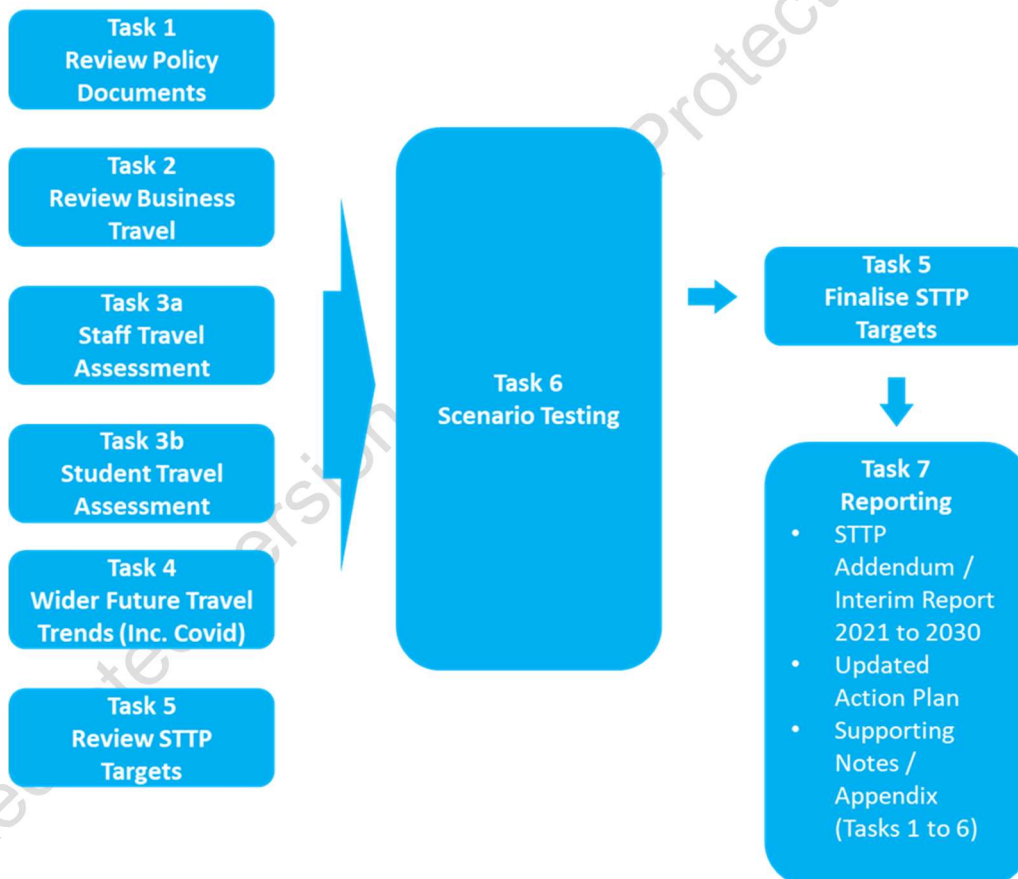


TECHNICAL NOTE

Job Name: University of Glasgow Strategic Transport and Travel Planning – Emissions Targets
Job No: 330610531
Note No: T3 (3a & 3b)
Date: 12/10/2021
Prepared By: G Scott
Subject: Staff and Student Travel Assessment

1 Background

On behalf of the University, Stantec is undertaking a set of tasks to provide considered and robust advice on how they can reduce carbon emissions associated with Transport related issues and to contribute to meeting the ambition of achieving carbon neutrality by 2030. This note covers Task 3a: Staff Travel Assessment and Task 3b: Student Travel Assessment from the diagram below.



One of the main outputs from these tasks is an [interactive map](#) showing:

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- Staff home postcode locations (sector level¹) with different layers according to the campus they are based at
- Main University locations (Gilmorehill, Garscube and Tay House)
- Travel times to each location by walking, cycling, public transport and car (note public transport is grouped as it makes allowance for linked trips, such as train, then subway).
- Transport network (cycle corridor in Glasgow, NCN, main bus routes, railway lines and stations).

This note also summarises some key conclusions.

2 Overview of Staff Travel for Daily Commute

2.1 Current Staff Mode Share

Table 2-1 shows the Pre-Covid staff mode share, by campus.

