Waterford Institute *of* Technology

INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

The workplace: a suitable setting for behaviour change? A mixed-method approach evaluating a workplace physical activity and active travel intervention and the implementation of workplace travel plans in Ireland

A dissertation submitted to Waterford Institute of Technology in fulfilment of the requirements for the Degree of Master of Arts

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Abstract

Introduction:
Levels of physical activity and active travel are low in Ireland. The strong tendency to use the car (driving culture) in Ireland places a considerable burden on public health. Increasing active travel may increase overall physical activity levels in adults. The workplace is an appropriate setting to target to change behavior. The primary purpose of this research was to evaluate the success of a workplace physical activity intervention and examine the important factors to implementing workplace travel plans in Ireland.

Methods:
Study 1 evaluates a 12-month physical activity and active travel intervention in a large workplace across Kilkenny City, using a mixed-methods approach. Seasonally matched repeat cross-sectional surveys (paper or online) were collected in five workplace sites at baseline (June 2017) and follow-up (June 2018). Manual counts were recorded in all five sites at baseline and follow-up to supplement the surveys. Manual counts were conducted at peak travel times to work (7:30am-9:30am and 4:30pm-6:30pm, respectively). A process evaluation was carried out in May 2019 with two key personnel in the delivery of the intervention to help understand the implementation process of the delivered intervention with two key personnel. A qualitative analysis was carried out for Study 2 with interviewees across Ireland with employees in both public and private sectors. Semi-structured interviews were carried out from April 2017 to February 2018.

Results:
In Study 1, a total of 217 respondents (baseline) and 220 respondents (follow-up) completed the self-report survey across all five workplace sites. At baseline, 56% (n=121) of respondents were meeting the National Physical Activity Guidelines. Following the intervention, there was a significant increase in physical activity behavior with 69.4% (n=152) of respondents meeting the guidelines ($p<0.05$). Over 90% of respondents travelled to work by car at both time points. Males has a significantly higher intention to cycle to work compared to females ($p<0.05$). Males were also more likely to automatically use the car travelling to work ($p<0.05$). Understanding behavior change, the role of the committee and meeting the intervention objectives were some of the main factors which impacted on the implementation. In Study 2, the driving culture in Ireland was widely acknowledged. The need for parking management strategies when implementing workplace travel plans was a highly emotive topic. Moving forward, workplaces need to take a more pragmatic and practical approach to promote sustainable travel.

Discussion:
Although there were significant improvements seen at follow-up, the low-dose intervention has many implications. A further understanding of the strategies required to implement successful workplace physical activity interventions in Ireland is needed. In order to implement successful workplace travel plans and improve the research in Ireland, the need to understand the workplace environment, identifying key drivers of the plan and the importance of employee engagement are all crucial factors.

Declaration

I hereby declare that this submission is my own work and that it contains no material previously published or written by another person, nor material which has been accepted for an award in any other university or institute of higher learning, except where due acknowledgement has been made in the text.

Signed: _____

Date:_____

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List of Abbreviations

CHBR	Centre for Health Behaviour Research
CSO	Central Statistics Office
DTTAS	Department of Transport, Tourism and Sport
GPAQ	Global Physical Activity Questionnaire
HI	Healthy Ireland
HSE	Health Service Executive
IPAQ	International Physical Activity Questionnaire
KRSP	Kilkenny Regional Sports Partnership
MVPA	Moderate-Vigorous Physical Activity
SES	Socio-Economic Status
WHO	World Health Organisation

1 Introduction

1.1 Physical inactivity and active travel

In Ireland, only one-third of adults aged 18 years and over are currently meeting the National Physical Activity Guidelines (World Health Organisation, 2018). This low level of adults meeting the guidelines may lead to major public health issues. Physical inactivity shows strong evidence for increasing the risk of major non-communicable diseases such as coronary heart disease, type 2 diabetes, breast cancer and colon cancer (Lee et al., 2012). Lee et al. reported that if the levels of physical inactivity were decreased worldwide by 10%, more than 533,000 deaths could be avoided every year and the life expectancy of the world's population would increase by 0.68 years.

In Ireland there is a strong tendency to use the car (driving culture) and the use of private motor vehicles is problematic for public health, cardio-metabolic risk and contributing to environmental pollution (Knott, Sharp, Mytton, Ogilvie, & Panter, 2019). There is an increasing interest from both public health and transport practitioners in promoting active travel for its potential to relieve traffic congestion, decrease parking pressure and improve health (Petrunoff, Rissel, & Wen, 2016). Reducing driving and increasing active travel (walking, cycling, or public transport) for commuting can result in improved physical activity levels (Yang, Panter, Griffin, & Ogilvie, 2012) as well as obesity rates and the risk of numerous non-communicable diseases (Knott et al., 2019). The workplace is an ideal and opportunistic place to promote active travel with a large proportion of the population working during the day (Malik, Blake, & Suggs, 2014). In Ireland, census data reports that over 1.88 million workers travelled to work, with 61.4% of these workers travelling by car, a statistic that has increased from 45% since 1986 (Central Statistics Office, 2018). Workplace physical interventions have shown a positive improvement in overall physical activity levels and behaviours (Conn, Hafdahl, Cooper, Brown, & Lusk, 2009; Keall, Chapman, Shaw, Abrahamse, & Howden-Chapman, 2018; Malik et al., 2014) with findings for active travel focused interventions reporting similar findings (Cairns, Newson, & Davis, 2010; Dalton, Jones, Panter, & Ogilvie, 2013; Petrunoff et al., 2016).

1.2 Policies related to active travel in Ireland

According to Winters, Buehler, and Götschi (2017) policies related to active travel may operate at various levels of the socio-ecological framework. This framework argues that interventions are most effective when targeting behaviours at physical and environmental levels. Although the main factor for promoting active travel is the provision of quality walking and cycling infrastructure, the introduction of policies may work best when implemented in comprehensive packages (Winters et al., 2017). In Ireland, there are a number of policies that have been introduced in recent years. In 2009, The Department of Transport, Tourism and Sport (DTTAS) published two policies which aimed to create a modal shift to more sustainable modes of transport in Ireland: Smarter Travel – A Sustainable Transport Future (Department of Transport, 2009a) and Ireland's first National Cycling Policy Framework (Department of Transport, 2009b) with a mission to create a stronger cycling culture across Ireland. In 2016, Ireland's first National Physical Activity Plan (Healthy Ireland, 2016) was published with the main aim of increasing physical activity levels across the entire nation, thus helping to improve the health and well-being of the Irish population. Although resources have yet to follow, the key action areas of the 'environment' and 'workplace' will play a crucial role in creating a modal shift from private car to active travel, and help the population achieve the national physical activity guidelines. This plan clearly sets out the physical activity recommendations for adults, which are as follows:

'Adults should be active for at least 30 minutes a day of moderate activity on 5 days of a week (or 150 minutes a week)' p. 6.

However, it is likely that the goal to lower carbon emissions is likely to be an even greater driver towards active transport than the health agenda. A recent report from the Climate Action Network shows that Ireland is off-track with its reductions in greenhouse gas emissions for both 2020 and 2030 (Climate Action Network Europe, 2019). The Minister for Communications, Climate Action and Environment has said that it is likely to cost the state more than €150 million to pay for carbon credits to compensate for the failure to meet the targets (Lee, 2019). The 2019 Low Carbon Agenda (Department of Communications, Climate Action & Environment, 2019) highlights that regional authorities have a range of policy options available to encourage active travel. The other benefits that can be achieved by active travel promotion can include the reduction of congestion, air and noise pollution, as well as energy use and greenhouse gas emissions.

1.3 Study context and rationale

In 2016, the Centre for Health Behaviour Research (CHBR) in Waterford approached a large workplace in Kilkenny City to implement a workplace physical activity and active travel intervention. A full description of the study is thoroughly outlined in Section 3.5. There is a need for more robust study designs on workplace physical activity interventions, with most studies not reporting on the implementation strategy used. Currently, there is a lack of evidence on the implementation of workplace physical activity and active travel interventions in Ireland and this needs to be addressed in order to see successful workplace interventions.

1.4 Aims and research questions

Study 1 in this thesis aims to describe the impact of the workplace physical activity intervention on physical activity levels and to evaluate the implementation strategy used. Study 2 aims to identify the factors that influence the implementation of workplace travel plans in Ireland. The research questions for each study are:

Study 1: A mixed-methods evaluation of a workplace active travel intervention

1. What impact did the intervention have on total daily minutes of active travel and physical activity?
2. What are the individual, social and physical environmental factors that influence active travel to work?
3. What were the factors that influenced the implementation of the workplace intervention described in this study?

Study 2: A qualitative analysis of the implementation of workplace travel plans in Ireland

1. What are the main factors that influence the implementation of workplace travel plans in Ireland?

2 Literature review

2.1 Introduction

This chapter will first discuss the role active travel has on an individual's physical activity levels and outline why the workplace is an appropriate setting to promote physical activity. The factors (individual, physical environmental and social environmental) that influence active travel to work will be reviewed. The chapter finishes with a detailed review of workplace physical activity interventions, with a focus of active travel interventions and travel plans.

2.2 How can active travel increase physical activity

Physical inactivity has a major influence on population health and the non-communicable diseases associated with physical inactivity have increased worldwide (Lee et al., 2012). The analysis by Lee et al. (2012) estimated that physical inactivity was responsible for 6% of the incidence of coronary heart disease, 7% of type 2 diabetes, and 10% each of breast cancer and colon cancer. Physical activity has been shown to have a positive impact on these diseases, based on a number of systematic reviews and meta-analyses (Chastin et al., 2019; Kyu et al., 2016; Li & Siegrist, 2012; Nunan, Mahtani, Roberts, & Heneghan, 2013; Reynolds, McKenzie, Allender, Brown, & Foulkes, 2014; Warburton, Charlesworth, Ivey, Nettlefold, & Bredin, 2010; Woodcock, Franco, Orsini, & Roberts, 2011).

With active travel accounting for 20-40% of all journeys made in the European Union (Department of Communications, Climate Action & Environment, 2019), epidemiological research suggests that reducing driving and increasing active travel can lead to an overall improvement in physical activity levels and reduce non-communicable diseases (Chastin et al., 2019; Kyu et al., 2016; Petrunoff, Rissel, & Wen, 2016; Rissel, Curac, Greenaway, & Bauman, 2012; Yang, Panter, Griffin, & Ogilvie, 2012). This is supported by a longitudinal study in the UK who reported that those who increased their levels of active travel reported an extra 112 minutes of physical activity per week, compared to those who remained unchanged (Sahlqvist et al., 2013). According to Malik, Blake and Suggs (2014) the workplace creates an ideal avenue for the delivery of physical activity interventions. A review of 40 studies in the workplace reported that interventions promoting stair use were found to increase physical activity levels in work, while personalised behavioural interventions increased overall physical activity levels (Commissaris et al., 2016).

2.3 Measuring physical activity and active travel

According to Bauman, Phongsavan, Schoeppe and Owen (2006), physical activity is a complex behaviour to measure. The measurement tools for physical activity typically involve self-report surveys and objective measures like accelerometers. The use of self-report surveys tend to be the most sought after tool because of their low cost and are more practical for large scale studies (Adamo, Prince, Tricco, Connor-Gorber, & Tremblay, 2009). However, the use of self-report surveys faces many limitations due to measurement error. Prince et al. (2008) reported that users are likely to overestimate levels of moderate and vigorous physical activity. Objective measures such as accelerometers have become a more widespread tool, but their time consumption, expensive and poor level of distinguishing activity type are negative traits (Adamo et al., 2009; Bauman et al., 2006; Haskell, 2016). There are no survey instruments that can measure both physical activity and travel behaviours (Adams et al., 2014). With the majority of studies using self-report surveys, the survey tends to be adapted, therefore study comparisons prove difficult. Similar to physical activity measurement, self-report surveys can lead to the underestimation of active travel. Many studies tend to ask about 'the main mode' of travel, which neglects more complex behaviour such as multi-modal travel (Panter & Jones, 2010). Although recent studies have measured active travel as a continuous measure in an attempt to improve survey sensitivity (Adams et al., 2014; Goodman, Sahlqvist, & Ogilvie, 2014), a repeated limitation is over-reporting. Researchers are advocating for the use of mixed methods to accurately measure and report on active travel behaviour (Adams et al., 2014).

2.4 Adult Physical activity levels and travel mode to work in Ireland

In 2013, only 31.3% of the adult population were meeting the recommended physical activity guidelines, with females (32%) reportedly more active than males (31%) (World Health Organisation, 2015). Recently in Ireland we have seen a slight improvement. It was reported in 2018 that only 33% of adults aged 18 years and over are meeting the current physical activity guidelines, with 34% of females and 31% of males meeting the guidelines (World Health Organisation, 2018). The most recent census data indicates that in 2016, 1.88 million workers travelled to work, an 11% increase since 2011 (Central Statistics Office, 2018). In 2016, 61.4% of workers commuted by car, with a small proportion travelling by foot (9.3%), bicycle (3%) and public transport (9.3%) (Central Statistics Office, 2018). In the previous 30 years, the increasing car use in Ireland is evident. In 1986 the percentage travelling to work by car was 45%, with 15.2% on foot and 6.8% by bicycle (Central Statistics Office, 2018).

Car use was at it's highest in 2011, with 63% driving to work by car. The trend in female car drivers has increased significantly over the previous 30 years. In 1986 less than 30% of females commuting to work did so by car. That number has more than doubled with 67% of females reported driving to work by car in 2016. There has been no sharp rise in male drivers with a 3% rise to 56.6% in 2016. Since 2002, there has been a steady incline in the number of commuters by bicycle. In 2002, over 26 thousand males and less than 8,000 females cycled to work. In 2016, over 41 thousand males and almost sixteen thousand females commuted to work by bicycle (Central Statistics Office, 2018).

2.5 **Factors that influence active travel to work**

Individual factors

The role of individual factors in determining travel mode has been the focus of many papers and reviews. The main factors are reviewed here are age, sex, family, car ownership, and education. Age was not found to be a consistent determinant of modal choice, with De Witte, Hollevoet, Dobruszkes, Hubert, and Macharis (2013) reporting it only significant in about half of the cases studied. Although this comprehensive review included the home to work commute, it was not the primary focus of the review. Similarly, Dalton, Jones, Panter, & Ogilvie (2013) reported inconsistent findings for age as a predictor of adult's mode of travel to work in the UK. However, a cohort study carried out in Australia by Merom, Miller, van der Ploeg, and Bauman (2008) highlighted that the age of an individual is a significant predictor of active commuting to work, with participants aged 45-65years 70% less likely to engage in active commuting (walking, cycling and/or public transport) over a single day, compared to those aged 18-45years. Similarly, in the UK, Pistoll and Cummins (2019) reported that middle and older aged adults were less likely to take up walking and cycling as a mode of transport, compared to younger adults. In an Irish context, age was also reported to influence modal choice to work, i.e. active commuting was less common with increasing age (Commins & Nolan, 2011). Employees aged 25-29 were 28% and 33% less likely to travel to work on foot/bicycle, or by bus/train, respectively, compared to those aged 15-24. However, the results from Caulfield's (2014) comparison of cycling to work from the 2006 and 2011 census data are slightly conflicting. Results suggest that in 2011 the younger age groups were less likely to cycle to work in Dublin, Cork and Galway than those aged 35-64 years. Although those aged 15-24 who commute to work by bicycle increased by almost 50%

in 2016 from 2011, this age bracket was reported less likely to cycle to work (Central Statistics Office, 2018).

Although De Witte et al. (2013) reported that there is no real consensus on the relationship between sex and modal choice, other studies report consistent evidence that males are more likely to actively commute to work than females (Dalton, Jones, Panter, & Ogilvie, 2013; Rissel et al., 2013). In Sydney, a large city with a limited amount of designated cycling infrastructure reported females were 66% less likely to cycle to work than males (Rissel et al., 2013). In the UK, the number of males commuting to work by bicycle and foot outnumbered females by a ratio of 4:1 and 2:1, respectively (Dalton et al., 2013). In Ireland, figures from the most recent 2016 census data indicate that there are almost 30,000 more females commuting to work by car than males (Central Statistics Office, 2018). The number of walkers to work increased by 4,500 from 2011, with almost 55% of walkers being women. There was a sharp rise of 43% in those commuting to work by bike in 2016 compared to 2011, with over 2.5 more male cyclists than females (Central Statistics Office, 2018).

Car ownership is reported to have a particularly strong inverse association with active commuting to work (Bopp, Child, & Campbell, 2014; Dalton et al., 2013; Heinen, van Wee, & Maat, 2010). The cross-sectional data from Cambridge, UK (Dalton et al., 2013), reported that those who owned one car were almost 98% less likely to walk, 93% less likely to cycle, and 94% less likely to use public transport to commute to work in comparison to those who didn't own a car. For those who own more than one car, they were over 99% less likely to walk, cycle or take public transport to work. Similar results were reported by Zander, Rissel, Rogers and Bauman (2014). Those with less than 1.3 cars per household were 11 times more likely to cycle to work, and approximately 2.5 times more likely to walk to work than those with 1.9 cars or more per household. This inverse association was not as pronounced when the data was analysed for women only. Bopp et al. (2014) reported that 58% of women were less likely to actively commute to work when there is a car available in the household. More recently in the UK, those with no access to a car were over 200 times more likely to walk to work (Batista Ferrer, Cooper, & Audrey, 2018). In Ireland, car availability is also reported to be a significant determinant of active travel when analysing data from the 2006 census. Those with a car available in their household were 87% less likely to travel by foot or bicycle and 82% less likely to travel by bus or train, compared to those with no car available (Commins & Nolan, 2011).

Many studies have reported a negative association between active commuting to work and the number of children in a family. This has been reported both in places with high and low levels of active travel (Bopp, Child, & Campbell, 2014; Panter, Griffin, Dalton, & Ogilvie, 2013). Cross-sectional data from the US on the factors associated with active commuting to work in women, reported that adults with children are 27% less likely to actively commute to work than those with no children (Bopp et al., 2014). Similar results from the UK were reported, whereby adults without children were twice as likely to walk for transport than those who have children (Panter et al., 2013). Likewise, in Ireland, having a single child under the age of 19 years is inversely associated with active commuting. Most recently, there was a 23% increase in parents with pre-school children who spent over 60 minutes commuting to work (Central Statistics Office, 2018). It is plausible that people with children are less likely to engage in active travel due to family commitments, a complicated schedule of being a working parent, as well as dropping children to cheche or school before and/or after work (trip-chaining).

Similarly, a higher level of education has also been consistently shown to increase the likelihood of active travel to work (Dalton et al., 2013; De Witte et al., 2013; Merom et al., 2008; Panter et al., 2013; Rissel, 2013). Merom et al. (2008) found those with a higher education level in the metropolitan areas of Australia were more likely to engage in active commuting to work. Panter et al.'s (2013) cohort study found that, after a follow-up of 12-months, participants with a degree were 3.5 times more likely to take up an alternative mode of travel to the car. A cross-sectional study from those participating in the 'Commuting and Health in Cambridge Study' also reported similar findings, where those without a degree were almost 60% less likely to walk to work, than those who had a degree (Dalton et al., 2013). In the Greater Dublin Area, those who had a third level education were 12% and 16% more likely to travel to work via foot/bicycle, and bus/train, respectively (Commins & Nolan, 2011).

Socio-economic status (SES) can be measured at either the individual level, household level, or area level, but will be reviewed here at the individual level for simplicity. There is less consistent evidence that the SES of an individual can impact on an individual's modal choice (De Witte et al., 2013; Heinen et al., 2010). While Rissel et al. (2013) reported no clear pattern between an individual's SES and cycling to work, according to Rind, Shortt, Mitchell, Richardson, and Pearce (2015) the relationship between SES and active travel can vary by time and place, where higher levels of active travel are found in poorer countries with limited

resources. This association between SES and active travel is supported in the UK by Rind et al. (2015) on environmental deprivation. It was reported that participants with the lowest income had higher levels of active travel, and that the percentage of trips in active mode rarely differed across different areas of environmental deprivation. Contrasting results were reported in the most recent 2016 census data in Ireland. Those in a higher social class are more likely to actively commute to work with 16% of 'professional workers' and 31% of 'managerial and technical' accounting for those that cycled to work. In comparison, 'unskilled workers' represented only 4.5% of cyclists commuting to work (Central Statistics Office, 2018). However, it is important to note that all sustainable transport modes cannot be treated collectively. For example, a small-scale study carried out on the usage of the Dublin bike-sharing scheme identified that 57% of respondents earned a salary of more than €40,000 annually, while 17% earned less than €30,000. This indicates that the Dublin bike sharing scheme has a relatively affluent user profile (Murphy & Usher, 2015).

Physical environmental factors

The distance travelled from home has also been highlighted as a determinant of active commuting to work (Dalton et al., 2013; Ogilvie et al., 2011; Panter, Griffin, Jones, Mackett, & Ogilvie, 2011; Saelens & Handy, 2008). Cross-sectional data from the 'Commuting and Health in Cambridge Study' by Panter et al. (2011) reported that those who lived less than three km from work were three times more likely to walk compared with those living greater than three km away. Dalton et al. (2013) stated that the estimated odds of walking were 3.9 times lower for every additional kilometre between a person's home and their workplace. Similarly, the estimated odds of walking were 1.3 times lower for cycling (relative to driving) for each additional kilometre between work and home (Dalton et al., 2013). In Spain, Cole-Hunter et al. (2015) found that commute distance was negatively associated with commuting by bicycle in both frequent and infrequent cyclists. Interestingly, 31% of frequent cyclists stated they would be 31% less likely to cycle due to distance, compared to 17% of infrequent cyclists. In Ireland, there is evidence that the car is the most common mode of travel, even for short distances. The national census data reported that for journeys less than 8km, 72% of the adults' travel by car compared with 16% on foot and 1.5% on bike (Central Statistics Office, 2018). It is important to note that over-estimating the perceived distance to work may act as a discouraging factor in walking for transport (Stigell & Schantz, 2011).

The relationship between the availability and cost of car parking and active commuting is significant. It is especially significant in areas of high population density. The availability of car parking near a person's workplace in Auckland, New Zealand has been shown to negatively influence active travel, whereas those without car parking were more likely to use public transport on the commute to work (Badland, Garrett, & Schofield, 2010). In the UK, participants from the 'Commuting and Health in Cambridge Study' reported the availability of free car parking at work significantly reduced their likelihood of active commuting, with participants 77% less likely to walk, and 46% less likely to cycle to work (Dalton et al., 2013). Similar results were reported in the US, with those who have access to free car parking 70% less likely to actively commute (Buehler & Pucher, 2012). In the US, it was reported that women who perceived there to be parking problems in their workplace were 14% more likely to actively commute to work (Bopp et al., 2014).

While the availability and price of car parking at work is important for creating a modal shift, the presence of cycling infrastructure at work is also important. There is a strong relationship between bike parking and cycling for transport. In the US, women were twice as likely to cycle to work when the employer offered bike parking, and 80% more likely to cycle to work when the employer had policies for bike storage (Bopp et al., 2014). A cross-sectional study by Cole-Hunter et al. (2015) carried out in Barcelona, found that the quantity of public bicycle stations for the public bike sharing scheme 'Bicing', within the home area (and not work), was positively associated with being a bicycle commuter (either frequent or infrequent). Buehler et al. (2012) reported that the odds of cycling to work are greater for employees with access to both bicycle parking and shower facilities, as opposed to just bicycle parking. The need for other cycling infrastructure can also impact on employees commute mode to work. An observational study during peak commuting times in Australia showed females were 43% more likely to use off-road paths rather than roads without bicycle facilities, or roads with on-road bicycle lanes (Garrard, Rose, & Lo, 2008). This is supported by two comprehensive reviews by Fraser and Lock (2011) and Buehler et al. (2012). Both reviews reported that the provision of separate cycling paths and cycling lanes is needed, especially where there are high volumes of motorised traffic (Buehler et al., 2012). In an Irish context, a case study of Dublin by Caulfield et al. (2012) reported that facilities that are segregated from traffic are the preferred form of cycling infrastructure, regardless of an individual's cycling confidence. Surprisingly, better facilities at work, better signage,

improved information and increased bike parking at work were found to be unlikely to encourage employees to cycle to work (Caulfield et al., 2012).

Social environmental factors

Although the social environment has been consistently shown to influence physical activity levels, the impact it can have on active commuting is limited (Clark & Scott, 2013). Kim, Rasouli and Timmermans (2018) explains that the study of social networks in active travel research was overlooked and has only gained momentum recently A review carried out by Panter and Jones (2010) identified six studies across the US, Europe, and Australia, which examined social support from family and friends and their influence on active travel. They failed to draw any definitive conclusions. However, there is consistent evidence on the relationship between social norms and active travel (Bopp et al., 2014; Clark & Scott, 2013; Cleland, Timperio, & Crawford, 2008; Heinen et al., 2010; Páez & Whalen, 2010; Willis, Manaugh, & El-Geneidy, 2014). The review carried out by Heinen et al. (2010) indicates that people may adapt their behaviour in line with a norm, in order to fit in with a certain group. Creating social support networks has been shown to increase cycling for transport. In a review carried out by Kim et al. (2018), males and younger adults tend to travel a longer distance for the social interaction. Social encouragement has also been shown to have mixed results in relation to influencing active commuting (Bopp et al., 2014; Clark & Scott, 2013; Cleland, Timperio, & Crawford, 2008; Panter & Jones, 2010; Sherwin et al., 2014). In the UK, Sherwin et al. (2014) reported that encouragement from work colleagues led to an increase of new cyclists commuting to work, while also reporting a real sense of a cyclist community. This study also reported positive findings for encouragement from friends, and even their own cycling effort was influencing others to uptake commuting by bike. Similarly, results from the US (Bopp et al., 2014) reported that women whose co-workers had a positive attitude toward active commuting had a 28% increased likelihood of actively commuting to work. In Ireland, there is a greater shift towards the social acceptability towards cycling for transport. Recently, an open letter was sent to An Taoiseach which was co-signed by the major health bodies to ensure that active travel will form an integral part of the All-of-Government Climate Plan (Diabetes Ireland, n.d.)

The difficulties associated with trip chaining have been highlighted as a negative determinant of active travel within the social environment (Heinen et al., 2010). According to De Witte et al. (2013), trip chaining is one of the most significant factors affecting modal choice, yet it is

one of the least reviewed factors. Trip chaining is highlighted as a significant influence on modal choice because trip chaining is determined by all trips in the chain, unless the first trip is to work (Nurul Habib, Day, & Miller, 2009). Primerano, Taylor, Pitaksringkarn, and Tisato (2008) reported that trip chaining is more commonly associated with women because they typically report a higher number of daily trips compared to men, which can include shopping, drop-offs, and pick-ups. It is highly likely that having children can impact on a person's commute to work. Parents reported to be more likely to commute by car to work if they had access to a car (Bjørkelund, Degerud, & Bere, 2016). A more recent study in the UK reported that not combining the school run or caring responsibilities were over four times more likely to commute by public transport (Ferrer et al., 2018). This may explain why a change in work and family commitments for women can lead to a greater willingness to cycle to work (Gatersleben & Appleton, 2007). Shiftan (2008) states if the individual was to adapt their behaviour for shopping (or other activities) within their neighbourhood as a single trip, there is a higher likelihood they will choose a non-motorised method of travel.

2.6 **Workplace physical activity interventions**

Interventions based on a socio-ecological approach (Mc Leroy, Bibeau, Steckler, & Glanz, 1988; Stokols, 1996) are needed to change human behaviour where actions are needed at multiple levels. Aittasalo et al. (2019) report that studies to date have not focused on a multi-level approach targeting interpersonal, organisational and infrastructural factors, with a more pragmatic approach to implement interventions in the real world needed (Aittasalo et al., 2019; Petrunoff et al., 2016).

Several reviews have reported on workplace physical activity interventions and reported positive outcomes on step counts, compliance to physical activity guidelines, active travel and stair climbing behaviours (Conn, Hafdahl, Cooper, Brown, & Lusk, 2009; To et al., 2013; Keall, Chapman, Shaw, Abrahamse, & Howden-Chapman, 2018; Malik et al., 2014). However, the results for these interventions are inconclusive. To et al. (2013) reported that only 60% of the reviewed interventions reported an improvement in physical activity levels, steps of BMI, with most interventions lasting only 6 months. According to Keall et al. (2018), the majority of reviews have focused on the effects of individual-level strategies, with few reviewing the effects of multi-stage levels of the social system. However, To et al. (2013) reported that interventions with a more robust research design were less likely to report positive findings, with the length of the interventions considered to be a confounding factor.

It is clear that establishing a greater evidence base on implementing workplace physical activity interventions is needed.

A six month workplace physical activity intervention was carried out in British Columbia on males in four workplace sites by Johnson et al. (2016). The implementation of the POWERPLAY programme involved on-site launch and recruitment, educational materials, workplace incentives. Promotional posts were used to advertise and create interest in the programme, with the educational materials to encourage increasing physical activity and healthy eating. The workplaces determined which components of the programme to implement and who would facilitate the implementation. The use of champions was also encouraged. Results showed an increase of 112 minutes per week of moderate-vigorous physical activity among employees. Although this study lacks a control, a strength of this study was the tailoring of the programme to the participants desire while accounting for the distance to home from work to make it more accessible. Similarly, results from a pre and post workplace physical activity intervention in Canada showed an average daily step increase of 788 steps over a six-week period (Lau & Faulkner, 2019). The aim of this intervention was to increase habitual physical activity levels and it consisted of both individual and organisational components.

2.7 **Workplace active travel interventions**

The findings for workplace active travel interventions are similar. According to Petrunoff et al. (2016), although the outcomes of many workplace active travel interventions look promising, the low level of controlled studies available increases the risk of bias in relation to drawing such a conclusion. This can be seen when the effectiveness of whole-workplace walking programme across five workplaces in the UK was examined Adams, Chalkley, Esliger and Sherar (2017). The intervention consisted of volunteer employees to act as ‘walking champions’, to take an active role in planning and delivering activities with support and resources available to them. The aim was to provide enough support to continue the promotion beyond the funded programme. The champion selected activities based in the interests of their workplace. The intervention outlined a seven-step intended implementation strategy and included steps such as engagement from senior management, the development of a steering group and the delivery of eight activities in each workplace over a two-year period. Although results showed no significant differences in usual mode of travel to work, in the time spent walking to and from work, walking during the working day and incidental

walking, there was a high risk of bias due to the low survey response and the lack of a control group. In comparison, a multi-level, randomised control trial to increase active commuting to work was carried out in 16 Finnish workplaces by Aittasalo et al. (2019). The intervention involved two phases: Phase 1 (environmental improvements) and Phase 2 (social and behavioural strategies). In Phase 2, each workplace nominated a team to carry out the strategies. The team made an action plan for their implemented strategies, with an average number of ten strategies per workplace. These teams were supported with a workbook of strategies categorised into individual, working unit and organisational. The specific details of these strategies were not reported. Although Aittasalo et al. (2019) reported positive change in employees' intention to cycle to work following Phase 1 and an improvement in employee's motivation for walking and cycling to work (8.7% and 5.5%, respectively), there was no effect on actual active commuting behaviour. It is plausible to suggest that the intervention was hampered due to real-world challenges faced during implementation such as the delay in construction work in Phase 1, and a change in workforce dynamics.

