Re-open our city and campus post-Covid: A case study of Trinity college Dublin, the University of Dublin

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ABSTRACT

Dublin, Ireland, like most other large cities has undergone lockdown due to the outbreak of the coronavirus. Ongoing physical distancing requirements, as cities reopen, has resulted in a collapse to transit’s capacity and ability to meet demand, forcing authorities to reimagine how people can travel in a pandemic/post-pandemic world. For Dublin, campaigns have focused on encouraging those who can walk or cycle to use active transport options if they are close enough to their place of employment, when the city fully reopens. The purpose of this is to ensure adequate physical distancing can occur while alleviating the pressure on public transport systems, thereby freeing up space for those who are unable to commute via active transport and for those beyond a range in which it is feasible. Trinity College Dublin, the University of Dublin (TCD) is located in the city centre of Ireland’s capital. Since less than 1% of staff drive to the campus and students are not permitted to park on the campus, the University community has been working with Dublin City Council (DCC) to advance planning and built environment interventions to enable staff and students to safely return to work and education. This paper presents the results of the “Commuting to Trinity while Covid-19 Social Distancing is Required” Travel Survey for TCD students and staff, conducted in June and July 2020 (n = 2653). Conducted to determine how staff and students would like to travel to TCD, when the campus fully reopens, it identifies which factors influence their mode choice and choice of working locations. The Trinity University campus makes for an interesting case study as it allows us to understand how the reopening of a major employment, educational and cultural site within an urban area, which is primarily served by transit and active transport, can address physical distancing restrictions and decreased capacity of public transport.

1. Introduction & background

In the months since the outbreak of the pandemic the academic community has published many papers to determine the short and long term impacts it could have on transport systems. These researchers have examined many aspects such as changes in working locations and changes to demand on all modes of transport. Studies have examined how working from home (WFH) could change how we consider mobility, and it may result in large economic savings from reduced congestion (Hensher et al., 2021; Beck et al., 2020).

A growing trend in the literature is examining the impacts that the pandemic might have upon the take up of public transport. When examining the uptake and satisfaction with public transport, crowding is something that needs to be carefully considered (Cantwell et al., 2009). During the pandemic and when planning for a post-pandemic world, the use of public transport has gotten much focus. Studies have examined users’ perceptions of using public transport and fears of contracting COVID-19 have been examined (Dong et al., 2021; Jenelius and Cebecauer, 2020; Abdullah et al., 2020). Some have postulated that fear of contamination may end up having long term impacts upon the take up of public transport into the future (Bucsky, 2020).

Globally, public transport systems had to operate with reduced capacity, this resulted in a focus upon how to encourage those that had to travel to work doing so by bicycle. This resulted in city authorities focusing upon investment in cycling networks. Research on cycling has been sparse to date and the findings seem to be mixed. Padmanabhan et al (2021) examined data from three shared bike systems in New York, Boston and Chicago and found usage rates fell during the pandemic. The authors also suggest that the pandemic is an opportune time to invest in active and micro-mobility modes to encourage a return to commuting in a sustainable way. Teixeira and Lopes (2020) examined bike sharing in New York and found that while usage rates fell during the pandemic, that demand was more resilient than the subway. They also suggest an equity impact in that those from lower income households could have a viable alternative if they could not afford to purchase a car. Tarasi et al (2021) also found in a study in the Mediterranean that cycling numbers...
did not increase during the pandemic, but they did find a positive impact as cyclists did feel safer due to the decreased motor traffic during travel restrictions.

Investments in cycling and public realm infrastructure can be seen as one of the positive consequences of the changes cities have made during the pandemic. Davis and Obree (2020) argue that changes in the status quo and a move away from car dominance, could happen in a short time window. The University of Aberdeen has also explored the likely travel patterns after the pandemic and recognise working from home and other travel demand management tools will be used to ensure users of the campus do not revert to old habits (Logan et al., 2020).

