ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

LaSUR
Laboratoire de sociologie urbaine

Transport mode choice in alpine resorts in Switzerland

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Presentation plan

1) Introduction: why transport research is important for mountain regions
2) Background: introducing mode choice, share, split and shift
3) Big data: the Swiss transport micro-survey
4) A new study: let's focus on mountains!
5) Hypothesis: people living in alpine resorts use public transport less than people living elsewhere in Switzerland
6) Preliminary results
7) Discussion
8) Conclusion and next steps

Introduction

Transport research is important for mountain regions because of

- Greenhouse gas emissions
- Energy consumption and distribution
- Congestion (full roads)
- Public transport financing (empty trains – except for tourists)
- Public health: air pollution, noise, accidents + an important contribution to the global epidemic of sedentariness

-> noncommunicable diseases and conditions such as:

i) Overweight, obesity, Type 2 diabetes, hypertension, etc.
ii) Cardiovascular diseases
iii) Pulmonary diseases
iv) Cancer
v) Mental health

Background

- **Transport mode choice** is an individual decision-making process with strong implications for sustainability. Mountain regions are under-researched in this field, which tends to concentrate on cities.
- **Mode share**: central to transport research is the idea that all trips can be attributed to a single or major mode. Mode share is usually described as a percentage of trips, regardless of their length or duration.
- **Mode split** is the relative importance of each travel mode. Policy makers often refer to measures liable to change the mode split in a given setting.
- **Mode shift** is a process whereby a population changes its transport behaviour. Improving public transport (carrot) or restricting facilities for cars (stick) can lead to mode shift.

Big data: the Swiss transport micro-survey

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Swiss transport micro-survey 2010

Data	Number of observations	Variables
Households / Ménages / Haushalte	59’971	99
Target people / Personnes-cibles / Zielpersonen	62’868	214
Trips / Déplacements / Ausgänge	85’436	36
Home trips / Boucles / Wege	211’359	87
Stages / Etapes / Etappen	310’193	116
Routes / Routen	285’529	4
Segments / Segmente	10’064’058	2

Swiss transport micro-survey 2010

- Each respondent has his/her own reference day; reference days are spread out through the week & year (2010)
- Each resident of Switzerland travelled an average of **37 km** on the reference day. This corresponds to a travel time, excluding waiting and transfer times, of **83 minutes**
- Men cover 11 km more per day than women
- Averages include the 10% of the population who stayed at home on the reference day
- People in households with monthly incomes > CHF 14’000 cover 2.5 times longer daily distances than persons with household incomes < CHF 2000.

A new study on alpine resorts

- This study investigates differences in mode choice between people living in 22 alpine resorts and people living in other areas in Switzerland.
- To define these resorts, the standards of the Swiss Statistical Office were used.
- There were 454 participants from alpine resorts in the MRMT2010 database, living in 22 *communes* (*Gemeinden*).
- Analyses were carried out using SPSS.
- List of resorts: see column on right.

N.B.
Ormont-Dessus includes Les Diablerets.
Bagnes includes Verbier.
Crans-Montana is not included because it is spread over several communes/Gemeinden.

Adelboden
Kandersteg
Grindelwald
Lauterbrunnen
Hasliberg
Lenk im Simmental
Saanen
Engelberg
Vaz/Obervaz
Laax
Flims
Samnaun
Scuol
Klosters
Arosa
Leysin
Ollon
Ormont-Dessus
Bagnes
Leukerbad
Saas Fee
Zermatt

Preliminary results

- On the reference day, people living in alpine resorts drove individual motorised vehicles slightly more than people living in other areas, covering 25.3 km per day against 16.9 in city centres, 23.2 in suburbs, 26.4 in outer suburbs and 26.7 in isolated towns. The highest levels of car and motorcycle driving were in peri-urban (31.1) and peripheral rural villages (29.1).
- Walking was as popular in alpine resorts as elsewhere, with an average of 2.3 km per day, slightly below city centres or isolated towns (2.4-2.5 km) and slightly above suburbs, outer suburbs and rural villages (all around 2 km).
- **It is only regarding public transportation that alpine resorts display a distinct profile: their residents cover 3.5 km on a typical day, against 11.0 for people living in city centres and 7-8 km for those living in other types of area.**

Daily walking: few differences between regions

Place of residence (type)	N	Mean	SD
City centre	17714	2.42	3.42
City first circle	8861	2.05	3.23
City second circle	19658	1.93	3.16
Isolated town	524	2.49	4.07
Peripheric rural	13562	1.73	3.30
Alpine resorts	**454**	**2.31**	**3.67**
Peripheral rural	2094	2.17	3.95

Daily car driving: few differences between regions (except city centres)

