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# The Evolution of Modal Choice Among Motorised Professionally Active People In Three Swiss Cities, 1994-2011

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## Abstract

This paper describes the evolution of modal choice in Geneva, Lausanne and Bern, between 1994 and 2011. Altogether, 1500 professionally active adults were interviewed by telephone in 1994, and 2198 in 2011. All respondents had access to efficient public transportation and a private car. The image of the car remained positive over the period, but declined from 80% positive opinions to 71% in Geneva, from 85% to 76% in Lausanne, while remaining constant in Bern at 82-83%. During the same period, positive perceptions of public transportation rose from 39% to 52% in Geneva, 30% to 61% in Lausanne, and 55% to 77% in Bern. The proportion of respondents professing to use the car “every day or almost every day” declined from 60% to 38% in Geneva, 70% to 53% in Lausanne, and 45% to 34% in Bern. The corresponding figures for public transport rose from 15% to 29% in Geneva, 16% to 27% in Lausanne, and 33% to 39% in Bern. In 1994, our group proposed a typology of 6 modal profiles. By 2011, the profile which had lost the most members was “exclusive car-drivers”, down from 21% to 9% in Geneva, 20% to 10% in Lausanne and 5% to 3% in Bern. The category which increased the most was “multimodalers”, from 29% to 32% in Geneva, 22% to 42% in Lausanne, and 40% to 59% in Bern. We suggest that the progression in multimodality and public transport patronage is linked to public policy decisions in favour of public transport in each city, and that differences between cities are due to structural elements such as urban form and fundamental transit system choices.

## 1 Introduction

Understanding modal choice, i.e. what underlies individual choices between transport modes, is an important mobility question, especially in urban areas where space is scarce and issues such as air pollution and noise affect large numbers of people. Modifying the modal split, in the sense of transferring usage from individual motorised transport to more ecological modes is an important policy goal worldwide. For over 20 years, public policies in urban areas have tried to reach such goals, but have been hindered by reluctance and resistance to change on the part of car users. Practical measures such as harnessing planning to counter urban sprawl and investing in transit systems have been rolled out in many countries, but with debatable – and often unmeasured – effects on modal split.

This paper proposes to explore modal choice and the evolution of the modal split through the results of a quantitative survey carried out in 3 Swiss conurbations – Geneva, Lausanne and Bern. Data on modal choice were collected in 1994 and 2011, using a similar methodology, allowing a comparison over time and between the 3 cities. The research questions are whether the logics underlying modal choice, and modal choice itself, have evolved between 1994 and 2011. We then speculate on the extent to which observed modal shifts might be linked to contextual changes occurring over the same period in each city: metropolisation, new transit systems, planning tools, etc.

First, we present our theoretical approach and methodology. Then we review key contextual elements in each city. Then we present the main results pertaining to representations and use of transport modes, leading to our typology of the mind-sets of modal choice. Finally, this typology is used to initiate a discussion about the possible links between context, policies, transport supply, and modal choice.

## 2 Theoretical approach and methodology

### 2.1 Understanding modal choice

#### 2.1.1 Modal choice: a rational choice?

Research on modal choice originated in economics where it was hoped that mobility practices might be explained by instrumental rationality, meaning that individuals would choose their travel mode by minimizing cost and travel time. The premise of rational choice appears explicitly or implicitly in the modal choice models which are the dominant methodology in the analysis of modal practices today (Kaufmann et al., 2010).

However, the rational choice paradigm has been unable to explain some transport behaviours (Flamm, 2004) and has been criticised in the specific field of daily mobility, where it has been argued that the rationality of economic models does not apply (Dupuy, 1975; Reichman, 1983;

Duhem et al., 1995). To better understand the complexity of daily mobility and its logical workings, other approaches need be taken into account.

Social action is the result of a combination of reasons or rationalities (Boudon, 1993; Boudon, 1989). Economic rationality is only one of the rationalities at play in modal choices. Another is so-called axiological or value/belief-oriented rationality which refers to the values and beliefs of an individual (Weber, 1922). A third is affective rationality: this depends on the perception of the situation, and is therefore informed by the experience and life story of the individual. Finally, traditional rationality is determined by ingrained habituation. These four rationalities form as many potential explanations of modal choice and of the difficulty to induce modal shift from cars to more sustainable means of transportation.

### 2.1.2 The dominant position of the car in the modal split

The dominant position of the car among other transport modes can be explained using these four types of rationality, or mind-sets.

Economic rationality considers that travellers choose their means of transport according to two objective values: time and money. Because the car is the most efficient means of transport in terms of speed, it is increasingly used (Gérondeau, 1994). It would then be the best means of transport to develop complex activity programmes in the least possible time and at the best price. If people's modal choice is based on this rationality, they will tend not to use public transportation even if its supply is improved, because public transport travel time is usually not competitive with the car. By framing the issue in this way, several studies showed that the localisation and density of housing, jobs and services could have an effect on modal choice by closing the gap between transit travel time and car travel time (Etienne & Toilier, 1995; Emangard, 1994; Salomon et al., 1993; Bonnafous, 1993; Haefeli et al. 2008). Public transport networks are more efficient in dense urban areas, which are often more difficult to navigate by car. The concentration of housing, jobs and services also makes cycling and walking more efficient, relative to the car.

