Snedden, Megan (2018) *"All stick, no carrot": an analysis of policy approaches to encourage modal shift in staff commuter travel at the University of Glasgow.* [MA].

http://endeavour.gla.ac.uk/416/

"All Stick, No Carrot": An Analysis of Policy Approaches to Encourage Modal Shift in Staff Commuter Travel at the University of Glasgow

GUID: 2127196

Word Count: 10,985

Submitted in partial fulfilment of the requirements of the

Degree of MA (SocSci) Social and Public Policy (Hons)

School of Social and Political Sciences, College of Social Sciences,

University of Glasgow

ABSTRACT

Transport is a leading contributor towards the global issue of climate change – therefore, effectuating a modal shift towards sustainable travel is recognised as a key climate change mitigation strategy. 'Workplace travel plans' enable employer organisations to achieve greater sustainability by influencing their staff's travel behaviour. However, their effectiveness is dependent on the scope and nature of policies implemented, and importantly, the reaction to them.

The University of Glasgow recently introduced an updated *Strategic Transport and Travel Plan,* which, amidst impending changes to the car parking management scheme and permit allocation system, is dominated by parking management strategies intending to significantly restrict on-campus parking. Ensuring the effectiveness of the travel plan is particularly pertinent ahead of the £1bn Campus Development project, which is expected to expand the campus, and staff and student cohort.

This study enhanced the evidence base available to inform University travel policy and improve the travel plan's effectiveness. It aimed to: (1) identify factors influencing staff travel behaviour, (2) understand how the University could most effectively promote modal shift towards public transport, and (3) analyse the potential effectiveness of the *Strategic Transport and Travel Plan*.

The main method used was qualitative interviews, conducted with staff who commute by car. This provided in-depth and insightful discussions surrounding the factors influencing travel behaviour and the barriers faced in travelling more sustainably.

This study found the factors influencing modal choice to be complex and determined by wider societal and geographical factors, which restrict the capability of policy levers to stimulate modal shift. Participants valued car travel due to the benefits it provides quality of life, while public transport was deemed inconvenient and expensive in terms of marginal costs. The research findings highlighted that the travel plan, in its current form, has significant potential to stimulate modal shift, and that favourable local authority policy assists this. However, due to the nature of coercive policies to discourage car travel, unsupported by strategies to incentivise and encourage public transport uptake, it found

that staff felt forced to change their travel behaviour, and that such an approach could negatively affect staff morale.

The study recommends that the parking management proposals should be complemented by incentives, such as public transport subsidies, to improve staff acceptance of reforms and the likelihood of modal shift. This approach mirrors recommendations in the existing literature, with providing both 'carrots' and 'sticks' deemed necessary. Furthermore, in recognition that car travel is a necessity for many staff, this study recommends the University should consider strategies to promote more sustainable car travel and optimize its influence over wider travel policy and service provision.

Future research should continually analyse the effectiveness of the travel plan to ensure the recommended policies and practices are having the desired effect, and to enable incremental changes to be made. Further research could target those living within walking and cycling distance of the University, to assess the effectiveness of strategies to promote modal shift towards active travel.

ACKNOWLEDGEMENTS

I would like to extend my thanks to the following:

Keith Kintrea, for supervising this Dissertation and consistently providing substantial and timely feedback and advice over the last nine months.

Viola Retzlaff, Travel and Transport Co-ordinator at the University of Glasgow, for offering her expert insight in to staff travel and sustainability at the University, and for assisting with the recruitment of participants.

All seventeen research participants, without whom this Dissertation would not have been possible, for discussing the issues surrounding staff commuter travel at the University of Glasgow in such a passionate yet eloquent manner.

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1. INTRODUCTION

The Climate Change (Scotland) Act 2009 set out a statutory framework to reduce greenhouse gas emissions by 80 per cent by 2050, targets which are world-leading in terms of ambition (Scottish Government, 2013: 1). However, as outlined in their *Programme for Government 2017-2018*, the Scottish Government (2017: 11-59) intends to introduce a new Climate Change Bill, with even more ambitious targets.

Transport accounts for 30.2 per cent of carbon monoxide emissions and 38.5 per cent of nitrogen oxides emissions (Scottish Government, 2015: 25). Considering road vehicle transport is alone responsible for 72 per cent of all transport-related emissions in Scotland (Transport Scotland, 2015), promoting a modal shift from private car travel towards 'sustainable travel' – namely public transport, walking, and cycling – should be central to strategies to tackling greenhouse gas emissions and air pollution. The Scottish Government holds that there has been insufficient progress made towards a modal shift over the last decade, with a two percent increase in the volume of road traffic, and six per cent fall in public transport passenger journeys (Transport Scotland, 2016: 12).

Existing knowledge suggests employer organisations can have significant influence over staff modal choice through the implementation of workplace travel plans, which include policies to promote public transport, and discourage car travel (Van Malderen, 2012; Vanoutrive, 2014; Petrunoff *et al*, 2016). This study aims to analyse the extent to which the University of Glasgow (2016) *Strategic Transport and Travel Plan 2016-2025* can be effective in stimulating a modal shift in staff commuter travel.

Accordingly, the study intends to answer the following research questions:

1. What factors influence staff travel behaviour at the University of Glasgow, and particularly, the use of private cars for commuting to work?
2. How can the University most effectively promote a modal shift towards public transport?
3. How effective is the University's *Strategic Transport and Travel Plan* likely to be in encouraging a modal shift away from private cars?

This study consists of semi-structured interviews with University of Glasgow staff who commute by car, with discussion centring on commuting behaviours, the factors influencing these, and the barriers faced in using sustainable travel. Understanding the factors influencing staff travel behaviour will enable potential policies to be analysed in terms of effectiveness, and the potential limitations to the University's travel plan to be assessed.

This research will highlight policy approaches to promote modal shift amongst current car commuters more effectively, with scope for the research findings to inform University transport policy and practise.

This Dissertation will be structured as follows:

Chapter 2 will review existing literature on promoting sustainable commuter travel.

Chapter 3 will outline the methodological approach and justify its ability to lead to the realisation of the research questions.

Chapter 4 will present and analyse the research findings of the qualitative interviews.

Chapter 5 will subsequently discuss and interpret the research findings and their implications for policy and practise.

Chapter 6 will gather final conclusions.

2. CONSIDERATIONS FROM THE WIDER LITERATURE ON ENCOURAGING MODAL SHIFT

This chapter will review the existing literature on encouraging modal shift, analyse the effectiveness of employer-led strategies to promote sustainable commuter travel, and explore the University of Glasgow travel plan objectives.

2.1. WIDER POLICY RESPONSES

There is consensus that the overarching aim of transport systems in the context of sustainability should be to encourage 'modal shift' from private car to sustainable travel (Redman *et al*, 2013: 126).

To encourage modal shift, policies which discourage private car travel and those which provide attractive alternatives are recommended to be simultaneously implemented (Batty *et al*, 2015: 109-110). 'Pull' policies to incentivise public transport include improving services in terms of reliability, frequency, convenience, speed, and cost: factors which have been found to have potential to increase patronage (Redman *et al*, 2013: 125). However, such strategies are deemed insufficient if implemented alone. Combined with 'push' policies which make car travel inconvenient or costly, car users can be influenced to change their travel behaviours (Batty *et al*, 2015: 114). Such policies include reducing the convenience of driving by enforcing parking restrictions; and increasing the financial cost of driving through taxes and parking tariffs. Studies have shown increasing the cost of private road transport to have greater success in encouraging modal shift than improving the convenience of public transport services (Redman *et al*, 2013: 124). Yet, such coercive policies may be poorly received by drivers (Dacko and Spalteholz, 2014: 229). Therefore, it is recommended that mutually supportive push and pull policies are introduced to improve the public acceptability and, subsequently, effectiveness of reforms (Petrunoff *et al*, 2017: 12). Studies have reported higher levels of modal shift if a combination of policies are implemented, with an estimated three times greater effectiveness in reducing car travel than isolated interventions (Sprumont *et al*, 2014: 292; Barla *et al*, 2015: 93).

