WHAT EFFECTS TELEWORKING HAS ON EVERYDAY AND RESIDENTIAL MOBILITY?

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SVI Conference Research 2025

LEARNINGS FROM A SNSF RESEARCH

A Research project « Does teleworking lead to sustainable mobility practices? Knowing and overcoming space-time rebound effects »

financed by Swiss National Science Foundation (SNSF)

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realised at University of Lausanne

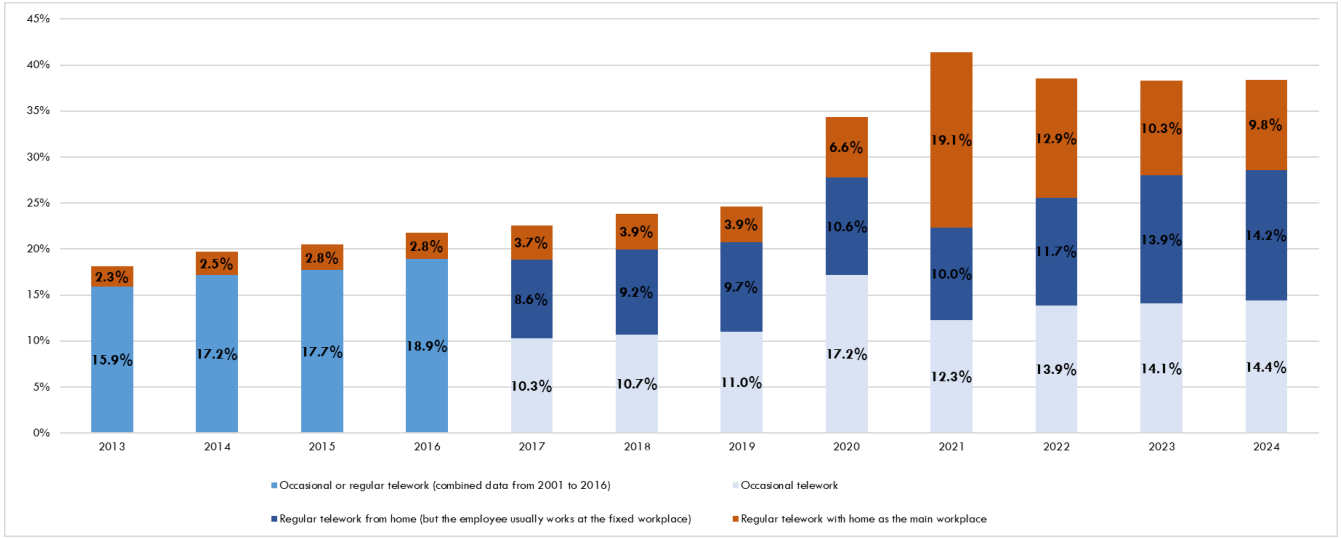
by Patrick Rérat, Emmanuel Ravalet
and Laura Hostettler Macias

DEFINITION AND CONTEXT OF TELEWORK

Definition of TW:

- Three forms of teleworking are to be distinguished (Thomsin, 2002): (1) Teleworking at home, (2) Itinerant telework ("on the move"), (3) Teleworking in third-places (co-working spaces, cafés, etc.)

- Substitution interest (when people still have to go to a workplace)



Source : Swiss Labour Force Survey (SLFS) 2013-2024, Swiss statistical office

→ Steady increase before the Pandemic

→ Boom in 2020 to 2021

→ A more stable situation concerning the share of teleworkers with a slight decrease on telework frequency

OUR RESEARCH QUESTION

"What are the effects of teleworking on everyday and residential mobility?"

This raises the issue of a potential “space-time rebound effect”. In other words, reducing the frequency of commuting trips could generate other trends (e.g. a higher tolerance for commuting, an increase in trips for other motives, a trend towards multiresidentiality, a decrease in residential mobility). More specifically, we will study the role teleworking plays in the choice of both residential and work places, the trips that are avoided and/or made possible by teleworking and the overall balance of greenhouse gas emissions of both teleworkers and non-teleworkers.

METHODS

- Mixed Methods Approach – Where the quantitative and the qualitative complement each other by allowing further information, that a single approach may lack.

