

|  | Massnahmenpaket A   | Massnahmenpaket B   |
|--|---|---|
| <b>Verkehrsfinanzierung</b><br>Abgaben auf Autos und Treibstoffe | Einführung einer <b>Gebühr</b> von <b>1.8 CHF je gefahrene 100 km</b>   | <b>Vergünstigung</b> von <b>CHF 1000</b> beim Kauf eines <b>umweltfreundlichen</b> Neuwagens, <b>Zuschlag</b> von <b>CHF 3000</b> beim Kauf eines <b>weniger umweltfreundlichen</b> Neuwagens |
| <b>Verkehrslenkung</b><br>Strassenbenutzungsgebühr               | Gebühren zu <b>Stosszeiten</b> in Zonen von <b>Städten und Agglomerationen</b>  | Gebühren zu <b>Stosszeiten</b> auf <b>allen Strassen</b>  |
| <b>Mittelverwendung</b><br>Vermehrter Einsatz                    | <b>Beseitigung von Engpässen</b> im <b>Nationalstrassennetz</b> (z.B. Bau einer zusätzlichen Spur auf einer Autobahn) | <b>Erweiterung des Nationalstrassennetzes</b> (neue Autobahnabschnitte)   |
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## Attitudes towards transportation policy in Switzerland: a new choice experiment

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# Attitudes towards transportation policy in Switzerland: a new choice experiment

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## Abstract

The Mobility and Transport Microcensus (MTMC) is the largest Swiss travel diary survey. In its 2021 edition, questions on attitudes towards transportation policy were for the first time conducted as stated ranking and stated choice experiments. These question types forced respondents to define priorities between investments and to find a trade-off between (1) government investments to improve the Swiss transportation system and (2) policies financing these investments. This paper presents the development of the new questionnaire, the tested policy measures and outlines how data on attitudes towards transportation policy were collected in the main survey in 2021 and how they will be analysed.

## Keywords

stated choice, stated ranking, stated preferences, political opinions, transport policy

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# 1 Introduction

The Mobility and Transport Microcensus (MTMC) is the Swiss national travel survey. With a sample of more than 57'000 persons in 2015 and a long list of questions, this is the largest national-level survey in Switzerland about travel behaviour. It is conducted every 5 years and contains a rich set of information about socioeconomic characteristics and travel behaviour, in particular about:

- socioeconomic characteristics of households and individuals,
- mobility resources (vehicles and public transport season tickets),
- daily mobility (trips on a given reference day),
- occasional journeys (day trips and trips with overnight stays), and
- attitudes towards transport policy in Switzerland.

Its findings help to determine transport and spatial development policies. They are used in transport modelling, for developing the Transport Outlook of the Swiss government and in public and private research, with 282 references as of today<sup>1</sup>.

The present paper focuses on the redesign of the question block on attitudes towards transport policy, also called Module 3 of the MTMC. 10% of the full sample are randomly assigned to answer the questions of Module 3. In the 2015 version of the MTMC, this sampling strategy resulted in 4677 valid interviews<sup>2</sup>.

The general objective of the gathered information on attitudes towards transport policy in Switzerland is to generate insights into the opinions of the population and to study the acceptability of policy measures. It can be used by the general public and the authorities, at the local, regional and federal levels. Such questions were integrated in the MTMC since its conception (see Section 2.1), with the goal, in 1974, to weight objectives and differentiate the preferences by groups of population. Today, the goals are to better understand:

- new sources for financing the infrastructure, in particular in the context of an increasing electric car fleet, not paying petrol taxes,
- the link between (1) the acceptance of a tax and (2) how its revenues will be used,
- the opinion in the population regarding congestion charges, and

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<sup>1</sup>List of publications using the data of the Mobility and Transport Microcensus

<sup>2</sup>4677 valid interviews corresponds to 10% of the 57'090 persons who answered the general survey, without the respondents younger than 18 years old

- the difference in acceptance between a distance-based tax (time invariant) and congestion charge (time varying).

It is important to emphasize that the results of this module of the MTMC are not forecasts of a future vote on the policy measures mentioned in the survey. First, the sample of the population participating to the MTMC is not the same as the sample of the population who actually votes. Second, voters are influenced by the political campaign that would happen if a vote would take place. The example of the congestion charge in Stockholm shows that voters are influenced by the voting recommendations of the political party that they feel closest to (Börjesson *et al.*, 2012). In Switzerland, the example of the 2013 popular initiative on the vignette, a yearly highway tax, shows that the results of the previous MTMCs were no forecasts for votes (see Section 2.1 for more details).

To understand attitudes towards transport policy, in the past versions of MTMC, the respondents rated various statement items on three ordinal rating items in a phone interview. This data collection method format limited the insights that could be drawn from the survey. Most importantly, respondents simply tended to agree with measures that involved government investments to improve the transport system, but to disagree with measures that involved increase taxes or fees. Hence, no trade-offs between different types of investments and ways to finance transport infrastructure and services could be derived.

In order to obtain more differentiated and usable insights into the transport policy preference structure of the Swiss resident population, the government agencies in charge with MTMC were interested in fundamentally revising the third module on transport policy attitudes of the Swiss Mobility and Transport Microcensus (MTMC) and open to change both the survey and data collection method in order to allow for deeper and more nuanced insights.

This paper presents the evaluation of different methods to replace the existing survey approach. This includes a broad review of different methodologies to survey opinions, evaluations of combinations of different survey techniques and first results of the feasibility study involving a test survey with approximately 400 respondents. As a result of this process, a combination of Stated Ranking and Stated Choice experiments is proposed as the ideal survey form that can replace former forms of opinion measures. The new survey form has been implemented in the MTMC 2021.

In order to demonstrate the suitability of this new form, the remainder of the article is

structured as follows. First, the possible alternatives to replace the existing survey section are shown. Second, the development of the new questionnaire which includes both stated ranking and stated choice experiments is presented. Third, the results of a feasibility study for the preferred variant from the combination of Stated Ranking and Stated Choice are shown. Fourth, a related test sample is presented that gives insights into possible results from the new method. The article ends with an outlook on possible analyses stemming from the MTMC 2021 data whose results will be available for the general public in early 2023.

## **2 The policy attitude module of the Mobility and Transport Microcensus**

### **2.1 Past developments**

This section focuses on the development of the questions on transport policy used in past versions of the MTMC. For a more general history of the MTMC, see Simma (2003).

The first MTMC survey took place in 1974 as a combination of written and personal interviews. Congestion and negative impacts of traffic on the environment created a need for data on mobility behaviour (Simma, 2003). Already this first edition had the goal of collecting information about attitudes towards transport policy. In total 1000 persons between 15 and 74 years old were asked in German, French and Italian language on transport policy issues in a separate accompanying research project that ended in 1977. Topics covered the motorization in Switzerland, the spatial accessibility of public transport and general transport and land use policy goals (e.g., reducing the negative impacts of traffic on people and their environment, achieving a balanced spatial and settlement structure, better satisfying the transport needs of the economy, etc.) (Eidgenössische Kommission für die schweizerische Gesamtverkehrskonzeption GVK-CH, 1978).

In 1979, results showed that 70% of the adult population think that public transport should be more promoted than before (vs 2% against), 13% that cars should be more promoted (vs 30% for the status quo and 54% against), 72% are for stricter regulations concerning car emissions and road noise (even if it would include costs), 86% are for more



pedestrian zones in the city centers, 79% believe that one must drive slower close to schools and playgrounds and 64% are for a similar rule, driving slowly, in general in residential neighbourhoods (“Quartierstrassen”) (Eidg. Verkehrs- und Energiewirtschaftsdepartement and Stab für Gesamtverkehrsfragen, 1983).

In 1994, as the MTMC turned to a Computer-Assisted Telephone Interviewing (CATI) methodology, statements were read on the phone by the interviewers and rated by the interviewees. The participants could answer on four rating items that were operationalized as strongly agree, partially agree, strongly disagree or no opinion. The survey included, Four statements concerned car traffic and five concerned public transport. Results were differentiated by urban/rural typology, language, gender, status of driver licence ownership (no/yes), car availability or ownership of a season ticket for public transport, and finally by mode choice. Compared with 1979, we can observe a stronger focus on questions with regard to prices and who pays for transport related costs (e.g. “Car drivers should pay themselves the costs they generate” among the 4 statements about car traffic, “Public transport should be cheaper”, “Too much tax money is used for financing public transport”, “Limiting public transport supply on unprofitable routes” or “Unprofitable train lines should be replaced by bus lines” among the 5 statements about public transport) (Office fédéral de la statistique and SG DFTCE - Service d’étude des transport, 1996).

In 2000, new questions on actual issues of Swiss transport policy are asked, in particular regarding the integration of the Swiss transport system into the European transport policy. This European focus is most probably related to the referendum on the European Economic Area (EEA) membership in 1992 and the negotiations about Swiss-European bilateral treaties, two of which concern air traffic and road traffic, signed in 1999. Another new urban topic has appeared in 2000: parking (“Should parking fees be increased in urban centres?”). A one-page summary explains the consequences of the answers on transport policy to the interviewees. It emphasizes the challenge of a positive attitude towards new solutions (e.g. to manage traffic in agglomerations or leisure traffic), and simultaneously an opposition to increased financial burdens (Office fédéral de la statistique and Office fédéral du développement territorial, 2002).

In 2005, 2010 and 2015, replies to questions on taxes and the use of revenues all show the same pattern: a majority of the population is against measures increasing the cost of mobility. Results of the last available survey, run in 2015, show that respondents mostly dislike paying for the transport infrastructure. A majority is against an entry tax for cars and motorbikes in urban centres at peak hours (61%), against an increase in parking costs in urban centres (68%), against an increase in the price of fuel (67%), against an increase

in parking costs in supermarkets (57%).

At the same time a vast majority supports using revenue from fuel and vehicle taxes to fund various forms of transport (Office fédéral de la statistique and Office fédéral du développement territorial, 2007, 2012, 2017). For example, in 2015 85% of the respondents tended to agree or fully agreed that such funds should be used for road traffic, 89% for improving walking and cycling and 81% for public transport. However, using the revenue to decrease other taxes or for the general budget of the state was generally not supported (Office fédéral de la statistique and Office fédéral du développement territorial, 2017). This is in line with acceptance studies (see e.g. Farrell and Saleh (2005); Schuitema and Steg (2008); Rentziou *et al.* (2011)).

However, there are two exceptions, where respondents agree to pay more. One is for using tunnels. It might be due to the fact that tunnels given as examples (Gotthard Road Tunnel and San Bernardino Tunnel) are not used by most respondent often or at all. Consequently, respondents would not be impacted by such a tax. The fact that tunnels need large investment costs and are some kind of emblematic construction might be an additional explanation. The other exception is the vignette, a yearly highway tax. 40% of respondents are in favor of the tax, 18% in favour under certain conditions and only 38% are against it. These survey results contradict the outcome of a popular initiative in 2013, where 60% of votes were against an increase by 20 CHF to 100 CHF. It is most probably due to the fact that no monetary value was defined in the survey question and the question was only in general about an increase.

In 2010, new questions on differentiated time-dependent transport costs were introduced. Unsurprisingly, increasing the costs at peak hours is negatively evaluated, while decreasing the costs between peak hours is positively evaluated. The general principle of varying costs is negatively evaluated. For example, in 2015 51% did not support time-differentiated pricing in public transport (Office fédéral de la statistique and Office fédéral du développement territorial, 2017).

These somewhat predictive results give reason for a change in the survey design based on a new methodology.

## 2.2 Need for a new methodology

The presentation of the results stemming from former versions of Module 3 clearly show four basic problems with regard to their methodological approach:

- There are no priorities between the different taxes, nor between the different measures for investments in the transport system.
- There are no links between revenue use (investments) and the revenue collection (e.x. taxes).
- The measures are formulated in a general way and no monetary values are stated in the survey question.
- An in-depth analysis of the preference structure is not possible based on single-statement items.

In addition, responding to a series of questions based on ordinal rating items in a computer-aided interview setting was perceived as monotonous and increased the response burden and duration of the survey substantially.

More generally, the criticism of the third Module of the MTMC can be broken down into the following three dimensions: i) limited analysis possibilities, and ii) lack of significance in terms of transport policy and iii) negative field experience and high survey burden. Therefore, the government agencies in charge with MTMC initiated a project to review the survey method, propose a new survey format and test it in a pilot study. The results of this project are summarised in the following chapters and have been described in a report in German (Bundesamt für Raumentwicklung, 2017)<sup>3</sup>.

## 3 Considered possibilities to measure attitudes towards transport policy

The previous type of survey on transport policy attitudes within the framework of the Mobility and Transport Microcensus can be classified as a direct method. It is a ranking procedure. The results represent the attitudes of the respondents regarding different policy attitudes on a three-point ordinal scale. This allows shares relating to agreement to

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<sup>3</sup>Available online: <https://www.are.admin.ch/are/de/home/medien-und-publikationen/publikationen/grundlagen/neugestaltung-des-moduls-zu-den-verkehrspolitischen-einstellungen.html>

be shown by means of descriptive analyses in the form of percentage share values for the categories. The application of indirect methods allows to overcome the shortcoming of the direct method used in 2015 and before which only allowed evaluation of the considered dimensions and measures in isolation from each other. In order to improve the information value of the results, the following approaches were considered and qualitatively compared with regards to survey format at feasibility to conduct it by CATI as part of the main MTMC survey, analysis options, response burden and survey cost.

### **3.1 Stated Ranking**

In a Stated Ranking survey, respondents are presented with a selection of possible alternatives. Respondents must then rank these alternatives based on their own agreement. This ranking is used to derive what determines the preference of individual alternatives. The experimental design for Stated Ranking involves defining the alternatives to be ranked. In order to not overwhelm the respondent, three to eight options are usually given for each question. Over multiple decision-making situations, however, a wider selection of alternatives can be taken into account through corresponding permutations.

Figure 1 shows an example how a simple Stated Ranking experiment can be formulated to let the respondent prioritise the use of funds in the domain of cycling. In a similar manner, one could also ask the respondent to indicate which domains should get more funds in future by specifying individual modes of transport as the alternatives that need to be ranked.

Stated ranking data can be analysed through various forms of descriptive statistics and modelled using discrete choice models.

### **3.2 Stated choice**

Different to stated ranking approaches, stated choice surveys only ask which alternative is considered the best fit. An alternative is defined by a set of variables with related attribute levels. For example, to gauge preferences in adapting general transport financing, two alternatives could be specified as indicated in Fig. 2.

