Raising awareness on mobility costs for households: a lever for changing residential choices and improving local governance?
Experimentation in the French Alpine metropolitan area

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Abstract

Despite efforts and innovations in urban planning and public transport options, urban sprawl and car use in metropolitan areas keep increasing. This is particularly true around large alpine conurbations, which are very dynamic but have significant geographic constraints. In regards to residential choices - the subtle trade-off between what people want, their resources, and personal and collective constraints - individual household decisions tend to take precedence over public policy objectives and tools. The MORECO project (MObility and REsidential COsts, INTERREG Alpine Space Programme) was developed in order to address questions about the tools that are needed to inform and raise awareness about household residential choices, as well as the associated "urban planning/transport" governance issues. The French partners - the Rhône-Alpes region and the PACTE-Territoires Laboratory - developed a mobility cost simulator (MobiCost) for both households and public and private professionals involved in household residential choices. The past three years of work have allowed us to assess user acceptance of the tool (how well users understand the tool and how to use it) and governance (determining the most appropriate institutional authority to manage the tool, given that it's primarily an awareness-raising tool with both political and technical impact).

Keywords: mobility costs, calculator/tools, regional governance, integrated urban and transport planning

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1. Introduction

Despite a number of efforts and innovations in urban planning and public transport, management of urban sprawl and car use remains a major problem for metropolitan areas. In France, for example, in the last 45 years the population in what INSEE calls "periurban" areas has increased more rapidly than in city centers (Baccaïni, Sémécurbe, 2009). In fact, in 2010 close to 25% of the French population lived in periurban areas (up from 22% in 1990 and 19% in 1968). The dream of a house and garden, the cost of real estate, construction subsidies, ease of travel, and urban pollution have all contributed to residential choices that are made without a full understanding of the advantages and consequences (Djellouli & Emilianooff, 2010, Dumont & Hellier, 2010; Berque, Bonnin & Ghorra-Gobin, 2006; EEA, 2006; Fouchier, 2001).

Furthermore, public policy objectives seem to be at odds with these individual behaviors and aspirations. Planning policies generally seek to limit "urban sprawl" due to land consumption, the costs of public amenities, sustainability and public health issues (Lévy & Le Jeannic, 2011; Desjardins, 2011), and increases in mobility costs for certain households and the resulting socio-economic insecurity (Rougé, 2005). Quota systems and policies to limit sprawl have been implemented, without much success. This inertia is a testament to the importance of individual or micro-local (small communes) decisions, and the relative inability of public authorities to affect them. Other solutions are therefore necessary, such as measures to influence residential choices through information, education, or "awareness-raising" (Desjardins, 2011).

In this context, drawing people's attention to the overall costs of their residential choices could potentially reduce the appeal of periurban areas. This complex cost affects both households and public authorities. The calculation is based on land and building costs, commuting costs, energy consumption, and public infrastructures including services, facilities, networks, etc. It also integrates financial, environmental, and temporal aspects.

But no matter how rational a cost-based argument may be, it must also be accompanied by high-quality residential options that include both good access to public transportation and affordable housing. It is in this spirit that new types of urban development are being envisioned. The Transit Oriented Development (TOD) model is one illustration: it seeks to increase the availability of housing (and services) in secondary urban centers served by efficient inter-urban public transport (Calthorpe, 1993). Nevertheless, in an institutional context (particularly in France) that includes a wide variety of decision-makers - public, semi-public, and private - questions arise about the forms of governance and the tools that are needed to support and encourage an approach such as TOD. What arguments can be used to influence decisions, and how can "awareness-raising" tools be integrated into decision-making for urban and transport planning?

The European project MORECO (mobility and residential costs) described below thus has a dual focus. In order to help develop secondary population centers located near public transportation, the project seeks to develop informational and awareness-raising tools to help households make better residential choices, and to improve understanding of issues related to urban planning/transport governance.

The project brings together Alpine regions from 5 European countries (Italy, Austria, Germany, Slovenia, and France) that are affected by these issues. As part of this project, the French partners - the Rhône-Alpes Region and the PACTE Laboratory (University Grenoble-Alpes) - have developed MobiCost, a mobility cost simulator for a long urban corridor from Valence to Annemasse that faces a number of challenges based on its location in a sensitive mountain environment: the Alpine Corridor.

