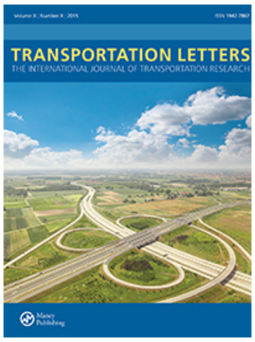

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Does undirected travel compensate for reduced directed travel during lockdown?

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ABSTRACT
The COVID-19 pandemic lockdown undeniably impacted travel behavior. It is assumed that directed (commute and non-work) trips reduced following reduced out-of-home activities. This study analyzing 764 respondents in Flanders, Belgium, explores whether undirected trips, or travel for the purpose of travel itself, increase as compensation or to 'get out and about'. Additionally, change in commute and non-work trip mode and frequency is analyzed to assess whether a shift from public to private transport modes and from motorized to active modes occurred. The effect of urbanization on travel behavior change was also evaluated. Results did not indicate a shift from public to private transport modes, suggesting a general decrease in directed trips, but indicated compensation for decreased car use with both undirected and active trips. The built environment was not significantly related to changes in travel behavior, suggesting that respondents participated in compensatory behavior during the lockdown regardless of residential urbanization.

KEYWORDS
Travel behavior; built environment; lockdown; travel pattern; travel compensation; undirected travel

Introduction

The COVID-19 pandemic and subsequent near-worldwide lockdown disrupted many individuals' daily travel in terms of trip purpose and mode choice. Commuting changed drastically as workplaces shut or moved online, non-work travel subsided as shops were closed and opportunities for amusement and socialization were forbidden, and some turned to Undirected Travel (UT) trips (e.g., recreational walking, jogging, or cycling) just to break the monotony. UT is defined as travel without a destination wherein the trip itself is the purpose of the travel (Mokhtarian and Salomon 2001). This further affected modal choice with public transport (PT) avoided as it was a breeding ground for the virus, cars sitting unused in garages, and bicycles and walking shoes pulled out of storage. Though numerous surveys explore travel behavior change during the lockdown, this research is unique in its exploration of whether a decrease in destination-specific travel (directed travel, e.g. commute or non-work trips) motivates an increase in travel for the purpose of travel itself (UT) during a period when directed travel substantially decreased due to a reduction in out-of-home activities. Investigation of the occurrence of this type of compensatory behavior can contribute to the travel behavior field by suggesting a need for travel itself contrary to the idea that travel is only ancillary to destinations. Additionally, whether lockdown stimulates a shift from motorized to active modes will be investigated and this can be important to those interested in promoting active travel, such as public health or sustainability policy makers. Finally, whether there is a shift from public to private modes during lockdown is evaluated and this could be important information for urban planners anticipating similar future crises. It is expected that these differences will depend on residential level of urbanization, which could be of further importance to urban planners and policy makers when making decisions about where to build travel infrastructure.

Though some activities were restricted prior and some regulations are still in place at the time of writing, the strictest measures of the Belgian lockdown period were in place from 18 March – 4 May 2020. Due to the high documented death rate and dense population in Belgium, these measures were firmer than in many other European countries. All gatherings and meetings were prohibited and non-essential stores, schools, and universities were closed. The allowed movements included emergency situations as well as food store, supermarket, pharmacy, doctor, newsagent, and bank visits. Access to these establishments was limited to a duration of 30 minutes and a capacity of one person per 10 square meters. Teleworking became the norm, though in situations where this was not possible travel to work was permitted. Sitting in parks was forbidden. Outdoor sports activities with a maximum of two people (i.e. walking, jogging, cycling) were permitted, but the accompanying person was required to live under the same roof. Any movement required maintaining a 1.5 meter distance from other people. PT continued to operate with guaranteed social distancing, though citizens were expected to reserve use for those who have no other travel option (i.e. physically unable to walk/cycle). Nonadherence to the lockdown rules resulted in a minimum €250 fine for individuals and minimum €750 fine for commercial establishments, with the possibility of forced closure for repeat offenses (Brzozowski 2020; Chini 2020; Hirsch 2020; Pornschlegel 2020).

This research investigates if and how travelers changed their travel patterns in terms of mode (walk, cycle, car, PT) and trip purpose (commute, non-work, UT) during the lockdown in Flanders, Belgium. UT trips are specifically further explored to evaluate whether a lockdown stimulates this type of travel and whether people with forced reduced travel compensate with UT trips. The concept of UT is vastly under-researched, though notable exceptions exist (Cao, Mokhtarian, and Handy 2009; Mokhtarian and Salomon 2001), and the lockdown situation was a unique

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scenario to discover how (and if) people travel when they have nowhere to go. Understanding UT is important to understanding destination-oriented travel, and vice versa, as well as the positive utility of travel (Mokhtarian and Salomon 2001) as compensatory behavior might exist.