2.8 Rationale for promoting physical activity and active travel in the workplace

Reviews of workplace interventions to increase physical activity and/or reduce sedentary behaviour have shown inconclusive findings, mainly due to the diversity of implementation strategies and lack of long-term evidence (Commissaris et al., 2016; Malik et al., 2014). There is an overwhelming need for more robust longitudinal, large scale active travel interventions conducted in real-world settings (Milat, Bauman, Redman, & Curac, 2011; Petrunoff et al., 2016; Winters et al., 2017). A process evaluation of interventions is important to assess the level of implementation and to link this with the effectiveness of the intervention. Some studies have reported findings regarding the level of implementation (Aittasalo et al., 2019; Lau & Faulkner, 2019) but with limited regard to explaining the extent of the intervention impact, the entire implementation process and the potential for scaling-up (Adams et al., 2017). The use of a mixed-methods approach to examine the acceptability of an intervention was reported as an acceptable approach to examine further research (Seaton et al., 2017). Similarly, The RE-AIM Framework was successfully used by Adams et al. (2017) to evaluate the implementation of a workplace walking programme in the UK and will be based upon for this study.

2.9 The need for mutually reinforcing intervention measures

Implementing a parking management strategy in the workplace is the most effective measure to reduce the level of car travel to work and increase levels of active commuting (Cairns, Newson, & Davis, 2010; Dalton et al., 2013; Petrunoff et al., 2016; Petrunoff, Rissel, & Wen, 2017; Petrunoff, Rissel, Wen, & Martin, 2015). Cairns et al. (2010) suggests that parking management was the single most important factor in achieving behaviour change. The methods of parking management included introduction of permits, parking charges or compensation for not using a private vehicle. It was also reported that the fees incurred from parking charges were a useful source of revenue for travel plans. Using cohort data from the Commuting and Health in Cambridge study (2009 – 2012), Knott et al. (2019) examined associations between changes in parking policies and the proportion of trips made by various modes of travel of 1,427 employees. Data collection consisted of a questionnaire at three timepoints as well as a seven-day travel diary. The introduction of less restrictive parking policies resulted in a 11.4% increase in the proportion of trips undertaken by car and a reduction in the proportion of trips made by walking or cycling at follow-up. Although cross-sectional studies report that employees who pay for parking or have no access to parking are more likely to actively commute, there is a lack of longitudinal evidence (Petrunoff et al., 2016). It is important to note that implementing a parking management strategy doesn't come without a challenge. The potential challenges facing a workplace when implementing parking management strategies were listed by Petrunoff et al. (2017). They include free parking (in employee contracts), shift work and staff unions claiming parking is an essential service for employees.

The implementation of parking management can be supported by using a soft approach. The need for interventions to consist of both 'carrot' and 'stick' approaches has been highlighted as the most effective method to achieve behaviour change (Brockman & Fox, 2011; Davies, 2012; Petrunoff, Rissel, & Wen, 2016; Petrunoff et al., 2017, 2015; Roby, 2010). Petrunoff et al. (2015) conducted a natural experiment study on the long-term impact of two similar travel plans in Western Australia. One workplace travel plan implemented a 'carrot and stick' approach with a robust parking management plan. The 'stick' approach consisted of parking prioritisation, paid parking and the introduction of a permit system. In comparison, the second workplace implemented a 'carrots' only approach and did not include a parking management plan. The plan included different strategies to encourage a modal shift such as awareness raising, fleet fuel reduction targets and loan bicycles. While both travel plans

yielded positive results, the carrot and stick travel plan showed a far greater reduction (42%) in driving by staff compared to a 5% reduction in the carrot only travel plan. Although response rates between the two sites were low for this study, the results were consistent with those reported by Cairns et al. (2010). Another workplace travel plan consisting of a 'carrot' and 'stick' approach in Bristol, UK was investigated by Brockman and Fox (2011). The plan included heavily restricting parking, parking permits, increased parking charges, improved changing facilities and infrastructure for active commuters. The carrot measures included a bicycle-purchase scheme and a car-sharing scheme. The impact of the travel plan over a nine-year period showed a significant impact on the mode of travel to work with a 19-30% increase for walkers, 7-12% increase for cyclists and a 33-55% decrease in car use. Although the results were positive, the lack of a control group means that the change in commuting patterns cannot be directly linked to the travel plan. While the appropriate measures that organisations need to adopt to change travel behaviour may vary, an overall plan which addresses parking management in addition to improving options for active commuting is essential.

2.10 Workplace travel plans

A workplace travel plan is a package of measures and policies aimed at supporting sustainable travel for work-related journeys. It compromises of actions to promote walking, cycling, public transport and other forms of sustainable travel (National Transport Authority, 2013). Some workplaces have developed a travel plan before introducing any intervention measures. Despite the workplace having the potential to increase active commuting levels of staff, while also addressing organisational barriers and the poor levels of physical activity, there are few evaluations of the effectiveness of workplace travel plans published in the peer-reviewed literature and their effectiveness has not been proven. A Cochrane review of organisational travel plans was conducted by Mac Millan, Hosking, Connor, Bullen and Ameratunga (2013). This rigorous systematic review assessed the effectiveness of 17 organisational travel plans in a work or education setting. The review concluded that there was insufficient evidence for the effectiveness of these plans for improving health. However, this review contained controlled studies that investigated only single actions within travel plans and did not investigate the effect of the overall travel plan itself. Following an examination of 21 travel plans by Cairns et al. (2010) an 18% reduction in the number of car journeys made were seen, with the 'typical plan' achieving reductions ranging from 10-30%. According to Cairns and colleagues, the travel plans that made substantial reductions were

well developed plans. The proportion of staff actively commuting to work had almost doubled with some organisations recording a 23% increase in walking, 21% in cycling and 53% using public transport.

2.11 Key components of the intervention implementation process

There are many important factors that influence the implementation process of workplace active travel interventions. These include engagement with senior management, developing a strategy, the need for up-skilling employees, creating a local collaboration, appointing a coordinator and an organisational committee. As highlighted earlier, the development of comprehensive workplace interventions contains a balanced mix of pro-walking and cycling measures and car restrictive measures generates the greatest intervention effect.

According to Petrunoff et al. (2013) engagement with senior management, carrying out a needs assessment and developing a strategy were the first steps in developing a successful hospital travel plan in Liverpool (Petrunoff et al., 2015). The following stages of the plan include implementation, evaluation and maintenance which are consistent with the health promotion programme management cycle of planning, implementing, evaluating and sustaining a health promotion programme (Bartholomew & Mullen, 2011). The 'best practice' cases of travel plan implementation have achieved large increases in active travel and reduced driving to work (Brockman & Fox, 2011; Petrunoff et al., 2015). An important aspect to the success of a travel plan was the adaptation to the parking and permit conditions 12 months after the policy publication by Brockman and Fox (2011). This adaptation allowed employees sufficient time to explore alternative travel modes. Similarly, Petrunoff et al. (2015) highlights the importance of the study carried out in Australia comparing workplace travel plans due to the implementation in the public sector as opposed to the private sector, where most parking policies have been implemented. An important aspect of the implemented parking policy was the follow-up qualitative study on the acceptability of the policy in place. This qualitative study allowed for minor improvements in the implementation of the parking policy based on the issues raised (abuse of parking permits and addressing work/life balance).

The need for up-skilling practitioners in the area of active travel and travel planning is needed (Petrunoff et al., 2017). However, there is debate as to whether the up skilling should be for the health promotional professionals or for people in local government. Similarly, Vario et al. (2017) reports that the need for formal education classes for bike maintenance and bike safety

is an important factor (Vairo et al., 2017). Although there is a need for up skilling practitioners, there is a need for a better understanding of the different skill sets acquired by both health and transport practitioners. Petrunoff et al. (2017) states that the individual skill set needed for particular actions in a travel plan can be complex e.g., for parking management.

Creating a local collaboration with local government, local public transport operators and other organisations is an effective approach to the delivery of workplace interventions (Brockman & Fox, 2011; Cairns et al., 2010; Davies, 2012; Petrunoff et al., 2017). The collaboration between the Bristol City Council and Bristol University (Brockman and Fox, 2011) proved to be successful with the council reducing the availability of non-resident parking surrounding the University, which had a positive impact on the implementation. Similar findings were identified in the review by Davies (2012) where twenty case studies of behaviour change projects identified common and specific elements which led to their success. Several studies reported frequent interaction between those delivering the campaign and the target audience. This interaction allowed for a more locally informed approach. Davies (2012) also reported that the formation of networks between stakeholders provided extra resources and support for campaigns. These networks allowed for the sharing of successful ideas at local level to provide more benefit on a national scale. MacMillan et al. (2013) recommends that partnerships between transport decision-makers and public health epidemiologist are needed to help design robust effectiveness studies to help increase the uptake of travel plans.

The use of a project coordinator or a champion when implementing a travel plan is a factor which is widely agreed on (Adams & Cavill, 2015; Adams et al., 2017; Cairns et al., 2010; Davies, 2012; Petrunoff et al., 2017). In the review carried out by Cairns et al. (2010) a dedicated travel plan coordinator and/or champion was a key factor in successful implementation. One issue highlighted by Cairns et al. (2010) was the need to allow enough coordinator time to ensure the travel plan is successful. The use of a coordinator or champion to deliver behaviour change is important with one study in a school setting reporting that the employment of an officer was the principal success factor of the campaign (Davies et al., 2012). The officer was trained to act as a role model for children, a champion for cycling, a negotiator with relevant stakeholders and a go-between for the parents. Similarly, in a community setting, Adams and Cavill (2015) report that the positive approach taken by a project coordinator when engaging with community groups and their relationship with the

group were positive factors. Although these studies were in different settings, the strategies used can be transferred over to the workplace setting. In agreement, Petrunoff et al. (2017) highlights the need for a permanent and dedicated coordinator position for implementing workplace travel plans. Despite this, the appointment of a 'bike coordinator' was missing from the majority of businesses interviewed by Vairo et al. (2017) who concluded that most workplaces had no intention to recruit a coordinator in the future. Interestingly, a review of 25 workplaces in the UK identified that the Human Resource Department tend to be involved in the administration of initiatives related to the travel plan such as cycle to work schemes and supplying information to staff (Roby, 2010). Roby (2010) suggests that this is way for travel plans to become more integrated in the workplace.

The extent of organisational commitment plays a key role in implementing a successful travel plan. The need for leadership in an organisation needs to come from both the top down and bottom up, with the need for top down leadership being critical for getting contested actions implemented (Petrunoff et al., 2017). Likewise, Cairns et al. (2010) reported that senior management leading by example has been shown to be an important factor in successful implementation. The importance of practicing what you preach was noted as a key theme for workplace employers in creating a cycling culture. Establishing a culture to facilitate behaviour change was also considered an important factor for several campaigns. The lack of organisational commitment as a common reason for implementation failure (Davies, 2012; Petrunoff et al., 2017; Vairo, Bopp, & Sims, 2017). With the need for organisational commitment, Davies (2012) note that some barriers to the operation of campaigns can include the lack of funding or lack of political support. The analysis suggests that the decline of some of the longer campaigns were due to personnel changes in the organisation (Davies, 2012).

2.12 Summary and Rationale

With the potential for active travel to work to increase physical activity levels, there are several individual, environmental and social factors which can influence active travel to work. Parking management is considered one of the most effective ways to create behaviour change, but it is recommended that it should be supplemented with the use of soft measures. When implementing a workplace physical activity and/or active travel intervention it is important to consider the level of engagement from senior management and the need for support from the top down is needed. While there is a clear need to carry out a needs analysis

and also to appoint a champion, the evidence is less convincing for upskilling the staff members.

There is a need for more longitudinal studies on the impact of workplace physical activity and active travel interventions in Ireland. More longitudinal studies will provide a real-life setting and highlight the need for a bottoms-up approach for intervention development. There is also a need for more research into interventions which focus on the implementation process of interventions to provide a 'best practice' guide for future implementation. With limited evidence available in an Irish setting, a separate, un-related qualitative exploration into the factors that influence workplace travel plans is needed. This study will attempt to address these gaps in the literature by describing the impact of a workplace physical activity intervention and by identifying the factors which influence the implementation of workplace travels plans in Ireland.

2.13 Research questions

Study 1: A mixed-methods evaluation of a workplace active travel intervention

1. What impact did the intervention have on total daily minutes of active travel and physical activity?
2. What are the individual, social and physical environmental factors that influence active travel to work?
3. What were the factors that influenced the implementation of the workplace intervention described in this study?

Study 2: A qualitative analysis on the implementation of workplace travel plans in Ireland

1. What are the main factors that influence the implementation of workplace travel plans in Ireland?

3 Methodology

3.1 Research Design

A mixed-method research design was used which comprised two studies. Study 1 consisted of a repeat cross-sectional study in a large public sector workplace in Kilkenny City which consisted of five sites. The impact of a workplace intervention was measured using self-report surveys in May 2017 (baseline) and May 2018 (follow-up). These surveys were supplemented by manual counts of pedestrians, cyclists and vehicles. The success of the intervention implementation process was evaluated by two semi-structured interviews. Study 2 consisted of a series of qualitative interviews with Smarter Travel advocates and coordinators from around the country at both local and national level. The interviews took place from April 2017 to February 2018. Interviewees were chosen based on their ability to provide rich information on the implementation of workplace travel plans. These interviews would contribute to our understanding of how effective workplace travel plans are to be implemented in the future.

Study 1: Methodology

3.2 Description of the workplace intervention sites

The Health Service Executive (HSE) consists of five sites located across Kilkenny Town (Figure 1.11). All sites are in close proximity to one another with good transport infrastructure and parking facilities for motorised transport available on each site. Although Kilkenny Town have good cycling infrastructure, secure bike parking facilities are limited across all five sites. The total numbers of employees in the workplace are approximately 1,750 across all five sites with St. Luke's Hospital having the largest workforce of approximately 1,150 staff (Table 1.1). Although each workplace has a main operational function as outlined in Table 1.1, each workplace consists of staff members from a wide variety of departments such as hygiene, nursing, medical doctors, administration and senior management.

Table 1.1. HSE workplace sites involved in the intervention

Site Number	Name of workplace	Main function of workplace	Approximate staff numbers
1	Lacken Area Offices	Administration and management	130
2	St. Canice's Hospital	Psychiatric hospital	240
3	St. Luke's Hospital	General hospital	1,150
4	James's Green	Community care health centre	120
5	Kilcreene Hospital	Orthopaedic hospital	110
	Approximate total of all five workplace sites:		1,750

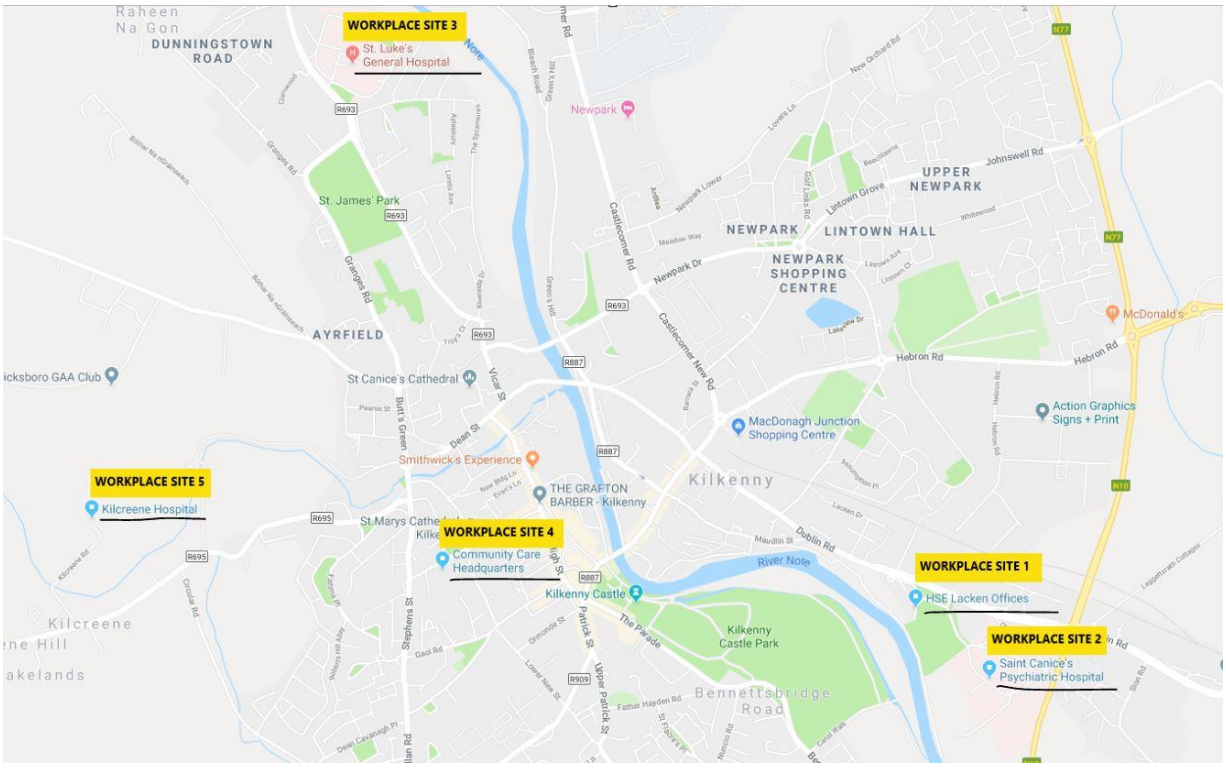

Figure 1.11. The location of all five HSE workplace sites in Kilkenny City

3.3 Workplace health policies

The HSE is the largest employer in Ireland with a workforce of over 105,000 staff. The Department of Health have tasked the HSE to become an exemplar by being the first public sector employer to address staff health and wellbeing as a key strategy in implementing the Healthy Ireland (HI) framework. The HI Framework was adopted by the Irish Government in 2013 in response to Ireland's changing health and wellbeing profile. The Department of Health has committed to develop legislation to reinforce a Healthy Workforce Framework which will make it mandatory for all public services to develop strategies and supports to improve employee health and wellbeing.

The HSE published HI in the Health Services Implementation plan 2015-2017 (Health Service Executive, n.d.). This plan sets out how the HSE is implementing the HI Framework within the Health Services in Ireland. It identifies 126 actions, focused around three priorities: Health Service Reform, Reducing Chronic Diseases, Staff Health and Wellbeing. Under Health Service Reform, the HSE Corporate Plan 2015-2017 (Health Executive Service, 2015a) was published in 2015 and sets out aims to improve the health service over a three-year period. The Corporate Plan outlines five goals, two of which include the need to promote personal health and wellbeing among staff to enable them to not only reach their own potential health and wellbeing but in doing so, be better able to promote the health and wellbeing of clients.

To further support this plan, The People Strategy 2015-2018 (Health Service Executive, 2015b) was developed and recognizes the vital role the workforce plays in delivering safer and better healthcare to the service users. Part of this strategy is to enable staff to become healthier in their workplaces through improved staff engagement, accreditation of staff support services and updating of key national policies.

3.4 The development of the intervention

In March 2017, a workplace travel planning presentation was delivered to a workplace committee in the HSE administrative offices in Kilkenny City. The workplace committee consisted of representatives from HSE Public Health (n=3), HSE Health and Wellbeing (n=1), and HSE Senior Management (n=1). Prior to the meeting (Meeting 1), this committee was non-existent. This meeting was initiated by the Centre for Health Behaviour Research (CHBR) in Waterford Institute of Technology after making initial contact with key personnel

from the HR Department. The presentation was facilitated by the CHBR and Kilkenny Recreation & Sports Partnership (KRSP). The presentation outlined the numerous advantages of workplace Smarter Travel projects, possible intervention initiatives and the process of implementing them. The mandate from HI for workplaces to implement health and wellbeing initiatives directed towards employees was used as a driving factor to implement an intervention. Following an agreement to implement a behavioural change intervention, the workplace committee then appointed site coordinators from each of the five work sites included in the study to help plan and implement the initiative in the workplace. Following this meeting, the research team had direct contact via email with three senior members of staff from the HSE in order to organise follow-up meetings and address any issues that arose. It is important to note that the role of the researcher in this process was to aid and facilitate the workplaces to implement their agreed initiatives, but not to be the leader or core implementer if these initiatives. Thus, the researcher remained an independent observer of the process and evaluator of the outcomes.

A Site Audit Tool (Appendix A) was developed by the research team with reference to a 'sample tool' developed by Smarter Travel Workplaces (2016). This tool was to identify the types of facilities the workplace had on site which may impact on the employee's decision to walk or cycle to work. It was then distributed to all site coordinators who carried out the site audit for their respective sites before sending it back to the workplace committee. The workplace committee, along with the site coordinators, Active Travel Officer (KRSP) and research team then met in late April 2017 in the HSE administrative offices in Kilkenny City (Meeting 2). The purpose of this meeting was to discuss the completed site audits, the next steps involved to develop the initiative and the development of a workplace survey. The Active Travel Officer from the KRSP took responsibility for providing support to the workplaces by assisting with the running of the initiatives as well as helping them to tie into the local Smarter Travel projects. During this meeting, potential implementation measures, resources and the potential sources of funding were all discussed. The committee also considered the significant costs associated with supplying more shower facilities and secure bicycle parking for the workplace.

At Meeting 3 it was agreed that the initiatives should be relatively low-cost and ones that are easy to implement. With the agreement of the Active Travel Officer and the workplace committee members, it was agreed that the initiative should not just be targeted at active travel to work, but it should incorporate physical activity at all levels in the workplace. It was

highlighted in from baseline survey in June 2017 (Appendix B) that the majority of employees have to travel a long distance to get to work, so focusing exclusively on sustainable travel to work was not feasible. From this point on, it was decided that initiatives would target a broad range of physical activity measures and be implemented with the main goal of increasing active travel during work and increasing general physical activity during the employee's working day. This decision to implement a broader initiative provided the workplace with support and funding from HI.

3.5 **Description of the intervention**

The intervention dose was ultimately of a very low intensity. Despite making considerable progress in developing clear actions, unforeseen delays meant that only a limited number of actions were implemented before the follow-up survey was administered in June 2018.

The first initiative was the development of a Sli Na Slainte route, a convenient walkway for lunchtime activity which was implemented by the workplace committee in February 2018. This walkway would run the perimeter of the workplace grounds connecting HSE Lacken Offices and St. Canice's Hospital with easy access and sign posted distances along the route. It was estimated that the total distance of the route would not exceed 2.5km. The members of Senior Management on the committee began organising a clear out of unused walkways around the premises and the production of signposts and a route map for employees. It was suggested that Sli Na Slainte routes would be considered in the other HSE sites if the route was a success. In early June 2018, there was no further progress on this. In order to promote the routes, a 'buddy system' was suggested to help engage employees and create a sense of community in the workplace. The committee agreed to make contact with KRSP for support to organise lunchtime walking groups. In May 2018, members of the workplace committee made contact with Kilkenny City Council to set up a partnership and see would they be interested in developing a walking or running track on local grounds, which would help increase the distance and accessibility of the Sli Na Slainte route for the HSE staff. In early June 2018, there was no development on either the clear out of unused walkways or the negotiations with Kilkenny City Council. The signposts for the walkway were being designed and developed. This initiative was not implemented.

The second initiative agreed by the committee was the investment in workplace fleet bikes. It was envisaged that the fleet bikes would be an ideal opportunity to increase both active travel and physical activity levels of employees during their working day. Quite often, employees

would have to travel from one workplace site to another during the day for a number of reasons. With each workplace site conveniently located near one another and good quality road infrastructure available, these fleet bikes would provide quick and easy access to each site without the inconvenience of finding a parking space. A fleet of ten bikes, helmets, high-visibility jackets and bike locks were purchased in March 2018 and branded with HSE and Healthy Ireland logos. This fleet of bikes was to act as a pilot study and if successful, they would be rolled out across different HSE sites in other counties. The development of a bike banner, consisting of Healthy Ireland and KRSP branding was developed to acknowledge the initiative was being carried out as a partnership with KSRP. Two fleet bikes were put on display in the main reception area of HSE Lacken Offices in April 2018 as an advertisement to employees that a new and exciting initiative was underway. As a partnership, it was proposed that KRSP would provide the staff of all workplaces with bicycle skills training to ensure adequate uptake and safe use of the fleet bikes. In May 2018, the fleet bikes remained in storage as they could not be used due to insurance reasons and the lack of bike storage facilities. In early June 2018 a contract for the terms and conditions for using the fleet bikes was drafted.

For the safety and security of the fleet bikes, the purchase of new secure bike sheds was needed. Although two of the five sites already had bicycle parking, to ensure maximum security for employees and the newly purchased fleet bikes, more durable and secure bicycle sheds were needed. With the lack of funding being a recurring issue, a promotional deal was made with a private company and the HSE Kilkenny. Each of the five sites would receive a secure and sheltered bike shed with code-access gates. Each shed would hold a maximum of twelve bikes and would be monitored 24/7 by CCTV. The location of each shed would be ideally beside the main entrance to the workplace. In May 2018, there had been no agreement to install these sheds in any of the sites and therefore this initiative was not mplemented. This had a noticeable knock-on effect on the release of the fleet bikes for staff use.

The final initiative that the HSE were looking to implement was to target the time employees spent sitting down during their working day. This initiative was not originally planned by the workplace committee but was of interest to the Senior Management of the HSE. The targeted initiatives for this was the introduction of standing desks for employees and the development of a computer-based programme which would display messages to staff every thirty minutes to take a break and stand up and move for five minutes. In March 2018 it was confirmed the HSE had spent money on a small number of standing desks. This was yet to be rolled out

among all staff departments, but it was an initiative they were looking to incorporate as part of the HI plan. In June 2018, there was no more substantial development in the proposed initiatives and were not implemented.

3.6 **Study population and Sampling**

3.6.1 Self-report survey

Survey respondents were recruited by opportunistic sampling in several health service worksites in Kilkenny City. The workplace committee identified the workplace sites located around Kilkenny City where they would implement a Smarter Travel intervention (Figure 1.11) and all sites were targeted. All employees across all five sites over the age of 18 years were included in the study population. The HSE global email address function was used as the main sampling frame. Paper versions of the survey were also made available to staff who did not have access to HSE email. Surveys were left at staff meeting points in the workplace (reception or canteen). The quantity of papers surveys printed is unknown.

3.6.2 Process Evaluation of Intervention

Participants for the process evaluation of the intervention were recruited based on their level of involvement in the development and implementation of the intervention. A shortlist of possible interviewees was identified by the research team and consisted of individuals from senior management, employees who were advocates and non-employees who helped implement part or all of the intervention. From this shortlist, two interviewees were selected based on their influential role in the workplace and their level of involvement in the development and implementation of the intervention. Both interviewees were contacted via email and an interview time, date and location was arranged.

3.7 **Data Collection Tools**

3.7.1 Baseline Survey (Appendix B)

The research team began to develop the survey in early April 2017. A weekly meeting was held between the research team to develop a first draft of the survey before sending it onto the workplace committee of the HSE via email for comment. The key issue that arose during the review of this first draft was the time taken to complete the survey. A conference call was held between the research team and Professor Adrian Bauman, a public health researcher, to discuss the feasibility of reducing the number of questions and the impact it could possibly

have on the quality of data collected. Based on his advice, the survey was condensed with unnecessary questions removed in order to make it more user-friendly and increase response rates. The final draft of the survey was agreed via conference call between the research team from the CHBR and the senior management from the HSE in May 2017. The final survey was ready for distribution in June 2017.

The first two sections of the survey (sections A-B) assessed the respondents' demographic details and details about their travel to and from work. The demographic questions included; sex, age, number of people and cars in their household, access to a working bicycle, education level and a general indicator of self-reported health and well-being in the form of the SF-1. The SF-1 is significantly associated with health and risk factors and is deemed to be an reliable tool to use (Gill, Broderick, Avery, Dal Grande, & Taylor, 2009). Section B used the means of travel to work questions from the most recent Central Statistics Office (Central Statistics Office, 2018) in order to compare collected data to the national figures that were recorded. The attitudinal statements in this section were rated on a 5-point likert-scale from 'strongly agree' to 'strongly disagree' and were adapted from the Commuting and Health in Cambridge Study (Ogilvie et al., 2010).

The third section (section C) of the survey was included to help inform the design of the intervention, as well as assess the barriers to commuting to work by bicycle. The barriers question was assessed using a 3-point likert-scale from 'no problem' to 'major problem and was adapted from the European CHIPS survey (European Cyclist Federation, 2016). The remaining questions in this section examined the types of interventions the workplace could include to increase Smarter Travel in the workplace. These were adapted from the Commuting and Health in Cambridge questionnaire as well as the Smarter Travel Workplaces survey.

The final sections (section D-G) of the survey were adapted from version two of the Global Physical Activity Questionnaire (GPAQ), based on the PASTA Project design (PASTA, n.d.). Section D of the survey measured the intensity of physical activity (moderate and vigorous) that the individual engaged in within a typical week at their workplace. Section E of the survey measured their activity while travelling to and from places and was adapted by splitting walking and cycling into different modes of travel, based on the PASTA Project design. Section F then assessed respondents' recreational physical activity (moderate and

vigorous) while Section G of the survey addressed the sedentary behaviour of the individual on a typical day.

3.7.2 Online Baseline Survey (Appendix C)

Following the final version of the baseline survey, the entire survey was replicated and inputted into online survey software (Survey Monkey) by the research team. All questions and sections on the survey remained the same.

3.7.3 Follow-up Survey (Appendix D)

In April 2018, eleven months following the initial survey, both the research team and workplace committee held a meeting to discuss any changes needed for a follow-up survey to be distributed to the HSE workforce. The main issue which arose was the time taken to complete the initial survey. With the initial survey having a detailed section on helping inform the design of the intervention, it was agreed that this section would be adapted to only assess the employee's awareness of the intervention to date. This reduced the overall length of the follow-up survey. The first two sections of the survey (A-B) remained the same as before, assessing the respondents' demographic details and details about their travel to and from work. Section C included questions to help assess the employees' awareness of any initiative to promote physical activity and/or active travel in the workplace instead of their suggestions for intervention measures. The final sections of the survey (section D-G) remained unchanged and measured the respondents' level of physical activity as outlined in the previous section. The adapted survey was sent to the workplace committee for comment and review. The final survey was ready for distribution in June 2018.

3.7.4 Online Follow-up Survey (Appendix E)

Following the final version of the follow-up survey, the research team replicated this survey into the online survey software (Survey Monkey). All questions and sections remained the same on the survey.

The reliability and validity of the GPAQ

The GPAQ was developed in 2002 by the World Health Organisation (WHO) and is the recommended physical activity measure within the WHO STEPwise surveillance system. It is a less burdensome version of the long International Physical Activity Questionnaire (IPAQ) (Bauman, Ainsworth, Bull , Craig, Sallis &, Pratt et al. 2009). It also provides a more policy

relevant measure of physical activity than the short IPAQ by including domain specific physical activity (Bauman et al. 2009). The reliability and validity of the GPAQ was examined by Bull, Maslin and Armstrong (2009) with reliability coefficients showing moderate to substantial strength (Spearman's rho 0.67-0.73) with concurrent validity between both the IPAQ and GPAQ showing similar strengths. Results on criterion validity using an objective measure concluded that it was in the fair to poor range (Spearman's rho 0.06-0.35). Similarly, in a comparative analysis, moderate to vigorous energy expenditure derived from the GPAQ showed significant correlations, however they were significantly lower when compared to a wearable sensor (Laeremans et al., 2017). Although the GPAQ was originally developed for population-level surveillance it is not recommended for intervention testing due to its potential measurement effort and cross-cultural differences in reporting physical activity (Bauman et al. 2009). However, an Irish study indicated that the GPAQ is a valid measure of moderate-vigorous physical activity (MVPA), change in MVPA, and is an appropriate tool for assessing the effectiveness of interventions to promote MVPA (Cleland et al., 2014).