This section of the paper also provides a background to Dublin and to TCD, providing some context as to the study area and the scale of the problem that the city and the University are facing. The University was founded in 1592 by Queen Elizabeth I and is one of the oldest universities in the world. The location of the University is in the city centre of Dublin and, as such, is surrounded by the central business district and the largest retail and leisure areas in the city. The University community includes more than 17,000 students and 4000 members of staff, making it one of the largest trip attractors in Dublin city centre. TCD has a Smarter Travel Committee that engages with stakeholders both within and beyond the University and promotes sustainable transport options to the main campus and satellite campuses. This Smarter Travel Committee conducts travel surveys, and the results show that less than 1% of staff travel to work by car on a daily basis and that 58% take public transport, 27% walk and 14% cycle to the campus (TCD, 2020). This low level of driving to the campus is encouraged due to the small numbers of parking spaces provided and the fact that students are not allowed to park on the campus. While this highlights the level of sustainable travel to the campus, it also shows how exposed we are to a reduction in capacity on public transport, due to physical distancing requirements.

Dublin is the capital of the Republic of Ireland and, in 2016, had a population of 1.1 m in the Dublin urban area, and within the Greater Dublin Area (GDA) a population of 1.9 m (CSO, 2018). Table 1 presents the mode share of those traveling to work, school or college in Dublin and in the GDA. The results show that, in the region, the automobile is the dominant mode for this trip purpose, however, walking, cycling and public transport combined, in the urban part of the region, have a larger mode share than the car.

The table clearly shows when the restrictions came into place and how the volume of traffic traveling in the city centre decreased and how it is now rebounding due to the easing of restrictions.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Means of travel in the region.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dublin</strong></td>
<td><strong>Greater Dublin Area (GDA)</strong></td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>On foot</td>
<td>168,915</td>
</tr>
<tr>
<td>Bicycle</td>
<td>56,067</td>
</tr>
<tr>
<td>Bus, minibus or coach</td>
<td>125,367</td>
</tr>
<tr>
<td>Rail</td>
<td>60,565</td>
</tr>
<tr>
<td>Motorcycle or scooter</td>
<td>4556</td>
</tr>
<tr>
<td>Motor car: Driver</td>
<td>283,034</td>
</tr>
<tr>
<td>Motor car: Passenger</td>
<td>104,936</td>
</tr>
<tr>
<td>Van</td>
<td>18,880</td>
</tr>
<tr>
<td>Other, incl. lorry</td>
<td>1202</td>
</tr>
<tr>
<td>Work, mainly at or from home</td>
<td>14,692</td>
</tr>
<tr>
<td>Not stated</td>
<td>49,930</td>
</tr>
<tr>
<td>Total</td>
<td>888,144</td>
</tr>
</tbody>
</table>

The first case of Covid-19 was reported in Ireland on the 29th of February 2020 and then on the 12th of March, the Irish government announced that a full lockdown would come into place. In the early stages of the lock down, those in Ireland were allowed to travel 2 km from their home for exercise and then this increased to 5 km on the 18th of May as restrictions began to be eased on a phased basis. Fig. 1 shows vehicle traffic volumes from a traffic counter in Dublin city centre from the 1st of January until the start of June 2020 (Dublin City Council, 2020). The graph clearly shows when the restrictions came into place and how the volume of traffic traveling in the city centre decreased and

The research presented in this paper summarizes the results of a survey that was conducted of TCD staff and students in the context of reopening Dublin city and also staff and students returning to the University campus.

The main research question the paper seeks to explore is: How does a university campus, where the majority of students and staff travel to it by non-car modes, function with limited capacity on public transport? To address this question, the paper also seeks to explore new norms around working and studying from home and what mode shifts could occur as we enter a post pandemic stage.

2. Reopening Dublin city measures

Dublin, like many other international cities, has come up with a blueprint for reopening the city as lockdown restrictions ease. The body that is charged with the management and operation of our transport and traffic networks in this city is DCC. They operate and manage an Urban Traffic Control Center that manages traffic and they are also responsible for the management and flow of public transport in the city. DCC is also responsible for the provision of pedestrian and cyclist facilities in this city and, it is mainly in this area, they have decided to focus their efforts for the reopening of the city.

In May 2020, DCC published a document entitled “Enabling the City to Return to Work” (Dublin City Council and the National Transport Authority, 2020). This comprehensive document tackled the daunting task of facilitating the large numbers of people who need to move around Dublin city while taking into account public health guidelines and adhering to reduced capacities in Dublin’s public transport. The document predicted that there would be an 80% reduction in public transport capacity, a 30% reduction in road traffic and aimed to have an increase of 100% in walking and 200% in cycling. The advice from the document again echoed the message that anyone within a 2-kilometer or a 5-kilometer radius of the city centre consider walking or cycling, rather than take public transport or drive. Fig. 2 presents a map of the city produced in the document showing the area that is covered by these radii.

