

MOBIS-COVID19/01: Results as of 06/04/2020

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Abstract

This series of working papers presents the ongoing analysis of the mobility behaviour in Switzerland during the period of special measures to combat the Corona virus. A sample of over 1200 participants was recruited from a previous GPS-based mobility study, MOBIS. A 4 week baseline period is therefore available for each participant from the second half of 2019, as well as socio-economic variables. Mobility indicators considered include modal splits, hourly counts, average daily distances, activity spaces and daily-radius. First results indicate drastic changes in mobility behaviour, with identifiable differences between socio-economic groups. The analysis continues to be updated as the situation progresses



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Abstract

To slow down the spread of the Coronavirus, the population has been instructed to stay at home if possible. This measure consequently has a major impact on our daily mobility behaviour. But who is being affected, and how? The MOBIS-COVID-19 research project, an initiative of ETH Zurich and the University of Basel, is a continuation of the original MOBIS study. The aim of the project is to get a picture of how the crisis is affecting mobility and everyday life in Switzerland.

Keywords

GPS logger; Travel diary app; COVID-19; Corona virus; MOBIS; Mobility behaviour; Switzerland

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Zusammenfassung

Um die Ausbreitung des Coronavirus zu verlangsamen ist die Bevölkerung angewiesen worden, wenn möglich zu Hause zu bleiben. Diese Massnahme hat daher einen grossen Einfluss auf unser tägliches Mobilitätsverhalten. Doch wer ist davon betroffen und wie? Das Forschungsprojekt MOBIS-COVID-19, eine Initiative der ETH Zürich und der Universität Basel, ist eine Weiterführung der originalen MOBIS-Studie. Ziel des Projekts ist es, ein Bild zu erhalten, wie sich die Krise auf die Mobilität und das Alltagsleben in der Schweiz auswirkt.

Schlagworte

GPS logger; Travel diary app; COVID-19; Corona virus; MOBIS; Mobility behaviour; Switzerland

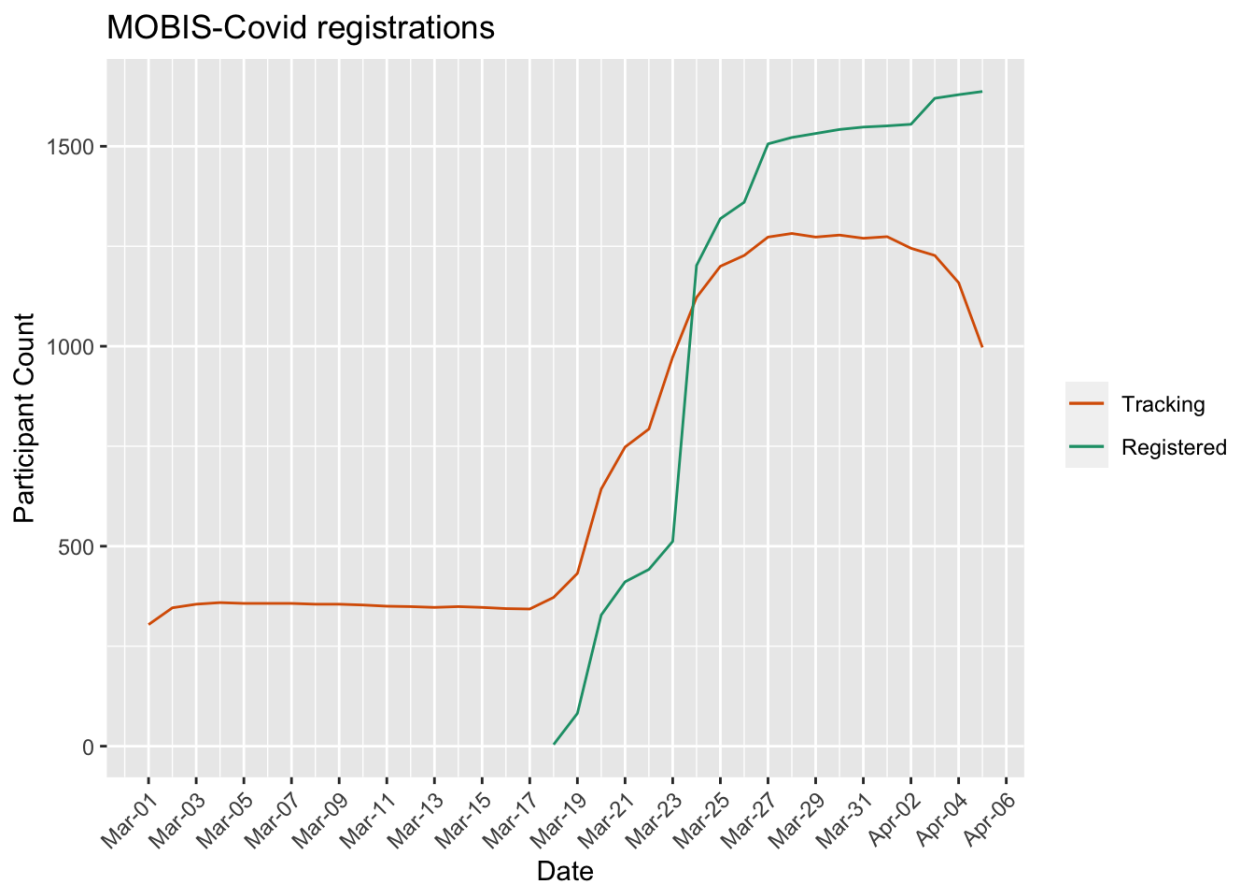
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MOBIS-Covid registrations

On March 16, 2020, 3700 participants who completed the MOBIS study between September 2019 and January 2020 were invited to reinstall the GPS Logger and Travel Diary App ‘Catch-my-Day’ to record their mobility behaviour during the period of special measures implemented to control the spread of the Corona Virus. The first 4 weeks of mobility data from the original MOBIS Study is taken for each participant as a baseline against which to compare current mobility patterns. These 4 weeks start place anywhere between 1st September and 15th November, depending on the participant. Only trips in Switzerland are currently considered, although data on cross border travel is available.