The link between travel and the built environment must be considered because different residential densities, access to destinations, land use mix, or walkability can affect access to travel modes, distance, time, or traffic congestion (Cervero and Kockelman 1997; Ewing and Cervero 2010; Frank and Pivo 1994; Gordon, Kumar, and Richardson 1989; Yin, Shao, and Wang 2019). Specifically, residential characteristics of proximity to business, living outside of a cul-de-sac, and the esthetics of the neighborhood stimulate UT (Cao, Mokhtarian, and Handy 2009). Therefore, the experience of lockdown UT is expected to vary among individuals in high- and low-density areas.

Recent research is being published about the effect of the lockdown on travel behavior. De Vos (2020) suggests that UT will be important to maintaining both physical and mental well-being during the lockdown, and that the reduction in out-of-home activities will cause a decrease in travel demand. However, he also suggests that where travel demand remains there may be a shift away from public to private or active transport modes. De Haas, Faber, and Hamersma (2020) found that, during the lockdown in the Netherlands, the amount of trips dropped 55%, distance of trips dropped 68%, and walking and cycling UT (termed 'roundtrips') gained in popularity with 20% of people expecting to continue these trips in the future. Ding et al. (2020), using Google search data before and during the COVID-19 outbreak in Australia, the UK, and the USA, found population-level increases and engagement with physical activity, suggesting that outside UT trips were encouraged because gyms were closed. Regarding commute, Pawar et al. (2020) found a 5.3% shift from public to private modes, but noted that actual commuting patterns did not reflect the perception of public modes as unsafe because commuters lacked private mode availability. On the other hand, regarding trips in general, Abdullah et al. (2020) found a significant shift from public modes to private and non-motorized modes, and did not find evidence of a shift from private cars to active modes.

This research investigates changes travel behavior (mode and frequency) among three different trip purposes during the COVID-19 lockdown: commute, non-work, and UT. The main research question asks whether lockdown, in addition to reducing travel in general, stimulates compensatory behavior of UT for directed trips, active for motorized modes, and private for public modes, and if these changes differ among residents in varying levels of urbanization. For commute trips, a decrease in frequency across all modes is hypothesized due to business closure and an increase in teleworking. For non-work trips, a decrease across all modes is also expected due to a reduction in out-of-home activities, although compensatory behavior from motorized to active travel modes could be seen due to a slower pace of life or incentive to get outside during the lockdown. UT trips are expected to compensate for a decrease in directed trips with active instead of motorized modes. A switch from public to private modes is expected due to a fear of exposure to the virus. Additionally, it is hypothesized that these changes will vary depending on participants' level of urbanization, as social distancing might be more difficult in urban areas and therefore could have impacted activity and travel behavior increasingly as density increased.

Materials and methods

An online survey was open and circulated for two weeks (20 April – 4 May) during the Belgian lockdown period by targeting Facebook community groups in 41 municipalities in the Ghent and Antwerp regions. Though Facebook sampling restricts the ability to conduct probability sampling, this method (convenience sampling) was chosen for its ease of use and speed with which many individuals could be reached – the duration of lockdown could not be anticipated and therefore survey distribution was time-sensitive. The municipalities were chosen as to offer a range of urbanization levels, from densely populated areas within Ghent and Antwerp to more rural populations outside of these cities. Initially there were 1041 respondents, but this was reduced to 764 as fewer provided optional address data.

Logistic regression models were chosen for this analysis as the most effective way to explore travel patterns with a categorical dependent variable (change in travel mode: more, less, or no change). Eight multinomial models (4 commute, 4 non-work) were estimated to explore the change in travel mode (walk, cycle, car, PT[1]) during the lockdown period. Respondents were asked, 'How have the anti-corona measurements affected your daily walking/cycling/car use/PT use?' (5-point Likert scale from *much less* to *much more*) to quantify change in travel. Lower values (1, 2) were combined to create the 'less' variable, higher values (4, 5) were combined to create the 'more' variable, and value 3 was used as the 'no change' variable. Key independent variables (Table 1) included usual travel mode prior to lockdown (walk, cycle, car, PT).