The second rationality, affective rationality, is not based on comparing quality of transport supply but on values. According to this mind-set, increased use of the car results from a higher desire for that means of transport compared to others. This desire is inspired by intrinsic characteristics such as the pleasure of driving or the private space offered by the car: two aspects linked to individualisation and which make the car a strong symbol of freedom. Indeed, research has shown that the car symbolises freedom while public transport representations mainly pertain to route and schedule constraints, crowding and enforced proximity (Pervanchon et al., 1991; Yonnet, 1985; Lejeune et al., 1982; Brög, 1977; Bassand et al., 1976; Matalon, 1971). Contrary to public transport, the car also allows a great degree of social differentiation (Boltanski, 1975; Bourdieu, 1979; Barjonet, 1989; Berge, 1994). Variety in design and style has helped make car possession and use more desirable. According to this mind-set, improving public transport will never make it as attractive as a private car.

Nevertheless, this value-oriented rationality can be used to advocate for modal shift, but based on collective beliefs such as environmental considerations.

The third mind-set, perceptive rationality, is linked to cognitive dissonance theory (Festinger, 1957). This states that an individual who perceives a mismatch (dissonance) between opinion and behaviour will adapt his or her representations as a priority (Lévy-Garboua & Blondel, 1997). In this perspective, the use of a means of transport renders it subjectively more efficient and valued than another mode. Regular use therefore creates its own positive feed-back mechanism. According to this mind-set, improvements to public transport systems will not lead to modal change because they are not perceived by car users (Parkhurst, 1996; VöV, 1989). Some aspects of perceptive rationality have been highlighted in social psychology studies around travel time: motorists tend to under-estimate their travel time by car and over-estimate travel time by public transport (Bailly, 1979; Brög, 1977; O'Farrel et Markham 1974). Other studies point to a tendency to underestimate travel costs linked to one's preferred mode and overestimate the costs of other modes (Brög, 1993) and to so-called perception bias, also in favour of the mode which is already being used (Goodwin 1985).

The fourth mind-set is closer to a traditional sociological approach because it involves habits and routines. Making changes implies efforts, such as searching for information or comparing experiences. Therefore, it is rational to make a choice once and for all, because this enables the establishment of a comfortable routine. According to this mind-set, habits and routines define modal practices (Dietrich, 1989 ; Flamm, 2004 ; Kaufmann, 1998). This rooting in lifestyle and habits represents a strong obstacle to changing modal practices. If travellers base themselves solely on this rationality, there is in fact no modal choice, because alternatives are not considered. This inertia was highlighted by Goodwin, and there have been many studies showing links between lifestyles and modal practices (Bonnet, 1980; Bonvalet, 1994; Andan, 1994; Haumont, 1995). Finally, some work has revealed the role of major life events and life transitions on modal choice (Rocci, 2007 ; Fouillé, 2010 ; Flamm, 2004). For example, a major collaborative research programme in Switzerland showed that moving house was a common initiator of new modal practices (Haefeli & al., 2008).

### 2.1.3 Need for new data / recent trends in urban mobility

Modal choice has often been considered as a choice between only two alternatives: public transport and the private car. However, it is becoming increasingly apparent that urban transport modes are diverse, including among others the private bicycle, bike-sharing, scooters, roller-skates, and car-sharing. Modes can also be combined in mobility chains, such as driving to the station, taking the train, and then walking and/or riding by bus to the final destination. In several countries including France, there does appear to be a trend towards increasingly multimodal behaviour (Rocci, 2007).

In the context of sustainable development, a spatial approach has sometimes been used to study short trips in urban areas. Here we adopt a different approach, based on the individual

logics of action (from the French *logiques d'action*) which underlie individual transport choices. Recent research has shown that the image of the various transport modes, which underpins these logics of action, is able to evolve over time (Kaufmann & al., 2008).

#### 2.1.4 Research questions

How have modal logics of action evolved between 1994 and 2011 in Swiss cities, in a context of metropolisation, environmental concerns and new urban planning tools, with increased and differentiated investment in transport systems?

Have these changes played out in the same way in Geneva, Lausanne and Bern? How do similarities and differences between these cities help us understand the guiding forces leading to modal shift?

#### 2.1.5 Methodology

This study is based on the results of telephone surveys conducted in 1994 and in 2011 among a population which is:

- **Urban**, i.e. residing in the city centre or in city suburbs well serviced by public transportation.
- **Active**, i.e. regularly and gainfully employed.
- Theoretically in a position of **modal choice**, meaning:
  1. the household owns a car, to which the respondent has full or partial access, or is a member of a car sharing service;
  2. the household lives within a 6-minute walk from a station serviced by a reliable mode of public transportation (study areas were delimited by isochrones using digital mapping tools).

At baseline, 500 people responding to these criteria were surveyed in each agglomeration. At follow-up, the sample size was increased to 779 in Geneva and 919 in Lausanne. In Bern, the number of surveys remained at 500.

Table 1 : Number of motorised professionally active adults surveyed in 1994 and 2011.

	1994	2011
Geneva	500	779
Lausanne	500	919
Bern	500	500
<b>TOTAL</b>	<b>1500</b>	<b>2198</b>

In 1994 and 2011, the survey aimed at identifying the image of different modes (car, public transportation and bicycle) in the surveyed population, and their declared uses of these same modes. Combining the two sets of results helped establish a typology of users, i.e. a **modal logic of action**.

