more so when these spaces are supposed to increase the prevalence of active mobility.

[9] Although the link between physical activity and longer life expectancy is not new (Paffenbarger et al. 1986) seeking solutions and encouraging it through built environment, in the city and with the architectural design is.

Spaces of effort

Taking a pragmatic approach to mobilities design (Jensen 2016), particularly through the exploration of the concept of effort, building upon existing theories on one hand, and looking into inhabitants' practices on the other, lead us to propose a threefold approach to urban spaces in order to encourage active mobility: spaces that accommodate and encourage all levels of effort. These three are complementary and together provide optionality:

- Reducing the required efforts through efficient, permeable street networks that guarantee the connectivity and continuity; creating an urbanity that integrates topography and permits an economy of efforts toward human scale amenities and mixed activities; to move from distances and required efforts for overcoming them, to proximity and accessibility.

- Ludification of spaces, where active mobility is taking place, or is planned to take place. As we have seen in the evidence from interviews, the fastest and the most direct roads are sometimes avoided in favor of more attractive ones. According to Gehl (2010), who has worked extensively on liveable cities where walking and cycling take primacy , the qualities that attract walkers and engage passers-by are, above all, are engaging and stimulating facades. "Soft edges", are active facades with doors, niches, plants, shops, distractions and entertainments corresponding to the stimuli that humans need at fairly short intervals of four or five seconds (Gehl 2010:77–79) . Thus, attractive and active paths sustain more walking effort.

- Explore and encourage entraining efforts. That is to say, efforts that train and develop skills by virtue of which more effort is encouraged and such efforts are more fully enjoyed. The challenge then lies in providing stimulating spaces of training, spaces that invite the development of skills particularly related to walking and cycling. I will explain this point further in the following.

The outcomes of our interviews confirm the positive attitudes of some of the inhabitants for physical effort, namely coming from their intrinsic motivation for well-being and fitness. However, there is also a certain amount (budget) of effort, which, having once been spent on one activity (in the gym or daily jogging or promenade running) people are less likely to invest further effort, to take the stairs or walk to work, for example. Until now the primary challenge addressed by active mobility has been to take advantage of the daily commute to tackle problems associated with inactivity. I argue that it is possible to re-conceptualize the effort exerted for attractive sport activities as

an opportunity for active travel simply by integrating them into the inhabitants' daily commutes.

In her book *A History of Walking* (2001), Rebecca Solnit associates the suburbanization trends of the first half of the twentieth century with the emergence of gyms as its corollary, as compensation for outdoors that were ceasing to exist. "If the suburb rationalized and isolated the family life, gym did it for exercise" (Solnit 2001:260). "And the most perverse of all the devices in a gym", she writes, "is the treadmill: a device with which to go nowhere in places that there is nowhere to go" (2001:264). In the context of reversing trends in cities from car urbanism to proximity, walking, and to lively outdoor public spaces, can we expect the gym and the treadmill, which is merely a simulated walking surface, to open up to the city and make it a more active part of urban life and urban mobility?

In the recent transformations of cities, urban spaces that have become important axes for training, apart from urban parks, are often linear public spaces; promenades, waterfronts, and greenways creating shared spaces traversed at different speeds, where the only modes excluded are motorized transport. Many revitalization projects have recently created urban axes that, having previously been dominated by cars, are transformed to host a variety of activities and become engaging public spaces. The banks of the Rhône River in the city of Lyon, for example, were converted from an enormous riverside parking lot into a continuous linear park of 5 km, stretching between two urban parks. It provides paths and places, and attracts various modes of mobility: skateboarders, bicycles, rollerblades, but also runners, brisk walkers, wanderers, or strollers, both as individuals and as groups. Berges du Rhône, or other comparable examples have become great recreational destinations in cities, hosting a variety of activities. However, these are only occasionally used explicitly as mobility infrastructure, and they often remain fragmented spaces, islands of effort.

Other examples, like recent conversions of highways to linear parks in Seoul, South Korea, for their strategic position and successful junction with public transport–one close to the central business district and the other passing by the central train station of the city–are more integrated into the system of mobility and are used as a pedestrian axis for inhabitants. Nevertheless they remain fragments in the extension of the metropolis area.

In order to engage and merge attractive effort in daily commutes, and thus, to effectively move toward prevalence of active mobilities, as extracted from the discussions with

the experts, these spaces have to form an ensemble, an interconnected network of "soft infrastructures" providing generalized accessibility throughout the city. An example of such extended network that takes seriously the walk as a means of transport is Alfred Peter's pedestrian scheme for Bordeaux, where the extension of the proposed path is not limited to the city center and goes beyond conventions of pedestrian roads. Another example is the city of Hamburg that plans for an extended green network – *Grünes Netz* – to extend throughout the city by 2030. Capitalizing on the existing green areas in the city, Hamburg is planning to create an extensive 70-km network of bike and pedestrian greenways to interlink these green areas, as well as connecting them to the outskirts – making it possible for inhabitants to move throughout the region without relying on a car. Thus, in order to profit from attractive effort in the service of daily mobility, urban spaces have to constitute interconnected pathways – and linear spaces – that also incorporate existing public places and popular destinations, punctual and imageable monuments–going beyond enclosed public places and fragmented promenades, toward a recognizable network.

Characterizing these pathways as axis of effort and equipping them with facilities tailored for the particular needs of such mobility (adapted surfaces, bicycle services, rest areas, or stations for refreshment and hygiene) encourages the integration of attractive efforts into daily mobility.

In order to highlight and value the exerted effort, one possible approach is to measure and visualize the physical performance. For example, one of the accompanying projects of Grand Paris Express envisions an "athletic route" connecting the future metro station, La Courneuve "Six Routes" to the two parks in the neighborhood; *Georges-Valbon* and *Marville* proposing radars to be installed along the course to allow athletes to know their performance in real time[10].

However, a narrowly predetermined and highly structured circulatory network contradicts the very nature of walking –its spontaneous and serendipitous character, which was also attested by our interviewees as an appreciated quality. Entraining spaces for active mobility, therefore, should not be conceived of merely as networks of transport, providing links between places, but rather as permeable linear spaces that enable

[10] The project is a winning entry of the competition launched by Grand Paris Express calling for innovative projects for new *active, digital and electric mobilities* (*projets innovants pour de nouvelles mobilités actives, électriques et numériques)*: https://www.societedugrandparis.fr/wp-content/uploads/2017/06/fiches-laurats-grand-paris-des-nouvelles-mobilits-210617.pdf