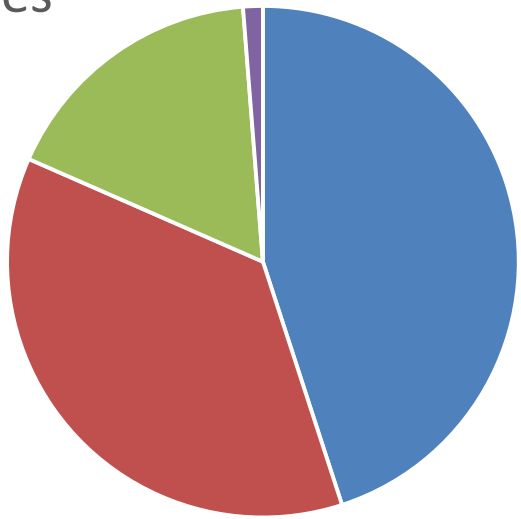
Place of residence (type)	N	Mean	SD
City centre	17714	16.9	42.7
City first circle	8861	23.2	47.2
City second circle	19658	26.4	49.2
Isolated town	524	26.7	58.2
Peripheric rural	13562	31.1	51.5
Alpine resorts	**454**	**25.3**	**68.8**
Peripheral rural	2094	29.1	57.8

Public transport use: large differences! (figures for all trips)

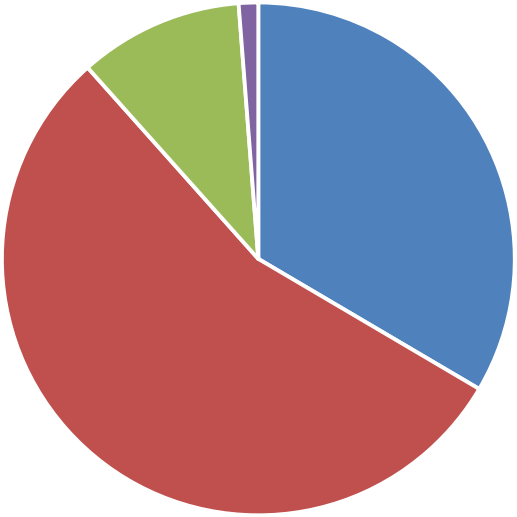
Place of residence (type)	N	Mean	SD
City centre	17714	11.0	39.3
City first circle	8861	7.8	29.7
City second circle	19658	8.	33.0
Isolated town	524	8.2	31.0
Peripheric rural	13562	7.1	31.3
Alpine resorts	**454**	**3.5**	**20.3**
Peripheral rural	2094	7.2	34.6