Currently, private car is the dominant mode of travel, with an increasing proportion of the public driving to work, up from 58.7 per cent in 2001 to 62.8 per cent in 2011 (Scotland's Census, 2013). This suggests strategies to encourage a modal shift in commuter travel are lacking and emphasises the need to determine effective solutions. The extensive benefits users perceive car travel to have over sustainable travel influences this dominance. Often, the perceived advantages of car travel, which provide short-term benefits to quality of life, reflects the disadvantages of public transport (López-Sáez *et al*, 2016: 556). In terms of cost, bus and train fares have risen by 14 and 16 per cent respectively over the last decade, whereas car purchasing costs have fell and motoring costs have only witnessed a two per cent real-terms increase (Transport Scotland, 2016: 13-16). Increasing the financial cost of driving is an intrinsic element of discouraging car use and stimulating a modal shift, but at present it is more cost-effective to travel by car than by public transport. Furthermore, car travel provides flexibility and freedom, with users not restricted by public transport routes and time-tabling (Kent, 2014: 113). Considering the overarching benefits that car travel provides, Kent suggests that transport policy and planning should account for it continuing to represent an integral aspect of commuter transport, and that car use should be limited, rather than entirely restricted.

In summary, to achieve a degree of modal shift, policies to disincentivise car travel and encourage sustainable travel should be simultaneously implemented to provide greater effectiveness and ensure better public acceptance. Such a policy-led approach to influence behaviour is essential, as considering the unequivocal benefits of car travel over public transport, individuals are unlikely to change their travel behaviour unless influenced to do so. However, such benefits present obvious limitations to the effectiveness of strategies to stimulate modal shift.

2.2. WORKPLACE TRAVEL PLANS

While the Scottish Government holds overall responsibility for the wider direction and delivery of national transport policy, other actors are essential for implementing local-level policies (Transport Scotland, 2016: 40-45). By acting as the mediator in their localised environment to influence staff, employer organisations can complement national strategies to encourage modal shift (Vanoutrive, 2014: 758; Petrunoff *et al*,

2015: 563). Home-to-work commuter travel is a major source of traffic congestion, pollution, and emissions (Ding *et al*, 2014: 117), and as generators of this travel, organisations have an important role in promoting sustainable mobility.

Through implementing internal transport management policies as part of 'workplace travel plans,' employers can significantly influence staff travel behaviour (Van Malderen *et al*, 2012: 10; 16). Workplace travel plans grew in prominence in the 1990s, with national guidance produced, and requirements placed on Government departments to introduce them (Cairns *et al*, 2010). Currently, the Public-Sector Climate Change Duty requires public sector bodies to "*contribute to carbon emissions reduction targets; contribute to climate change adaptation; and to act sustainably*" (Scottish Government, 2016). Integral to meeting responsibilities placed under this duty, workplace travel plans have subsequently been introduced by many organisations (Petrunoff *et al*, 2016: 39).

As with wider policies to encourage modal shift, travel plans will often include measures to discourage car use and promote sustainable alternatives, tailored to specific needs of the organisation (Van Malderen *et al*, 2012: 11). Parking management strategies, such as restricting parking provision and increasing parking charges, can significantly affect modal choice (Batty *et al,* 2015: 115). Notably, transport practitioners perceive parking management to be an essential component of workplace travel plans (Petrunoff *et al*, 2017: 7; 12). Across the UK, there has been an average 24 per cent reduction in staff car travel in workplace travel plans where parking management policies were implemented, compared to 10 per cent in those that had not addressed parking (Petrunoff *et al*, 2016: 43-45). The cost of parking is key, with charged parking schemes deemed to be the most efficient parking management policy (Sprumont *et al*, 2014: 291). Convenient and inexpensive parking is associated with higher levels of staff commuting to work by car (Rissel *et al,* 2013: 3572), whereas higher parking charges improve the likelihood of sustainable modes being considered (Whalen *et al*, 2013: 134). Increasing parking fees can tackle issues of parking demand and congestion, whilst raising sufficient revenue. However, such strategies to discourage car use should only occur once adequate support for public transport has been provided (Rotaris and Danielis, 2015: 163).

For workplaces where parking permits were allocated, Zhou (2012: 1027) showed that permits restrict day-to-day commuter choice and encourage car use after purchase. In

response, some workplaces replaced seasonal permits with daily permits, improving flexibility and enabling staff to use alternative modes where possible (Whalen *et al*, 2013: 140). Further parking management strategies to enhance flexibility may include car-sharing, which can offer a greener alternative to single occupancy travel (Kent, 2014: 113). This has been encouraged through discounting parking for those who car-share (Cairns *et al*, 2010: 487), although this would pose regulatory difficulties.

Enforcing 'push' policies risks negatively affecting staff morale (Nordfjærn and Rundmo, 2015: 1; Kent, 2014: 114), as restricting workplace parking can be perceived as coercive and invasive on personal freedoms (Petrunoff *et al*, 2015: 565). Conversely, travel plans with public transport incentives and flexible working practises can boost staff retention and recruitment (Roby, 2010: 27). Some organisations have increased staff acceptance of parking restrictions by allocating parking on a needs-basis, further to working alongside transport providers to improve services and discount fares (Petrunoff *et al*, 2015: 566; Cairns *et al*, 2010: 487).

To overcome such concerns, incentive-based 'pull' policies should be simultaneously implemented (Petrunoff *et al*, 2017: 12). Although improving the quality and reliability of services is the most successful strategy to encourage public transport uptake (Fürst, 2014: 1), this is outside the capabilities of most employer organisations. National and local government policy can significantly constrain or enhance travel plans (Cairns *et al*, 2010: 474), and while organisations can work alongside councils, Government, and public transport providers, they are undoubtedly limited in the travel plan policies they can pursue (Macmillan *et al*, 2013: 255). Therefore, subsidised public transport tends to dominate employer-led pull strategies (Yang *et al,* 2015: 215), although, such incentive-based strategies may not be feasible or financially viable for some organisations (Petrunoff *et al*, 2017: 13). Research found that employer-subsidised public transport can reduce car travel by up to 58 per cent, but that this would be financially unsustainable unless complemented by a revenue-raising policy (Rotaris and Danielis, 2015: 163).

To summarise, by implementing internal transport policies, large employers can complement wider government policy to stimulate modal shift more effectively. As with wider approaches, enforcing both 'push' and 'pull' policies are necessary, although

organisations are more limited in the scope of policies to enforce, with parking management and public transport incentives dominating policy approaches.

2.3. THE UNIVERSITY OF GLASGOW TRAVEL PLAN

The University of Glasgow is bound by the Public-Sector Climate Change Duty, required to promote sustainability, and reduce its environmental impact. Its *Strategic Transport and Travel Plan* (University of Glasgow, 2016) is central to attempts to improve the sustainability of staff, business, and fleet transport (Keep Scotland Beautiful, 2016: 5-6).

Ahead of the large-scale development of the Gilmorehill campus, which is expected to significantly increase the staff and student cohort (University of Glasgow, 2014: 8), it is particularly necessary for effective transport management policies to be implemented. The Campus Development project represents a monumental landmark in the history of the University, with £1bn investment over a 20-year period intending to expand the Gilmorehill campus by up to 74 per cent of current capacity (University of Glasgow, 2014: 3-18). Notably, the travel plan is grounded in the transport principles set out in the *Campus Development Framework*, including to (University of Glasgow, 2016: 6):

- actively promote a modal shift through University policy;
- make the campus and surrounding areas accessible for pedestrians and cyclists;
- improve connectivity with existing public transport links.