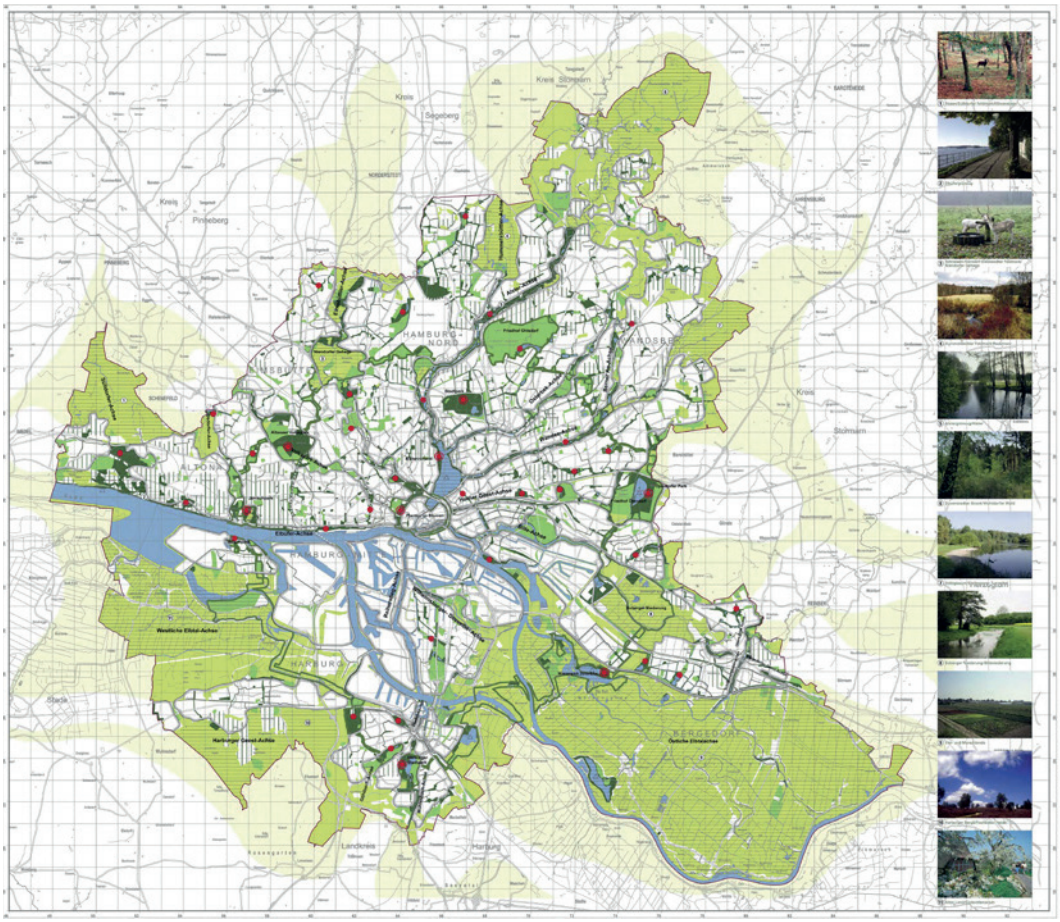


Fig 4. Grünes Netz Hambourg, 2010
© Hamburg Stadtentwicklungsbehörde.

diverse activities and relate them with mobility flows. These spaces should incorporate the architectural body of the city, creating a porous fabric by interpenetrating built and unbuilt, activity and building, in courtyards, arcades, and stairways[11].

In Lyon, there exists another type of path conducive to active mobility, called "traboules", which reduces the distances, by passing through buildings and other material obstacles. Traboules, from Latin, "trans ambulare", means "passing through". These open corridors through the architectural volumes increase the porosity and thus, the diversity of possible routes – the built fabric is pierced by public channels that are reserved for pedestrians. The example of Lyon shows two qualities necessary for spaces to effectively accommodate effort. First, legible and imageable promenades and boulevards, hosting diverse speeds and activities, like Berges du Rhône. Second, a meshwork, rather than a conventional linear network (Ingold 2007:63) of paths, passing through the built fabric, that confers porosity to the built space that is then no longer an obstacle. While in the case of Lyon, these two types of spaces do not superimpose, Peter's scheme for Bordeaux, tries to support the main axis, the X shape, with a secondary, more refined mesh of pedestrian links organized around existing or proposed small centralities. While the networked city tends to correspond to the ideals of minimizing effort – in which the trips are made from one point to the other in the shortest time – the city of meshworks consists in the creation of varied spaces, valuing not only the departure and arrival points, but also the varied experiences of travel for itself and by itself. What was formerly obstacle for efficiency can become positive stimuli for attractive effort; a steep road, an extended path. The city of entraining effort, thus, shapes and is shaped by the interlacing lines of walking and cycling routes engaged in a concertof effort sustained by spaces that elicit the "practice" of active mobility.

[11] Walter Benjamin introduces the concept of porosity in a text on the city of Naples co-authored with Asja Lacis. They repeatedly employ the adjective porous to describe the city both in its architectural arrangements and its city life: "As Porous as this stone is the architecture. Building and action interpenetrate in the courtyards, arcades and stairways. In everything they preserve the scope to become a theatre of new, unforeseen constellations…porosity results not only from the indolence of the Southern artisan, but also, and above all, from the passion for improvisation, which demands that space and opportunity be at any price preserved" (Benjamin 1986:166). Bernardo Secchi and Paola Viganò take porosity as the relation of built and unbuilt space in the city, void and solid (Secchi and Viganò 2011).

5.2. Agility, the case against slowness

Decorticating the car-pedestrian oppositions, formulated during the last century, I argued in Chapter 3, that the oppositions have strongly shaped the theoretical debates, urban projects and urban visions of the car age. Demonstrating the dynamic character of polarities, I discussed the shifting values that have changed through the car history, taking us in their most recent episode to what we have referred to as "weak signs of change". This characterizes the transition that was discussed extensively in Chapter 4, moving from car dominance towards alternative systems, from dichotomies towards new coordinates, new sets of values that soften the oppositions by introducing new gradients between the poles. In the following, proposing a brief overview of the age-old opposition of speed and slowness, I discuss a series of concepts that have challenged the rigidity of such duality. Further, drawing on the outcomes of interviews with experts and the focus group, I argue against the concept of "slowcity". Finally, I introduce the notion of *Agility*, showing by spatial examples and experiences of cities, what could be an agile city and the possible advantages of such reframing.

Beyond distance/time relation

Speed of travel (slowness itself being a speed) has been so far, a determining element of politics of mobility (Cresswell 2010) and has informed urban schemes, visions and mobility policies. Speed as a criterion of comparison between pedestrian and car –as the basis of an absolute measuring unit– significantly influenced functionalist planning during the twentieth century (e.g. urban expressways, bypass highways, etc.). In Chapter 3, I traced a path from the excitement for speed to critiques of hyper-mobility and pleas for slowness, to more recent approaches that go beyond the distance-time relation and focus on accessibility.

La règne de la vitesse, and its euphoria soon encountered its limits, facing congestions as byproduct of proliferation of car and the induced distances as corollary of car infrastructure, it started a comedown that has yet to be over. As we know, despite the critics on accelerations, the fervent development of car infrastructure continued. These critics, however, gave rise to projects for slowness, parallel and separated from spaces of speed. Buchanan (1963), for example, in his report, is not concerned with a genuine reduction in total number of cars and restrictions on car mobility. Rather, he seeks practical solutions for the future that both contains environmental areas for pedestrians and foresees the future demand and therefore guarantees fluid and efficient car mobility. "Accessibility" is defined in Buchanan's report as "ease of access for vehicle users", and the two main requirements for good accessibility are detailed as first, the ability for vehicle