The following figure shows the number of registered and tracking participants per day. A running panel of around 250 participants were already tracking before the sample was reinvited. This allows results for the weeks before the MOBIS-Covid study was officially started, although the sample size is a lot smaller, and hence the results.



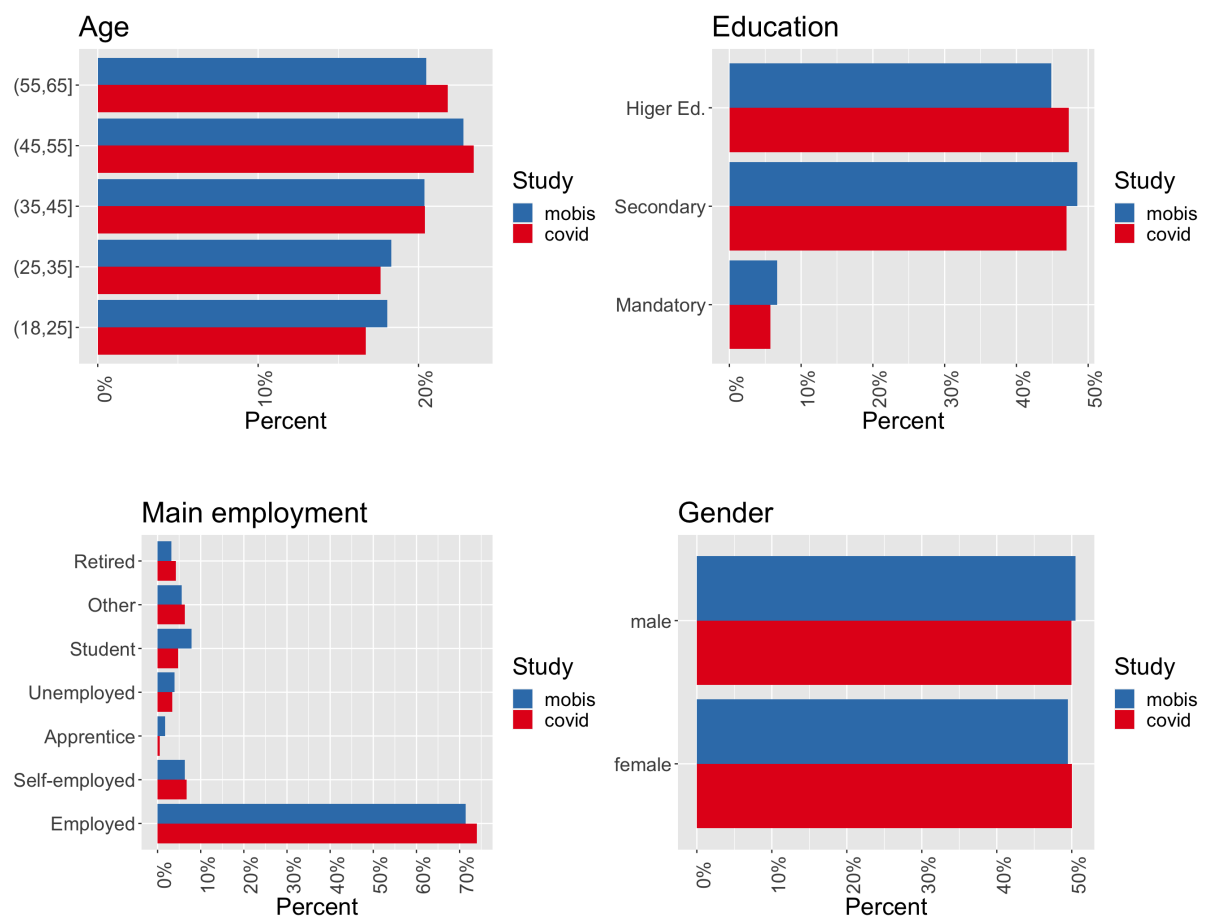
The daily values are normalized where necessary by the number of tracking participants per day. The analysis will be extended in the coming weeks to accommodate participants