Figure 1: Example of a Stated Ranking experiment to prioritise the use of funds in the domain of cycling

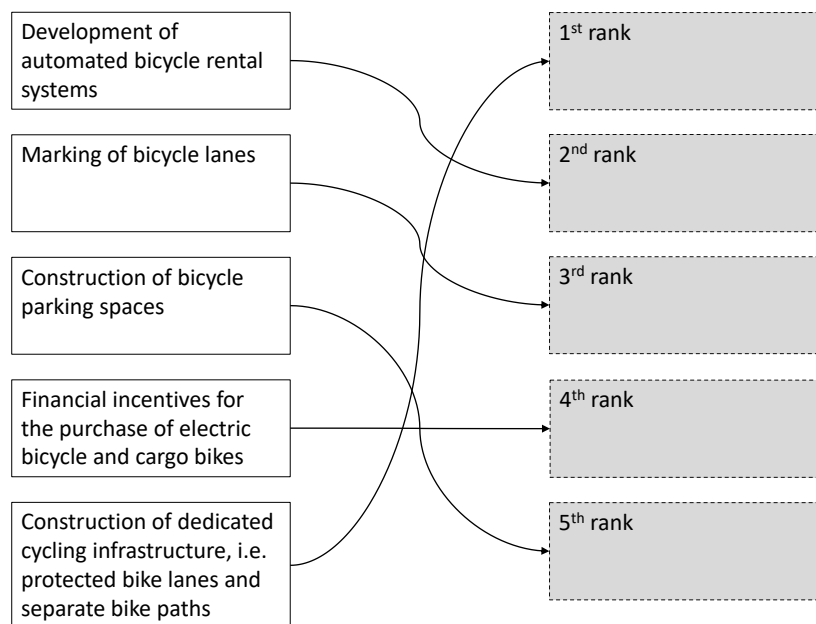


Figure 2: Example of a Stated Choice experiment with 2 alternatives, A and B, and 6 attributes, described as a table

|  | <b>Alternative A</b>                | <b>Alternative B</b>                            |
|--|-------------------------------------|---|
| <b>Transport finance</b>                         |                                     |   |
| <b>Adaptation of existing finance mechanisms</b> | Price increase of motorway vignette | No changes                                      |
| <b>Road Pricing</b>                              | Charges on congested routes         | Introduction of paid express lanes on motorways |
| <b>Use of funds</b>                              |                                     |   |
| <b>Road network</b>                              | Bottleneck removal                  | More funds for operation and management         |
| <b>Accompanying measures</b>                     | Noise protection                    | Better bicycle infrastructure                   |

Stated choice cannot be meaningfully analysed through descriptive statistics. Insights are derived through analysis with suitable econometric models such as logit approaches. Given that only two or three alternatives are evaluated by the respondents, the definition of the alternatives can be more detailed including more variable and attribute levels. The visual representation of stated choice experiments usually allows respondents to directly compare the attribute levels of the same variable between the alternatives. Trade-offs between different variables can be quantified based on a the ratio of the related parameter values. Different to Stated Ranking, descriptive analysis of the results is not possible with

a Stated Choice approach which represents an disadvantage in terms of reporting.

### 3.3 Rating / Vignette analysis

Vignettes are multi-dimensional stimuli consisting of a short, carefully constructed description of a person, object, or situation, representing a systematic combination of variables. Atzmüller and Steiner (2010); Eifler (2007). The variables usually include only two or three attribute levels which can be of nominal, ordinal or interval scale. However, for practical reasons normally only nominal scaled variables are employed. Vignette methods have been adopted and adapted for application in a range of disciplines for both qualitative and quantitative work. To allow for quantitative analyses, respondents are asked to rate vignette using an ordinal or interval scaled variable.

Switching the existing question format to a rating procedure would allow the derivation of simple descriptive statistics such as computing averages and standard deviations if equidistance between the response categories is assumed. But even if a metric scale would be used, vignette analysis is still a one-dimensional attitude measurement, where individual alternatives do not have to be weighed by the respondents. Regression techniques such as ordinary least square (OLS) are usually applied for data analysis using the respondents rating of the vignette as the dependent variable. While trade-offs between different variables can be quantified based on the resulting parameters, the respondents did not implicitly compare different vignettes with each other.

### 3.4 Stated Adaptation

Stated Adaptation is a stated preference approach which is particularly suitable if the choice task involves some budgetary constraints. The decision about selecting a set of transport infrastructure project or measured to be funded given a certain budgetary constraint could be very well depicted using Stated Adaption question formats. However, the questions of interest in Module 3 are related to the preference with regards to transport policy and not specific projects. Therefore, we did not consider Stated Adaptation as promising method for the application in Module 3 and refrained from taking it into account in the further process of the feasibility study.

### 3.5 Rating scale

Rating scales were considered as a further option to direct method to survey to what extent different transport policy opinions on transport financing and expenditure of funds are supported. To this end, the respondents would be asked to indicate approval with various transport finance and expenditure items on a seven step scale. Such questions could for example ask for the level of satisfaction if a mileage-based tax (those who drive more, pay more) would be introduced.

Direct methods do not allow as such, they do not overcome the identified shortcomings of the previous type of survey on transport policy attitudes within the framework of the Mobility and Transport Microcensus. Therefore, they were not further considered.

### 3.6 Conclusion: selection of methods for the feasibility study and related implications

Based on the examination of different survey forms, Stated Ranking and State Choice were selected as the most promising variants to be further examined in the feasibility study. Different to direct methods those Stated Preference-based methods also allow the quantification of trade-offs, i.e. weighting in the case of opposing dependencies. Compared to Vignette analysis, those two methods also allow the consideration of more attribute levels and therefore a more detailed and nuanced description of the alternatives. As a result, interpretations such as “if the fuel tax is reduced by 10%, an additional 5% of the population supports the introduction of mobility pricing” could be derived.

In addition, the respondents are asked to directly compare different alternatives by weighing the attribute levels of the various variables. From a behavioural point of view, this provides a more sound basis for the derivation of trade-offs based on parameter estimates as in the case of vignette analysis. However, neither State Choice nor Stated Ranking surveys can be conducted with CATI, but require data to be collected through a paper and pencil (PAPI) or computer-assisted web interview (CAWI). Given the advantages of the Stated Preference approaches with regards to deriving quantitative insight, it was decided to change the data collection method.

## 4 Feasibility study

The objective of the feasibility study was to

- define ready-to-use questionnaires for both the stated ranking and stated choice instruments,
- conduct a pilot test to gauge response rate,
- analyse the collected data to evaluate the data quality and suitability of the different survey formats,
- derive suggestions for the main survey.

The results of the feasibility study are presented in this chapter.

### 4.1 Development of the questionnaires

The development of the questionnaires started by sketching different survey formats. In order to keep the choice situations as simple as possible, it was decided to define separate experiments for private motorised transport and public transport. In a next step, the considered variables and attribute levels for each choice experiment were defined. Care was taken to ensure that the variables and attribute levels used in the two methods largely overlap to facilitate the comparison of the results. However, due to the different response burden of stated ranking and stated choice experiments, certain differences with regards to the number of variables and related attribute levels that define a specific choice situation were accepted.

The experimental designs for all Stated Ranking and Stated Choice experiments were created with the software Ngene (ChoiceMetrics Pty Ltd, 2014) as a so-called efficient design. This ensures that all attribute levels are listed approximately equally often in the experimental design and that the trade-offs offered for the individual decision situations have a good bandwidth and that no choice situations are taken into account in which one alternative dominates the others, i.e. is more attractive with regard to all variables. To this end, a set of priors were defined that describe the relative attractiveness of the different attribute levels and ensure that statistically optimal decision-making situations are created for the evaluation. Priors related to variables that describe price or tax increases were assigned with negative values. Positive values were assigned to priors related to variable that describe improvements of the transport system. Based on the



analysis of the literature, the priors were defined in a way that attributes linked to new funding mechanisms result in a higher disutility than those relating existing funding schemes. Similarly, for higher taxes and price levels priors that imply a higher relative disutility were used.

For the sake of simplicity, we restricted to a paper-based questionnaire in the feasibility study. The questionnaire was developed together with a graphic designer. Based on the experiment plans generated with Ngenex, the ready-to-use questionnaires were then automatically generated with a script.

For the sake of brevity, in this paper the design of the stated ranking and stated choice experiment is only described to the extent that it is possible to interpret the findings of the feasibility study. For a more detailed description, please refer to the project report Erath and Ohnmacht (2017). However, the questionnaire as used for the MTMC is described in detail in section 5 of this paper.

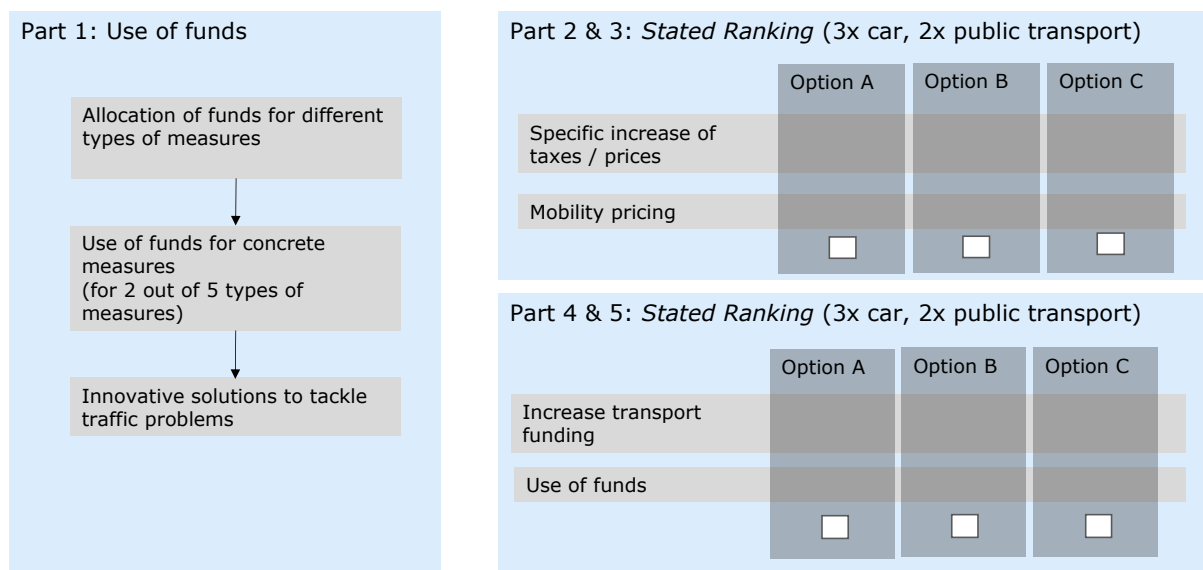
#### **4.1.1 Stated ranking experiment**

In order to introduce the respondents step by step to more complex questions, the experiment provides for three blocks of different stated ranking experiments (see Figure Fig. 3. In the first block, the respondents are asked to indicate their preference with regards to different possibilities to allocate funds. The choice situations of the second block include three alternatives, each defined with a specific increase of an existing funding scheme (e.g. increase of fuel tax by 7.5 Rappen) and specific traffic management approach (e.g. cordon pricing in cities during peak hours). In the third block, each alternative combines certain transport funding mechanism or specific traffic management approach with an approach to use the newly generated funds.

#### **4.1.2 Preference with regards to the use of funds**

In a first question, respondents are asked to indicate for which area of transport a certain amount of taxpayers' money should be used for improvements. Respondents are then

Figure 3: Overview of stated ranking experiment as tested in the feasibility study



asked to rank the following options according to their preference: Road infrastructure, public transport, cycling, walking and reduction of environmental impact.

In a second block with two questions, the preference regarding concrete measures for two of the areas listed in the first question is surveyed. In the area of cycling for example, the concrete measures include:

- Construction of cycle paths, separate from motorised traffic
- Expansion of bicycle lanes on roads
- Expansion of bicycle parking spaces
- Expansion of bicycle rental systems
- Expansion of 30 km/h speed zones

The considered measures of the other areas are listed in the project report Erath and Ohnmacht (2017).

In a CATI survey, it is possible that the first of the two ranking tasks relates to the area for improvements that was identified as the preferred option in the first block. This ensures that preference is expressed at the detailed level on topics where the respondents actually identify a potential for improvement. However, to ensure a balanced data set, the area of the second ranking task was still randomly assigned.

The last question in this section asks about the preference for a selection of innovative

approaches to solving mobility problems. The considered measures, which the respondents are asked to rank according to their preference are: Shared transport, autonomous vehicles, more housing in cities and agglomeration, flexible working arrangements, real time traffic information, increase of costs for mobility.

### 4.1.3 Preferences regarding transport financing and mobility pricing

Each of the alternatives of the choice situations to understand the preferences with regards to transport funding includes a specific adaptation of existing financing elements and a form of mobility pricing (see Fig. 4). Separate choice sets are generated for individual motorised transport and public transport. In each choice situation the respondent is asked to rank three packages of measures. Three choice situations are generated for individual motorised transport and two for public transport, as the number of variables is higher for motorised transport.

Figure 4: Example of a stated ranking experiment regarding transport funding and mobility pricing for the case of private motorised transport

|  | Alternative A   | Alternative B   | Alternative C  |
|--|---|---|--|
| <b>Change in funding of road transport</b> | <b>Increase of fuel price by 7.5 Rappen</b> per litre                         | <b>No change</b>                                      | Increase of <b>motorway vignette</b> from 40 to <b>130 CHF</b> |
| <b>Road pricing</b>                        | <b>Cordon pricing</b> in cities and agglomerations <b>during peak periods</b> | Charges on <b>congested roads during peak periods</b> | Charges on <b>all roads during peak periods</b>                |
| <b>Your preference</b>                     | <b>2</b>  | <b>1</b>  | <b>3</b>   |

For each type of adaptation of existing financing elements three attribute levels are defined. When selecting the respective attribute levels, it was ensured that the resulting revenues are roughly comparable across the individual variables. In the questionnaire, however, only the respective characteristics were described, but not the expected additional revenues. Table 1 shows the considered variables along with the respective attribute levels.