3.7.5 Screenline Count Form (Appendix F)

The screenline count form was used at both baseline and follow-up and was adapted from the National Pedestrian and Cyclist Documentation Project (National Bicycle and Pedestrian Documentation Project (2014). This standard screenline count form recorded the number and sex of both pedestrians and cyclists that crossed an imaginary screenline on a street. The form was adapted to help capture the numbers of pedestrians, cyclists and cars that crossed the imaginary screenline. The sex of the cyclists and pedestrians was identified, along with the number of cyclists using a helmet. Detailed instructions for using the form are listed in Appendix F.

3.7.6 Process Evaluation of Intervention Topic Guide (Appendix G)

The interview topic guide for the process evaluation included a focused selection of semi-structured questions mainly based on the RE-AIM Framework (Glasgow, Vogt, & Boles, 1999) with questions also relating to eight conceptually distinct implementation outcomes as outlined by Procter, Mutrie, Davis and Audrey (2014). The outcomes were categorised loosely under the headings of the RE-AIM Framework to provide structure to the guide. Both the framework and implementation outcomes were used to help capture the interviewee's experiences in implementing the intervention with the aim of understanding the

implementation processes and contribute to the existing body of implementation research. The five steps to translate evidence into practice are; Reach, Effectiveness, Adoption, Implementation and Maintenance.

3.8 Data Collection Methods

3.8.1 Self-report survey

Following the development of the survey in April to June 2017 and May to June 2018 (Section 3.4), the final version of both surveys (online and paper) were piloted. Both surveys were distributed to members of the research team, colleagues and members of the steering group. The paper surveys were distributed to employees from other organisations and friends of the research team. There were no adjustments made to the final versions, with the average time to complete the baseline survey being eight minutes and six to seven minutes for the follow-up survey. The surveys were converted to PDF and sent via email to the site coordinators in the HSE where the survey was printed for use. The link for the online survey was made 'live' and this was sent via email to the IT Technician in the HSE to distribute to all staff.

An e-mail was sent out to all staff in 2017 and 2018 containing a brief information letter about why the workplace was implementing the initiative as well as a link to the online survey. Paper surveys were also available for staff through their designated site coordinator. This was to increase the response rate and target those without access to a staff email. Site coordinators were asked to print off a number of surveys to begin with and leave them in an easy access point for employees across the workplace site. The front desk, the staff canteen and the site coordinators office were all recommended access points. Paper surveys could be returned to the site coordinator after completion and were mailed back to the research team. A mail-back survey based on the KONTIV Design was used to ensure high-response rates (Evert, Brög, & Erl, 2016). The KONTIV Design outlines a phased procedure of reminding and motivating (by both mail and post) survey participants to complete the survey. The research team adapted this approach and used reminder emails to encourage participants to complete the survey. One week after initial contact, the research team contacted the workplace committee and informed them of response rates. The workplace committee then sent out a reminder notice via email to encourage staff members to complete the survey. Surveys completed within a two-week timeframe of being distributed were entered into a

prize draw for a €50 One4All voucher. While this was the case at baseline, the €50 One4All voucher was not used at follow-up.

3.8.2 Screenline counts

Screenline counts of workplace employees travelling to work were carried out on the first Tuesday and Wednesday (Site 1, 2, 4 and 5) of June 2017 and on the second Tuesday and Thursday of June 2017 in Site 3. This process was replicated on the same days in June 2018. The researchers identified a suitable time period for the counts to be carried out based on the timeframe of people starting their work shift. The time period for the screenline counts on sites 1, 2, 4 and 5 was from 7:30am to 9:30am. There was an additional time period carried out for the third site due to a high change-over in staff shifts. The time periods for this site were 7:30am-9:30am and 4:30pm-6:30pm. All sites were monitored on two separate days to ensure the traffic count was consistent.

Research assistants were recruited and received training on conducting the screenline counts at each site. The screenline of each site was shown to the research assistant using Google Maps (Appendix H) and they were asked to conduct a pilot data collection from 7:00am-7:15am to ensure they were familiar with the process involved. The research assistants recorded the date, time period, weather conditions and the location of the screenline at the top of the form. Every pedestrian, cyclist and car that crossed the screenline was recorded. Those travelling via other forms of transport such as lorries and vans were recorded as 'other'. Regular phone calls were also made to research assistants to ensure the counts were recorded correctly and if any issues arose during the counts they were dealt with immediately. The only issue to arise was the method of travel recorded if an individual parked their car in a pay and display across the road and walked over the screenline. In these instances, the individual drove to the destination, so they were recorded as driving their car or van.

3.8.3 Process Evaluation of Intervention

Both interviewees were contacted via email to request permission to conduct a semi-structured interview where the purpose of the interview was explained to them. After agreeing to take part, both a consent form and topic guide was emailed to the participant prior to the interview. One interview took place in the interviewee's place of work at the date and time agreed, while the second interview took place via teleconference. Both interviews took place during the final week in March 2019. Before the interview took place, the informed

consent form was signed by both parties. The interview was recorded using an Olympus VN-765 digital voice recorder. Interview times ranged from 25-30 minutes.

3.9 **Data Analysis**

3.9.1 Self- Report Survey

The data analysis was conducted using IBM SPSS Statistical Package 24. All data recorded from the self-report survey was cleaned and truncated. All data recording errors were rectified and reported as 'missing' or 'non-applicable'. The physical activity outcomes were analysed and cleaned based on the rules provided in the GPAQ Analysis Guide (World Health Organisation, n.d.).

Descriptive statistics were calculated via means and percentages where necessary. For categorical data, Chi square tests were conducted to assess differences between groups at each time point. Differences between genders were also examined using Chi square tests. Continuous data was analysed to test for significant differences at follow-up using an independent t-test. Where data was not normally distributed, non-parametric tests (Mann-Whitney U test) were used. Responses to open ended questions were reviewed and the most frequently mentioned comments were reported.

3.9.2 Manual Counts

The percentage change in pedestrians, cyclists and car users was calculated over the two time periods (2017 and 2018). Data from all five sites were included.

3.9.3 Process Evaluation of Intervention

The data analysis replicated that described for Study 2 as outlined in detail in Section 3.15. Both interviews were transcribed verbatim on Microsoft Word 2016. Memo writing took place after the interview to help capture the thoughts of the researcher. Both transcripts were analysed in NVivo 11 by both initial and focused coding. The code book created during data analysis can be found in Appendix I. This codebook listed and defined the properties of each code. There was no map of codes generated for the process evaluation of the intervention.

3.10 **Ethical Considerations**

Survey respondents were made aware that all data collected would be entirely anonymous. To ensure anonymity each survey was issued a random non-identifiable survey number.

Although the survey asked for specific data in relation to demographics and questions about their physical activity levels, all respondents were free to refrain from answering any question asked and free to withdraw from the study at any time. Ethical approval was granted by the Waterford of Institute of Technology Research Ethics Committee (Appendix J).

Study 2: Methodology

3.11 Study population and sampling

Participants for the qualitative study were recruited using a snowball sampling technique. A shortlist of interviewees who were advocates of sustainable travel and project coordinators were identified by the research team by their relevant experience. This shortlist identified suitable people from all around the country who would be able to provide rich information on the implementation of workplace travel plans that they were involved in. The shortlist also consisted of those who haven't been involved in any workplace travel plans to ascertain the reasons why not. This shortlist included advocates and coordinators from a local, regional and national level from both public and private sector companies. The potential interviewees were contacted via email and those who responded with interest were recruited for participation. To ensure anonymity, the interviewees were described by their location and the type of sector they worked in (Table 1.2). Following the interview, all interviewees were asked to recommend key informants for further interviews that could provide valuable data on the implementation of workplace travel plans.

Table 1.2. Description of qualitative interviewees

	Small city/town	Large city	Public sector	Private sector
Interviewee 1		✓	✓	
Interviewee 2		✓	✓	
Interviewee 3		✓	✓	
Interviewee 4	✓		✓	
Interviewee 5		✓	✓	
Interviewee 6	✓		✓	
Interviewee 7	✓			✓
Interviewee 8		✓		✓
Interviewee 9	✓			✓
Interviewee 10	✓		✓	

3.12 Data Collection Tools

3.12.1 Qualitative Interview Topic Guide (Appendix K)

The interview topic guide included a number of semi-structured questions. The interview topic guide was developed over several meetings with the research team, where researchers discussed the important questions to gather the correct information. On several occasions, the research team roleplayed a possible interviewee to determine the possible direction the interview may take. The questions were also designed based on the researcher's knowledge of the role the interviewee and their previous experience. These semi-structured questions ranged from questions about their understanding of Smarter Travel to their opinions on the implementation of Workplace Travel Plans and their opinions on the future direction of travel planning. Although the interview consisted of predominantly semi-structured questions, interviewees were able to provide rich information on their personal experiences in implementing Smarter Travel initiatives during their career. Example questions are:

- How successful have efforts been to promote travel plans you were involved in?
- Why do some companies not engage? Can you tell us any stories?

Following several interviews, the topic guide was adapted slightly to reflect some of the core emerging trends from the previous interviewees.

3.13 Data Collection Methods

All interviewees (n=10) were initially contacted by email to request permission to conduct an interview where the purpose of the study was explained to them. After agreeing to be interviewed, the interview topic guide and informed consent form (Appendix L) were emailed to the participant one week prior to the interview. Interviews predominantly took place in the interviewee's place of work (n= 7) at a suitable date and time. However, if this could not be arranged, the interviews took place via Skype (n= 3). All interviews took place from April 2017 to February 2018. Before each interview commenced, the interviewee signed the informed consent form. For the interviews taking place via Skype, the interviewee verbally consented and sent the signed copy of consent via email. The interviews were recorded using an Olympus VN-765 digital voice recorder. Interview times ranged from 25-60 minutes.

3.14 Research method used

This study adopted a general ethos of Grounded Theory and mainly used a constructivist approach as advocated by Charmaz (2006). Grounded theory was developed by Glaser and Strauss (Glaser & Strauss, 1967). It describes an entire approach to research – design, data collection, analysis and reporting. It is used for identifying and establishing relationships between categories. Grounded theory is the end product of this process; it provides us with an explanatory framework with which to understand the phenomenon under investigation (Rogers & Willig, 2017). A number of key strategies, including constant comparative analysis, theoretical sampling and theoretical coding are used in the process of grounded theory. During the research process, Rodgers and Willig (2017) states that the researcher will move back and forth in an attempt to ground the analysis in the data, with the aim being data saturation. As a result of this process, there is no series of steps to be followed by the researcher. Grounded theory encourages the researcher to continuously review earlier stages of the research and, if necessary, to change direction.

Glaser and Strauss (1967) explain that the theory which emerges from the data is already there and it is just waiting to be discovered. They suggest that the researcher should not have any preconceived ideas in order to generate a theory that is already grounded in the data.

Charmaz (2006) adopts a more constructivist approach to grounded theory. Unlike the position of Glaser and Strass (1967), Charmaz (2006) assumes that neither data nor theories are waiting to be discovered. The researcher can construct grounded theories based on their past and present involvements, interactions with people, perspectives and their research practices.

Not all components of grounded theory were adopted in this study because the development of a new theory was not an aim of this study. This approach was chosen because the focus of the study was on interpreting the interviewee's unique experiences and understanding of workplace travel plans.

3.15 Analysis of qualitative data

All interviews were transcribed verbatim using Microsoft Word 2016. Following this initial phase, they were anonymised by searching text for any identifiable reference to a specific location, job role or organisation and replacing these words with generic words such as 'my workplace'. Memos were written immediately after the interview had ended and after listening to each individual interview. These memos helped to capture the thoughts of the researcher and form ideas on the creation and explanation of analytical codes. This process helped shape the direction of the following interviews. This memo-writing process was maintained throughout the data analysis after both conducting and transcribing the interviews.

The interviews were analysed using both initial and focused coding as described by Charmaz (2006). The third type of coding (axial coding) associated with grounded theory was not used for the analysis of this study as it can limit how, what and how the researchers learn about their study and therefore restrict the codes they construct (Charmaz, 2006). All interview transcripts were read several times within the NVivo 11 software to allow the researcher to become familiar with the content. Initial coding was generated using 'line by line coding' as opposed to 'incident by incident coding'. Line by line coding was chosen in order to create leads to pursue. This helped in allowing the data collection to be more focused. Following the initial coding process, these codes were refined using constant comparison analysis.

The next phase of data analysis was focused coding. This involved creating a hierarchy of codes to categorise large amounts of data. Before this hierarchy of codes was finalised, both researchers involved with the study carried out a reliability assessment as examined by Cook (2012). This process the researchers independently coding a number of transcripts blind using

these focused codes and then held a meeting to discuss and cross-reference their findings. In this meeting an agreement and understanding about the nature of the codes and the data were made. The next step was the development of a codebook. This codebook listed and defined the properties of each focused code (Appendix I). Each transcript was re-coded in NVivo using the codebook. The final step of the data analysis was selecting the most significant themes across several codes and labelling them the hierarchy of codes to create a relationship between all the codes. During this process it was noted that not all codes can be categorised under a single category heading. This led to the development of a map of codes highlighting the relationships between the codes under the different category headings (Figure 1.61).

3.16 Ethical Considerations

All interviewees were made aware of the aims of the research prior to their agreement to participate. They were made aware that their involvement in the study was entirely voluntary and they were free to withdraw from the study at any time without reason. Furthermore, they were made aware that all data in the interview transcript which may identify them as a participant would be replaced with pseudonyms ensuring their anonymity. All of the approached interviewees agreed to participate and there were no withdrawals. Ethical approval was granted by the Waterford of Institute of Technology Research Ethics Committee (Appendix J).

4. Results

Study 1: A mixed-methods evaluation of a

workplace active travel intervention

4.1 Sample characteristics

Sample characteristics at both baseline and follow-up are presented below (Table 1.3). At baseline, there were 217 respondents, 12.4% of the (approximate) total working population between all five sites. At follow-up there was 220 respondents, 12.6% of the total number of employees across all five sites. The sample characteristics at baseline (n=217) and follow-up (n=220) are divided by sex. Females represented 82% of respondents at baseline ($p<0.001$) and 83.2% of respondents at follow-up ($p<0.001$). There was no significant difference between the mean number of cars or vans in the household at follow-up (1.92 vs. 1.93). Over half of respondents at baseline had access to a working bicycle. A greater proportion of females had access to a working bicycle at both time points ($p<0.05$). A greater proportion of respondents had access to a working bicycle at follow-up compared to baseline (50.4% vs. 55.0%), although no significant difference was found. Over 60% of respondents reported having children under the age of 16 at both baseline and follow-up. The majority of respondents had third level education at both baseline and follow-up.

Table 1.3. Sample characteristics at both baseline and follow-up by gender.

	Baseline (n=217)			Follow-up (n=220)		
	Male	Female	Total	Male	Female	All
% (n)	17.5 (38)	**82.0 (178)****		16.4 (36)	**83.2 (183)****	
Age (years, mean ± SD)	46.9 (10.2)	44.4 (9.5)	44.8 (9.6)	48.3 (8.6)	42.3 (9.5)	43.3 (9.6)
Cars/vans in the household (n, mean ±SD)	1.64 (.783)	1.98 (.902)	1.92 (.891)	1.91 (.742)	1.93 (.804)	1.93 (.792)
Working bicycle (%, n)	65.8 (25)	**47.1 (82)***	50.4 (107)	72.2 (26)	**51.6 (94)***	55.0 (120)
Level of education (%, n)						
Secondary	21.4 (6)	78.6 (22)	13.1 (28)	11.8 (2)	88.2 (15)	7.8 (17)
Diploma or Certificate	8.0 (5)	92.0 (57)	29.0 (62)	15.3 (10)	84.6 (55)	30.0 (65)
Undergraduate Degree	18.6 (8)	81.4 (35)	20.1 (43)	20.0 (9)	80.0 (36)	20.8 (45)
Postgraduate Degree	22.5 (18)	77.5 (62)	37.9 (81)	15.7 (14)	84.2 (75)	41.2 (89)
No. of children in household (%, n)						
Under 5	13.5 (5)	18.8 (33)	17.9 (38)	11.4 (4)	15.4 (28)	14.8 (32)
5-15 years	43.2 (16)	43.4 (76)	43.3 (92)	15.0 (16)	46.4 (84)	46.2 (100)
16 years and over	43.2 (16)	93.1 (163)	92.4 (196)	94.2 (33)	92.2 (167)	92.5 (200)

**p<0.05, **p<0.001*

4.2 Respondent's perceived health rating

The perceived health rating of survey respondents can be seen in Figure 1.31 below. Respondents perceived themselves to be very healthy at both time points. Only 3.2% (n=7) and 1.8% (n=4) of respondents perceived their health to be 'very poor', 'poor' or 'fair' at baseline and follow-up respectively. In contrast, 84.6% (n=182) and 92.1% (n=200) of respondents perceived their health to be 'good', 'very good' or 'excellent', at baseline and follow-up respectively. The most commonly reported rating was 'excellent' at baseline (32%, n=69) and 'very good' at follow-up (35.9%, n=78). However, there were no significant differences found between time points ($p>0.05$).

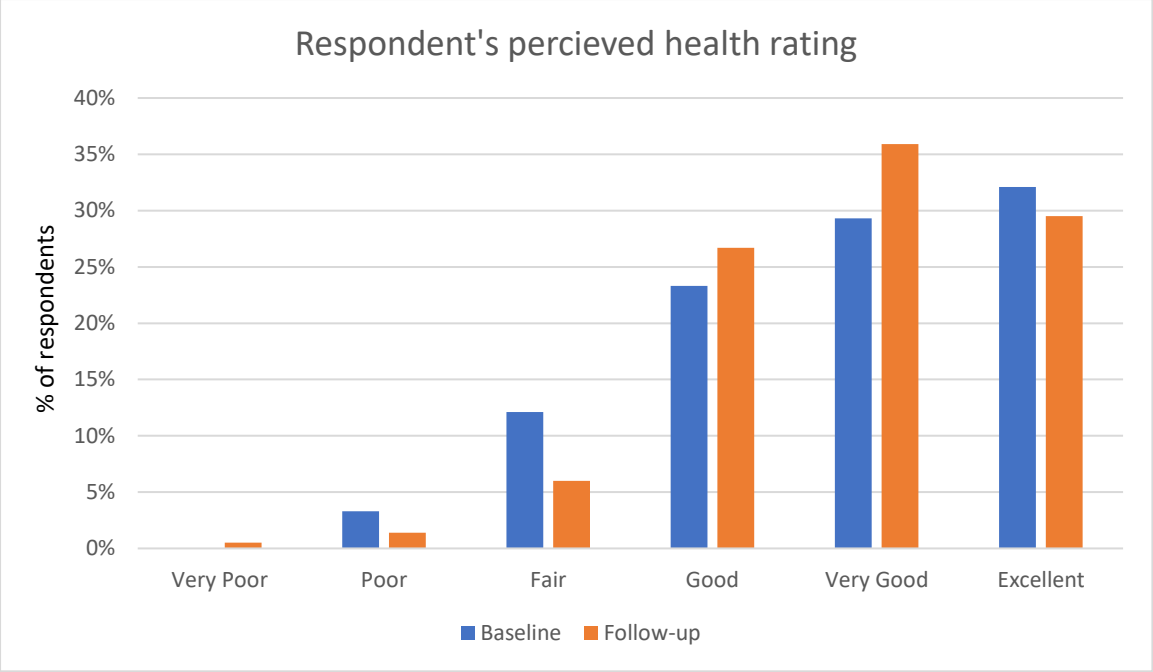

Figure 1.21. Respondent's perceived health rating during the past four weeks at baseline and follow-up.

4.3 Staff feedback on the design of the intervention

The baseline survey consisted of questions to gauge respondents' interest in potential measures they would like introduced into their workplace. These measures are shown in Table 1.4 below. Over 50% of respondents wanted to have a subsided gym membership and to have prompts to take movement breaks while sitting during work. Thirty-nine percent of respondents agreed they would like to see incentive schemes introduced for green commuters, with approximately 31% stating they would like reserved park and ride spaces. Almost 32% of respondents would like bicycles available for trips during the workday. Thirty three percent of respondents wanted the introduction of lunchtime walking groups with 25% agreeing that a Sli Na Slainte route should be created.

Table 1.4. Staff feedback on measures to be introduced into the workplace

Measures to be introduced	**% of respondents, Yes (n=217)**
Reserved park and ride spaces	30.9
Green Commuters coffee mornings	17.5
Information on Cycle to Work Scheme	25.8
Incentive schemes for green commuters	39.2
Cycle skills training	24.4

Active meetings at work	19.4
Subsidised gym membership	53.5
Bicycle maintenance classes	21.7
Bicycles available for trips during the workday	31.8
Standing desks	23.2
Sli na Slainte walking route	25.0
Money towards purchase of bicycle accessories	24.9
Prompts to take movement breaks during work	50.7
Online software programme to facilitate car-sharing	18.0
Lunchtime walking group	33.2
Stand-up breaks during work hours	26.3
Cycle parking conveniently located	31.3

The impact of the intervention on active travel and physical activity

4.4 Meeting the National Physical Activity Guidelines

The level of physical activity was recorded by the using the GPAQ. This self-report method gathered information on respondents work-related, transport-related and recreational physical activity (Section 3.7). According to Ireland's National Physical Activity Plan (Healthy Ireland, 2016), the physical activity guidelines are five days of 30-minute moderate-intensity activity per week. The results for The percentage of respondents meeting the National Physical Activity Guidelines in Table 1.5 below show there was a significant difference in those meeting the National Physical Activity Guidelines at follow-up ($p<0.05$). At follow-up almost 70% of respondents were meeting the national physical activity guidelines, compared to 56.2% at baseline.

Table 1.5. The percentage of respondents meeting the National Physical Activity Guidelines

	Baseline (n=217)	**Follow-up (n=220)**
Meeting the National Physical Activity Guidelines (%)	56.2	**69.4***

**p<0.05*

4.5 Screenline counts

The screenline data count in Table 1.6 suggests there was a positive effect for cycling in several of the workplace sites. There was an 80% increase in the number of cyclists at follow-up albeit from a very low baseline figure, i.e. from 10 to 18 cyclists Three out of the five sites recorded an increase in the number of cyclists There a 16.5% increase in the number of pedestrians over the five sites, with a similar result recorded for the increase in the number of cars. St. Luke's hospital had a large footfall and car count compared to the other four sites.

Table 1.6. Screenline counts for all five workplace sites during 2017 and 2018.

	Baseline 2017	**Follow-up 2018**	**Difference (+/-)**
Lacken Offices			
Pedestrians	10	12	+2
Cyclists	0	2	+2
Cars	438	476	-38
St. Canices			
Pedestrians	11	9	-2
Cyclists	0	0	
Cars	34	42	-10
St Luke's Hospital			
Pedestrians	98	123	+25
Male	31	40	+9
Female	67	83	+16
Cyclists	10	13	+3
Male	5	11	+6
Female	5	2	-3
Cars	1,108	1,393	-285
James's Green			
Pedestrians	42	43	+1
Cyclists	0	0	
Cars	176	176	
Kilcreene Hospital			
Pedestrians	3	4	+1
Cyclists	0	3	+3
Cars	286	300	+14
Total for all sites			**% Change 2017-2018**
Pedestrians	164	191	16.5%
Cyclists	10	18	80%
Cars	2,042	2,387	16.9%

4.6 Mode of travel to work

Mode of travel to work at baseline and follow-up presented below shows mode of travel to work at baseline and follow-up. Respondents asked how they would usually travel to work for the longest part of their journey. There was no significant difference found for mode of travel to work between baseline and follow-up.

At baseline (n=217), 89.1% of respondents travelled as the driver of a car, with a further 4.2% travelling as a passenger in a car. At follow-up there was a slight increase in the number of respondents driving a car to work (92.1%) with 2.3% travelling as a passenger in a car. Both of these proportions are noticeably higher than the 60% of people driving to work recorded by the National Census Data on Commuting in Kilkenny (Central Statistics Office (CSO), 2016).

There was a smaller proportion of people walking to work at follow-up (3.6% vs. 2.3%). The number of people cycling to work increased from 2.1% at baseline to 2.3% at follow-up. Overall, the levels of walking and cycling to work in the HSE were very low compared to the National Census Data on Commuting in Kilkenny (CSO, 2016). The CSO data for Kilkenny indicates that approximately 17% and 3.5% of people walk and cycle to work as their usual mode of transport.

The number of respondents at both baseline and follow-up were too small to provide any evidence of trip-chaining during their travel to work. However, some evidence for trip-chaining were provided based on the open-ended questions in Section 4.7.

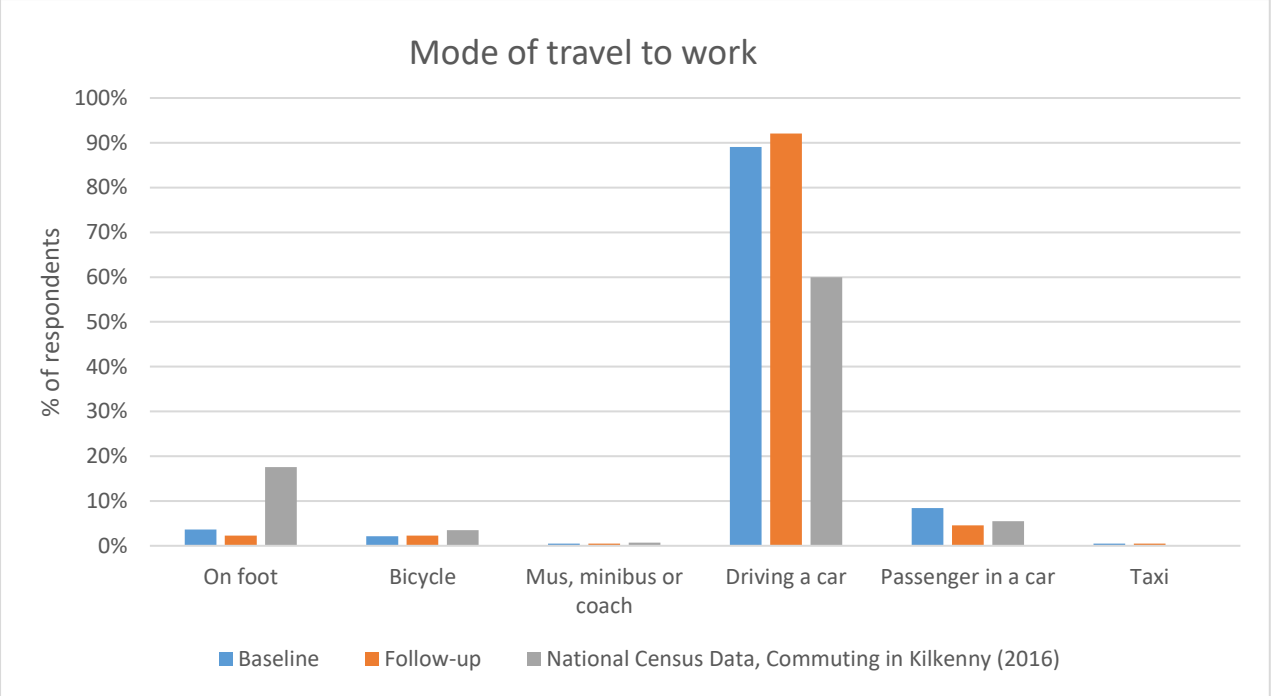

Figure 1.31. Mode of travel to work at baseline and follow-up

4.7 Reasons for mode of travel

The mMain reasons for choosing mode of travel to work are shown below at baseline (n=217). There was no significant difference found between groups at baseline and follow-up, or between males and females at the different time points ($p>0.05$). Distance was the main reason for choosing a mode of travel at both baseline and follow-up (36.6% and 36.1%, respectively). The lack of alternative modes of travel and being the quickest option were also cited as important reasons for choosing their mode of travel.

The respondents who chose 'other' in the survey at baseline (17.3%) and follow-up (16.2%) provided some insight into other factors that determined their mode of travel. One of the most consistently reported answers was needing the car for work commitments. Some comments on work commitments included;

'I need my car for work as I have to travel to see clients in the community'

'I need my car for work commitments'

'I work in multiple locations'

Many respondents also stated that they needed the car for trip-chaining with some respondents commenting;

'I do two school runs while I'm on the way to work'

'School and creche drop-offs'

'I often need to use the car to go to other locations during the day'

Table 1.7. Main reasons for choosing mode of travel to work

	Baseline (n=217)	**Follow-up (n=220)**
Main reason for mode of travel to work	**%**	**%**
Distance	36.6	36.1
Lack of alternative	16.2	18.5
Quickest	15.2	14.8
Habit	4.7	5.1
Cheapest	1.6	0.9
Other	17.3	16.2
Trip chaining		
Work commitments		

The individual, social and physical environmental factors that influence active travel to and from work

Respondents' attitudes about travelling to and from work at baseline and are shown in Table 1.8. Almost 80% of participants agreed that the roads are dangerous on route to work, with 50% and 21.3% agreeing that there are no convenient routes for walking and cycling, respectively. The volume of traffic was an issue with only 7.8% agreeing that there was little traffic on the road. A greater proportion of females agreed that there is little traffic on the roads compared to male respondents (7.5%, $p<0.05$). Public transport was another issue with only 2.7% stating that they had access to convenient public transport.

The intention of respondents' to walk, cycle or drive to work and the ease with which they could this. Over 20% agreed it would be easy for them to walk, while only 6.6% had intended to walk to work on the next occasion. Thirty percent of male respondents said it would be

easy for them to walk to work, compared to 18.1% of female respondents ($p>0.05$). Similarly, only 24.4% stated that it would be easy for them to cycle to work, with only 8.4% indicating their intent to cycle next time. A greater proportion of male respondents agreed that it would be easy for them to cycle to work compared to females (40% vs 21.2%, $p<0.001$). Correspondingly, a greater proportion of males stated that they intended to cycle to work next time compared to females (81.3% vs 93.2%, $p<0.05$) Almost 96% of participants agreed it would be easy for them to use the car and 91% intended to do so next time.

The following set of statements related to the strength of habit associated with driving to work. Approximately 88% and 81% of respondents stated that using a car is something that they do automatically and would find hard not to do, respectively. A greater proportion of males agreed that using the car is something they do automatically, compared to females (80.6% vs 89.5%, $p<0.001$). Similarly, a greater proportion of males said using a car is something they find it hard not to do compared to females (76.7% vs 82.8%, $p<0.001$)

The extent to which colleagues engaged with active and passive modes of transport is reported. Less than 4% of participants agreed that their colleagues walk any part of the journey to work, with less than 5% agreeing that their colleagues cycle any part of the journey. A slightly higher proportion of respondents (7.2%) agreed that members of senior management actively commute to work. Over 95% agreed that many of their colleagues drive to and from work. As was the case with active modes of travel, a small proportion of respondents agreed that members of senior management drive to and from work. A greater proportion of female respondents agreed that members of senior management drive to and from work compared to male respondents (71.3% vs 87.5% $p<0.05$).