Furthermore, two binary logistic regression models estimated the likelihood of a respondent participating in at least weekly UT walks and UT cycle trips or not during the lockdown period. Respondent answer choices ranged from *never* to *several times per day* (7-point Likert scale) to the following question, 'Since the introduction of the measurements against the corona virus, I carry out undirected walks [cycle trips] without a specific destination'. Dependent variables were coded into binary 'weekly UT walks' and 'weekly UT cycle trips'. Key independent variables included change in car and PT-use for directed travel, and UT before lockdown (any mode; binary variable). Respondents had the option to choose more than one mode that they used frequently (i.e., values 4 and 5 on a 5-point scale from *never* to *always*). There were 137 participants (17.9%) who did not report taking UT trips before the lockdown, but participated in at least weekly UT during the lockdown. There were 82 participants (10.7%) who reported normally taking UT trips before the lockdown but did not participate in UT during the lockdown.

Control variables for all logistic regression models and statistics for respondents can be seen in Table 2. Though the age distribution of survey participants is similar to that of the Flanders region, women, university-educated, high-income, and unemployed people are over-represented. These representations are important to keep in mind when interpreting results. To quantify level of residential urbanization, address-level data was geocoded, one-kilometer (~10 minutes walking) street-network buffers were created, and built environment data within the buffers was analyzed to produce a continuous urbanization score (Ewing and Cervero 2010) relative to the sample. This follows GIS-measured methodology from the International Physical Activity and the Environment Network (IPEN) adult study (Adams et al. 2014). The required GIS measures included population density, transit stations, street-network intersection density, and land use data from Flanders, and was retrieved with open-source availability through the Geoportal of the Belgian Federal Institutions (Belgian geoportal 2020; geo.be). Lockdown regulation

Table 1. Travel behavior before and during lockdown by mode and trip purpose[2].

Before Lockdown											During Lockdown						
Commute			Non-Work		UT	Change in Frequency for All Directed Trips									UT		
								Decreased			Increased		No Change				
Mode	N	%Sample	N	%Sample	Mode	N	%Sample	Mode	N	%Sample	N	%Sample	N	%Sample	Mode	N	%Sample
Cycle	252	33.0	322	42.1	Any Mode	396	51.8	Cycle	218	28.5	268	35.1	278	36.4	Cycle	336	44.0
Foot	142	18.6	246	32.2				Foot	142	18.6	416	54.5	206	27.0	Foot	519	67.9
Car	380	49.7	463	60.6				Car	664	86.9	18	2.4	82	10.7	Car	0	0.0
PT	134	17.5	113	14.8				PT	511	66.9	14	1.8	239	31.3	PT	0	0.0

Table 2. Statistics over control variables; percentage (%) of sample for binary variables, average (μ) response for Likert-based and continuous variables.

Control Variables		% or μ
Covariates	% Female	75.9
	μ Age	45.6
	% University Educated	63.7
	% HH Monthly Income >€3000	46.2
	μ Urbanization (range [0,12.1])	7.1
Employment	% Employed	56.4
	% Affected by COVID	8.0
	% Searching for Job	3.0
	% Unemployed	14.9
	% Retired	17.7
Lockdown Regulations	μ Follow (range [1,5])	4.5
	μ Take Seriously (range [1,5])	4.8
Private Travel Access	% Driving License	90.7
	% Car Ownership	90.1
	% Bicycle Ownership	90.1
Positive Attitude Toward Behavior	μ Walk (range [7,35])	28.6
	μ Cycle (range [7,35])	27.1
	μ PT (range [7,35])	16.8
	μ Car (range [7,35])	21.0
Residential Characteristics	% Garden	76.4
	% Terrace	75.8
	% Green Space	92.9

compliance responses (‘I only perform essential movements’, ‘I take the coronavirus seriously’) were on 5-point Likert scales from *absolutely not* to *absolutely*. Attitudes toward travel behavior for each mode (Kroesen, Handy, and Chorus 2017) were calculated using responses to seven statements (5-point Likert scale from *absolutely disagree* to *fully agree*): ‘Walking/cycling/driving/using PT is (1) easy, (2) relaxing, (3) nice, (4) healthy, (5) traffic safe, (6) safe from coronavirus, (7) good for the environment’, to represent positive travel attitudes. The scores on the seven statements were then summed with a possible range of scores from 5–35 (Cronbach’s α for each mode >.821, indicating internal consistency). Residential characteristics (garden, terrace, green space) were added only in the binary UT models as a lack of these features could incentivize a need to get out of the house and into nature (whereas they would probably not incentivize a directed trip like going to the supermarket or to work).