As effective parking management policies are essential for expanding organisations (Petrunoff *et al*, 2017: 13-14), a new parking management scheme is in the process of development (University of Glasgow, 2016: 25). While not solely motivated to achieve a modal shift, many principles cover sustainability, aiming to (University of Glasgow, n.d.):

- reduce on-campus vehicle parking sites;
- increase car parking charges in line with peer institutions to remove disincentives to public transport and raise revenue;
- encourage a variety of transport mode choices through flexible parking permits.

The existing parking system allocated permits on a first-come, first-served basis, and failed to account for personal circumstances or distance of travel. With permit applications no longer open, new staff, particularly working parents and those living a

considerable distance from the University, are disadvantaged. A new parking permit allocation system, currently under staff consultation, intends to redistribute permits annually on a needs-basis. Further options to introduce daily permits and give priority to car sharers are being explored (University of Glasgow, 2016: 25). The travel plan recognises that measures to promote sustainable travel should be enforced before reducing parking provision and will provide interest-free loans for public transport season tickets (University of Glasgow, 2016: 24). Yet, while the University's approach to parking management is in line with recommendations, its strategies to promote public transport arguably falls short of what is necessary, ultimately lacking substantive incentives.

Strategies to promote public transport have varying success depending on the environment of the workplace, with access to transport links and parking restrictions associated with higher public transport patronage (Van Malderen *et al*, 2012: 11). The University of Glasgow is well-situated for public transport links, served by Subway and railway stations and surrounded by restricted parking zones enforced by Glasgow City Council. Therefore, it is unsurprising that a staff and student survey found the majority to already commute by public transport and active travel. While 'unsustainable' travel is more common amongst staff – two in five (38.6 per cent) of whom travel by car, in comparison to one in ten (10.6 per cent) students (University of Glasgow, 2016: 10) – the University is performing extremely well in comparison to other workplaces, with 62.8 per cent of employed people in Scotland driving to work (Scotland's Census, 2013). Although such statistics are encouraging, there is scope to further improve, with targets to reduce single occupancy car travel from 28.6 to 15 per cent by 2025.

It is common in University settings to have high uptake of sustainable travel, with studies finding correlations between having a University degree and sustainable travel, even after adjusting for residence location and socioeconomic status (Rissel *et al*, 2013: 3573). Although there are a range of occupational groups, this would suggest that universities are attractive environments for promoting sustainable travel. An example of a successful University-based travel plan is at the University of Bristol, whereby a combination of push and pull measures aimed at easing congestion led to an increase in staff walking from 19 to 33 per cent, and a reduction in car commuters from 50 to 33 per cent. It discouraged car use by increasing parking charges and limiting on-site parking,

supported active travel by introducing site-based cycling infrastructure, and promoted public transport by providing employer-subsidised bus season tickets, and running dedicated bus services (Brockman and Fox, 2011: 211-215). Although the individual effects of each strategy could not be identified, this supports other evidence suggesting the most effective travel plans involve implementing mutually supportive policies. Moreover, this example of best practise outlines the scope of policies universities have the capability to introduce.

2.4.   SUMMARY

To summarise, this chapter explored wider strategies to encourage modal shift – with the necessity to synchronously implement push and pull strategies highlighted – and considered the limitations to policies to affect a modal shift. It then analaysed how such an approach could be undertaken by employer organisations to influence staff travel behaviour, assessing the effectiveness of the limited policy approaches organisations have at their disposal, and recognising parking management and public transport incentives to be key to workplace travel plans. Lastly, to provide the necessary understanding for this study, the specific context of University of Glasgow and its *Strategic Transport and Travel Plan* were examined.

Considering the *Strategic Transport and Travel Plan* has been recently introduced as an action plan, with its policies and practises unconfirmed, and the new car parking scheme yet to be introduced, this study presents a prime opportunity to analyse the potential effectiveness of the travel plan and propose policy recommendations to the University.

3. METHODOLOGY:
QUALITATIVE APPROACH TO INFORM TRAVEL POLICY

This chapter will outline the methodological approach of the research study and justify this as means to effectively answer the research questions.

3.1.   METHODOLOGICAL APPROACH TO PRIMARY RESEARCH

This study comprised semi-structured interviews, and in line with most qualitative research, took an inductive approach (Bryman *et* al, 2012: 26), intending to add to the existing body of knowledge, and answer the following research questions:

1. What factors influence staff travel behaviour at the University of Glasgow, and particularly, the use of private cars for commuting to work?
2. How can the University most effectively promote a modal shift towards public transport?
3. How effective is the University's *Strategic Transport and Travel Plan* likely to be in encouraging a modal shift away from private cars?

In-depth interviews were conducted with staff members who regularly commute to work by car, a group specifically targeted to understand through which means the University can most effectively encourage current car commuters to use sustainable transport. Policies implemented without such discussions may fail to effectively influence behaviour in the intended fashion. Participants were asked to discuss their commuting travel behaviours, the factors influencing these, and the barriers faced in using more sustainable forms of commuter transport – see Appendix 3 for the Indicative Interview Topic Guide. Interviews took place amidst the consultation process for the new car parking management scheme and parking permit allocation system, which heavily influenced discussion.

Participants were recruited using 'snowball sampling', whereby staff members who were already known to the researcher were directly contacted as individuals regarding their participation in the study and asked to assist with recruiting participants by disseminating information amongst colleagues.

Participants primarily travelled to work by car and parked on-campus, while some parked off-campus, and others infrequently used public transport if necessary. Participants were recruited from a range of professions, working hours, working and residential locations – see Appendix 4 for the Interview Sample. This range provides significant insight in to the complexities of travel behaviour, while also highlighting the common experience shared by staff who commute by car. With 17 participants, it is unlikely the sample is wholly representative of the staff base.

This study was granted ethical approval by the University of Glasgow School of Social and Political Sciences Ethics Committee. The primary ethical concerns surrounded consent and confidentiality, with complete confidentiality unable to be guaranteed due to the sample size and limited nature of methods through which participants were recruited. To ensure the research was ethically sound, participants were presented with a Plain Language Statement (see Appendix 1) prior to the commencement of interviews, outlining the aims of the study and what participation in the study would involve. Thereafter, participants read and signed a Consent Form (see Appendix 2) to provide informed consent to partaking in the study and being audio recorded. This affirmed that participation in the study was voluntary, consent could be revoked at any time without giving reason, and complete confidentiality could not be ensured. For purposes of confidentiality, participants were assigned pseudonyms, grouped by local authority for residential location, and by occupational groups.

All interviews were transcribed, and thereafter, the data was manually coded and thematically analysed, with the core themes most prevalent throughout the transcriptions determined (Bryman *et al*, 2012: 13). The data was grouped according to each corresponding research question – factors influencing staff travel behaviour, policy approaches to encourage sustainable travel, and limitations of the travel plan – and thereafter by theme.

3.2.   JUSTIFICATION OF RESEARCH METHODS

Qualitative research provides in-depth insight to individuals' personal experiences and perceptions, and unlike quantitative research, enables 'meaning' to be interpreted from data (Holstein and Gubrium, 2010: 152). Qualitative research methods are arguably most effective for gaining insight in to a specific context (Dacko and Spalteholz, 2014: 225), and

useful for gathering information on under-researched topics, such as travel behaviours in specific population groups (Simons *et al*, 2013: 2).