In order to achieve the desired modal shift, DCC has identified several segregated cycling lanes and numerous bus priority measures to be introduced around the city. This will also be coupled with increased pedestrian space within the city centre. The overall aim of these policies and interventions is to ensure that physical distancing can be achieved while traveling into and around the city centre.

The priority given to walking and cycling was chosen after several studies, both in Ireland and internationally, showed that while the pandemic was still in place and without a vaccine available, that the majority of people had a preference to use these modes of transport. Also, these modes of transport would be the most successful in moving a large number of people, while adhering to physical distancing requirements.

As the University campus is in the city centre, where a large number of the facilities that have been introduced by DCC are located, it has connected the campus to the suburbs and outer suburbs of the city. The University has been working with DCC on the identification of these routes for a number of years and the current situation has resulted in the planning process been expedited and delivery of infrastructure happening within the space of months. Fig. 3 presents some of the pedestrian and cyclist inventions that have been introduced at the front entrance to TCD.

In June 2020, TCD made a submission to DCC, welcoming the “Enabling the City to Return to Work” Programme. Endorsed by TCD’s Provost, this submission noted that 64% of the Trinity community commutes 6 kms or less to the campus, with walking and cycling popular up to that distance. The document detailing how TCD could support DCC in its efforts to reopen Dublin, while Covid-19 restrictions remain, and focused on two key priorities for the University:

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Firstly, TCD advocated for immediate changes to walking and cycling infrastructure on four routes, which would have the highest impact for the University community. These routes had been identified as priorities for the University, since 2018, and the specific recommendations by route were informed by community engagement events and consultations hosted by TCD between June and December 2019. Aligned by route, recommendations included: widening footpaths; installing bike lanes, including separated facilities; increasing the width of narrow cycle lanes; prioritizing walking and cycling at junctions; updating signal timing; reducing speed limits on roads; and where feasible, using green features to implement the changes recommended.

As a second strategy, TCD would deliver a complementary communications campaign for the University community to encourage people to walk or cycle, if they commuted 5kms or less. This included details of walking and cycling times for set distances (2 km, 4 km, 5 km, etc.); the location of showers; the locations of bike parking; details of how to use Dublin’s bike sharing schemes, how to sign up to Trinity’s Bike to Work scheme (government backed tax free scheme for purchasing bikes); a commitment to advocate for a similar student-equivalent.

While both strands are currently advancing, with significant examples of infrastructure and communications emerging to support a coordinated reopening of Dublin, this article presents the research methods and analysis for the “Commuting to Trinity while Covid-19 Social Distancing is Required” Travel Survey for TCD students and staff, conducted in June and July 2020 (n = 2653).

3. Methods and data collection

3.1. Data collection

The University reopened on the 28th of September 2020 with a blended learning approach. Laboratories and tutorials all took place on the main campus and larger lectures being conducted online and as of January 2021 this was still the case. One of the main aims of this study is to ascertain how staff and students will travel to the campus when these classes recommence. To gain an understanding of the concerns and preferences of the college community a survey was conducted online in July 2020 and sent to our student and staff members. The survey was open for the first two weeks in July 2020 and 2653 responses were collected which represents a 12.5% response rate. The survey collected some demographic and socioeconomic variables (see Table 2) and several questions around the return to work/study on campus (see Tables 4–6).

The analysis conducted on the data collected was primarily an examination of the descriptive statistics. To gain a deeper understanding of the trends within the data a cluster analysis was conducted on the survey sample. The analysis conducted in this research used a two-step cluster analysis approach. This clustering approach allowed the research to identify two distinct groups within the sample and to examine the characteristics of these groups. The latter analysis that was conducted was that of a cross tabulation of the data collected using the two groups identified in the cluster analysis as the main variables. A simple splitting of the dataset into students and staff could have been undertaken, but this would have missed other relationships found in the clusters, such as preferences for modes of transport and locations of work and study. In this cross-tabulation analysis, Pearson Chi-Square and Cramers V were estimated to determine the statistical strength of the cross-tabulations conducted.