The tool is designed for both households and various stakeholders (promoters, real estate agencies, financing institutions, social housing and services, local authorities, etc.) that are directly or indirectly involved in household decision-making. While the experiment is still too recent to evaluate its impact on residential choices, our analysis of its implementation has allowed us to identify two necessary conditions for it to be effective: user acceptance of the tool (how well they understand the tool and how to use it) and institutional governance (political support, the appropriate scale, connections between stakeholders, etc.).

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2 National Institute of Statistics and Economic Studies. In France, a periurban area includes all the communes in which 40% of the workforce commutes to one or several urban centres (conurbation with more than 10,000 jobs).
This article is organized into three sections. First, we'll provide an overview of the project’s territorial context and its implications for public policy. Secondly, we'll describe the operational context. And in conclusion, we'll present the MobiCost tool: how it works, how it can be used, and the expected results. We'll also pay particular attention to the relationship between technical aspects and governance issues and constraints.

2. The context of the experiment: local issues and global concerns

2.1. The spatial context: a polycentric metropolitan area

The Alpine Corridor is a term originally used by geographers and planners, and now politicians, to describe a functional area that covers 300 km from Valence to Annemasse. This area has no institutional structure, but common challenges (environment, transport, metropolisation, centrality) have prompted public authorities to consider joint planning efforts at the Corridor level. Even though the Geneva conurbation in the Northern part of the Alpine Corridor is very developed, most of the Corridor is actually located in the Rhône-Alpes region. It has 1.6 million inhabitants (close to 30% of the region's population), distributed along a very specific linear configuration. Its location amidst mountain ranges has led to the development of a succession of urban centers in the valleys, connected to one another by various types of transport infrastructure, including the motorway and the train on the main axes.

Fig. 1. Urban centers within the Alpine Corridor in the Rhône-Alpes Region. (Idées Territoires, 2012)
The result is a polycentric configuration with a series of seven metropolitan areas from North to South: Annemasse (bordering Geneva), Annecy, Chambéry, Grenoble, Voiron, Romans, and Valence. The area’s economic dynamism (33% of the top metropolitan jobs in the Rhône-Alpes Region are located there) had led to significant population growth (+50% between 1950 and 1990, +8.5% from 1999 to 2007) and a gradual increase in periurban housing. This housing is located on mountain slopes that provide high-quality residential areas, but which are ecologically fragile and highly symbolic. This urban sprawl is areal and diffuse throughout the mountainsides, and then longitudinal along the valley, punctuated by small cities with no train service.

Jobs have become increasingly polarized into conurbations, and residents have spread out into peripheral areas. This has led to an increase in commuting, 85% of which is by car! On average, workers in the Alpine Corridor drive more than 20 km and spend close to 40 min per day in their car to get to work\(^3\). The consequences are above all environmental: soil artificialisation, increased fragility of mountain areas, and greater atmospheric pollution.

![Work-home trips in the five major urban areas](image)

**Fig. 2.** Work-home trips in the five major urban areas (Idées Territoires, based on INSEE 2008)

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\(^3\) The authors’ calculation based on INSEE census data from 2008.
Commutes towards the four main urban areas in the Alpine Corridor (Valence, Grenoble, Chambéry, and Annemasse), as well as towards Switzerland, show the respective extent of these commuters areas. There are also several bipolar zones, such Grenoble-Chambéry, Chambéry-Annecy, and Annecy-Geneva.

Motorway and train traffic also reveals the great complexity in the interactions between these different levels (fig 3a and 3b). There are three types of overlapping networks: long-distance trips via train routes that are connected to the national high-speed network (via Lyon, Valence, and Geneva); inter-city traffic with a series of successive links; and periurban traffic, reflecting the polarization around each conurbation (Systra, 2003).

A lot fewer commuters travel by train, and the trips are organized a bit differently. Train travel is less effective for longer trips or for travel to Geneva. However, the train does serve a number of small cities that are secondary population centers in the Alpine Corridor.

The longitudinal configuration of the Alpine Corridor might appear to lend itself well to polycentric territorial organization. Nevertheless, the existing forms of governance actually accentuate territorial divisions and have led to the creation of distinct and discontinuous policy areas, in total contradiction with the axial configuration of urban development in the Corridor. Though there are many cooperative projects between the different territories, none of them have considered the Alpine Corridor in its entirety and thus have limited institutional value (Fourny, Papa, Périgois, 2010). For example, urban planning through SCOTs (Territorial Coherence Plans) divides the Alpine Corridor into 7 or 8 planning areas! As a result, the in-between, bi-polar spaces or mountain areas on the outskirts of cities are infrequently or badly integrated.
The same can be said for transport management. The PTUs (Urban Transport Areas) that coordinate and manage transport in the conurbations also succeed one another along the Alpine Corridor (fig 4). There are obvious gaps between the main conurbations, which don't take into account the furthest peripheral and multi-polar areas, even though they rely on these central systems.