Results

Directed trip mode change

Results from the eight multinomial logistic regressions (Table 3) indicated that frequent active travelers (foot; cycle) before the lockdown tended to walk and cycle less for commuting (B = 0.82; B = 0.98) and non-work travel (B = 0.87; B = 0.76) during the lockdown. However, there was a shift of those who normally commuted by foot to car (B = 1.71), and those who normally completed non-work trips by bicycle to PT (B = 3.75) – although some reduced their PT-use (B = 0.45). Those who often used cars before the lockdown continued this behavior, but also tended to walk more for commute (B = 0.46), and were less likely to reduce their cycling for either trip purpose (B = −1.12; B = −0.89) and PT-use for commuting trips (B = −0.47). Frequent PT-users before the lockdown decreased their PT-use significantly during the lockdown for commuting trips (B = 1.80), but for non-work trips were more likely to either decrease (B = 1.25) or increase (B = 1.89) their PT-use than remain unchanged. There was not a significant shift from PT-use toward other private transport modes. Urbanization did not have the hypothesized effect with no significant results. Though unrelated to hypotheses, additional interesting findings from the control variables show that for both types of directed trips university-educated and higher-income individuals were more likely to increase walking, retired individuals were more likely to reduce car and PT-use, and individuals following the lockdown regulations were less likely to have increased walking.

Weekly UT

Those who took at least weekly UT walks and/or bicycle rides during the lockdown were more likely to have a decrease in their daily (directed) car use during the lockdown compared to those who did not take these weekly UT trips (B = −0.28; B = −0.39). Those who took at least weekly walks during the lockdown were more likely to have regularly participated in UT trips before the lockdown (B = 0.50), and those with positive attitudes toward walking and cycling were more likely to participate in those activities at least weekly (B = 0.12; B = 0.18). Level of urbanization did not have a significant relationship with UT trips (Table 4). Though unrelated to original hypotheses, additional interesting findings show that retired individuals were more likely to take a weekly UT walk, and individuals following the lockdown regulations were less likely to take both a weekly UT walk and cycle.

Discussion and conclusion

As expected, all types of travelers changed their travel patterns during the lockdown. Those who normally cycled before the lockdown decreased their cycling for directed trips, some decreased their PT-use, and some increased their PT-use. Pedestrians decreased their overall walking but increased car use for commute trips. Car users were less likely to decrease their daily cycling for directed trips, and also less likely to decrease their PT for commuting. PT-users used less transit for commute, but were more likely to either decrease or increase their use for non-work trips than remain unchanged. This indicates that neither a significant shift from public to private modes nor from public motorized to active modes was seen. However, those with decreased car use were likely to replace those trips with UT walking or cycling trips. This presents evidence for both a shift from directed trips to UT trips and from private motorized trips to active trips, suggesting compensatory behavior.

The link to the built environment was not as important as originally hypothesized as the residential urbanization of travelers for all trip purposes did not have a significant relationship to travel behavior change. On the other hand, travel attitudes and attitudes toward the lockdown were indicative of travel behavior. Those with positive attitudes toward walking, cycling, and car use increased their use of those modes, respectively, and those with positive attitudes toward PT reduced their use of those options (likely for the aforementioned availability reasons). Those who reported following the lockdown regulations were less likely to increase their walking for destination-oriented trips and were also less likely to participate in weekly UT. Additionally, retired individuals were more likely to reduce car and PT use and more likely to take a weekly UT walk. Further, it seems that having some sort of walking experience was important for those who took at least weekly walking trips, though this was not the case for those taking UT cycling trips indicating that perhaps individuals have rediscovered walking UT during the lockdown.

Table 3. Multinomial logistic regressions for change (more or less) in daily travel frequency by mode (walk, cycle, car, PT) and trip purpose (commute or non-work).