4. Analysis and results

4.1. Descriptive statistics

This section of the paper presents some of the descriptive statistics of the sample collected. The aim is to provide an overview of the
Fig. 2. Walking and Cycling Zones (Dublin City Council, 2020b).

Fig. 3. Examples of cyclist and pedestrian priority.
The cluster analysis conducted on the data collected produced two clear clusters. The nature of cluster analysis means that some respondents will not fall into either cluster estimated due to diverse opinion amongst the survey sample. This is the case with the data collected and 281 respondents did not fall into either of the clusters estimated below. The clusters estimated describe both a student and staff cluster. Details of each of the characteristics of these clusters are presented below:

**Student Cluster:** aged 18–20, that prior to COVID would take the bus to college, and while restrictions are in place would like to study from home 1–2 days a week and when travelling to college would choose to walk (N = 1499 (63.2%))

**Staff Cluster:** aged 35–45, that prior to COVID would use rail to get to college, and while restrictions are in place would like to WFH 3+ days a week and when travelling to college would choose to cycle. (N = 873 (36.8%))

Table 3 presents the cluster fit statistics of the two clusters estimated. The relative predictor importance values show how the significant these variables are in determining the makeup of the cluster. Table 3 shows that age and whether or not the respondent was a student or a staff member had the greatest overall impact upon the formation of the cluster. The Silhouette value determines the overall strength of the cluster or for the want of the better term the overall model fit. The value of 0.5 would be considered to be a relatively good model fit for this type of analysis.

Tables 4-6 present the results of a series of cross-tabulations where the variable of cluster membership is used to examine several of the questions asked in the survey. The results in Table 4 present gender, distance from the main campus, and if the respondents would walk or cycle when the campus reopens. When comparing the results between the two clusters there seems to be little difference between genders and cluster membership. A comparison between the two clusters shows that those in the staff cluster where are more likely to live a greater distance from the campus. When comparing those that said if they lived within 2 km of the campus that they would walk there seems to be little difference between the results for cluster membership for this question. The results also showed that over 60% in each cluster said that they would consider walking this distance. A similar result was found when asking respondents would they be prepared to cycle to the campus with the most notable result from the student cluster with just under 30% saying that they would prefer to walk to the campus. This result mirrors that of the cluster membership and therefore this result would be expected.

The results presented in Table 5 examine respondents concern related to contracting the coronavirus while using several forms of transport. The first result shows that a larger proportion from the staff cluster are concerned about contracting the virus than using public transport. A similar finding was shown when respondents were asked if they considered walking or cycling to have a lower risk of contracting the virus than using public transport as a much higher proportion from the staff cluster considered this to be a risk. The final question presented in Table 5 asked respondents did they consider the risk of contracting the virus while driving to be low and both clusters equally agreed that this was the case.

Table 6 presents the final set of results of the paper. They examine the acceptance amongst the University community of some of the interventions DCC are planning to introduce prior to September 2020. The
results examined the acceptability of increasing space for pedestrians and the amount of segregated cycling facilities that connect the campus. The first two sets of results asked is there adequate space for pedestrians and the amount of segregated cycling infrastructure in the city, both sets of results show that the college community disagree or disagree strongly with these statements, with little difference between clusters. The final two questions in Table 6 asked should the policies being purposed by DCC be supported. The results for these final questions showed that both staff and students support the widening of pedestrian facilities and the increase in safe and segregated cycling facility as the city re-opens. The one deviation between the two clusters that is noteworthy is that staff strongly agreed with these statements in higher numbers then students.
Table 6