- Qualitative Biographical Interviews N= 30 – Interviews followed a semi-structured guide: including employment trajectories and (tele)work arrangements, commuting patterns, housing choices, and familial responsibilities. Information on how individuals navigate and make sense of telework, situating their professional practices within broader residential contexts, partner relationships, and family dynamics.

- Quantitative Survey N= 5’100

WHY QUALITATIVE RESEARCH ON TELEWORK AND MOBILITY?

- **Diversity of Teleworkers**: Highlight the wide range of people engaging in telework, across different demographics and lifestyles.
- **Adoption of Telework Practices**: Explore how individuals integrate telework into their everyday (professional) routines.
- **Linked Lives & Household Dynamics**: Examine how family roles, household contexts, and social relationships shape telework experiences and mobility patterns.
- **Motivations for Telework**: Understand the personal, professional, and practical reasons behind choosing telework.
- **Value of Longitudinal Data**: Reveal how telework practices and impacts evolve over time – for instance, comparing experiences of newcomers to those with years of teleworking. Biographical interviews provided a first glimpse into these changes, however following up with the same individuals in future would offer even deeper insights.

SHORT FOCUS ON THE QUANTITATIVE SURVEY

The survey was conducted in spring 2022, in the post-crisis period

- Across the entire Swiss territory (survey conducted in 3 languages)
- Among a working population representative of Swiss workers
- With a sample of 5,100 Swiss workers
- 55 questions – approximately 15 minutes to complete
- Including a detailed record of the trips made on the most recent teleworking day and on the most recent day spent at the regular workplace

- Weighted and cleaned data: adjustments were made based on respondents' sociodemographic and geographic profiles (data from Swiss Labour Force Survey (SLFS)

RESULTS

"What are the effects of teleworking on everyday and residential mobility?"

TYPES OF TELEWORKERS

The interviews contributed to the development of a typology of teleworkers, structured around daily mobility practices and, consequently, their relationship with space and time. This typology not only illustrates the spatiality of telework in Switzerland but also reflects the diversity of the 30 participants and the ways in which they appropriate teleworking in their everyday lives.

Three main types were identified:

Short commuters (under 30 minutes): For this group, telework is not primarily a strategy to avoid commuting, but rather a matter of personal preference, such as feeling more at ease and comfortable when working from home

Long commuters: Telework is strongly associated with avoiding the burden of extended daily travel. The time saved is often reinvested in other activities, enhancing personal well-being.

Multilocals: This smaller group integrates telework into a more complex spatial arrangement, maintaining a secondary residence or staying temporarily in urban areas during the workweek. Telework allows them to reconcile remote living with the demands of urban employment.

This typology demonstrates the heterogeneity of teleworking practices and highlights how individuals adapt the arrangement to their own spatial and temporal circumstances.

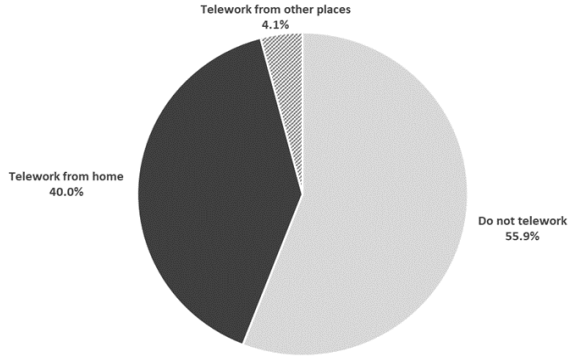
THREE MAIN MOTIVATIONS

- **Freeing up time**: Not having to commute freeing time up for other activities. For example going earlier to work out, having time at home, enables greater distances between workplace and home and also enables the multilocal lifestyle. (Hypermobility)