## 2.2 Context

Between 1994 and 2011, many changes have taken place in the fields of planning, transportation and information technology. Geneva, Lausanne and Bern have undergone similar changes which can be summed up as: metropolisation, in the sense of significant economic and demographic growth, accompanied by a varying degree of urban sprawl. Relevant public policies across this time period have included a renewal of the public transportation supply, restrictions on automobile access to city centres, and the consideration of “soft” modes in planning policy. Nevertheless, each conurbation has followed its own specific trajectory based on its historical heritage and political dynamics.

### 2.2.1 Geneva: a dense, historically car-oriented city

Geneva, the second largest conurbation in Switzerland after Zurich, has experienced very strong economic and demographic growth. This exacerbated the imbalance between jobs – concentrated in the city centre – and housing, increasingly located on the outskirts, including neighbouring France. This imbalance has strongly increased transportation demand. After decades of being a car-oriented city, central Geneva is now characterized by a saturated road network and a public parking capacity which is limited compared to demand.

Overall, between 1994 and 2011, the Geneva context has changed significantly and it has become increasingly difficult to drive into the city (as a result of a policy decisions, but also due to growing congestion). At the same time, the supply side of public transportation and soft mobility has been developed, most notably with the extension of the tram system whose length grew from 9 km to 57 km during this period.

### 2.2.2 Lausanne, a regional centre undergoing rapid metropolisation

Lausanne enjoys a central location in the heart of French-speaking Switzerland, between a hilly hinterland and Lake Geneva. As the capital of the canton of Vaud, it has been an important regional centre for centuries, strategically situated only 60 km from central Geneva, and on the road to Bern, the Federal capital. With a ring of suburban towns and a major University campus, Lausanne makes for a dynamic urban setting, which has recently acquired some metropolitan features and, consequently, a growing transportation demand.

Lausanne stands out among the other cities in the study because of a major qualitative leap in public transport supply that took place in 2008: since then, an automatic underground transit line, the M2, passes through the city centre, thus connecting the lakeside (Ouchy) with the upper outskirts of the city (Epalinges), rising some 300m in elevation. Compared with this

significant development, road networks have developed in a more limited manner due to restrictive parking policies which were introduced with a view to reducing noise and air pollution in the city.

### 2.2.3 Bern: a benchmark of urbanity

Bern, the Swiss federal capital located in the German-speaking part of the country, is frequently cited as an example of good practices in terms of coordination between transportation policies and development planning. The “Bern model” has been evoked since the 1990s to describe the city’s ability for concerted planning.

Bern’s planning practices continued during the 1994 to 2011 period, as the city and its neighbouring villages and towns considerably extended public transport supply, particularly the railway (S-Bahn) and tram networks. In addition, significant measures were taken to make the city more bicycle- and pedestrian-friendly.

## 3 Key results

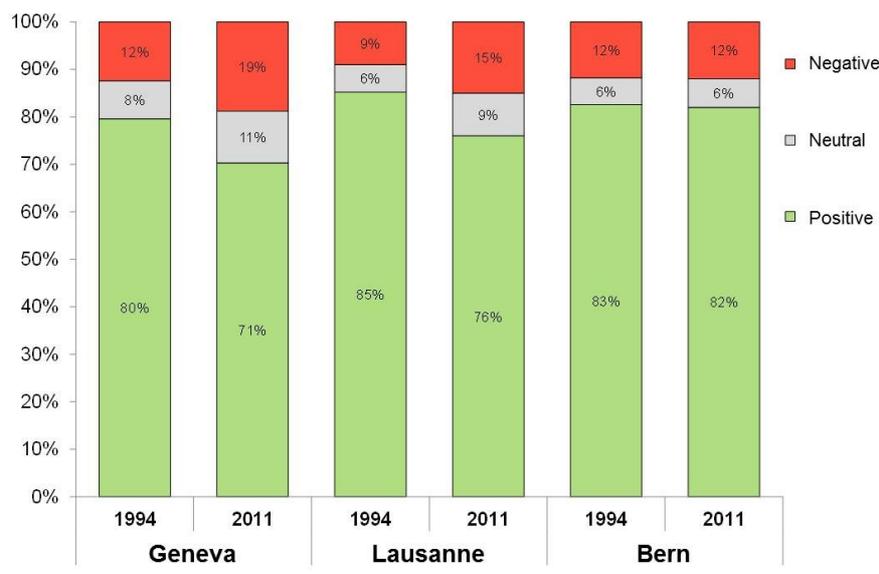
The survey highlights major changes in transport mode representations and mobility patterns – changes which are indicative of important shifts in modal choice mind-sets.

### 3.1 Positive representations of modes of transportation

To respectively describe the car, public transport and the bicycle, respondents were asked to give three adjectives (without prompting). After grouping the adjectives into broad categories, we were able to identify positive, negative and neutral ratings for each mode.

Our data indicate that between 1994 and 2011, perceptions of the **car** remained very positive. To our surprise, we noted that the percentage of surveys with a positive image was even higher in Bern than in Geneva or Lausanne (82%, versus 71% and 76% respectively). However, the percentage of surveys with a positive image of the **car** decreased considerably in the two French-speaking areas (from 80% to 71% in Geneva and from 85% to 76% in Lausanne) while remaining stable in Bern (from 83% to 82%). There was therefore an overall drop in positive ratings for the car, although all values remained high.