Table 2-1 Percentage Staff Mode Share, by Campus (2019)

All Staff	Foot	Bicycle	Public bus / coach	Subway	Train	Motorcycle	Taxi	Car sharing - passenger	Car sharing - driver	Car sharing - taking turns	Car driver alone	Other
Gilmorehill	30.9	10.3	13.3	4.1	16.5	0.4	0.2	3.2	3.6	1.0	21.1	0.7
Garscube	12.6	11.6	5.8	0.3	9.9	0.0	0.3	1.7	4.4	2.0	50.7	0.7
Tay House	9.0	5.6	18.0	5.6	32.6	0.0	0.0	3.4	0.0	2.2	23.6	0.0
Total Staff	22.7	10.5	12.4	3.6	16.8	0.3	0.2	3.0	3.5	1.2	25.1	0.7

The highest overall mode of choice for staff is 'car driver alone', with 25% of the mode share and if this is taken as representative of the University then 2,150 staff members would travel alone by car to the University. Overall, 67% of staff use non-car-based modes, to access the University with active travel modes combined making up one-third of the modal split.

Key points:

- While the University is keen to encourage active travel modes, many staff members live too far away for this to be a feasible option. It is estimated that over 8,000 (93%) staff live within a one-hour travel time by public transport to the campus they are based at and over 5,500 (67%) within a 40-minute cycle.
- The majority of staff do not arrive at the University by private car.
- Stantec recommends the University should focus on:
 - Encouraging / shifting staff who drive alone to public transport where feasible, or car share, if appropriate.

¹ A postcode sector combines a postcode area, a postcode district and a single character indicating the location's inward code; for example 'G61 1'.

TECHNICAL NOTE

- Encouraging / shifting staff who take relatively short trips by public transport to walk or cycle, for example a 40-minute walk or cycle, by promoting the cost and health benefits.

2.2 Mode Share Trends Over Time

Table 2-2 shows the changes in staff mode share over time since 2013.

Table 2-2 Staff Mode Share Over Time

Mode	Students			Change 2015 to 2019
	2013	2015	2019	
Foot	21%	24%	23%↑	+2%
Bicycle	7%	10%	10%↑	+3%
Public bus/ Coach	10%	10%	12%↑	+2%
Subway	3%	3%	4%↑	+1%
Train	13%	14%	17%↑	+4%
Motorcycle	1%	1%	0%↓	-1%
Taxi	0%	0%	0%	-
Car passenger	3%	3%	3%	-
Car driver with passenger(s)	8%	6%	3%↓	-5%
Car sharing - taking turns	-	-	1%↑	n/a
Car driver alone	32%	29%	25%↓	-7%
Other	1%	1%	1%	-
Total Responses	2,345	2,320	2,015	

Table 2-2 shows that overall, there has been little change on the staff travel habits until 2019 apart from 'car driver alone' which witnessed a 7% reduction in this mode share. A reduction in the number of staff driving was observed after the car parking management scheme was introduced. Staff Carbon Emissions from Commuting

Table 2-3 shows the trend in staff carbon emissions associated with the daily commute to the University since 2015. The overall decrease is largely attributable to the decrease in staff mode choice 'car driver alone'.

Table 2-3 Staff Carbon Emissions Trends

	2015	2017	2019
Emissions (kg/CO ₂ e)	4,721,933	4,557,335	4,422,201
No. Staff	7,509	-	8,599

Figure 2-1 shows a breakdown of the carbon emissions for staff's daily commute to the University by mode from the 2019 Travel Survey. It shows that 'car driver alone' account for the largest emissions (65%) with public transport making up around 25% share.

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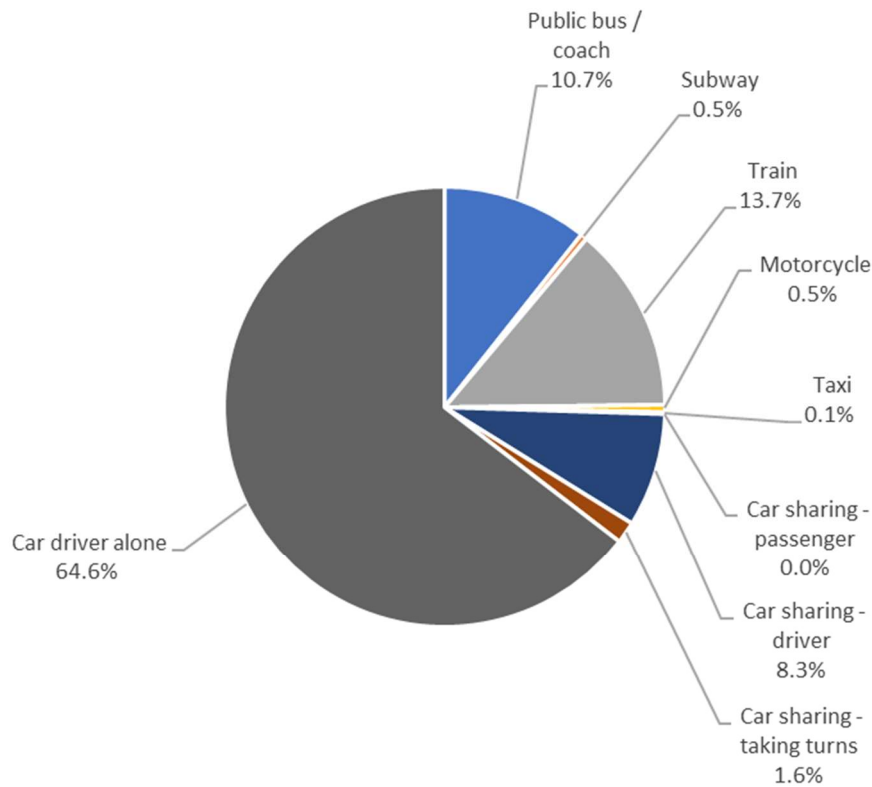