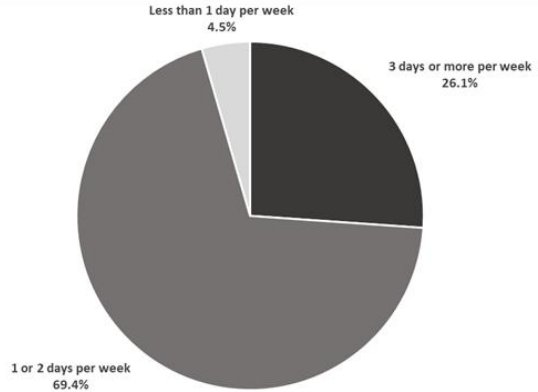
- **Responsibilities besides Work**: Other responsibilities besides work, family life balance – for those who do not have a family domestic tasks

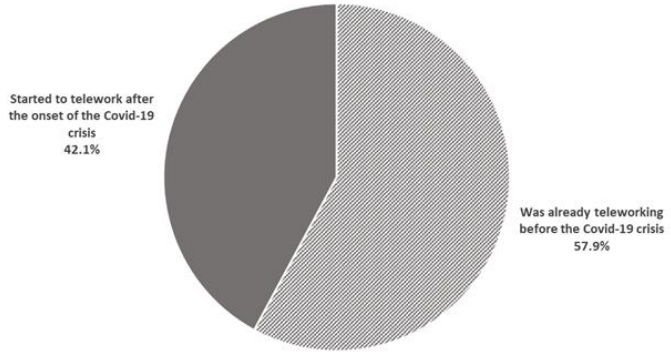
- **Atmosphere at Home**: Not only but mostly for the short commuters not the time they lost by being mobile, but the environment the atmosphere, feeling like themselves at home, not having to be in an open space, not having to wear formal cloths etc. (Hyperlocalisation)

DESCRIPTIVE INFORMATION



- 40% of home-based teleworkers, and 4.1% who telework in other places
- A large majority telework from 1 to 2 days per week
- A major part of the telework population was already teleworking before the Pandemic





WHO ARE THE TELEWORKERS?

		Home-based telework			Recent teleworker			Experienced teleworker		
		B	E.S	Exp(B)	B	E.S	Exp(B)	B	E.S	Exp(B)
Gender	Woman (ref.)									
	Man	0.042		1.043	-0.030	0.070	0.970	0.197	0.080	1.217**
Age class	Less than 35 (ref.)									
	From 36 to 55	0.155		1.167**	-0.410	0.071	0.663***	0.342	0.084	1.408***
	More than 56	-0.050		0.951	-0.802	0.093	0.448***	0.344	0.105	1.410***
Education	Compulsory education (ref.)									
	Secundary education	0.173	0.177	1.189	0.173	0.163	1.189	0.567	0.224	1.764**
	Tertiary education	0.713	0.177	2.041***	0.529	0.164	1.697***	0.935	0.224	2.547***
Household structure	Alone (ref.)									
	Couple without child	0.062	0.101	1.064	-0.015	0.099	0.985	0.076	0.111	1.079
	Couple with child(-ren)	0.009	0.094	1.009	0.017	0.091	1.017	0.223	0.103	1.249**
	Alone with child(-ren)	-0.022	0.148	0.978	0.351	0.139	1.420**	-0.020	0.166	0.980
	Other	0.052	0.136	1.053	0.172	0.131	1.188	-0.252	0.161	0.777
Living region	French-speaking region of Switzerland	-0.225	0.078	0.798***	0.187	0.074	1.206**	-0.379	0.087	0.684***
	German-speaking region (ref.)									
	Italian-speaking region	-0.557	0.195	0.573***	0.238	0.175	1.269	-1.438	0.294	0.237***
Type of residence town	Large and medium-size center (ref.)									
	Small center	-0.612	0.120	0.542***	-0.073	0.113	0.930	-0.403	0.130	0.669***
	Suburban from a metropolitan region	-0.386	0.084	0.680***	-0.001	0.082	0.999	-0.285	0.092	0.752***
	Suburban outside a metropolitan region	-0.468	0.103	0.627***	-0.046	0.099	0.955	-0.289	0.113	0.749***
	Rural town	-0.558	0.109	0.573***	-0.314	0.106	0.730***	-0.321	0.117	0.725***
Occupancy rate	Less than 50%	-0.801	0.155	0.449***	0.023	0.134	1.024	-0.173	0.157	0.841*
	From 50% to 70%	-0.605	0.105	0.546***	0.030	0.096	1.030	-0.190	0.114	0.827**
	From 75% to 95%	-0.188	0.091	0.829***	-0.139	0.089	0.871*	0.158	0.098	1.171
	100% (ref.)									
Constant		-0.530	0.206	0.589***	-0.297	0.193	0.743	-1.885	0.253	0.152***