Comparable studies have used qualitative research methods to a similar effect as intended in this study, arguing that it is an essential means to develop effective strategies to promote sustainable transport (Ghekiere *et al*, 2014: 1). It is crucial to understand both the factors encouraging unsustainable travel, and the barriers to accessing sustainable transportation (Simons *et al*, 2013: 1), as this knowledge will enable policy-makers to design evidence-based interventions (Shay *et al*, 2016: 129). For example, by understanding which quality attributes are valued by commuters, the most appropriate improvements to public transport services and infrastructure can be enforced (Dacko and Spalteholz, 2014: 222). Regarding this study, understanding why staff choose to commute by car will give useful insight in to how the University of Glasgow can most effectively exert modal shift.

The existing body of knowledge on workplace travel plans is dominated by quantitative research analysing the success of existing measures (Zhou, 2012; Whalen et al, 2013; Batty et al, 2015; Rotaris and Danielis, 2015). Moreover, the University of Glasgow travel survey provided extensive quantitative data on staff and student travel behaviours. Although some questions focussed on the factors which encourage and discourage different travel behaviours, responses were pre-determined and arguably did not provide sufficient insight (Peter Brett Associates, 2016). This study intended to complement the findings and interpretations gathered from existing quantitative research. Given this, a qualitative approach with in-depth semi-structured interviews was deemed the most appropriate research method to lead to the realisation of the intended research questions.

4. ANALYSIS OF RESEARCH FINDINGS

This chapter will present and analyse the research findings, reflecting on their relevance to the research questions. It will comprise three sections, corresponding with the research questions. Firstly, it will outline the factors influencing staff travel behaviour, and thereafter, present discussion surrounding policy approaches to identify through which means the University's travel plan could most effectively influence modal choice. Lastly, to enable analysis of the potential effectiveness of the travel plan, potential limitations will be understood.

4.1. FACTORS INFLUENCING STAFF TRAVEL BEHAVIOUR

Throughout all interviews, participants perceived the benefits of car travel to be synonymous with the limitations of public transport, focussing on factors such as time, reliability, frequency, cost, and overall convenience. Time and speed represented a dominant influence over travel behaviour, with all participants reporting public transport to significantly extend their commute:

> "[The bus] stops everywhere on the way to Braehead so it would take an hour and a half. I work 4 hours 20 minutes, so if I had to take public transport, that would be 3 hours just travelling, whereas I can do it in 45 minutes by car" *(Katherine, Administration, Renfrewshire).*

> "It's the time it takes, more than the cost. It's reliable, it's just a reliably slow service. It would take 2 hours of my day commuting – it's just not possible" *(Fraser, Teaching and Research, Glasgow).*

The extended commuting time often resulted from public transport services being indirect, with the speed, frequency, and directness of public transport services having more influence on likelihood of modal shift than distance of travel. Due to the location of the University within the West End of Glasgow, travelling by public transport would often require staff to travel to the city centre and get a connecting service:

> "I'd have to get [the bus] to the city centre. From home, it would be a 15-minute walk to the bus stop and then 1 hour 20 minutes on the express bus, whereas it

takes me 35 minutes to drive it. Going home, I'd have to get to the city centre and if I missed the bus, I'd have to wait an hour until the next one" *(Julie, Professional Services, Falkirk).*

Further to the additional time incurred, the above quotation highlights issues regarding the flexibility and frequency of services. Participants raised concerns with having to wait for the scheduled service and not having the freedom to travel at the time of their choosing, further to the time consequences of missing infrequent services:

"Sometimes you can't always get away dead on 5pm. It might be that you've got caught up in something and you've missed the bus. If I miss it, I need to stand there for another half hour" *(Irene, Administration, Glasgow).*

"If you use public transport, you're stuck with nine to five… If it's past 5pm, I'm quite happy to stay on till 6:30pm, and a lot of the time we do that, but with public transport, I'd be really disincentivised to do that. It really restricts that flexibility" *(Carolyn, Professional Services, Glasgow).*

The flexibility and freedom that car travel provides appears to be a key factor influencing modal choice, with having the freedom to travel home when best suits the employee providing a better work-life balance:

"For me, work-life balance is important. I tend to not leave at five and I like the flexibility of being able to stay on or not, and another twenty-seven hours travelling per month is a lot for my quality of life" *(Colin, Professional Services, South Lanarkshire).*

Considering this impact on work-life balance, participants reported that if they were forced to take public transport, the extent to which it would impact their quality of life would affect their willingness to be flexible and work beyond contracted hours:

"It limits how flexible I can be as an employee, and that does sound like the price they might have to pay. It adds on to stress because it's all very well saying 'that's all right, I just won't work extra hours,' but work piles up" *(Carolyn, Professional Services, Glasgow).*

"I'm not going to waste my time putting in fifty, sixty hours a week for an institution that cares so little for you. It's my discretionary time that'll go through the floor, therefore my willingness to get through the workload will go through the floor" *(Alasdair, Professional Services, Renfrewshire).*

For most respondents, car travel presents unquestionable benefits in terms of time-savings and convenience, with slow and indirect public transport services adding unnecessary time to the working day. Furthermore, unaffected by factors such as reliability and frequency, car travel provides a level of flexibility and freedom which is unachievable with public transport. The combination of these factors provides valued benefits to staff's quality of life and impacts on the level of flexibility they can have as an employee of the University.

Regarding the cost of travel, all participants reported car travel to be significantly more cost-effective:

"The cost of fuel for four weeks is £102 including my parking permit...if I was to get a Zone Card it would be £140, plus driving – that's a lot more money" *(Colin, Professional Services, South Lanarkshire).*

"I'd spend £15-16 a day [on public transport], but I pay £7-8 on petrol... When I was without my car for a month, I was absolutely haemorrhaging money on public transport" *(Ruth, Teaching and Research, Argyll & Bute).*

"I had a Zone Card, it took me to work, it cost me £156. I've got a wife and three kids – if they were gonna take public transport, they pay more, but in the car, we all go. It just doesn't work out economically" *(Greg, Manual, North Ayrshire).*

"If I had to drive to the train station, I don't know whether I could afford to have a car and pay for a train ticket. The car would be sitting there, effectively doing nothing, but still costing me as much" *(Julie, Professional Services, Falkirk).*

The above quotations highlight the complexity of commuting journeys, and the extent to which making the switch to public transport would pose considerable difficulties both logistically and financially. Not only is public transport perceived to be inconvenient, but wholly unaffordable. Moreover, as shown through their awareness of the exact costs of car travel versus public transport, and ability to calculate cost-savings, participants

genuinely appeared to have seriously considered alternative travel modes but found car travel to be the most convenient and cost-effective option. However, the cost-savings identified were only marginal costs and did not account for the overall expenditure of owning and running a car. Most participants recognised car travel to be more cost-effective as, due to the wider reliance on car travel, they would require a car regardless of how they travelled to work.

Interestingly, while the cost of public transport discouraged participants, they were less affected by potential increases to the cost of driving. When asked their opinions on the incremental increase to University parking permits from £250 to £300 per annum, all responded that having a permit, with the flexibility, freedom, and unequivocal convenience it provides, was a necessity regardless of the cost:

> "That would make absolutely no difference because it's the convenience, being able to live my life the way I want" *(Angela, Professional Services, South Lanarkshire)*.

> "The benefits would still outweigh what I'd be paying. If it was similar in cost between parking and public transport, I would still choose to drive" *(Christine, Professional Services, Inverclyde)*.

> "I am not averse to price rises within reason. I don't think what they are charging is unreasonable to be honest – I would pay three times that to have the facility to park. For me, it is more of a necessity" *(Sharon, Teaching and Research, East Dunbartonshire)*.

This contradicts evidence that financial disincentives improve the effectiveness of strategies to encourage modal shift. Therefore, it could be suggested that while the cost of public transport discourages staff from changing their mode of travel, the overall benefits to quality of life outweigh the cost of car travel. An influencing factor may be the relatively low cost of the University parking permit, which is currently below average in comparison to peer institutions.