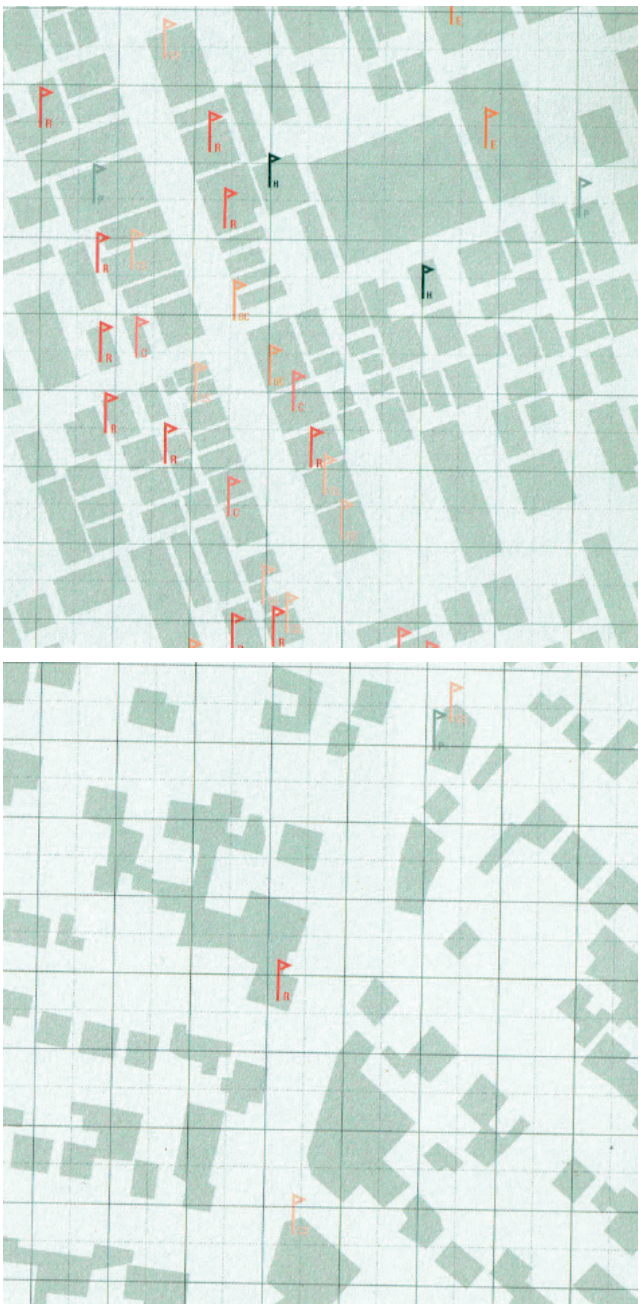


Fig 5.The comparative schemes of urban fabric of Tokyo vs. Paris done by LIN could be interpreted as a comparison of the contextual speed within these two contexts. The monotonous residential fabric in Paris renders it 'slower' comparing to that of Tokyo. (Geipel, Andi, and Laboratory for integrative architecture and urbanism 2009).

users "to move from one part of city to another in safety, with reasonable speed, directness, and pleasantness from driver's eye view" and second, the ability for the driver "to penetrate without delay close to his final destination and to stop there without restriction" (Buchanan 1963:39). While in Buchanan's description there is an emphasis on the quality of the experience, the notion transforms into a quantifiable aspect of travel and becomes a key concept in urban and transport planning (Koenig 1980).
Defining accessibility as "potential opportunities for interaction" (Hansen 1959) car became a substantial instrument for accessibility gains as it can reach more and farther destinations. However, by increasing distances and reducing densities, as territorial consequence of car, the overall accessibility gains are cancelled and car mobility becomes identified as "mobility without accessibility" (Farber and Paez 2011).

More comprehensive account of mobility, taking into consideration both social and spatial mobility, and not limited to actual but also potential displacement was introduced under the notion of Motility. Motility was defined as the capacity of the entities to be mobile, taking into consideration their access to different options (range of means of transport for example), the competence of the mobile entities (or potentially mobile) and how they act upon these possibilities and options (Kaufmann, Bergman, and Joye 2004). Further, mobility is increasingly understood as creation of links, opportunities for synergies rather than overcoming distances. In this context, Amar (2010) has introduced the notion of *Reliance* as the new value of mobility that goes beyond the distances covered, rediscovering the value of relations with people, places, and activities.

New conceptions of mobility redefine the notion of speed. Lévy in *Ville pédestre, ville rapide* (2008) proposes the idea of *Contextual Speed*, that is access to people, places and social realities rather than movement through space in time. He asserts that a pedestrian in a dense and diverse city that favors pedestrian metrics is "faster" than for example a driver speeding up in a highway, that is to say the pedestrian has access to more relevant social realities. In a contextual approach, therefore, the urban masses, linked by "mobile" elements become a variant of their speed. In Lévy's conceptualization, one sees the advantage of being a pedestrian in the city (as opposed to accelerating in the highway) but it also confirms the necessity and inescapability of higher speeds in lower densities.

Denouncing the speed-slowness opposition and accusing the current "praise of slowness" as a helpless eulogy for the triumphing speed, Amar (2014) proposes velocity: "Velocity is neither slow nor fast". Comparing velocity with speed, he explains that the rapid movement traverses, or transcends the territory while the "*veloce*" movement

experiences (and sometimes suffers) the air, wind, climate, shade and sun, and perfumes of the territory[12]. Velocity is "movement accompanied by sensations" that he exemplifies with bicycle, deliberately questions the categorizations in urban projects in which bicycle is considered a "slow" mode.

Travel time matters

In response to the proposed future post-car scenarios during the focus group the question of speed of travel and in general the pace of life was raised several times. I described the various positions of different actors, associating quality of life with slower paces of travel, others seeking rapidity and connectivity. Given that in both groups no-car life-styles exist, this observation suggests dissociation between speed of travel and car mobility.

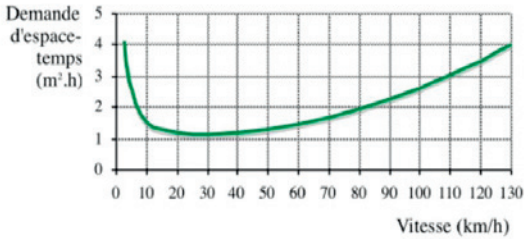


Fig 6. Time-space requirement of the car according to its speed (Crozet 2016)
Around 20-40 km/h = minimum of space-time requirement.

Despite discourses on the virtues of slowness, and encouragements for slow modes in public discourses and as a strategy for modal shift since a few decades, many are still prompt to reduce their travel time[13] even by paying extra fees (Binder and Ravalet 2017). We have seen during the focus group that even for multimodal individuals who live in the center and have the capacity to choose between different modes, car is a rational and recurrent option when it comes to particular destinations, like attending a volleyball club in Morges. Travel time matters and if the choice between modes is between a 20-minutes car trip to Morges and much longer travel of several passages between bus and train and another bus with waiting times in between, then most often

[12] My translation from "le mouvement rapid traverse, voir transcende, le territoire; le mouvement véloce rencontre le territoire, l'aime, le goûte, le caresse. Le mouvement véloce éprouve (et parfois souffre) l'air du temps, le vent, le climat, l'ombre et le soleil, les parfums." (Amar 2014:72)

[13] An international survey on aspirations linked to future lifestyles and mobility (Forum de vies mobiles) reveals that more than 60% of the interviewed individuals consider that their life rhythm as too fast and they aspire for a slower pace of life in general. While 50% of them declare that they lack time for doing everything they wish to accomplish, which explains the general tendency to value time and opt for transport modes that save time. Although we know already that the gained time with faster transport means is usually spent on conquering more space rather than saving time (L'obervatoire société et consommation 2016).

car is chosen over other options. This individual (Marcello) who conducts his daily routine without car, owns a car, as he says, for "liberté de mouvement", suggesting that with the extended waiting times in schedules and correspondences between different modes the sensation of "liberté" is limited.

In conversations with experts the emphasis was on re-organization of the city's time-space; redistribution of urban surfaces and right of ways between different modes, that is envisioning new rhythms for the city in the perspective of emphatically distancing from car. Alternatives with different temporalities –tram, bicycle, pedestrian, and even car– were imagined in a regular and regulated way, emphasizing not on reduced times, but on reduced variations of time, that is mastering time with a reliable mobility system. Mastering time and the value of travel time refer also to the increasing number of activities that are possible to combine with one's trip, enabled by telecommunication advances and the increased comfort of the public transport.