Figure 1: Change in the overall image of the car, in % of respondents



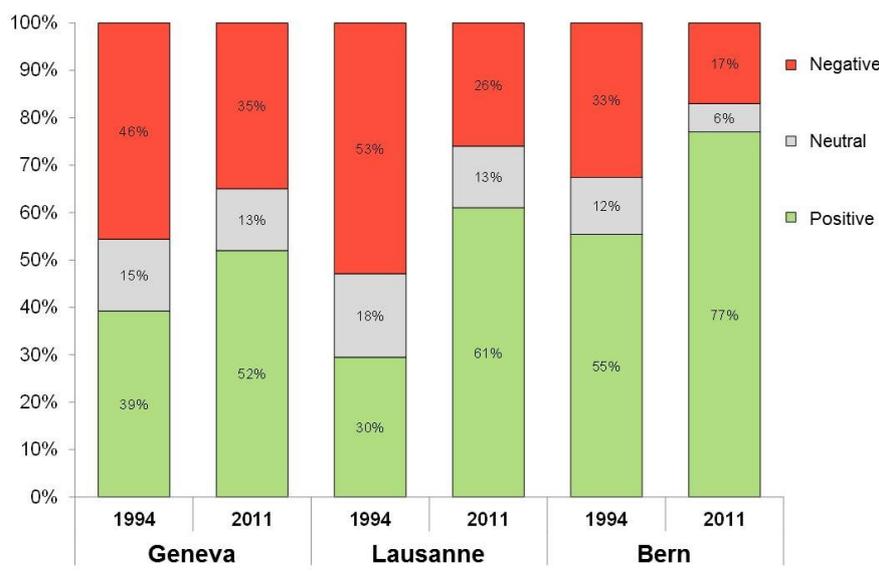
The adjectives “practical” and “fast” appear in both surveys, in all three cities, and are among the most cited adjectives overall. Between 1994 and 2011, the importance given to the adjective “fast” declined sharply. In Geneva, adjectives used to describe speed accounted for 19% of citations in 1994, and only 11% in 2011. Compared to 1994, we also noted the appearance of the adjective “polluting”, indicating a growing awareness of the negative externalities generated by this mode of transportation.

Table 2 : Changes in the perception of the car, in % of adjectives cited

Geneva	Lausanne	Bern									
		1994	2011	1994	2011	1994	2011				
Practical	25%	Practical	23%	Fast	27%	Practical	25%	Practical	25%	Practical	22%
Fast	19%	Fast	11%	Practical	25%	Fast	13%	Fast	19%	Comfortable, easy	13%
Comfortable, easy	14%	Independence	10%	Independence	13%	Independence	10%	Comfortable, easy	14%	Fast	12%
Independence	13%	Comfortable, easy	10%	Comfortable, easy	12%	Polluting	9%	Independence	13%	Independence	10%
Expensive	6%	Polluting	9%	Expensive	6%	Comfortable, easy	9%	Expensive	6%	Expensive	8%

Regarding **public transportation** (including urban transit systems as well as trains), ratings were less positive than for the car, but they improved considerably between the two surveys. The proportion of respondents with a positive perception of public transport increased by 13% in Geneva. The most significant increase was in Lausanne, at +31% between 1994 and 2011. This should probably be attributed to a “metro effect”. In Bern, the percentage of respondents with a positive image was already high in 1994, at 52%, (Geneva only achieved this level in 2011) and increased by a further 22 percentage points in 2011. Massive investment as well as new information technologies probably played a key role in this evolution.

Figure 2 : Changes in the overall image of public transportation, in % of respondents



Compared with 1994, public transport in 2011 was less often described with negative adjectives such as “slow,” “restrictive” or “uncomfortable.” In Lausanne, “restrictive” and “slow” were replaced by “practical” and “environmentally-friendly”. In all cities, “slow” disappeared from the top five adjectives. In Bern, the top five adjectives all became positive in 2011.

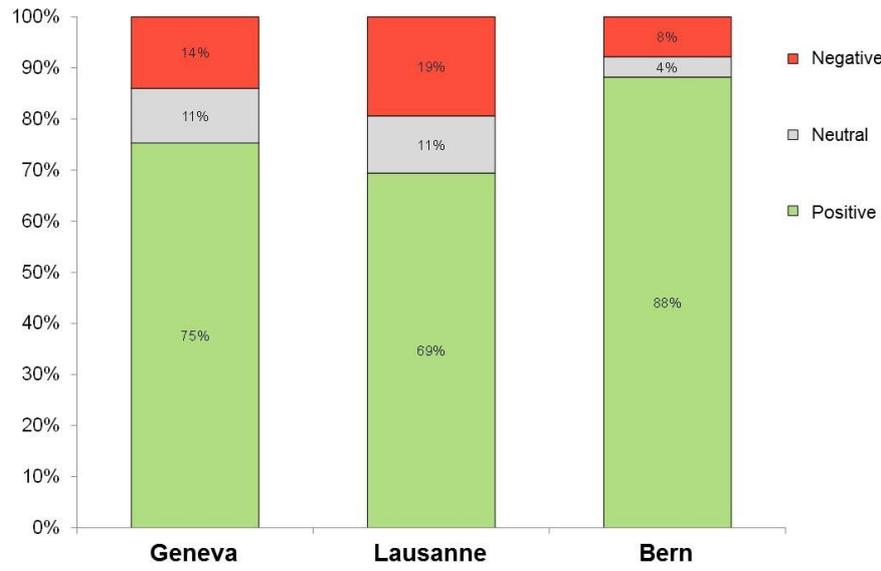
Table 3 : Changes in the perception of **public transportation**, in % of adjectives cited