Figure 2-1 Staff Daily Commute Carbon Emissions by Mode

As shown in Figure 2-1, despite the drop in 'car driver alone' from 32% to 25% of the modal split, it still represents 65% of the carbon emissions derived by commuting for all staff. It should be mentioned that active travel modes are not part of the pie chart, as their contribution is assumed as zero.

2.3 Where Staff Live

2.3.1 Table 2-4 provides a breakdown of staff home postcode locations².

² Sector level home postcode data provided by HR in Spring 2021

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Table 2-4 Where Staff Live 2021

Area	No.	%
Partick, Hillhead, Knightswood, Yoker, Whiteinch (G11, G12, G13, G14)	2073	25%
Maryhill, North Kelvinside, Possilpark, Summerston (G20, G22, G23)	805	10%
City Centre (G1, G2, G3, G4)	742	9%
Drumchapel, Bearsden, Milngavie, Clydebank (G51, G61, G62, G81)	613	7%
Gorbals, Pollokshields, Shawlands (G41, G42, G5)	507	6%
Cathcart, Castlemilk, Cambuslang, Rutherglen, East Kilbride, Clarkston, Eaglesham (G44, G45, G72, G73, G74, G75, G76)	458	5%
Paisley (PA)	445	5%
East Glasgow (G21, G31, G32, G33, G40)	356	4%
Easterhouse, Cumbernauld, Baillieston, Bothwell, Uddingston (G34, G67, G68, G69, G71)	329	4%
Pollockshaws, Giffnock, Pollock, Newton Mearns, Barrhead, Neilston	325	4%
Midlothian (ML)	305	4%
Edinburgh (EH)	271	3%
Kilmarnock (KA)	225	3%
Govan, Ibrox, Cardonald, Hillington, Penilee (G51, G52)	218	3%
Falkirk (FK)	158	2%
Bishopbriggs, Kilsyth, Kirkintilloch (G64, G65, G66)	137	2%
Bowling, Old Kilpatrick, Dumbarton, Alexandria, Arrochar, Helensburgh (G60, G82, G83, G84)	137	2%

Although most staff live within the Glasgow postcode area, a significant percentage live outside this geographic boundary (17%) making active travel modes less feasible and increasing the potential of staff requiring multiple transfers if using public transport, reducing its attractiveness due to the time of combined journeys.

2.4 Opportunities to Influence Staff Travel

Error! Reference source not found. provides a breakdown of staff travel times based on mode by providing the number of staff within each travel time catchment.

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Figure 2-2 redacted for Data Protection Reasons

Key points:

- UofG Action: Stantec recommends the main aim for the University is to encourage a shift away from car use (primarily single occupancy) to more sustainable and less carbon emitting travel modes. This should be a transfer aspiration to cycling and public transport (where practical). To meet carbon emission targets, there will also likely be a requirement to shift some trips from public transport to cycling or walking. As well as seeking to provide the required infrastructure to safely accommodate cycling and walking, the University should focus on the benefits of walking and cycling. It is known that people are generally more likely to be influenced by associated health benefits and / or saving money, when asked to change their behaviour.

TECHNICAL NOTE

3 Overview of Student Travel for Daily Commute

3.1 Current Student Mode Share

Table 3-1 shows the Pre-Covid student mode share by Campus.