Cross-tabulation of Cluster Analysis and active mode facilities required.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Staff Cluster</th>
<th>Student Cluster</th>
<th>Pearson Chi-Square (df, Sig. p)</th>
<th>Cramers V (Sig. p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is adequate space for pedestrians in Dublin to facilitate social distancing as the city reopens</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly agree</td>
<td>Count 28</td>
<td>59</td>
<td>24.344 (df; Sig. p 0.000)</td>
<td>0.102 (Sig. p 0.000)</td>
</tr>
<tr>
<td>Agree</td>
<td>Count 146</td>
<td>345</td>
<td>% within cluster 3.3% 4.0%</td>
<td>% within cluster 17.1% 23.1%</td>
</tr>
<tr>
<td>Neutral</td>
<td>Count 183</td>
<td>283</td>
<td>% within cluster 21.4% 19.0%</td>
<td>% within cluster 38.0% 39.7%</td>
</tr>
<tr>
<td>Disagree</td>
<td>Count 325</td>
<td>592</td>
<td>% within cluster 58.0% 59.7%</td>
<td>% within cluster 20.3% 14.3%</td>
</tr>
<tr>
<td>There is adequate safe, segregated cycling in Dublin to facilitate social distancing as the city reopens</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly agree</td>
<td>Count 22</td>
<td>52</td>
<td>76.647 (df; Sig. p 0.000)</td>
<td>0.181 (Sig. p 0.000)</td>
</tr>
<tr>
<td>Agree</td>
<td>Count 90</td>
<td>276</td>
<td>% within cluster 2.6% 3.5%</td>
<td>% within cluster 10.7% 18.5%</td>
</tr>
<tr>
<td>Neutral</td>
<td>Count 131</td>
<td>361</td>
<td>% within cluster 15.6% 24.3%</td>
<td>% within cluster 35.5% 30.8%</td>
</tr>
<tr>
<td>Disagree</td>
<td>Count 298</td>
<td>459</td>
<td>% within cluster 35.6% 30.8%</td>
<td>% within cluster 20.3% 14.3%</td>
</tr>
<tr>
<td>Footpaths should be widened around Trinity and between Trinity’s campuses and residences to facilitate social distancing as the city reopens.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly agree</td>
<td>Count 274</td>
<td>348</td>
<td>24.345 (df; Sig. p 0.000)</td>
<td>0.102 (Sig. p 0.000)</td>
</tr>
<tr>
<td>Agree</td>
<td>Count 255</td>
<td>502</td>
<td>% within cluster 32.2% 23.3%</td>
<td>% within cluster 29.9% 33.6%</td>
</tr>
<tr>
<td>Neutral</td>
<td>Count 184</td>
<td>332</td>
<td>% within cluster 21.6% 22.2%</td>
<td>% within cluster 12.3% 15.7%</td>
</tr>
<tr>
<td>Disagree</td>
<td>Count 105</td>
<td>235</td>
<td>% within cluster 4.0% 5.2%</td>
<td>% within cluster 4.0% 5.2%</td>
</tr>
<tr>
<td>Safe, segregated cycling should be installed around Trinity and between Trinity’s campuses and residences to facilitate social distancing as the city reopens.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly agree</td>
<td>Count 370</td>
<td>545</td>
<td>13.598 (df; Sig. p 0.009)</td>
<td>0.076 (Sig. p 0.009)</td>
</tr>
<tr>
<td>Agree</td>
<td>Count 269</td>
<td>523</td>
<td>% within cluster 43.6% 36.6%</td>
<td>% within cluster 31.7% 35.1%</td>
</tr>
<tr>
<td>Neutral</td>
<td>Count 136</td>
<td>263</td>
<td>% within cluster 16.0% 17.7%</td>
<td>% within cluster 16.0% 17.7%</td>
</tr>
<tr>
<td>Disagree</td>
<td>Count 47</td>
<td>116</td>
<td>% within cluster 5.5% 7.8%</td>
<td>% within cluster 5.5% 7.8%</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>Count 26</td>
<td>41</td>
<td>% within cluster 3.1% 2.8%</td>
<td>% within cluster 3.1% 2.8%</td>
</tr>
</tbody>
</table>

4.3. Analysis of open-ended survey responses

In addition to the main two-step cluster analysis approach, a supplementary thematic analysis was also conducted on the qualitative (free-text comments) data obtained through some open-ended questions included in the survey. Respondents could choose to openly comment on five of the survey questions, providing them an opportunity to elaborate on the reasons behind their planned change of travel mode, and any other expressions they wished to share on commuting to college when the reopening of the city commences. Following a thematic analysis approach, each open response provided was reviewed and open coded by question, then organised and merged into hierarchical categories, and finally abstracted into key emergent, overarching themes. The results of this analysis are discussed under two main headings; i) Motives driving change of travel mode and ii) Perceived barriers to cycling and walking, when the reopening of the city commences. This qualitative analysis of open responses provides additional support for and a deeper contextual understanding of the main quantitative survey results.