Table 1.8. Attitudinal statements about the respondents' journey to work

	Agree (%)		
	Males	**Females**	**Total**
On my journey to and from work:			
It is pleasant to walk	51.6	47.9	48.3
Roads are dangerous	70.6	81.5	79.5
There is convenient public transport	2.9	2.7	2.7
There are convenient routes for cycling	26.5	20.2	21.3
There is little traffic	9.0	**7.5***	7.8
There are no convenient routes for walking	48.5	50.7	50
It is safe to cross the road	37.5	31.5	32.4
Next time on my journey to and from work:			
It would be easy for me to walk	30.0	18.1	20.2
I intend to walk	10.3	5.9	6.6
It would be easy for me to cycle	40.0	**21.2****	24.4
I intend to cycle	17.2	**6.5***	8.4
It would be easy for me to use a car	93.1	96.5	95.9
I intend to use a car	**81.3***	93.2	90.6
Using a car is something:			
I do automatically	**80.6****	89.5	87.4
I would find it hard not to do	**76.7***	82.8	81.3
At my workplace:			
Many of my colleagues walk all or part of the way to and from work	9.3	2.7	3.9
Many of my colleagues cycle all or part of the way to and from work	12.5	2.7	4.4
Many of my colleagues drive to and from work	93.8	96.1	95.7
Members of senior management walk or cycle all or part of the way to and from work	6.2	6.7	7.2
Members of senior management drive to and from work	87.5	**71.3***	74.3

**p<0.05, **p<0.001*

4.8 Barriers commuting by bicycle

Barriers for commuting by bicycle at baseline below demonstrates the barriers associated with commuting to work by bicycle at baseline. There were several barriers to cycling that respondents highlighted as 'major problems'. These included: no shower facilities (45.3%), no lockers or changing room facilities (47.7%), lack of secure (26.6%) or covered (29.2%) cycle parking, not being able to carry luggage on a bike (42.4%) and needing to stop at other destinations on their journey (36%). It appears that the dress code at work has limited influence on commuting by bicycle with only 13.5% claiming it to be a major problem. The most frequently cited barrier to cycling to work when the categories of major and minor

problem are combined was having no shower facilities with 74.4% of respondents identifying it as a problem.

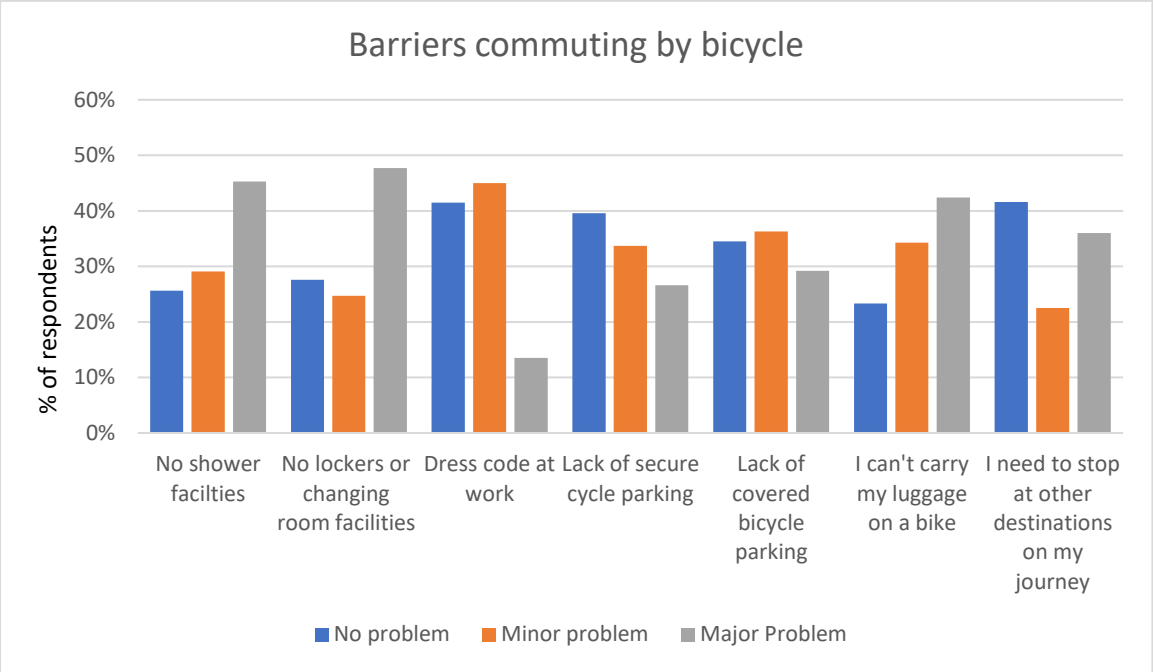

Figure 1.41. Barriers for commuting by bicycle at baseline

Respondents who reported these barriers to be a 'major problem' for commuting by bicycle are broken down by gender in Table 1.9 below. There was no significant gender difference ($p<0.05$) although it should be noted that 39.6% of females agreed that they needed to stop at other destinations on their journey to work compared with only 21.1% of men.

Table 1.9. Major barriers to commuting by bicycle to work, by gender.

	Male Agree n (%)	**Female Agree n (%)**	**Total Agree n (%)**
No shower facilities	53.1 (17)	43.1 (60)	45.3 (77)
No locker or changing room facilities	56.2 (18)	45.4 (64)	47.7 (82)
Dress code at work	9.3 (3)	14.5 (20)	13.5 (23)
Lack of secure cycle parking	21.8 (7)	27.9 (38)	26.6 (45)
Lack of covered cycle parking	18.7 (6)	31.8 (44)	29.2 (50)
I can't carry my luggage on a bike	38.7 (12)	43.6 (61)	42.4 (73)
I need to stop at other destinations on my journey	21.1 (7)	3.6 (57)	36.0 (64)

4.9 Distance travelled to work

At baseline (n=217), over 40% of respondents had less than a 10km journey to work, with 28.3% travelling less than or equal to 5km (Table 1.10). Almost 25% of respondents travelled between 11-20km to work with over one-third of respondents travelled over 20km to work. Table 1.10 outlines mode of travel to work, according to their journey distance to work. Driving a car was the most common mode of travel for all distances. Approximately 83% (n=51) of respondents travelling less than 5km to work travelled by car. The figures for active commuting to work were low at baseline. Almost 13% of respondents that lived within 5km of work walked (Figure 1.61). There was no walking beyond this distance. A total of 8% (n=17) of respondents cycled to work (3.7% living within 5k and 4.3% living within 10km). There was no cycling for those living beyond 10km from work.

Table 1.10. Distance travelled to work at baseline

Distance travelled to work at baseline	% (n=217)
<5km	28.3
6-10km	12.5
11-20km	24.6
>20km	34.6

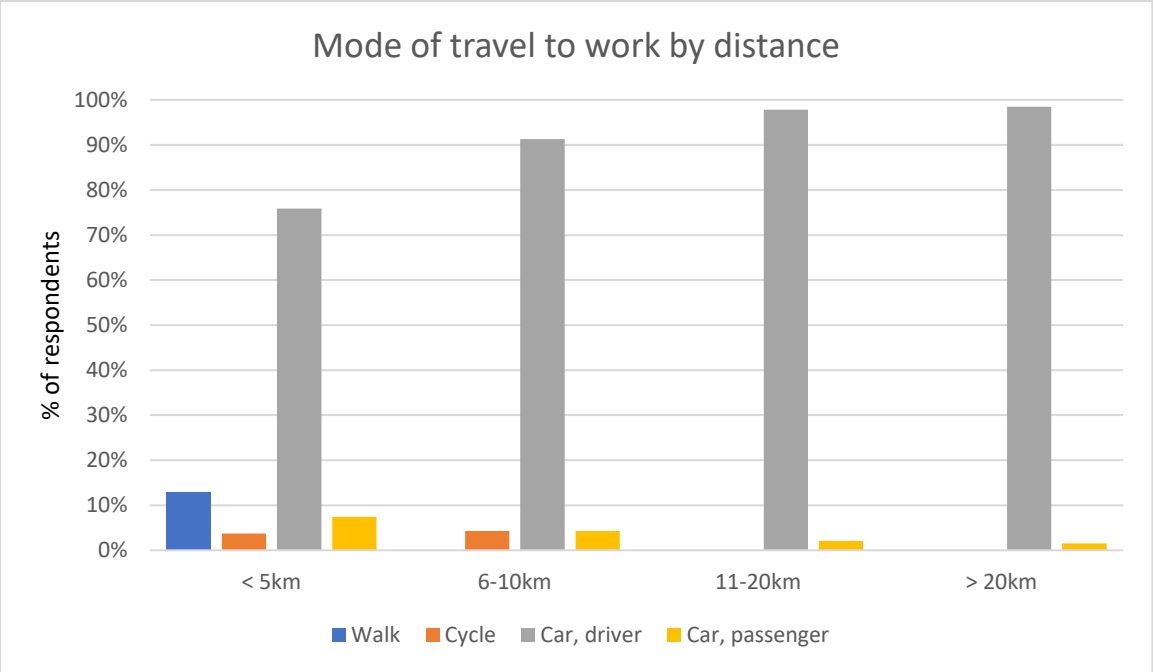

Figure 1.51. The mode of travel to work, categorised by distance travelled

Factors that influenced the implementation of the workplace intervention

Two interviewees who had a role to play in the implementation of the workplace intervention were interviewed. The semi-structured interviews were based on the RE-AIM Framework.

4.10 Identifying the reach of the intervention

Both interviewees identified all staff across the five Kilkenny City workplace sites, as the reach or target audience of the intervention. However, there was little discussion of the importance of identifying a specific target audience for the successful implementation of the intervention. While discussing the reach of the intervention, interviewee 2 stated that the employees with an interest are the ones who will sign up to it. Although seeing employees signing up to the intervention shows *'we've got commitment from the five sites'* (Interviewee 2), achieving sufficient reach can be mitigated by the difficulty associated with *'pulling representatives from all five sites together'* (Interviewee 1). Having a representative from each site can help extend the intervention reach across all workplaces.

The nature of the intervention was deemed appropriate by both interviewees but for different reasons. The high volume of employees in the region that travel to and from work was seen as the main reason for implementing the intervention according to Interviewee 1.

'*The evidence was there showing we could possibly do something, albeit a supportive environment for staff, whether it was travelling to work or during work.'* (Interviewee 1).

Interviewee 2 believed the intervention had good potential because of the large workforce but also because levels of active commuting were very low at baseline. The use of the baseline survey was cited as being useful by Interviewee 2 to help identify the reach of the intervention. The results from the baseline survey showed that a large proportion of staff had to commute long distances to work. With this large proportion of staff commuting by car, Interviewee 2 suggested moving forward that what *'we might need to do, is identify the people who are actually living three to four kilometres from the worksite'* (Interviewee 2) and support that group. Based on these results from the baseline survey, the intervention focus then shifted towards both active commuting to and from work as well as during the working day.

4.11 Funding the intervention

The financial cost of running the intervention appeared to have a large influence on the overall effectiveness of the intervention and is a factor that will limit the potential for these interventions to be replicated in other workplaces. The design of the intervention was influenced by the baseline survey and *'the cost* [of the intervention] *was secured, we had the funding and there was commitment to fund it.'* (Interviewee 2). However, there were several comments made by both interviewees that suggested the level of funding was inadequate for the level of intervention measures highlighted in the baseline survey. The funding for securing the bicycles was met according to both interviewees, but the funding for *'putting in showers, modifying cycle racks and shelters … there didn't seem to be any funding there for it'* (Interviewee 1). The cost of implementing bicycle sheds, new cycle paths as well as creating a Sli na Slainte connection between sites and upgrading the current walkways were all drawn up. However, according to Interviewee 1, the progress on implementing these measures was slow. Interviewee 2 provided some insight into the process and highlighted that the logistics of getting everything up and running proved a learning curve for the workplace.

'Learnings from that we had to source where to put bicycle sheds, and the whole logistics of that from an estates point of view. Going out and reviewing the sites, finding suitable sites, what sites were available, space wise for a shed … what type of shed we were going to put in … and then where we were going to source that. That whole process was quite long – but there's a huge learning from it.' (Interviewee 2).

The funding for the proposed measures was secured due to the workplace's decision to co-ordinate the intervention under the Healthy Ireland framework to support staff health and wellbeing. Interviewee 2 stated that the workplace saw this as a key initiative and did so *'with the mindset of rolling it out across the region'* (Interviewee 2). However, Interviewee 1 stated that although the workplace intended to roll out the intervention … *'now I believe it might have been a box ticking exercise for Healthy Ireland funding'* (Interviewee 1).

4.12 Lessons about behaviour change

The lack of understanding of the factors that contribute to the processes involved in behaviour change can play a significant part in the implementation process and future adoption of a workplace intervention. There was an inconsistency between the interviewee's understanding of what factors constitute behaviour change. While both interviewees agreed

that the intervention had generated important learning for the implementation of similar projects, they both offered different reasons for this. The role the environment had in supporting action was highlighted as *'the real big learning curve for us'* (Interviewee 2) and this was something that didn't come to light until after the purchase of the bicycles. The time of year in which the intervention was implemented was also suggested as a factor that can impact on behaviour change with Interviewee 2 highlighting.

'if you're looking to change behaviour and practices, you have a greater chance of getting new people to adopt behaviour if the weather is better. Normally people cycling along in the winter months are fairly well established in their behaviour' (Interviewee 2).

In contrast, Interviewee 1 believed that the important project outcomes were at a more strategic level and the understanding *'of what to do and what not to do when going into the workplace, what the level of supports should be and the level of commitment from both sides'* (Interviewee 1) was key.

Concerns about the priority of the implementation process was expressed several times by Interviewee 1. When reflecting on the implementation process and the project steering group, it was suggested that *'cycling infrastructure was way down their list of priorities … and while they did attend meetings and all that, I think they had bigger fish to fry'* (Interviewee 1). Interviewee 1 also stated that they'd *like to* [think they're committed] *… again, I haven't heard from them for a while … a couple of months … I'd love to know what are the bikes doing up there now. Obviously it's way down the list of priorities for them'* (Interviewee 1).

Moving forward, Interviewee 1 believed that the HSE's strategy for behaviour change should be *'long term, not the way we can just parachute in over five months and hope to change something that's been there years and years'* (Interviewee 1).

4.13 The role of the committee in adopting and maintaining a successful intervention

Having individuals with behaviour change experience and active travel experience should be used to help inform more successful interventions. According to Interviewee 1, the people in charge must have enthusiasm for promoting active modes of travel, but they also need the *'authority to implement a car parking strategy to go hand in hand with an active travel strategy'* The communication strategy that was used during the intervention via newsletters and promotional material to promote the intervention was deemed successful by Interviewee

2. In contrast, Interviewee 1 stated that these soft measures need to be reinforced with *'having someone with real authority to change the whole way of thinking up there'* (Interviewee 1).

Interviewee 2 reflects on the diversity in the committee where *'some people brought a keen knowledge around bikes and cycling and others brought an interest around physical activity and behaviour* change'. Although this may have been the case, a different opinion was shared by Interviewee 1 where the lack of active travel expertise in the committee was considered a major limitation;

'It's just the people with no active travel [experience]*, I don't think they understood why anyone would cycle to work, they didn't get it'* (Interviewee 1).

The role the committee plays when adopting an intervention is an important factor in the delivery and future maintenance of an intervention. When setting up the original committee it consisted of a broad range of individuals from public health, senior management, facilities managers, and other personnel. This wide range of individuals contributed to having *'a wealth of skill and knowledge in the room'* (Interviewee 2). The importance of creating this partnership was to have key people from all five sites that were committed to the project from the outset. Although Interviewee 2 stated the partnership worked well, they admitted that the partnership *'was hard to maintain and hard to sustain as well'* (Interviewee 2). The reason for the difficulty in maintaining this partnership was suggested by Interviewee 1. They highlighted the following:

'The first half [of the committee] *was active travel who were very keen on it, wanted to push it on and thought it was a really good idea. They had a really good ethos, the idea. The other people that were there, were surprised that other people would consider things, they had no passion or drive. They had no experience'* (Interviewee 1).

The skillset of those adopting the intervention can have a significant impact in terms of intervention maintenance. Both interviewees were happy with the skill set of the personnel on the committee, but there was little elaboration on what the specific skills required should be. Interviewee 2 mentioned that one of the skills required would be to create a link between the committee and the five sites. This link would be useful to help *'bring the information back, attend the meetings and bring the information back to their base'* (Interviewee 2).

The importance of having a person on the committee with authority to drive the intervention and make decisions was considered essential for the maintenance and adoption of an intervention. This role seems to have been overlooked. The lack of authority on the committee was strongly highlighted by Interviewee 1 on several occasions throughout the interview and suggested that *'the structures within the workplace don't give authority to anyone to make change'* (Interviewee 1). Given the number of senior management employees on the committee the lack of direct responsibility given to staff was highlighted as a concern by Interviewee 1. They stated that;

'it's down the pecking order and they all had other jobs to do. So nobody had the specific role, or even to call people because they're all doing other jobs'. (Interviewee 1).

'it's nobody's job … that's the problem'. (Interviewee 1).

'even though we had senior management, I don't know were they afraid to make decisions or … is there some internal politics that would be scorned on for defying opportunities for active travel' (Interviewee 1).

Moving forward, having an employee from the Human Resource Department to drive and maintain the intervention was suggested by Interviewee 1. They suggested that perhaps this was missing from the original committee. Interviewee 2 spoke less about the authority needed to make decisions, but they suggested having a keen interest in the area was the motivator to make change;

'There is a drive, they go in there and do it because you've a personal interest in it. Maybe give it a little more energy, a little bit more over and above' (Interviewee 2).

An essential additional task needed for the long-term maintenance of this is identifying;

'a person to drive it. A person who's sole … passion with a feel and ethos for active travel. Having a person with authority to make change. That's the key thing to make change, in terms of parking, in terms of active travel'. (Interviewee 1).

4.14 Understanding the project objectives

The need for understanding the project objectives is an important factor in the maintenance of an intervention. At the beginning of the intervention both interviewees were positive and enthusiastic about meeting the perceived objectives. However, the lack of intervention effectiveness can be potentially explained by discrepancy between interviewees

understanding of the project objectives. Increasing both *'awareness'* and *'curiosity'* among staff around their behaviour was seen as the main objective by Interviewee 2. In comparison, Interviewee 1 stated that their expectation was to see good cycling facilities on all five sites to encourage more active commuting to meetings and during their lunchbreaks as opposed to driving. Interviewee 1 explained what they perceived to be the focus of the intervention;

'we felt that given the provision of bikes that were adaptable for all small, medium and large people, providing the actual facilities, the equipment, locks, the helmets … being able to sign in and out with their swipe card. We made it as easy as possible just to take a bike … we felt that then if the small number of people that were cycling to work saw this that … there would be an increase in the number of people cycling.' (Interviewee 1).

The interviewees' understanding of the project objectives also diverged with how to promote cycling as well as introducing disincentives for driving. This helped to explain the low intensity of the intervention. While it was acknowledged by both interviewees that purchasing the bikes and accessories was *'done immediately'* (Interviewee 1), Interviewee 2 suggests that the logistics of constructing bicycle sheds and storage for bicycles '*proved very problematic for us. That was the biggest challenge'* (Interviewee 2). According to Interviewee 2, if there was better planning in place for bike storage it could have supported the intervention a little better to produce positive results and meet the objectives. Interviewee 1 stated that the availability of parking spaces was one of the main issues which influenced the intensity of the intervention as. They stated;

'they have access to parking spaces … and that's the problem. Also having access to double parking, and parking up on grass verges … and that's acceptable. And if the person had authority to change all that and force people from illegal parking to active travel'. (Interviewee 1).

Some possible reasons for not meeting the objectives are explained and may have also contributed to the low intensity of the intervention. A frustrated interviewee 1 claimed that *'I feel we were chasing them. The intervention wasn't a priority for them.'* (Interviewee 1). Whereas Interviewee 2 believed that external factors were to blame for the low intensity of the intervention.;

'The whole thing is based on the external factors, that … we had organised training for staff on bikes and that was cancelled.' (Interviewee 2).

Both interviewees reflected on the potential achievement of the project in the future if the objectives were met. While *'the initial willingness to engage'* (Interviewee 1) was noted as a key element that proved to be successful, Interviewee 1 was not confident that the intervention would having lasting and sustainable benefits due to the fact *'nobody was in charge … there's no staff member with an actual role'* (Interviewee 1). In contrast, Interviewee 2 believed the intervention was a very successful pilot study where the objectives were met and it will have lasting and sustainable benefits. According to Interviewee 2, the bikes are available in all five sites. The usage of the bikes had increased and *'our regular people are using them, but we'll have to put out another campaign with estates, put out another promotion with staff'* (Interviewee 2). It was noted that interviewee 1 was unfamiliar with the progress of the project at the time of interview;

'I'd like to see where the ten bikes, ten helmets, locks and lights … the last time I was there the two bikes were sitting at reception … I looked at the tyres and they don't seem as if they've been used.' (Interviewee 1).

Interviewee 1 strongly portrayed their disappointment in the implementation process of the intervention at the conclusion of the interview;

'I was just disappointed. There was a lot of learning in it for me, I was disappointed that it wasn't successful'. (Interviewee 1).

Study 2: A qualitative analysis on the implementation of workplace travel plans in Ireland

The factors that influence the implementation of workplace travel plans in Ireland

As outlined in Table 1.2, a total of 10 participants were interviewed from both the public and private sector from various counties around Ireland. The main themes can be seen in Figure 1.61 below, with the hierarchy of codes highlighted in yellow, with the sub-codes in blue.

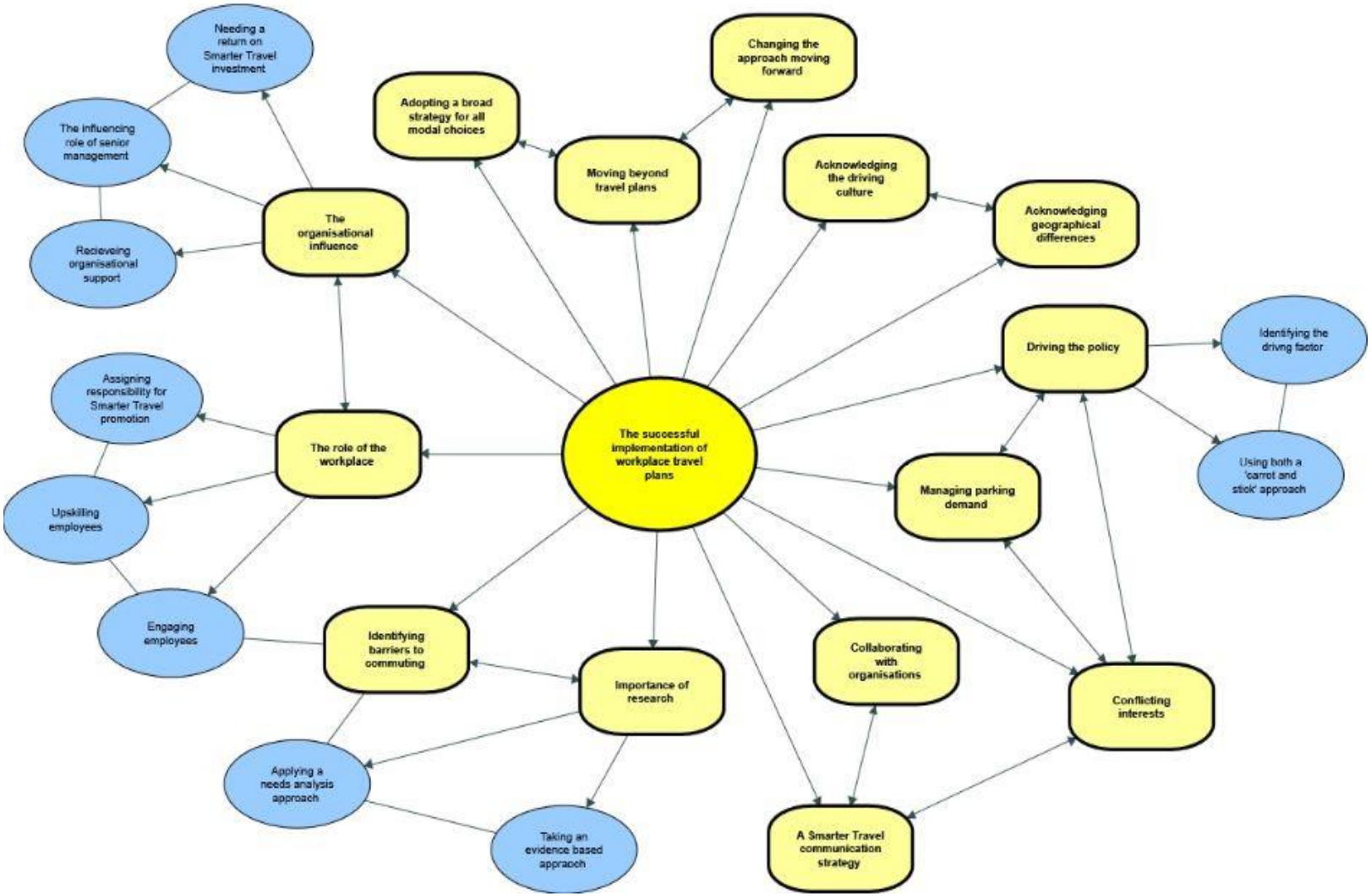

Figure 1.61. Map of codes highlighting the relationship between different category headings

4.15 Acknowledging the driving culture in Ireland

The majority of interviewees acknowledged that there is a strong driving culture in Ireland. The normative use of the private car as a mode of transport has been highlighted several times and the consensus is that *'people are creatures of habit'* (Interviewee 5) who will get into the car and drive to work without a second thought. Free ample parking in workplaces and third-level institutions across the country seems to play a key role in the development of the driving culture in Ireland. One interviewee from a public sector workplace in a large city explains.

'There's a very strong driving culture here, stronger than my previous workplace. The reason being, this is an inner-city workplace where they've always enjoyed free, ample car parking, … they've always enjoyed free ample parking, that's … that's changing.' (Interviewee 2).

Similarly, a third-level institution in a smaller city provides free car-parking because it is regarded as a *'basic human right'* (Interviewee 3) for staff members.

Several interviewees regarded Ireland as being less favourable to everyday cycling and believed that this driving culture is having an impact from a very young age. The development of the driving norm stems from the lack of appropriate transport planning where building new primary and secondary schools are being constructed in isolation. Walking or cycling to school independently for these children is not an option.

'It is this whole culture in Ireland that it is not favourable to everyday cycling, and it starts at school age. Whether it's where the schools are being built, primary schools, secondary schools … every schoolchild is being driven to school by Mummy or Daddy to their classroom. When new secondary schools are being built, anywhere up the country, they're being built in the middle of nowhere where you definitely can't walk or cycle independently from Mummy or Daddy to school.' (Interviewee 3).

This is transferrable to young adults when they turn eighteen or attend college; the first thing to do is *'get your driving licence and buy a car, because you haven't learned anything different'* (Interviewee 3).

Changing the driving culture is necessary but changing behaviour the goal should be to change the norm so that it's the norm to walk or cycle to destinations. The issue seems to be people don't know how to change it and the reality is that if one small workplace changes the

norm, they are only a small fish in a big sea of driving. It is difficult to see a positive change in behaviour because *'what we're seeing now is a generation that may not have cycled for years, a huge percentage of people are car owners, to the detriment of cycling'* (Interviewee 9).

4.16 Acknowledging geographical differences:

Acknowledging geographical differences when implementing a travel plan is a widely agreed-upon topic. The promotion of Smarter Travel tends to be a lot easier in Dublin than in rural towns or smaller cities across Ireland. This prompted some interviewees to suggest that the level of promotion should be based on the geographical location;

'The Smarter Travel in the city centre offices in Dublin is probably going to be walking, cycling, and public transport. Smarter Travel in an organisation at the edge of Galway or Waterford is probably going to be …eh... car-sharing and then with as much as possible could do with walking, cycling and public transport, depends on what's available...' (Interviewee 1).

Rural towns find it difficult to promote sustainable travel with the limited transport and cycling infrastructure available compared to the large cities like Dublin and Cork. Although these cities have the infrastructure to promote cycling, Interviewee 7 stated that safety is an issue with people concerned about sharing the road with trams and buses in the city centre.

The geographical differences in public transport services were also a major discussion point. Some interviewees stated it is difficult to employ staff in locations where public transport access is limited compared to other locations in the same city.

'We definitely have people coming from the north of the city who don't … wouldn't work in this south-city office location. They'd exclusively want to look at the north-city location because they're thinking of transport links …' (Interviewee 8).

The majority of interviewees outside of Dublin complained about the lack of public transport services and stated that *'public transport would be nothing on par with Dublin'* (Interviewee 5). However, one interviewee stated that public transport is an issue everywhere including Dublin. Although the bigger cities may have the options, it is still unsuitable as a convenient mode of travel in the larger cities due to difficulties with travel times. However, an increase in public transport use was seen in one large city outside of Dublin when the *'public*

transport routes were overhauled to make them more efficient' (Interviewee 1) for the specific needs of the city.

It is not only the infrastructure and services available that differ between cities in the promotion of sustainable travel. The development and implementation of workplace travel plans is greatly influenced by the support offered by the local authorities who have experience working with travel plans. However, the geographical divide was evident again when one interviewee highlighted their frustration with the high levels of support in Dublin but the lack of support on the ground in the smaller towns and cities outside of Dublin. One interviewee stated;

'many of the decision makers are simply stuck in their kind of … semi-detached suburban mindset and the thing is people who are living in the city centre are happy with it and don't really want to move out to the suburbs and the two family cars and drive in. It's simply not their lifestyle.' (Interviewee 3).

4.17 The importance of research

Applying a needs analysis approach

Participants suggested the need for applying a needs analysis approach prior to implementing travel plans. According to one interviewee the main outcome of the need analysis should be *'to understand their* [the organisation's] *barriers are to sustainable travel so we can better understand what we need to put in place that would best be of most value to employees. Y'know, what are the barriers that we can remove for people that it's easier for them to engage in Smarter Travel.'* (Interviewee 10).

This will help them have a better understanding of what travel-related actions or initiatives would be of most value to their employees. Some interviewees shared their experiences of carrying out comprehensive surveys to monitor several factors including traffic coming in and out of the premises versus parking spaces available, reviewing how employees travel to and from work and having detailed discussions with local residents to address their concerns about the implementation of travel plans. One interviewee explains how these surveys have helped to geo map where the majority of staff are living.

'as part of the pre planning we'd have done a comprehensive staff survey, which would feed into some of the information elements of our current modal split, but we have geo mapped

where our staff are living, and predominantly, there are significant clusters of them living on the south side of the city.' (Interviewee 2).

The input received by staff members is generally seen as a way to help remove some of the barriers associated with sustainable travel. Interviewee 10 highlighted that getting people's input is an essential part of the whole programme. Most interviewees have addressed the need for staff input and how this helps ease the implementation of travel plans. However, one interviewee from a private sector company highlighted the lack of planning involved by stating nobody has *'ever'* asked how do the employees travel to work or if they have the necessary facilities available for different modes of travel. It is assumed *'they get there. In some ways'* (Interviewee 8).