***p<0.01, **p>0.05, *p<0.1 ; Model1: p<0.01, Khi²=242.269, Nagelkerke R²= 0.073; Model2: p<0.01, Khi²= 158.293, Nagelkerke R²=0.047; Model3: p<0.01, Khi²=165.692, Nagelkerke R²=0.054

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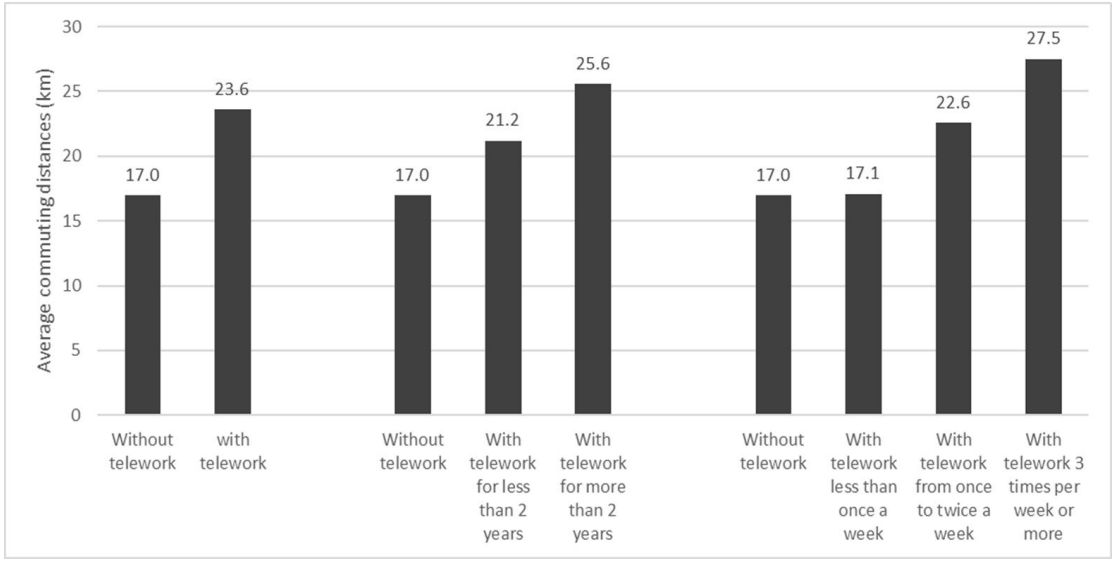
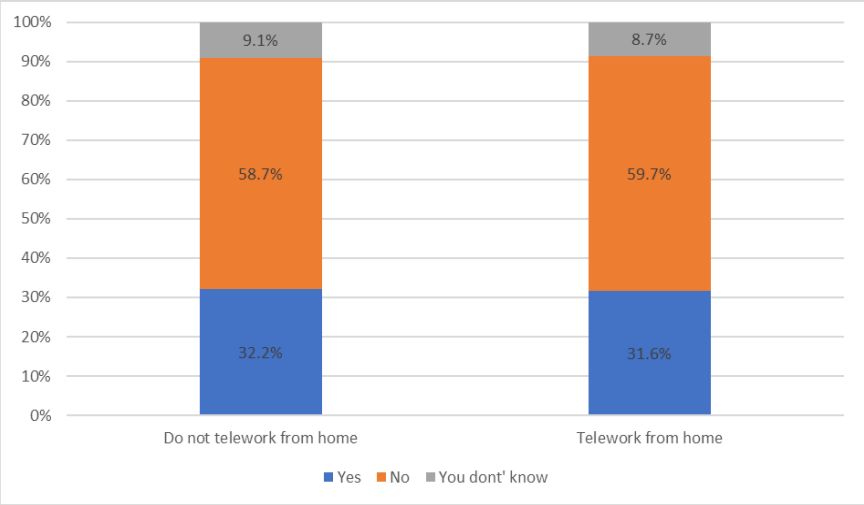
HOME-WORK DISTANCES