Table 1: Variables and attribute levels to define changes in transport funding as used in the feasibility study

| <b>Private motorized transport</b>  | <b>Attribute levels</b>                                      | <b>Estimate of additionally generated funds per year</b> |
|---|--|--|
| Price of motorway vignette (today 40 CHF)   | 70 CHF<br>100 CHF<br>130 CHF                                 | 246 Mio CHF<br>473 Mio CHF<br>678 Mio CHF                |
| Increase of fuel tax  | 7.5 Rappen / litre<br>15 Rappen / litre<br>22 Rappen / litre | 238 Mio CHF<br>460 Mio CHF<br>678 Mio CHF                |
| Distance-based road charge  | 0.6 CHF / 100km<br>1.2 CHF / 100km<br>1.8 CHF / 100km        | 245 Mio CHF<br>474 Mio CHF<br>686 Mio CHF                |
| Increase of motor vehicle tax   | + 10%<br>+ 20%<br>+ 30%                                      | 215 Mio CHF<br>430 Mio CHF<br>640 Mio CHF                |
| Bonus/malus system for passenger cars. Revenues from emission intensive cars are used to finance bonus payments for environmentally friendly cars. The attribute levels define the rebate (x) and additional charges (y). | x=-1000, y=+3000<br>x=-2000, y=+6000<br>x=-3000, y=+9000     | 203 Mio CHF<br>406 Mio CHF<br>609 Mio CHF                |
| No changes  | -  | -  |

| <b>Public transport</b>                   | <b>Attribute levels</b>         | <b>Estimate of additionally generated funds per year</b> |
|---|---------------------------------|--|
| Increase of ticket prices                 | x =+ 5%<br>x =+ 10%<br>x =+ 15% | 172 Mio<br>343 Mio<br>515 Mio                            |
| Increase of season card prices            | x =+ 5%<br>x =+ 10%<br>x =+ 15% | 129 Mio<br>258 Mio<br>386 Mio                            |
| Increase of ticket and season card prices | x =+ 5%<br>x =+ 10%<br>x =+ 15% | 300 Mio<br>600 Mio<br>901 Mio                            |
| No changes                                | -                               | -  |

#### 4.1.4 Combination of transport financing and use of funds

In the third block, the respondents are presented with packages of measures for ranking, which combine transport financing and how funds are used. The focus of this part of the survey is to answer the question of the extent to which the acceptance of different types of transport financing also depends on the way in which the funds are used.

The considered attribute levels of the transport financing variable include either an increase of existing transport taxes or a certain type of mobility pricing. With regards to the used of funds, a subset of the variables as used in the first block was considered. To ensure that the questions remain simple to understand, no detailed information on the actual level by how much taxes or ticket prices are increased was included. Fig. 5 shows an example of a stated ranking experiment regarding the combination of transport financing and use of funds in the case of public transport. The detailed list considered variables along with the respective attribute levels are available in the report of the project Erath and Ohnmacht (2017).

Figure 5: Example of a stated ranking experiment regarding the combination of transport financing and use of funds in the case of public transport

|  | <b>Alternative A</b>   | <b>Alternative B</b>          | <b>Alternative C</b>  |
|--|--|-------------------------------|---|
| <b>Pricing of tickets and season cards</b> | <b>Price increase of tickets</b> , no change of price for season cards | <b>No change</b>              | <b>Increase of all tickets and season cards</b> that are <b>valid during peak periods</b> |
| <b>Use of new funds</b>                    | <b>More frequent services</b>  | <b>No service improvement</b> | <b>More seats</b> in existing services  |
| <b>Your preference</b>                     | 2  | 1                             | 3   |

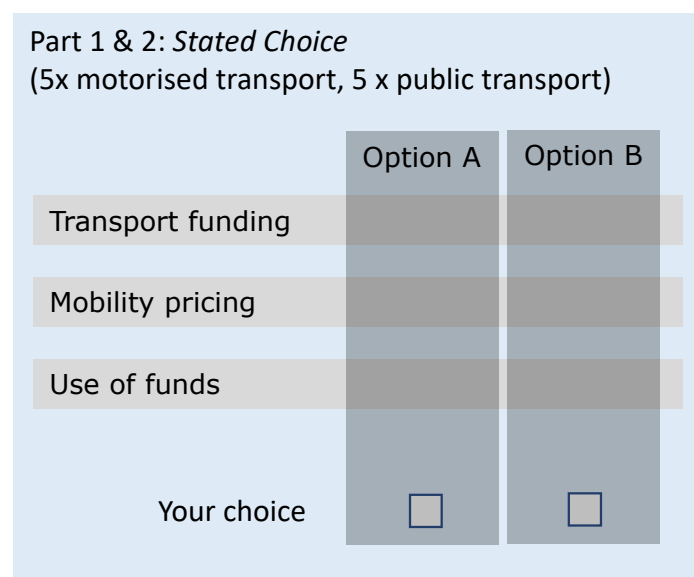
## 4.2 Design of the stated choice experiment

Compared to a Stated Ranking, Stated Choice experiments comparably impose less response burden to respondents as they only need to identify the most preferred alternative and not compare and rank all alternatives. This allows to specify individual alternatives more extensively, both by including more variables and more detailed attribute levels. Hence, Stated Choice experiments are generally better suited to derive trade-offs. In this spirit, the Stated Choice experiment tested in the feasibility study includes three variables to define a certain policy scenario (see Fig. 5): i) type of transport funding with varying attribute levels ii) type of mobility pricing and iii) use of funds. Different than in the two tested Stated Ranking experiments with only two variables each, the choice situations

trigger respondents to directly trade-off between all those three policy dimensions.

Separate choice experiments are used to define policy scenarios concerning private motorised transport and public transport. In the pilot test of the feasibility study, each respondent was asked to answer five choice tasks of each choice experiment, i.e. ten in total.

Figure 6: Overview of stated choice experiment as tested in the feasibility study



#### 4.2.1 Stated choice experiment for policy scenarios on private motorised transport

Figure Fig. 4 shows an example of a stated choice experiment on policy scenarios for private motorised transport.

The variables and attribute levels to define the change in taxation of private motorised transport are the same as used in the stated ranking questionnaire (see Fig. 4). With regards to road pricing, the following options were used:

- Charges on all roads during peak periods,
- Charges on congested roads during peak periods,
- Cordon pricing in cities and agglomerations during peak periods,
- Introduction of managed express lanes whose use is subject to a fee,

Figure 7: Example of a stated choice experiment for a private motorised transport policy scenario

|                              | Alternative A   | Alternative B  |
|------------------------------|---|--|
| <b>Taxes on cars or fuel</b> | <b>No change</b>  | Introduction of <b>distance-based road charges: 1.8 CHF per 100 km</b>     |
| <b>Road pricing</b>          | <b>Cordon pricing</b> in cities and agglomerations <b>during peak periods</b> | Introduction of <b>managed express lanes</b> whose use is subject to a fee |
| <b>Use of funds</b>          | <b>No improvement</b>   | <b>Elimination of bottlenecks</b> in the national road network             |
| <b>Your choice</b>           | <input type="checkbox"/>  | <input type="checkbox"/>   |

- No road pricing.

The considered attribute which define how the newly generated funds are being used include both attributes that specify road network improvements and more generally defined improvements for other modes or areas of transport. In addition, two options without transport improvements are also included:

- Additional revenue flows into the state coffers without earmarking,
- Elimination of bottlenecks in the national road network ,
- Improving traffic conditions in cities and agglomerations,
- Extensions of the motorway network,
- More funds for operation and maintenance of the road network,
- Improvements in public transport,
- Improvements in cycling infrastructure,
- reduction of environmental impact,
- Additional revenue flows into the state coffers without earmarking.
- No change.

#### 4.2.2 Stated choice experiment for policy scenarios: public transport

Figure Fig. 8 shows an example of a stated choice experiment on policy scenarios for public transport.

Figure 8: Example of a stated choice experiment for a public transport policy scenario

|   | Alternative A   | Alternative B   |
|---|---|---|
| <b>Change of ticket prices</b>  | Price increase of <b>season cards</b> increase by <b>+10%</b>   | <b>No change</b>  |
| <b>Time and connection-specific pricing</b><br>(also applies to season cards) | Travelling during <b>off peak periods</b> is <b>20% cheaper</b> | Travelling on connections with <b>high occupancy</b> are <b>+20%</b> more expensive during peak periods |
| <b>Use of funds</b>   | <b>More frequent services</b>                                   | <b>Increasing the comfort for transfers</b> (waysfinding, short distances, shopping opportunities)      |
| <b>Your choice</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  |

The variables and attribute levels to define price increases of tickets and season cards to generate more funds are the same as used in the stated ranking experiment (see Table 1). The distinction between separate price increases for single tickets and season tickets, as well as price increases that affect both financing elements allows to analyse whether the acceptance of price increases differs depending on the form of payment. Again, information on the amount of additionally generated funds is not included in the questionnaire.

The attributes defining the mobility pricing mechanism include both price increases during peak periods and price reductions during other times of the day. Depending whether such price changes apply to the entire network or just to services with high, respectively low occupancy, in total four different mobility pricing attributes were employed. For each of those four attribute, two attribute levels (+/- 10%, +/- 20%) that describe by how much prices would change were used. In addition, no time and service dependent pricing was included as a further attribute.

The considered attributes which define how the newly generated funds are being used only include attributes that specify improvements in the area of public transport expect for the option that funds are allocated to the budget of the government without earmarking.



- More frequent on rail lines (trains),
- More frequent services on local transport (S-Bahn, trams, buses),
- Higher seating capacity on existing connections,
- Modernisation of trains, busses and trams (e.g. new vehicles, refurbishment of existing vehicles),
- Additional revenue flows into the state coffers without earmarking.

### 4.3 Pilot test

A pilot test was conducted to gain experience with the survey instrument with regards to the response rate, to get feedback with regards to the comprehensibility of the stated choice and stated ranking experiments and to collect data to estimate simple choice models. The objective was get insights how the survey instrument could or would need to be improved for the main study as part of the MTMC.

#### 4.3.1 Fieldwork

In a first phase, the questionnaires were tested in focus groups and the identified areas for improvement were implemented. For the sake of simplicity, we only used a paper-based questionnaire in the feasibility study. However, for the main study as part of the national travel survey the survey was carried out both as PAPI or CAWI where respondents were able to choose whether to respond online or through a physical questionnaire (see Section 5).

The sample frame included 1500 person above the age of 18 years whose postal addresses were provided by the Swiss Federal Statistics Office. Only addresses in the german speaking part of Switzerland were considered for this pilot test. Each person obtained either a stated choice or stated ranking questionnaire. Besides the choice experiments, the questionnaire included also questions regarding the comprehensibility of the survey instrument, whether certain terms used in the questionnaire were not clear or unknown. In addition, the respondents were invited to provide general feedback about the survey.

The response rate was for both questionnaires 27%, somewhat higher than the predicted

20% based on the response burden (Axhausen *et al.*, 2015). Due to the high response rate, we did not send a reminder letter. Only about 1% of the respondents made use of the support hotline.

The analysis of the age structure of the respondents showed that people older than 70 years are underrepresented, while people between 56 and 70 years are over-represented. Similar with other transport surveys, the respondents have an above-average income and are significantly more likely to have a public transport pass.

### **4.3.2 Data analysis**

The herein presented results of the data analysis restricts to aspects that concern the applicability of the survey instrument and a comparison of the suitability of the two tested stated preference approaches. The stated ranking questionnaire caused the respondents less difficulty to complete. About 25% of the respondents of the stated ranking and 34% of the stated choice experiment indicated that completing the questionnaire caused them moderate or great difficulty. However, for both questionnaires, more than half of the respondents indicated that it was relatively easy, easy or very easy to fill the questionnaire.

The terms used in the questionnaire were generally well understood and only few terms were indicated as unknown. About 35% of the respondents of the stated choice experiment and 25% of the stated ranking experiment provided general feedback as free text to the questionnaire. The feedback included often expressions of the respondent's views on transport policy. A good example of such a statement is as follows: "With this questionnaire, it is not clear to me whether my opinion really comes into play. Therefore, let me make it clear: petrol price increase yes, no tolls on congested roads, no more new lanes on motorways, financial support to lower the cost of buying energy-efficient cars, no price increase for railways, more local trains.". Another participant wrote: "Interesting type of questioning according to the 'I chose the lesser of two evils'. I am curious about the evaluations".

Based on the data of the first stated ranking experiment, a differentiated analysis of the preference structure with regards to the use of transport funds was derived. Based on ordered logit models, significant differences in the preference structure were identified for

almost all provided attributes, in particular between the three most preferred measures. In addition, it was possible to identify significant effects how socio-demographic attributes such as age, income, sex but also spatial type of the municipality of residence influence the preference of certain attributes. The two-stage approach with the survey of preference first at a high level and then with regard to possible fields of action for the preferred modes of transport has proven to be successful.

The performance of the ordered logit models to analyse the two more demanding stated ranking experiments was mixed. While it was possible to identify statistically significant differences between different types of transport funding and type of mobility pricing, no statistically significant parameter related to any attribute level that define the level of levies and taxes could be estimated. Furthermore, it was not possible to identify significant preference differences with regards to the use of newly generated funds, neither in the case of private motorised transport nor public transport oriented choice sets. With regards to the preference of different types of transport funding the findings from the literature were confirmed as the respondents generally preferred already existing funding schemes. This also applies to the preference structure concerning the type of mobility pricing where positive parameter values were estimated for pull measures and negative values for push measures.

The multi-nominal logit models which we developed with the data from the stated choice experiments led to better results. Using the data of private motorised transport experiment, statistically significant parameter values were estimated for both the different types of funding mechanisms and the related tax levels. Temporally and spatially restricted mobility pricing measures such as cordon pricing during peak hours turned out to be significantly more preferred than pricing in the whole network during peak hours or the introduction of express lanes. With regards to the use of funds, the parameter values showed meaningful though not significant differences. For example, the elimination of bottlenecks was preferred more than measures to increase traffic safety.

Statistically significant parameter values with the expected sign were also estimated for the stated choice model on policy scenarios for public transport. An increase in ticket or season ticket prices is always perceived negatively. However, if only season tickets are affected by price increases, people who do not currently own a season ticket consider such a policy comparably more positively. With regards to mobility pricing, the results clearly show that pull measures such as price reductions during off peak hours are positively conceived. Push measures are generally rejected, especially for the higher price level or if they are applied to all trips during peak hours. With regard to the use of funds, the

findings from the first experiment of the stated ranking questionnaire were confirmed. The greatest need for improvement is identified in increases in the number of journeys in local and regional transport and in the number of seats offered.

#### **4.4 Conclusion and recommendation for the main survey**

Formulating the transport policy questions on the use of funds as a stated ranking Experiment offers many advantages: It forces respondents to rank the individual measures relative to each other, which also eliminates the repetitive nature of the previous survey type. The descriptive analysis of the data offers a high degree of significance for transport policy and ordered logit models can be used to examine the extent to which different socio-demographic variables influence the preference structure.

The preference derived from the more complex Stated Choice and Stated Ranking experiments regarding the use of funds in trade-offs with revenue sources is overall consistent with the results of the first simpler Stated Ranking survey, which focused only on the use of funds. This shows that the results of the Stated Choice and Stated Ranking experiments are valid despite the higher complexity. However, a descriptive analysis of the results is not possible due to the survey methodology. It is therefore recommended to employ both survey formats for the main study, as they serve different analytical purposes.