4.3.1. Motivations driving change of mode during Covid-19 reopening of the city

The two-step cluster analysis revealed two distinct clusters that prior to Covid-19 would use some form public transport, and who have now indicated they would choose to either walk or cycle. A further analysis of the ‘open’ qualitative responses indicated that for both clusters, two key factors are driving their decision to switch mode of travel from public transport to walking or cycling namely; i) Public transport as a travel mode option has gone from inadequate (Pre-Covid) to impossible (Post-Covid) and ii) Perceived lack of enforcement of current public health guidelines on public transport.

4.3.1.1. Perceptions of public transport: From “inadequate” to “impossible”. An overwhelming response to the question asking participants about the reasons contributing to their planned change of mode, was that they have considerable doubt in Dublin’s public transport network to effectively cope with the volume of demand, especially considering that the network is now operating at a significantly reduced capacity.

“Public transport is my only option for getting to and from work. Capacity is often inadequate when public transport is operating normally. If public transport continues to operate at reduced capacity to facilitate social distancing, I would have no confidence that I could rely on public transport to get me into work and back home again” (Respondent, Staff Cluster)

The perception amongst both clusters was that Dublin’s public transport network before the outbreak of the Covid-19 pandemic was not fit for purpose and was considered quite inadequate in accommodating the volume of commuters especially during peak travel hours. Several respondents shared personal experiences of either waiting at stops as several full buses, tram and train carriages passed, or extremely overcrowded and uncomfortable journeys.

“…being packed like sardines on the Luas!! Joining at Milltown, I have had to queue on the platform waiting for 3–4 trains to pass before being able to get on and then would be standing wedged between people and often with parts of my arms or face squashed against the doors and people - an absolutely unacceptable situation even during ‘normal’ times and unthinkable regarding Covid.”

These high levels of frustration with what was perceived to be an already overburdened public transport service, and which many believe will be magnified as a result of reduced capacity, was a major contributing factor in their decision to walk or cycle in the reopening phase.
“I have to push on and stand on top of people for the whole journey. Standing with a mask on for 45 min on top of people in an already stuffy environment would be hell. I won’t do it.”

“If the buses can only run at half capacity it will be significantly more difficult to actually be able to get on a bus at rush hour in the morning as they will already be at the new maximum capacity by the time they reach my stop.”

4.3.2.2. Perceived pedestrian “Blackspots” in the city centre. The cluster analysis revealed that the majority of survey respondents, over 60% in each cluster, said that they would consider walking if they lived within a 2 km radius of campus. It is essential to understand any perceived barriers for those who wish to walk to campus. The analysis of open responses revealed that although many felt walking in the city to be generally safe, they maintained that certain areas in the city are more likely to be congested, due to narrow footpaths and larger volumes of people. Respondents felt that, in these areas particularly, it will be more difficult to adhere to socially distancing guidelines. Many of the ‘problem areas’ mentioned specifically are those directly surrounding or in close proximity to campus or on the main commuter routes into TCD.

“As it is a busy city there are certain areas where it is harder to social distance either due to higher footfall or different footpath sizes which create some bottlenecks. It’s the quantity of people in some certain areas is the issue. Some footpaths are so narrow, especially around Westland row etc it would essentially be impossible to social distance in my opinion.”

These expressed concerns around cycling safety and inadequate infrastructure, may help explain why when asked would they be prepared to cycle to the campus, just under 30% of the student cluster said that they would prefer to walk to the campus.

Given that many respondents feel that public transport is unlikely to be an option for them now, their decision to switch to cycling may not be completely voluntary, thus increasing their levels of perceived anxiety and apprehension around cycling to college

“I now plan on cycling to college from outside the 5 km radius, but honestly, I’m not looking forward to it. In my experience the bicycle lane system in Dublin, both in the city centre and the greater Dublin area, is woefully designed. Bicycle lanes should not be “shared” with bus lanes and taxis, and motorists should be physically prevented from hopping into the bicycle lane with bollards. I know people who have had a number of close encounters with bus and taxi drivers and motorists, and that make me nervous.”

Other respondents who have stated they will cycle, pointed out that as more and more students and staff choose to cycle in the aftermath of the city’s reopening, they want to see greater investment in access/showering/storage amenities on and around campus for cyclists.