Geneva	Lausanne	Bern									
		1994	2011	1994	2011	1994	2011				
Practical	17%	Practical	17%	Restrictive	17%	Practical	19%	Practical	17%	Practical	17%
Restrictive	15%	Uncomfortable, unpleasant	12%	Slow	15%	Environmentally-friendly	11%	Environmentally-friendly	14%	Comfortable, easy	11%
Slow	15%	Expensive	9%	Practical	14%	Expensive	9%	Restrictive	12%	Environmentally-friendly	10%
Uncomfortable, unpleasant	11%	Environmentally-friendly	8%	Expensive	11%	Uncomfortable, unpleasant	8%	Expensive	11%	Safe, reliable	7%
Expensive	9%	Fast	7%	Uncomfortable, unpleasant	10%	Fast	6%	Slow	9%	Fast	6%

While not covered in the 1994 survey due to its weak presence in urban issues and planning policies at the time, we decided to investigate the image of the **bicycle** in 2011.

This mode of transportation enjoys a very positive image in our sample. Some 75% of those surveyed in Geneva gave it a positive rating. The score was higher in Bern, at 88%, and somewhat lower in Lausanne, at 69%.

Figure 3 : Overall positive or negative image of the **bicycle**, in % of respondents



Concerning adjective categories, we found that healthy, practical and environmentally-friendly topped the list. However, cycling is considered dangerous – especially in Geneva, where traffic density has an impact on danger and its perception – and tiring, particularly in Lausanne which is a notoriously hilly area.

Table 4 : Perception of the bike, in % of adjectives cited

Geneva	Lausanne	Bern			
Sports/leisure/healthy	18%	Sports/leisure/healthy	23%	Sports/leisure/healthy	22%
Practical	16%	Environmentally-friendly	13%	Practical	14%
Dangerous	13%	Practical	13%	Fast	12%
Environmentally-friendly	11%	Dangerous	8%	Economical, inexpensive	10%
Fast	9%	Tiring	8%	Environmentally-friendly	10%
Comfortable, pleasant, easy	6%	Economical, inexpensive	7%	Independence (or freedom)	5%
Economical, inexpensive	6%	Comfortable, pleasant, easy	6%	Comfortable, pleasant, easy	3%
Independence (or freedom)	4%	Not practical	4%	Dangerous	3%
Tiring	3%	Fast	3%	Tiring	3%

Overall, the results show that the surveyed professionally active adults have positive representations of the various transport modes. Even though they own a car or have ready access to one, these city dwellers do not denigrate other modes and seem potentially open to using them. This reflects a major change in collective values and mentalities, probably linked to increased awareness of environmental issues, during the period between the two studies.

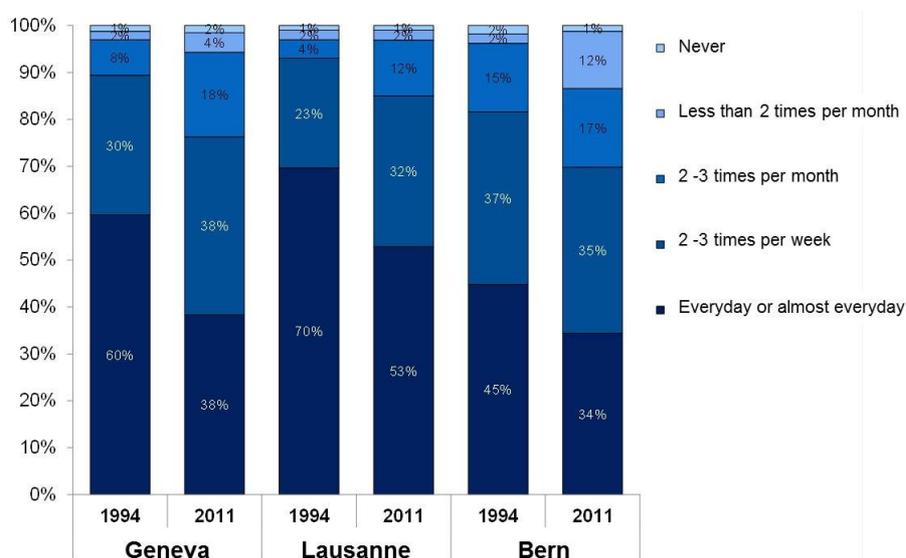
### 3.2

### 3.3 Varied uses of modes of transportation

The changes observed between 1994 and 2011 are related not only to representations, but also to the actual transport behaviour of our sample.

Our data on use of transport modes<sup>1</sup> indicates that the **car** still holds a very important position for the daily commutes of our sample, but with considerable differences between the three cities. In 2011, more than half of the Lausanne respondents (53%) claimed to use their car every day or nearly every day. In Geneva and Bern, this percentage was 38% and 34% respectively. In Bern, 12% of respondents claimed to use their car less than 2-3 times a month, versus 2% in Lausanne and 4% in Geneva. The frequency of car use clearly decreased between 1994 and 2011: the decline in daily use of the car was approximately 22 percentage points in Geneva, 17 in Lausanne and 11 in Bern.