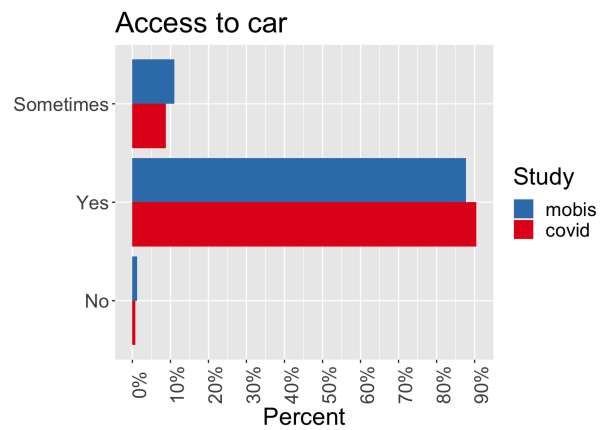
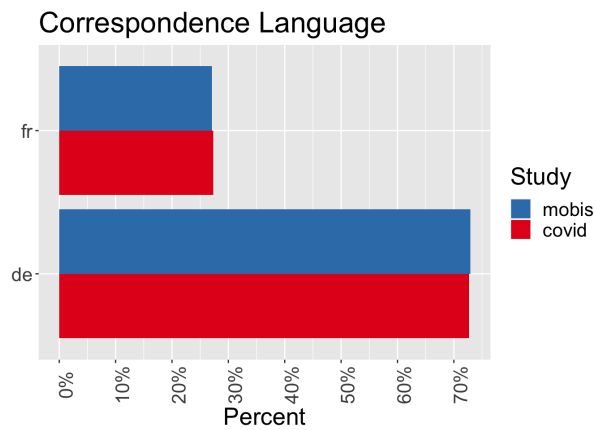
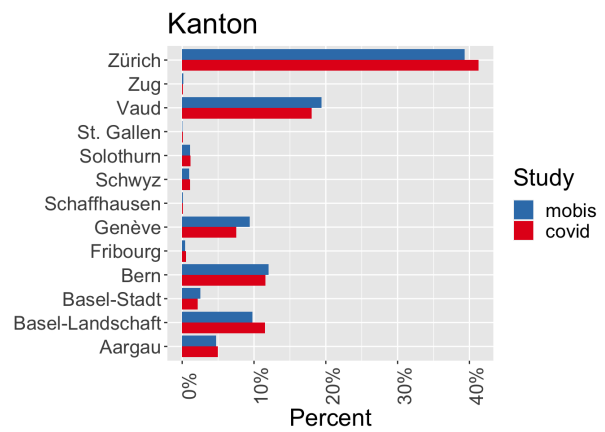
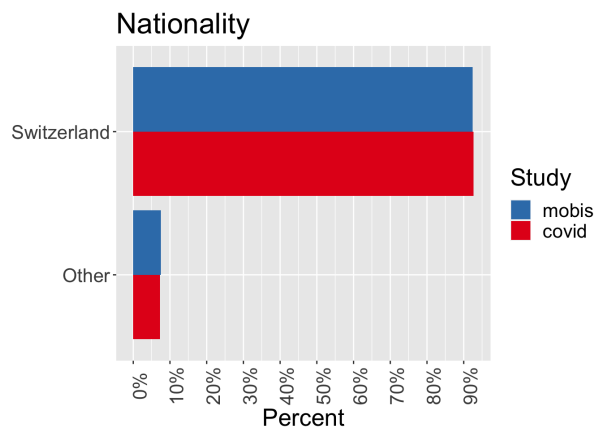
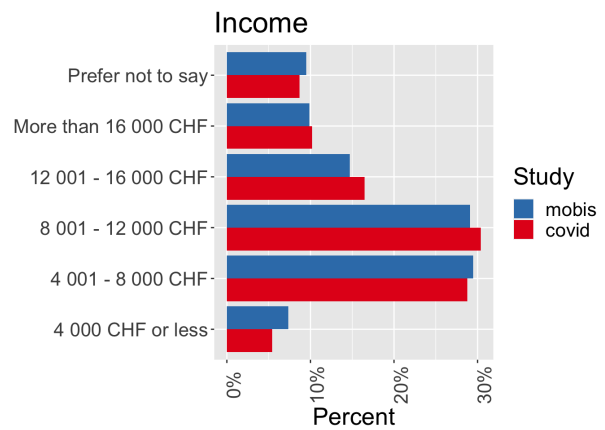
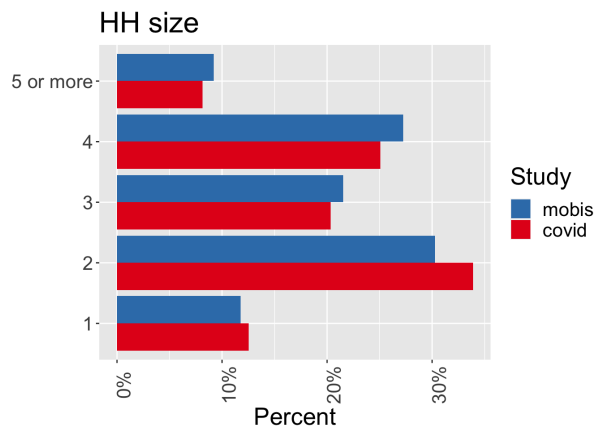
who record no GPS activity but are participating in the study - This will be necessary if a total lockdown is implemented.

The GPS Travel diary used, Catch-my-Day (for iOS and Android) can have a 2-3 day delay before the tracks are available for analysis. The scaling by active participants accommodates for this, but the results of previous reports may change when the report is updated.