“I would like to see bike ramps such as at the back of the Berkeley near the 24 hr study room, it just needs to be a ramp to help push the bike up while you climb the stairs. I would love to see the students’ union open up a bike repair facility on campus.”

“The facilities available at work to get ready after the cycle e.g. a locker for clothes etc and clean shower facilities just aren’t there. This is more of a deterrent for a longer distance cycle. Availability of showers is a key thing stopping many people cycling.”

“There is no secure bike cage/rack available for staff & students. Bikes are stolen regularly. A new colleague who started on Monday 29th June got his bike stolen the following day. Trinity needs to install a safe storage facility for bikes especially during C19 reopening period.”

“covered, theft-proof, secure bicycle storage on site is the key factor for me. I would cycle in from over 10 km distance if those things were in place.”

4.3.2.1. Lack of safe cycling infrastructure in the city /amenities for cyclists on campus. There was an apparent willingness amongst respondents to choose cycling as their preferred mode as the city reopens, however and perhaps unsurprisingly, fears around safety continues to act as a barrier for many

“I would love to cycle to campus but the health risk involved currently feels greater than contracting the virus due to taking public transport. Trinity needs to make a push now for a massive overhaul of cycling infrastructure. Much of Trinity’s work force could cycle to work but the infrastructure is not there to make people feel safe enough.”

“I would like to cycle to Trinity where possible, however I currently do not feel safe cycling in city traffic along the quays, Thomas Street, Dame street etc. I would like if TCD pushed for more safe, segregated cycle tracks to be built on major routes to campus”

“I think that shifting people’s mode of transport, to take pressure off public transport is a good idea. The issue is, I’m not sure that the city is set up for this. Cycling is a great idea in theory, and something I wish was accessible for all in the city, but, it simply [is ] a stress inducing nightmare to cycle around Dublin city. Bicycle lane markings are inadequate, and seem to be more of a suggestion rather than a rule (both for cyclist and driver)”
“Often congestion points such as corners and crossings which are somewhat a cause for concern. You’re shoulder to shoulder a lot of the time in the city centre, once you’re off the busy streets you’re ok.”

“College Green and surrounding areas are always teeming with people, in particular bus stops. Impossible to keep 2 m from people.

“Dame St footpaths are too narrow. Anyone who has walked up dame street knows its a game of dodging people walking the opposite way/ standing/ waiting at bus stops/ coming out of shops.”

“Footpaths in Dublin are always busy and you get stuck behind big groups of people very easily. Certain areas in particular around college green can be very congested, due to tourists and shoppers coming from Grafton Street”

The above examples provide additional support for the quantitative results presented in Table 6. Namely, that both clusters disagree or disagree strongly that there is adequate space for pedestrians and that there adequate segregated cycling infrastructure in the city, and that both staff and students support the widening of pedestrian facilities and the increase in safe and segregated cycling facility as the city reopens.

5. Discussion of qualitative findings

This paper sought to understand how a university campus, where the majority of students and staff travel to it by non-car modes, will function with limited capacity on public transport. Specifically, for Dublin city, initiatives encouraging those who can walk or cycle to use active transport options have been launched. Analysis of the survey data identified two clusters; a student cluster, who when travelling to college would choose to walk, and a staff cluster who when travelling to college would choose to cycle. We wanted to obtain a deeper insight into some of the reasons why students and staff of TCD have made these travel mode choices.

Our analysis of their open responses indicates that, in general, there is strong desire among TCD staff and students to walk or cycle to campus. People who were commuting to campus on public transport prior to the Covid-19 outbreak were dissatisfied with the service, particularly in relation to capacity levels. We can infer from the open responses that their decision to change to active travel modes is a combination of reduced capacity on public transport and safety concerns. Both staff and students acknowledged in their responses that public transport capacity is going to remain at this reduced capacity level for some (unknown) time to come. A common narrative in the open responses was that they had “always wanted to take up cycling”, or that they had “given serious consideration” to walking or cycling in the past. It seems, therefore, that the reduced capacity on public transport during the pandemic has given many the final “push” to make that change.

This prompts the question however, what will happen once government ease public transport capacity restrictions? Will all staff and students revert to public transport again once capacity levels are returned to pre-Covid levels? Providing a definitive answer to these questions is beyond the scope of this paper, our analysis of the open survey responses however does provide some useful insights in this regard.