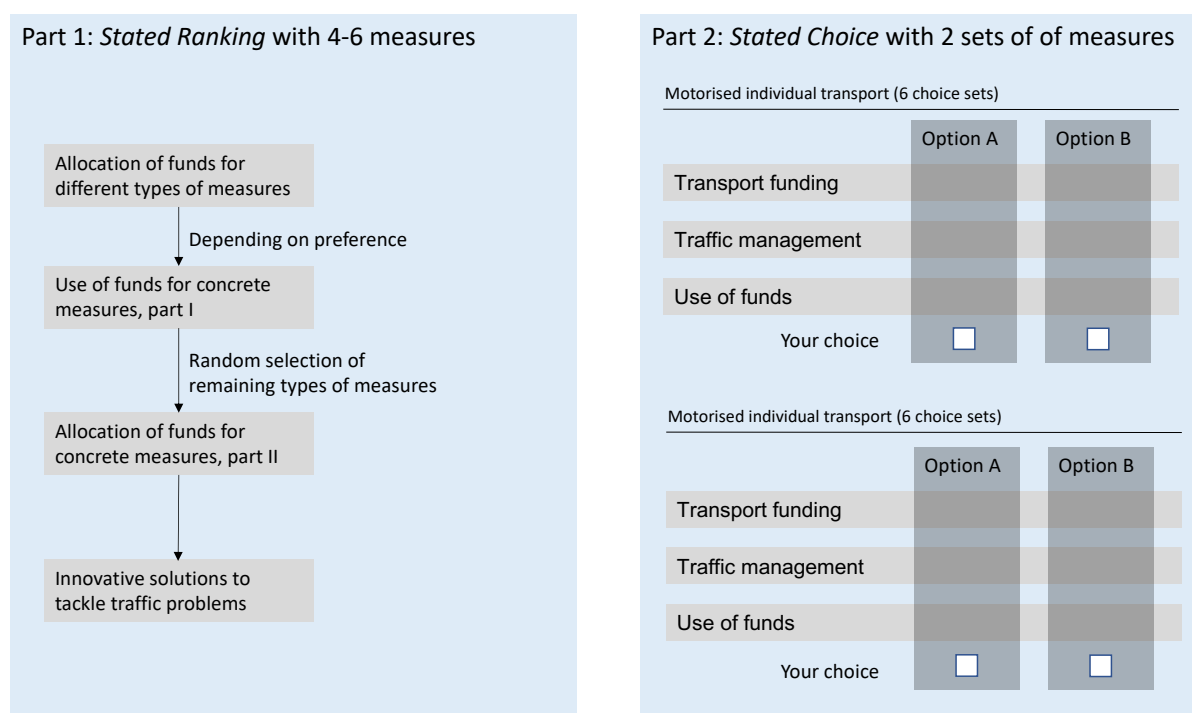
A comparison of methods between Stated Choice and Stated Ranking in terms of survey burden and analysis possibilities is in favour of the Stated Choice approach. Not only features the Stated Choice approach a lower response burden, the explanatory power of the models estimated with Stated Choice data was better as more parameters could be estimated as statistically significant and the model fit was also better.

It is therefore recommended that the preference structure towards the use of funds is determined on two levels (on a high level between modes and for on a detailed level for each mode) with a simple Stated Ranking Experiment. With a subsequent Stated Choice experiment, the preference structure with regards to various possibilities of transport financing and mobility pricing is measured in combination with elements of the use of funds.

For the main survey it is therefore recommended that the preference structure towards the use of funds is determined at a higher and detailed level by means of a simple Stated

Ranking Experiment (see Fig. 9). With a subsequent Stated Choice Experiment, the preference structure is then queried with regard to various possibilities of transport financing and traffic management in combination with elements of the use of funds.

Figure 9: Survey concept for main study



## 5 Main survey

### 5.1 Definition of the policy measures for the final survey

Once the methodology was been defined and the feasibility study carried out, the precise measures to be included in the main survey, in 2020, have been put out to consultation with the sounding board constituted of the transport-related offices within the Federal Department of the Environment, Transport, Energy and Communications (DETEC)<sup>4</sup> and with the steering committee of the MTMC.

<sup>4</sup>Federal Office of Transport, Federal Office for Civil Aviation, Swiss Federal Office of Energy, Federal Roads Office, Federal Office for the Environment

One of the goals in defining the final policy measures for 2020 was to select measures that could last for more than one survey edition (at least also for the next one in 2025), to allow for comparisons over time.

The final survey is available in German, French and Italian in Appendix A.

The first part contains 4 stated ranking questions. The first stated ranking question asks to rate 5 categories of measures: improvements in (1) public transport, in (2) road, (3) bicycle and (4) pedestrian traffic, and (5) reducing the environmental impact of transport. Questions 2 and 3 are stated ranking questions on detailed measures on one of the 5 categories previously defined, randomly chosen for each participant. The detailed measures for each category are presented in Table 2. The fourth and last question of Part 1 of the survey is a stated ranking question on 5 innovative measures to solve the current traffic problems. The detailed measures are presented in Table 3

## **5.2 Questions on the phone and recruiting**

The first contact with the randomly selected participants to the MTMC happens by mail. In this first contact letter, 10% of the sample, randomly selected among the adult participants ( $\geq 18$  years old) and who are able to answer by themselves on the phone, are informed that there will be two parts to the survey, the first on the phone and the second online or in paper-and-pencil form.

For this sub-sample, questions were asked on the phone at the end of the interview regarding the experience with road congestion and with public transport without available seats on the way to work or school/university.

Finally, the interview asked for the email address to send the survey. If the respondent refuses to give her email address, then they were asked if they would agree to participate to the paper-and-pencil version.

Both the contact email and the contact letter emphasize that there are no correct or wrong answer, only the personal opinion of the person is important.

Table 2: Detailed measures in stated ranking questions for each category of measures

|   |
|---|
| <b>Improvement in public transport</b>  |
| Modernisation of trains, buses and trams (e.g. new vehicles, internet access)   |
| Increasing comfort and efficiency when changing trains (e.g. signposting, short distances, more shopping facilities)          |
| More seats in the existing connections  |
| Improvement in local and regional transport (suburban trains, trams, buses): more frequent or faster                          |
| Improvement in long-distance transport (trains): more frequent or faster  |
| <b>Improvement in road traffic</b>  |
| Expansion of the national road network (e.g. new motorway sections)   |
| Elimination of bottlenecks in the existing national road network (e.g. construction of an additional lane on a motorway)      |
| Smoothing out traffic in cities and agglomerations (e.g. construction of new bypasses, roundabouts instead of traffic lights) |
| Increasing road safety (e.g. infrastructural measures, driver assistance systems)   |
| Provision of information on the current traffic situation in order to avoid traffic jams (e.g. through apps on smartphones)   |
| <b>Improvement in bicycle traffic</b>   |
| Expansion of 30 km/h speed zones  |
| Expansion of bicycle rental systems (bike sharing)  |
| Expansion of colour-coded bicycle lanes on roads  |
| Expansion of bicycle parking spaces   |
| Expansion of cycle paths  |
| <b>Improvement in pedestrian traffic</b> Expansion of pedestrian zones with 20 km/h speed limit                               |
| Redesign of streets (e.g. wider pavements, pedestrian zones)  |
| More direct connections (e.g. pedestrian bridges, additional pedestrian crossings)  |
| Increasing the quality of stay (e.g. more seating, street cafés, green spaces)  |
| Increasing safety (street lighting, improving visibility)   |
| <b>Reducing the environmental impact of transport</b>   |
| Levy on CO <sub>2</sub> emissions caused by transport for all means of transport (e.g. car, plane)                            |
| Financial incentives for the purchase of energy-efficient and low-emission new cars   |
| Financing measures for the reduction of traffic noise (e.g. low-noise road surfaces, quieter trains)                          |
| Driving bans for polluting cars in cities when air pollution limits are exceeded  |
| Sales ban on cars with high fuel consumption (e.g. more than 10 litres per 100 km)  |

After a certain time without answer, reminders were first sent per email (for those using the web version) and later per post (for all participants).

Table 3: Detailed measures in stated ranking question on innovative measures to solve the current traffic problems

|  |
|--|
| More housing and jobs in cities and agglomerations (and thus shorter distances)  |
| General increase in prices for mobility (car and public transport)   |
| Support for self-driving vehicles (e.g. through legal frameworks, pilot trials)  |
| Support mobility sharing: car sharing such as Mobility, carpooling (ridesharing), bike rental systems (e.g. through legal frameworks, pilot trials). |
| Support flexible forms of work to reduce or shift traffic (e.g. working from home or other locations, free choice of working hours).                 |

### 5.3 Pretest survey in 2019

The survey was tested in Summer 2019, together with the full questionnaire of the MTMC. Among the 180 persons who were asked to take part to this particular module on opinions on transport policies, 174 accepted (96.7%) between June 6, and July 19, 2019. 140 of them answered the questionnaire (80.5%). Among them, 86 participated online (61.4%) and 54 used the paper-and-pencil survey (38.6%).

5 participants started the online version and then switched to the paper version.

According to LINK Marketing Services AG, who ran the survey, 14 persons used a smartphone to answer the web version.

Satisfaction questions were asked at the end of the pretest survey, with possible answers being on a 5-level scale (very ..., ..., neutral, not ..., not at all ...). Results are shown in Table 4, where the 2 answers on both extremes are grouped (e.g., “very interesting” and “interesting” are grouped together and “not interesting and “not at all interesting” are also grouped together for the first question) and the neutral value in the middle is not explicitly presented (but can be deduced as the difference to 100%).

We see that the survey was mostly considered interesting and easy to answer, in particular for those answering online. The time needed to fill in the questionnaire was perceived by respondents to be reasonable, the majority of respondents answering the neutral third level answer “Completely adapted” (not too long, not too short). Answers are generally less positively evaluated by people answering the paper version. These respondents tend to be older.



Table 4: Pretest survey 2019: Results of the satisfaction questions

| Questions   | Answers         | Online | Paper | Total |
|---|-----------------|--------|-------|-------|
| How interesting was it for you to fill in the questionnaire?              | Interesting     | 48%    | 27%   | 40%   |
|   | Not interesting | 11%    | 29%   | 18%   |
| How well did you understand the questions?                                | Easy            | 68%    | 52%   | 62%   |
|   | Difficult       | 14%    | 19%   | 16%   |
| How pleasant was it for you to fill in the questionnaire?                 | Pleasant        | 44%    | 27%   | 38%   |
|   | Unpleasant      | 11%    | 29%   | 18%   |
| How well did the questions/answers correspond to your personal situation? | Appropriate     | 44%    | 23%   | 36%   |
|   | Not appropriate | 18%    | 29%   | 22%   |
| How would you rate the time it took you to complete the questionnaire?    | Short           | 9%     | 19%   | 13%   |
|   | Long            | 26%    | 23%   | 25%   |

## 5.4 Note on on the coronavirus pandemic

The MTMC survey first started in January 2020. Due to the coronavirus pandemic, the MTMC 2020 survey has been suspended in March 2020 and entirely conducted in 2021 instead, starting in January 2021 and collecting data for a full year.

Data related to the questions about transport policy were collected between January 13, 2020 and March 23, 2020. 522 persons answered to the questions. These data were however not used and only 2021 data will be analyzed.

## 6 Concept for future analysis of the 2021 data

The results of the 2021 MTMC modul 3 will be first published in Spring 2023, together with the full report on the MTMC survey including data on mobility resources, daily mobility and occasional journeys. This chapter describes how the data will be analyzed until then, without showing results from the survey.

### 6.1 Stated Ranking Data

Stated ranking data can be both used for descriptive statistics including graphical representation (Section 6.1.1) and for discrete choice modelling including socio-economic

characteristics in the analysis (Section 6.1.2).

### 6.1.1 Descriptive statistics and graphical representation

The main goal of a visual representation of the ranking data is to illustrate the priorities among the different measures. It might be done with numbering, with colours, etc. It is important to keep the graphs simple, adapted to the larger public, and to avoid misunderstanding or misinterpretation, including people seeing the results only for a glance on slides. The graphics should be in principle able to stand alone, without a long explanatory text.

**Divergent bar chart** For each of the 5 categories of measures/measures presented to the respondents (see Section 5.1), it is possible to calculate the proportion of people choosing them as 1st priority, resp. as 2nd, 3rd, 4th or 5th priority. The proposed representation of this data here is to use a bar chart, with the bars centred on the middle of the “3rd priority” category (“diverging bar chart”). This makes comparison easy: we see which measure has more rankings above the middle priority (1st and 2nd priorities) and below the middle priority (4th and 5th priorities).

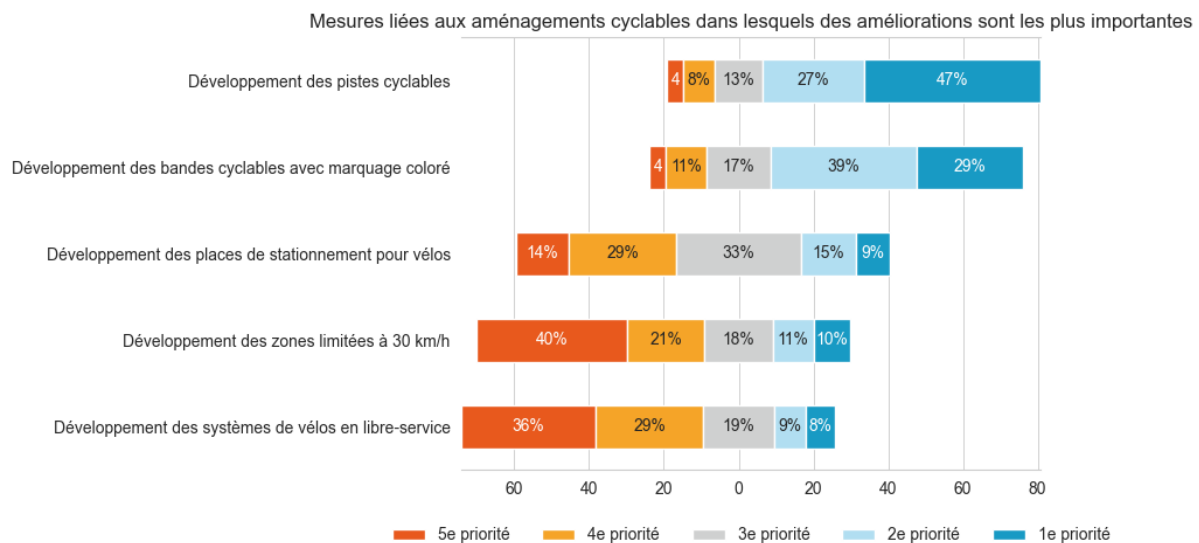
In such a graph, the distribution of priorities given by respondents is shown horizontally, while the priority between measures is shown vertically.

Each horizontal full bar represents 100%. We decided not to show it explicitly by adding two scales from 0% to 100% above and below the bars, in order to keep the graphic simple and not to add confusion for the reader.

One of the priorities in presenting the results of the stated ranking is to present the order of priority in investments according to the respondents. The diverging bar chart visually presents how this order was established and is consequently better than a bar chart. A divergent bar chart also has the advantage of showing the full distribution of the answers.