Experts, moreover, emphasized on the necessity to rebalance the city through a redistribution of space and time between different modes. A commonly proposed solution to this end was the much-debated topic of generalized speed limit for cars in the cities, which was proposed by the experts and was positioned against the creation of separate slow zones. The generalized speed limit, however, has to be interpreted as a possible solution for a more efficient use of space, since as demonstrated by Crozet (2016) the flow rate (débit) peaks around the 30km/h. Hence, the speed limit helps avoiding congestions and consequently increases the speed of the city in general rather than being a proposal for slowness.
In other words, a walkable bicycle-friendly multimodal city that in addition sets a general speed limit for the circulation of cars is by no means a "slow" city. Limiting the absolute speed of car (one among many modes) –which is also more probable to increase the overall efficiency of the vehicular traffic rather than genuinely increasing the travel time– is emancipating all other modes, giving them time and space. "Slow city" terminology is deeply rooted in car paradigm, since the city as described above is only "slow" comparing to a car city that does not exist any more.

***Agility* a new Quality for travel**

In a contextual approach the access of the moving element to people, places, services and social realities, rather than merely the distance covered in a given time determines its "speed". By reduction of the density of the environment and decreasing intensity of services and activities, for example as one walks from dense and diverse city centers towards the lower density urbanity, the contextual speed decreases. We have explored,

together with PCW's subproject B the potentials and viability of application of Accelerating Moving Walkways (Scarinci et al. 2017) as an intermediate metric between walking and riding bus in the zones of lower densities. Hypothesizing that while in the city center such infrastructure could create barriers to the spontaneous movement, characteristic of walks in the city, in lower densities, with longer blocks and within monotonous landscape could provide a credible active alternative (Bahrami 2015). Switching from walking to cycling as we move away from dense city center intensifies the environment by increasing the number of encounters with people, places, and social realities in a given time. Through the notion of *Agility* I argue that an essential quality is the capacity to switch smoothly between different speeds, adapting to the intensity of the context. It is this precise quality, emerging from an interrelation of the environment and the system of mobility that we can call *Agility*.

Agility is the quality or state of being agile, that is, having a quick resourceful and adaptable character; quick and light in motion (Merriam-Webster online dictionary), from Latin *agere*, sharing the Proto-Indo-European root, *ag-*, with action and agency[14]. In the context of mobility and within urban projects, *agility can be defined as the capacity to mediate between different speeds, depending on the context, in order to maintain the high access at every moment,* in other words ***continuity and smooth transitions between spaces, modes and speeds to best adapt the context***. Compared to accessibility that is an objective and quantifiable assessment of the accessible destinations, from a given point), agility is a quality of the movement itself (just as is speed) and acts upon travel time either by reducing or rationalizing its use. This is possible through a close responsiveness between the system of mobile elements and the urban and geographic context of the travel. In this perspective, design for agility and effort is by no means contradictory, rather they complement and reinforce each other. Integrating walking (and cycling) to the journey planning increases the efficiency of the trip. Optimizing itineraries in public transportation with walks between rides could can reduce the overall travel time (de Jonge and Teunter 2013).

Looking into the history of innovative projections for mobility, one can find similar ideals. For example, in ludic images of Walt Disney's 1957 futurist motion picture, exploring scenarios for future of mobility, it fantasizes the possibility to move around with a car and just getting rid of it at the moment where it becomes an impediment rather than an asset for the mobility. It pictures the future vehicle as an inflatable car to be deflated when necessary or disposable car, destroyed or thrown out at the end of each journey, liberating the most maneuverable and agile vehicle: the pedestrian (Kimball 1958).

[14] From http://www.etymonline.com/index.php?term=agility

The diffused character of shared infrastructures in the new systems of shared mobility provides, to certain degree such capacity. Free-floating car sharing or bike sharing programs get close to such ideals. The MVG bike sharing system in Munich, for example, enables the user to leave their bicycle wherever they want - at their destination or anywhere they happen to be when they choose to switch to another mode - without requiring that they look for a return station. Although such systems are criticized for being exclusive to smartphone users, as the booking system only works with an online application, it also suggests the potentials of the smartphone generation for supporting a transition from the existing car-based system.

Moreover, the passages between different modes could be facilitated with the presence of mobility hubs, in different scales traversing the individual, collective, fast and slow modes. This can range from larger scale of metropolitan and regional transport hubs to smaller centralities that bring together different modes and simplify the transition from one to the other. Munich has experimented neighborhood transport hubs in the city where underground station, tram, bus, car sharing (stationary+free floating), bicycle, charging station for e-car sharing, MVG, and taxi encounter.

An integrated approach towards agile transitions should consider all the passages of a trip that is from planning and ticketing to the journey itself. An excellent case of an integrated system, that could exemplify policies that target agility rather than speed, is Optymo network implemented in Belfort, a city in north-east France. The example was given by Alfred Peter during the interview, as mentioned in the previous chapter. Peter explained that the context of a medium sized city like Belfort, where usual space scarcity for cars is not a problem and lack of parking or congestion cannot motivate inhabitants' mode shift, alternatives in order to move away from car need to be strong, convincing and capable of competing with the private car. Optyma network, created in 2007 and completed in a second phase in 2014 and 2016, combines bike and car sharing with public transport system (bus and BRT) in a unique urban and suburban network. Different providers and management entities –public and private providers– in this case, unify in a single interface and offer a coherent service to the users. With a single Optymo card, and a post-payment system, the user has access to 102 municipalities by means of buses, bicycle services and free-floating car sharing. Therefore, many perceived inconveniences of multi-modality, in terms of tickets, tariffs, and schedules, are simply removed.

Optymo started with merely introducing new mobility services. In its second phase it was complemented with modification in the streetscape and introduction of road-diet measures, providing new urban setting. While the type of interventions, such as reducing the road width, changing the pavement, providing more space for pedestrian, are often associated with slowness in urban discourses, its purpose is by no means slowing down the flows. On the contrary, it aims at increasing the accessibilities and accelerates the flows of public transport and the correspondence between pedestrian, bus, bike, and car.

So far, reasoning in terms of accessibility (access to people, places, services and social realities) I have described agility as the capacity to move with the speeds that correspond to the context (in order to keep a high level of *contextual speed*) and therefore the capacity to smoothly change between modes and speeds. This implies an increase in the absolute speed when it comes to lower densities. However, as we have seen in critiques of the car, speed itself and its infrastructures induce distances and create territorial ruptures that ultimately result in more speed and less access. Therefore, we can hypothesize that increasing speed increases the intensity of the environment, provided that the acceleration itself does not subsequently de-densify the context by its metrics. This entails that, on one hand, vehicles that maintain a high level of *adherence* to the immediate environment, on the other hand, providing an environmental context with intensities and diversity of activity, along the roads with *riverainté* (Brès 2015). Planning for agility, in lower densities, suburbs to peri-urban areas, in this sense, could be defined as searching the right balance between what the environment offers and the characteristics of the mobile elements. In the next section I will discuss such characteristics of existing and emerging vehicles that with an adequate reception in urban policies and urban spaces are likely to materialize a thorough change from car.

5.3. Plurality of vehicular units

Seeking solutions to motorization problems, the critics and acknowledged limits of the car system, as I described extensively in Chapter 3, launched in late 1960s an engagement in developing innovative solutions as alternatives to the private car and integrating them into future visions and urban schemes. Concerned with circulation problems in the center, many ideas were put forward to re-invent the two metrics of car and pedestrian. However, these innovations, the ludic and purposive vehicles that attempt to efficiently and opportunistically use the space of cities, choked by then with the presence of cars, disappeared from architectural books and urban reflections with the "interruption of future"[15] in urban projects and as the more decisive measures of modal shift from car took off in transport planning.