Travel behaviour is further influenced by extraneous factors, such as personal circumstances. Working parents and those caring for elderly relatives were particularly reliant on car travel:

"I would have to cut my hours significantly to be able to come in by public transport because of the school drop-off. I can't work later, I can't work any earlier, and I already cut my lunch" *(Sharon, Teaching and Research, East Dunbartonshire).*

"I need to be available to look after my parents, and that's a priority. I don't like public transport at all, but if it was the only option to get to work then I'd have to do that in the short-term, and in the long-term look for another job" *(Alison, Teaching and Research, Glasgow).*

"There are no alternatives that don't involve car use. If there was a viable alternative, I would take it. I'm running out of options. I have no solution, which is why this is an emotive subject – it's getting to desperation" *(Fraser, Teaching and Research, Glasgow).*

Such factors differ from those discussed above, as they restrict the viable alternatives available to staff and present greater challenges for travel policy to respond to. It suggests there are circumstances under which car travel should not be restricted, in the interest of both the employees and the employer, who may face difficulties with staff retention.

In summary, participants reported that commuting to the University of Glasgow by public transport significantly extends travel time and presents unaffordable financial costs. Staff would not be discouraged by incremental increases to the cost of driving, with other factors which present short-term benefits to overall quality of life valued more. Considering this, it is unsurprising the staff in question would choose to commute by car.

4.2.   POLICY APPROACHES TO ENCOURAGE SUSTAINABLE TRAVEL

Policies planned to come in to effect at the University of Glasgow in 2018 include increases to parking permit fees, reductions to parking spaces, and further restrictions on parking permits. This study found staff may not be averse to higher parking charges, if revenue is invested in promoting sustainable travel:

"If they used the money from [parking] to reduce people's public transport, I wouldn't have a problem. For me, that makes sense, because that encourages the staff that can use public transport, to use public transport" *(Roy, Manual, South Lanarkshire).*

> "In my opinion, they should rank it right up. How far would I go? I don't know. If it was dearer than public transport, probably not, but if it worked out the same, I'd pay it" *(Carolyn, Professional Services, Glasgow)*.

However, this sentiment was not shared by one part-time staff member on a lower pay grade, who found the University parking permit to be inflexible and unaffordable:

> "It's too expensive. As a part-time person, you pay the same as a full-time person – it wouldn't be cost-effective if I had to pay. There should be more flexibility…it is unfair we pay the same as a full-time person, and unfair that lower grades pay the same. It should be a percentage of your salary" *(Katherine, Administration, Renfrewshire)*.

Increasing parking permits to the same level for all staff may be unfair and further alienate lower pay grades. As highlighted, the University may wish to explore issuing permits at a percentage of staff salary and consider part-time staff who would only require parking two to three times per week.

Restricting parking spaces will likely have more influence over staff travel behaviour than increasing permit charges – especially considering Glasgow City Council's restricted parking zones throughout the West End – as this would eradicate much of the convenience of car travel and remove the choice from the employee:

> "I would just have to use public transport, I would have no choice. There isn't car parking for visitors in this area – all the streets are residential you need a permit for" *(Christine, Professional Services, Inverclyde)*.

> "On-street parking is all metered now and there's no car parks nearby. I would just have to stick to the underground and train, and like it or lump it" *(Carolyn, Professional Services, Glasgow)*.

This would suggest restricting University parking, coupled with restrictions to on-street parking in the local area, has significant scope to reduce car travel to campus.

However, this may not be without negative effects on the University, considering some participants recognised the University's current plans to be dominated by coercion and lacking positive incentives:

> "What incentives are they giving us? Nothing – it's all just big stick, no carrot. It doesn't exactly motivate people to change what they are doing" *(Greg, Manual, North Ayrshire).*

> "I think there has to be some encouragement to people, rather than making it a stick, it would be better if they could make it a positive change" *(Colin, Professional Services, South Lanarkshire).*

This signifies that there is a need for 'pull' policies, such as employer-subsidised public transport, as means to improve staff acceptance and likelihood of modal shift. While there is no evidence of this approach being considered at the University, it is an incentive staff would widely welcome:

> "If I was given a cheaper ticket by the Uni, it would be very helpful… The University seriously needs to be doing something" *(Greg, Manual, North Ayrshire).*

> "Absolutely, that would be a great incentive. If they offered something like that in exchange for losing my permit, I'd be happy to take that on" *(Sandra, Professional Services, South Ayrshire).*

Considering earlier discussion regarding cost, this would suggest that rather than as a permanent policy to encourage a modal shift, subsidised transport could be an effective short-term approach to appease staff who have had their parking permit removed and ease their transition to public transport.

However, participants recognised that transport subsidies would be unlikely to provide cost-effectiveness:

> "It would still be more than I pay now…more than my petrol for a fortnight, and I'd still have to pay all the other running costs for my car, whether or not I drive it. They'd have to go some to get me a discount. Even then, there's the inconvenience, the complete inconvenience" (*Linda, Professional Services, Renfrewshire).*

Considering the significant difference in the marginal costs of public transport and car travel, it would likely still cost staff more to travel by public transport even with employer-subsidised travel passes, which constrains this strategy as a long-term solution.

As previously discussed, car travel will continue to dominate and strategies to promote sustainable travel must therefore account for this. Replacing annual permits with flexible passes could give staff the freedom to travel by car and public transport, interchangeably:

> "Putting up the fees for parking would probably encourage me to use my car more, to get my money's worth. If I'm paying a lot of money to park my car, why would I be coming in on the train? I think flexible parking sounds good – that means I would only be paying for two or three days parking" *(Sandra, Teaching and Research, South Ayrshire).*

> "[Flexible permits] would lead more to a subsidy for a Zone Card. If I've got to buy a Zone Card for four weeks to make it cost-effective, that means bringing your car in is a complete and utter waste of money" *(Colin, Professional Services, South Lanarkshire).*

This supports evidence that annual permit or travel pass ownership removes day-to-day commuter choice and suggests flexible permits may be a policy the University wishes to pursue to limit car use and promote sustainable travel where possible, further to benefitting part-time staff. Yet, as recognised, this should complement policies to ensure public transport does not consequently become an even less favourable alternative.

With regards to car-sharing, participants supported the wider principle, but some argued it would not be suitable, considering circumstances such as flexible working hours and caring responsibilities:

> "I would happily car-share, I'm not averse to that at all, but I can't see me convincing someone to car-share with me and do a school drop and a nursery drop, or if they are sick… I don't see how I could be reliable for someone" *(Sharon, Teaching and Research, East Dunbartonshire).*

> "I do think [car-sharing] is going to be the answer, if it's workable, because there's no point coming in one person in a car – it doesn't make sense. I'd prefer to that to being told 'you're not getting [a permit]'" *(Colin, Professional Services, South Lanarkshire).*

> "It's not convenient for me if I have to leave early for my parents and the person relying on me is left in the lurch. It might work for people who are nine to five. For

people that need flexibility, it's not suitable" *(Alison, Teaching and Research, Glasgow).*

The University is exploring the possibility of introducing car-sharing priority permits, and while participants reported that it may not be suitable for all staff, there could be sufficient uptake and reduction in single occupancy vehicles.

To summarise, this evidence suggests that parking restrictions will have the greatest effect on travel behaviour, while increasing the cost of parking would have minimal influence on modal shift. However, several participants highlighted the University's proposals as being coercive – therefore, higher parking fees could be used to subsidise public transport passes, or similar incentives. Lastly, there is scope for alternative policies which involve car use, with appetite for flexible permits and car-sharing.

4.3.   LIMITATIONS OF THE TRAVEL PLAN

There are limits to the policy approaches the University can take to encourage sustainable travel, and wide-ranging compounding factors restricting the potential effectiveness of the travel plan.