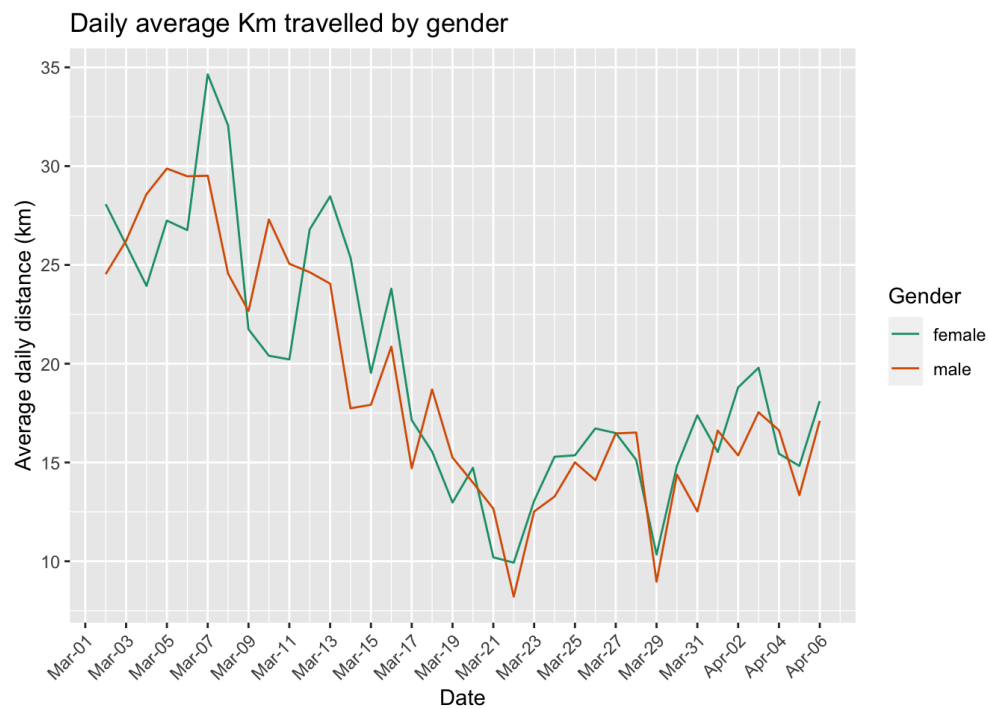
Differences in the distributions

The following charts show the characteristics of the MOBIS-Covid sample compared to the original MOBIS Sample. There are some small differences, but generally the samples are consistent. This chart will be extended to compare to the relevant census data.