Table 3-1 Percentage Student Mode Share by Campus (2019)

All Students	Foot	Bicycle	Public bus / coach	Subway	Train	Motorcycle	Taxi	Car sharing - passenger	Car sharing - driver	Car sharing - taking turns	Car driver alone	Other
Gilmorehill	52.5	6.4	9.6	4.7	17.2	0.2	0.4	0.7	0.6	0.5	6.8	0.4
Garscube	40.3	8.5	19.4	0.0	12.4	0.0	0.0	3.9	3.9	2.3	9.3	0.0
Total Students	49.3	6.9	11.9	4.3	16.4	0.2	0.3	1.1	1.0	0.7	7.4	0.3

Active travel modes are the overall preferred choice for students at 56% with only 7.4% of students travelling as 'car driver alone'. If this is taken as representative of the whole university population, 7.4% would see about 2,300 students travelling by car across both Glasgow campuses, which is still a significant number.

The highest overall mode of choice for students is walking, with 49% of the mode share. Overall, 89% of students use non-car-based modes, to access the University.

Key points:

- While the University is keen to encourage uptake of cycling amongst students, a high proportion live close enough to the campus they are based at to walk. For this group, transfer to cycling is unlikely to be an attractive option.
- Stantec recommends the University should focus on:
 - Encouraging / Shifting students who drive alone to Gilmorehill to cycling or public transport (where feasible).
 - Encouraging / Shifting students who get relatively short trips by public transport to Gilmorehill to cycle by promoting the cost savings and health benefits, in combination with provision of convenient and easily accessible infrastructure.
 - Encourage students who drive alone to the Garscube Campus to car share (subject to Covid regulations) or cycle (subject to distance of journey and availability of safe infrastructure).

TECHNICAL NOTE

3.2 Mode Share Trends Over Time

Table 3-2 shows the changes in student mode share over time since 2013.

Table 3-2 Student Mode Share Over Time

Mode	Students			Change 2015
	2013	2015	2019	
Foot	51%	50%	49%↓	-2%
Bicycle	5%	6%	7%↑	+2%
Public bus/ Coach	13%	14%	12%↓	-1%
Subway	5%	4%	4%	-1%
Train	14%	14%	16%↑	+2%
Motorcycle	0%	0%	0%	-
Taxi	0%	0%	0%	-
Car passenger	1%	1%	1%	-
Car driver with passenger(s)	1%	1%	1%	-
Car sharing - taking turns	-	-	1%	n/a
Car driver alone	6%	7%	7%	+1%
Other	3%	1%	0%↓	-3%
Total Responses	4,141	3,720	2,006	

Table 3-2 shows that overall, there has been little change in the way students travel to the University since 2015. The percentage of students walking has reduced by 2% while the percentage cycling has increased by 2%. The percentage using public buses / coaches has fallen by 1% and the percentage using the train increased by 1%.

3.3 Student Carbon Emissions from Commuting

Table 3-3 shows the trend in student carbon emissions associated with the daily commute to the University since 2015. The overall increase is largely attributable to an increase in the student population during this time, rather than 'actual' changes in travel behaviour.

Table 3-3 Student Carbon Emissions Trends

	2015	2017	2019
Emissions	5,606,986	5,706,305	5,916,692
Students	25,155	-	29,052

Figure 3-1 shows a breakdown of the carbon emissions for student's daily commute to the University by mode. It shows that 'car driver alone' account for the largest emissions (43%), despite being the chosen mode for a relatively small proportion of students (7%).

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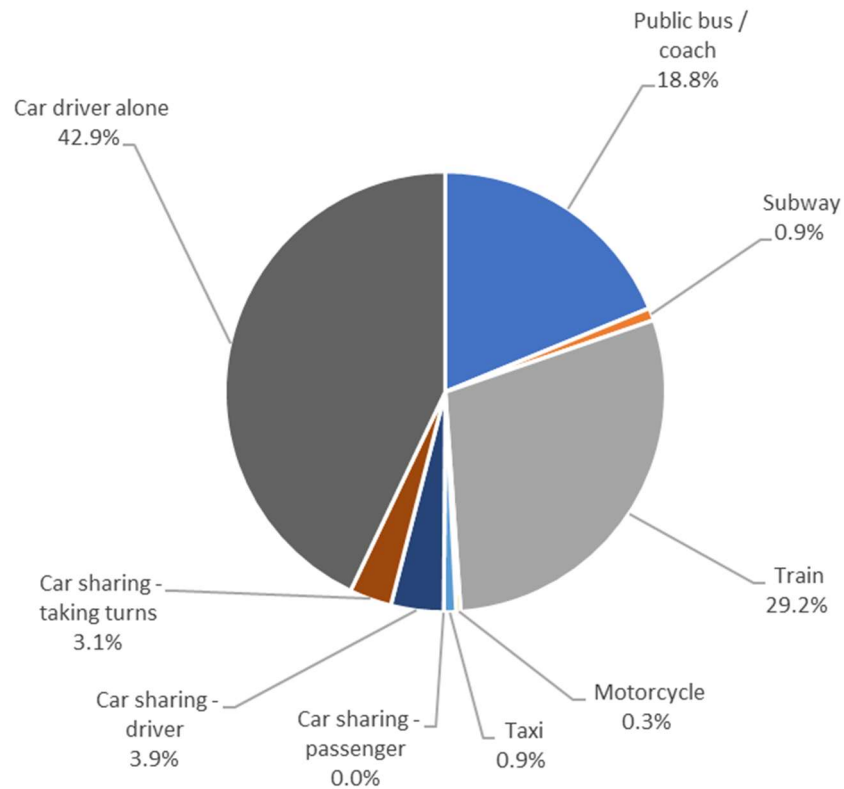