Following recommendations of colleagues, we use divergent colors, from red to blue. It has the advantage of visually showing the measures with the highest priority according

Figure 10: Divergent bar chart, with the example of measures related to cycling. The numbers presented in the graphic are NOT the results of the MTMC 2021 and are just for the illustration of the divergent bar chart.



to the respondents. One possible drawback is that the red color could be interpreted as “respondents are against the measure”, while in reality, they might find it good, but simply less of a priority, which is not exactly the same meaning.

Such graphs take a lot of space, in comparison with stacked bar charts. It might be a problem for presenting all the measures (7 such graphics) in a compact format. They are also rather complex, in particular when we look at the zero where the category “3rd priority” is centered. Explaining exactly what represents this zero is difficult. A quick reader might not ask herself the question. It might however trigger questions and need a reading example, explaining how to interpret the graphic.

### 6.1.2 Choice modelling

A logit choice model will be estimated from the data using the PandasBiogeme package for Python 3 (Bierlaire, Michel, 2020). It will provide:

- the general preference (“alternative specific constant”) for the choice variable (the category of measures or detailed measure in a given category), all socio-economic variables being equal. Examples (not from an analysis of the data):

- The overall preference for improved public transport is higher than for improved pedestrian facilities;
- In the area of cycling facilities, the general preference for the development of cycle paths is higher than for the development of bike-sharing facilities;
- preferences conditional on socio-economic factors. This represents the preferences of certain socio-economic sub-groups for certain measures. Example (not from an analysis of the data):
  - People with a car at their disposal rank road traffic improvement as more important than those without a car at their disposal;
  - Regarding cycling facilities, people living in households with children under 12 years of age rank the development of 30 km/h zones as more important than people living in households without children under 12 years of age.

A possible model structure is presented in Allison and Christakis (1994).

The model will be validated by estimating it on a random sub-sample of 80% of the respondents and applying it to the remaining 20% to assess its predictive power (cross validation).

## 6.2 Stated Choice Data

Stated choice data are not adapted to descriptive statistics and are difficult to communicate visually. The presentation of the results of this part of the survey is consequently more difficult for a general public.

### 6.2.1 Choice modelling

The model will include the choice attributes presented to the respondents (transport financing, traffic management/mobility pricing and money use), with the value presented to respondents when there were numerical values, as binary variables otherwise. Interactions with household income and car ownership capturing taste variation will be tested. The results could show, for example, that household income significantly modifies preferences for a transport financing measure, e.g., the modification of the price of a motorway yearly

ticket/vignette. It might be possible that households earning more than CHF 12'000 per month would be in favour of an increase in the price of the vignette, while households earning less than CHF 12'000 per month would not express significant preferences for this measure.

The choice model will incorporate interaction terms between two measures (if relevant and significant). We can imagine that some specific transport financing measures (e.g., increasing fuel prices) are more acceptable when they are associated with specific use of revenue (e.g., elimination of bottlenecks in the national road network). We will also test the inclusion of socio-economic variables (including information on mobility resources - car ownership, public transport passes, etc.).

Some factors will not be included in the model, although the review of the literature shows that they influence the acceptability of congestion charging or mobility pricing:

- the belief in the effectiveness of congestion charging (if one believes in effectiveness, then one supports congestion charging / mobility pricing more);
- political opinions concerning the environment (if one supports a strong environmental policy, then one supports congestion charging and mobility pricing more).

This information is not collected in the MTMC. Also given its unobservable nature, it is difficult to implement tailored transport policies with respect to these dimensions.

## 6.2.2 Presentation of the results

The quantitative results of a choice model are difficult to present to the general public. In particular, it is not possible to make simple graphical representations of the numerical results. It is possible to present the percentage points of support over and above the status quo for all attributes, e.g., “If the price of the motorway vignette increases from CHF 40 to CHF 100, support for the package of measures is 2% lower than for the status quo”, as in Fesenfeld *et al.* (2020).

The advantages of this approach are:

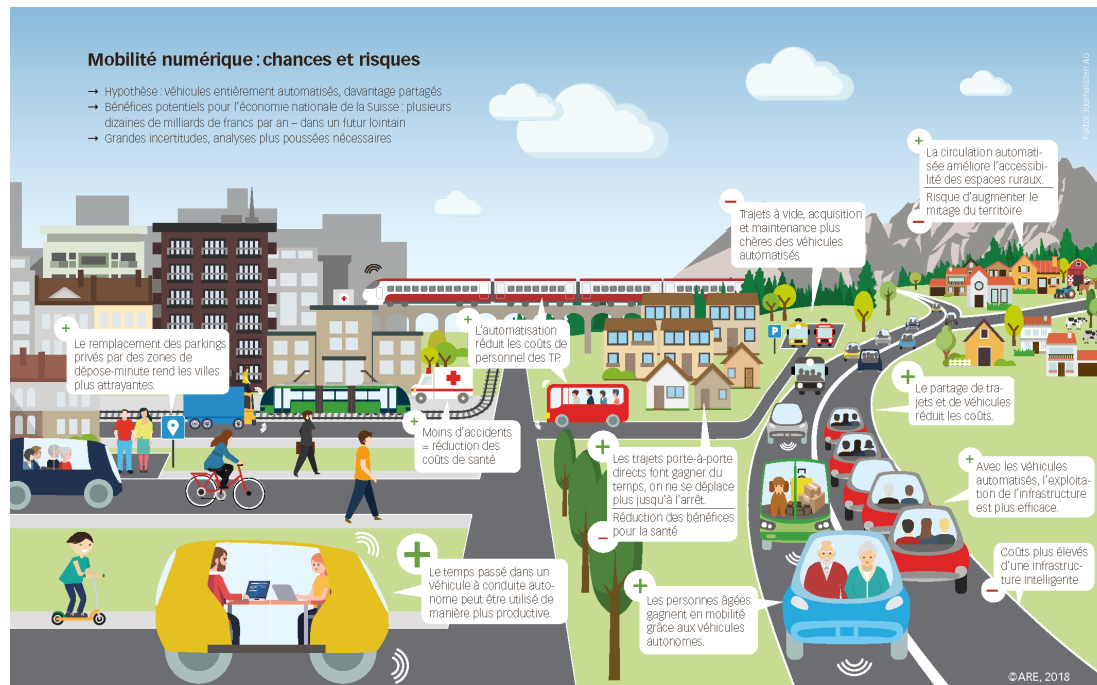
- It allows the presentation of measures that are linked to each other (e.g. “If the

price of the motorway vignette decreases while introducing a congestion charge to access certain areas of cities and agglomerations during peak hours, people's support is 3% higher than the status quo”);

- It allows to highlights the full potential of the model, not only showing the signs of the parameters (people do not like taxes but like investments in the transport system), but also numerical values and trade-offs between the financing and revenues use factors, and results for complete package of measures;
- It reduces the risk of over-interpreting the results in relation to absolute shares (e.g., “If the price of the motorway vignette increases from CHF 40 to CHF 100, 28% of the respondents/population support the measure”).

It is also possible to present the results qualitatively, in text form (“If the price of the motorway vignette is increased, support for the package is lower than for the status quo”) or as an infographics. An example of such a presentation is shown in Figure 11, showing the opportunities and threads of shared and autonomous mobility (Ecoplan, 2018).

Figure 11: Opportunities and threads of shared and autonomous mobility



## 7 Conclusion

In this paper, we have presented a new approach for collecting data on attitudes towards transportation policy in Switzerland based on stated preferences. We have described the history of attitudes in the Mobility and Transport Microcensus and the need for a new methodology in Section 2 and how we have developed a new survey methodology, exploring different methods (Section 3), running a feasibility study (Section 4) and a pretest (Section 5.3) for finally collecting new data in 2021. This paper does not describe the results of the 2021 data collection. It describes the possibilities for future analyses (Section 6) and transparently presents the data that will be available to researchers in 2023.

These questions on acceptability (defining policies, priorities in investment and financing measures) must be differentiated from the stated preference (SP) surveys on mobility behaviour such as mode and route choice (Weis *et al.*, 2021). While SP surveys on mobility behaviour might include policy measures that does not yet exist and with a low acceptability, such as mobility pricing / congestion charges, their focus is on daily behaviour. They study the mobility behaviour if this policy was already implemented, while the acceptability studies asks if this policy should be implemented.

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## **A Questionnaire in German, French and Italian**



Dr. Antonin Danalet 04.11.2019

## Modul 3: Fragebogen

Referenz/Aktenzeichen: COO.2093.100.5.821144

### 1 Teil 1: Allgemeine Fragen (Stated Ranking)

#### 1.1 Frage 1 (gleiche Massnahmen für alle Teilnehmer, zufällige Reihenfolge)

Nehmen Sie an, Steuergelder stehen für Verbesserungen in verschiedenen Bereichen des Verkehrs zur Verfügung. In welchem der folgenden fünf Verkehrsbereiche sind Verbesserungen für Sie am wichtigsten, zweitwichtigsten usw.? Bitte vergeben Sie für jeden Bereich einen Rang. Rang 1 beschreibt den in Ihren Augen wichtigsten Bereich, Rang 2 den zweitwichtigsten usw. Beispiel: 5 / 3 / 2 / 1 / 4

| Bereiche des Verkehrs                                 | Rang 1-5 |
|---|----------|
| Verbesserung im öffentlichen Verkehr (Zug, Bus, Tram) |          |
| Verbesserung im Strassenverkehr (Auto, Motorrad)      |          |
| Verbesserung im Veloverkehr (inkl. E-Bike)            |          |
| Verbesserung im Fussverkehr                           |          |
| Reduktion der Umweltauswirkungen des Verkehrs         |          |

#### 1.2 Fragen 2 und 3 (zwei Fragen von den fünf hier vorgestellten Fragen)

Die Fragen 2 und 3 werden rein zufällig gewählt.

##### 1.2.1 Frage «Verbesserung im öffentlichen Verkehr» (zufällige Reihenfolge)

Welche Verbesserungen im öffentlichen Verkehr (Zug, Bus, Tram) sollen vorgenommen werden? Bewerten Sie die fünf Massnahmen in den untenstehenden Kästchen. Rang 1 beschreibt dabei die in Ihren Augen wichtigste Massnahme, Rang 2 die zweitwichtigste Massnahme usw.

| Massnahmen  | Rang 1-5 |
|---|----------|
| Modernisierung der Züge, Busse und Trams<br>(z.B. neue Fahrzeuge, Internet-Zugang)                                  |          |
| Erhöhung des Komforts und der Effizienz beim Umsteigen<br>(z.B. Wegweisung, kurze Wege, mehr Einkaufsmöglichkeiten) |          |
| Mehr Plätze in den bestehenden Verbindungen   |          |
| Verbesserung im Nah- und Regionalverkehr<br>(S-Bahnen, Trams, Busse): häufiger oder schneller                       |          |
| Verbesserung im Fernverkehr (Züge): häufiger oder schneller   |          |

### 1.2.2 Frage «Verbesserung im Strassenverkehr» (zufällige Reihenfolge)

**Welche Verbesserungen im motorisierten Individualverkehr (Auto, Motorrad) sollen vorgenommen werden?** Bewerten Sie die fünf Massnahmen in den untenstehenden Kästchen. Rang 1 beschreibt dabei die in Ihren Augen wichtigste Massnahme, Rang 2 die zweitwichtigste Massnahme usw.

| Massnahmen   | Rang 1-5 |
|--|----------|
| Ausbau des Nationalstrassennetzes<br>(z.B. neue Autobahnabschnitte)  |          |
| Beseitigung von Engpässen im bestehenden Nationalstrassennetz<br>(z.B. Bau einer zusätzlichen Spur auf einer Autobahn)     |          |
| Verflüssigung des Verkehrs in Städten und Agglomerationen<br>(z.B. Bau von neuen Umfahrungen, Kreisel anstelle von Ampeln) |          |
| Erhöhung der Verkehrssicherheit<br>(z.B. bauliche Massnahmen, Fahrerassistenzsysteme)                                      |          |
| Bereitstellung von Informationen zur aktuellen Verkehrslage, um Staus zu vermeiden (z.B. durch Apps auf Smartphones)       |          |

### 1.2.3 Frage «Verbesserung im Veloverkehr» (zufällige Reihenfolge)

**Welche Verbesserungen im Veloverkehr (inkl. E-Bike) sollen vorgenommen werden?** Bewerten Sie die fünf Massnahmen in den untenstehenden Kästchen. Rang 1 beschreibt dabei die in Ihren Augen wichtigste Massnahme, Rang 2 die zweitwichtigste Massnahme usw.

| Massnahmen   | Rang 1-5 |
|--|----------|
| Ausbau von Tempo-30-Zonen                                    |          |
| Ausbau von Veloverleihsystemen (Bike-Sharing)                |          |
| Ausbau von farblich gekennzeichneten Velospuren auf Strassen |          |
| Ausbau von Veloabstellplätzen                                |          |
| Ausbau von Velowegen   |          |

### 1.2.4 Frage «Verbesserung im Fussverkehr» (zufällige Reihenfolge)

**Welche Verbesserungen im Fussverkehr sollen vorgenommen werden?** Bewerten Sie die fünf Massnahmen in den untenstehenden Kästchen. Rang 1 beschreibt dabei die in Ihren Augen wichtigste Massnahme, Rang 2 die zweitwichtigste Massnahme usw.

| Massnahmen   | Rang 1-5 |
|--|----------|
| Ausbau von Begegnungszonen mit Tempo 20  |          |
| Umgestaltung von Strassen (z.B. breitere Trottoirs, Fussgängerzonen)                         |          |
| Direktere Verbindungen (z.B. Fussgängerbrücken, zusätzliche Fussgängerstreifen)              |          |
| Steigerung der Aufenthaltsqualität (z.B. mehr Sitzgelegenheiten, Strassencafés, Grünflächen) |          |
| Erhöhung der Sicherheit (Strassenraumbeleuchtung, Verbesserung der Sichtverhältnisse)        |          |

**1.2.5 Frage «Reduktion der Umweltauswirkungen des Verkehrs» (zufällige Reihenfolge)**

**Welche Massnahmen im Bereich der Umwelt und der Energie sollen vorgenommen werden?**

Bewerten Sie die fünf Massnahmen in den untenstehenden Kästchen. Rang 1 beschreibt dabei die in Ihren Augen wichtigste Massnahme, Rang 2 die zweitwichtigste Massnahme usw.

| Massnahmen  | Rang 1-5 |
|---|----------|
| Abgabe auf den durch den Verkehr verursachten CO <sub>2</sub> -Ausstosses für alle Verkehrsmittel (z.B. Auto, Flugzeug) |          |
| Finanzielle Anreize beim Kauf von energieeffizienten und emissionsarmen Neuwagen  |          |
| Finanzierung von Massnahmen für die Reduzierung des Verkehrslärms (z.B. lärmarme Strassenbeläge, leisere Züge)          |          |
| Fahrverbote für umweltschädliche Autos in Städten bei der Überschreitung von Schadstoffgrenzwerten in der Luft          |          |
| Verkaufsverbot von Autos mit hohem Treibstoffverbrauch (z.B. mehr als 10 Liter pro 100 km)                              |          |