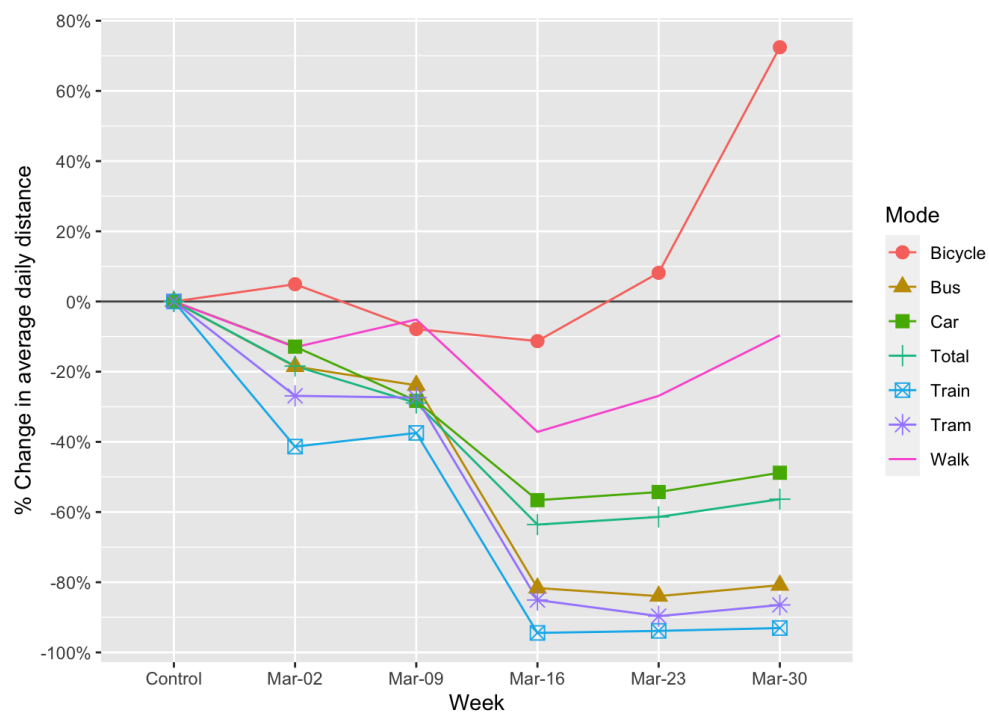




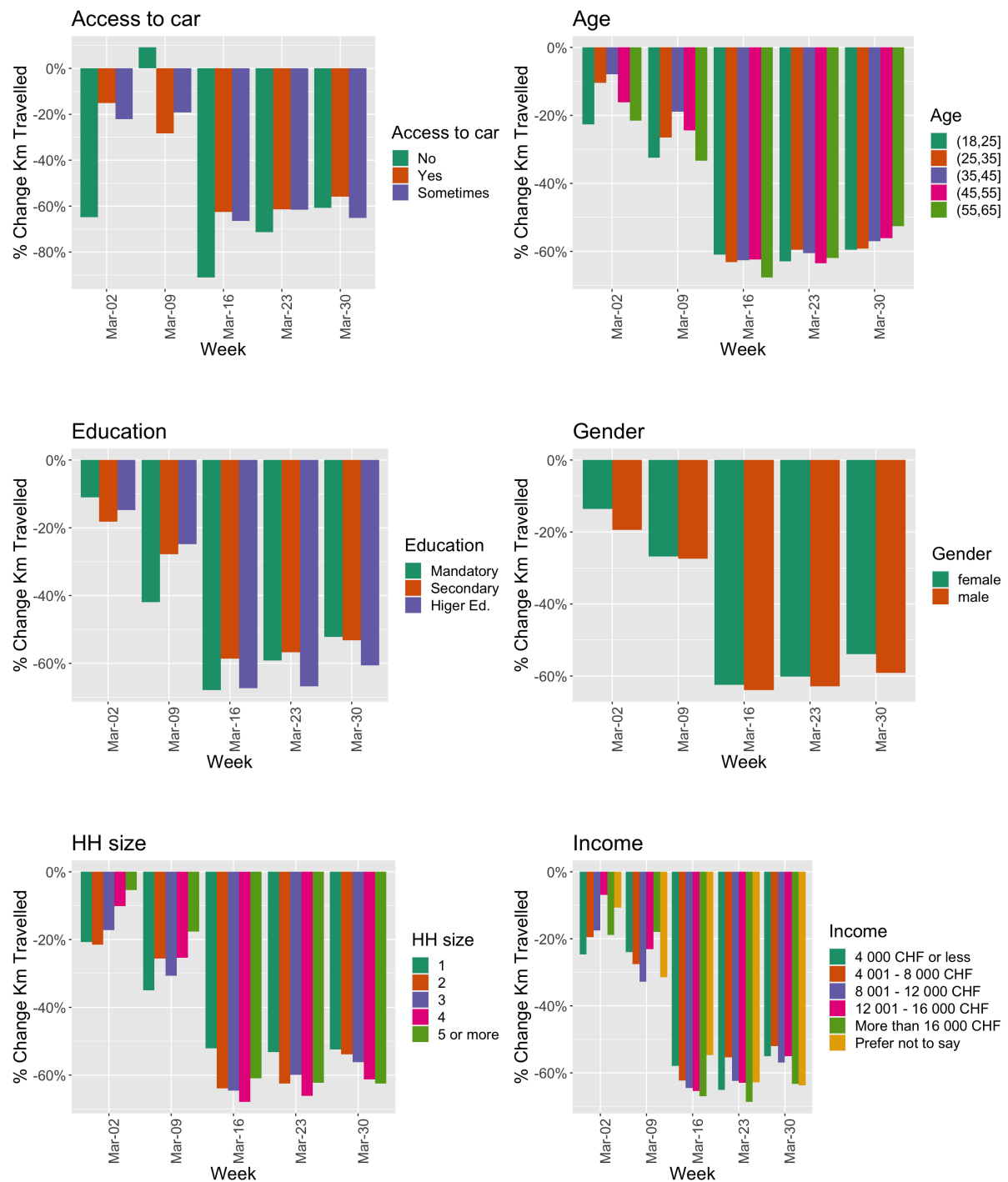
Average daily distance

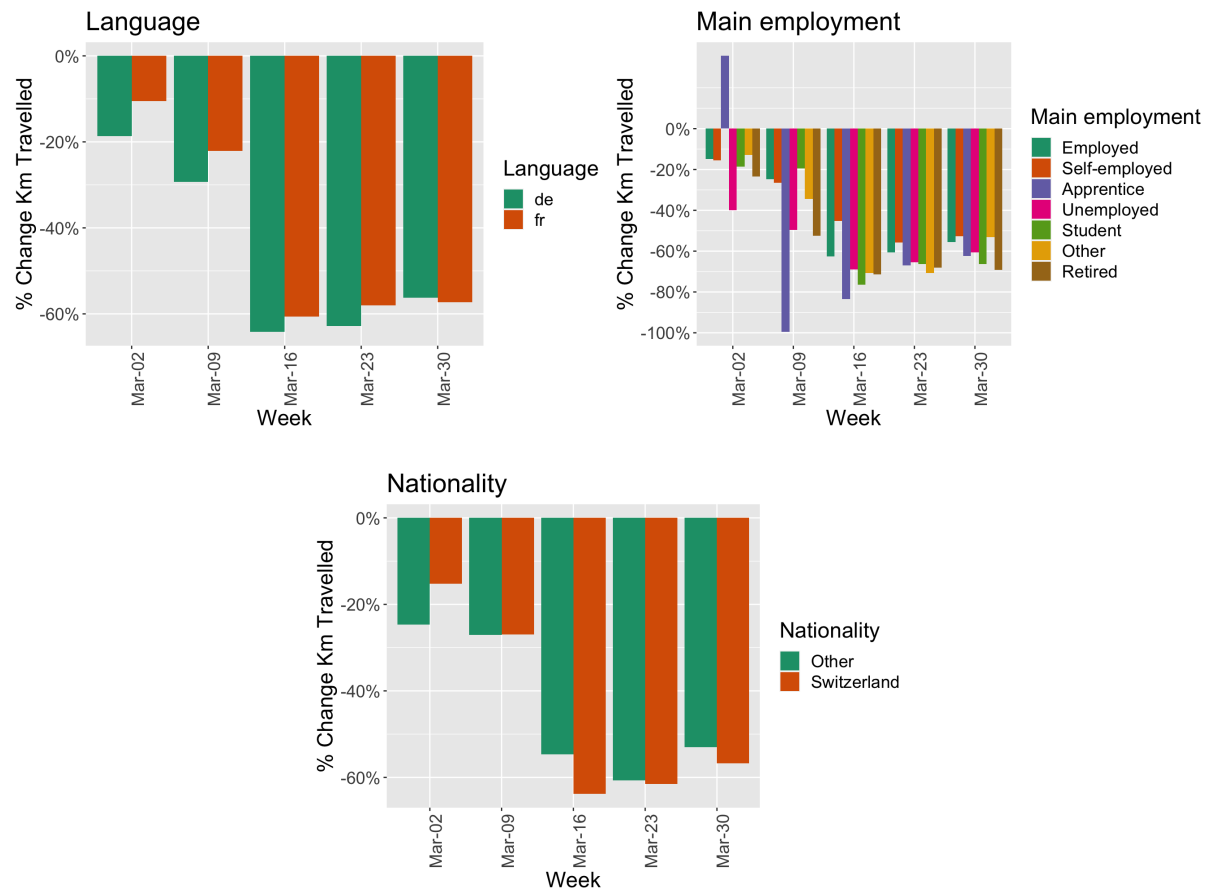


Overall change in kilometers travelled by transport mode



Normalized against the baseline period





Reduction in kilometers travelled by Canton

Table 1: Change in kilometers travelled by home canton (%)

Canton	N	Mar-02	Mar-09	Mar-16	Mar-23	Mar-30
Aargau	68	-25	-41	-71	-58	-51
Basel-Landschaft	159	-13	-8	-60	-60	-58
Basel-Stadt	30	-14	-36	-71	-74	-66
Bern	163	-30	-33	-66	-59	-56
Fribourg	7	-61	-23	-63	-56	-60
Geneva	105	7	-45	-69	-60	-56
Schwyz	15	-6	12	-42	-67	-45
Solothurn	16	-13	-41	-62	-65	-53
Vaud	247	-7	-22	-64	-70	-67
Zurich	583	-16	-25	-60	-58	-56

Activity space and daily travel radius

A commonly used simple definition of the activity space is the 95% confidence ellipse of the activity locations, in this case weighted by duration. In the following analysis, the

activities at the home location are included, for those that had the app activated on that day. This is an important metric which gives an idea of the area in which travel is being performed. The daily travel radius is also presented.