Often, the factors influencing participants' mode of travel concerned the quality and quantity of public transport services:

> "You need a car where we are. We're only twenty-odd miles from Glasgow, but it's not served well at all" *(Greg, Manual, North Ayrshire).*

> "If there were other options, I would take them, but because of where I live and the public transport links, I come by car" *(Fraser, Teaching and Research, Glasgow).*

> "If there was a viable option for public transport, I would look in to it quite seriously" *(Julie, Professional Services, Falkirk).*

Notably, having good public transport links was recognised as affecting modal choice to a greater degree than distance of travel. Participants would be willing to take public transport if this was feasible, but ultimately, University travel plan policy approaches will be unable to improve this feasibility, the responsibility for which arguably lies with actors

such as Glasgow City Council, Strathclyde Partnership for Transport, and Transport Scotland, as recognised by participants:

"I would consider getting the bus but there isn't good coverage, and that's really government policy. It's Government that needs to spend more money on infrastructure. If there were more buses going in to the villages and easier access, it would encourage people…but the University as an employer, I don't know what they can do" *(Katherine, Administration, Renfrewshire).*

"I don't think there's much they can do. They can't improve transport links. There are people who have no option but to drive to work. It's catch-22 – they want to encourage people to take public transport, but until that's a viable option, it's just going to make a lot of people unhappy" *(Alison, Teaching and Research, Glasgow).*

Another potential limitation, particularly in terms of parking management, is how such reforms will be received by staff. Participants were probed as to whether the University should exert influence over their travel behaviours, with mixed responses:

"It's a big employer, it should be a civic organisation – I think it's perfectly reasonable that it should take a view of its role in that wider sense" *(Marilyn, Teaching and Research, Glasgow).*

"The University should be a world leader. We should be up there, influencing Government, pointing out all the negative aspects of car ownership and encouraging public transport" *(Katherine, Administration, Renfrewshire).*

"We should all be encouraged to change our behaviour and be more environmentally-friendly. I think the problem is if that's done in a way that doesn't take in to account the genuine adverse effects it can have. The University as an employer should be wary of reducing conditions of service, which is what they are doing to me by making these decisions. If the University makes it more difficult to come in by car, that's going to reduce my quality of life and my happiness" *(Colin, Professional Services, South Lanarkshire).*

While there was recognition from participants that the University has a responsibility to encourage sustainable travel to work, and that this is largely justifiable, there were

concerns surrounding the effects of disincentive-dominated travel policies on the work-life balance of employees:

> "The main objection people have is that they are being forced, not being given a choice, being told by the University how they will travel to work…" *(Irene, Administration, Glasgow).*

> "It's fundamentally unethical. It's effecting your civil liberties quite deliberately. From a HR perspective, it's bonkers. Staff motivation, staff attraction, staff retention. The fact it's discretionary time you're playing with. You talk about how work-life balance matters, but this is effecting work-life balance" *(Alasdair, Professional Services, Renfrewshire).*

Such concerns surrounding staff motivation, attraction, and retention are serious limitations to workplace travel plans more widely, and following in-depth discussions with staff, it can be argued this may also impede the success of the University's travel plan. For some, reforms to the parking management scheme would force them to seek alternative employment opportunities:

> "If I don't get a permit, I would seriously have to look for a job elsewhere. There's three people in this office that would do that. People who will have to take two hours on public transport will choose not to work at the University, and that reduces the pool of capable, diverse staff. It will be the people who can afford to live within a reasonable distance. [The University] may get all their staff travelling by public transport, or walking, but it won't be the current staff they have" *(Linda, Professional Services, Renfrewshire).*

> "I would realistically look elsewhere for work, because it's not practical or feasible to carry on travelling that far. It's forcing you to leave your job" *(Julie, Professional Services, Falkirk).*

The new parking management scheme appears to have caused significant concern for some staff that parking restrictions will make their position at the University untenable due to the added time, cost, and inconvenience that a modal shift to public transport would enforce upon them. The focus of the University's parking management reforms appears to be on *all* staff, rather than those who live closer to the University, have good

public transport links, and viable alternatives to car travel. This may unfairly penalise staff who live a considerable distance from the University, and as the above quotation highlights, reduce the diversity of the workforce. Whilst the detail of such reforms has not yet been published, arguably, it is this lack of clarity which has caused significant concern amongst staff, who are unsure whether they will have a permit in future.

Overall, there are serious limitations to the University's travel plan, which should be considered. Participants would be willing to commute by public transport if it were a viable, attractive alternative, however, it is outside the university's capabilities to make this the case, limited in the nature and scope of policies they can implement. Importantly, there are considerable concerns amongst the staff base regarding the coercive approach to the travel plan, with many feeling forced to change their mode of travel against their will, and this impacting on their willingness to work at the University.

5. DISCUSSION:
WHERE NEXT FOR THE UofG TRAVEL PLAN?

This chapter will: interpret the findings to provide conclusions to the research questions; outline recommendations for policy and practise; and analyse the empirical limitations of the research, suggesting areas for future research.

5.1.   INTERPRETATIONS OF RESEARCH FINDINGS

This study intended to: (1) identify factors influencing staff travel behaviour at the University of Glasgow, (2) understand how the University could promote public transport, and (3) analyse the potential effectiveness of the *Strategic Transport and Travel Plan* in encouraging modal shift. The following section will interpret the findings according to each corresponding research question.

1. What factors influence staff travel behaviour at the University of Glasgow, and particularly, the use of private cars for commuting to work?

The factors highlighted as influencing staff travel behaviour were largely analogous with those outlined in the literature and focussed on the short-term benefits to staff such as time, frequency, flexibility, and freedom, with benefits of car travel synonymous with limitations of public transport. The poor quality and quantity of public transport services, contrasted with the benefits of car travel, were understood to be the primary aversion to sustainable travel, further to the University of Glasgow's location outside the city centre, which reduced the directness and speed of public transport. Above all, staff perceived such factors to significantly influence quality of life.

Although the cost of public transport discouraged participants from modal shift, potential increases to driving costs provided no encouragement. The perception of car travel providing cost-effectiveness may be influenced by the relative low cost of parking permits, but arguably to a greater degree by the cost of public transport being contrasted with the marginal costs of car travel, rather than with all associated costs of car ownership. Therefore, the dominance of car travel and necessity of car ownership influences commuter modal choice, as it is more cost-effective for staff who own a car to utilise it for commuting purposes than take public transport. While cost is a key

influencing factor which discourages modal shift, factors such as time, frequency, and flexibility have more weight, considering benefits to life quality. This would suggest although policy approaches to subsidise the cost of public transport may reduce current disincentives, their success in stimulating a modal shift may be limited.

The study found modal choice to be inextricably locked in to the wider geographical and societal landscape. Geographically, the feasibility of travelling by public transport was significantly affected by residential location, which is difficult to change considering lifestyle, familial commitments, and affordability of living closer to the University or public transport links. With regards to public transport improvements, transport providers are unlikely to justify improving local service provision to smaller towns, considering demand, or lack thereof. The extent to which work-life balance was highly regarded further affected modal choice, with the study highlighting staff to have priorities aside from work, such as family life. Notably, caring responsibilities affected modal choice, with many working parents ultimately reliant on car travel, and unlikely to be influenced by incentives to take public transport or disincentives to travel by car. Arguably, policy should instead focus on those who have viable alternatives.

2. How can the University most effectively promote a modal shift towards public transport?

Reducing parking as planned through the new parking management scheme has considerable potential to affect modal choice. Combined with on-street parking restrictions, it ultimately removes the element of choice, but risks negatively affecting staff motivation, attraction, and retention. Many staff rely on car travel, whether due to caring responsibilities, distance of commute, or poor transport links, so considerable difficulties will arise if, following reforms, there are more staff with genuine needs than parking permits and spaces. This is particularly pertinent in the context of the campus development project completion, which will expand the staff base.