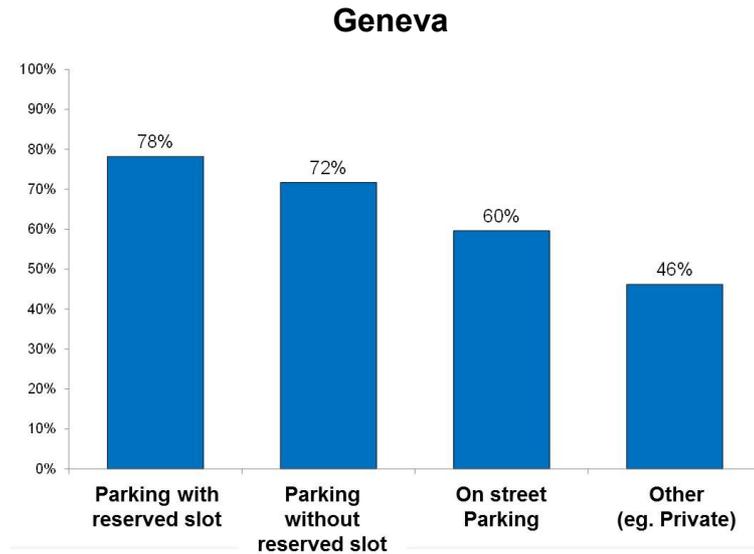
Figure 4 : 1994-2011 change in the frequency of car use among drivers in Geneva, Lausanne and Bern, in % of respondents.



By 2011, many drivers had given up using their car for certain trips, and parking conditions were often given as a reason. This is especially clear for the home-work commute, in all three cities. Having to resort to on-street parking is associated with a reduction in car use, as can be seen in the example of Geneva (see below) where there is a difference of about -18 percentage points in car use between workers with an available parking place at the workplace and those constrained to use on-street parking.

1 In response to the question: How often do you use (mode X) for all reasons combined? (*A quelle fréquence utilisez-vous... tous motifs confondus?*)

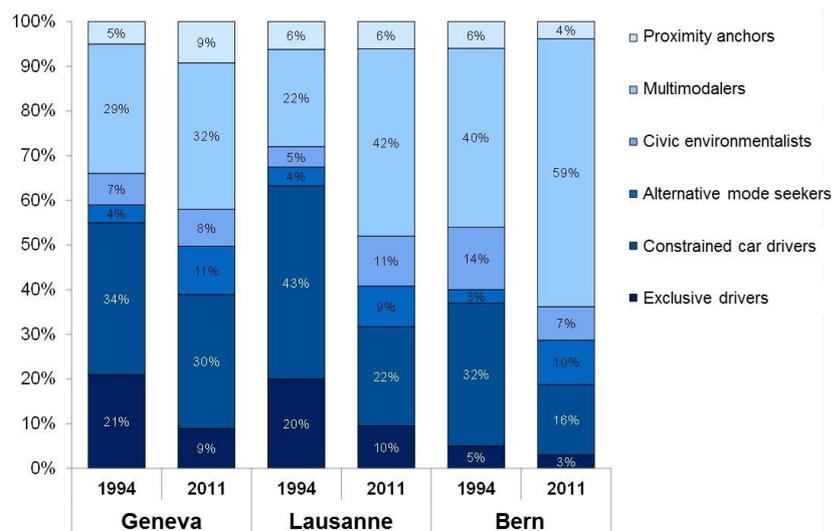
Figure 5: Percentage of frequent (2-3 times a week or more) car users (as the driver) for the home-work commute, based on parking conditions at the workplace, in % of respondents.



In parallel to a decrease in the frequency of car use, our data show an increased use of the train and other public transportation systems. For some people, resorting to these modes remains rare; for others it is regular or daily.

Geneva has seen the greatest increase in those who commute daily by **public transportation**, from 15% to 29%. In Lausanne, the increase was from 16% to 27%. In Bern, the already relatively high percentage, at 33%, rose to 39%. In this city, the proportion of those who said they “used urban public transportation 2-3 times a week or more” also rose, from 25% to 34%. In all cities, the percentage of people who never used urban public transportation fell – a drop of approximately 10 points in Geneva and Lausanne (down to 10% each) and 2 points in Bern (down to 3%). In 2011, only a very small minority of our sample said they never used public transportation.

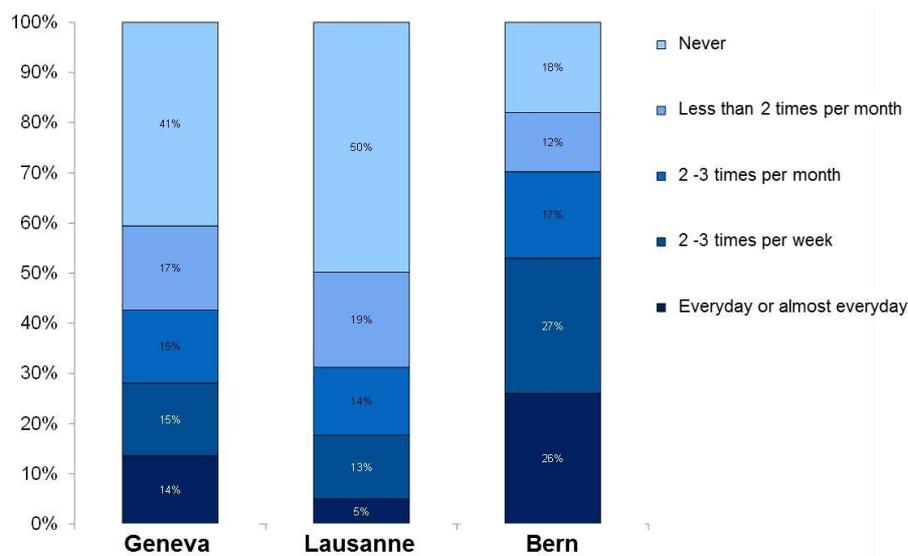
Figure 7 : 1994-2011 change in the frequency of use of urban public transportation in Geneva, Lausanne and Bern, in % of respondents.