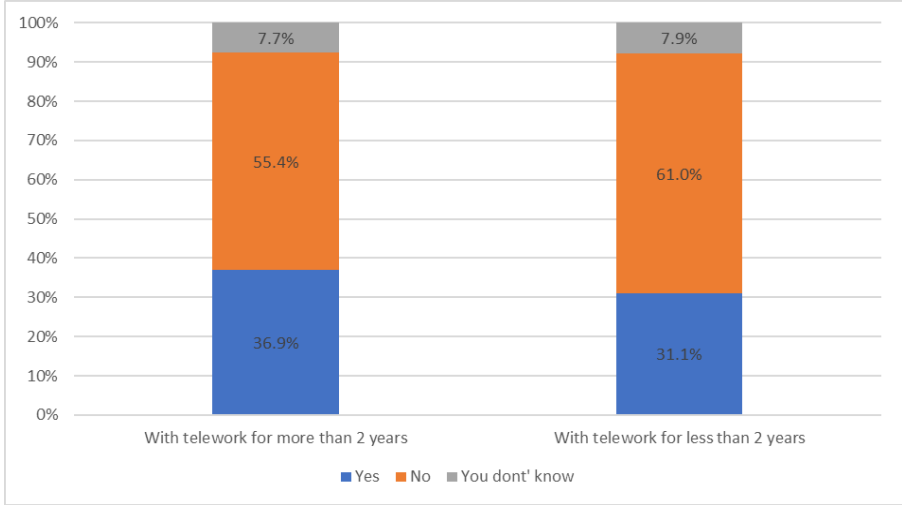


- Teleworkers do have more important mean home-work distances than non-teleworkers
- Experienced teleworkers live further to their work place than recent teleworkers
- Mean home-work distances are positively correlated with telework frenquency

RESIDENTIAL MOBILITY PROJECT

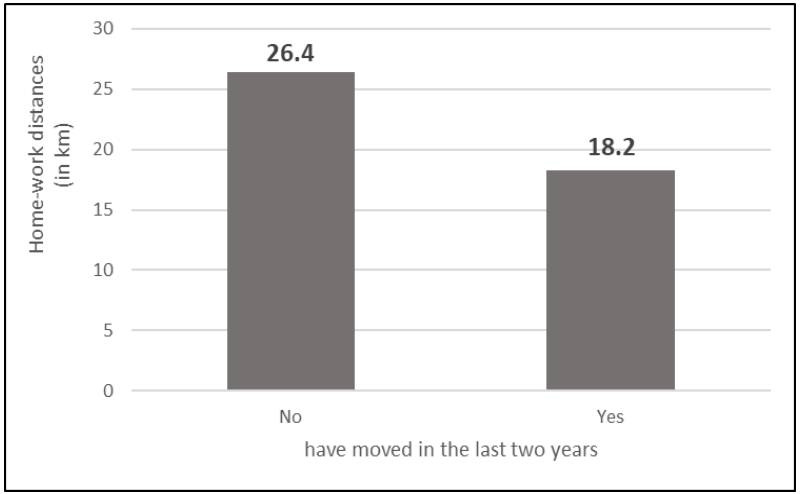
Are you considering to move within the next 3 years?