Figure 3-1 Student Daily Commute Carbon Emissions by Mode

Key points:

- There has been an overall upward trend in carbon emissions which is likely to be a result of increased student numbers and a relatively unchanged travel mode share.

3.4 Student Living Location Trends

Table 3-4 presents the main student locations by postcode for 2021.

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Table 3-4 Where Students Live 2021

Area	No.	%
Partick, Hillhead,Knightswood,Yoker,Whiteinch (G11, G12, G13, G14)	9,255	30%
City Centre (G1, G2, G3, G4)	7,540	24%
Maryhill, North Kelvinside,Possilpark, Summerston (G20, G22, G23)	3,158	10%
Cathcart,Castlemilk, Cambuslang,Rutherglen, East Kilbride,Clarkston,Eaglesham (G44, G45, G72, G73, G74, G75, G76)	1,151	4%
Midlothian Postcode Area (ML)	1,125	4%
Paisley Postcode Area (PA)	1,120	4%
Gorbals,Pollockshields,Shawlands (G41, G42, G5)	953	3%
Edinburgh Postcode Area (EH)	892	3%
Pollockshaws,Giffnock, Pollock, Newton Mearns,Barrhead, Neillston	805	3%
East Glasgow (G21, G31, G32, G33, G40)	762	2%
Easterhouse, Cumbernauld, Baillieston, Bothwell, Uddingston (G34, G67, G68, G69, G71)	700	2%
Kilmarnock Postcode Area (KA)	695	2%
Drumchapel, Bearsden, Milngavie, Clydebank (G51, G61, G62, G81)	553	2%

Although the vast majority of students live within the Glasgow postcode area a small percentage live outwith this geographical area, which still represents a large absolute number of students. For them, active travel or some public transport modes are unfeasible due to distance, or time or both.

Table 3-5 shows the most common locations where students live and how these have fluctuated over time.

Table 3-5 Student Population Location Trends

Postcode	2008	2010	2013	2015	2019	2021
G12 – West End / Dowanhill / Hillhead / Hyndland	16%	15%	18%	15%	17%	13%
G20 – Maryhill / North Kelvinside / Ruchill	12%	13%	14%	15%	11%	10%
G3 – Anderston / Finnieston / Garnethill / Woodlands	13%	10%	12%	16%	15%	16%
G11 – Broomhill / Partick / Partickhill	6%	6%	8%	8%	11%	14%
G13 – Anniesland / Knightswood /Yoker	2%	2%	3%	2%	3%	2%
G4 – Calton / Cowcaddens / Kelvinbridge / Townhead	2%	4%	3%	4%	4%	5%
G1 – Merchant City	0%	0%	2%	1%	1%	1%
G41 – Pollokshields / Shawlands	1%	2%	1%	1%	2%	1%
G42 – Battlefield / Govanhill / Mount Florida	2%	0%	1%	1%	1%	1%

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Table 3-5 shows that there has been an increase in the proportion of students living in G11 and G3, around the West End as well as G4. In comparison, there has been a decrease in the proportion of students living in G20 and G12.

Table 3-6 shows where students live in more detail. It shows the postcode districts with the most students living in Glasgow but also highlights that there are a high number of students living in postcode areas outside Glasgow (Midlothian, Paisley, Edinburgh, Kilmarnock).

Table 3-6 Where Students Live by Postcode Area (2021)

Table 3-6 redacted for Data Protection Reasons

Table 3-7 summarises the main student accommodation locations with the number of student residents.

Table 3-7 University Student Accommodation Locations

Accommodation	Full postcode	No. Students
Cairncross House	G3 8NH	144
Kelvinhaugh Street, Kelvinhaugh Gate	G3 8PE	194
Murano Street	G20 7SB	515
QM Residence	G12 0PR	288
Student Apartments	G12 8LD	31
Winton Drive and Lister House	G12 0QA	160
Wolfson Hall	G20 0TH	119
MacLay Residences	G3 8QP	239

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3.5 Opportunities to Influence Student Travel

While students generally travel using sustainable and active travel choices, there are opportunities to lower the carbon emissions associated with the daily commute to the University by:

- Students who drive to Gilmorehill
- Students who live close enough to cycle, but use public transport

Driving to Gilmorehill

The most recent Travel Survey, in 2019, found that 115 student respondents drive alone to the Gilmorehill campus and Figure 3-2, below, presents these student's home addresses.