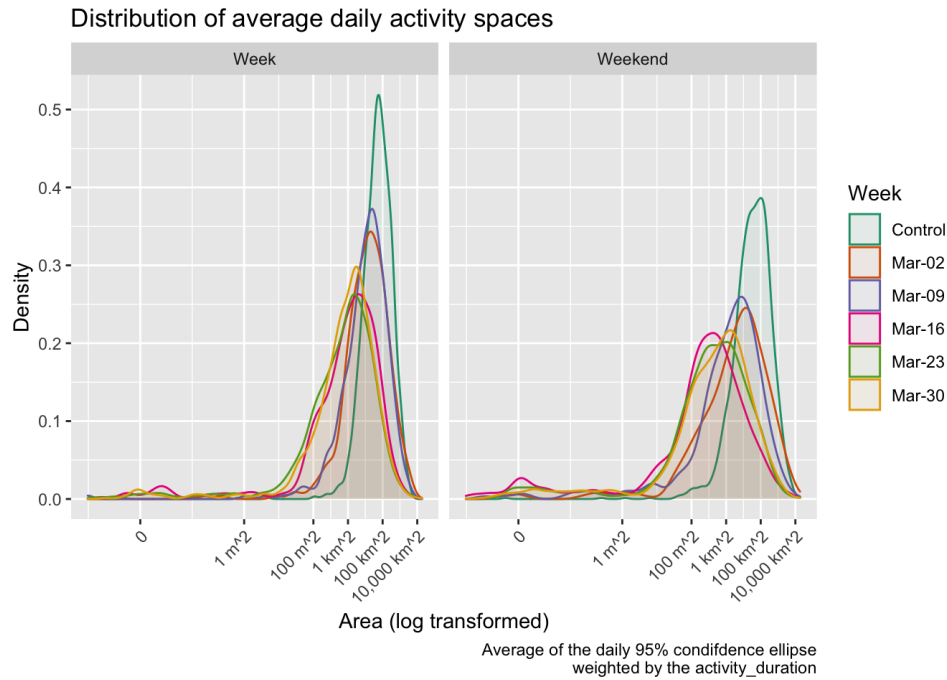
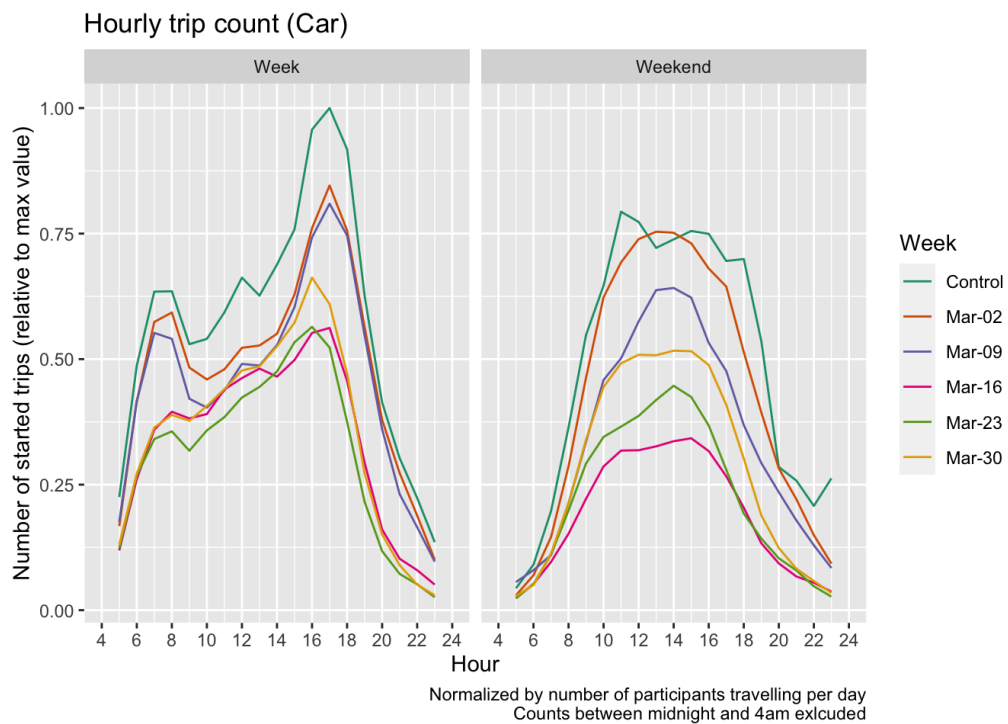
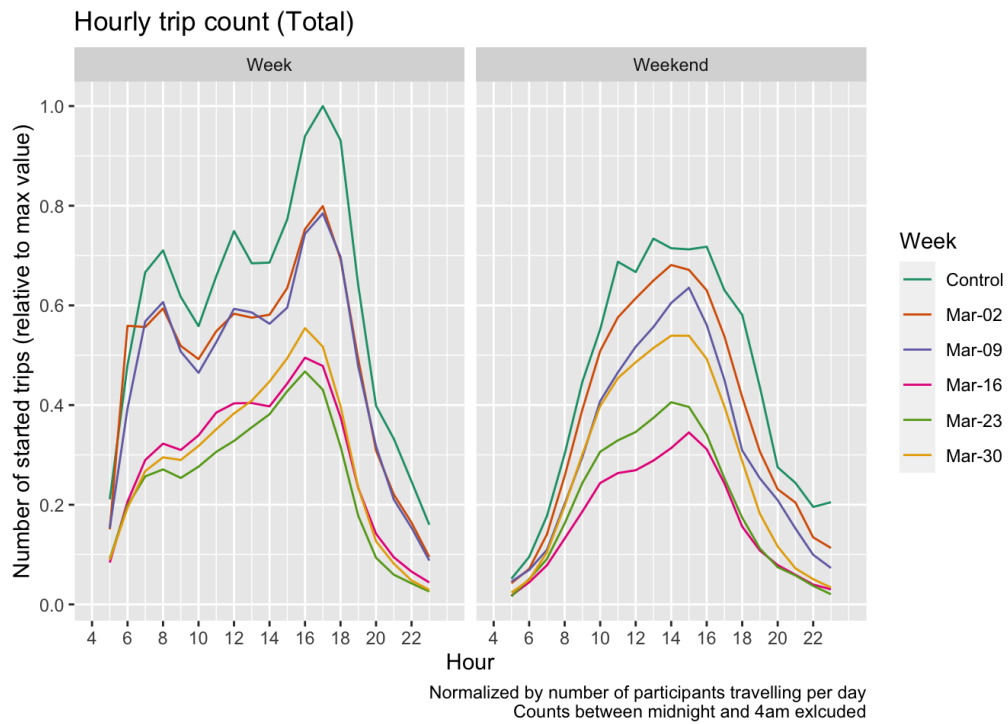