Fig. 4 Urban Transport Areas in the Alpine Corridor (Coopération Métropolitaine Sillon Alpin, 2010)

4 Urban Transport Areas in Valence, Romans - Bourg-de-Péage, Grenoble, Chambéry, Aix-les-Bains, Annecy, Annemasse, Bellegarde, and more recently Voiron
Given the interdependence between residential strategies and mobility as part of the periurbanization process, public policies must associate transport and urban planning, and address both strategy and action. A sustainable planning approach requires that authorities acquire all the information that will allow them to fully understand the diversity and continuity of territorial dynamics, and then share this knowledge to establish a dialogue between territorial decision-makers, stakeholders from different sectors (transport, urban planning), and a variety of partners at different levels (public, semi-public, private, non-profit, etc.). As such, the advantage of the MORECO project is that it helps improve the connection between knowledge-based tools and governance issues.

2.2. The operational context, a European framework

The Rhône-Alpes region took advantage of the Alpine Space Cooperation Program’s third call for projects to establish the conditions for a dialogue between territorial and sectoral stakeholders in the Alpine Corridor. Ten pilot sites worked with the MORECO project: Annemasse, La Roche sur Foron, Chambéry, Montmélian, Brignoud, Voreppe, Moirans, Tullins, Saint Marcellin and Valence TGV TER. These sites were chosen according to their relevance to transport issues and their densification potential.

The objective of this project is to help establish sustainable spatial planning that is founded on complementarity between urban development and mobility. To do so, MORECO seeks to "objectify" and publicize mobility costs in periurban areas. Indeed, households that settle on the outskirts of cities tend to focus on property and construction costs in their financial decisions, ignoring or quite often underestimating their transport costs. The purpose of this project is therefore to raise awareness of these costs so they can be fully integrated into the decision-making process. The MORECO project lasted three years, from July 2011 to July 2014.

In terms of methodology, after carrying out a diagnosis of various public policies related to urban planning or transport in their region or country, the MORECO partners conducted a statistical, then sociological analysis of the residential strategies and mobility behavior of households in different pilot sites. These diagnostic and discovery phases allowed us to envision three types of decision-making or awareness-raising tools, focused on three target groups:

- Households: via mobility cost simulators and educational materials on the various types of mobility costs related to periurban housing (time, money, quality of life, environment, etc.).
- Urban planning professionals and the technicians from public authorities: via strategic mapping (GIS) tools and tools to calculate the "cost/distance" of areas to be urbanized.
- Elected officials and public and private decision-makers: via educational materials on various issues and possible solutions to connect urban planning and transport policies.

The Rhône-Alpes Region emerged as a legitimate institution at the appropriate scale for leading such an approach. It is the only institutional body with sufficient planning competence that is also able to address the issues at the level of the Alpine Corridor, by "transcending" the previously mentioned boundaries and local territories. The region has authority over regional railway transport, and as part of its sustainability policy it is responsible for structuring urbanization through the railway network, via two main axes: greater use of Regional Express Trains for the commute to work, and densification of areas near train stations to develop housing that is less dependent on individual car use.

Lastly, the international partnership between the five European countries has several objectives: the development of generic tools, after experimentation in different institutional and metropolitan situations; the transfer of knowledge and good practices; and experiments to identify the conditions (particularly related to governance) that are required to implement these tools.

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5 Surveys of periurban households in the Grenoble urban area conducted by Idées Territoires in 2012.
3. Raising awareness of mobility costs: a lever to influence household practices and local policies?