		CHANGE IN MODE FREQUENCY DUE TO LOCKDOWN															
		WALK $R^2 = 0.233$		CYCLE $R^2 = 0.317$		CAR $R^2 = 0.249$		PT $R^2 = 0.300$		WALK $R^2 = 0.228$		CYCLE $R^2 = 0.292$		CAR $R^2 = 0.245$		PT $R^2 = 0.292$	
		Less	More	Less	More	Less	More	Less	More	Less	More	Less	More	Less	More	Less	More
Key Independent Variables		COMMUTING MODELS								NON-WORK MODELS							
Usual Travel Mode	Cycle	0.35	0.16	*0.98*	0.13	−0.02	−0.50	0.32	−0.16	0.16	−0.22	*0.76*	−0.37	−0.63	−0.15	0.45	*3.75*
	Foot	*0.82*	0.12	0.46	0.25	0.04	*1.71*	0.33	0.26	*0.87*	0.34	−0.02	−0.01	0.34	1.07	0.29	−1.35
	Car	−0.27	0.46	*−1.12*	0.11	−0.04	−0.97	−0.47	−0.82	−0.04	0.19	*−0.89*	−0.11	−0.03	0.31	−0.30	−0.42
	PT	0.25	0.29	−0.14	−0.12	0.39	−0.69	*1.80*	0.30	0.49	0.11	0.20	0.02	0.22	−0.29	*1.25*	*1.89*
Control Variables																	
Covariates	Female	−0.16	0.06	−0.08	0.09	−0.29	−1.28	0.33	−0.37	−0.16	0.05	0.00	0.09	−0.32	−1.27	0.28	−0.44
	Age	−0.01	*−0.03*	−0.02	−0.01	0.02	−0.03	0.00	*0.10*	−0.01	*−0.03*	−0.01	−0.01	0.02	−0.03	0.00	*0.10*
	University Educated	0.45	*0.57*	0.34	0.22	*0.69*	−0.31	0.12	0.96	0.41	*0.59*	0.34	0.25	*0.78*	−0.34	0.19	0.32
	HH Monthly Income >3000	−0.07	*0.63*	0.25	0.32	0.26	−0.63	−0.07	−0.80	−0.08	*0.64*	0.17	0.31	0.28	−0.68	−0.16	−1.05
	Urbanization	0.02	0.09	0.04	0.02	−0.04	0.06	0.03	−0.03	0.02	0.07	0.07	0.03	−0.07	0.10	0.02	0.02
Employment (Reference: Employed)	Affected by COVID	−0.12	0.45	−0.41	0.06	0.71	1.27	−0.17	1.22	−0.28	0.46	−0.68	0.07	0.62	1.23	−0.37	1.61
	Searching for Job	−0.82	0.13	−1.35	0.12	1.22	0.09	0.16	−18.90	−0.96	0.00	−1.43	0.17	1.10	0.61	−0.11	−18.22
	Unemployed	−0.21	−0.29	−0.10	−0.49	*1.63*	0.31	*0.64*	−17.55	−0.10	−0.29	−0.02	−0.42	*1.66*	0.86	*0.64*	−16.81
	Retired	−0.17	0.14	*0.76*	0.60	*1.45*	−20.19	*0.87*	−0.21	−0.16	0.07	*0.74*	0.64	*1.47*	−19.30	*0.84*	−0.69
Lockdown Regulations	Follow	0.02	*−0.46*	0.28	−0.15	0.03	0.79	0.00	−0.33	−0.01	*−0.46*	0.21	−0.17	0.01	0.89	0.00	−0.18
	Take Seriously	0.15	0.02	0.14	−0.08	0.29	1.04	0.28	0.14	0.13	0.02	0.10	−0.07	0.31	0.95	0.25	0.23
Private Travel Access	Driving License	−0.05	0.48	*1.07*	*1.01*	0.76	1.61	−0.52	*−2.59*	0.02	0.63	*0.86*	0.94	0.76	1.34	−0.65	*−3.33*
	Car Ownership	*−1.17*	−0.56	*−0.87*	−0.44	*1.14*	*−1.97*	0.10	0.24	*−1.20*	−0.67	−0.67	−0.44	*1.07*	*−2.12*	0.15	1.05
	Bicycle Ownership	0.13	0.02	0.20	*1.97*	0.20	0.88	0.59	−1.35	0.19	0.00	0.33	*2.00*	0.36	0.79	0.54	*−2.65*
Positive Attitude Toward Behavior	Walk	0.02	*0.08*	−0.04	*−0.07*	0.00	0.07	−0.02	0.06	0.01	*0.07*	−0.03	*−0.06*	−0.01	0.10	−0.02	0.13
	Cycle	−0.05	0.01	0.01	*0.15*	0.01	−0.06	0.01	−0.03	−0.04	0.01	0.01	*0.16*	0.03	−0.08	0.01	−0.12
	PT	−0.03	−0.01	0.02	−0.03	*−0.07*	0.04	*0.07*	0.10	−0.02	−0.01	0.01	−0.04	*−0.07*	0.04	*0.08*	0.07
	Car	0.05	−0.02	−0.01	−0.01	0.03	*0.15*	−0.01	−0.08	0.04	−0.01	−0.02	−0.01	0.02	*0.14*	−0.01	−0.01

Note: references those with no change in daily movement; bold and italicized Beta values significant at $p < 0.05$ level, bold Beta values significant at $p < .10$ level

Table 4. Binary logistic regression for weekly UT.