Taking an evidence-based approach

In Ireland, the lack of evidence for changing employee travel behaviours has delayed the successful implementation of travel plans and behaviour change programmes. According to interviewee 1, the *'original attempt'* at a behaviour change programme in Ireland was only ten years ago. With no previous research in an Irish context, the interviewee explains how their organisation developed the programme from scratch while looking at best-practice internationally. Similarly, Interviewee 2 discussed their involvement with implementing a successful workplace mobility management plan for the first time and helping provide a template for others to follow.

'I suppose one of the big things was, there was no previous cases to go on. It was very much a blank canvas, which I suppose was kind of positive in some respects. It had never been done in this country before, particularly in the public sector. To implement a mobility management plan had been unheard of. Prior to that, mobility management plans were usually just submitted with a planning application that was gave to them, so the workplace took a very pioneering, and innovative approach, actually implemented the plan that was needed. It had been a huge success, in terms of reducing car usage. It provided a template for others to follow suit …' (Interviewee 2).

Surveys are suggested as the main method used to generate evidence for the various workplaces. Two interviewees confirmed they send out a Smarter Travel Workplaces online survey annually to receive feedback from staff. One interviewee claimed the feedback she receives from her annual survey sent out to both staff and students is good and she has a good

understanding of what is happening on the ground in their workplace. However, although the information helps capture modal shift it does not capture enough information on the effectiveness of specific Smarter Travel measures.

Poor management at a national level also limits evidence being produced as a second interviewee explained how they did not distribute the surveys for feedback because

'The NTA coordinator that we had last year only sent me the template of it in March, and then Easter was late and then … so we didn't do a survey last year.' (Interviewee 4).

The need for effective measurement tools to evaluate initiatives is evident. A senior manager from a large public sector company explained the importance of specific feedback and its relationship to future investment. This workplace was discussing the investment in a small fleet of bikes to promote Smarter Travel in the workplace and how the evaluation of this pilot will determine if this initiative it to be rolled-out company wide.

'we'd survey who used the service and asked what's worked for you, what hasn't worked, because you want to identify without being negative about it, to a certain degree to do better. And let's see what the …how do we do that better because we want to get it introduced again, across all systems. We want to be able, if possible, to take out whatever's not working or can be improved upon.' (Interviewee 5).

4.18 Driving the policy

Identifying the driving factor

All interviewees agreed that understanding the main reason for implementing a workplace travel plan was essential. It seems the driving factor for some interviewees is more focused on the health side with other interviewees more interested in developing sustainable travel. How the company identifies the driving factor for their workplace travel plan *'depends on what the organisation is trying to do, and what shift they're trying to achieve, and what shift they have to achieve'* (Interviewee 1).

It is apparent that workplaces differ in their approach to identifying the driving factor for workplace travel plans. Interviewee 10 explains how targets were set for implementing a strict mobility management plan in their workplace compared to a different approach used by Interviewee 3.

'So my job really … was to implement a mobility management plan, kind of to eh … a successful mobility management plan, to mitigate against the impact it would have on the campus, and targets were set, as per the planning application to reduce car usage … a whole series of targets set, interim targets set as well. Targets set to be achieved for public transport, cycling, walking, they were all broken down into interim targets, so over the course of it … it was given a five-year plan.' (Interviewee 10).

'We never really had any specific targets in terms of numbers or so, ehm … I was greeted with the phrase 'What's good for cycling in the city, is good for cycling in the company' so plough ahead and I took their word on that.' (Interviewee 3).

While some interviewees identified tackling the number of cars on the road as a driving factor, the reasons for this varied slightly. Staff having nowhere to park due to high demand for parking spaces was referred to by several interviewees with others referring to the company's objective to create a healthier workforce. The latter appeared to be one of the main driving factors for a number of interviewees which was mentioned as part of an employee health and wellbeing policy. Interviewee 6 reflected on the important role of Healthy Ireland as government policy and how it can be used as an agenda for workplaces to push for funding to promote their workplace travel plan. Having such a policy may give you extra leverage with external stakeholders according to Interviewee 2 who identified it as *'national strategic significance'*.

Although some organisations appear to favour either sustainable travel or a healthier workforce *'when there's an opportunity to combine sustainable travel with health benefits … that's a win win!'* (Interviewee 10). Interviewee 1 explained that focussing on both can be advantageous as they both can carry the same messages at the end of the day.

Using both a carrot-and-stick approach

In terms of implementing a workplace travel plan, there is a consensus among some interviewees that it may not be a success unless you use both a carrot and stick approach. Those interviewees who agree with this approach are coming from a project management background from different parts of the country with relevant travel plan experience. The introduction of parking charges was the measure considered most important. They believed that unless this is introduced as 'the stick', the likelihood of implementing a successful plan is limited and *'the key to the whole success was the big stick coming out with the parking*

charges' (interviewee 2). The introduction of parking charges can be hugely emotive and although *'nobody wants to charge their employees or their colleagues for parking … it is the single, most effective measure to reduce demand for cars'* (Interviewee 1). The difference in workplace organisation locations may also influence the type of carrot and stick measures that are implemented. It was suggested by one interviewee that because Dublin is so inconvenient to drive in, the implementation of parking charges would be easier compared to a smaller town. Interviewee 9 discussed the issue of implementing parking charges in a city outside of Dublin and the difficulties it may bring.

'I think the harder one to implement is the stick one, where you increase the price of parking or remove parking spaces from the city centre. And that's a huge issue then as well because when you do that you will have kickback from people saying … 'oh well in other cities you have cheaper parking, free parking' and people will go shopping there. So you're trying to balance … what are you … you going to run against the Chamber of Commerce in terms of … increasing the cost of parking here and having the outcry over that as well.'

The importance of the 'carrot' is rarely mentioned by the interviewees but the importance of having a choice in terms of travel mode was highlighted by interviewee 1 and the need to avoid *'that kind of condition that makes people who don't have any choice suffer'* (Interviewee 1). The 'carrot' approach was briefly described by one interviewee as the development of all marketing, promotion and publication of the TaxSaver ticket scheme, extra bike parking and pool bike schemes. The best method of implementing these initiatives is to *'do these things in tandem with the parking* [supply] *coming down*' (Interviewee 2).

4.19 Managing parking demand

As previously mentioned, there is agreement among all interviewees that there is a strong driving culture in Ireland. One reason for this appears to be the years of ample free parking. Managing the demand for parking is a strongly emotive topic among interviewees and it is described as a *'political hot potato'* (Interviewee 1). Some interviewees propose that parking should be used as an enticement to provide employers with recruitment opportunities and although;

'people have an interest in their health, not necessarily from a travel perspective and certainly if you're wedded to the car, like, like some people are, they're not going to give it up, unless there is a restriction on let's say parking' (Interviewee 1).

The use of parking permits to manage the demand for parking appears to be a strategy used by some interviewees. In a rural town where employees have the use of free parking, the demand is at an all time high. A free-parking permit system was brought in help manage parking demand closer to the building. This was to help incentivise car-sharing among employees and lower the demand for spaces. The difference in geographical location was highlighted when one interviewee in Dublin explains how the annual parking permit fee costs the employee over €2,000.

There appears to be a disagreement among interviewees on the topic of daily parking charges with one interviewee claiming it would *'be a disincentive to our employees to have to pay to park, when locally there is no paid parking'* (Interviewee 10). However, in a large public sector company in Dublin, parking charges were ramped up in conjunction with the loss of parking and it was used as an incentive for more sustainable travel. The implementation of a daily parking charge compared to an annual permit is best suited to promote the use of sustainable travel. One interviewee from a large public sector organisation explains why they plan to implement daily rates compared to the permit system.

'What we never, the route which we never went down was some kind of flat-fee for the year or so. So you pay €50 a year and then you have parking access … because you should make the choice on a daily basis.'

'So for those who come only once a week, they pay only €2, for those who come five times a week they pay ten etc. etc. So we never went down that route having a flat rate.'

'For those people who only come a couple of days they only pay for a couple of days, and for those who come on a daily basis, they pay each and every day … because the effect would be once you've paid your €50 or €100 a year, whatever it is … it's out of sight, out of pocket, out of mind … and then you know you've free parking and there's no incentive on a daily basis to leave your car at home.' (Interviewee 3).

With some workplaces having a limited parking capacity, it seems the conversation of introducing charges is one which is quickly dismissed. One interviewee explains;

I suppose a lot of what we have is limited enough parking, if you're here you're here, if you're not, you're not. But it certainly hasn't been a conversation that we've had whether we should charge or not charge. I don't recall having that kind of a conversation.' (Interviewee 6).

Similarly, with limited parking facilities available in a private organisation in a small city, parking demand is at an all-time high. However, the introduction of parking charges to combat this demand seems unlikely with the interviewee sternly explaining *'well no, you won't be charged for parking'*. (Interviewee 7).

Providing an overflow car park as an alternative to limited parking is something which was discussed in both private and public organisations. A large public sector organisation in a small city explained how the local council provided them with an overflow car park to meet the demand for parking in order to avoid confrontation with local residents. Similarly, a large private sector company in a large city explains

'We can't offer people … well, we can't offer many people car spaces. So we don't have the offering of car spaces. Not here … but we do have spaces in nearby and there's tickets there, but the company pays for them for anyone … so it's kind of like our overflow.' (Interviewee 8).

4.20 The organisational influence on implementing plans

Influencing role of senior management

The majority of interviewees acknowledged that the involvement of senior management is an important factor for implementing successful workplace travel plans. Although there is limited evidence on the successful implementation of workplace travel plans in Ireland, one interviewee working for a large public sector organisation in a large city explained how they overcame this barrier:

'I got the senior management to buy in from the start, and that was the key to it, so the CEO, right we're gonna go this way and they pursued it. It took time to achieve that so … once I had that,overcame the barrier of not having a peer reviewed sort of case to reference'. (Interviewee 2).

The reported level of involvement needed from senior management varied between interviewees with interviewee 6 describing how the actions and behaviour of the senior management can speak volumes to their employees. Similarly, it was considered by another interviewee that no matter how small or large their involvement is, the recognition from the employer is vital;

'*… if it's only paying for the prices for people taking bicycling incentives it's mugs, or coffee, people need some kind of recognition from their employer, that what they've done is important and valued.'* (Interviewee 1).

It was portrayed by a number of interviewees from private sector companies that the interest of senior management and their attitude towards Smarter Travel plays a role in their involvement. Interviewee 7 explained that Smarter Travel isn't something that interests the CEO of a private sector company and it's not something he has focused on. This view was shared by Interviewee 8 who could not pinpoint a single person from senior management who would be a champion of promoting active travel. The health and wellbeing of employees in general is *'one thing that their eyes kind of glaze over … they lose the kind of interest in it'* (Interviewee 8).

The level of involvement of senior management can also influence the process in a negative manner. One interviewee (Interviewee 4) explained the difficulties they encountered when a senior manager wanted the location of a secure bike shed moved from the car park directly in front of the building. Moving the location of the secure bike shed made it less appealing and less convenient for employees. Interviewee 4 offers a possible explanation for this change; *'I think they didn't want people to see that as the first thing as they come into this premises'.* (Interviewee 4).

Needing a return on Smarter Travel investment

The general consensus among interviewees was that the level of investment needed to promote sustainable travel and workplace travel plans can be significant and this was a limiting factor. One interviewee from a public sector company in a large city explained that companies are investing their own resources with limited or no financial assistance. How they invest their funds is dependent on what is of interest to them. The lack of funding and complex financial planning involved is outlined by Interviewee 3;

'we have recent budgets here for our commuting activities, which we use everything that we take in from the car park, the car park fees … and that's where everything gets paid from. From the park and ride buses to improvements here for cycle parking, for security on the outlying car parks, the car parks, etc. etc. etc. So uhm, the investment for alternative means is only a fraction of what I have taken in and what I have spent … so just to illustrate that the line-share goals … I introduced park and ride travel … which is free of charge … and so, I'm

not even close to breaking even for various reasons. I'd say at the end it's one of the most limiting factors …… and I just learn to plan a bike shelter or a nice solution for covered bike parking … it can come down to, who do we pay, what kind of shelter, will it be makeshift, do we make a design, what would be the best bike racks to put in there so we get in most of the bicycles on a given length of wall. So yeah … and then there's the whole kind of financial-admin side, or cost-admin side … it's all on my desk!!' (Interviewee 3).

The considerable financial investment needed seemed to deter organisations away from these plans, especially those outside of a large city. One interviewee explained how they might be able to implement options for bicycle parking which are popular in larger cities like bike lockers that *I've seen at Heuston Station and that sort of a stuff, but they're expensive … I think it's just the numbers don't add up, it's a smaller city'* (Interviewee 4).

Investing in other options like shuttle buses was a negative experience for one workplace with the organisation *'spending huge amount of money'* (Interviewee 5) and no staff availing of the service. The investment into CocaCola Zero bikes have also been described as *'a financial dog, they're an absolute loss-making set-up'* (Interviewee 1).

One interviewee from a private sector company in a large city explained a possible reason for the workplace not investing in workplace travel plans.

'Like I've said before, it might be attractive for their corporate image but it's more attractive to give money and match funding that employees raise for charity events rather than implementing a workplace travel plan. So it's not the sexy thing to do for companies. The first thing is 'Oh it's a lovely idea … and how much is it gonna cost?' That's a huge … and it wouldn't be high on a lot of companies eh … it's a lot easier to give other things to staff, to retain staff and keep staff happy. Smarter Travel is kind of down the pecking order in terms of incentives and sexy things to do.' (Interviewee 9).

Although the high cost of some initiatives can be a deterrent, it was highlighted that the cost of initiatives can be kept at a minimum while providing a return on investment for the company. Interviewee 6 explains the cost of implementation shouldn't have the final say on whether an organisation should invest in workplace travel plans or not.

Receiving organisational support

Although the majority of interviewees agree that receiving organisational support is important for the successful implementation of Smarter Travel initiatives, the majority of interviewees argue that there is limited support and funding available.

The support provided to the organisations by the National Transport Authority in a workplace outside of Dublin *'has been brilliant … I'd ring them about the Stepper Challenge and everything, they're absolutely fantastic'* (Interviewee 5). A second workplace in a small city has highlighted how the National Transport Authority has offered their support;

'they come down to make us aware of … y'know car share initiatives that are out there … the strategies nationally. They have meetings or talks with relevant employees in terms of creating awareness. Ehm … they have shared information with us with what has worked with other companies. They have provided us with some promotional material to us when we were running initiatives … like freebies and things like that' (Interviewee 10).

With the organisational support being limited from the National Transport Authority, one workplace explained they provided all the promotional material themselves without any support.

The availability of funding to support the organisation was an overwhelmingly emotive topic for the majority of interviewees. The contrast between what both large and small private sector companies can lobby funding for was raised by one interviewee. With large companies being able access funds for improved facilities and employee well-being programmes, the smaller companies find this more difficult. Interviewee 1 explains that although *'some of the budgets our partners have are quite minimal, they are quite inventive with them and creative, so they do fun things'.*

However, both large and small public sector organisations find it difficult to source funding with the National Authority providing funding *'to a limited extent … but primarily the organisation* [are funding the initiatives]*'* (Interviewee 2). Another interviewee from a large public organisation explains the difficulties they encounter with minimal funding available to the organisation;

'we're a public organisation so funding is always going to be an issue. Because if the NTA aren't going to fund, the shuttle services or some different type of way of working around it … more buses … But its money is what you need … and resources.

This is always been there. And we are trying to work that, and if we need funding then we go for it. But you've got to have a business case to get funding, you can't just go and go 'I need money' … we're talking huge money here … It's a massive amount of money needed' (Interviewee 5).

These difficulties have led to one organisation looking for alternative means of funding with one organisation applying for funding through the Healthy Ireland Initiative because *'there's funding there'* (Interviewee 5) and another interviewee refusing to *'get into funding because I'm not sure what way funding is going at the moment'* (Interviewee 9).

4.21 Collaborating with organisations

It appears collaboration between organisations and authorities is something which is needed to create a modal shift towards more sustainable travel. Based on the interviews, there is no 'one-size fits all' approach.

There are different opinions among interviewees of what exactly a collaborative partnership consists of. One interviewee explained that it;

'has to be a collaborated effort with regard to all local businesses where we would all come together and discuss the traffic flow in the radius area. I think that's the only way – collaboration. And also talk to hospitals, talk to other businesses up the country who've done similar things. I do believe that sharing information is a huge way of being able to move things forward' (Interviewee 5).

Other interviewees held similar beliefs. They believed that the local council, the National Authority and local businesses should all be part of any travel-related collaboration. Collaborating with other local authorities and organisations was also discussed as being useful when applying for funding from the National Transport Authority as a collective group rather than as a single organisation. Having key stakeholders in a collaborative project is extremely beneficial for the organisation because *'they have experience doing it, they have guidance, and they can tap into national resources easily'* (Interviewee 1).

Interviewee 3 shared their experience in setting up a collaborative travel project. It consisted of people from the City Council, transport planners and several large companies including Bus Eireann, Irish Rail and the Health Service Executive. This group would meet on a monthly basis and *'try discuss matters, try to run campaigns, try to influence projects in the council, try to lobby from the ground… just to keep the ball rolling'* (Interviewee 3).

The frequency for meetings was not a topic which was discussed in detail. However, Interviewee 10 explained that although collaboration is important, an annual meeting between organisations and authorities is enough to keep the topic of sustainable travel on the agenda.

4.22 The role of employees

Up-skilling employees

The topic of up-skilling workplace employees was one of the least discussed topics. It appears that different interviewees have different thoughts on how they would up-skill the employees in their workplace. One interviewee from a public sector workforce in a large town explained how they would provide training to staff members who put their name forward to act as a champion for initiatives. Interviewee 6 believed that this up-skilling gave the employees more responsibility and generated more buy-in for the initiatives. This interviewee was the only one to make reference to up skilling employees in relation to facilitating and helping to roll out initiatives on the ground.

The remaining interviewees discussed the up skilling of employees in terms of the skills required by employees to shift to more sustainable modes of travel. Providing bicycle training to employees was the most common measure discussed by interviewees with one interviewee explaining some of the barriers that people face.

'people don't feel safe cycling on the road with so many cars. But even using cycling tracks … but getting to and from the cycle tracks. So it's a whole thing on safety … ehm … they may not have cycled for 20-25 years and in that twenty years, there's roundabouts have been introduced, so people don't know how to cycle roundabouts and it's a huge fear of how to get from one side to the other. So people I think is …cycle training is a huge thing.' (Interviewee 9).

The lack of enthusiasm for up-skilling employees was evident in one workplace in a private sector company in a small city. They described how the Cycle to Work Scheme was introduced to employees, but no bicycle training or road safety training was provided. It was agreed that training would be of benefit to those *'less seasoned cyclists'* (Interviewee 7) but there was no interest in providing it.

Engaging employees

The majority of interviewees agreed that engaging with employees is an important factor in implementing workplace travel plans and promoting sustainable travel. Interviewee 10 explained that having an interest in the topic helps with engagement, but it is also seen as being a responsible employer. Receiving staff feedback can also be used as a way of engaging according to Interviewee 2. Having staff pay more attention to the facilities available and providing suggestions may prompt them to engage in the initiatives being promoted.

Engaging with employees can be approached in a number of ways with the sharing of information about what's available to employees around the local area working well in a private sector workplace in a small town. They provided maps of the local area which included cycling routes and pedestrian routes which are segregated from vehicles. A similar approach was also successful in a public sector workplace in a large city. One interviewee explained how providing information to their employees at induction was an important way of engaging.

'you might get the CEO to write about his commute to work, he's perhaps cycling in now and again, so you'd get him to write in about his cycle to work. You'd have occasional champions like that. In terms of the front office role, if you like what I call them, there's a lot of engagement with staff, marketing of the TaxSaver ticket scheme, the Cycle to Work scheme, all staff are met by me at induction to make them aware of what's going on here and the impact it has.' (Interviewee 2).

One workplace in a large city took an innovative approach to engage employees in cycling by organising a lunchtime cycle seven times per year around the local neighbourhood to highlight all the possible shortcuts, the nice cycle routes along quiet residential areas and ideally create an interest in cycling among employees. Other interviewees engaged employees by facilitating coffee mornings for active commuters where information packs would be distributed.

Interviewees were unsure about why employees don't engage in the promotion of workplace travel plans. However, interviewee 10 suggested that uptake of their sustainable travel initiatives was low in comparison to their health-orientated initiatives because of *'practical reasons … it's not always easy for people to change their transportation habits.'* (Interviewee 10). They also acknowledged that poor weather may have impeded employee engagement

with certain initiatives.

Assigning responsibility for Smarter Travel promotion

The need for assigning a role for Smarter Travel promotion is something which is widely agreed on among interviewees. One of the most prominent factors discussed in the interviews was the lack of clarity on which workplace department this work is supervised under. One interviewee explained how the Human Resource Department was responsible for Smarter Travel with another workplace stating it is managed by the Estate's Office.

One interviewee from a public sector workplace in a small city explains how the workload was assigned to a number of different departments in the previous years, with estates and the HR department being the main ones (Interviewee 4).

One workplace was described as having absolutely no involvement in Smarter Travel promotion. The interviewee was asked which workplace department should look after the promotion of Smarter Travel, however there was no obvious suggestion.

'But if you look at our roles, we're too busy to be going after people for cycling or whatever. It would have to come from HR or Health & Safety. Health and Safety are too busy, send it down to HR and … the personnel in that department would be … active, or into cycling.' (Interviewee 7).

It is suggested by several interviewees that the role of Smarter Travel promotion should be assigned to a 'champion'. This champion is someone who has an interest in the topic and is passionate about either sustainable travel or the physical activity aspect of it and plays an important role in getting people involved in Smarter Travel initiatives. According to a couple of interviewees there are many ways to view a champion. According to Interviewee 5 the champion can be as simple as having an employee putting their face and story on a poster for promotional work, to a facilitator of lunchtime walking groups (Interviewee 6) right through to a person who has an interest in the topic and will generate local interest too (Interviewee 3).

The role of a champion can vary from site to site, but the fundamental characteristics and skills of a champion are important if initiatives are going to succeed.

The champion is *'the person who is going to drive it, and if you have a situation where the person being appointed [to] that role isn't really the right person, or doesn't have the*

interest, it would fail because they don't have the interest or maybe the skills to drive a behaviour change programme because it's a very specific thing. They might be fantastic at building facilities for cycle parking, drying rooms and so on, so they're essential to your travel plan because they're building really important infrastructure. But the person doing the behaviour change stuff may not necessarily be the same person.

But I would suggest that you need to have someone in place to actually implement the plan, who is a good champion, support from senior management to do it, and then some kind of resources, be it personnel and or financial, to actually do what it is that they want to do. (Interviewee 1).

A similar outlook on the role and skill set of a champion is explained by a public sector workplace in a small city;

'a person might be a champion walking or cycling to work, but if they're not able to influence others … or have some understanding of the mechanisms of behaviour change … then they're just a champion in name and don't have any influence over any of the employees or other staff members.' (Interviewee 9).

Although the majority of interviewees highlight the importance of a champion, Interviewee 2 explained that *'you might use the occasional champion'* but there is no need for ongoing champions.

Many interviewees highlighted the heavy workload involved with Smarter Travel promotion in the workplace. It was mentioned that the administration side of the role was one that was causing a heavy workload. Interviewee 1 explains how their role was a coordinator and has now moved over to an administration role where they are involved in writing funding applications and the annual reports; activities that are considered as '*the boring stuff*' (Interviewee 1).

In a similar role, one interviewee explained how they were involved in the front office role which involves the promotion of sustainable travel. However, they were also involved behind the scenes with the planning aspects and administering both TaxSaver and Bike to Work schemes. This dual-office role was described as *'the trouble office and the back office'* (Interviewee 2).

There is a huge effort involved in promoting sustainable travel with the volume of emails being highlighted as creating a heavy workload by one employee. Interviewee 4 stated that

employees need to be regularly informed about Smarter Travel events, bike parking facilities and other general travel-related reminders.

The workload was highlighted as one of the most challenging things by one interviewee from a public sector company in a large city.

'I'd say the most challenging thing was the workload. At some stage, some days I did nothing else other than checking invoices and giving advice to people on what bike to buy and where to buy from …' (Interviewee 3).

A number of interviewees outlined how the workload involved was just landed on their desk by default. Interviewee 8 explained how the TaxSaver scheme was under their ownership because the company had lost their payroll manager. In a similar position, Interviewee 3 explained that people in charge of the promotion of sustainable travel, change positions regularly and this created difficulty with the workload being shared to other employees.

Although there are negative comments related to the workload involved, there were a few interviewees who stated that the workload is not an issue when it is managed correctly. According to one interviewee (Interviewee 6), spreading the workload out among the committee makes it a lot easier to manage.

4.23 Conflicting Interests

When implementing travel plans in the workplace it can highlight a number of conflicting interests between those involved. The majority of interviewees described their understanding of travel plans as having an alternative method of travel to the private car, creating more sustainable travel. However, there is uncertainty among a small proportion of interviewees about their understanding of Smarter Travel, with one interviewee stating their knowledge of Smarter Travel is *'very vague'* (Interviewee 8).

The importance of implementing sustainable travel measures to the organisation was a topic which was discussed by a number of interviewees. According to one interviewee there is a very corporate element to implementing travel plans and *'if it's not making a positive impact to what's important to the business, then it's not important'* (Interviewee 1). A similar mindset was shared by another interviewee when they stated, *'if you don't have an interest in cycling or running to work you have no interest in that [sustainable travel]'* (Interviewee 7). The importance of the level of interest shown by the organisation was highlighted again when

Interviewee 9 explained the level of involvement has declined because the person involved *'didn't really give a f*ck about active travel'* (Interviewee 9).

Conflicting opinions on sustainable travel measures between the organisation and employees led to a number of interviewees stating they have had a number of issues dealings with trade unions. One organisation in a small city has had ongoing conflict related to parking management strategies for several years and *'we were never able to reach an agreement on that or anything'* (Interviewee 3) with the final decision coming from an executive level. In relation to charging staff for parking, it was suggested that their focus was on generating revenue rather than the promotion of sustainable travel. Implementing these measures can cause *'a huge amount of unrest and unhappiness* [in the organisation]*'* (Interviewee 2). One interviewee explains the whole situation as *'politics*.'

'Politics … if we ever get the staff racks, the staff unions … it gets quite difficult. Then the question is, are we playing a kind of power game and if you get to HR, industrial relations, you always give and take and they might actually give in on the parking front to get a deal on some complete other end, something which might have nothing to do with commuting' (Interviewee 3).

4.24 A Smarter Travel communication strategy

The majority of interviewees confirmed there is a communication strategy in place to help promote Smarter Travel in their workplace.

Communicating to staff by social media is a new phenomenon with one interviewee from a large city explaining '*there was not a whole load of social media going on back then* [2007] *…* [but it] *is something I utilise now'* (Interviewee 2). The use of Facebook is also used by Interviewee 3 with the goal to help get more people active. However, it was explained that communication through social media should only be used in a positive light. It should be used to help highlight the initiatives which are happening around the work campus. Interviewee 2 explains;

'I'd tweet about what's going on, what's relevant to people, a bit more positive. We've been through the negative, difficult stuff so trying to get more involved in positive stuff. The most difficult case is over. Ehm, so it's no good … you don't tweet negative stuff either, stuff that's emotive, that's not [an] appropriate mechanism for that, that has to come through a more

formal communication from myself via email or in person with staff representatives or in groups or whatever.' (Interviewee 2).

The use of staff emails appears to be the most common communication strategy when it comes to promoting initiatives in the workplace. Interviewees in both the private sector and public sector tend to use emails as a way of communicating new initiatives to staff. One interviewee from a private sector company *'sent out an email saying we were going to trial it* [a Smarter Travel initiative] *for a month and if there was good take-up after that we'd keep it'* (Interviewee 4). Sending emails can also be used as a way to increase staff involvement in initiatives and gather necessary information to make these initiatives a success. Interviewee 5 explained that by;

'Sending people emails and linking emails. Sending off how to get involved, how to ring me, call me, how I got the cyclist involved… was I sent an email calling on cyclists last week, 'I'm looking for your help'. And what I want to do is re-invigorate group cycling for the week, sit down and talk about the issues that they're having, what would they like to see happen, what would they like to see happen around the catchment area … to make it safer for them to cycle. And that's huge …' (Interviewee 5).

Staff feedback has also been identified as a communication strategy by a small number of interviewees but there appears to be mixed messages on its importance. One person explained that the feedback they received from staff was very useful and they are *'working their way through it'* (Interviewee 6). A similar message is portrayed by Interviewee 2 when they highlight feedback is always welcome. The feedback received can be impractical, but *'some of them are welcome and good, and you'd run with them be whatever way it comes'* (Interviewee 2). Although it appears feedback may be useful to the workplace, one private sector workplace in a large city explained *'our attitude would be that we don't want feedback. And just to be happy with that you have'* (Interviewee 8).

The use of newsletters to communicate information to staff is mentioned by a small number of interviewees. Although used by a small number of workplaces, the information surrounding the use of newsletters is limited. Interviewee 9 explained how they deliver information to staff via newsletters and the content would primarily be based on the promotion and success of Smarter Travel initiatives. A private sector company in a large city explains that *'our newsletter, they're probably our biggest issue'* (Interviewee 8) and how there is a lack of communication with staff. Another interviewee believes *'things like doing*

newsletters, [we're] *kind of obliged to do … the hospital wanted all of that. Again, waste of time in my opinion'* (Interviewee 2).

4.25 Adopting a broad strategy for all modal choices

Adopting a broad strategy and ensuring that multiple modes of travel are considered to increase sustainable travel in the workplace is something which is agreed on by all interviewees. While there were a number of initiatives discussed to target walking, car-sharing and public transport, the promotion of cycling to work is the main topic which is discussed. One interviewee from a large city explained how his interest in cycling led to a large cycling-based initiative in the workplace;

'I'm very biased towards cycling, so there was Bike to Work Week, free bike services for staff, pool biking, there was heavy … a lot of marketing and promotion, a lot of development in marketing and promotion.' (Interviewee 2).

With this promotion working for one workplace, it may not work for another organisation. Interviewee 1 highlighted the importance of focusing the promotion on a modal choice which will suit both the characteristics of the environment surrounding the workplace and the demographic profile of the employees;

'So for example, we have a partner, say we have a partner in Cork, and they're the top of some of the biggest hills there … cycling isn't going to be the easiest ask for that workforce'

'So say in the hospitals, you might have a primarily female, ehm, audience, they'd be open to walking, it'd be harder to push cycling, but walking... And say for example, security is going to be more of an issue there because maybe they might be older, or just the fact that they are female, walking in the dark to an off-site car park, for example is going to be an issue and is not going to be attractive. So it depends on the workforce, their profile, what's available, what's around them and so on, and then the resources that the employer has themselves' (Interviewee 1).

With other interviewees highlighting their involvement in a number of initiatives for different modal choices, certain promotions can cause difficulty for the organisation. Not having sufficient transport links around the area impeded one workplace in a small city from promoting public transport;

'You can get here directly from one town now on a bus, but otherwise than that, there's not many other options, especially if you're out on the next town you've … then you've to get a bus into town, and then if you're dropping kids and that sort of a stuff … people are at that age now, staff wise here, and that's just not an option really.' (Interviewee 4).