After not being included in the 1994 survey, in our 2011 survey, cycling turned out to be especially important for the home-work commute.

It is in Bern that this practice is most common: 26% of our sample claimed that they rode every day, or nearly every day. More than half of all respondents in that city (53%) used their bike 2-3 times a week or more. In Geneva, the practice was less common but nonetheless substantial: 14% respondents rode their bike every day or almost every day, while 28% said they used it 2-3 times a week or more. In Lausanne, cycling was less common: 50% of the sample said they never travelled by bike. As mentioned earlier, there is an obvious link to the city's topography, which makes cycling much more difficult than elsewhere.

Figure 8 : Frequency of use of bikes (all reasons) in 2011, in % of respondents.



Finally, the data indicate an interesting trend towards a diversification of the modes used, notably with a modal shift from the car to public transportation for certain trips.

### 3.4 Different types of users and their evolution between 1994 and 2011

By comparing our findings on the perception of transport modes (5.1.) and those concerning actual modal practices (5.2.), we were able to categorise respondents into six main types of users, corresponding to the main logics of action underlying modal choice.

- The first two types describe people who prefer to use the car:
  - 1 **Exclusive car drivers**, who travel only by car, whose activities and schedules are structured around the accessibility offered by this mode of transportation.
  - 2 **Constrained car drivers**, who are forced to use another mode of transportation for certain destinations, usually due to parking and/or traffic conditions.
- Two other types generally prefer alternative modes (public transportation and soft modes):
  - 3 **Alternative mode seekers**, who prefer modes other than the car because of their convenience.
  - 4 **Civic environmentalists**, who prefer other modes than the car because of their personal convictions.
- One user group is potentially open to all modes:
  - 5 **Multimodalers**, who choose their transport mode based on its effectiveness. Depending on the reason for the trip, the time of day, the destination and other constraints, they can just as easily drive as take the train, walk or cycle.
- Finally, a residual group was identified:
  - 6 **Proximity anchors**, who prefer not to commute at all.

Applying this typology to our 1994 and 2011 data, we obtain a pattern of mobility demand that varies from one city to another. In 2011, logics of action based on car use were far less present in all three cities, while “multimodalers” accounted for a large proportion of respondents.

In all three cities, the proportion of **exclusive car drivers** fell between the two surveys. The decrease was most impressive in Geneva and Lausanne, where the percentage fell from 21% to 9% and from 20% to 10% respectively. In Bern, this mind-set was already rare and was further reduced from 5% to 3%.

**Constrained car drivers** were also less numerous overall in 2011 than in 1994. Although the proportion increased from 34% to 30% in Geneva, numbers fell in Lausanne and Bern, from 43% to 22% and from 32% to 16% respectively. This reduction reflects an improvement in the image of public transportation, which is no longer considered a second choice. We can therefore assume that many restricted car drivers have moved into the category of **multimodalers**.

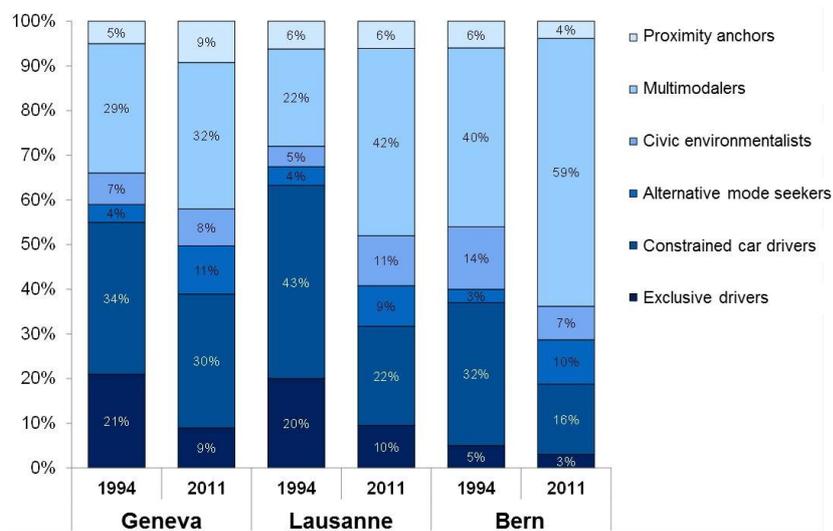
Between 1994 and 2011, there was a remarkable growth in the proportion of **alternative mode seekers**, who prefer not to use their car if possible. This group’s share increased by 7 percentage points in Geneva and Bern, and by 5 points in Lausanne.