As increases to driving costs are unlikely to sufficiently influence staff travel behaviour, there is scope to increase parking permit fees as means fund sustainable travel incentives. There are arguably benefits to a conservative, piecemeal approach until there is greater staff acceptance. Thereafter, parking fees could be significantly raised to provide some disincentives to car travel, and the necessary revenue to finance sustainable travel

incentives. Although, there would be difficulties quantifying staff acceptance, and such benefits would have to be enforced simultaneous to price rises. There is further concern that permit hikes would disproportionately affect lower paid and part-time staff, with permit fees as a percentage of salary and flexible permits potential solutions.

Mirroring the literature, it was recognised as necessary for the University to provide positive incentives to complement the disincentives central to their existing plans, but as means to improve staff acceptance more than to encourage modal shift. There are substantial restrictions to which incentives the University can conceivably provide, with improving the convenience of public transport largely the responsibility of transport providers, and central and local government policy. The incentives the University can offer are merely financial, such as subsidising public transport; however, factors such as time and convenience have greater influence over travel behaviour than cost. While this implies subsidised travel may not be as significant as the literature suggests, such a policy approach is nevertheless important to improve staff acceptance of parking reforms. However, as this may be financially unsustainable, with existing public transport users also seeking subsidises, this could only be a temporary measure for those relinquishing their permits.

Considering the dominance of car travel and poor staff acceptance of reforms, it is advisable to offer greener, car-based alternatives to single occupancy travel and limit car travel where possible. The University has an existing car-sharing scheme, but this was perceived to be unsuitable by those with caring responsibilities. It may transpire that more staff would be willing to car share if this were means through which to keep their parking permit, and that the scheme may have greater success following reforms. Flexible permits could remove financial barriers to modal shift and enable day-to-day commuter choice between public transport and car travel, further to benefitting part-time employees. However, considering it is less cost-effective to buy daily public transport tickets, flexi-permits may necessitate further subsidies, while there may be considerable administrative and policing difficulties.

3. **How effective is the University's Strategic Transport and Travel Plan likely to be in encouraging a modal shift away from private cars?**

Ultimately, it could be argued that the University of Glasgow's *Strategic Transport and Travel Plan* will be significantly effective in encouraging a modal shift away from private car travel, if on-campus parking is reduced to a similar degree as planned, as this will provide extreme disincentives to car travel and effectively force staff to change their mode of travel. This is assisted by the ever-expanding restricted parking zones enforced by Glasgow City Council throughout the West End, which has removed viable alternatives to on-campus parking. Arguably, on-campus restrictions may not have as much influence over travel behaviour if it were not for this Council policy.

However, the travel plan will undoubtedly have consequences for the wider University. Most participants reported they would either seek other employment or refuse to work overtime if unable to park on-campus, suggesting that while the travel plan is likely to be effective in reducing the proportion of staff commuting by car, this may not be the existing staff base. Issues surrounding staff attraction, motivation, and retention should not be brushed over, but cynically, the University may have little concern surrounding the retention of non-academic staff and may perceive them to be more dispensable. It is possible that under the new system, permits may be allocated to senior and academic staff members for 'business needs', to ensure the retention of more 'valuable' staff.

Although staffing concerns are legitimate potential limitations to the University's travel plan, these are largely avoidable with a more incentive-based approach. While solely restricting parking may stimulate a modal shift, other policies to incentivise sustainable travel are crucial to improve fairness and staff acceptance. Policy should focus primarily on encouraging those who can more feasibly undertake a modal shift, to do so, while promoting greener forms of car travel for those who will encounter more difficulty. However, as discussed, the University is limited in the scope of strategies it can utilise to incentivise sustainable travel, hence why current plans are dominated by 'push' policies, a limitation which may be reflective of how successful travel plans can be more widely. As aversion to public transport is influenced by poor frequency, speed, and overall quality of services, there are obvious limits to what the University can do in this regard. However, the University should look to examples of success and work alongside providers, stakeholders, and planners to achieve public transport discounts for staff and more direct services from nearby towns to the University at peak times.

This study has highlighted the difficulties in achieving greater sustainability. Effectively using policy levers to influence modal choice is undoubtedly challenging in an era where car travel is perceived to be a necessity and the transition to public transport deemed to be inconvenient, unaffordable, and reduce quality of life. Both the factors influencing modal choice and the policy responses to promote sustainable travel are complex, and there is arguably no entirely effective approach to encourage modal shift that is not without consequences, or financial or administrative difficulties. Despite these complexities, it is predicted that the travel plan will be effective in stimulating modal shift. However, as noted, this is largely assisted by the Council's restricted parking zones, which suggests a whole-systems approach to be more effective. This is not only applicable to the context of the University of Glasgow travel plan, but to wider national and international strategies to tackle climate change.

5.2. IMPLICATIONS FOR POLICY AND PRACTICE

Reflective of the research findings, the following proposals for policy and practise are recommended:

1. Provide concrete incentives to encourage sustainable travel amongst staff

'Push' policies, such as parking management, must be coupled with 'pull' policies to encourage sustainable travel. A feasible approach for the University to incentivise modal shift is to provide employer-subsidised public transport, at least as a temporary measure to appease staff who have relinquished parking permits. Such an approach is necessary for maintaining staff morale, further to influencing modal shift. Providing incentives will require investment from the University – to fund this investment, there is scope to increase parking fees over time, with staff willing to pay more to subsidise those who can feasibly take public transport. However, it is recommended increases to parking permits are relative to salary.

2. Explore policies to promote more sustainable car travel

Parking restrictions will present difficulties for staff who do not have viable alternatives – considering this, car travel should be limited, but not entirely restricted. The University should use the new car parking management scheme and permit allocation system to effectively limit car use where possible by introducing flexible permit schemes to enable

day-to-day commuter choice. Car-sharing could be promoted through financial incentives and used as a condition for receiving a permit.

3. Work alongside external actors to influence wider transport and travel policy

As wider policy undoubtedly influences travel plan success, the University must use its influence as a large employer and powerful institution to continue to work alongside public transport providers, Glasgow City Council, and the Scottish Government. Other universities and large organisations have been successful in taking similar approaches to push for wider improvements to public transport services, more peak-time services direct from nearby towns to the University, and staff discounts.

5.3. LIMITATIONS OF RESEARCH

Considering the scope of this study as an Undergraduate Dissertation, there are limitations to the research, with it unable to be as all-encompassing as it could otherwise have been. A notable limitation was the exclusion of discussion regarding barriers to active travel and policy approaches to encourage walking and cycling as travel alternatives. The University does have schemes to promote cycling – and has a generous proportion of staff and students cycling to campus at 9.7 and 6.2 per cent, respectively – but all participants reported their distance of commute to have prevented active travel. Furthermore, the qualitative research methods were unable to present findings which were fully representative of the wider staff base, or which could be generalised. However, a wide range of participants were selected to make the sample as representative as possible, a sizeable sample chosen relative to the scope of the study, and strong themes detected throughout the research. Considering qualitative research does not aim to generalise (Bryman *et al*, 2008: 266), this limitation is not reflective of the appropriateness of the methodology. Moreover, these limitations were expected, and on reflection, this methodological approach remained the most appropriate.

Rather, it is recommended that future research focuses on staff and students who live closer to the University to assess the effectiveness of strategies to promote active travel. Furthermore, to complement and build on this study's findings, further research should be undertaken in conjunction with the University's travel survey to analyse whether recommended policies and practises are having the desired effect.

6. CONCLUSIONS

This chapter will summarise the conclusions drawn from the research and its implications for policy and practise.