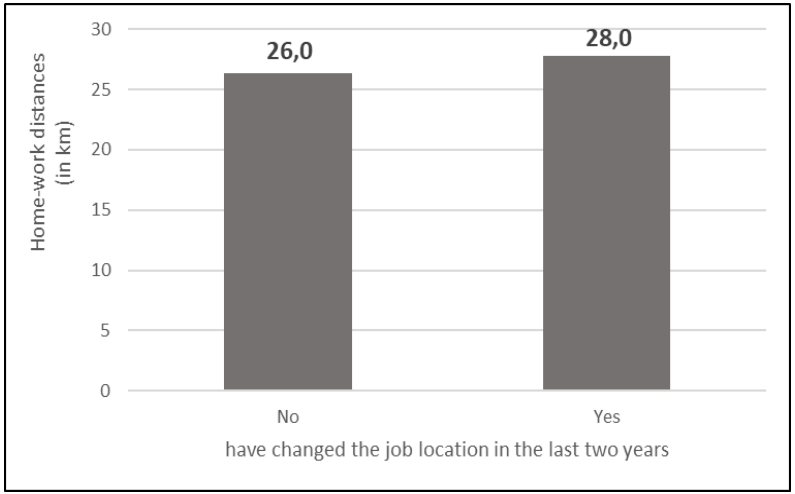




- No specific residential plans for teleworkers compared to non-teleworkers
- Recent teleworkers are more likely to have relocation plans (36.9% vs 31.1%)

WHY SUCH HOME-WORK DISTANCES ?





- Those who telework and who recently moved do not live further from their workplace
- Those who telework and who recently change their job places have longer mean home-work distances (but difference is low)
- The role of both variable is not confirmed in models, which signifies there is not obvious rebound effect of telework on distant residential relocation or distant job changes

dependant variable: home-work distance		B	S.E.	t	Pr>|t|	
Linguistic Region	French-Speaking Region	-1.288	1.614	-0.798	0.425	
	German-Speaking Region (ref)					
	Italian-Speaking Region	-7.236	3.504	-2.065	0.039	**
Work Rate	Work Rate]0%-50%]	1.356	2.758	0.492	0.623	
	Work Rate]50%-70%]	-4.002	2.152	-1.860	0.063	*
	Work Rate]70%-90%]	-0.892	2.127	-0.420	0.675	
	Work Rate]90%-100%] (excl.)					
Area Type (Residence)	Large or Medium Urban Center (excl.)					
	Small Urban Center	4.561	2.803	1.627	0.104	
	Metropolitan Suburb	3.472	1.832	1.895	0.058	*
	Peri-Urban Suburb	11.330	2.283	4.963	0.000	***
	Rural	13.734	2.667	5.150	0.000	***
Area Type (Workplace)	Large or Medium Urban Center (excl.)					
	Small Urban Center	-6.280	2.739	-2.293	0.022	**
	Metropolitan Suburb	-0.905	1.666	-0.543	0.587	
	Peri-Urban Suburb	3.267	3.119	1.048	0.295	
	Rural	-3.743	3.223	-1.161	0.246	
Age	Less than 35 (excl.)					
	35-54	-3.506	2.368	-1.480	0.139	
	55 and more	-5.310	2.547	-2.084	0.037	**
Household structure	Single (excl.)					
	Childless couple	0.248	2.174	0.114	0.909	
	Couple with a child or children	-1.605	2.002	-0.802	0.423	
	Alone with a child or children	-0.997	3.286	-0.303	0.762	
	Other	-2.657	3.335	-0.797	0.426	
Education degree	Compulsory education (excl.)					
	Secundary education	-0.097	3.685	-0.026	0.979	
	Tertiary education	4.050	3.754	1.079	0.281	
Employment type	Self-employed	-4.862	3.610	-1.347	0.178	
	Senior manager	10.636	3.585	2.967	0.003	***
	Junior manager	-1.066	3.508	-0.304	0.761	
	Employee	-1.842	3.500	-0.526	0.599	
	Apprentice or internship (excl.)					
Gender	Man	6.214	1.620	3.836	0.000	***
	Woman (excl.)					
Telework situation	**Teleworker**	**3.679**	**1.532**	**2.402**	**0.016**	**
	Non-teleworker (excl.)					
Constant		9.291	6.452	1.440	0.150	