MODE SHARES FOR ALL TRIPS

City centres



Isolated towns

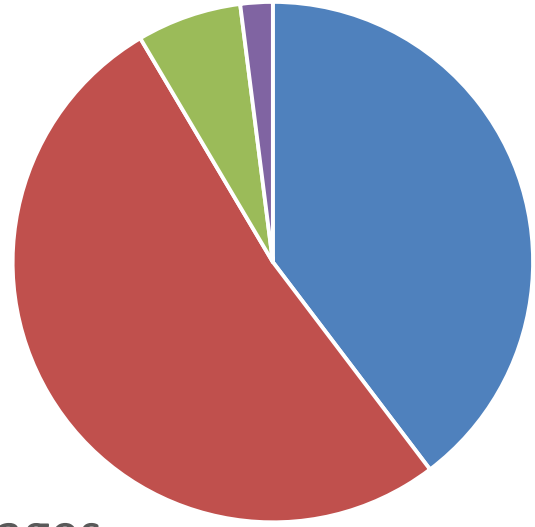


Walk/cycle

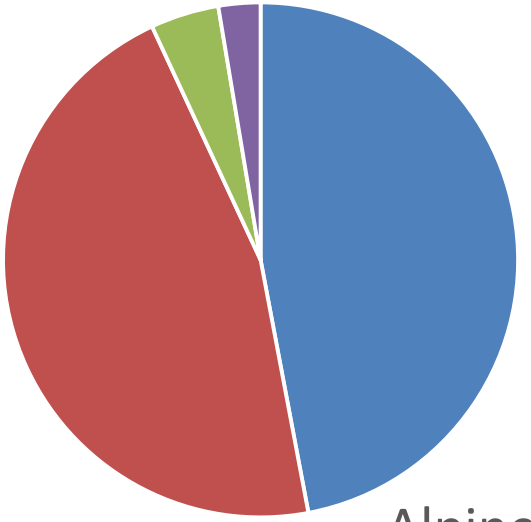
Car/motorbike

Public transport

Other



Rural villages



Alpine resorts

Results & further research

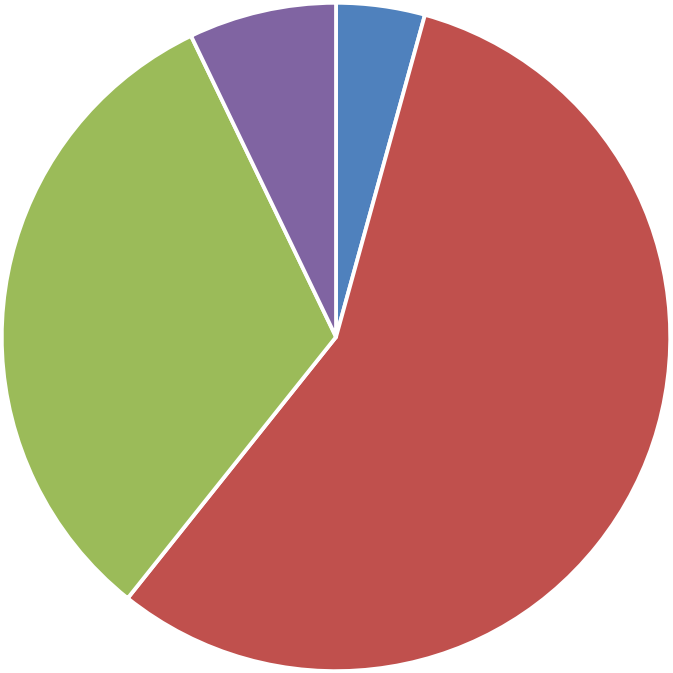
- To try to understand this discrepancy, we reduced the 22 communes in the alpine resort category to 18 by removing 4 that contributed less than 10 participants to the survey.
- Among the remaining resorts, 6 were in Canton Bern, 5 in Graubünden, 4 in French-speaking Vaud or Valais, one in central Switzerland and two in German-speaking Valais.
- We verified public transport services in several of these resorts by using the cff.ch search engine to establish a list of departures on a typical weekday in 2015 (the system did not allow searches in 2010).
- Almost all had good service. For example, Adelboden had 54 bus departures in various directions between 5:35 and 22:25 and Zermatt had 83 train departures towards the valley between 5:37 and half past midnight.

Results & further research

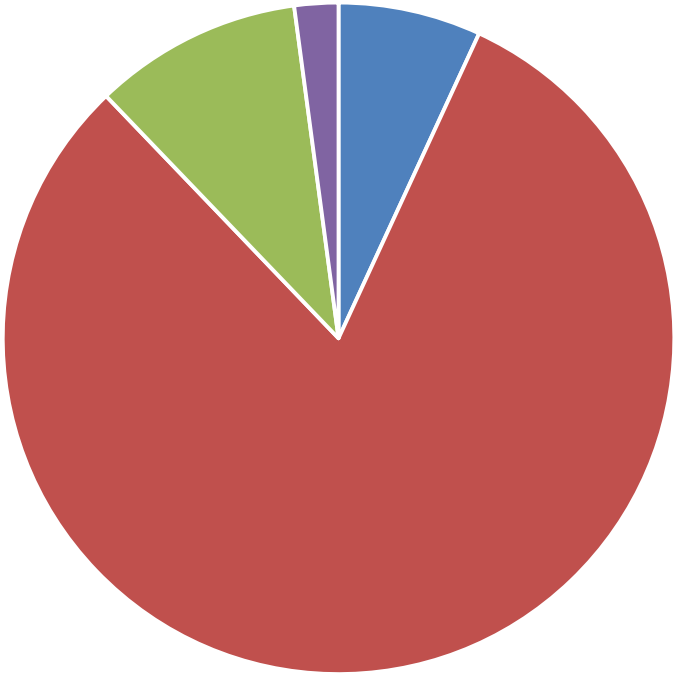
- We analysed all trips in the database which were either to or from a mountain resort, but not both (to exclude trips within resorts).
- Looking at mode shares for these specific trips, we found that only 10% were carried out using public transport if the person lived in a mountain resort, against 23-32% if he/she lived in a city or conurbation.
- Fully 80% of trips to or from mountain resorts were by car if the person lived in a mountain resort, against 55% if she lived in a city centre and 61-65% if she was from a suburb.

MODE SHARES FOR TRIPS ONLY TO OR FROM ALPINE RESORTS

City centres



Alpine resorts



Walk/cycle
Car/motorbike
Public transport
Other

Discussion I

- We found that people living in alpine resorts use public transport less than other residents of Switzerland, when travelling to or from alpine resorts.
- Our results suggest that this is not linked to insufficient coverage, nor to low overall levels of transportation.
- In many mountain areas, transport infrastructure and services which are important for sustainability are used by tourists
- This research suggests that they are insufficiently used by local residents. For financial reasons, this may lead to some Swiss mountain railway lines being closed over the next few years.
- As a contribution to the scientific and political agenda, we suggest that mountain resorts in Switzerland draw up traffic management plans involving not only visitors but also local residents, with a view to achieving mode shift.

Discussion II

- It would be interesting – and useful – to try to understand why mountain resort residents use public transport less than other residents of Switzerland.
- If the problem is the image of public transport, this is an issue that has been identified, tackled and partly solved before in other settings (mainly in cities).
- It would therefore be useful to find out what values and attitudes towards public transport are similar to people currently not using public transport in cities, and which values and attitudes may be specific to mountain regions (and why).

Conclusion: ideas for future research

In order to kick-start research on transport behaviour in mountain regions, a two-pronged approach is suggested. In each case, there would be a focus on the transport behaviour of people living in mountain regions (not only alpine resorts)

GENERAL LEVEL

Put forward research themes linking transportation issues and mountain research, as part of a more general package seeking to stimulate international research on mountain areas (cf. Roundtable).

SPECIFIC LEVEL

Begin work on a detailed project proposal to be submitted for funding with the Swiss National Science Foundation (and/or other funders). Although the focus will be on Switzerland, international collaborations are both desired and necessary.

Thank you for your attention!

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