Within the vast gradient of introduced intermediate vehicles in this period, only bicycle, for its history and its solid place in the imaginary of the users reemerged successfully as a (potential) means of transport. After a drastic drop between 1950s and 1970s in bicycle's share of trips in many European cities (Bruhèze and Veraart 1999), it resurged by a collective will expressed through protests and critical masses as well as political and professional direction to include –even if marginally– bicycle into urban transport schemes (e.g. Ploeger et al. 1993). The extended inventory of vehicles proposed by Richards in 1976 is reduced down to four main categories in urban transport literature: public transport, automobile, bicycle, and pedestrian. Héran (2001), for example, compares the advantages of the different modes through these four entries and Lévy (2004) attempting to propose a more precise and differentiated categorization includes motorcycle and distinguishes between different means of public transport[16]. Today, however, we observe an indisputable presence of small hybrid vehicles that are positioned at the micro (niche) level of a process of transition and in the absence of recognition and integration into a larger system risk to remain as merely eccentric curiosities and ludic objects for spare time of the urbanites. In this section, to go beyond car-pedestrian duality in schemes and in our solutions, I explore the extended gradients that lie between car and pedestrian, arguing for the imperative for their recognition and integration, in the perspective of a transition from car. The set of properties we propose to analyze will render possible a comparison between the modes.

[15] Dominique Rouillard describes that the presence and prevalence of the "future" as a theme in urban projects in 1960s disappears between 1970s to late 1990s before reemerging in early 2000s (Rouillard 2009).

[16] Lévy's list include walking, bicycle, automobile, motorcycle, taxi, bus, tram, metro, train, airplane.

What is a transport mode?

I introduced earlier Goffman's notion of *vehicular unit* as a commensurable measure for studying relations in public and within different modalities of transport and their social conditions (see Chapter 3, body-machine section). Differentiating between vehicular units according to the thickness of their "shell", Goffman considers pedestrian as "a pilot encased in a soft and exposing shell, namely his clothes and skin" (1972:7). The shell metaphor as a unifying image, for Goffman, enables a comprehensive analysis of different modes. Spheric metaphor also has been commonly used among past and contemporary researchers to describe motorcar, referring both to social relations encompassed within car, and its physical features as an enclosed space.

Urry (2006), referring to the car, employs the terms *Cocoon* and *Capsule*, pronouncing the private character of its space and its atmosphere. Lofland, refers to it as "private realm bubble with hard shell" that allows its passengers to move through the public sectors of the city encased in a cocoon of private space". She lists the use of the automobile as one of the methods for urbanites to privatize public space and to reduce the complexities of living in "a world of strangers", which is her definition for public space. The automobile, she suggests, "makes it possible for one to encounter the city at the same time one is avoiding it" (Lofland 1973:136; Lofland 1998:88). Spheric representation of car, however, is not limited to the professional jargon of urban sociology and mobility; it reappears in inhabitants' discourses:

Thomas "La voiture ça fait bulle aussi, et moi j'aime bien ce truc de bulle. Après à pied je suis dans ma tête donc ça me fait bulle aussi." (from sub-project A interviews)

Nadine "Je me suis cassé le bras l'année passée, et j'ai changé de mode. Et je me suis dit *je sors de ma bulle ! Je ne suis plus dans ma voiture*. Et j'ai apprécié, j'ai vraiment apprécié." (from Focus Group)

The shell or *coquille* in French, was used to describe the spatial experience of inhabiting by Gaston Bachelard (2012). Car evokes home. It has been paired and compared with the domestic sphere for the inhabitable, intimate space it provides (Baudrillard 1978:90). Its image was promoted and its comfort was advertised as an extension of one's home. Shell, cocoon, capsule, and even one's home embody strongly the presence of a separation skin, the walls, creating a privatized atmosphere. The shell, therefore, distances and protects the pilot from the environment and from other vehicles. However, it also mediates the relations with the exterior. With the shell metaphor, Goffman (1972) underlines the fragility of the mobile individual, and the necessity of commu-

nication with other transport means at least for avoiding collisions. The shell mediates both separations and communications. Taking the examples of thick skin ships and submarines and contrasting them with more exposing vehicles like open cars, bicycles, and rickshaws, Goffman underlines that the more protective the shell, the more, on the whole, the unit is restricted to simple movements and hence to reduced flexibility and maneuverability of the vehicle.

Within Mobilities studies and more particularly automobility literature many have devoted their attention to this aspect of motorcar separating it from the surroundings as "speeding capsules of alienation" and generator of "social disconnections" (Nixon 2014; Freund and Martin 2007), resulting in harmful behavior such as road rage and a form of "alienation" from the environment as well as the others: ''the environment beyond the windscreen becomes an alien other'' (Urry 2012:63). Moreover, extending Goffman's sociological inquiries, more recent studies have considered the in-between experiences of vehicles like bicycle, motorcycle or convertible car, proposing a sociology of traffic that considers the other modes along with the cars (Conley 2012; Nixon 2014). The literature, therefore discusses the interior space of the vehicles, attesting that the shell is not merely protector from the exterior environment but also provider of an internal space, allowing emotions and activities that are not otherwise easily possible in public [footnote: "Within the private cocoon of glass and metal intense emotions are released in forms that would otherwise be socially unacceptable." (Urry 2007:128). This aspect brings us to the concept of *Spheres* as developed by Sloterdijk to describe the ensemble of social and spatial relations (Sloterdijk 2011; Sloterdijk 2014b; 2016). Such approach enables an assessment of vehicular units as atmospheric experiences, to which I will come back shortly.

Spheres: Separations-Communications

Goffman's exemplification of the shell–soft and exposing like clothes and skin of the pedestrian and the iron frame of the automobile–takes shell to be a physical material feature, varying in dimension but also suppleness and texture; from vulnerable human body, to the robust frame of the car. The physical material feature (skin), however, alone, is unable to describe the range of various experiences and particularly to determine the extent to which a transport mode is (dis)connected from/to its immediate environment. In other words the "thickness" of the shell, is not merely a consequence of its physical envelope. A car that slows down in the city softens its shell to some degree, or the speed of the bike rider is what principally distinguishes its experience from the pedestrian. While car has been depicted often as the utmost private space, it is also capable of creating meaningful social occasions of exchange and encounter when slowing down (Bahrami 2016). The physical envelope and the speed of the movement determine the

features of a vehicle's shell. They also impact the visual field and the soundscape, and together create the interior experience and shape its impact on the outer world. Accordingly, sharing the same speed and the rhythm of movement between two vehicles, for example two runners or bicycle riders results in what we can call *co-isolation*, unifying their shells, creating a common sphere. The capacity of co-isolating with other bikes was mentioned and appreciated by the cyclist in the focus group and was linked to the absence of car traffic or abundance of space reserved for the bikes.

Vehicular unit as a climatic experience[17]

Studies that focus on how the use of different vehicles shapes individuals' sense of energy use for mobility reveal "nuanced and tacit awareness of energy use within users of active modes" (Nixon 2012). So far, speaking of vehicles, I have not mentioned the energetic component, the source of energy for the movement and its consequent experiences, this is because on the one hand, my point of departure was reflections on the spatial relations of the moving bodies as well as the specific context in which they move, within the mass of different activities and services or their lighter arrangements and their distances. On the other hand, I already and extensively discussed the experience of *effort,* as an integral urban experience, which is in fact nothing but the experience of energy expenditure. However, before going back to the socio-spatial aspects of the vehicular units, I will briefly underline an aspect of the car's experience that is influenced by its shell, the interior sphere it creates, and its impact on its exterior environment.