Model caracteristics: R=0.306; R2=0.093; adj. R2=0.077; Var. F=5.840; Sig <0.001

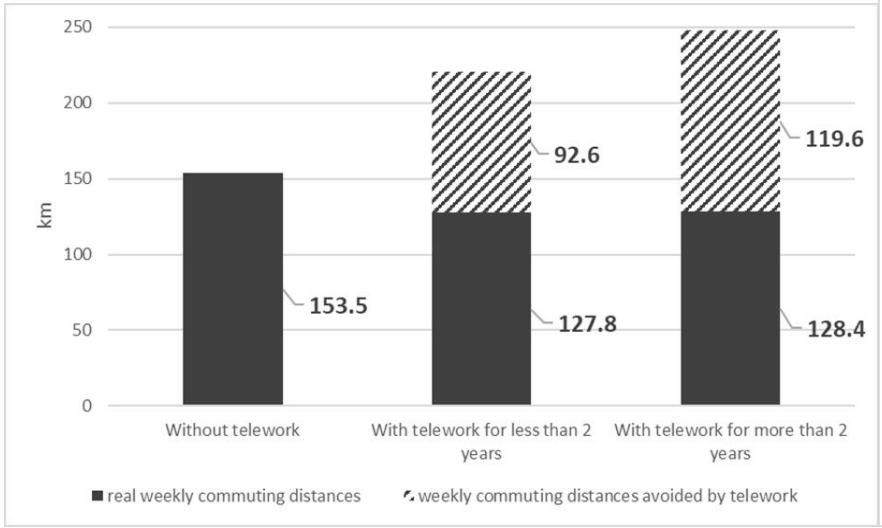
*** p<0.01; ** p<0.05; * p>0.1

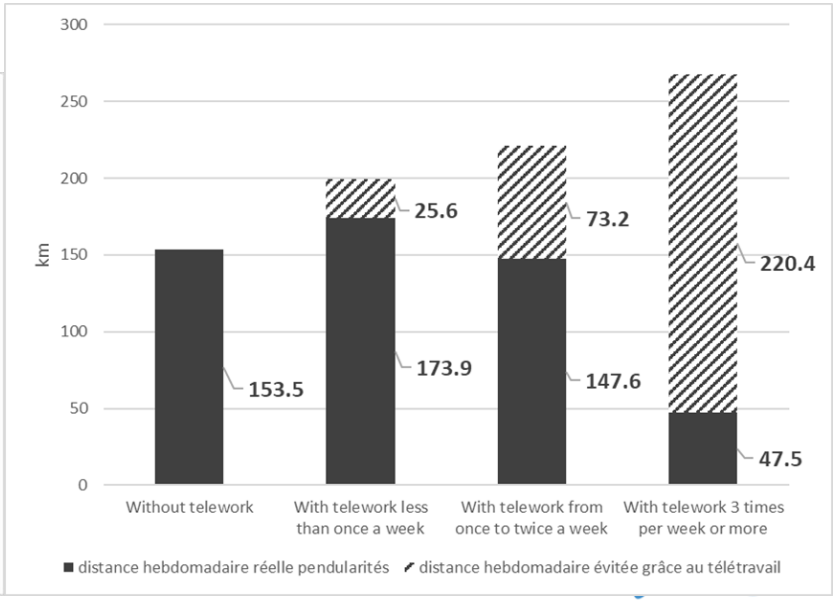
TELEWORK ATTRACTIVENESS

- Teleworkers tend to have longer home-to-work distances than those who do not, **even when considering only those who have not moved or changed their workplace in recent years (see the table on the left)**
- Teleworking appears to be more attractive to those who already live far from their place of work.

AVOIDED COMMUTING TRIPS

- At the weekly scale, based on mean home-work distances and telework frequency, we can measure effective commuting distances travelled and avoided commuting distances.
- Experienced teleworkers avoid more important distances than recent ones





NON-WORK TRIPS

	Time budgets (minutes)	Non-teleworkers	Home-based teleworkers	Home-based teleworkers	
				Recent teleworker	Experienced teleworker
Workday at home	Escorting (children, etc.)		3.2	3.4	2.9
	Shopping		7.9	8.5	6.9
	Meals		1.9	2.1	1.6
	Leisure		11.5	13.3	8.9
	Other		4.7	6.0	2.9
Workday at the workplace	Escorting (children, etc.)	2.9	3.9	5.4	1.4
	Shopping	6.7	5.6	5.7	5.1
	Meals	2.9	4.2	3.6	5.2
	Leisure	12.5	10.1	11.8	7.5
	Other	2.6	2.3	2.5	2.0

- Non-work trips have to be studied on workdays at home, but also on workday at the workplace, to make it possible to get a more complete view
- More that a rebound effect observed on the workday at home, it appears that some activities are organised on a specific way by teleworkers (more often done when they telework AND less often done when they go to the workplace)