Figure 3-2 redacted for Data Protection Reasons



Figure 3-2 Postcode Sector Locations of Students who Drive Alone to Gilmorehill Campus

Investigating alternatives for these students who currently drive has been tested, via journey time analysis with 37% of those driving found to live within a 60-minute cycle of the Gilmorehill campus.

Within the 2019 travel survey, five respondents stated that they required their car for personal commitments - from childcare, to work related reasons. Those that drive highlighted that parking is an issue for them in terms of price and location, suggesting they have not considered the full impact in terms of the space commitments and environmental impacts that these journeys have.

The most frequently cited location to park was at subway car parks, such as Shields Road, or surrounding streets including: Kelvinhall, Hillhead, while the Lilybank area was also frequently cited.

Figure 4 shows that those driving alone are usually located outside of Glasgow City, or on the outskirts where alternative means of transport may be less attractive. The most common reasons why student respondents chose to drive alone are highlighted within Table 3-8.

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Table 3-8 Student Reasons for Driving Alone to Gilmorehill

	Car driver alone	
	No.	%
It is the quickest	95	83%
It is the most convenient	85	74%
It is the cheapest	47	41%
No or only unsuitable public transport available (i.e. too infrequent)	39	34%
Other modes are too expensive	34	30%
Too far to walk	30	26%
Mode fits with my work pattern	28	24%
I enjoy using this mode	24	21%
Too far to cycle	18	16%
Too much to carry	16	14%
No alternative available (includes access to car, motorbike, bicycle)	8	7%
I have a disability which makes it necessary	7	6%
Personal safety	6	5%
Other	5	4%
Parking too difficult / expensive	4	3%
Easy parking provided	3	3%
Health/exercise reasons	2	2%
For business use	1	1%
Enables travel with friends	1	1%
Travel distance is small	1	1%
Environmental reasons	0	0%
Total Responses	454	
Total Respondents	115	

Table 3-8 shows that the convenience, cost and speed of private car use are key determinants in mode choice.

Table 3-9 shows what students who 'drive alone' to the Gilmorehill Campus stated would encourage them to walk instead.

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Table 3-9 Encouraging Walking Amongst Student Car Drivers Alone to Gilmorehill

	Car driver alone	
	No.	%
Nothing would encourage me to walk / walk more	63	55%
More lockers and storage facilities	18	16%
Improved lighting and security on route	18	16%
Improved signage, giving distances and walking times	18	16%
Better quality walking surfaces / fewer obstructions on footpaths	13	11%
Improved showers / changing facilities	11	10%
Safer and more pedestrian crossings on route	10	9%
More information on pedestrian routes	9	8%
Improved air quality	9	8%
Less traffic and parking around the University	7	6%
A walking buddy or group	6	5%
More accessible walking routes suitable for persons with impaired mobility	5	4%
More routes that are suitable to take a buggy or pram	-	0%
Total Responses	187	
Total Respondents	115	

Table 3-9 shows that encouraging walking from these students would be challenging with 55% of respondents stating that nothing would encourage them, with a minority of responses stating typical infrastructure improvements may encourage them.

Table 3-10 shows what students who drive alone to the Gilmorehill Campus stated would encourage them to cycle instead.

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Table 3-10 Encouraging Cycling Amongst Student Car Drivers Alone to Gilmorehill

	Car driver alone	
	No.	%
Nothing would encourage me to cycle / cycle more	75	65%
Improved showers / changing facilities	18	16%
More lockers and storage facilities	18	16%
Better / safer cycle routes and improved lighting	17	15%
More cycle routes away from busy roads	17	15%
Having more time available	14	12%
More direct cycle routes	13	11%
Improved signage on cycle routes including distances/cycling times	11	10%
Better information about cycling routes	9	8%
Access to my own bike	8	7%
Improved cycle parking on site	7	6%
Regular bicycle repair service	6	5%
Less traffic and parking around the University	6	5%
Improved air quality	6	5%
A cycle buddy or group	5	4%
More information on campus cycling facilities	5	4%
Improved security on site	4	3%
Lower speed limits for motorists	4	3%
Guided rides	4	3%
Access to a bike hire scheme	4	3%
Cycle training	3	3%
Access to an electric bike	3	3%
Other	4	3%
Total Responses	261	
Total Respondents	115	

Again, a large percentage of respondent's state that nothing would encourage them to cycle, while a minority state that improved infrastructure for cyclists would provide encouragement.