		Weekly Walk	Weekly Cycle
	R^2	0.21	0.32
Key Independent Variables			
Change in Daily Movement	Car	*−0.28*	*−0.39*
	PT	0.00	0.01
	UT Before Lockdown	*0.50*	−0.01
Control Variables			
Covariates	Female	*−0.48*	−0.35
	Age	*−0.03*	0.00
	University Educated	0.37	0.12
	Monthly HH Income >3000	−0.04	−0.14
	Urbanization	0.00	−0.03
Employment (Reference: Employed)	Affected by COVID	0.28	−0.13
	Searching for Job	−0.23	−0.10
	Unemployed	−0.43	*−0.94*
	Retired	0.60	0.21
Lockdown Regulations	Follow	*−0.46*	*−0.28*
	Take Seriously	0.05	−0.21
Private Travel Access	Driving License	−0.18	0.01
	Car Ownership	−0.06	0.25
	Bicycle Ownership	0.11	*2.89*
Positive Attitude Toward Behavior	Walk	*0.12*	*−0.09*
	Cycle	0.00	*0.18*
	PT	0.01	−0.02
	Car	−0.02	−0.01
Residential Characteristics	Garden	−0.07	0.13
	Terrace	0.13	−0.16
	Green Space	−0.09	0.27

Note: references those with less than weekly UT; bold and italicized Beta values significant at $p < 0.05$ level, bold Beta values significant at $p < .10$ level

The decrease in active commute and non-work trips by normal active mode users might simply be a reflection of the very limited action space available during the lockdown. The surprising shift from walking to car use and cycling to PT-use could perhaps indicate that these users were taking advantage of less congested streets and empty buses or trains, possibly indicating the existence of a 'latent demand' as it became easier for some people to take these modes. The lack of shift from PT to other private transport modes (especially for commute) could be explained by (1) the job functions of PT-users – perhaps these users have jobs that were not functional during the lockdown, indicating a decrease in commuting trips in general, or (2) travel inequity if PT users have no other transportation option.

The main limitation of this study is the convenience sampling method and subsequent over-representation of female, high-educated, high-income, and unemployed respondents. Though typical UT behavior has not yet been studied from a gender perspective, the imbalance in gender here must be considered as there might be a risk that the typical UT travel behavior of men is lost within that of women. With more time to prepare, a probability sample of the Flanders region could have provided a more accurate representation of the population. Additionally, though the opportunity to investigate travel behavior during the lockdown period was seen as an advantage as there was a decrease in out-of-home activity, next steps could investigate UT during a more normal time period. Nonetheless, the findings of this study can inform travel behavior and planning research during both times of lockdown and in a return to normalcy.

In sum, a decrease in directed travel stimulated an increase in UT. This type of compensation activity suggests a need for travel itself contrary to the idea that travel is only ancillary to destinations. This is important to travel behavior research as much can be learned from altering the perspective of travel to action that is inherently beneficial instead of simply a means to an end. Additionally, lockdown stimulates a shift from private motorized to active modes, but not necessarily from public motorized modes. This is important to fields interested in promoting active travel, such as public health or sustainability policy making, because it indicates that individuals who normally drive will use active modes when they have more time to do so. Finally, no evidence of a shift from public to private modes during lockdown indicates that PT-users have no other option, and could be interesting to travel behavior research as an example of captive traveling or transportation inequity. No significant difference in travel behavior changes among levels of residential urbanization can indicate to urban planners that infrastructure to further encourage active and UT travel compensatory behavior is important in all areas, not just those that are highly dense. Indeed, there is a need for more research to fully understand UT trips and their relation with directed travel and the compensatory behavior that is created by lockdown situations.

Notes

1. PT systems in the Flanders region include bus, tram, metro, train, and TaxiBus (door-to-door transport for those with limited mobility) services.
2. Survey questions did not differentiate between mode for UT trips before lockdown, only if the respondent *regularly participated in UT trips*. Survey questions differentiated by mode for UT trips during lockdown, and respondents could have regularly participated in both UT walks and UT cycles. There were no respondents that took weekly UT car or PT trips.

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