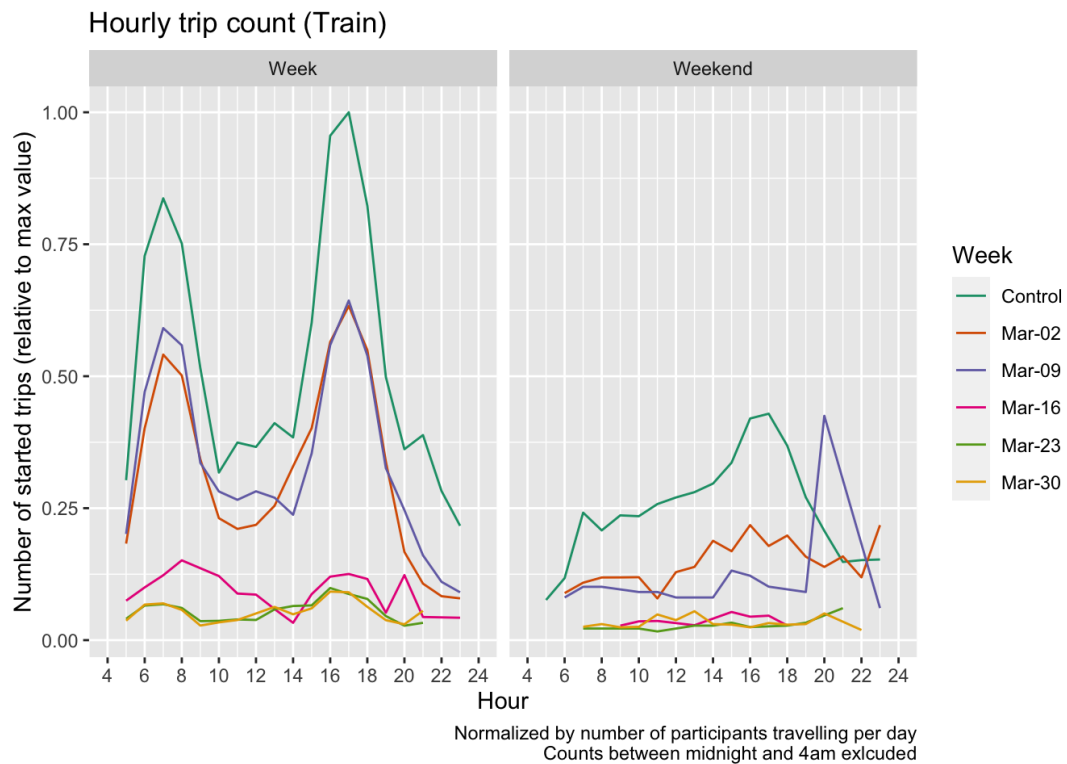
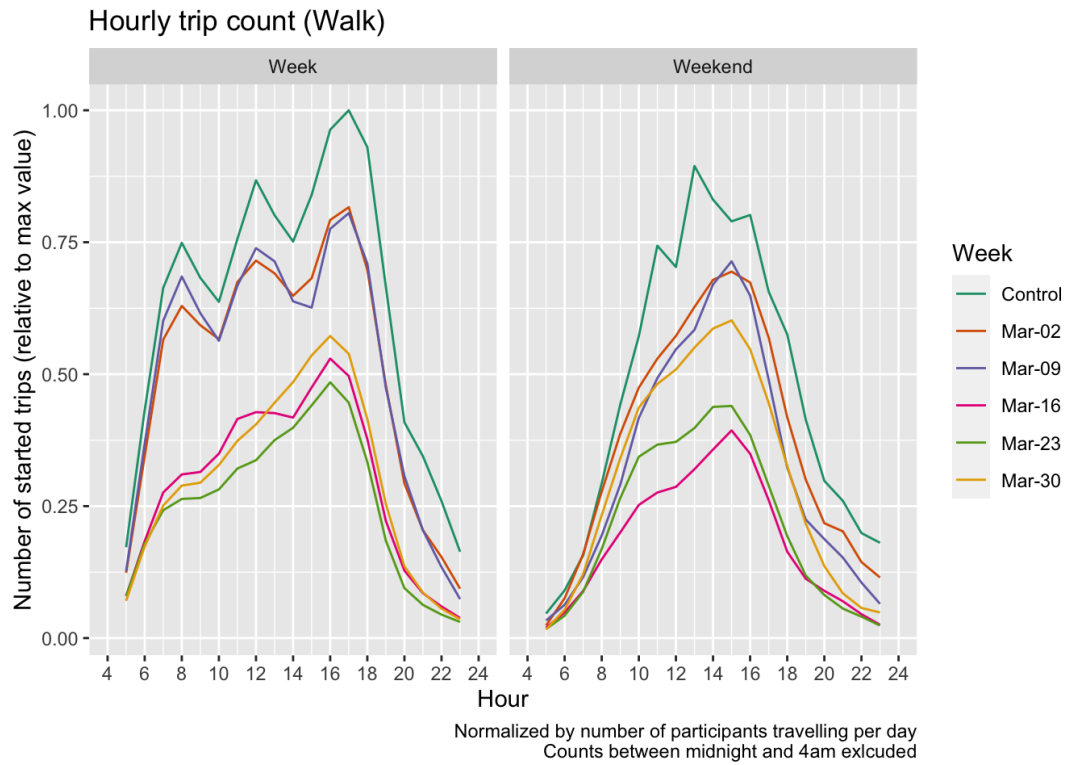
Table 2: Change in activity space area (%)