6.1. SUMMARY OF RESEARCH FINDINGS

The study aimed to analyse the potential effectiveness of the University of Glasgow's *Strategic Transport and Travel Plan* in encouraging a modal shift in staff commuter travel.

In-depth interviews with staff who commute by car enabled a deeper understanding of the factors influencing staff travel behaviour, which were highlighted to be largely analogous with the existing literature. Factors such as time and flexibility, which provided convenience and short-term benefits to quality of life, were found to have more influence than cost. Public transport was deemed to be significantly less cost-effective than car travel, with the perceived necessity of car ownership meaning the cost difference was understood in marginal terms.

Accordingly, the study found restricting the provision of on-campus parking spaces and permits to have greater potential to influence travel behaviour than increasing the cost of parking, as this would reduce convenience and remove the choice from staff. However, it was recognised the University's proposals were dominated by 'push' policies, and, concurrent with the literature, a more incentive-based approach was necessary to alleviate concerns surrounding staff attraction, motivation, and retention.

Overall, considering proposed restrictions to on-campus parking, it can be concluded the *Strategic Transport and Travel Plan* has significant potential to encourage a modal shift. This is assisted by Glasgow City Council restricted parking zones, which remove off-campus parking alternatives. However, while parking management may be effective in terms of modal shift, this approach would considerably affect staff morale, hence policies to discourage car travel must be complemented with those to incentivise public transport uptake. Furthermore, with many staff reliant on car travel due to geographical and societal factors, policy should be targeted more towards those who have viable alternatives.

6.2. WIDER IMPLICATIONS OF RESEARCH

Considering the impending Campus Development, it is crucial the University gets its approach to travel planning correct. As shown through the existing literature, workplace travel plans have been effective by combining policies to discourage car travel and incentivise public transport. The University have identified means through which to do the former, but achieving the latter is vital to ensuring optimum effectiveness.

Despite employers' best attempts to encourage modal shift through strategies such as parking management, this will always be limited by public transport failing to provide an attractive enough alternative. Nonetheless, any attempts that can be made through workplace travel plans to assist wider transport policy will be beneficial and will be a small but important element of attempts to achieve even more ambitious climate change targets enforced through the upcoming Climate Change Bill.

Further to providing insight in to the complexities of promoting modal shift at the University of Glasgow, this study suggests why there have been wider difficulties with achieving greater sustainability across Scotland. As modal choice is locked in to societal and geographical factors, modal shift is often constrained. Urry (2011) argues that 'developed' countries are locked into high carbon systems, and that this is unlikely to fundamentally change without technological advancements. As highlighted by participants of this study, car travel provides an unrivalled level of convenience to commuters, assisted by poor public transport service provision across Scotland.

Therefore, perhaps the most plausible means to reduce the environmental impact of transport is not to promote a modal shift towards public transport, but to ensure technological advances are reflected in the widespread uptake of ultra-low emission vehicles (ULEVs). The Scottish Government (2017: 39) intend to phase out the sale of new petrol and diesel vehicles by 2032 and promote the use of ULEVs. If through time, such vehicles become 'greener' than public transport, the University of Glasgow may live to regret its decision to not incorporate parking facilities in to the Western Infirmary site as part of the Campus Development project.

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8. APPENDICES

8.1. PLAIN LANGUAGE STATEMENT

Title of Project: "All Stick, No Carrot": An Analysis of Policy Approaches to Encourage Modal Shift in Staff Commuter Travel at the University of Glasgow

Name of Researcher:

You are being invited to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether you wish to take part. Thank you for reading this.

By interviewing members of staff at the University of Glasgow who commute to work by car, this study will aim to understand the factors influencing staff transport habits, and how University can promote sustainable transport amongst staff.

As a member of University staff who commutes to work by car, please consider if you would like to participate in this study. Participation is voluntary, and it is your choice to participate in this study. If you do choose to participate, you can decide not to answer questions, or to withdraw from the study at any point. Participation in this study will involve being asked questions about your transport habits and opinions on various transport policies and practises. The interview will last 30 to 45 minutes.

The interview will be audio recorded and quotes will be included in the publication resulting from this study, which will be presented as an Undergraduate Dissertation. You will be referred by pseudonym to protect your anonymity, and the audio recording will be deleted. However, it is not possible to guarantee complete confidentiality as it is possible that members of staff may be able to recognise each other's inclusion in the dissertation. Please note that assurances on confidentiality will be strictly adhered to unless evidence of wrongdoing or potential harm is uncovered. In such cases the University may be obliged to contact relevant statutory bodies or agencies.

If you would like to participate in this study, you can contact myself: 2127196s@student.gla.ac.uk or my supervisor: keith.kintrea@glasgow.ac.uk with an expression of interest. If you have any questions about your participation in this study, you can also contact the above for further information. If you have any concerns regarding the conduct of this research project you can contact the School of Social and Political Sciences Ethics Officer.

If you would like a written summary of results, please request this by contacting myself: 2127196s@student.gla.ac.uk. As this dissertation will be submitted in April 2018, this will be available from May 2018 at the latest.

Thank you for taking the time to read this information sheet.

8.2. CONSENT FORM

Title of Project: "All Stick, No Carrot": An Analysis of Policy Approaches to Encourage Modal Shift in Staff Commuter Travel at the University of Glasgow

Name of Researcher:

1. I confirm that I have read and understand the Plain Language Statement for the above study and have had the opportunity to ask questions.

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.

3. I consent to the interview being audio recorded.

4. I acknowledge that participants will be referred to by pseudonym in the report arising from this research.

5. I understand that by participating in this study, absolute confidentiality cannot be guaranteed.

I agree to take part in this research study ☐

I do not agree to take part in this research study ☐

_____   _____   _____

Name of Participant   Date   Signature

_____   _____   _____

Name of Researcher   Date   Signature

8.3.   INDICATIVE INTERVIEW TOPIC GUIDE

Background Information:

- Occupation and working hours
- Postcode, miles driven, and time taken to commute

Current Transport Behaviour:

- General car related behaviour i.e. main use of car, how it fits in to lifestyle
- What mode(s) of transport are currently used to commute to work?
- How long have participants been using current mode(s) of transport?
- Factors influencing choice of mode(s)
- If participants' travel behaviour has changed over time, why?

Future transport behaviour:

- Have participants considered other modes – if so, which, and why?
- What would participants recognise as the benefits and drawbacks of public transport?
- What could the University do more to encourage them to use public transport?

Parking:

- Do participants park on campus and/or have a University parking permit?
- What changes to parking would have greatest effect on behaviour?
- How should scarce parking spaces be allocated?
- What would the best alternative be if unable to get a University parking permit?

8.4. INTERVIEW SAMPLE

Name	Occupational Group	Residential Location (by Local Authority)	Approximate Mileage (Home-to-Work)	University Parking Permit?
Angela	Professional Services	South Lanarkshire	18	Y
Irene	Administration	Glasgow	3	Y
Christine	Professional Services	Inverclyde	28	Y
Greg	Manual	North Ayrshire	22	Y
Sharon	Teaching and Research	East Dunbartonshire	6	Y
Linda	Professional Services	Renfrewshire	14	Y
Marilyn	Teaching and Research	Glasgow	4	Y
Katherine	Administration	Renfrewshire	14	N
Colin	Professional Services	South Lanarkshire	18	Y
Roy	Manual	South Lanarkshire	13	N
Fraser	Teaching and Research	Glasgow	4	N
Carolyn	Professional Services	Glasgow	6	Y
Ruth	Teaching and Research	Argyll and Bute	39	N
Sandra	Teaching and Research	South Ayrshire	34	Y
Julie	Professional Services	Falkirk	19	N
Alasdair	Professional Services	Renfrewshire	14	Y
Alison	Teaching and Research	Glasgow	4	Y