The **civic environmentalist** logic of action has seen contrasting developments. In Geneva, its percentage remained stable at 7-8%. In Lausanne, it increased from 5% to 11% between the two studies. In Bern, however, the decrease was significant, from 14% to 7%. Due to the excellent provision of alternative transport in this city, not using one's car may now be perceived as a question of common sense rather than an environmental statement.

In our view, the core element of our results is the increase in the proportion of **multimodalers** between the two surveys. Although the increase was slight in Geneva (+3 percentage points), the proportion grew respectively by 20 and 10 percentage points in Lausanne and Bern.

Finally, the share of **proximity anchors** remained low (<10%) in all cities and surveys. Their level increased in Geneva (from 5% to 9%), remained stable in Lausanne (at 6%) and decreased in Bern (6% to 4%).

Figure 9 : 1994-2011 change in the distribution of respondents based on modal choice logic, in %



### 3.5 The contrasting profiles of our cities of study

#### 3.5.1 Geneva: high public transportation patronage despite a less positive image of this mode compared to the other cities

The results for Geneva and its suburbs show marked changes in terms of representations and mobility practices, with a significant reduction in the frequency of car use. Despite a marked improvement between the two surveys, public transportation still has a less positive image in Geneva than in Lausanne or Bern, especially as regards comfort (or lack thereof). This does not prevent high levels of use of public transportation patronage (mostly for the home-work commute). Compared with the 1994 survey, public transport use has experienced a dramatic leap. Geneva also saw a major progression in terms of soft modes, which enjoy a positive image and which many workers prefer in order to avoid congestion, as well as the lack of comfort and inconvenience associated with public transportation. In fact, modal choice mind-sets based on the use of alternative (non-car) modes have become even more popular than in the two other cities, even though they appear to result from constraints imposed on car drivers.

### 3.5.2 Lausanne: a major improvement in the image of public transportation which is not yet fully reflected in its use

Our findings show that the qualitative leap in the public transportation supply in Lausanne has resulted in a greatly improved image. Even though the shift is clearly in favour of public transportation, it seems that this positive image has not yet been entirely translated into increased frequency of use. The car is still used more frequently in Lausanne than in Geneva or Bern.

However, following a multimodal logic of action, respondents in Lausanne are happy to leave their car when public transportation becomes particularly efficient, as is the case with the city's new M2 metro line.

### 3.5.3 Bern: A virtuous modal that is growing stronger

In Bern, the virtuous model already established in 1994 has become even stronger. The image of public transportation – already very positive in 1994 – was further improved in 2011, as was the excellent image of walking and cycling. Given the difficulty of travelling by car in the city centre and the quality of infrastructure for public transport, cycling and walking, Bernese respondents often do not use their car, even though they have maintained a positive image of this transport mode.

Multimodal thinking and acting based on the use of soft modes and public transportation is now dominant in Bern, and people who travel exclusively by car are a small minority.

## **4 Conclusion: major shifts in mode image and mode use leading to the emergence of a multimodal lifestyle**

An originality of this study is to analyse both the image and the use of various transport modes, and combine the results to define modal logics of action which are compared between 1994 and 2011.

We observe a major shift in values and opinions applied to transport modes in our sample. The car maintains a good image but its image is far less positive than before. A significant proportion of respondents associate cars with pollution in 2011, which was not the case in 1994. Over the same time scale, the image of public transport has improved dramatically in all three surveyed cities; we suggest that this is linked to substantial public investment leading to improved supply in this sector. Cycling also has a very positive image in 2011, although a comparison with 1994 was not possible in this case.

These shifts in perceptions and attitudes correspond to similar shifts in mode use, which is in itself a sign of robustness for our results. Modal choice is an option that can be reviewed daily for most of the working adults in our survey. While car use remains frequent, the concept of using it systematically for all types of trips has diminished drastically, and has almost disappeared in Bern.

Although all our respondents have easy access to a car, most of them prefer to use other modes for certain trips in the city centre or for the home-work commute. We hypothesise that this mode shift is due to changes in representations and values, but also constraints on parking, fear of congestion, and investment in infrastructure and services related to public transport, walking and cycling.

At a macro-sociological scale, these results give indications about emerging lifestyles in the three surveyed cities. Multimodality now appears to be a significant urban trend. Car use is no longer the default value, while using public transport and/or cycling has been normalised. The well-educated urban executive, working on the train, popping into a shop at the train station and thus avoiding car parking problems and congestion, is an archetype which has prospered in Swiss cities between 1994 and 2011. Riding a bicycle all year round, for transport purposes, is also a trend no longer limited to environmental enthusiasts but to anyone who is interested in the practical navigation of a city. The relative efficacy of each transport mode seems to be inspiring modal choices, much more than image considerations. Depending on trip motive, time, destination, etc. these new multimodal citizens can either go by road or by rail, by bicycle or on foot.

These new urban trends have important implications for the cities in which they were studied, and for other cities in Switzerland and elsewhere. They imply that there has been an important change in values and attitudes, related to an increasing focus on sustainability and quality of life over the past 15-20 years. This general shift in values has had a practical impact in the three cities considered in this study, where it has led to public policy decisions which have in turn encouraged the use of travel modes other than the car. It can now be seen that these investments have had measurable results, which are even quite spectacular in the area of mode shift.

## 5 References

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