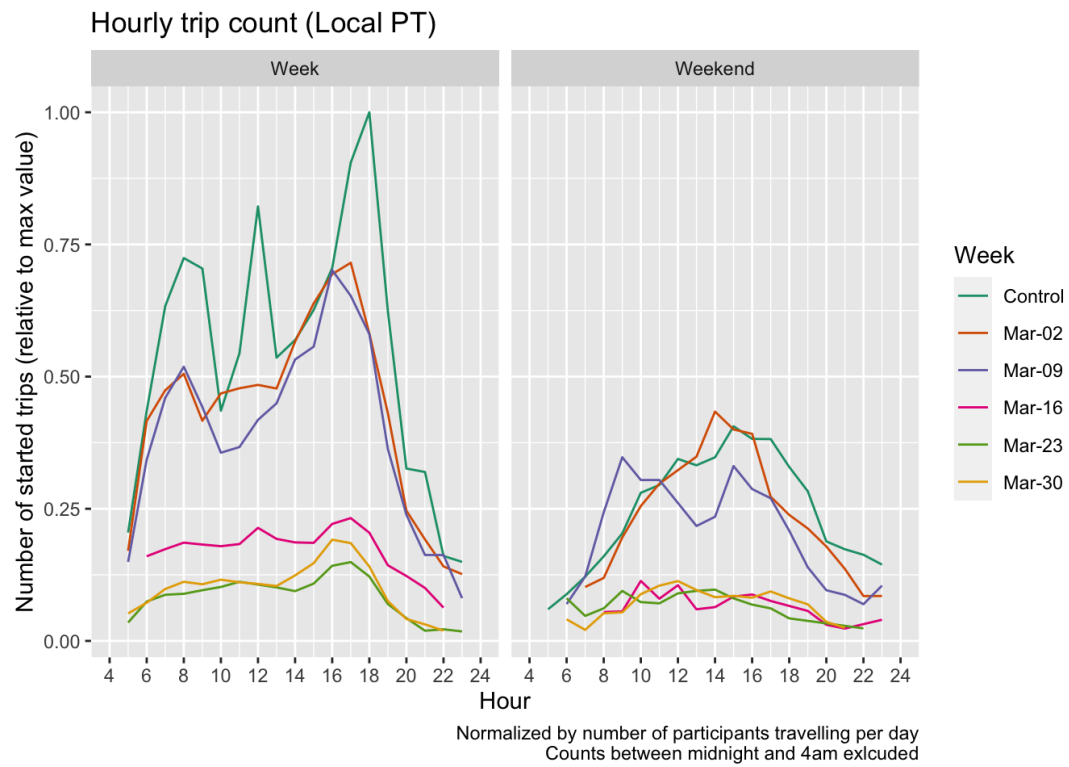
Week	Weekday	# Activities/day	Change	Area (km ²)	Change	Daily Radius (km)	Change
Control	week	7.00	-	193.44	0%	12.76	-
	weekend	6.19	-	261.21	0%	13.82	-
Mar-02	week	6.12	-13%	172.58	-11%	10.92	-14%
	weekend	5.65	-9%	181.15	-31%	11.25	-19%
Mar-09	week	6.39	-9%	120.36	-38%	10.27	-20%
	weekend	5.47	-12%	91.58	-65%	8.80	-36%
Mar-16	week	4.82	-31%	35.96	-81%	5.71	-55%
	weekend	3.56	-42%	27.82	-89%	3.71	-73%
Mar-23	week	4.39	-37%	37.84	-80%	4.92	-61%
	weekend	3.95	-36%	57.94	-78%	4.96	-64%
Mar-30	week	4.76	-32%	47.79	-75%	5.35	-58%
	weekend	4.25	-31%	37.31	-86%	5.16	-63%

Hourly counts

The number of trips started per hour, smoothed with a rolling average over 3 hours. The y axis is normalized by the maximum hourly value in the graph.







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