There exist a body of literature that correlates drivers' inconsiderate behaviors and 'road rage' to the cars' cocooned character and its closure from the environment and other people (Taylor 2003). Similarly we can hypothesize that the strong separation of the vehicle, while increasing the immunity from the exterior world reduces the sensibility to the atmospheric conditions: temperature, weather condition, as well as the quality of air and pollution. While creating a sense of comfort, it also reduces the sensibility and awareness to one's environmental impact. In a car, or more generally in a strong shell, the earth is experienced as a surface to move on rather than a space of immersion and interaction (Ingold 2011:124). Without an efficient internalization of the exterior environment –for example through an indicator on the dashboard[18] or without being more often "outdoor" (Amel, Manning, and Scott 2009) there is a risk of being disconnected from the impact of our mobility choice. More than metaphors, therefore, *separations*

[17] This section was presented in Swiss Mobility Conferernce, Alexandre Rigal, Farzaneh Bahrami, *What is a transport mode? On cars, the senses and climatic experience*, 20 & 21 October 2016, University of Lausanne, Switzerland.

[18] For example the *ecoscore* screen on the dashboard of Car2Go cars evaluates and visualizes the style of driving, accelerations and decelerations, and its impact on the environment.

and *communications* of the shell shape and inform our mobility practices and choices.

Placing Vehicular Units

I have evoked the term *gradient* several times referring to the various vehicular units in a classification based on the thickness of their shell (physical envelope + speed), situating somewhere between pedestrian and car. By this gradient of vehicular units, I refer to the large spectrum of vehicles between man-powered small devices such as rollers, scooters, skate boards to the portable electrically-powered ones like Solowheels, kick scooters, and Segways, to cargo bikes, rickshaws, compact electric cars. The use of these vehicles becomes specifically evident on campuses, along the axes of *effort* (e.g. waterfronts, linear parks) and in specific events such as car-free days (fig: *Paris Sans Voiture).* They cover an extended range of speeds, from very close to the walking pace, reaching 30 km/h for the personal transporters and more for electric bikes or compact cars. Due to the advances of electric engines and their batteries they can cover long distances with the full battery. Their increasing practice and their market success might be indicators of their significance in the changing practices of mobility. Testimonies from public debates, media and online forums reveal an enthusiasm for their use specifically as a complementary method to combine with public transport and a solution for the last kilometers, but also a great deal of confusion on their codes of use and regulations, on roads and rights of passages (see for example Martino 2016; Schmuck 2015; Les Trottinettes Électriques Font Un Tabac - Le Parisien 2017; Piétons et Cyclistes s'opposent Aux Véhicules Électriques Sur Les Trottoirs 2014).

Some of these vehicles are classified under the mobility aid category, that is, to assist the movement of people with mobility impairment and therefore they are allowed on the sidewalks with pre-registration. Some others are allowed on bicycle paths within the city, yet others are unlawful to use anywhere other than on private property with the owner's permission. In Switzerland, after the long-time negotiations, new regulations facilitate their use by recognizing for example velo-taxi and Segway as a transport means that could share the road with cars and, use the bike lanes where available[19].
However, other devices with lower speeds remain outsiders to the realm of both pedestrians and cars. The lack of clarity of positions and regulations, which impacts inevitably practices, is perhaps linked to the underestimation of the in-between categories in urban discourses (and projects), and research agendas in mobility. In expert interviews of the previous chapter also there was an indication on the necessity of taking these vehicles into consideration and their challenge for the urban project calling for reorganization and reformulation of the categories.

[19] Office fédéral des routes OFROU, Assouplissement des prescriptions relatives à certains véhicules électriques: https://www.newsd.admin.ch/newsd/message/attachments/40242.pdf

The renewed attention to the velomobility and specifically e-velomobility research is introducing new horizons, proposing shift of strategies and policies towards more active and sustainable modes of e-mobility rather than the current focus on electric cars (Behrendt 2017). Another attempt towards recognition of the *in-betweens* has been the introduction of Ecomobility as a mobility paradigm that focuses on the integrated, socially inclusive, and environmentally friendly transport option. Ecomobility program proposed by ICLEI, (International Council for Local Environmental Initiatives) envisions the promotion of EcoMobile cities and has so far executed few congresses as well as two editions of Ecomobility Festival (2013, Suwon, Republic of Korea, Johannesburg, South Africa) which consists of the experimentations of a car-free neighborhood supported by various light electric or man powered vehicles all along one month. Seemingly, a place is opening up within the discourses on the city and mobility, considering the diversity of vehicles and practices. For example, a city near Montpellier, in France, offers public free-floating scooter-sharing for the inhabitants specifically destined to be combined with TER trains (Corréard 2017).

In a recent publication Rouillard and Guiheux (2016) focus on the future of urban vehicles, hypothesizing a rearrangement of urban and architectural spaces as the consequence of proliferation of *Vehicule Electrique Communicant* (Electric communicating vehicles). The *VEC*s as depicted by the authors correspond very well to the in-between category as I have defined above and seek scenarios for their integration and exploitation as an opportunity for the future of urban. They successfully demonstrate the advantage of such diffused accessibility (considering 15km/h speed for the vehicles) when combined with public transport through six case studies, within the city fringes and lower densities in different contexts. In Berlin area (Heinersdorf and Weißensee) which is the richest in terms of public transport among the case studies, the accessibility of the territory is increased by a factor of 1.74 while in Paris periphery (Plateau de Saclay) the accessibility is multiplied by three times (Guiheux and Rouillard 2016:76).

However, attempting to compete with car mobility and the 'door-to-door' ideal of car paradigm, Rouillard and Guiheux adopt a *least effort* approach. The vehicles become extensions of the bodies and create a perfect hybrid. Thereby, they reconfigure the exterior-interior balance by bringing the vehicles inside and extending their space of relevance. Taking the auto showroom (Le Salon de l'automobile) as a model for the space of encounter, they eliminate the parking space, integrating it to the extended interior of shopping mall. Considering the parking as a rupture in the process of mobility on one's way to the supermarket, for example, they take the VECs to the interior space of the mall. The street can penetrate into the building and continue to the upper floors. Thanks

to the ramps that replace the lifts, vehicles circulate in the building (with reference to *Lingotto*[20]), hence, an osmosis between vehicles and buildings is created (Guiheux and Rouillard 2016:141–145). This comfort paradise, however, acknowledges the necessity of physical activity and provides gyms in configuration of the proposed functions, often next to the parking place in the upper floors. The inhabitants of this urban future will probably walk even less than the residents of the car-oriented suburbia, who used to walk at least to the parking[21]. Depicted as such, vehicles entering the extended interior space, and adapting the interiors to the vehicles in distances, dimensions, and infrastructure is as if vehicles are about to transform the buildings as car once transformed the city, expanding and de-densifying, adapting it to the speeds and scales of another "vehicular unit" rather than the primary one, the pedestrian. However, in an integrated approach, a transition towards proliferation and plurality of vehicular units corresponds to and complements the two aforementioned axes of change in mobility paradigm, encouraging and entraining *Effort* and facilitating *Agility*.