**1.3 Frage 4 (gleiche Massnahmen für alle Teilnehmer, zufällige Reihenfolge)**

**Welche Massnahmen lösen aus Ihrer Sicht die aktuellen Verkehrsprobleme am besten?**

Bewerten Sie die fünf Massnahmen in den untenstehenden Kästchen. Rang 1 beschreibt dabei die in Ihren Augen beste Handlungsoption, Rang 2 die zweitbeste Handlungsoption usw.

| Massnahmen   | Rang 1-5 |
|--|----------|
| Mehr Wohnraum und Arbeitsplätze in Städten und Agglomerationen (und somit kürzere Wege)  |          |
| Generelle Erhöhung der Preise für Mobilität (Auto und ÖV)  |          |
| Unterstützung von selbstfahrenden Fahrzeugen (z.B. durch gesetzliche Rahmenbedingungen, Pilotversuche)   |          |
| Unterstützung des Teilens von Mobilität: Carsharing wie Mobility, Fahrgemeinschaften (Ridesharing), Veloverleihsysteme (z.B. durch gesetzliche Rahmenbedingungen, Pilotversuche) |          |
| Unterstützung von flexiblen Arbeitsformen, um Verkehr zu reduzieren oder zu verlagern (z.B. Arbeiten von zu Hause aus oder an anderen Orten, freie Wahl der Arbeitszeiten)       |          |

**2 Teil 2: Motorisierter Individualverkehr (Auto, Motorrad) (Stated Choice)**

Die stetige Zunahme des Verkehrs in der Schweiz erhöht die Kosten für Betrieb, Unterhalt und Ausbau des Strassennetzes. Es stösst zudem vermehrt an die Kapazitätsgrenzen. Zur Finanzierung und Steuerung des Verkehrs sowie zur Behebung bestehender Probleme können Massnahmen ergriffen werden:

**Verkehrsfinanzierung:** Einnahme von Geldern aus Abgaben und Treibstoffen

**Verkehrslenkung:** gezielte Strassenbenutzungsgebühren, um den Verkehr zu steuern

**Mittelverwendung:** vermehrter Einsatz von Geldern für bestimmte Massnahmen

In den folgenden 6 Entscheidungssituationen werden jeweils 2 Massnahmenpakete vorgestellt, um Gelder einzunehmen, den Verkehr zu steuern und die finanziellen Mittel einzusetzen. Bitte kreuzen Sie jeweils an, welches Massnahmenpaket Sie eher unterstützen würden.

## 2.1 Entscheidungssituation 1 (Beispiel)

|   | Massnahmenpaket A  | Massnahmenpaket B  |
|---|--|--|
| <b>Verkehrsfinanzierung</b><br>Abgaben auf Autos oder Treibstoffe | Keine Änderung der bestehenden Finanzierungselemente   | Einführung einer <b>Gebühr</b> von <b>1.8 CHF je gefahrene 100km</b> |
| <b>Verkehrslenkung</b><br>Strassenbenutzungsgebühr                | Gebühren zu <b>Stosszeiten</b> in Zonen von <b>Städten und Agglomerationen</b>   | Gebühren zu <b>Stosszeiten</b> auf <b>überlasteten Strassen</b>      |
| <b>Mittelverwendung</b><br>Vermehrter Einsatz                     | <b>Verflüssigung des Verkehrs</b> in <b>Städten und Agglomerationen</b> (z.B. Bau von neuen Umfahrungen, Kreiseln anstelle von Ampeln) | <b>Verbesserungen</b> im <b>Veloverkehr und Fussverkehr</b>          |
|   |  |  |

Bitte kreuzen Sie Ihre Wahl in jeder Entscheidungssituation an.

## 2.2 Entscheidungssituation 2 bis 6

Genau wie 2.1, mit den Daten von dieser Tabelle:

| Variable  | Ausprägungen   |
|---|--|
| <b>Abgaben auf Autos und Treibstoffe</b>  |  |
| Hint: alle Werte sind mit + oder – explizit geschrieben.  |  |
| « <b>Preiserhöhung</b> der <b>Autobahnvignette</b> von 40 CHF auf <b>70 / 100 / 130 CHF</b> pro Jahr»<br>« <b>Abschaffung</b> der <b>Autobahnvignette</b> » (wenn x = 0 CHF)<br>« <b>Preissenkung</b> der <b>Autobahnvignette</b> von 40 CHF auf <b>x=-20 CHF</b> pro Jahr» | x = 0 CHF: Abschaffung<br>x = 20 CHF<br>x = 70 CHF<br>x = 100 CHF<br>x = 130 CHF           |
| « <b>Erhöhung</b> der <b>Treibstoffpreise</b> um <b>+7.5 / +15 / +22 Rappen</b> pro Liter»<br>« <b>Senkung</b> der <b>Treibstoffpreise</b> um <b>-10 / -5 Rappen</b> pro Liter»   | x = -10 Rappen<br>x = -5 Rappen<br>x = 7.5 Rappen<br>x = 15 Rappen<br>x = <u>22</u> Rappen |
| Einführung einer <b>Gebühr</b> von <b>x CHF je gefahrene 100km</b>  | x = 0.6 CHF / 100km<br>x = 1.2 CHF / 100km<br>x = 1.8 CHF / 100km                          |
| « <b>Erhöhung</b> der <b>Motorfahrzeugsteuer</b> um <b>+10 / +20 / +30%</b> »<br>« <b>Senkung</b> der <b>Motorfahrzeugsteuer</b> um <b>-5 / -10%</b> »  | x = -10%<br>x = -5%<br>x = +10%<br>x = +20%<br>x = +30%                                    |
| <b>Vergünstigung</b> von <b>CHF x</b> beim Kauf eines <b>umweltfreundlichen</b> Neuwagens, <b>Zuschlag</b> von <b>CHF y</b> beim Kauf eines <b>weniger umweltfreundlichen</b> Neuwagens   | x = 1000, y=3000<br>x = 2000, y=6000<br>x = 3000, y=9000                                   |
| <b>Keine</b> Änderung der bestehenden Finanzierungselemente   | -  |

### Strassenbenutzungsgebühr

- Gebühren zu **Stosszeiten** auf **allen Strassen**
- Gebühren zu **Stosszeiten** auf **überlasteten Strassen**
- Gebühren zu **Stosszeiten** in Zonen von **Städten und Agglomerationen**
- **Keine** Strassenbenutzungsgebühren

### Mittelverwendung

- **Beseitigung von Engpässen** im **Nationalstrassennetz** (z.B. Bau einer zusätzlichen Spur auf einer Autobahn)
- **Verflüssigung des Verkehrs** in **Städten und Agglomerationen** (z.B. Bau von neuen Umfahrungen, Kreiseln anstelle von Ampeln)
- **Erhöhung der Verkehrssicherheit** (z.B. bauliche Massnahmen)
- **Verbesserungen im öffentlichen Verkehr**
- **Verbesserungen im Veloverkehr und Fussverkehr**
- **Erweiterung des Nationalstrassennetzes** (neue Autobahnabschnitte)
- **Reduzierung der Umweltauswirkungen** des Verkehrs
- **Keine** Änderung zur heutigen Situation

## 3 Teil 2: Öffentlicher Verkehr (Zug, Bus, Tram) (Stated Choice)

Der stetige Passagierzuwachs im **öffentlichen Verkehr** erhöht die Kosten für Betrieb, Unterhalt und Ausbau dieses Verkehrssystems. Es stösst zudem vermehrt an die Kapazitätsgrenzen. Zur Finanzierung und Steuerung des Verkehrs sowie zur Behebung bestehender Probleme können Massnahmen ergriffen werden.

In den folgenden 6 Entscheidungssituationen werden jeweils 2 Massnahmenpakete vorgestellt. Bitte kreuzen Sie jeweils an, welches Massnahmenpaket Sie eher unterstützen würden.

### 3.1 Entscheidungssituation 1

|   | Massnahmenpaket A   | Massnahmenpaket B  |
|---|---|--|
| <b>Änderung der Fahrpreise</b><br>bei Einzelbilletten und/oder Abonnementen | Preiserhöhung bei <b>Einzelbilletten</b> um <b>+15%</b>   | <b>Keine Änderung</b> der Billett- und Abonnementspreise                             |
| <b>Verkehrslenkung</b><br>Änderung der Fahrpreise                           | <b>Gleiche Preise</b> zu <b>allen Tageszeiten</b> und <b>unabhängig von der Auslastung</b> auf der gefahrenen Strecke | Fahrten während den <b>Nebenzeiten</b> sind <b>auf dem ganzen Netz 10% günstiger</b> |
| <b>Mittelverwendung</b><br>Vermehrter Einsatz                               | <b>Mehr Sitzplätze</b> in den bestehenden Verbindungen  | <b>Keine Änderung</b> zur heutigen Situation   |
|   |   |  |



## Entscheidungssituation 2 bis 6

Genau wie 3.1, mit den Daten von dieser Tabelle:

| Variable  | Ausprägungen           |
|---|------------------------|
| <b>Änderung der Fahrpreise</b>                                    |                        |
| Hint: alle Werte sind mit + oder - explizit geschrieben.          |                        |
| Preiserhöhung bei <b>Einzelbilletten</b> um ...%                  | + 5%<br>+ 10%<br>+ 15% |
| Preiserhöhung bei <b>Abonnementen</b> um ...%                     | + 5%<br>+ 10%<br>+ 15% |
| Preiserhöhung bei <b>Einzelbilletten und Abonnementen</b> um ...% | + 5%<br>+ 10%<br>+ 15% |
| <b>Keine Änderung</b> der Billett- und Abonnementspreise          |                        |

### Zeit- und streckenabhängige Preise

Hint: alle Werte sind mit + oder - explizit geschrieben.

|  |  |
|--|--|
| Preismechanismus   |  |
| <ul style="list-style-type: none"> <li>• Alle Fahrten während den <b>Stosszeiten</b> kosten ...% <b>mehr</b></li> <li>• Fahrten auf <b>stark belasteten Strecken</b> während den <b>Stosszeiten</b> kosten ...% <b>mehr</b> (gilt auch für Abbonemente)</li> <li>• Fahrten während den <b>Nebenzeiten</b> sind <b>auf schwach ausgelasteten Strecken</b> ...% <b>günstiger</b> (gilt auch für Abbonemente)</li> <li>• Fahrten während den <b>Nebenzeiten</b> sind <b>auf dem ganzen Netz</b> ...% <b>günstiger</b></li> <li>• <b>Gleiche Preise</b> für <b>alle Tageszeiten</b> und <b>unabhängig von der Auslastung</b> auf der gefahrenen Strecke</li> </ul> | +10%<br>+20%<br>+10%<br>+20%<br>-15%<br>-30%<br>-15%<br>-30% |

### Mittelverwendung

- **Häufigere Züge** im **Fernverkehr**
- **Häufigere Fahrten** im **Nah- und Regionalverkehr** (S-Bahnen, Trams, Busse)
- **Mehr Sitzplätze** in den bestehenden Verbindungen
- **Modernisierung** der **Züge, Busse und Trams** (z.B. neue Fahrzeuge, Auffrischung des Interieurs)
- **Erhöhung des Komforts beim Umsteigen** (z.B. Wegweiser, kurze Wege, mehr Einkaufsmöglichkeiten)
- **Keine Änderung** zur heutigen Situation



Antonin Danalet 04.11.2019

## Module 3 : Questionnaire

Référence du dossier : COO.2093.100.5.821144

### 1 1<sup>re</sup> partie : Questions générales (*classement déclaré*)

#### 1.1 Question 1 (mêmes mesures pour tous les participants, ordre aléatoire)

Admettons qu'une partie des recettes fiscales puisse être allouée à des améliorations dans différents secteurs des transports. Dans lequel des cinq secteurs suivants estimez-vous que des améliorations sont les plus importantes ? Classez les secteurs par ordre d'importance. Le rang 1 correspond à la mesure la plus importante à vos yeux, le rang 2 à la deuxième mesure la plus importante, etc.

Exemple : 5 / 3 / 2 / 1 / 4

| Secteurs  | Priorité, de 1 à 5 |
|---|--------------------|
| Amélioration des transports publics (train, bus, tram)              |                    |
| Amélioration du trafic routier (voiture, moto)                      |                    |
| Amélioration des aménagements cyclables (y compris vélo électrique) |                    |
| Amélioration des aménagements piétons                               |                    |
| Réduction de l'impact environnemental du trafic                     |                    |

#### 1.2 Questions 2 et 3 (deux questions sur les cinq énoncées ici)

La sélection des questions 2 et 3 est purement aléatoire.

##### 1.2.1 Question « amélioration des transports publics » (ordre aléatoire)

Quelles sont les améliorations à apporter dans les transports publics (train, bus, tram) ? Classez les cinq mesures ci-dessous par ordre de priorité. Le rang 1 correspond à la mesure la plus importante à vos yeux, le rang 2 à la deuxième mesure la plus importante, etc.

| Mesures  | Priorité, de 1 à 5 |
|--|--------------------|
| Modernisation des trains, des bus et des trams (p. ex. nouveaux véhicules, accès Internet)   |                    |
| Amélioration du confort et de l'efficacité lors des changements (p. ex. signalétique, raccourcissement des distances, plus de commerces) |                    |
| Plus de places sur les lignes existantes   |                    |
| Amélioration du trafic local et régional (RER, tram, bus) : augmentation de la fréquence ou de la vitesse                                |                    |

|  |  |
|--|--|
| Amélioration du trafic longues distances (trains) :<br>augmentation de la fréquence ou de la vitesse |  |
|--|--|

### 1.2.2 Question « amélioration du trafic routier » (ordre aléatoire)

Quelles sont les améliorations à apporter au niveau du trafic individuel motorisé (voiture, moto) ? Classez les cinq mesures ci-dessous par ordre de priorité. Le rang 1 correspond à la mesure la plus importante à vos yeux, le rang 2 à la deuxième mesure la plus importante, etc.

| Mesures   | Priorité, de 1 à 5 |
|---|--------------------|
| Extension du réseau des routes nationales (p. ex. construction de nouveaux tronçons autoroutiers)   |                    |
| Élimination des goulets d'étranglement sur le réseau existant des routes nationales (p. ex. construction d'une voie supplémentaire sur une autoroute)     |                    |
| Fluidification du trafic dans les villes et les agglomérations (p. ex. construction de nouveaux contournements, remplacement des feux par des giratoires) |                    |
| Renforcement de la sécurité routière (p. ex. travaux d'aménagement, systèmes d'aide à la conduite)  |                    |
| Diffusion d'informations sur l'état du trafic afin d'éviter les embouteillages (p. ex. via des applications pour smartphones)                             |                    |