Although most public transport routes may not link directly to the preferred destination, Interviewee 1 suggested the use of fleet bikes to help connect public transport routes as a way of encouraging more sustainable travel rather than drive by private car. The promotion of car-sharing caused upset in one organisation when people who were the single occupant of a car were not allowed to park in the designated car parking area. If this wasn't monitored by security then *'people just got out of their cars and moved the cones and took the spaces'* (Interviewee 4).

Taking a cross-departmental approach to promoting sustainable travel is recommended by a number of interviewees. One interviewee explains that working from multiple angles can help manage the demand for travel while *'making it as sustainable as possible'* (Interviewee 1). Interviewee 10 stated that their workplace offer a number of initiatives based around walking, cycling and car sharing for employees and the appropriate promotion comes from working *'cross-functionally with Human Resources and the Environment, Health and Safety Department'* (Interviewee 10).

The reason for taking a cross-departmental approach to promoting sustainable travel is highlighted by one interviewee;

'I'm working very closely with them because they see the whole active travelling from the health promotion side, I see it from the commuting side, so you can kill two birds with a stone'. (Interviewee 3).

A similar reason was mentioned by a second interviewee when they explained;

'Although we're the transport agency, the approach that we would take is more... why it's important to the individual is not transport, it's going to be health or finance, or stress management, their leisure time, whatever it might be. So for us, we take a broad approach to Smarter Travel and active travel' (Interviewee 1).

4.26 Changing the approach in future

In order to create a modal shift to more sustainable travel in the future, several interviewees suggested taking a more practical approach in future planning. The topic of implementing what's practical to the employer was highlighted from only one interviewee. They explain that the organisation needs to be pragmatic in terms of targets for mobility management plans and *'you can only target on what's realistic in terms of what's there outside the gate for the employer to promote'* (Interviewee 1). It was mentioned that when an organisation is developing a plan it is important that it is not *'like patchwork, half effort'* (Interviewee 3). If there is an agreement to promote sustainable travel it needs to be underpinned with some substantial improvements on the ground. Interviewee 3 explains;

'This is something that sometimes I have to raise towards city council which is not something they've thought of either, but if they okay it I'd like to talk about behavioural change, National Bike Week Awareness, blah-di blah Bike Week, blah blah blah whatever … but they need to improve it on the ground in terms of cycling infrastructure or in terms of walking routes or in terms on walking shortcuts to separate neighbourhoods or something. It needs to be compromised with substantial improvements on the ground.' (Interviewee 3).

Targeting employees who live within close proximity to the workplace was a factor mentioned by three different interviewees. In order to make a change one interviewee suggests that their focus should be on targeting people that travel less than ten kilometres to work and incentivise these people to leave their cars at home. A further two interviewees agreed that workplaces should be targeting those who travel relatively short distances to work and believed that anyone who travels over 40km to work and doesn't carpool is ridiculous. One interviewee explained their opinion on targeting those who live nearby;

'by targeting those that are under the threshold distance for cycling to work and actually finding them in the workplace and actually working with those people. You're not going to increase a person's willingness to travel to work … when they're driving thirty or twenty kilometres. So it's the ones that are living in the city or the area where it is possible.' (Interviewee 9).

Further investment in the infrastructure needed to promote sustainable travel was mentioned as another way to change the approach moving forward. However, there was mixed messages coming from interviewees about the type and extent of funding needed. Interviewee 1 suggested that if the employer invests in on-site facilities such as drying rooms, changing

areas and cycle parking that it would have an impact on the mode of travel used for workplace travel. Interviewee 7 highlighted the need for drying rooms as being very important for their workplace when you're cycling into work in the rain. This would negate the need for employees to bring in multiple changes of cycling gear. It would be very hard to change people's behaviour *'if there's no facility that allows it to happen'* (Interviewee 6). An example of an employee contemplating cycling to work was given by one interviewee;

'*so say I've a bike and I live three miles out the road, I'll cycle in but I've nowhere to park my bike that's actually safe. I'm thinking I'm after paying money for my bike, but if there's nowhere for you to put it so that y'know it's not left outside somewhere, and it's left out in the rain. So small things like that need action'* (Interviewee 6).

While having an investment for facilities in the workplace is considered important, some interviewees expressed their desire for more investment in road infrastructure. The behaviour change component of an initiative is also highlighted as important, but it can't be completed like *'patchwork'* (Interviewee 3). It was suggested that *'if you promote things* [behaviour change]*, you also need to underpin it with substantial improvements on the ground … in terms of cycling infrastructure or in terms of walking routes'* (Interviewee 3). The lack of infrastructure for walking and cycling was highlighted when one interviewee explained how *'we've got this greenway but everyone is driving to the greenway. It's crazy stuff and the car parks are full because everyone is driving there'* (Interviewee 4). They then expressed how the *'little bit of the road sided off with a white line on the road'* is insufficient in terms of cycling infrastructure. The decision to walk or cycle for transport is dependent on whether the route has sufficient walking or cycling infrastructure. Interviewee 6 explains that *'it might sound simplistic [to have infrastructure], but even things like that make a difference'*.

The lack of current funding for workplace facilities and infrastructural changes is a limiting factor for engagement with one interviewee expressing that *'funding is a MAJOR thing'* (Interviewee 5). It is suggested that the availability of grants for workplaces *'to develop their Smarter Travel infrastructure would be welcome'* (Interviewee 10). Although the interviewee admitted there are currently good resources available, they suggest that if there was some development on this and to *'roll out some national initiatives that companies can engage with. I think that would be a positive development'* moving forward (Interviewee 10).

The need for further investigation into what policies are in place at national level was suggested by Interviewee 9. It was suggested that a national policy could incentivise

companies to have a certain percentage of employees travelling to work by sustainable modes. According to one interviewee, the role of such a policy should be;

'To increase the infrastructure and it has to have certain plans in place. We saw the success of the no smoking ban in places … on a similar level we need to be able to highlight or deal the benefits of active travel' (Interviewee 9).

The idea of cross-promoting other department's policies was suggested by an interviewee from the public sector in a large city. They explained;

'We've got a huge problem in terms on obesity, health, diabetes, all of those whether it's physical activity levels … we know Smarter Travel has a role to play there because it's certainly the commute … you can break a habit there … it's regular, like there's huge opportunities, and we would work with Healthy Ireland colleagues and the National Health Sustainability Office and we would work with colleagues like that where it would make sense for us to work together, be cross-promoting each other's messages because they're the same messages at the end of the day.' (Interviewee 1).

A similar mindset was portrayed from another interviewee working in the public sector in a small city. They recommended using the current Healthy Ireland initiative to address the current issues with Smarter Travel in the workplace. They highlighted how it shouldn't just be used for commuting in general;

'If there's issues that we're saying that … around Smarter Travel, let's consider Smarter Travel in the context of the workplace as well, not just in the context of … people commuting all the time. Although people commuting all the time is part of people getting to work. Let's think about it in the context of … if it's smart, then well isn't it smart to do it in the workplace as well. So to me it's about all being part of the same thing. It's about public transport for work, for life generally, if you just want to go shopping, for whatever you want to do. I think the workplace should be included as part of that process.' (Interviewee 6).

4.27 Summary

In summary, the strong driving culture in Ireland is widely acknowledged and it was suggested that this culture stems from a young age due to the lack of appropriate transport planning. The goal moving forward should be to normalise the practice of using sustainable travel. When implementing future travel plans, it is important to take into consideration the geographical location of the workplace. That is, the promotion of active travel and public

transport is easier in urban locations with high population densities. Managing parking demand was a highly emotive topic for interviewees with the introduction of parking fees and annual permits causing disagreements. While all participants considered the introduction of parking fees to have some value, only those based in larger cities cited this measure as being both essential and politically feasible. Workplaces need to develop strategies targeting multiple modes of travel as opposed to single modes in order to change employee travel behaviours. However, it is important to consider what modes will work for each individual site. A collaborated effort to change behaviour between local authorities and local organisations should be utilised. While it was suggested that workplaces need to take a more practical and pragmatic approach to promoting sustainable travel, this needs to be reinforced by a stronger national policy for sustainable travel. A strong national policy should ensure there is cross-departmental responsibility for promoting Smarter Travel in workplaces. The promotion of sustainable travel must not be limited to soft measures such as events and programmes. Soft measures need to be supported by comprehensive infrastructural measures to facilitate walking and cycling particularly.

5 Discussion

5.1 Summary of results

Study 1 evaluated the impact of a 12-month cross-sectional workplace physical activity intervention, across five workplace sites in Kilkenny City. Response to the survey was low, i.e. less than 13% of employees responded. Of these, over 80% were female at both timepoints ($p<0.001$). Over 50% of respondents had access to a working bicycle, with over 60% reported having children under the age of 16. The majority of respondents at both timepoints reported having tertiary education. Significant intervention effects were seen in the number of workplace employees meeting the National Physical Activity Guidelines ($p<0.05$). There was no intervention effect on the mode of travel to work. While domain-specific physical activity wasn't analysed separately, data gathered on the mode of travel to work and the screenline counts suggests there was no intervention effect on active travel to work. The total number of cyclists increased from 10 to 18 (screenline counts) at follow-up, albeit from a low baseline number. However, both the self- report survey and the screenline counts highlight an increase in car travel. The survey reports a 3% increase in those travelling by car. Whereas the screenline count at follow-up reports an increase in over 300 (16.9%) of car drivers across all five sites. Distance was considered the main factor when choosing the mode of travel to work, although results were not significant ($p>0.05$). In order to aid the adoption and implementation of similar interventions, the process evaluation highlighted the following factors; the need to improve the reach of the intervention, the funding needed to implement and support the intervention, the need for a better understanding of behaviour change, the role of a committee, and the need to fully understand the project objectives.

Study 2 reports about the strong driving culture in Ireland and it is suggested that this culture stems from a young age by the lack of strategic planning of road infrastructure. The geographical location of the workplace should be considered when implementing travel plans, with the distance travelled to work by employees and the resources available playing a key factor. The need for managing parking demand is a strongly emotive topic among interviewees, with the introduction of parking fees only cited to work in larger cities. Moving forward, workplaces need to develop policies that target various modes of travel in order to change employees' behaviour. A practical and cross-departmental national policy for sustainable travel is needed. The implementation of soft measures needs to be supported by comprehensive infrastructural measures that facilitate active commuting.

5.2 Factors that contributed to an intervention effect

Based on the demographics of participants in Study 1, there are a number of components that may have contributed to the rise in those meeting the physical activity guidelines. It is important to note that from the cross-sectional data, a direct intervention effect on individuals cannot be obtained. However, the significant increase in females having access to a working bicycle at follow-up (51.6%), may have contributed to the unlikely increase in reported physical activity behaviour, compared to those at baseline. The measurement of error associated with self-report surveys may have also contributed to these findings. Given the low response rate of surveys, it is possible that only the interested employees are responding to the survey and this may not truly represent the entire workforce. While this finding cannot be directly linked to the increase in physical activity, it is inconsistent with findings from Dalton, Jones, Panter, & Ogilvie (2013) and Rissel et al. (2013). These studies both suggest males are more likely to cycle to work than females, as opposed to this study. There is also a small decrease in participants who reported having children under the age of 5 years in their household. This may have led to a reduction in the need for trip-chaining during the day as well as the need for car use. This finding is supportive of previous research where having children is inversely associated with active commuting and physical activity levels (Bopp et al., 2014). The reduction of trip-chaining being associated with higher levels of physical activity at follow-up seems likely with the number of cars/vans per household also less in the female respondents at follow-up. Car ownership has consistently being reported as having a negative effect associated with active commuting to work (Batista Ferrer et al., 2018; Bopp et al., 2014; Zander et al., 2014).

The work-related physical activity components of the intervention may have contributed to the increase in reported physical activity. While domain-specific physical activity was not analysed separately, the comparison between the self-report survey and screenline counts suggests this is plausible. With the low implementation of intervention strategies on active travel to work, there was a stronger push to deliver initiatives encouraging physical activity during the working day. The introduction of fleet bikes for travel between sites for meetings and work-related activity was the main intervention factor implemented that seems the most plausible reason. This is supported by Lau and Faulkner (2019) where the introduction of a workplace physical activity intervention in a real-world setting increased in daily walking levels among employees. The lack of any parking management measures to encourage active travel and the failure to upgrade the bicycle parking as planned during this period would also

have had a negative impact on active travel to work. It is possible the lack of 'stick' measures hindered the potential significance of the intervention, with Petrunoff, Rissel, Wen and Martin (2015) highlighting the need to support the 'stick' measures with 'carrots' to create a significant modal shift.

The low intervention impact on active travel to work may also be explained by the lack of strategy targeting specific employees. According to the survey, distance was considered to be the main reason for choosing the mode of travel to work at both timepoints. Accounting for the distance to home from work to make the intervention more accessible for employees is important (Johnson et al., 2016). In comparison, this study had no specific strategy to change behaviour of those employees who lived within a 10km radius to work. With over 40% of employees living within a 10km distance from work and Kilkenny City identified as a 'Smarter Travel Town' in recent years, the potential to increase active modes of travel to work was missed. The impact of distance on the commute to work plays a significant impact on the mode of travel (Panter et al., 2011). Similarly, there was also no attempt to change the travel behaviour of those living over 20km away from work. The survey reported almost one-third of employees living over 20km from work. Tailoring intervention strategies while accounting for employees' distance travelled to work can be used as a strength to increase physical activity levels (Johnson et al., 2016).

The lack of initiatives targeting car travel could also have contributed to the low intervention impact. There was a lack of any car-sharing initiatives such as the promotion of car-pooling or reserved park and ride spaces. Also, there was free ample parking available in three of the five workplace sites, meaning employees had no incentive to seek an alternative to the car. The baseline survey suggested demand for car-sharing initiatives was popular among employees with 30.9% of respondents highlighting the need for reserved park and ride spaces and almost 40% of employees requesting incentive schemes for green commuters. Similarly, the lack of any infrastructural changes and 'stick' measures may also have had an impact on the low figure of active commuting to work. The need to implement a parking management strategy has been continuously highlighted and is seen as one of the most effective measures to create change (Cairns et al., 2010; Dalton et al., 2013; Knott, Sharp, Mytton, Ogilvie, & Panter, 2019; Petrunoff et al., 2016). The idea of introducing a parking management strategy was not received well by the senior management of the workplace. It was feared it could create conflict by removing free access to spaces, a strong correlate of driving to work highlighted by Buehler and Pucher (2012). Although there were discussions about the design

and location of new secure bicycle sheds and potential shower facility access for active commuters, there was no progress on these facilities following the 12 months. At baseline, the lack of shower facilities, changing room facilities and the lack of secure and covered bicycle parking were all highlighted as barriers to commuting by bicycle. With over 80% of employees' being female, the introduction to such facilities has been strongly associated with higher levels of active commuting in females (Bopp et al., 2014).

The lack of a strategic implementation strategy was a decisive factor in the low intervention reach. When implementing a workplace intervention, the use of a strategic implementation plan is needed (Adams et al., 2017; Cairns et al., 2010). While this intervention didn't have a clear timeframe and structure written out, Cairns et al. (2010) states that this should be an obvious component to a successful plan. The lack of an appropriate timeframe was evident when trying to roll-out the fleet bike scheme. The time needed to organise the purchasing of the fleet bikes was minimal, but the issues that arose in relation to the insurance of bikes and employees using the bikes proved to be a decisive factor in the delay of one of the only initiatives. The delay from the purchase of the bikes until the terms of use was three months: March 2018 to June 2018. The onset of actual bike usage following the agreement of terms is unknown. These delays were unexpected, and it had a noticeable knock-on effect to how other strategies of the intervention were implemented. This delay was then exacerbated by the onset of winter months. The follow-up may not be a true reflection for any behaviour change among employees. While the usage of fleet bikes was not measured during the intervention, it is plausible to suggest that the initial usage of the fleet bikes led to a sharp rise in physical activity. This rise may have contributed to an over-reporting of physical activity behaviour and it may not represent a true value of uptake. A possible explanation to the unexpected findings of the intervention is given by To et al. (2013). They found that less robust interventions most likely provided better findings, with a longer duration intervention providing a more accurate representation of the intervention effect.

The employees' perception of road safety to work showcases some contradicting attitudes towards active travel. While almost 80% of respondents agree that the 'roads are dangerous', almost one third of the same respondents agree that it is safe to cross the road. This discrepancy can be explained due to having little or no experience when cycling on the road, but have experience crossing the road by foot. This may explain why males were less likely to agree that the roads were dangerous and there were more convenient routes for cycling. This is supported by Garrard et al. (2008) who reported that in Australia, females were more

likely to use off-road paths rather than on-road infrastructure. The habit strength of employees is very noticeable following the analysis of the statements. The intention at baseline to engage in active travel to work was low. Although over 20% of respondents agreed it would be easy for them to walk or cycle to work, the percentage of employees with the intention to walk or cycle on their next journey was very low. With the poor intention to walk or cycle to work, coupled with the high percentage of staff who live a considerable distance from work (34.6% > 20km) it is plausible that there was never going to be a high level of engagement with the intervention. Converting employees' intentions into behaviour change can be a difficult task as demonstrated in Finland (Aittasalo et al., 2019) . Aittasalo et al. (2019) state while the social and behavioural strategies can increase one's intention to cycle, behaviour change can prove to be difficult without the correct infrastructural measures. This supports the results for mode of travel to work at follow-up, with over 90% of employees showing intention to drive the car to work on their next journey, but there was no significant change recorded following the intervention.

5.3 Evaluating the implementation of the intervention

The process evaluation carried out has also helped to explain the outcomes of the intervention and highlights key areas to ensure future adoptions are successful. First of all, the failure to strategically plan to reach a wider audience, coupled with the low campaign awareness and the lack of incentives to respondents are some of the key learnings. These factors may have contributed to the poor response rate and the lack of intervention effect on active travel to work. This intervention did not identify and target employees living within a certain distance threshold to work and may have been a key factor to increasing active commuting to work (Panter et al, 2011; Dalton et al, 2013). Although intervention awareness was not measured in this study, the poor response rates highlight a low level of awareness about the campaign. Adams et al. (2017) reported similar findings where a low level of awareness towards the campaign resulted in poor publicity towards the initiatives.

Although a workplace committee was in place and consisted of different experiences and skillset, there was no one person spear-heading the intervention from the top down, or the bottom up. Having personnel from Senior Management to help promote and link the programme with other departmental objectives can help create a support network and platform to change behaviour (Adams et al., 2017; Petrunoff et al., 2013; Petrunoff et al., 2017). The lack of 'stick' measures to create behaviour change was evident in the

intervention. Although the committee was headed by a number of senior authority figures within the organisation, there was a strong level of debate and discussion about moving forward with the implementation of certain initiatives. The final decision never seemed to stop with one person. This reflected poorly on the site coordinators. Having involvement from the top down is critical to getting contested actions such as this implemented (Petrunoff et al., 2017).

In an attempt to promote the intervention on the ground in all five sites, the appointment of a site coordinator was made at committee level. The role of the coordinator was to lobby the promotion of any intervention from the ground level up, provide feedback and encourage behaviour change. Throughout the intervention period, the role of these coordinators diminished. There was no time allocation or specific workload given to this role by the committee. Project coordinators were also faced with challenges throughout their time, including the demands of their normal daily job, a decisive factor highlighted by Adams et al. (2017). In some cases, site coordinators moved work location and were never replaced. Similarly, members of senior management who were keen to drive the intervention from the beginning moved positions and the initial willingness to engage was diminished. These changes during the period on the intervention (June 2017-June 2018) of key personnel on the committee may have caused disruption to the flow of intervention implementation. Davies' (2012) analysis suggest this may be the case with the changes to personnel within the organisation highlighted as a reason for the decline for some campaigns within the workplace. The level of promotion, engagement and interaction with employees would also have diminished leading to a poor level of involvement in the intervention.

The members of senior management driving the intervention also had an influence on the funding available to use for the intervention. While the limited amount of funding available was highlighted during the process evaluation, it could be argued that perhaps the proposed infrastructural changes needed to change behaviour were too costly to warrant. However, in the initial stages of implementation, before the positional changes in senior management, funding for the proposed infrastructural changes was sourced from multiple avenues including Healthy Ireland (HI) and internal avenues such as estates funding and employee wellness funds. Following the changes in senior management, similar to that noted by Davies (2012), some potential funding sources never materialised. It is likely that the lack of funding had a negative impact on the implementation process for active commuting to work and turned the focus of the intervention more to changing physical activity behaviour at work.

5.4 **Assessing the workplace prior to implementation**

There is a strong acknowledgment by the majority of interviewees that Ireland has a strong driving culture. While one interviewee states this culture is related to habit, little reasoning for this habit was given. The availability of free ample car parking in workplaces was highlighted as a key factor that encourages people to use the car as opposed to more sustainable modes of travel to work. This finding is consistent with numerous studies (Cairns et al., 2010; Dalton et al., 2013; Petrunoff et al., 2017), with Dalton et al. (2013) reporting the availability of free parking leading to a significantly reduced likelihood of actively commuting to work. This driving culture is embedded from an early age with schools and universities contributing to the high car dependency. While the availability of free car parking in third-level institutions across the country was highlighted, the role of primary schools in creating this culture was more frequent. One interviewee suggested that this culture stems from the building of schools, where there is a lack of consideration of the needs of pedestrians and cyclists. With schools being *'built in the middle of nowhere'* (Interviewee 3), the infrastructure for active commuting is not provided. In agreement with this, Winters, Buehler and Götschi (2017) state that the land-use policies that shape the way communities are built has an impact on the levels of active travel. Similarly, both Badland, Garrett, and Schofield (2010) and Buehler and Pucher (2012) report workplaces providing car parking facilities for employees contributes to car dependency.

Although this was not directly discussed by interviewees, the link between acknowledging the poor driving culture and geographical location of the workplace can help identify the successful factors of a travel plan in both rural areas and large cities. Similar to Petrunoff et al. (2015) the importance of carrying out a needs analysis approach prior to implementing any travel plan was considered important to ensure a travel plan which acceptable to the workforce. The use of a comprehensive survey was cited by several interviewees as important in gathering information about their workplace, but only one interviewee confirmed they used a survey to develop and implement a workplace travel plan. It is plausible if the information retrieved from a comprehensive survey was not used to develop a strategy of implementation, it is likely a poor travel plan will ensue. The input received from staff members can also be important when implementing a travel plan. This input from staff can help keep the plan relevant to the workforce. Similarly, Seaton et al. (2017) highlights that employee feedback is important, especially when implementing or modifying an intervention. While the lack of evidence on the effectiveness of travel plans in Ireland was highlighted in some interviews,

the methods currently being used to develop an evidence base is poor. With poor management at national level and the poor development of measurement tools being emphasised, the information being gathered may taint the opportunity to develop a specific strategy to implement travel plans.

5.5 Key drivers of a workplace travel plan

The need to identify the driving factor for a workplace travel plan is considered important for its' successful implementation. The driving factor for a travel plan may be health-orientated or transport-orientated according to interviewees. Having an unclear vision of the key drivers of a travel plan may poorly reflect the intensity of implementation. The comparison between the goal setting of two workplaces can be used as an example. One workplace had clear set targets to determine if the travel plan was a success, whereas a second workplace had no specific targets and methods to analyse success. Based on this approach, there is no way to determine if a travel plan that has been implemented was successful or unsuccessful. In contrast, the development of an action plan to reach key targets was a key factor in the successful intervention carried out in Finland (Aittasalo et al, 2019).

The need to implement a 'carrot' and 'stick' approach to meet the pre-determined targets was highlighted by some interviewees as the only effective measure to deliver a successful workplace travel plan. This finding is consistent with the previous reviews carried out on the successful implementation of travel plans (Brockman & Fox, 2011; Cairns et al., 2010; Roby, 2010). Although the implementation of parking charges as the 'stick' was an emotive topic, without it, the likelihood of being successful is limited. This is a point which is highlighted by Cairns et al. (2010). It seems the main concern for workplaces implementing such 'stick' approach is the negative backlash from employees. It appears that the interviewees with management experience and set clearly defined targets were more inclined to implement a strict 'stick' approach. Interviewees with a less focus target were the individuals cautious not to cause conflict in the workplace. There was no discussion by interviewees about the strategy used to implement a 'carrot' and 'stick' approach, compared to the strategies outlined in previous studies in both the UK and Finland (Adams et al., 2017; Aittasalo et al., 2019). It is possible this is down to the limited experience of the interviewees in implementing travel plans.

One of the most popular methods for 'stick' approaches is the management of the demand for parking. While parking management is considered to be the single most effective way to

tackle the poor driving culture as highlighted by Cairns et al. (2010), the difficulties associated with implementing a parking management strategy is evident when in a large city, new employees were reported to travel longer distances to work, provided there was free parking facilities available to them. Although the availability of parking may entice new employees in larger cities, a better parking management strategy in the workplace may help cater for long distance commuters.

The introduction of parking permits as a strategy to manage parking was one of the most discussed topics by interviewees. Parking permits can be used to reduce the high levels of car travel (Knott et al., 2019; Petrunoff et al., 2015). One workplace in Dublin reported that an annual parking permit would cost the employee €2,000. This was used as a disincentive to travel by car and engage in more sustainable modes of travel to work. The use of permits can be effective in both reducing unnecessary travel by car and managing spaces for employees who travel long distances to work. A workplace in rural Ireland found the use of permits was successful. The permit system in rural Ireland was free of charge, but it was only available to employees who registered for a car-sharing scheme to work and was targeted at those travelling long distances. This can be related back to the importance of implementing what is practical to the employer as demonstrated by Johnson et al. (2016). It should be noted that this specific workplace has a number of external supports including funding and community-based programmes to reduce car use. This would have had a significant bearing on the success of the implementation of parking permits. The possibility of a collaborated-effort in the community may contribute to better parking management. One interviewee highlights how the workplace has not introduced parking charges because there are no local parking restriction measures in place, and it would be a disincentive to charge employees. In comparison, the collaboration between a city council and university about restricting on-street parking in the UK led to a successful reduction in the availability of parking (Brockman & Fox, 2011). Collaborations have been mentioned by interviewees as potential to receive funding from national resources. This may help contribute to more infrastructural changes in the community and provide employees with a better opportunity to move away from car travel towards more sustainable modes.

5.6 **The importance of employee engagement**

The involvement of senior management has been acknowledged as an important factor when implementing travel plans. Having members of senior management involved in the

implementation of travel plans help highlight the importance of behaviour change to employees. As demonstrated earlier, the need for leadership coming from the top down as well as the bottom up is important for the successful implementation of a workplace travel plan (Petrunoff et al., 2017). One interviewee explained that the success of their workplace travel plan was the key factor in the buy-in from the CEO of the organisation. The interest shown by senior management can help positively influence a modal shift towards more sustainable travel. One interviewee reported any recognition, big or small, towards behaviour change can have a positive impact on the employees. Interestingly, it was mainly private sector organisations who had a negative experience in getting senior management involved. These were the organisations which were limited in resources. One interviewee in a large city explained that investing in Smarter Travel could hamper their *'corporate image.'*

The need to engage employees during the development and implementation of a travel plan can be a decisive factor in determining its success. Adams et al. (2017) strongly recommends the need for more employee engagement and programme flexibility. This may increase the employees' interest in some initiatives. An increase in engagement can also act as a method of advertisement to reach a wider audience. While staff feedback can be a useful way of increasing engagement, it can often lead to impractical suggestions. The need for a well-established communication system with staff is important when increasing engagement, a view which is also held by Cairns (2010). Social media has been highlighted as a method to communicate the positive message about initiatives happening in the workplace, with staff emails the most common form of communication. These methods can help promote any initiatives as well as increase engagement. However, it is important to note that not all employees have access to an email while at work, so the promotion of initiatives could be delayed or the communication channels not utilised efficiently. Each workplace should communicate to their staff on a multiple-strategy basis to increase awareness and engagement levels of employees.

Assigning a 'champion' for the promotion of the workplace travel plans is essential. While there is no specific role identified by the interviewees, it seems likely that the role of the champion will vary depending on the workplace and the specific needs of the workplace. One interviewee highlighted the importance of the champion having the correct skill-set in promoting behaviour change. This is supportive of the findings by Petrunoff et al. (2017), where the some of the health practitioners involved may need additional training in the context of travel planning. Adams et al. (2017) highlighted that a champion was more likely

to engage with the programme when the role was closely aligned to their normal daily job requirements. It is plausible that the champion for one aspect of the travel plan is not suitable for another aspect. The role of senior management should play a vital role here in ensuring the correct champions as assigned to certain aspects of the plan. The lack of involvement from senior management and insufficient support can cause the champions challenges (Adams et al., 2017). However, the increasing workload involved in being a champion has been reported negatively, and it is suggested that it takes away from the role. Several interviewees expressed their concern about the heavy workload involved and how it has changed their position from where it originally started. This appears to be from the lack of clarity to which work department the role falls i.e. Human Resources, Estate Management or Administration Offices. According to Roby (2010) the way for travel plans to become more integrated into the workplace is with the Human Resource department being involved in the administration of initiatives.

While internal support has a large role to play, the need for external funding to help support the implementation of travel plans can be essential in determining the success of the travel plan. The support offered from the National Transport Authority has got mixed reviews. While some interviewees express their gratitude to the authority for their supporting implementing workplace travel plans, others are displeased with the lack of funding and resources available. With larger organisations able to lobby for better funding for improved infrastructural changes, the smaller organisations find it more difficult to implement a successful travel plan. The lack of funding or political support can be negatively associated with successful interventions (Davies, 2012). Similarly, funding can have an impact based on the location of the company. The funding and support opportunities tend to be greater for companies located in larger cities.

5.7 The future of workplace travel planning

Adopting a multi-modal when implementing a travel plan is strongly recommended by some interviewees. Cycling was one of the preferred modal choices to promote within the workplace. Some interviewees are keen advocates of cycling so it is important to note that implementing cycling only initiatives may not suit all workplaces. Interventions which focus on a single mode of travel may not represent the interests of employees and the suitability of the workplace. The need to have a broader suite of measures in place is important to attract more employees. Having a strong understanding of the workplace surroundings is

advantageous so the correct modal choices can be promoted efficiently and effectively. One interviewee explains that the use of fleet bikes for trips between public transport routes, or drop-off points is an efficient way to promote multiple modes of travel. Collaborating with other businesses can be an effective way of meeting objectives and *'kill*[ing] *two birds with one stone'* (Interviewee 3).

The need to implement what is practical to the employer is suggested. Targeting employees who live in close proximity to the workplace is an effective way of changing behaviour, which is supported by both Panter et al. (2011) and Dalton et al. (2013). In organisations with a small workforce this may be easy to identify, but this may not be the case in a large workforce. This again highlights the importance of a needs analysis prior to the development of intervention. The lack of current funding for workplaces is a limiting factor to implement a travel plan. In order to implement successful plans in the future, the question of how funding and resources should be spent needs to be answered. In 2012, there was over €21million invested into 'Smarter Travel Towns' in Ireland with a further €4.5million divide between 'Active Travel Towns' by the National Transport Authority. This funding was to deliver behaviour change initiatives, but was the correct interventions invested in for these specific towns? Although this funding was not specific to workplaces, the appropriate investment may have a positive influence in the wider-community and positively influence workplaces. In order to maximise the potential in change, from a limited pot of funding, the need for more research and a better understanding of the type of initiatives to promote travel plans in certain workplaces is needed.