In the previous section, I argued that in order to move towards agility as an urban quality, the spatial (and territorial) agenda have to be complemented with a refreshed model of diffused shared mobility. This could be achieved specifically by taking seriously the vehicular innovations, swift pace and soft-shell vehicles that keep a high level of adherence to their immediate environment, while contributing to its diversity rather than merely consuming and privatizing the space. Moreover, with the integration of positive attitudes for physical activity into urban practices and providing adequate spaces, this approach encourages effort as a response to the imperative of public health and in order to move towards healthy cities, equitable communities, beyond the "fitness divide"[22] by fostering the presence of active public spaces.

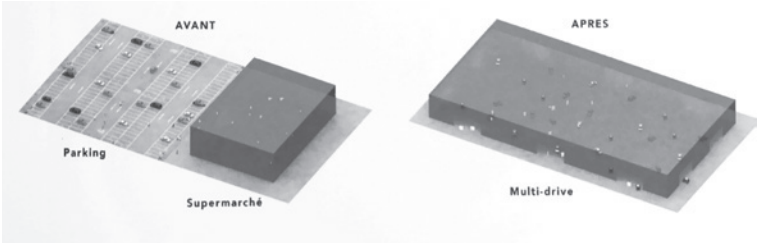


Fig 7. Transformation of architecture by the advent of VECs (Guiheux and Rouillard 2016)

[20] Fiat factory in Turin, Italy

[21] "In Houston, a pedestrian is somebody on his way to his car" (Kay 1998:269)

[22] By fitness divide Richard Florida (2016) refers to inequalities in fitness and healthy lifestyles in American cities, referring to the American Fitness Index report, prepared by the American College of Sports Medicine based on individuals' behaviors, such as daily exercise as well as the infrastructure that supports healthy lifestyles, including number of recreational facilities and presence of parks.

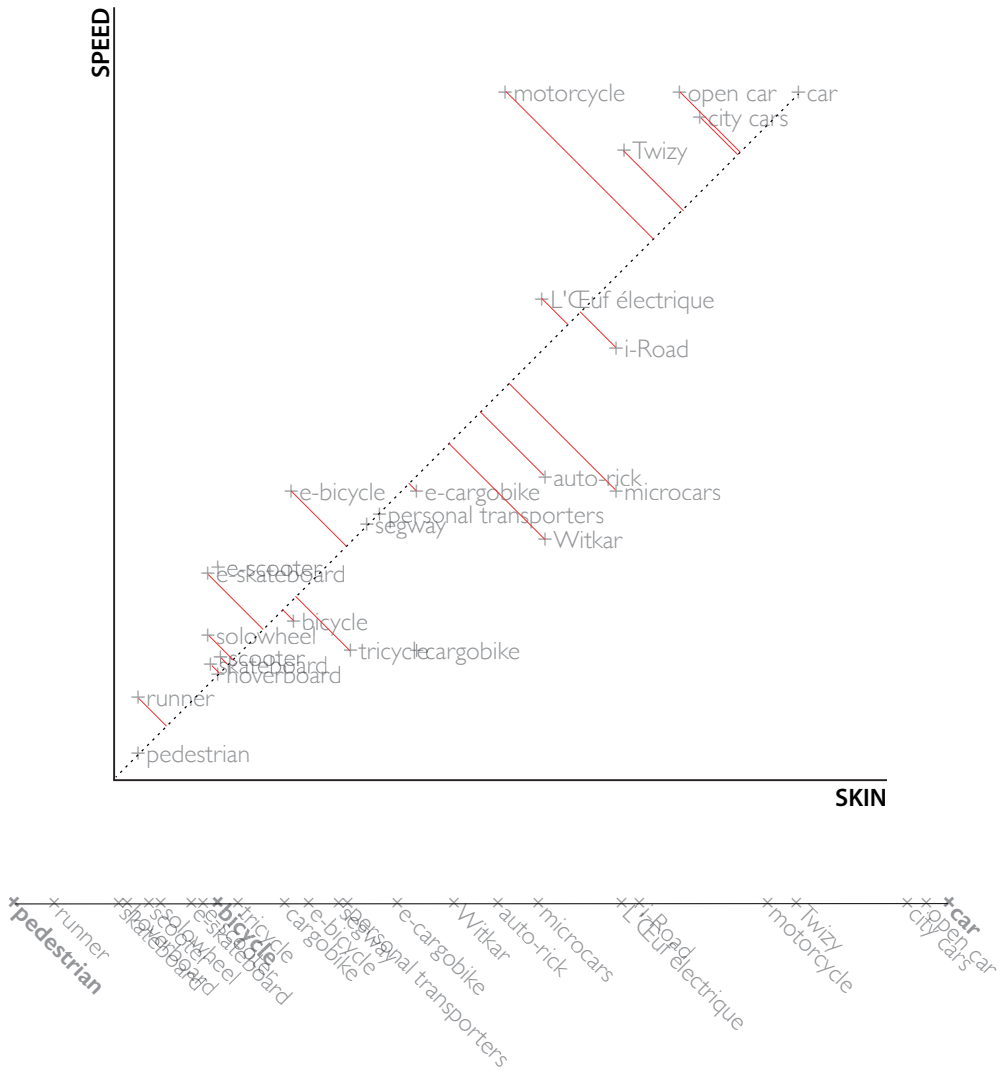


Fig 8. Gradient of vehicles, based on the thickness of their shell (a combination of the physical envelope and the speed of the vehicles).

In chapter 2, "tipping points" were mentioned as a series of interrelated possible changes that together can topple the car system into a post-car one. Dennis and Urry (2013) mentioned among other things, new fuel systems, smart vehicles, and new materials for vehicles' envelope, as possible shift-provokers in the car system. According to what we have discussed in this section, a serious consideration for vehicular units –with soft envelopes, smart or highly dependent on their smart pilots, based on different sources of energy, from metabolic to electric and their adapted combinations– in urban schemes, urban discourses, and eventually urban policies corresponds to Dennis and Urry's post-car diagram.

Moreover, in the course of the interviews with experts the necessity to change the hierarchy of the roads between car and other modes was extensively discussed with a consensus for the shared spaces rather than the canalized segregated passages privileging one mode over the others. Imholz, underlined the new vehicles as a new challenge for the urban projects even within the soft modes themselves, distinguishing even between different types of cyclists, those who speed up and the ones that easily cohabit with pedestrians or other small devices like rollerblades.

Drawing on what has been said about vehicular units, their shell and their capacities to interact with the others as well as the context (separations and communications), we can conclude that the vehicles with more or less same thickness of the shell can cohabit easier with one another. The diagram below classifies the shell characteristics of a series of vehicles based on a value of their skin (physical envelope) as well as their speed, which provides us with a gradient of cohabitations (fig 8). The gradient of cohabitation of the vehicles enables us to rethink the section of the streets and mobility axes, gradually transitioning from softer shells to the thicker ones. The gradual transition should imply diversity without canalization, and rather than abrupt edges between different worlds, provides soft neighborly relations. Therefore, as discussed in the concluding notes of the Chapter 4 it enables dynamic "relations" between mobile subject and the environment. Such ecosystem accommodates the diversity of modes. In combination with public transport and axes of effort, both in city and in context of lower density, encourages effort and facilitates agility, proposing spaces of idiorrhythmy and accessibility.

5.4. Implications

This thesis has been an attempt to construct links between three components: (1) theoretical reflections in mobility, sociology of mobility and imaginary, (2) the perceived signs of change in practices of the inhabitants, and (3) urban projects. More precisely, the goal has been to explore the first and second, to pull them towards the third, and extract material from them for renewing the instruments and frameworks of design. In this sense it is a work of mediation between disciplines.