### 1.2.3 Question « amélioration des aménagements cyclables » (ordre aléatoire)

Quelles sont les améliorations à apporter aux aménagements cyclables (y compris vélo électrique) ? Classez les cinq mesures ci-dessous par ordre de priorité. Le rang 1 correspond à la mesure la plus importante à vos yeux, le rang 2 à la deuxième mesure la plus importante, etc.

| Mesures  | Priorité, de 1 à 5 |
|--|--------------------|
| Développement des zones limitées à 30 km/h                           |                    |
| Développement des systèmes de vélos en libre-service                 |                    |
| Développement des bandes cyclables avec marquage coloré sur la route |                    |
| Développement des places de stationnement pour vélos                 |                    |
| Développement des pistes cyclables                                   |                    |

### 1.2.4 Question « amélioration des aménagements piétons » (ordre aléatoire)

Quelles sont les améliorations à apporter aux aménagements piétons ? Classez les cinq mesures ci-dessous par ordre de priorité. Le rang 1 correspond à la mesure la plus importante à vos yeux, le rang 2 à la deuxième mesure la plus importante, etc.

| Mesures  | Priorité, de 1 à 5 |
|--|--------------------|
| Développement des zones de rencontre limitées à 20 km/h  |                    |
| Réaménagement de la voirie (p. ex. élargissement des trottoirs, zones piétonnes)                             |                    |
| Itinéraires plus directs (p. ex. passerelles pour piétons, plus de passages piétons)                         |                    |
| Renforcement de la convivialité de l'espace public (p. ex. plus de bancs, terrasses de cafés, espaces verts) |                    |
| Renforcement de la sécurité (éclairage public, amélioration de la visibilité)                                |                    |

**1.2.5 Question « réduction de l'impact environnemental du trafic » (ordre aléatoire)**

**Quelles sont les mesures à prendre en ce qui concerne l'environnement et l'énergie ?** Classez les cinq mesures ci-dessous par ordre de priorité. Le rang 1 correspond à la mesure la plus importante à vos yeux, le rang 2 à la deuxième mesure la plus importante, etc.

| Mesures   | Priorité, de 1 à 5 |
|---|--------------------|
| Taxe sur les émissions de CO <sub>2</sub> liées au transport pour tous les moyens de transport (p. ex. voiture, avion)  |                    |
| Incitations financières à l'achat de nouveaux véhicules économes en énergie et à faibles émissions                      |                    |
| Financement de mesures de réduction du bruit du trafic (p. ex. revêtements anti-bruit, trains plus silencieux)          |                    |
| Interdiction de circuler en ville pour les voitures polluantes lors des pics de pollution                               |                    |
| Interdiction de la vente de voitures dont la consommation de carburant est élevée (p. ex. plus de 10 litres aux 100 km) |                    |

**1.3 Question 4 (mêmes mesures proposées à tous les participants, ordre aléatoire)**

**Quelles seraient d'après vous les mesures les plus efficaces pour résoudre les problèmes actuels en matière de transports ?** Classez les cinq mesures ci-dessous par ordre de priorité. Le rang 1 correspond à la mesure la plus importante à vos yeux, le rang 2 à la deuxième mesure la plus importante, etc.

| Mesures   | Priorité, de 1 à 5 |
|---|--------------------|
| Davantage de logements et d'emplois dans les villes et les agglomérations (d'où une réduction des distances à parcourir)  |                    |
| Hausse générale du coût de la mobilité (voiture et transports publics)  |                    |
| Mesures de soutien pour les véhicules autonomes (p. ex. modification de lois, expériences pilotes)  |                    |
| Mesures de soutien pour la mobilité partagée : autopartage de type Mobility, covoiturage, systèmes de prêt de vélos (p. ex. modification de lois, expériences pilotes)                        |                    |
| Soutien aux modèles de travail flexibles, qui permettent de réduire ou de décaler les déplacements (p. ex. télétravail depuis chez soi ou un autre lieu, libre choix des horaires de travail) |                    |

## 2 2<sup>e</sup> partie : Trafic individuel motorisé (voiture, moto) (choix déclaré)

La croissance ininterrompue du trafic en Suisse fait grimper les coûts d'exploitation, d'entretien et d'aménagement du réseau routier. Par ailleurs, les limites de capacité sont de plus en plus souvent atteintes. Des mesures peuvent être prises afin de financer et de gérer le trafic ainsi que de régler les problèmes existants :

**Financement des transports** : Prélèvement de recettes générées par les taxes et les carburants

**Gestion du trafic** : Péages ciblés visant à gérer le trafic

**Utilisation de l'argent** : Augmentation du soutien financier à certaines mesures

Dans chacune des six situations suivantes, deux paquets de mesures sont présentés afin de collecter de l'argent, de gérer le trafic et d'utiliser l'argent. Veuillez cocher le paquet de mesures que vous seriez le plus enclin-e à soutenir.

### 2.1 Situation 1 (exemple)

|  | Paquet de mesures A   | Paquet de mesures B  |
|--|---|--|
| <b>Financement des transports</b><br>Taxes sur les véhicules ou les carburants | <b>Aucune</b> modification des éléments de financement existants  | Introduction d'une <b>redevance de 1,80 CHF pour 100 km parcourus</b>        |
| <b>Gestion du trafic</b><br>Péages   | Péages pour accéder à certaines zones des <b>villes et agglomérations aux heures de pointe</b>  | Péages pour accéder aux <b>axes routiers surchargés aux heures de pointe</b> |
| <b>Utilisation de l'argent</b><br>Augmentation du soutien financier            | <b>Fluidification du trafic dans les villes et les agglomérations</b> (par ex. construction de nouveaux contournements, remplacement des feux par des giratoires) | <b>Améliorations des aménagements cyclables et piétons</b>                   |
|  |   |  |

Pour chaque situation, veuillez cocher la case correspondant à votre choix.

### 2.2 Situations 2 à 6

Même principe qu'au point 2.1, avec les données de ce tableau :

| Variable  | Caractéristiques  |
|---|---|
| <b>Taxes sur les véhicules ou les carburants</b>  |   |
| Note : toutes les valeurs sont explicitement accompagnées d'un + ou d'un -.   |   |
| « <b>Augmentation du prix de la vignette autoroutière de 40 CHF à x=70/100/130 CHF par an</b> »<br>« <b>Suppression de la vignette autoroutière</b> » (si x = 0 CHF)<br>« <b>Baisse du prix de la vignette autoroutière de 40 CHF à x=20 CHF par an</b> » | x = 0 CHF : suppression<br>x = 20 CHF<br>x = 70 CHF<br>x = 100 CHF<br>x = 130 CHF             |
| « <b>Hausse du prix des carburants de x=+7,5 / +15 / +22 centimes par litre</b> »<br>« <b>Baisse du prix des carburants de x=-10 / -5 centimes par litre</b> »  | x = -10 centimes<br>x = -5 centimes<br>x = 7,5 centimes<br>x = 15 centimes<br>x = 22 centimes |
| Introduction d'une <b>redevance de x CHF pour 100 km parcourus</b>  | x = 0,6 CHF / 100 km<br>x = 1,2 CHF / 100 km<br>x = 1,8 CHF / 100 km                          |
| « <b>Augmentation de l'impôt sur les véhicules à moteur de x=+10 / +20 / +30 %</b> »<br>« <b>Baisse de l'impôt sur les véhicules à moteur de x=-5 / -10 %</b> »   | x = -10 %<br>x = -5 %<br>x = +10 %<br>x = +20 %<br>x = +30 %                                  |
| <b>Prime de x CHF à l'achat d'un nouveau véhicule écologique, surtaxe de y CHF à l'achat d'un nouveau véhicule moins écologique</b>   | x = 1000, y = 3000<br>x = 2000, y = 6000<br>x = 3000, y = 9000                                |
| <b>Aucune</b> modification des éléments de financement existants  | -   |

### Péages

- Péages **aux heures de pointe** pour accéder à **toutes les routes**
- Péages **aux heures de pointe** pour accéder aux **routes surchargées**
- Péages **aux heures de pointe** pour accéder à certaines zones des **villes et agglomérations**
- **Aucun** péage

### Affectation des ressources

- **Elimination des goulets d'étranglement du réseau des routes nationales** (p. ex. construction d'une voie supplémentaire sur une autoroute)
- **Fluidification du trafic dans les villes et les agglomérations** (p. ex. construction de nouveaux contournements, remplacement des feux par des giratoires)
- **Renforcement de la sécurité du trafic** (p. ex. travaux d'aménagement)
- **Amélioration des transports publics**
- **Améliorations des aménagements cyclables et piétons**
- **Extension du réseau des routes nationales** (construction de nouveaux tronçons autoroutiers)
- **Réduction de l'impact environnemental** du trafic
- **Aucun changement** par rapport à la situation actuelle

### 3 3<sup>e</sup> partie : Transports publics (train, bus, tram) (*choix déclaré*)

La croissance ininterrompue du nombre d'usagers fait grimper les coûts d'exploitation, d'entretien et d'aménagement du réseau de **transports publics**. Par ailleurs, les limites de capacité sont de plus en plus souvent atteintes. Des mesures peuvent être prises afin de financer et de gérer le trafic ainsi que de régler les problèmes existants.

Pour chacune des six situations suivantes, deux paquets de mesures sont présentés. Veuillez cocher le paquet de mesures que vous seriez le plus enclin-e à soutenir.

#### 3.1 Situation 1

|   | <b>Paquet de mesures A</b>  | <b>Paquet de mesures B</b>  |
|---|---|---|
| <b>Modification des prix</b><br>des billets et/ou des abonnements   | Hausse des prix des <b>billets de +15 %</b>   | <b>Pas de modification</b> des prix des billets et des abonnements                            |
| <b>Gestion du trafic</b><br>Modification des tarifs                 | <b>Prix fixes, indépendamment de la plage horaire</b> et de la <b>fréquentation</b> de la ligne empruntée | Les trajets en <b>heures creuses</b> sur l' <b>ensemble du réseau coûtent 10 % moins cher</b> |
| <b>Utilisation de l'argent</b><br>Augmentation du soutien financier | <b>Plus de places assises</b> dans les liaisons existantes  | <b>Aucun changement</b> par rapport à la situation actuelle                                   |
|   |   |   |

## Situations 2 à 6

Même principe qu'au point 3.1, avec les données de ce tableau :

| Variable  | Caractéristiques          |
|---|---------------------------|
| <b>Modification des tarifs</b>  |                           |
| Note : toutes les valeurs sont explicitement accompagnées d'un + ou d'un -. |                           |
| Hausse des prix des <b>billets</b> de ... %                                 | + 5 %<br>+ 10 %<br>+ 15 % |
| Hausse des prix des <b>abonnements</b> de ... %                             | + 5 %<br>+ 10 %<br>+ 15 % |
| Hausse des prix des <b>billets</b> et des <b>abonnements</b> de ... %       | + 5 %<br>+ 10 %<br>+ 15 % |
| <b>Pas de modification</b> des prix des billets et des abonnements          |                           |

### Tarifs différenciés en fonction des horaires et des lignes

Note : toutes les valeurs sont explicitement accompagnées d'un + ou d'un -.

#### Mécanisme tarifaire

- |   |                |
|---|----------------|
| <ul style="list-style-type: none"> <li>• Tous les trajets <b>aux heures de pointe</b> sont <b>majorés de ... %</b></li> </ul>   | +10 %<br>+20 % |
| <ul style="list-style-type: none"> <li>• Les trajets <b>aux heures de pointe</b> sur des <b>lignes à forte fréquentation</b> sont <b>majorés de ... %</b> (s'applique aussi aux abonnements)</li> </ul> | +10 %<br>+20 % |
| <ul style="list-style-type: none"> <li>• Les trajets <b>aux heures creuses</b> sur des <b>lignes à faible fréquentation</b> sont <b>minorés de ... %</b> (s'applique aussi aux abonnements)</li> </ul>  | -15 %<br>-30 % |
| <ul style="list-style-type: none"> <li>• Sur l'ensemble du réseau, les trajets <b>aux heures creuses</b> sont <b>minorés de ... %</b></li> </ul>  | -15 %<br>-30 % |
| <ul style="list-style-type: none"> <li>• <b>Prix fixes, indépendamment de la plage horaire</b> et de la <b>fréquentation</b> de la ligne empruntée</li> </ul>   |                |

#### Affectation des ressources

- **Trains plus fréquents** pour le **trafic longues distances**
- **Courses plus fréquentes** pour le **trafic local** et **régional** (RER, tram, bus)
- **Plus de places assises** dans les liaisons existantes
- **Modernisation des trains, des bus et des trams** (p. ex. nouveaux véhicules, rafraîchissement de l'intérieur des voitures)
- **Amélioration du confort** lors des **changements** (signalétique, raccourcissement des distances, plus de commerces)
- **Aucun changement** par rapport à la situation actuelle





Dr. Antonin Danalet 18.12.2019

## Modulo 3: questionario

N. registrazione/dossier: COO.2093.100.5.821144

### 1 Parte 1: domande di carattere generale (classifica indicata)

#### 1.1 Domanda 1 (stesse misure per tutti i partecipanti, ordine casuale)

Supponga che una parte delle entrate fiscali possa essere destinata a miglioramenti nei diversi settori dei trasporti. In quale dei cinque settori seguenti ritiene sia prioritario prevedere dei miglioramenti? Classifichi i settori in ordine di priorità. La priorità 1 corrisponde, a Suo avviso, alla misura con la massima priorità, la priorità 2 alla seconda, ecc. Esempio: 5 / 3 / 2 / 1 / 4.

| Settori   | Priorità (1-5) |
|---|----------------|
| Miglioramento dei trasporti pubblici (treno, bus, tram)                       |                |
| Miglioramento del traffico stradale (automobili, motoveicoli)                 |                |
| Miglioramento delle infrastrutture ciclabili (biciclette elettriche comprese) |                |
| Miglioramento delle infrastrutture pedonali                                   |                |
| Riduzione dell'impatto ambientale del traffico                                |                |

#### 1.2 Domande 2 e 3 (due domande delle cinque qui esposte)

La scelta delle domande 2 e 3 è casuale.