3.1. The social impact of mobility costs

Periurban households tend not to be aware of their mobility costs, and rarely take them into account. The work of Zahavi (1974) showed that household transport time budgets were often considered to be (and observed to be) relatively constant over time and between cities. Transport rarely takes more than an hour and represents 5% to 15% of the household budget. Though an increase in the speed of transport has pushed housing farther and farther away, rising fuel costs might motivate households to move closer to the center. However, when they have limited revenues and/or own a house that is hard to sell, they can remain stuck where they are. As a result, pockets of financial insecurity have appeared, or are at risk of developing if fuel or real estate prices increase (Rougé, 2005; Coutard, Dupuy et Fol, 2002). This risk is all the greater given the uneven distribution of transport costs: 6% of total revenues for better-off households in urban centers, compared to 15% for low-income households living in second ring suburbs and driving cars (Nicolas, Pochet & Paimboeuf, 2002; Orfeuil & Polacchini, 1998). Furthermore, this risk is not one that households plan for: mortgage payments are based on income earned rather than available income; expenses that cannot be reduced, such as transport costs, are not taken into account. We also noticed that households were not aware of, nor did they try to calculate their total mobility costs. Surveys conducted at MORECO study sites confirmed the results of other studies (ADETEC, 2012; Baudelle, Darris, Olliviro, Pihan, 2004): households rarely calculate real transport costs. They usually only take into account the cost of fuel and motorway tolls, given that cars are seen as indispensable, no matter which form of mobility is used.

3.2. An unacknowledged or distorted reality

To a certain extent, residential choices are based on factors that aren't purely monetary: the desire for single-family home, the quality of life that is associated with getting away from the city, the sense of security that comes from owning property, the psychological reward of owning a car (individual freedom). These are all "priceless", and aren't subjected to rational estimates: cars are "worth the cost", whatever it may be, and people would rather not know the true cost, perhaps to avoid facing reality. Conditions for bank loans also reinforce this exclusive focus on the cost of housing, while masking mobility costs.

Similarly, comparisons between car travel and alternative modes of transport are rarely made, or they are based on partial or incorrect data (cost of a trip rather than integrated costs). Thus different usage values are compared (comfort, flexibility) without truly taking into account their true economic impact. In residential areas that have little access to public transport, an evaluation is often made based on time. However, an assessment of time saved is highly subjective, and depends on the personal values that are attributed to the activity, or how transport time is spent (Fourny, Cailly, 2004).

4. Objectifying transport costs to raise awareness: the MobiCost simulator

4.1. A tool to help households make residential choices

Any tool that seeks to help a "potential periurban dweller" evaluate the full cost of transport must therefore take into account the various types of transport and reasons for travel. This tool is different from various online services that provide a specific answer to a specific question (how much will it cost and how long will it take to go from point A to point B at this particular time).

Such tools are increasingly available, particularly for major metropolitan areas. One example is WoMo (http://womo.mvv-muenchen.de/), which the Munich Transport and Tariff Association developed for the Munich metropolitan area. The French MORECO project partners looked to the work done in Munich for inspiration.

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6 An analysis of several types of calculators, including the WOM, was conducted by Susanne Franz of the Kaiserslautern Institute for Mobility &
However, developing a tool to increase awareness of overall transport costs, and indirectly, the advantages of taking public transport into account in residential choices and mobility decisions is highly dependent on the local context. The MobiCost simulator was thus adapted to the specific institutional and territorial context of the Alpine Corridor.

4.2. Design constraints and outputs

The impact of the political and institutional context:

The weakness of political and institutional organization in the Alpine Corridor, as previously mentioned, had several consequences on the development of this cost simulator.

First of all, there is no structure or authority with both the necessary capability and legitimacy to centralize and organize all the information on public transport options, particularly for intra-urban transport and inter-urban buses.

Secondly, the objectives of the MOBICOST project required that we take a particular approach to mobility:

1. By trying to influence household residential strategies and mobility choices, which is different from offering a daily service with information on specific and particular conditions for a location or time period.
2. By providing planners and decision-makers with thematic information that could be compared in spite of differences in spatial and temporal scales, in order to improve coordination between transport and urban planning policies.

Given that transport services are subject to frequent changes (route, schedule, fees, location of stops, etc.), it was simply not feasible to design a mobility cost calculator with the geographic and temporal precision that is possible in a politically, administratively, and technically unified and organized area.

As such, the calculator's results cannot be regarded as ends in themselves, but rather as information that helps to create or reinforce a message or inform discussions that go beyond a simple assessment of mobility costs.