The role of the urban project is changing, as the sharp boundaries between the expert and the layperson disappear, and as citizen-actors gain more presence and share in determining futures. With participatory urbanism becoming a mainstream practice, the urban project goes from merely building a link between the social imaginary and actual reality (Secchi, 2002), towards becoming a strong medium that contributes to and re-shapes new imaginaries. It contributes to the public discourses, constantly re-evaluating and debating the qualities associated with the myriad of ways in which we are mobile. In this sense, proposing new coordinates and in general new frameworks for the urban project is above all an attempt to act upon the social imaginary.

The axes of change that I proposed as new coordinates, already constitute the premises of some of the urban projects, exist within the discourses of urban experts, and more importantly are detectable in everyday practices. For example, projecting the emergence of "soft networks", is an acknowledgement of the *effort* and a proposal for integrating it into the urban projects and policies. Likewise, the emphasis on the micro-centralities in larger territories and the mobility hubs in cities, as well as the provisions of facilities to encourage and support intermodality are in fact steps towards attaining more agile territories. Indeed, formalizing them and integrating them into a coherent system of coordinates can increase their agency in bringing about change.

By parameterizing differently, and transforming the way the question of mobility is described and presented, a new image of the problem is rendered. Such reframing can develop through an epistemological phase, introducing the themes as possible new frames of reference within the educational context on sciences and practices of the city. New worldviews imply new sets of understandings and discourses that can range from public debates on various scales of interventions to political discourses on mobility strategies and decision-makings on the futures of the city. Thereby, they are likely to enter the popular discourses and personal accounts of daily mobility, making place for new imaginaries, influencing the practices and spaces. Beyond new sets of

understandings, analysis and diagnosis, such reformulation can have more direct and concrete spatial and social consequences, changing the existing hierarchies, i.e. in the categorizations of spaces or the measuring units. As the man seated in his automobile, rather than the man standing on his legs, set the standard for space measurement, re-shaping the city and the architecture in the last century[23], the rediscovery of those legs, upright and active, and augmenting them with new sets of situated and diffused new vehicles could once again change the spatial relations. Rouillard and Guiheux (2016) showed what could be the architectural consequences of a new system of vehicles. In this direction, proliferation and prevalence of Vehicular Units, as proposed here, could, for strongly remodel the ground floor of the buildings and the interface between inside and outside, as regulations and norms change. This could be expected as an extension of a trend that has already started, for example, in Paris, where providing ground floor bike racks is now mandatory for new developments[24] and providing car-parking place is not.

The integration of the axes of effort and the consideration of Vehicular Units can have consequences on the streetscape, adapting the road section to the gradual transition of vehicles based on the ecosystem of their cohabitations. In this approach, where the street section is organized according to the vehicles' gradient of shells, hard-shell car (steel and petroleum car) can coexist with the rest of the vehicles at the end of the spectrum while its gradual phasing out can be envisioned. This could come with the changing preferences rather than enforced systematic changes, to exclude the car. Moreover, such transformation could result in new typologies of roads and therefore new classifications. New typologies, partly extending the already started trend of reconversion of highways, for example, imply also new cartographic representations. In the same fashion that the evolution of the road typologies from pre-car era, transformed cartographic categorizations that can be attested, for example, from the Siegfried Map[25]

[23] Frank Lloyd Wright, The disappearing city, 1932:82.

[24] See in the Expert Interviews section, the appointment no. 5, interview with Paul Lecroart.

[25] The *Topographic Atlas of Switzerland*, known as Siegfried Map is an official map series of Switzerland starting from late 19th century

to the current representations[26].

In the same way that as recently some cities have begun to propose an an active mobility master plan, we can evaluate the possibility of a masterplan for a neighborhood, city or a region based on the diffused mobility of Vehicular Units. A comprehensive mobility master plan could integrate the considerations on vehicular units – stations, parking, estimated numbers, etc. – with the public transport network and detail their interfaces. Such interfaces should include the facilities for the axes of effort, such as roads network with particular sport surfaces, refreshment areas, etc. The question of facilities, material design, and their characteristics accompanying such networks requires further study.

In dispersed urbanity, referring to the territorial model as proposed by Viganò, Fabian, and Secchi (2016), a transition towards soft-shell Vehicular Units, would imply transformations towards the *sponge* model of the territory and the road system, making an analogy with the motion of a fluid within a sponge. This entails a road network characterized by permeability and porosity that unlike large mobility infrastructures, establishes a programmatic relationship of continuous exchange with its context. The axes of public transport like railway, in this perspective, would constitute the *pipes*. As argued by Secchi (2016) the spongy territory increases the resilience to the interruptions and congestions. Moreover, a territory with the entrained active inhabitants is more resilient to the external shocks such as petrol shortages or energy crises.

The three coordinates raise questions rather than proposing straightforward answers, open up roads for investigations in experiences, methods, and strategies. This could be done through assessments of the existing situations, as well as conducting thematic interviews to fine-tune the definitions and their implications. Regarding effort for example a quantitative study of durations of bearable efforts, according to the three types explored, can further inform the design and planning of spaces. Studies can be done for testing quantifiability of agility, for example proposing a model, in which density and absolute speed are its variables.

[26] Comparing the legends of Siegfried Map to the current maps edited and distributed by Swisstopo (Swiss Federal Office of Topography) the classifications change respectively from: 1) Kunststrasse von grösster Breite 2) Kunststrasse von geringerer Breite 3) Fahrweg ohne kunstarlage 4) Fussweg to 1) Autoroute, voies séparées; 2) Semi-autoroute, voies non séparées; 3) Route de 1ère classe; 4) Route de 2ème classe; 5) Route de 3ème classe; 6) Route de quartier 7) 4ème classe, chemin carrossable; 8) 5ème classe, chemin rural, chemin forestier, piste cyclable; 9) 6ème classe, sentier.

Ultimately, it is important to note that the recognition and valuation of emerging practices can go beyond the scale of direct intervention. For example, the consideration of positive attitudes for effort, as an emerging phenomenon, and accordingly designing for it, not only accommodates and encourages the already active commuters, but also generates nd reinforces a social context, and a social practice (acceptance and norm). In that it is likely to bring more people to opt for active mobility. This is to say, perhaps, the most distinct feature of Copenhagen, for example, is not merely the extent and comfort of its bicycle infrastructures, but rather the sheer number of people practicing it and the status of just riding one's bike, its commonality that distinguishes Copenhagen as the capital of cycling. I would therefore conclude by hypothesizing that the virtuous circle to be developed is over and above the practices of the single individual, but lies also in the body of the society as a whole.

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2000-2006	Master of Arts in Design, University of Tehran, Tehran, Iran.

Academic and Professional Experience

2014-2016	Teaching, Laboratory of Urbanism, ENAC, EPFL, On The Road: Towards Post-car World, *Territoire et Paysage* teaching unit, master level.
2014-2015	Teaching assistant, Chôros Laboratory, ENAC, EPFL. Edx MOOC: Exploring Humans' Space: An Introduction to Geographicity, Prof. Jacques Lévy.
2011-2013	Researcher, Marseille-Provence 2013, European Capital of Culture, *Les Quartiers Créatifs*, 15th and 16th arrondissement. La Viste and Les Aygalades.
2008-2010	Collaborator, Systematica, Urban and transport planning, Milan, Italy. www.systematica.net
2008-2013	Projects for public spaces, among which: Festival des Architectures Vives, Montpelier, France, design and execution of ephemeral structure in public space; Jardin des Métis, Quebec, Canada, design and execution of a landscape playground; Autoportraits Urbains, interactive installation in La plaine de Plainpalais, Geneva.

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