Table 3-11 shows what students who drive alone to the Gilmorehill Campus stated would encourage them to use public transport instead.

TECHNICAL NOTE

Table 3-11 Encouraging Public Transport Amongst Student Car Drivers Alone to Gilmorehill

	Car driver alone	
	No.	%
More frequent services / more reliable services	74	64%
Lower cost of public transport	71	62%
More suitable / direct public transport links / closer stops	59	51%
Up-to-date travel information on times, routes and fares	36	31%
Extension of the University's interest-free loan and discount scheme for season tickets for staff, to include more public transport operators	22	19%
More secure / better waiting areas	17	15%
Less congestion on roads	12	10%
Improved personal safety and security on public transport	9	8%
Better accessibility to public transport services, including for those with mobility impairments	9	8%
Change of job requirements (resulting in less business need, different working hours or less to carry)	7	6%
Increase in parking permit price or parking fees	4	3%
Loss of car parking permit	3	3%
Other	8	7%
Total Responses	331	
Total Respondents	115	

Table 3-11 shows that lower cost and more convenience in terms of frequency of service and journey times would encourage greater uptake in public transport from those that currently 'drive alone'.

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Table 3-12 Encouraging Less Car Use Amongst Student Car Drivers Alone to Gilmorehill

	Car driver alone	
	No.	%
Lower cost of public transport services	63	55%
More frequent and reliable public transport services	50	43%
Improved accessibility of public transport infrastructure and vehicles	38	33%
Nothing would encourage me to use private car less for travel to the University	28	24%
Lack of parking at destinations	25	22%
Increased cost of parking at destinations	23	20%
Improved quality of walking and cycling routes	11	10%
More congestion on roads	11	10%
Other	8	7%
Total Responses	257	
Total Respondents	115	

Table 3-12 shows that lowering the cost of public transport and more frequent and reliable public transport services are most commonly identified by staff as being likely to encourage them to not drive to the University. These, of course, are outwith the University's direct control.

Encouraging Cycling to Gilmorehill

The University are committed to encouraging students to cycle to the Gilmorehill Campus as demonstrated by:

- Ongoing increase in secure cycle parking on campus
- Ongoing work to provide more and higher quality showers, changing and drying facilities, lockers etc.
- Ongoing provision of other services for cyclists, such as regular Dr Bike's sessions

These fit well with local, regional and national policy objectives to encourage more cycling. Glasgow City Council is investing heavily in a range of infrastructure projects aimed at encouraging people to cycle for every day trips and policy is shifting to encourage active travel as a first choice option.

It has to be acknowledged that many students live so close to the University that walking is much more feasible than cycling and this has to be taken into consideration when considering mode shift targets for cycling. Figure 3-3 shows the results of an accessibility analysis of student home postcode locations using TRACC software to calculate travel time by walking and cycling.

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FigureT 3-3 redacted for Data Protection Reasons

Figure 3-3 Summary of Student Walking and Cycling Times to Gilmorehill

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Figure 3-4 presents cycling travel times to Gilmorehill by postcode sector showing where the main concentrations of students live and where the dedicated cycle routes run with catchments for each route indicated within the table.