5.8 **Study strengths & limitations**

The main strengths of this study include the use of a workplace committee, the use of manual counts to support the survey, administering the site audit and the process evaluation. The development of a workplace committee consisting of both health practitioners and members of senior management from the workplace helped provide support from outside of the workplace and offered experience in the role of both health promotion and active travel planning during the planning and implementation process. The administration of site audits pre-intervention helped to develop the design of the intervention and ensure the initiatives that were implemented were suited to the workplace and the staff members. One of the biggest strengths to this study was evaluating the implementation of the intervention. This helped the

researchers to fully understand the low response rates and the impact the strategies used had on the employees. In study 2, the involvement of both transport practitioners and health practitioners from a range of both public and private sector was a key strength. This ensured a broad range of opinions and experiences on the implementation of workplace travel plans across Ireland. Another strength of this study is the gathering of information and perspectives from both transport practitioners and health practitioners using semi-structured interviews. This allowed for a more in depth analysis on their experience with travel plans, as opposed to a questionnaire.

The limitations of the research methods in Study 1 were associated with both the research design and the research instruments used. The use of a repeat cross-sectional study design made it difficult to match participants at both baseline and follow-up. This limited the opportunity to report behaviour change following the intervention. The lack of control group for this study did not allow for a comparison to those employees who were exposed to the intervention. There were several limiting factors associated with the self-reporting survey tool used for this study including the risk of over-reporting on physical activity behaviour. Although the GPAQ is a reliable and validated tool, it has a high recall bias. Other issues include the lack of differentiation between domain-specific physical activity and the different modes of travel, i.e. walking or cycling, something which may have yielded significant results in this study. The lack of an implementation strategy proved to be a limiting factor in this study for several reasons. The lack of this strategy contributed to the poor time management of the intervention. The failure to secure adequate funding for more infrastructural changes and improvements in facilities proved significant with the delay in implementing active commuting initiatives evident. The failure to implement a 'stick' measure such as parking management was associated with a limitation to this study, with such measures considered to be the most important factor for behaviour change. Limitations of Study 2 include lack of experience of interviewees in implementing travel plans. Implementing travel plans in Ireland is a relatively new concept. Due to the relatively new experience, local and state funding towards implementing workplace travel plans is limited and more difficult to evaluate a comprehensive travel plan. The findings in this study may not representative of all practitioners involved with workplace travel plans. The use of snowball sampling may have created a bias with practitioners recommending colleagues who potentially have the same mindset, leading to an unbalanced argument around workplace travel plans.

5.9 Implications of the research findings

1. The greater need of understanding toward employees who are travelling large distances to work. There is a need for a targeted intervention using audience differentiation. Targeted initiatives or receiving different marketing messages at this group may prove more beneficial than incorporating a one-size fits all approach.

2. Employees didn't appear to buy in to the initiative as evidenced by the poor response rates. A greater understanding of the underlying reasons for this needs to be appreciated. Staff in the HSE have been undergoing challenging changes to their working conditions and a sense of fatigue or apathy to further initiatives that are perceived as management led are possible.

3. Future studies may not need to solely focus on active travel to work measures to create significant behaviour change. Targeting employees' behaviour during the working day and implementing working day initiatives may prove beneficial to increase the overall active travel and physical activity levels of employees.

4. The need to incorporate 'stick' measures (parking management) is needed. Without these measures it is unlikely we will create any substantial change in the poor driving culture in Ireland.

5. The context of the workplace is important. The need to fully understand and assess the workplace in terms of geographical settings, the surrounding transport infrastructure and the distance employees are travelling to work can be advantageous. The issues involved with implementing workplace travel plans in settings that lack the correct resources seems to be overlooked.
6. There is a need for meaningful involvement of employees throughout the process of delivering travel plans. There needs to be more focus on the allocated time needed for employees to engage with the travel plan development.
7. In a real-world setting things change. Embedding the rationale into several agendas, creating a collaboration, and the need to cross-promote each other's messages is good for many government departments.

5.10 Conclusion

In summary, while the findings of Study 1 indicate that there was a significant improvement in employees meeting the physical activity guidelines at follow-up, these results are from a

very low response rate and does not reflect on the entire workforce. This low dose intervention was implemented in an ad hoc manner and has many limitations. This study has demonstrated to need to further understand the physical, social and cultural barriers to active travel and/or physical activity in other workplaces in Ireland. This will help deliver more successful active travel and/or physical activity interventions. The findings of Study 2 point to a large combination of factors that should be considered when implementing workplace travel plans in Ireland. The need to fully understand various components of the workplace can be advantageous to the organisation in both the planning and implementation of a travel plan. The various roles employees play during the implementation stage should not be overlooked. While targeting what is practical to the employer is suggested, collaborating with one another and cross-promoting each other's message is important for the future of Ireland in terms of climate change, public health and social engagement.

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7 Appendices

Appendix A. Site Audit Tool

Waterford Institute of Technology
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

KRSP
KILKENNY RECREATION & SPORTS PARTNERSHIP
AN IRISH SPORTS COUNCIL INITIATIVE

smartertravel
workplaces

Site Audit – Workplaces

Instructions:

The Site Audit contains two sections, Section A and Section B. Please complete both sections.

Please answer questions in the space provided in the box.

Answers should be kept brief and to the point, unless otherwise asked.

If you wish to expand on an answer, record your answer in the 'Other comments/additional

Section A: General Site Audit

Site Details
Name of organisation: Address of organisation: Name of auditor(s):
Site and Building Access
Number and location of site entrances?
Who uses entrances and what are the opening hours?
Car Parking
How many formal car parking spaces are there?
Is there evidence of informal car parking?
Is there designated parking for car-pooling vehicles/expectant mothers/mobility impaired/'other' car drivers?
Is there a company car policy?
Are the car parks managed, e.g. permit system, barriers, Pay & Display, short term spaces in areas of high demand?
On-Site Facilities
Are there set-down parking areas on-site? Are they located at a footpath?
Are showers and changing rooms provided for employees walking and cycling to work? How many and where? What standard are they? How often are they cleaned?
Are storage areas such as lockers provided? How many and where? e.g. Close to cycle parking
Is travel information (public transport timetables, information on cycle parking locations, etc.) provided to employees?

What and where? E.g. notice board, at reception/canteen etc.
Walking
Are signposts, street names and property numbers provided where necessary?
Are walking routes on-site well lit?
Are walking routes on-site overlooked (natural surveillance) or covered by CCTV?
Do walking routes on-site feature paths, pedestrian crossings, street lighting, dropped kerbs and tactile paving?
Are pedestrians separated from vehicular traffic on-site?
Is there a formal walking route marked out on site (e.g. Sli na Slainte)? How is it publicised?
Is 'street clutter' kept to a minimum on paths?
Are walking routes through the sites pleasant to use?
Are footpaths free of flooding?
Are footpaths away from noise and exhaust fumes where possible?
Cycling (see Section B for full cycle facilities audit)
How many cycle parking spaces are available?
Where is the cycle parking located?
Are the spaces covered by CCTV or natural surveillance?
What type of cycle parking is provided? e.g. covered, secure
Is cycle parking well lit?
Is cycle parking signposted?
Is cycle parking visible from the main entrances?
Is visitor cycle parking available?
Are there areas where people informally park/store their bikes? (railings/offices/corridors)
Are fleet bikes provided? If so, how many?
Are cyclists separated from vehicular traffic on-site?
Do employees receive cycle business mileage? If so, at what rate?
Is the cycle to work scheme offered? Are there any restrictions on participation?
Are cycle routes through the site pleasant to use? Are there any issues with potholes, 'ponding' of water at the side of the road, etc.?

Public Transport
What schedules bus services are available? When do they operate (frequency/start and finish times)?
Is an inter-site shuttle-bus provided?
Where are bus stops situated in relation to your site? Are bus shelters provided?
Is there a train station nearby? What is the service provision?
Where a bus enters the site, can it enter/exit the site swiftly at peak times?
Is up-to-date public transport information (timetables, directions to stops) available on-site? Where?
Are walking times and distances to local public transport nodes and amenities indicated?
Are 'Tax Saver' tickets available to your staff? Are they monthly or annual? Are there restrictions on purchase windows or availability of tickets?
Is access to public transport stops from your site direct? Could you open access/gates to allow more direct access?
Car Sharing
Does your company promote car sharing through a formal scheme?
Are spaces marked out for car-sharers? How many and where?
Has your organisation availed of free, private car-sharing group on www.carsharing.ie?
Business and Inter-Site Travel
Is there a corporate policy relating to business and inter-site travel? E.g. the use of public transport for specific journeys?
Are there company/pool vehicles available for use? How many? What fuel do they use?
What rate of business mileage do employees receive for driving on business?
Is there business mileage allowance for modes other than a car?
Are tele-conferencing facilities available? Are separate rooms/headsets available? Do employees know how to use/book these facilities?

HR Policies
Does your organisation promote flexible working policies such as flexi-time, compressed working week, job sharing, home working?
Local Area
What facilities are available on-site or close by (e.g. shop, bank, dry cleaners, post office)?
Are there any proposed infrastructure changes on-site or locally that will affect how employees travel? If so, explain briefly:
Motorcyclists
Are motorcycle spaces provided? If so, how many?
Where are the spaces located? Are they well-lit and sheltered, with CCTV?
Taxi Services
Are there clear information points for local taxi services?
Is there a waiting area for taxis?
Does the site justify a dedicated taxi-rank?
Goods/Services Vehicles
Are there regular courier/haulage deliveries?
Have suppliers reported any problems findings the site or making deliveries on-site?
Other Comments/Additional Information

Section B: Cycle Facilities Audit

How many cycle parking spaces are available?
What is the percentage of employees using the site? *E.g. cycle parking for 20% of employees. 20% is a good threshold to aim for in urban areas. This may take some time to achieve, so a rule of thumb for provision may be to add another 20% every time the occupancy reaches 80%.*
How many cycle parking spaces are located close to building entrance?
Is cycle parking overlooked? *Is there passive surveillance to enhance security?*

What other measures could be considered to increase security, e.g. regular patrols of the area with notices to indicate this. *Is CCTV coverage available?*
How many cycle parking spaces are secure and accessible by cyclists only?
How many cycle parking spaces are covered? *This is very important to cyclists, both to keep bikes dry and to keep them in good working order.*
How well lit is the cycle parking area? *Include the walk from the cycle parking to the building entrance or exit site.*
Are cycle racks of an appropriate size and easy to use? Can bikes be secured by the frame? *Cycle parking which only holds the wheels can damage bikes, particularly if they fall over.*
Are there areas on site where 'informal' cycle parking occurs? *e.g. bikes attached to railings or lampposts. Informal parking indicated a need for bike parking in that area.*
Is visitor's cycle parking provided? Is it publicised?
What is the speed of the traffic on site?
Are there any barriers obstructing cyclists when leaving or entering the site? *For example, barriers into car parks*
Where cycle racks are located close to vehicle parking bays, is there space for the vehicle doors to open without making contact with bikes or racks?
Is signage for cycle parking/building entrances/changing facilities clear and visible?
Are drying rooms provided for cyclist's gear?
Are showers and changing rooms provided for active commuters?
Are they in good condition? Would you be happy to use them?
Are storage areas/lockers for cyclists' equipment provided? *Where are the lockers located in relation to cycle parking/building entrances?*

The number of lockers provided should relate to the number of cycle parking spaces. *Ideally lockers should be keyless, so they facilitate multiple short-term users.*
Where is information on site cycle facilities provided (e.g. at cycle parking, online, induction packs, notice boards)? *Information might include location of cycle parking/showers/lockers, opening times of entrances etc.*
Is local cycling information provided to employees? *E.g. routes, route planners, local area maps* *What is provided and where is it displayed?*
Are cyclists separated from vehicular traffic on site? *Note that this is not always necessary.*
Is cycle training provided to employees?
Is bike maintenance provided on site?
Is there a corporate policy relating to cycling on business/inter-site travel?
Are bike fleets provided? *If so, how many?* *How are they publicised?* *Are bike fleets maintained (by whom and how frequently)?*
Do employees receive and allowance for business travel by bike? *What is the rate?* *How is it publicised?*
Is the Cycle to Work scheme offered? *If so, how often throughout the year?* *How is it publicised?*
Are discounts available to your organisation's employees in bike shops in your area? *How are they publicised?*
Are cycle routes through the site pleasant to use? *Are there any issues with potholes, 'ponding' of water at the side of the road, etc.?*
Any other comments/Additional information:

Please indicate the heading and/or question under which your comment applies:

Appendix B. Baseline survey

Office use only
Code:

Waterford Institute *of* Technology
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

About this questionnaire

Why did I receive this?
We are hoping to introduce a new initiative to increase the number of our employees who walk and cycle for transport (Smarter Travel). We designed this questionnaire to find out about the current travel behaviours of our staff and to get your ideas on what might work. The questionnaire will only take a few minutes to complete and all the information we collect will be kept in the strictest confidence and anonymised.

ALL QUESTIONNAIRES COMPLETED BY 20TH JUNE 2017 WILL BE ENTERED INTO A DRAW FOR A €50 ONE4ALL GIFT VOUCHER.

Paper surveys can be returned to your site coordinator (listed below) or completed and submitted online via Survey Monkey. If you have any questions or concerns about completing this questionnaire or ideas to promote Smarter Travel in the workplace, please contact your relevant site coordinator (contact details below).
Thank you, in advance, for your time.

Workplace Site	Co-ordinator Name	Contact details
Lacken	Gemma Leane	Gemma.Leane@hse.ie
	Dr Jacinta Mulroe	Jacinta.Mulroe@hse.ie
St Canice's	Helen Maher	Helen.Maher1@hse.ie
St Luke's Hospital	Mary Ryan	MaryF.Ryan@hse.ie
James's Green	Deirdre Maher	Deirdre.Maher2@hse.ie
Kilcreene	Kay Slattery	Kathleen.Slattery@hse.ie

Section A: Demographics

1. What workplace site do you spend MOST of your time working at? *(tick one box only)*

○ Lacken ○ St Luke's Hospital ○ Kilcreene

○ St Canice's ○ James's Green

2. Are you male or female? *(tick one box only)*

Male ○ Female ○

3. How old are you? ☐ Years IF YOU PREFER NOT TO SAY, PLEASE TICK HERE ☐

4. How many cars and vans are owned, or available for use, by members of your household?

☐ Cars and vans IF ZERO (0), PLEASE TICK HERE ☐

5. Do you have access to a working bicycle? *(Tick one box only)*

Yes ○ No ○

6. What is the highest level of education you have completed to date?

Primary ○ Undergraduate Degree ○

Secondary ○ Postgraduate Degree ○

Diploma or Certificate ○

7. How many people, including yourself, live in your household? *(Write in numbers)*

Children aged under 5 ☐

Children aged between 5-15 ☐

Adults aged 16 and over ☐

8. Overall, how would you rate your health during the PAST FOUR WEEKS?

Excellent	Very good	Good	Fair	Poor	Very poor
○	○	○	○	○	○

Section B: About your travel to and from work

9. How do you usually travel TO work? *Pick one box only for the longest part (distance) of your journey.*

○ On foot	○ Passenger in a car, with driver going to same destination
○ Bicycle	○ Passenger in a car, with driver going to different destination
○ Bus, minibus or coach	○ Taxi
○ Train, Luas, or DART	○ Lorry or van
○ Motorcycle or scooter	○ Other means
○ Driving a car	○ Work mainly from home

10. What is your main reason for choosing that mode? *(tick one box only)*

○ Cheapest	○ Habit
○ Quickest	○ Personal safety
○ Environmentally-friendly	○ Other commitments
○ Lack of alternative	○ Reliability
○ Less stressful	○ Distance
○ Other (please specify): _____	

11. How far is your journey from home to work? *Please provide the distance for **one direction** only.*

☐ Miles **or** ☐ Kilometres

12. What is the name of the nearest town/village you travel to work from?

_____

For each of the following statements, please tick one box to show how strongly you agree or disagree

13.	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly Disagree
	Tick one per row				
On my journey to and from work:					
It is pleasant to walk	○	○	○	○	○
The roads are dangerous for cyclists	○	○	○	○	○
There is convenient public transport	○	○	○	○	○
There are convenient routes for cycling	○	○	○	○	○
There is little traffic	○	○	○	○	○
There are no convenient routes for walking	○	○	○	○	○
It is safe to cross the road	○	○	○	○	○
Next time, to get to and from work:					
It would be easy for me to **WALK**	○	○	○	○	○
I intend to **WALK**	○	○	○	○	○
It would be easy for me to **CYCLE**	○	○	○	○	○
I intend to **CYCLE**	○	○	○	○	○
It would be easy for me to **USE A CAR**	○	○	○	○	○
I intend to **USE A CAR**	○	○	○	○	○
Using a car to get to and from work is something:					
I do automatically	○	○	○	○	○
I would find it hard not to do	○	○	○	○	○

14.	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly Disagree
At my workplace:	*Tick one per row*				
Many of my colleagues walk all or part of the way to and from work	○	○	○	○	○
Many of my colleagues cycle all or part of the way to and from work	○	○	○	○	○
Many of my colleagues drive to and from work	○	○	○	○	○
Members of senior management walk or cycle all or part of the way to and from work	○	○	○	○	○
Members of senior management drive to and from work	○	○	○	○	○

Section C: Promoting active travel in your workplace

15.

a. To what extent are the following aspects barriers to you commuting by bicycle?

	No problem	Minor problem	Major problem
No shower facilities at work	○	○	○
No lockers or changing room facilities at work	○	○	○
Dress code at work	○	○	○
Lack of secure cycle parking at work	○	○	○
Lack of covered cycle parking at work	○	○	○
I can’t carry my luggage/shopping/equipment on a bike	○	○	○

I need to stop at other destinations on my journey to/from work (e.g. school)	○	○	○

b. Which of the following measures would you like to be introduced into your work-place *(Please tick all boxes that apply)*

○	Reserved park and ride spaces e.g. reserved parking spaces for staff who wish to park in one HSE site and cycle to another.	○	**'**Green commuter' (cyclists, pedestrians, public transport users and car-sharers) coffee mornings
○	Information on bikes available through the Cycle to Work scheme	○	Incentive scheme (money, vouchers, prizes etc) for 'green commuters'
○	Cycle skills training	○	Active meetings at work
○	Subsidised gym membership	○	Bicycle maintenance classes
○	Bicycles available for trips during the working day	○	Standing desks
○	Sli Na Slainte walking route marked out in the local area/on-site	○	Money towards the purchase of bicycle panniers (bags),waterproof or reflective clothing, bicycle lights etc.
○	Prompts to take movement breaks while sitting in work	○	An online software programme to facilitate car-sharing
○	Lunchtime walking group	○	Stand-up breaks during working hours
○	Cycle parking conveniently located		

16. List 3 suggestions to increase the number of HSE employees that walk or cycle for transport?

1._____

2._____

3. _____

Section D: About your activity AT WORK

These questions are about the time you spend doing physical activity **at work in a typical week**. Think of work as the things that you have to do such as paid or unpaid work, study/training, and household chores or gardening.

'Vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate.
'Moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate.

17. Does your work involve **vigorous-intensity** activity that causes large increases in breathing or heart rate like carrying or lifting heavy loads, digging or construction work for **at least 10 minutes continuously**?

Yes ○ No ○ (IF NO, GO TO Q.18)

a. In a typical week, on how many **days** do you do vigorous intensity activities as part of your work?

Number of days ☐

b. How much **time** do you spend doing vigorous-intensity activities at work on a typical day?

Hours ☐ Minutes ☐

18. Does your work involve **moderate-intensity** activity that causes small increases in breathing or heart rate such as brisk walking *[or carrying light loads*] for **at least 10 minutes continuously**?

Yes ○ No ○ (IF NO, GO TO Q.19)

a. In a typical week, on how many **days** do you do moderate intensity activities as part of your work?

Number of days ☐

b. How much **time** do you spend doing moderate-intensity activities at work on a typical day?

Hours ☐ Minutes ☐

Section E: About your travel TO AND FROM PLACES

The next questions **exclude the physical activities at work** that you have already mentioned. Now I would like to ask you about the usual way you travel to and from places. For example to work, for shopping, to visit friends, or to the church.

19. Do you walk or use a bicycle for **at least 10 minutes** continuously to get to and from places?

Yes ○ No ○ (IF NO, GO TO Q.20)

a. In a typical week, on how many **days** do you walk for **at least 10 minutes continuously** to get to and from places?

Number of days ☐

b. How much **time** do you spend walking on a typical day?

Hours ☐ Minutes ☐

c. In a typical week, on how many **days** do you cycle for **at least 10 minutes continuously** to get to and from places?

Number of days ☐

d. How much **time** do you spend cycling on a typical day?

Hours ☐ Minutes ☐

Section F: Recreational Activities

The next questions **exclude all the walking and cycling for transport activity** that you have already mentioned. Now I would like to ask you about sports, fitness and recreational activities (leisure), including going for a walk or on a cycle tour.

'Vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate.
'Moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate.

20. Do you do any **vigorous-intensity** sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate like running or football for **at least 10 minutes continuously**?

Yes ○ No ○ (IF NO, GO TO Q.21)

a. In a typical week, on how many **days** do you do vigorous-intensity sports, fitness or recreational activities?

Number of days ☐

b. How much **time** do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?

Hours ☐ Minutes ☐

21. Do you do any **moderate-intensity** sports, fitness or recreational (leisure) activities that cause a small increase in breathing or heart rate such as brisk walking, cycling, swimming, volleyball for **at least 10 minutes continuously**?

Yes ○ No ○ (IF NO, GO TO Q.22)

a. In a typical week, on how many **days** do you do moderate intensity sports, fitness or recreational (leisure) activities?

Number of days ☐

b. How much **time** do you spend doing moderate-intensity sports, fitness or recreational (leisure) activities on a typical day?

Hours ☐ Minutes ☐

Section G: Sedentary behaviour

The following question is about sitting or reclining when at work, at home, getting to and from places, or with friends. This includes time spent sitting at a desk, sitting with friends, travelling in a car, bus, train, reading, playing cards or watching television, **but does not include time spent sleeping.**

22. How much time do you usually spend **sitting** or reclining on a typical day?

Hours ☐ Minutes ☐

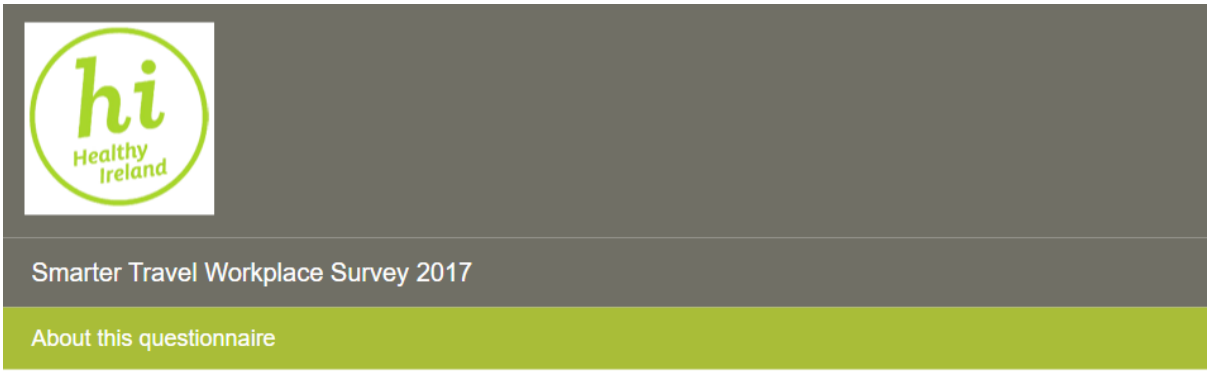
Prize Draw Details

Please give us your contact details in order to be entered into the prize draw

Phone	
Email	

Thank you for taking the time to complete this survey.

Appendix C. Online baseline survey



Why did I receive this?

We are hoping to introduce a new initiative to increase the number of our employees who walk and cycle for transport (Smarter Travel). We designed this questionnaire to find out about the current travel behaviours of our staff and to get your ideas on what might work. The questionnaire will only take a few minutes to complete and all the information we collect will be kept in the strictest confidence and anonymised.

All questionnaires completed by 20th June 2017 will be entered into a draw for a €50 One4All gift voucher.

Paper surveys can be returned to your site coordinator (listed below) or completed and submitted online via Survey Monkey. If you have any questions or concerns about completing this questionnaire or ideas to promote Smarter Travel in the workplace, please contact your relevant site coordinator (contact details below).

Thank you, in advance, for your time.

Lacken
Gemma Leane - Gemma.Leane@hse.ie
Dr Jacinta Mulroe - Jacinta.Mulroe@hse.ie

St Canice's
Helen Maher - Helen.Maher1@hse.ie

St Luke's Hospital
Mary Ryan - MaryF.Ryan@hse.ie

James's Green
Deirdre Maher - Deirdre.Maher2@hse.ie

Kilcreene
Kay Slattery - Kathleen.Slattery@hse.ie

Smarter Travel Workplace Survey 2017

Section A: Demographics

1. What workplace site do you spend MOST of your time working at? (tick one box only)

- ◯ Lacken
- ◯ St Luke's
- ◯ Kilcreene
- ◯ St Canices
- ◯ James' Green

2. Are you male or female?

- ◯ Male
- ◯ Female

3. How old are you?

- ◯ If you prefer not to say, please tick here
- ◯ Write your answer in the box below (in years)

4. How many cars and vans are owned, or available for use, by members of your household?

- ◯ IF ZERO (0), PLEASE TICK HERE
- ◯ Write answer in the box below

5. Do you have access to a working bicycle?

- ◯ Yes
- ◯ No

6. What is the highest level of education you have completed to date?

- ◯ Primary
- ◯ Secondary
- ◯ Diploma or Certificate
- ◯ Undergraduate Degree
- ◯ Postgraduate Degree

7. How many people, including yourself, live in your household? (Write in numbers)

Children under 5	
Children aged between 5-15	
Adults aged 16 and over	

8. Overall, how would you rate your health during the PAST FOUR WEEKS?

- ◯ Excellent
- ◯ Very good
- ◯ Good
- ◯ Fair
- ◯ Poor
- ◯ Very poor

Prev Next

Section B: About your travel to and from work

9. How do you usually travel TO work? *pick one box only for the longest part (distance) of the journey.*

- ◯ On foot
- ◯ Bicycle
- ◯ Bus, minibus or coach
- ◯ Train, Luas, or DART
- ◯ Motorcycle or scooter
- ◯ Driving a car
- ◯ Passenger in a car, with driver going to same destination
- ◯ Passenger in a car, with driver going to different destination
- ◯ Taxi
- ◯ Lorry or van
- ◯ Other means
- ◯ Works mainly from home

10. What is your MAIN REASON for choosing that mode?

- ◯ Cheapest
- ◯ Habit
- ◯ Quickest
- ◯ Personal safety
- ◯ Environmentally-friendly
- ◯ Other commitments
- ◯ Lack of alternative
- ◯ Reliability
- ◯ Less stressful
- ◯ Distance
- ◯ Other (please specify)

11. How far is your journey from home to work? *Please provide the distance for **one direction** only in miles **OR** kilometers.*

Miles	
Kilometers	

12. What is the name of the nearest town/village you travel to work from?

13. **Please tick one box per statement to show how strongly you agree or disagree**

On my journey to and from work:

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
It is pleasant to walk	○	○	○	○	○
The roads are dangerous for cyclists	○	○	○	○	○
There is convenient public transport	○	○	○	○	○
There are convenient routes for cycling	○	○	○	○	○
There is little traffic	○	○	○	○	○
There are no convenient routes for walking	○	○	○	○	○
It is safe to cross the road	○	○	○	○	○

14. For me, to get to and from work next time:

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly Disagree
It would be easy for me to **WALK**	○	○	○	○	○
I intend to **WALK**	○	○	○	○	○
It would be easy for me to **CYCLE**	○	○	○	○	○
I intend to **CYCLE**	○	○	○	○	○
It would be easy for me to **USE A CAR**	○	○	○	○	○
I intend to **USE A CAR**	○	○	○	○	○

15. Using a car to get to and from work is something

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
I do automatically	○	○	○	○	○
I would find it hard not to do	○	○	○	○	○

16. On my journey to and from work:

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
Many of my colleagues walk all or part of the way to and from work	○	○	○	○	○
Many of my colleagues cycle all or part of the way to and from work	○	○	○	○	○
Many of my colleagues drive to and from work	○	○	○	○	○
Members of senior management walk or cycle all or part of the way to and from work	○	○	○	○	○
Members of senior management drive to and from work	○	○	○	○	○

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Section C: Promoting active travel in your workplace

17. To what extent are the following aspects barriers to you commuting by bicycle?

	No problem	Minor problem	Major problem
No shower facilities at work	○	○	○
No lockers or changing room facilities at work	○	○	○
Dress code at work	○	○	○
Lack of secure cycle parking at work	○	○	○
Lack of covered cycle parking at work	○	○	○
I can't carry my luggage/shopping/equipment on a bike	○	○	○
I need to stop at other destinations on my journey to/from work (e.g. school)	○	○	○

18. Which of the following measures would you like to be introduced into your workplace? (Please tick all boxes that apply)

- [ ] Reserved park and ride spaces e.g. reserved parking spaces for staff who wish to park in one HSE site and cycle to another.
- [ ] 'Green commuter' (cyclists, pedestrians, public transport users and car-sharers) coffee mornings
- [ ] Information on bikes available through the Cycle to Work scheme
- [ ] Incentive scheme (money, vouchers, prizes etc) for 'green commuters'
- [ ] Cycle skills training
- [ ] Active meetings at work
- [ ] Subsidised gym membership
- [ ] Bicycle maintenance classes
- [ ] Bicycles available for trips during the working day
- [ ] Standing desks
- [ ] Sli Na Slainte walking route marked out in the local area/on-site
- [ ] Money towards the purchase of bicycle panniers (bags),waterproof or reflective clothing, bicycle lights etc.
- [ ] Prompts to take movement breaks while sitting in work
- [ ] An online software programme to facilitate car-sharing
- [ ] Lunchtime walking group
- [ ] Stand-up breaks during working hours
- [ ] Cycle parking conveniently located

19. List 3 suggestions to increase the number of HSE employees that walk or cycle for transport?

1:
2:
3:

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Section D: About your activity AT WORK

These questions are about the time you spend doing physical activity at work in a typical week. Think of work as the things that you have to do such as paid or unpaid work, study/training, and household chores or gardening.

'Vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate.

'Moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate.

20. Does your work involve **vigorous-intensity activity** that causes large increases in breathing or heart rate like carrying or lifting heavy loads, digging or construction work for **at least 10 minutes continuously**?

- ◯ Yes
- ◯ No

Prev Next

Section D: continued

21. In a typical week, on how many **days** do you do vigorous intensity activities as part of your work?

Number of days

22. How much **time** do you spend doing vigorous-intensity activities at work on a typical day?

	Hours	Minutes
Time		

Prev Next

Section D: continued

23. Does your work involve **moderate-intensity activity** that causes small increases in breathing or heart rate such as brisk walking [or carrying light loads] for **at least 10 minutes continuously**?

- ◯ Yes
- ◯ No

Prev Next

Section D: continued

24. In a typical week, on how many **days** do you do moderate intensity activities as part of your work?

Number of days

25. How much **time** do you spend doing moderate-intensity activities at work on a typical day?

	Hours	Minutes
Time		

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Section E: About your travel to and from places

The next questions **exclude the physical activities at work** that you have already mentioned.