CO2 EMISSIONS

		Co2 Total Emissions	
		Teleworking day	Non-teleworking day
Without telework			2030.2996
With telework	All teleworkers	502.0850	2425.4848
With telework	For less than 2 years	649.8266	3038.5529
	For more than 2 years	493.2287	2118.1741
With telework	3 days or more per week	474.2170	2584.9932
	From 1 to 2 days per week	503.1163	2492.8190
	Less than 1 day per week	647.1010	465.5387

- Distances, frequencies and transport mode used for commuting trips and non-work trips allow to calculate CO2 emissions
- Mobitool emission data are used
- On a general point of view, there is a need for 3 telework days to compensate for the greater distances travelled on non-telework days
- Recent teleworkers emit more Co2 than experienced ones, because of their greater use of car and because of their non-work trips

OUTLOOKS

- High level of appropriation: Motivations include work-life balance, family responsibilities, and lifestyle preferences. Teleworking frees up time for personal life, hobbies, and emotional comfort.
- Spatial reorganization of work
- Telework supports both hyper-mobility and residential fixity. ("Hyper-mobility" vs "Hyper-localisation")
- No real effects on residential or job mobilities since the crisis
- Telework is particularly appealing to individuals who already reside far from their workplace
- Gained time is reinvested in non-work activities (in and outside the house), with some impacts of teleworking on non-work activities both on work days in the workplace and telework days
- Positive sustainability effects are not guaranteed. It depends on the seniority and frequency of such practices, on how gained time and space are used and on the means of transportation used
- Possible long term effects (longitudinal studies)

OUTLOOKS

Future challenges/ Recommendations

- Longitudinal research on residential patterns of teleworkers
- Encourage research on coworking spaces in periurban and rural areas (to reduce the need for commute), but also in urban areas (where the living spaces are in tendency smaller)
- Encourage research/studies on mobility plans and telework conventions to asses the way telework is organized by employers/employees and could be regulated by public authorities
- Public transport offer that adapts to flexible working (this could be flexible season tickets).

FROM THIS SNSF RESEARCH TO A SVI PROJECT

In parallel to this research, a SVI project was realised with Transitec, BMH and Unil

on remote work and transport demand: new trends and impacts

with an individual analysis through diverse databases

and through an analysis on PT and car demand evolution from 2019 to 2023

a model was built to assess the impact of telework on travel demand

→ The report is to be published at the end of this year.

FOR FURTHER INFORMATION

- Literature review and research agenda – *Geography Compass* (published)
  Hostettler Macias, L., Ravalet, E., & Rérat, P. (2022). **Potential rebound effects of teleworking on residential and daily mobility**. *Geography Compass*, *16*(9), e12657.

- New Geography of telework – *Applied Geography* (published)
  Hostettler Macias, L.., Ravalet, E., & Rérat, P. (2025). **How does telework impact daily and residential mobilities: New geographies of working and living in Switzerland.** *Applied Geography*, *178*, 103591.

- Life course perspective – *Mobilities Journal* (to be submitted)
  Hostettler Macias, L. (to be submitted) . ***Live here, work (t)here: telework a strategy for families? An exploration of Family (im)mobility.***

- Lifestyle perspective – *Urban Geography* (in writing)
  Hostettler Macias, L. (in writing). **Teleworkers and Their Mobility: The appropriation of Telework – a lifestyle perspective**

- *Explanation of higher home-work distances for teleworkers – Transportation (*under review)
  Ravalet, E., Motte-Baumvol, B. & Rérat, P. (submitted). **Why do teleworkers live further from their workplace than non-teleworkers? Residential mobilities and work relocations dynamics in Switzerland**

- CO_2 Article – Transportation research part D (to be submitted)
  Ravalet E., Rérat P. (to be submitted) **Teleworking and Daily Mobility in Switzerland: Substitutions, Compensations, and Accumulations**

- Report SVI – with BMH and Transitec – founding Federal Roads Office FEDRO (Publication in 2026)
  Nouvelles formes de travail et effets sur la demande de transport