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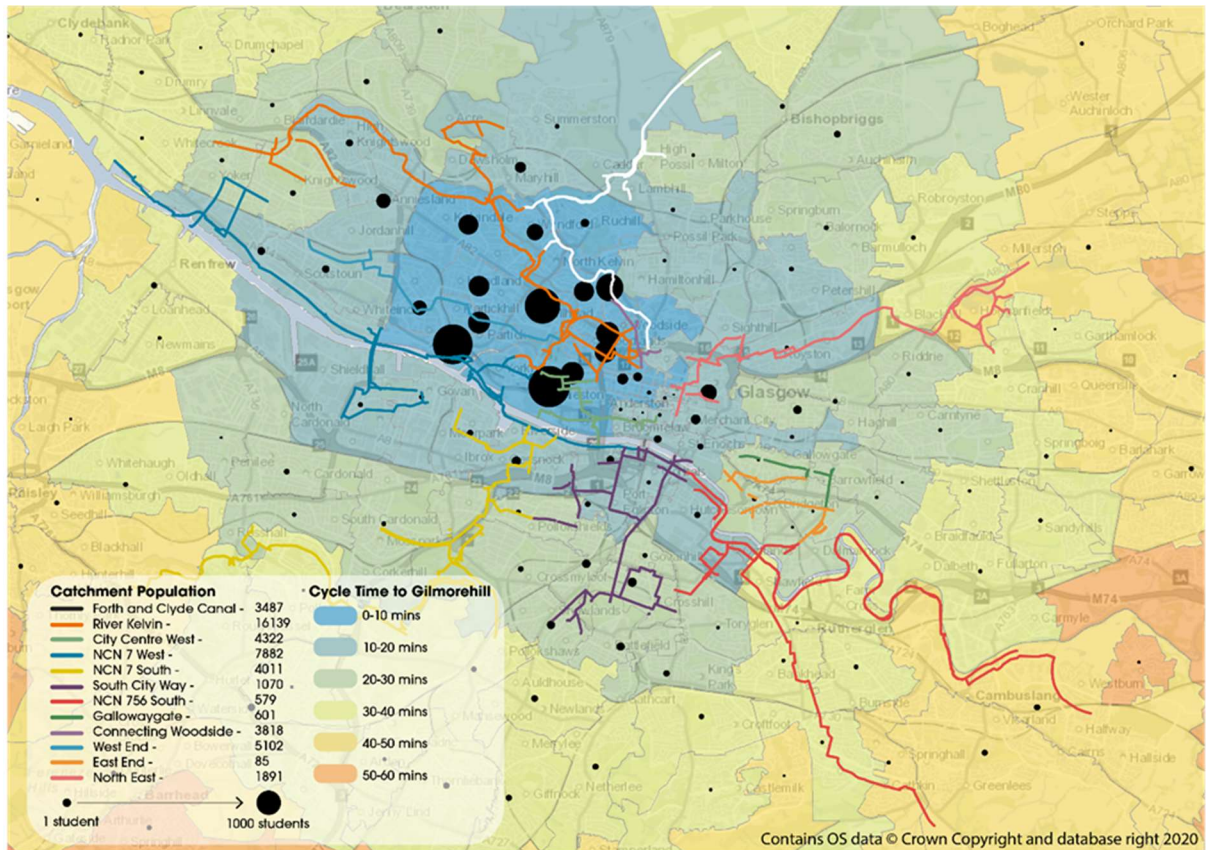


Figure 3-4 Cycle Time, Cycle Corridors and Students Home Postcodes

Key points:

- UofG Action:** Stantec recommends the University should focus on reducing the number of students who drive to the Gilmorehill Campus, given its relative high accessibility that affords options to travel by more sustainable modes. The main shift is likely to be to public transport for these students, where, of course, services and costs are outwith the University's control. The University should engage with public transport operators to ensure the needs of students are considered.
- UofG Action:** As with staff, the University should seek to provide the required infrastructure to accommodate cycling and walking. To promote active travel modes, the University should focus on the benefits of walking and cycling (it is known that people are more likely to be influenced by health benefits and / or saving money).

4 Conclusions

4.1 Mode Shift Priorities

Based on the accessibility analysis and ongoing scenario testing, Stantec recommend that the University requires to focus on encouraging those staff and students who currently drive to use public transport and cycling. However, this will likely not be enough to meet modal shift and related carbon emission reduction targets because public transport still generates carbon. This means some staff and students who already use public transport will require to be shifted to cycling.

As noted previously, student travel patterns seem to be generally more fixed and vary less than staff travel patterns, however, there is still a need to change student travel patterns to achieve

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modal shift and related carbon reductions. In particular, the percentage of students driving could be reduced.

The modal shift priorities are illustrated in Figure 4-1, below.

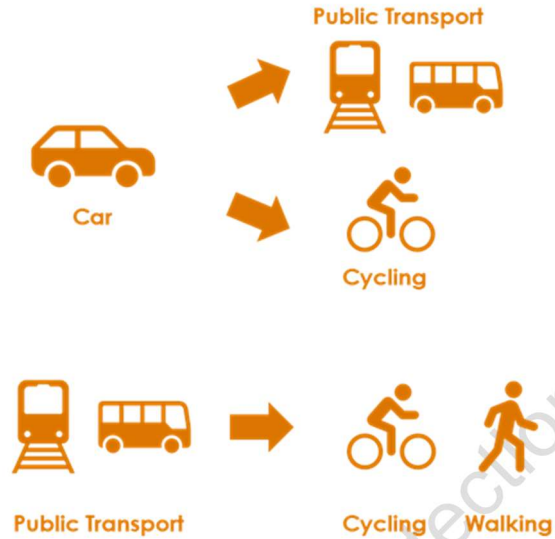


Figure 4-1 Modal Shift Priorities

TECHNICAL NOTE**Appendix A Travel Assumptions**

Appendix omitted for Data Protection Reasons

Redacted version for Data Protection