Now I would like to ask you about the usual way you travel to and from places. For example to work, for shopping, to visit friends, or to the church.

26. Do you walk or use a bicycle for **at least 10 minutes continuously** to get to and from places?

- ◯ Yes
- ◯ No

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Section E: continued

27. In a typical week, on how many **days** do you walk for **at least 10 minutes continuously** to get to and from places?

Number of days

28. How much **time** do you spend walking on a typical day?

	Hours	Minutes
Time		

29. In a typical week, on how many **days** do you cycle for **at least 10 minutes continuously** to get to and from places?

Number of days

30. How much **time** do you spend cycling on a typical day?

	Hours	Minutes
Time		

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Section F: Recreational Activities

The next questions **exclude all the walking and cycling for transport activity** that you have already mentioned. Now I would like to ask you about sports, fitness and recreational activities (leisure), including going for a walk or on a cycle tour.

'Vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate.

'Moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate.

31. Do you do any **vigorous-intensity** sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate like running or football for **at least 10 minutes continuously**?

- ◯ Yes
- ◯ No

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Section F: continued

32. In a typical week, on how many **days** do you do vigorous-intensity sports, fitness or recreational activities?

Number of days

33. How much **time** do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?

	Hours	Minutes
Time		

Prev Next

Section F: continued

34. Do you do any **moderate-intensity** sports, fitness or recreational (leisure) activities that cause a small increase in breathing or heart rate such as brisk walking, cycling, swimming, volleyball for **at least 10 minutes continuously**?

- ◯ Yes
- ◯ No

Prev Next

Section F: continued

35. In a typical week, on how many **days** do you do moderate intensity sports, fitness or recreational (leisure) activities?

Number of days

36. How much **time** do you spend doing moderate-intensity sports, fitness or recreational (leisure) activities on a typical day?

	Hours	Minutes
Time		

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Section G: Sedentary Behaviour

The following question is about sitting or reclining when at work, at home, getting to and from places, or with friends. This includes time spent sitting at a desk, sitting with friends, travelling in a car, bus, train, reading, playing cards or watching television, **but does not include time spent sleeping**.

37. How much **time** do you usually spend sitting or reclining on a typical day?

	Hours	Minutes
Time		

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Appendix D. Follow-up survey

Office use only
Code:

Waterford Institute of Technology
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

KRSP
KILKENNY RECREATION & SPORTS PARTNERSHIP
AN IRISH SPORTS COUNCIL INITIATIVE

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

hi Healthy Ireland

About this questionnaire

Why did I receive this?
Over the past 12 months, the Healthy Ireland working group have been planning and implementing small initiatives to help increase physical activity and active travel in our workplace. We have designed this short questionnaire to help evaluate our work. The questionnaire will only take a few minutes to complete and all the information we collect will be kept in the strictest of confidence and anonymised.

ALL QUESTIONNAIRES COMPLETED BY 22ND JUNE 2018 WILL BE ENTERED INTO A DRAW FOR A €50 SPORTS VOUCHER.

Paper surveys can be returned to your site coordinator (listed below) or completed and submitted online via Survey Monkey. If you have any questions or concerns about completing this questionnaire or feedback on our initiatives to promote Smarter Travel in the workplace, please contact your relevant site coordinator (contact details below).
Thank you, in advance, for your time.

Workplace Site	Co-ordinator Name	Contact details
Lacken	Gemma Leane	Gemma.Leane@hse.ie
St Canice's	Helen Maher	Helen.Maher1@hse.ie
St Luke's Hospital	Mary Ryan	MaryF.Ryan@hse.ie
James's Green	Deirdre Maher	Deirdre.Maher2@hse.ie
Kilcreene	Kay Slattery	Kathleen.Slattery@hse.ie

Section A: Demographics

23. What workplace site do you spend MOST of your time working at? *(tick one box only)*

○ Lacken	○ St Luke's Hospital	○ Kilcreene
○ St Canice's	○ James's Green	

24. Are you male or female? *(tick one box only)*

Male ○ Female ○

25. How old are you? ☐ Years IF YOU PREFER NOT TO SAY, PLEASE TICK HERE ☐

26. How many cars and vans are owned, or available for use, by members of your household?

☐ Cars and vans IF ZERO (0), PLEASE TICK HERE ☐

27. Do you have access to a working bicycle? *(Tick one box only)*

Yes ○ No ○

28. What is the highest level of education you have completed to date?

Primary	○	Undergraduate Degree	○
Secondary	○	Postgraduate Degree	○
Diploma or Certificate	○		

29. How many people, including yourself, live in your household? *(Write in numbers)*

Children aged under 5 ☐

Children aged between 5-15 ☐

Adults aged 16 and over ☐

30. Overall, how would you rate your health during the PAST FOUR WEEKS?

Excellent	Very good	Good	Fair	Poor	Very poor
○	○	○	○	○	○

Section B: About your travel to and from work

31. How do you usually travel TO work? *Pick one box only for the longest part (distance) of your journey.*

○ On foot	○ Passenger in a car, with driver going to same destination
○ Bicycle	○ Passenger in a car, with driver going to different destination
○ Bus, minibus or coach	○ Taxi
○ Train, Luas, or DART	○ Lorry or van
○ Motorcycle or scooter	○ Other means
○ Driving a car	○ Work mainly from home

32. What is your main reason for choosing that mode? *(tick one box only)*

○ Cheapest	○ Habit
○ Quickest	○ Personal safety
○ Environmentally-friendly	○ Other commitments
○ Lack of alternative	○ Reliability
○ Less stressful	○ Distance
○ Other (please specify): _____	

33. How far is your journey from home to work? *Please provide the distance for **one direction** only.*

☐ Miles **or** ☐ Kilometres

Section C: Employee Awareness

34. Are you aware of any initiative to promote physical activity and/or active travel in your workplace?

Yes ○ No ○ (IF NO, GO TO Q.14) I don't know ○

35. What were the main messages or events surrounding this initiative(s)?

_____

_____

_____

_____

_____

Section D: About your activity AT WORK

These questions are about the time you spend doing physical activity **at work in a typical week**. Think of work as the things that you have to do such as paid or unpaid work, study/training, and household chores or gardening.

'Vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate.
'Moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate.

36. Does your work involve **vigorous-intensity** activity that causes large increases in breathing or heart rate like carrying or lifting heavy loads, digging or construction work for **at least 10 minutes continuously**?

Yes ○ No ○ (IF NO, GO TO Q.18)

a. In a typical week, on how many **days** do you do vigorous intensity activities as part of your work?

Number of days ☐

b. How much **time** do you spend doing vigorous-intensity activities at work on a typical day?

Hours ☐ Minutes ☐

37. Does your work involve **moderate-intensity** activity that causes small increases in breathing or heart rate such as brisk walking *[or carrying light loads*] for **at least 10 minutes continuously**?

Yes ○ No ○ (IF NO, GO TO Q.19)

a. In a typical week, on how many **days** do you do moderate intensity activities as part of your work?

Number of days ☐

b. How much **time** do you spend doing moderate-intensity activities at work on a typical day?

Hours ☐ Minutes ☐

Section E: About your travel TO AND FROM PLACES

The next questions **exclude the physical activities at work** that you have already mentioned. Now I would like to ask you about the usual way you travel to and from places. For example to work, for shopping, to visit friends, or to the church.

38. Do you walk or use a bicycle for **at least 10 minutes** continuously to get to and from places?

Yes ○ No ○ (IF NO, GO TO Q.20)

a. In a typical week, on how many **days** do you walk for **at least 10 minutes continuously** to get to and from places?

Number of days ☐

b. How much **time** do you spend walking on a typical day?

Hours ☐ Minutes ☐

c. In a typical week, on how many **days** do you cycle for **at least 10 minutes continuously** to get to and from places?

Number of days ☐

d. How much **time** do you spend cycling on a typical day?

Hours ☐ Minutes ☐

Section F: Recreational Activities

The next questions **exclude all the walking and cycling for transport activity** that you have already mentioned. Now I would like to ask you about sports, fitness and recreational activities (leisure), including going for a walk or on a cycle tour.

'Vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate.
'Moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate.

39. Do you do any **vigorous-intensity** sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate like running or football for **at least 10 minutes continuously**?

Yes ○ No ○ (IF NO, GO TO Q.21)

a. In a typical week, on how many **days** do you do vigorous-intensity sports, fitness or recreational activities?

Number of days ☐

b. How much **time** do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?

Hours ☐ Minutes ☐

40. Do you do any **moderate-intensity** sports, fitness or recreational (leisure) activities that cause a small increase in breathing or heart rate such as brisk walking, cycling, swimming, volleyball for **at least 10 minutes continuously**?

Yes ○ No ○ (IF NO, GO TO Q.22)

a. In a typical week, on how many **days** do you do moderate intensity sports, fitness or recreational (leisure) activities?

Number of days ☐

b. How much **time** do you spend doing moderate-intensity sports, fitness or recreational (leisure) activities on a typical day?

Hours ☐ Minutes ☐

Section G: Sedentary behaviour

The following question is about sitting or reclining when at work, at home, getting to and from places, or with friends. This includes time spent sitting at a desk, sitting with friends, travelling in a car, bus, train, reading, playing cards or watching television, **but does not include time spent sleeping.**

41. How much time do you usually spend **sitting** or reclining on a typical day?

Hours ☐ Minutes ☐

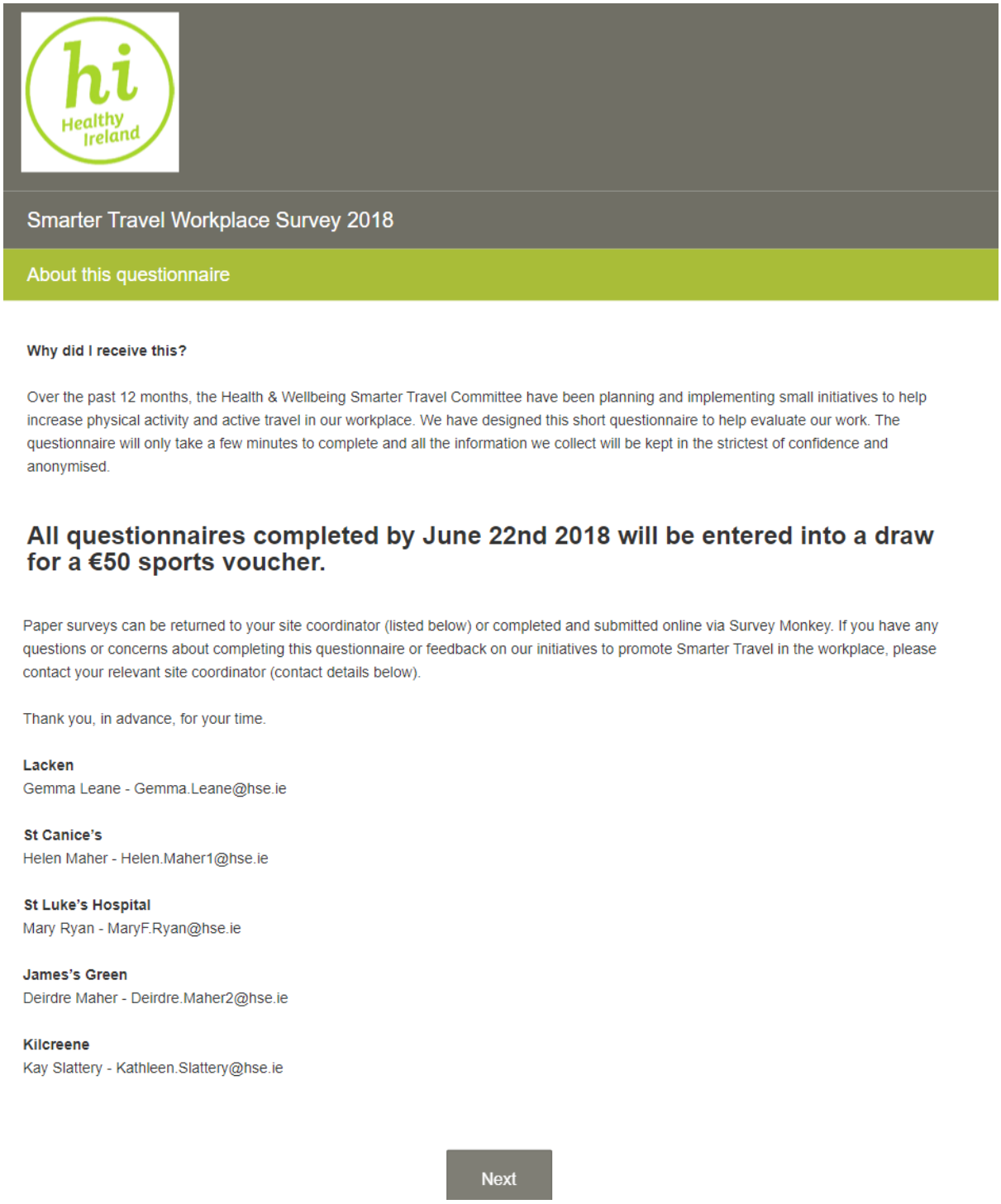
Prize Draw Details

Please give us your contact details in order to be entered into the prize draw

Phone	
Email	

Thank you for your time in completing this questionnaire.

Appendix E. Online follow-up survey



Smarter Travel Workplace Survey 2018

Section A: Demographics

* 1. What workplace site do you spend MOST of your time working at? (tick one box only)

- ◯ Lacken
- ◯ St Luke's
- ◯ Kilcreene
- ◯ St Canices
- ◯ James' Green

2. Are you male or female?

- ◯ Male
- ◯ Female

3. How old are you?

- ◯ If you prefer not to say, please tick here
- ◯ Write your answer in the box below (in years)

4. How many cars and vans are owned, or available for use, by members of your household?

- ◯ IF ZERO (0), PLEASE TICK HERE
- ◯ Write answer in the box below

5. Do you have access to a working bicycle?

- ◯ Yes
- ◯ No

6. What is the highest level of education you have completed to date?

- ◯ Primary
- ◯ Secondary
- ◯ Diploma or Certificate
- ◯ Undergraduate Degree
- ◯ Postgraduate Degree

7. How many people, including yourself, live in your household? (Write in numbers)

Children under 5	
Children aged between 5-15	
Adults aged 16 and over	

8. Overall, how would you rate your health during the PAST FOUR WEEKS?

- ◯ Excellent
- ◯ Very good
- ◯ Good
- ◯ Fair
- ◯ Poor
- ◯ Very poor

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Section B: About your travel to and from work

9. How do you usually travel TO work? *pick one box only for the longest part (distance) of the journey.*

- ◯ On foot
- ◯ Bicycle
- ◯ Bus, minibus or coach
- ◯ Train, Luas, or DART
- ◯ Motorcycle or scooter
- ◯ Driving a car
- ◯ Passenger in a car, with driver going to same destination
- ◯ Passenger in a car, with driver going to different destination
- ◯ Taxi
- ◯ Lorry or van
- ◯ Other means
- ◯ Works mainly from home

10. What is your MAIN REASON for choosing that mode?

- ◯ Cheapest
- ◯ Habit
- ◯ Quickest
- ◯ Personal safety
- ◯ Environmentally-friendly
- ◯ Other commitments
- ◯ Lack of alternative
- ◯ Reliability
- ◯ Less stressful
- ◯ Distance
- ◯ Other (please specify)

11. How far is your journey from home to work? *Please provide the distance for **one direction** only in miles **OR** kilometers.*

Miles

Kilometers

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Section C: Employee Awareness

12. Are you aware of any initiative to promote physical activity and/or active travel in your workplace?

- [ ] Yes
- [ ] No
- [ ] I don't know

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13. What were the main messages or events surrounding this initiative?

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Section D: About your activity AT WORK

These questions are about the time you spend doing physical activity at work in a typical week. Think of work as the things that you have to do such as paid or unpaid work, study/training, and household chores or gardening.

'Vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate.

'Moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate.

14. Does your work involve **vigorous-intensity activity** that causes large increases in breathing or heart rate like carrying or lifting heavy loads, digging or construction work for **at least 10 minutes continuously**?

- ◯ Yes
- ◯ No

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Section D: continued

15. In a typical week, on how many **days** do you do vigorous intensity activities as part of your work?

Number of days

16. How much **time** do you spend doing vigorous-intensity activities at work on a typical day?

	Hours	Minutes
Time		

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Section D: continued

17. Does your work involve **moderate-intensity activity** that causes small increases in breathing or heart rate such as brisk walking [or carrying light loads] for **at least 10 minutes continuously**?

- ◯ Yes
- ◯ No

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Section D: continued

18. In a typical week, on how many **days** do you do moderate intensity activities as part of your work?

Number of days

19. How much **time** do you spend doing moderate-intensity activities at work on a typical day?

	Hours	Minutes
Time		

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Smarter Travel Workplace Survey 2018

Section E: About your travel to and from places

The next questions **exclude the physical activities at work** that you have already mentioned.

Now I would like to ask you about the usual way you travel to and from places. For example to work, for shopping, to visit friends, or to the church.

20. Do you walk or use a bicycle for **at least 10 minutes continuously** to get to and from places?

- ◯ Yes
- ◯ No

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Section E: continued

21. In a typical week, on how many **days** do you walk for **at least 10 minutes continuously** to get to and from places?

Number of days

22. How much **time** do you spend walking on a typical day?

	Hours	Minutes
Time		

23. In a typical week, on how many **days** do you cycle for **at least 10 minutes continuously** to get to and from places?

Number of days

24. How much **time** do you spend cycling on a typical day?

	Hours	Minutes
Time		

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Section F: Recreational Activities

The next questions **exclude all the walking and cycling for transport activity** that you have already mentioned. Now I would like to ask you about sports, fitness and recreational activities (leisure), including going for a walk or on a cycle tour.

'Vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate.

'Moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate.

25. Do you do any **vigorous-intensity** sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate like running or football for **at least 10 minutes continuously**?

- ◯ Yes
- ◯ No

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Section F: continued

26. In a typical week, on how many **days** do you do vigorous-intensity sports, fitness or recreational activities?

Number of days

27. How much **time** do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?

	Hours	Minutes
Time		

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Section F: continued

28. Do you do any **moderate-intensity** sports, fitness or recreational (leisure) activities that cause a small increase in breathing or heart rate such as brisk walking, cycling, swimming, volleyball for **at least 10 minutes continuously**?

- ○ Yes
- ○ No

Prev Next

Section F: continued

29. In a typical week, on how many **days** do you do moderate intensity sports, fitness or recreational (leisure) activities?

Number of days

30. How much **time** do you spend doing moderate-intensity sports, fitness or recreational (leisure) activities on a typical day?

	Hours	Minutes
Time		

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Section G: Sedentary Behaviour

The following question is about sitting or reclining when at work, at home, getting to and from places, or with friends. This includes time spent sitting at a desk, sitting with friends, travelling in a car, bus, train, reading, playing cards or watching television, **but does not include time spent sleeping**.

31. How much **time** do you usually spend sitting or reclining on a typical day?

	Hours	Minutes
Time		

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Prize draw details

32. Please enter your contact details below in order to be entered into the prize draw

Email

Phone

Prev Done

Appendix F. Screenline count form

Screenline Count Form and Instructions

Counter Name: _____

Junction: _____ **Exact count spot**:

_____

Date: _____ **Time Period**: 07:30-09:30 ☐

16:30-18:30

Weather Conditions: _____ (complete at end of period)

Preparation for Count Day:

1. You will need the following:
    a. Count forms
    b. High-viz jackets
    c. Clipboard
    d. Pens

Count Instructions:

1. Record the exact location that you are standing for the count. Use shop, building, name or landmark.
2. Count all cyclists, pedestrians and cars that cross your screenline under the appropriate headings (male, female).
3. If a cyclist is wearing a helmet, record them in the appropriate box with an 'X'.
4. If there is more than one person on a bike (i.e. parent and child) count them as two individuals.
5. Pedestrians include people in wheelchairs (including motorised) and children in buggies.
6. People on skateboards, rollerblades, or flickers should be recorded as 'Others'.
7. Record each cyclist/pedestrian/car using the method shown below i.e. 5 in total, then start another 5. If the cyclist is wearing a helmet just place an 'X' in the lower portion of the box.

1	I	6	𝍸 I
2	II	7	𝍸 II
3	III	8	𝍸 III
4	IIII	9	𝍸 IIII
5	𝍸	10	𝍸 𝍸

8. Bicycle parking should be recorded during the period from 09:30 – 10:00. Count the number of bikes parked in the formal bicycle parking and record on the bicycle parking form. Describe the type of bike parking. Count and record any bikes parked informally in the vicinity.

Some final points:

9. If you are aware of any new bike parking racks in addition to that listed in this document, please include them in the count.
10. You will need to print enough record sheets for the day.
11. You need to stick strictly to the data collection times.
12. The count streets should be retained by co-ordinator for the counts in the town.
13. Remember to count everyone that passes through the imaginary screenline(s).

	Pedestrians		Cyclists		Cars	Other
	Male	Female	Male	Female		

Bicycle parking:

Number of bikes parked in the formal bike parking area:

_____

Description of the bike parking:

_____

Number of bikes informally parked:

_____

Appendix G. Process evaluation topic guide

Process Evaluation – HSE Intervention

Reach:

Who was the target audience for the intervention?

Were there any barriers to this reach? Probe how to overcome barriers (if any)

What was the level of acceptability shown by senior management to the intervention?

Effectiveness:

What type of changes did you expect to see among the target audience & workplace sites?

How appropriate was the intervention for the workplace? Did it have relevance?

Do you think the intervention has created an evidence-base for future implementation?

Adoption:

Did the HSE meet their perceived objectives?

What was the initial intention shown by HSE to adopt an intervention?

What external threats/supports were there when implementing the intervention (if any)?

Did the people running the intervention have the correct skill-set required? Probe skill-set needed.

What do you think will be the greatest barriers to organisations adopting a similar intervention?

Implementation:

Was the intervention delivered as expected? Probe the expected vs reality.

1. Adherence to the programme protocol.

2. Dose of the programme delivered

3. Quality of the delivered programme

What were the key elements of the intervention that proved to be successful? Why?

What were the key elements of the intervention that proved to be unsuccessful? Why?

How did the cost of the intervention, the implementation strategy and the delivery impact the intervention?

How feasible was the intervention? Probe recruitment, participation rates & resources

What impact did the committee have on the implementation process? Probe difficulties

Maintenance:

How committed to you think senior management are to continue if the intervention provides positive results?

How confident are you that this intervention will have lasting and sustainable benefits? It is likely?

Is there funding in place to sustain the projects?

Is there any modifications that are needed to sustain the initiative over time? Probe cost, staff training, reduced intensity of workload.

Appendix H. Google Map screenline

Two photos below are used as an example as how the screenline was identified to counters.

Photo 1: Kilcreene Hospital Screenline

Photo 2: Lacken Offices screenline

Appendix I. Code book

	Code Name	Code Description
1.	Conflicting interests	The interviewee states or demonstrates different opinions between organisations and work professionals on Smarter Travel policies and/or implementation of Smarter Travel initiatives. Details on divided staff opinions and attitudes towards ST should be included in this code.
2.	Acknowledging geographical differences	The differences and/or difficulties in implementing ST initiatives between different geographical settings across Ireland. Making reference to organisations location, towns and cities. Do not include driving culture(s) in this code.
3.	Moving beyond travel plans	Making reference to focusing on travel planning and how to promote Smarter Travel successfully rather than focusing on the traditional travel plan documentation. This also includes making reference to the lack of travel plans or their implementation in the workplace. Actions and processes taken to increase workplace facilities should be included here. Include references to site-specific plans and avoiding a 'one size fits all' approach.
4.	Adopting a broad strategy for all modal choices	Taking a multi-strategy approach to Smarter Travel. The workplace engaging in multiple aspects of ST, rather than focusing on one specific area. Considering a multi-agency point of view on initiatives is included under this code.
5.	Receiving organisational support	The supports which are offered or available by the organisation, local and National Authorities to plan and deliver initiatives. Include the interviewee identifying the lack of support available for promoting ST initiatives from the national/local authorities. Reference to external funding should also be included in this code.
6.	Applying a needs analysis approach	A detailed analysis of the workplace site and its surroundings prior to implementing a ST intervention. Including details of workplace demographics, local infrastructure, facilities on and off-site.
7.	Needing a return for Smarter Travel investment	The need for return on investment in ST initiatives and travel planning. Reference to the hesitancy to provide/receive funding for ST initiatives should be included here.
8.	Identifying barriers to commuting	Discussion or reference to barriers or difficulties to commuting to work from an employee point-of-view. Taking into consideration the numerous advantages and/or disadvantages by commuting to work by car.
9.	A Smarter Travel communication strategy	The impact an advertisement strategy could have in promotion of ST initiatives. How does the workplace communicate ST initiatives to its employees etc? Community engagement and ST awareness should be included here.

10. .	Collaborating with organisations	The importance of creating collaborations with local businesses and authorities to help influence and promote ST. Include past experiences around collaborations.
11.	Taking an evidence-based approach	Adopting a research strategy prior to implementing ST initiatives to identify the successful and/or unsuccessful efforts of previous projects. Reflections and discussions on past experiences are also included.
12.	Influencing role of senior management	The involvement of senior management and the impact (positive/negative) that may have on the promotion of ST. Their involvement in planning procedures, securing funding and general interests (or lack of) should be recorded.
13.	Assigning responsibility for Smarter Travel promotion	The need for a specific job role or appointing a champion in relation to travel planning and/or ST. References to the role/workload involved in ST promotion, dissatisfaction of job position and the lack of clarity on which workplace department this work is carried under are also included. All other references to champions and advocates are included here.
14.	Changing the approach moving forward	Details and suggestions on what the future direction of travel planning entails.
15.	Managing parking demand	Managing the demand for parking by implementing various parking management strategies and the process involved. Reflections of past experiences should be included here.
16.	Identifying the driving factor	The importance of identifying the main policy driver in order to change behaviour. Any reference to identifying ST as a method to increase the health status of the workforce. Using different policies to change behaviour (Travel plans, health and wellness, carbon footprint etc).
17.	Acknowledging the driving culture in Ireland	Highlighting a long history of habitual car use, car dependency and the difficulties it possesses in travel planning. Allow for comparisons with other countries but do not mistake for code 'acknowledging geographical differences.'
18.	Using both a 'carrot and stick' approach	Taking a hard measure and unfavourable approach in order to influence more sustainable travel while implementing soft measures to change behaviour.
19.	Engaging employees	This includes anything in relation to working with staff and getting them on board. Educating staff on the benefits of ST. Encouraging ST through incentives. Different types of incentives for different modes (lights for bikes, priority car sharing spaces etc.)
20.	Up skilling employees	Providing staff training to build a capacity for ST in workplaces. Developing programme-related skills and personal skills of employees should also be included here.

Appendix J. Ethical approval

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info@wit.ie

Waterford, Ireland.
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www.wit.ie

REF: 16/HSES/07

27th October, 2016.

Mr. Michael Kavanagh,

[redacted]

Dear Michael,

Thank you for bringing your project *"The evaluation of a Smarter Travel behaviour change programme targeting adults in Waterford City"* to the attention of the WIT Research Ethics Committee.

We have approved the conduct of this project, subject to the following amendments:-

Application form:

(a) On page 6 under the confidentiality section, please amend the reference to the Data Protection Act.
(b) Include in the data management section, your method of data destruction.

We will convey this decision to Academic Council.

Yours sincerely,

Prof. John Wells,
Chairperson,
WIT Research Ethics Committee

cc: Dr. Barry Lambe
Dr. Niamh Murphy

Appendix K. Interview topic guide

Interview topic guide: Smarter Travel advocate

Background to research

I am carrying out some qualitative research on the implementation of workplace travel plans on behalf of Waterford Institute of Technology. Our main area of interest in the qualitative component of our study is to understand the perspectives of both project coordinators and the advocates of workplace travel plans. What we want to achieve from this interview is to identify what elements work and/or don't work in implementing these plans, what supports are available for workplaces who engage, your experience of working with and implementing these travel plans, and to explore the similarities and/or differences between different professions' perceptions of workplace travel planning. By retrieving this information, we then hope to develop a set of recommendations to implement successful workplace travel plans with long-term effectiveness in the future.

Introduction

- What is your understanding of Smarter Travel / Smarter Travel Workplaces?
- Tell me about your role / interest in Smarter Travel.
- What has led to your involvement in workplace active travel promotion?
- What are your experiences in workplace active travel promotion? Probe experiences
- What role have you played in respect of workplace travel plans?

Workplace active travel measures in general

- In your opinion, why is active travel to work necessary?
- What do you see as the main purpose of encouraging employees to drive less to work?
- How would you prioritise activities for workplaces? Probe why.

- Travel plans seem to play a major part. Can you share any experience working with them? Did they work? Were they useful?

Smarter Travel advocate experiences

- How successful have efforts been to promote travel plans you were involved in? Where? When? What were the programme overall goals? Were the goals achieved?
- What types of barriers or difficulties did you have? How did you overcome them?
- What measures did you bring in? Why? How did you manage to bring the measure in successfully?
- Typically, what did the organisation(s) you worked with do well?
- What did the organisation(s) you worked with not do well?
- Why do some employees not engage? Can you tell us any stories?
- What supports were available to you as an advocate? Did you use them? Were they helpful?

Workplace travel plans

- What do you think of travel plans as a means of increasing active travel to work? Probe why, big cities vs small cities
- Why are companies getting involved in travel plans? What is the role they should take in making sure these plans are a success?
- What influence does _____have in the efforts of implementing workplace travel plans?
    a. Funding (local/national)
    b. Support from the public & other sectors
    c. Involvement of the community

Key personnel

- Did a transport/health professional support the implementation of the workplace travel plan you were involved with?
- If so, what was their involvement?
- Looking back, is there anything you would do differently?

The future of travel plans

- What do you think the future directions could be for implementing travel plans?
- How about workplace travel plans generally?
- What about at state level? Are travel plans a strategy that justifies further investment by the health/transport departments?
- How can workplaces be supported better in the future based on your experiences?

Open prompt

- Is there anything else you would like to add?
- Do you have any recommendations for others to interview?

Appendix L. Interview consent form

Waterford Institute *of* Technology
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

Interview consent form

Who is doing the research?

Mr Michael Kavanagh from the Centre for Health Behaviour Research in Waterford Institute of Technology.

Why?

To understand the perceived elements of successful workplace travel plans.

What is involved?

This component of the research is a qualitative study which means that the research data will be from interviews. You will be asked questions on a number on 'Smarter Travel' related topics. These will include your views on the importance and benefits of active travel and what factors you consider to have the greatest influence on workplace travel planning. The interview will be recorded and will subsequently be transcribed verbatim. Once transcribed, the audio recordings will be permanently deleted. It is important to highlight ***any text that may identify you or another person will be removed. Pseudonyms will be used to ensure anonymity***. You will also be given an opportunity to review the final transcript and how the information is used in the final manuscript before publication.

Questions for you to consider:

1. I confirm that I have had the purpose and nature of the above study clearly explained to me
2. I understand that my participation is voluntary and I am free to withdraw at any time without a given reason.
3. If interviewed, I agree to written notes been taken by the interviewer.
4. If interviewed, I agree to the interview being audio-recorded.
5. I agree to the use of anonymous quotes in the research report.

Signature of participant: _____ Date: _____

Signature of researcher: _____ Date: _____