##### 1.2.1 Domanda «Miglioramento dei trasporti pubblici» (ordine casuale)

**Quali miglioramenti dovrebbero essere apportati ai trasporti pubblici (treno, bus, tram)?**

Classifichi le cinque misure sotto riportate in ordine di priorità. La priorità 1 corrisponde, a Suo avviso, alla misura con la massima priorità, la priorità 2 alla seconda, ecc.

| Misure  | Priorità (1-5) |
|---|----------------|
| Modernizzazione dei treni, bus e tram (p. es. nuovi veicoli, accesso a Internet)  |                |
| Aumento del comfort e dell'efficienza nelle coincidenze (p. es. segnaletica, riduzione delle distanze da percorrere, più possibilità per fare acquisti) |                |
| Più posti sulle linee esistenti   |                |
| Miglioramento del traffico locale e regionale (treni suburbani, tram, bus): aumento della frequenza o della velocità                                    |                |
| Miglioramento del traffico a lunga percorrenza (treni): aumento della frequenza o della velocità  |                |

**1.2.2 Domanda «Miglioramento del traffico stradale» (ordine casuale)**

**Quali miglioramenti dovrebbero essere apportati al trasporto individuale motorizzato (automobili, motoveicoli)?** Classifichi le cinque misure sotto riportate in ordine di priorità. La priorità 1 corrisponde, a Suo avviso, alla misura con la massima priorità, la priorità 2 alla seconda, ecc.

| Misure  | Priorità (1-5) |
|---|----------------|
| Potenziamento della rete stradale nazionale (p. es. costruzione di nuovi tratti autostradali)   |                |
| Eliminazione dei problemi di capacità sulla rete delle strade nazionali esistente (p. es. costruzione di una corsia autostradale supplementare)                       |                |
| Miglioramento della scorrevolezza del traffico nelle città e negli agglomerati (p. es. costruzione di nuove circonvallazioni, sostituzione di semafori con rotatorie) |                |
| Aumento della sicurezza del traffico stradale (p. es. misure infrastrutturali, sistemi di assistenza alla guida)  |                |
| Diffusione di informazioni sulla situazione del traffico al fine di evitare code (p. es. con app per smartphone)  |                |

**1.2.3 Domanda «Miglioramento delle infrastrutture ciclabili» (ordine casuale)**

**Quali miglioramenti dovrebbero essere apportati alle infrastrutture ciclabili (biciclette elettriche comprese)?** Classifichi le cinque misure sotto riportate in ordine di priorità. La priorità 1 corrisponde, a Suo avviso, alla misura con la massima priorità, la priorità 2 alla seconda, ecc.

| Misure   | Priorità (1-5) |
|--|----------------|
| Ampliamento delle zone con limite di velocità massimo di 30 km/h                 |                |
| Ampliamento delle offerte di bike sharing  |                |
| Ampliamento delle corsie riservate ai ciclisti segnalate con colori sulla strada |                |
| Ampliamento dei parcheggi per le biciclette                                      |                |
| Ampliamento delle ciclo piste  |                |

**1.2.4 Domanda «Miglioramento delle infrastrutture pedonali» (ordine casuale)**

**Quali miglioramenti dovrebbero essere apportati al traffico pedonale?**

Classifichi le cinque misure sotto riportate in ordine di priorità. La priorità 1 corrisponde, a Suo avviso, alla misura con la massima priorità, la priorità 2 alla seconda, ecc.

| Misure  | Priorità (1-5) |
|---|----------------|
| Ampliamento delle zone di incontro con limite di velocità massimo di 20 km/h                                    |                |
| Riorganizzazione delle strade (p. es. marciapiedi più larghi, zone pedonali)                                    |                |
| Itinerari più diretti (p. es. ponti pedonali, passaggi pedonali supplementari)                                  |                |
| Aumento della qualità degli spazi pubblici (p. es. più possibilità per sedersi, luoghi di ristoro, spazi verdi) |                |
| Aumento della sicurezza (illuminazione delle strade, miglioramento della visibilità)                            |                |

**1.2.5 Domanda «Riduzione dell'impatto ambientale del traffico» (ordine casuale)****Quali misure dovrebbero essere apportate nell'ambito dell'ambiente e dell'energia?**

Classifichi le cinque misure sotto riportate in ordine di priorità. La priorità 1 corrisponde, a Suo avviso, alla misura con la massima priorità, la priorità 2 alla seconda, ecc.

| Misure   | Priorità (1-5) |
|--|----------------|
| Tassa sulle emissioni di CO <sub>2</sub> del traffico per tutti i mezzi di trasporto (p.es auto, aereo)                      |                |
| Incentivi finanziari per l'acquisto di nuovi veicoli efficienti dal punto di vista energetico e a basse emissioni            |                |
| Finanziamento delle misure di riduzione del rumore del traffico (p. es. pavimentazioni fonoassorbenti, treni più silenziosi) |                |
| Divieto di circolazione in città per automobili inquinanti in caso di superamento dei valori limite delle emissioni          |                |
| Divieto di vendita di automobili ad alto consumo di carburante (p.es. più di 10 litri per 100 km)                            |                |

**1.3 Domanda 4 (stesse misure per tutti i partecipanti, ordine casuale)**

**A Suo avviso quali sarebbero le misure più efficaci per risolvere i problemi attuali generati dal traffico?** Classifichi le cinque misure sotto riportate in ordine di priorità. La priorità 1 corrisponde, a Suo avviso, alla misura con la massima priorità, la priorità 2 alla seconda, ecc.

| Misure   | Priorità (1-5) |
|--|----------------|
| Più alloggi e posti di lavoro in città e negli agglomerati (di conseguenza, riduzione delle distanze da percorrere)  |                |
| Aumento generale dei prezzi per la mobilità (automobili e mezzi di trasporto pubblici)   |                |
| Promozione dei veicoli a guida autonoma (p. es. con condizioni quadro giuridiche, progetti pilota)   |                |
| Promozione della mobilità condivisa: carsharing (p. es. Mobility), possibilità di carpooling, offerte di bike sharing (p. es. con condizioni quadro giuridiche, progetti pilota) |                |
| Promozione di modelli di lavoro flessibili, al fine di ridurre o trasferire il traffico (p. es. telelavoro dal domicilio o da altri luoghi, libera scelta degli orari di lavoro) |                |

## 2 Parte 2: Trasporto individuale motorizzato (automobili, motoveicoli) (scelta indicata)

La costante crescita del traffico in Svizzera aumenta i costi di esercizio, di manutenzione e di potenziamento della rete stradale, che raggiunge sempre più i suoi limiti di capacità. Al fine di finanziare e gestire il traffico, come pure di risolvere i problemi esistenti, possono essere adottate misure negli ambiti seguenti.

**Finanziamento dei trasporti:** riscossione di entrate generate da tasse e carburanti

**Gestione del traffico:** riscossione mirata di pedaggi al fine di migliorare la scorrevolezza del traffico

**Impiego delle risorse finanziarie:** maggiori contributi finanziari per determinate misure

Ciascuna delle sei situazioni seguenti presenta due pacchetti di misure volti a finanziare i trasporti, a gestire il traffico e a impiegare le risorse finanziarie. Apponga una crocetta sul pacchetto di misure che preferirebbe sostenere.

### 2.1 Situazione 1 (esempio)

|   | <b>Pacchetto di misure A</b>   | <b>Pacchetto di misure B</b>   |
|---|--|--|
| <b>Finanziamento dei trasporti</b><br>Tasse sulle automobili o sui carburanti | <b>Nessuna</b> modifica degli elementi di finanziamento esistenti  | Introduzione di una <b>tassa di 1,80 CHF ogni 100 km percorsi</b>                  |
| <b>Gestione del traffico</b><br>Pedaggi                                       | Pedaggi nelle <b>ore di punta</b> per accedere a determinate zone di <b>città e agglomerati</b>  | Pedaggi nelle <b>ore di punta</b> per accedere alle <b>strade molto trafficate</b> |
| <b>Impiego delle risorse finanziarie</b><br>Maggiori contributi finanziari    | <b>Miglioramento della scorrevolezza del traffico nelle città e negli agglomerati</b> (p. es. costruzione di nuove circonvallazioni, sostituzione di semafori con rotatorie) | <b>Miglioramenti delle infrastrutture ciclabili e pedonali</b>                     |
|   |  |  |

Per ogni situazione, apponga una crocetta sul pacchetto di misure che sceglierebbe.

### 2.2 Situazioni 2-6

Stesso principio del punto 2.1 con dati presi dalla tabella seguente:

| Variabile   | Caratteristiche   |
|---|---|
| <b>Tasse sulle automobili o sui carburanti</b>  |   |
| Nota: tutti i valori sono indicati in modo esplicito con un + o un -.   |   |
| «Aumento del prezzo del contrassegno autostradale da 40 CHF a $x = 70/100/130$ CHF l'anno»<br>«Soppressione del contrassegno autostradale» (se $x = 0$ CHF)<br>«Diminuzione del prezzo del contrassegno autostradale da 40 CHF a $x = 20$ CHF l'anno» | $x = 0$ CHF: soppressione<br>$x = 20$ CHF<br>$x = 70$ CHF<br>$x = 100$ CHF<br>$x = 130$ CHF |
| «Aumento del prezzo dei carburanti di $x = +7,5/+15/+22$ centesimi al litro»<br>«Diminuzione del prezzo dei carburanti di $x = -10/-5$ centesimi al litro»  | $x = -10$ ct.<br>$x = -5$ ct.<br>$x = 7,50$ ct.<br>$x = 15$ ct.<br>$x = 22$ ct.             |
| Introduzione di una <b>tassa</b> di $x$ CHF ogni 100 km percorsi  | $x = 0,60$ CHF / 100 km<br>$x = 1,20$ CHF / 100 km<br>$x = 1,80$ CHF / 100 km               |
| «Aumento dell'imposta sui veicoli a motore del $x = +10/+20/+30$ %»<br>«Diminuzione dell'imposta sui veicoli a motore del $x = -5/-10$ %»   | $x = -10$ %<br>$x = -5$ %<br>$x = +10$ %<br>$x = +20$ %<br>$x = +30$ %                      |
| <b>Contributo</b> di $x$ CHF per l'acquisto di un nuovo veicolo <b>a basso consumo</b> , <b>supplemento</b> di $y$ CHF per l'acquisto di un nuovo veicolo <b>ad alto consumo</b>  | $x = 1000, y = 3000$<br>$x = 2000, y = 6000$<br>$x = 3000, y = 9000$                        |
| <b>Nessuna modifica</b> degli elementi di finanziamento esistenti   | -   |

**Pedaggi**

- Pedaggi nelle **ore di punta** per accedere a **tutte le strade**
- Pedaggi nelle **ore di punta** per accedere alle **strade molto trafficate**
- Pedaggi nelle **ore di punta** per accedere a determinate zone di **città e agglomerati**
- **Nessun** pedaggio

**Impiego delle risorse finanziarie**

- **Eliminazione dei problemi di capacità** sulla **rete delle strade nazionali** (p. es. costruzione di una corsia autostradale supplementare)
- **Miglioramento della scorrevolezza del traffico nelle città e negli agglomerati** (p. es. costruzione di nuove circonvallazioni, sostituzione di semafori con rotatorie)
- **Aumento della sicurezza del traffico stradale** (p. es. misure infrastrutturali)
- **Miglioramento dei trasporti pubblici**
- **Miglioramenti delle infrastrutture ciclabili e pedonali**
- **Ampliamento della rete delle strade nazionali** (costruzione di nuovi tratti autostradali)
- **Riduzione dell'impatto ambientale** del traffico
- **Nessuna modifica** rispetto alla situazione attuale

**3 Parte 3: trasporti pubblici (treno, bus, tram) (scelta indicata)**

La costante crescita del numero di passeggeri nei **trasporti pubblici** aumenta i costi di esercizio, di manutenzione e di potenziamento di questo sistema di trasporto, che raggiunge sempre più i suoi limiti

di capacità. Al fine di finanziare e gestire il traffico, come pure di risolvere i problemi esistenti, possono essere adottate misure negli ambiti seguenti.

Ciascuna delle sei situazioni seguenti presenta due pacchetti di misure. Apponga una crocetta sul pacchetto di misure che preferirebbe sostenere.

### 3.1 Situazione 1

|  | <b>Pacchetto di misure A</b>  | <b>Pacchetto di misure B</b>  |
|--|---|---|
| <b>Modifica dei prezzi</b> dei biglietti e/o degli abbonamenti             | Aumento dei prezzi dei biglietti del <b>+15 %</b>   | <b>Nessuna modifica</b> dei prezzi dei biglietti e degli abbonamenti  |
| <b>Gestione del traffico</b><br>Modifica delle tariffe                     | <b>Tariffe fisse</b> in tutte le fasce orarie e <b>indipendentemente dal grado di sfruttamento</b> della linea utilizzata | Le corse su <b>linee poco utilizzate</b> nelle <b>fasce orarie secondarie</b> costano il <b>10 % in meno</b> (vale anche per gli abbonamenti) |
| <b>Impiego delle risorse finanziarie</b><br>Maggiori contributi finanziari | <b>Più posti a sedere</b> sulle linee esistenti   | <b>Nessuna modifica</b> rispetto alla situazione attuale  |
|  |   |   |

**Situazioni 2-6**

Stesso principio del punto 3.1 con dati presi dalla tabella seguente:

| <b>Variabile</b>  | <b>Caratteristiche</b> |
|---|------------------------|
| <b>Modifica delle tariffe</b>   |                        |
| Nota: tutti i valori sono indicati in modo esplicito con un + o un -.         |                        |
| Aumento dei prezzi dei <b>biglietti</b> del .... %                            | +5 %<br>+10 %<br>+15 % |
| Aumento dei prezzi degli <b>abbonamenti</b> del .... %                        | +5 %<br>+10 %<br>+15 % |
| Aumento dei prezzi dei <b>biglietti</b> e degli <b>abbonamenti</b> del .... % | +5 %<br>+10 %<br>+15 % |
| <b>Nessuna modifica</b> dei prezzi dei biglietti e degli abbonamenti          |                        |

**Prezzi differenziati in funzione della fascia oraria e della linea**

Nota: tutti i valori sono indicati in modo esplicito con un + o un -.

**Meccanismo tariffario**

- |  |                |
|--|----------------|
| • Tutte le corse nelle <b>ore di punta</b> costano il ... % <b>in più</b>  | +10 %<br>+20 % |
| • Le corse su <b>linee fortemente utilizzate</b> nelle <b>ore di punta</b> costano il ... % <b>in più</b> (vale anche per gli abbonamenti)       | +10 %<br>+20 % |
| • Le corse su <b>linee poco utilizzate</b> nelle <b>fasce orarie secondarie</b> costano il ... % <b>in meno</b> (vale anche per gli abbonamenti) | -15 %<br>-30 % |
| • Le corse <b>sull'intera rete</b> nelle <b>fasce orarie secondarie</b> costano il ... % <b>in meno</b>  | -15 %<br>-30%  |
| • <b>Tariffe fisse</b> in <b>tutte le fasce orarie</b> e <b>indipendentemente dal grado di sfruttamento</b> della linea utilizzata               |                |

**Impiego delle risorse**

- **Treni più frequenti** nel **traffico a lunga percorrenza**
- **Corse più frequenti** nel **traffico locale** e **regionale** (treni suburbani, tram, bus)
- **Più posti a sedere** sulle linee esistenti
- **Modernizzazione** dei **treni, bus e tram** (p. es. nuovi veicoli, rinnovamento degli interni)
- **Aumento del comfort** nelle **coincidenze** (p. es. segnaletica, riduzione delle distanze da percorrere, più possibilità per fare acquisti)
- **Nessuna modifica** rispetto alla situazione attuale