Usage-centered design:

To a certain extent, the tool was based on usage-centered design, and thus had to meet three conditions:

- The results for the entire Alpine Corridor have to be homogeneous and continuous: the overlap of areas of influence is very concretely reflected by the fact that in a number of households, people work in different urban centers and must make choices based on comparable information
- The data used in the calculation have to be coherent and viable: the variety of producers and the heterogeneous nature of the information meant that we could only use data that we knew to be financially, technically, and politically accessible and updatable.
- The tool has to be easy to use, with useful results: given that the primary objective wasn’t to offer a specific service or information, but rather provide data that would influence the perceptions and decisions of households and public decision-makers, the methodological challenge was to prioritize ease of use (by asking for the least amount of information possible) and the relevance of the results (that incorporated all the factors, even approximately), rather than precision.

A simulator rather than a cost calculator:

Transport as part of the MORECO project, and is available at: http://www.alpine-space.eu/uploads/tx_txrunningprojects/MORECO_Good_Practice_Collection_Tools.pdf
MobiCost was thus designed as a simulator rather than a cost calculator. Starting with information provided by the household (essentially focused on work location and schedule), the results provide a concrete answer to the following question: if I live in this particular community, what will my travel costs and travel time be for a variety of potential or necessary means of transport. For any given configuration, the simulator can typically inform the user of the need for an additional vehicle, as well as its cost per kilometer, which is inversely proportional to the number of kilometers driven by this "secondary" vehicle.

The simulation can also modify travel conditions: for example, by changing the price of gas; by modifying the means of transport; by carpooling to the train station or inter-urban bus stop; or by choosing to live in an urban center close to all the necessary services, thus eliminating the need for a car altogether.

**Calculation method and data used:**

As indicated in figure 7, the MobiCost simulator calculates three types of information:

- Information about the household and its working members that is as simple and intuitive as possible (figure 8)
- Additional information stemming from the initial data, but which the user can modify (for ex. the closest station to a particular residential area, the price of a public transport pass in the town where the individual works)
- Default parameters (for ex. speed of bicycle travel)

The calculator then makes two calculations:

- A systematic "cost" calculation (in money, time, distance, CO2) for the household's commutes
- And then successive calculations of inter-modal access to the workplace based on information that was provided or deduced, as well as the different related costs (for ex. the need to acquire an additional car to travel to the station)

Several databases or data matrices are used to produce these results:

- Travel distance and duration come from a commercial database (Odomatrix) functioning from municipality center to municipality center. A survey of commuters in the pilot site showed that the difference between calculated and actual durations does not exceed 5 min
- Information about the closest municipality offering basic services comes from the French national statistics institute (INSEE)
- Matrices and tabs related to trains, buses, and highways were painstakingly developed using information published by the relevant operators
- Other parameters and formulas came from various sources (for ex. The Touring Club of Switzerland to calculate cost per kilometer)

The MobiCost simulator was developed as an Excel application. The version that was tested and stabilized is currently being implemented as a web application.
Fig. 5 MobiCost functional organization

Fig. 6 Content of the data entry interface
4.3. Individual mobility in numbers and pictures

**Individual mobility costs: time, distance, money, pollution:**

At the household level, an increase in daily travel can generally be understood as a combination of "efforts": the distance travelled (source of fatigue and risks), the time spent (to the detriment of other activities), the resulting monetary cost, and the pollution emitted.

We know that although these different factors can be calculated mathematically, they don't necessarily all have the same influence on household perceptions and decisions, depending on income, family structure, location of the home or workplace, and travel conditions. It therefore seemed necessary to offer an estimate of the economic, social, and environmental costs of travel that combined all these different aspects. This choice had a strong impact on the methodology, since the calculator had to integrate both inputs and outputs at different time intervals: for example, some variables are based on a specific daily trip (i.e. the distance from home to work), while others are calculated over longer time intervals (cost/km of car use). As such, some of the simulator's results made more sense when presented as a daily calculation (travel time, for example), while others were calculated on a monthly basis (particularly those related to costs).

In addition to modeling mobility in terms of distance, time, and cost, the simulator also had to explain the different types of information that were produced and design relevant or appropriate methods to aggregate or disaggregate data.

Given the diversity, complexity, and variability of the factors that influence the mobility choices of household members, we needed to develop a method of calculation that would produce realistic rather than real results.

This raised the issue of how to present the results, especially given that the purpose of MobiCost is not just to provide information but to effect changes in behavior.