A key theme emerging from the qualitative findings is that a lack of safe cycling and walking infrastructure in the city was stated as a major barrier to walking and cycling by respondents. Since the collection of our survey data, rapid and significant investment in both cycling and walking infrastructure has been made in several parts of Dublin city and county including several main commuter routes into the city. Furthermore, in October 2020, results from Dublin City Council’s ‘Your Dublin Your Voice’ survey revealed “widespread support” for these improvements to cycling and walking infrastructure in the city, with 67% calling for government to retain these infrastructural changes post COVID-19.

In July 2020, A National Transport Authority survey results revealed strong support (87%) for investing even more in cycling infrastructure in Dublin. Given both the increased investment in making Dublin roads safer and footpaths, and the public support shown for the retention of these government ‘Covid Mobility Measures’, would at least suggest that a total abandonment of active travel modes taken up by the student and staff clusters once Covid-19 restrictions are lifted, is unlikely. Further research would be needed to investigate this.

6. Conclusions

The results presented in this paper provided an interesting insight as to how a University community based within a city centre is preparing to reopen with certain social distancing restrictions in place. The work that is being conducted by TCD and DCC to promote the use of sustainable modes of travel to travel to the city centre campus once teaching recommences is vital to the operation of the University. The first term, September to December 2020, all classes were online and laboratories and tutorials in small groups took place on campus. Once the discussion started about how the University would reopen for staff and students it became clear that full engagement with the City Council was imperative due to the ways in which our staff and students travel to the University campus. TCD is one of the most sustainable campuses in the world when it comes to mobility with less than 1% of staff driving to the campus on a daily basis. This is a record that the University is particularly proud of and it is something that this engagement can ensure will continue even with social distancing requirements are in place.

The results of the research conducted demonstrate the appetite of staff and students to embrace active modes of transport when returning to the campus. It also shows the need for the plans that DCC are implementing in the city to ensure that social distancing can still take place. The study also shows that staff and students are concerned about using public transport to arrive at the campus and this is a particular concern due to the high proportion of this cohort that take this mode of transport. While all of the mobility needs of the campus cannot be achieved with walking and cycling alone, the study does show that a significant percentage of staff and students are willing to study and work from home. This main issue that the University and city faces is that there will be a significant reduction in public transport capacity. It is planned that working together to promote active modes of transport and enabling remote learning and working can bridge this gap that the reduction in public transport capacity creates.

The main findings and suggestions of this paper pertain to the city and campus fully reopening. However, this is not something that has been achieved as yet due to the pandemic and rolling travel curtailments and WFH advice. The City Council has continued with its plans to increase cycling provision in the city and preparing the city for the point when returning to the office becomes the norm.

Our paper highlights several interesting conclusions and provides a snapshot as to how Dublin city and TCD are planning to return to work and study after the pandemic passes. As this is an evolving situation, policy makers now more than ever before, need evidence-based policy research. The paper also opens up several discussions that need to happen in Dublin and in other cities, how and will our mode choices change as we emerge from the pandemic. City authorities in Dublin are planning that a greater proportion of people will want to travel by less crowded modes of transport and due to pre-pandemic congestion in the city it is hoped this will be by active modes. The investments that have taken place in cycling infrastructure to provide segregated cycle lanes which could ease any concerns on safety and encourage this mode shift.

Many are considering how demand public transport may change after the pandemic. Our research provides some insight into this question showing respondents are reluctant to use these modes but are willing to switch to active modes, more research is required in this area. The results on WFH/SFH also provide insight to policy makers on how this could change travel patterns. If the number of trips is reduced from increased home working and study, it could free up capacity in our transport networks and reduce emissions, but further research is needed in this area.
CRediT authorship contribution statement

Brian Caulfield: Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Resources, Data curation, Writing - original draft, Writing - review & editing, Project administration. Sarah Browne: Conceptualization, Methodology, Formal analysis, Investigation, Resources, Data curation, Writing - original draft, Writing - review & editing, Project administration. Martina Mullin: Conceptualization, Methodology, Investigation, Resources, Data curation, Writing - review & editing, Project administration. Sarah Bowman: Conceptualization, Methodology, Investigation, Resources, Data curation, Writing - review & editing, Project administration. Clare Kelly: Conceptualization, Methodology, Investigation, Resources, Data curation, Writing - review & editing, Project administration.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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