**The cartographic approach:**

As part of our efforts to help households make residential choices, we held local focus group discussions before developing the simulator, where the idea emerged to map simulated costs. There are 3 advantages to using a cartographic approach:

- It can be used early on in the household's decision-making process by providing a geographic orientation to their housing search.
- It promotes a comparative approach that is consistent with MobiCost's function as a simulation tool rather than a service.
- And for the purposes of research and expertise, it provides data that can be used to compare costs with other types of variables (property prices, demographic structure, etc.).
4.4. An experimental approach focused on "fieldwork" and "stakeholders"

Focusing on professionals who come in contact with households:

It's obviously quite difficult to reach households that are thinking about moving to periurban areas. So in order to validate the design and utility of MobiCost we decided to contact public and private professionals that were likely to come into contact with households. Given the diversity of professional cultures and concerns, this approach gave us a broad sense of how mobility costs might (or might not) be integrated or simply taken into consideration. We thus observed and analyzed the ability of these professions to use the MobiCost simulator or serve as relays.

Different viewpoints on mobility costs:

As part of an academic workshop, a group of Master's students mapped out the steps that households take to acquire a home, along with the various professionals they will necessarily or potentially come across. Based on that
information, the students interviewed 2 to 3 representatives from each of those professions in the study area corresponding to figure 7. The interviews included two sets of questions: one about the interviewee’s opinion of the relevance of mobility costs to their profession, the other more specifically about the structure and utility of the MobiCost simulator.

| Type of population reached | Closeness of connection to households | Consideration of mobility costs in professional practices | Intellectual interest shown by those who were interviewed | Effectiveness as a relay to disseminate the MobiCost tool |
|---------------------------|--------------------------------------|----------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|
| Banks                     | ++++                                 | ++                                                       | +++                                                   | +++                                                   |
| Real estate agents        | ++++                                 | +                                                        | ++                                                    | ++                                                    |
| Promoters                 | ++                                   | 0                                                        | +                                                     | 0                                                     |
| Notary public             | ++++                                 | 0                                                        | 0                                                     | +                                                     |
| Social housing manager    | ++++                                 | +                                                        | +                                                     | ++                                                    |
| Information and welfare services | ++                              | +++                                                      | +++                                                    | +++                                                    |
| Local authorities in charge of urban planning and transport | +                                   | +                                                        | ++                                                    | ++                                                    |
| Land use experts and organisations | 0                               | +                                                        | 0                                                     | +                                                     |

Fig. 8 Summary of interviews with professionals involved in household residential choices: how interested are they in the cost simulator? To what extent can they relay information about mobility costs? (Idées Territoire + PACTE + Région Rhône-Alpes, 2014)

An analysis of the interviews highlighted several key points that are summarized in figure 8:

- Real estate professionals showed little interest in taking mobility costs into account. The determining factors in their profession are above all related to constraints and opportunities regarding land and regulations.
- Public planners were interested in the issue, but still don't see it as a strategic component of political choices regarding urban planning and transport.
- Public or private actors that are impacted in some way by household financial solvency (banks, social services, etc.) were very interested in having access to and relaying mobility cost information.

5. Conclusion

Our starting point was the inability of public planners to act on common interest principles (whether they agree with them or not), such as reducing land consumption or CO2 emissions. This inability drove us to research other
types of actions focused on individual practices, perceptions, and strategies. MobiCost is thus a tool that is designed for individual use, to help influence the individual's decision-making process. It doesn't take into account subjective factors that affect decisions, as this would be quite problematic, but rather increases awareness of costs in order to inform, support, and rationalize the decision. This awareness reduces social vulnerability by allowing individuals to estimate the risks they are taking, and even to balance this cost through "savings" in other areas. But it is not prescriptive, as the individual is the one who weighs the different arguments. However, it does individualize the broader social issue of sustainability in utilitarian and monetary terms, which is why additional awareness-raising measures based more on ideology could be useful.

Nevertheless, our efforts to develop this mobility cost simulator, and to test it with various public or private professionals involved in household residential choices allowed us to make two observations:

- In term of households, the calculations aren't necessarily difficult, but it's hard to assess how they are subjectively perceived and understood.
- In terms of public decision-making assistance, some of this information comes across as "sensitive" or even "explosive", in the sense that it showcases the appeal (or not) of a particular town, and can therefore have an impact on how it is perceived by potential residents.

In both cases, it's clear that the content and design of this tool go far beyond its technical aspects. The individual information it provides could also help transform planning governance, in addition to influencing individual behavior. However, a number of scientific challenges remain given that it requires experimental, interdisciplinary, and partnership-based approaches.

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