

CLIENT PROJECT REPORT CPR2714

Accessible Public Realm: Updating Guidance and
Further Research

Technical Annex 4: Inclusion of mental health
(RQ3)

Posner R & Sharp R

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Quality approval:

Anastasia
Kounatidou
(Project Manager)



Marcus Jones
(Technical
Reviewer)



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Executive summary

To date guidance has had a primary focus on physical mobility and visual impairment. However, evidence shows that mental health can affect our travel behaviour and that our transport systems can impact mental health while travelling. The wide range of mental health difficulties makes it difficult to understand the impact that it can have on an individuals' ability to navigate the built environment. The research aimed to:

1. Categorise the types of mental health difficulties experienced in England and Scotland
2. Determine the prevalence rate of each of these mental health difficulties in England and Scotland
3. Identify the barriers and needs of each mental health difficulty in navigating the built environment and determine which can be addressed through infrastructure changes.

The research was undertaken as three tasks. The first two involved literature reviews and the third was a survey of members of the public who have experience of living with a mental health condition. The findings from the literature review allowed identification of the wide range of mental health conditions currently experienced in England and Scotland. They also demonstrated several limitations, primarily that, to date, the prevalence rates of numerous mental health conditions are still unknown. The absence of reliable statistics for so many mental health conditions is a barrier to understanding the ways in which mental health and the built environment interact and, consequently, in designing a built environment that is truly inclusive and ensures safe mobility for all.

Participants reported that their mental health had several impacts on their ability to travel and navigate the built environment. These included difficulties with route planning, avoidance of certain environments (e.g. avoiding crowded environments), infrastructure design (e.g. confined spaces) and physical safety (e.g. fear of crashing into others). These were reported across several different modes of transport.

Participants also reported various negative effects that travelling had on their mental health. These are summarised below.

Theme	Impact on mental health	Pedestrian	Cyclist	Bus	Train
Infrastructure design/maintenance (e.g. confined spaces; artificial environments; obstructed walkways; lack of dedicated cycling infrastructure/ storage)	Increased anxiety; Increased stress	Yes	Yes		
Atmosphere (e.g. noise, air quality; congested roads; artificial lighting)	Increased anxiety	Yes		Yes	Yes

Theme	Impact on mental health	Pedestrian	Cyclist	Bus	Train
Route navigation and planning (e.g. unfamiliar routes/environments; navigation difficulties)	Increased anxiety; Increased stress	Yes	Yes	Yes	Yes
Provision of information (e.g. large volume of information; complex information/signage)	Increased anxiety			Yes	Yes
Other people (e.g. unpredictable/unsafe behaviour; lack of travel companion; busy environments)	Increased anxiety; Increased stress	Yes	Yes	Yes	Yes
Vehicle design (e.g. lack of escape during transit; difficulties to alight; poor ventilation)	Increased anxiety			Yes	Yes
Bus service attributes (e.g. lack of control; non standardised customs)				Yes	
Bus stop design (e.g. secluded bus stops; poor lighting; inadequate seating; lack of shelter)				Yes	
Train station design (e.g. Lack of facilities; narrow platforms; difficulties with entry/exit barriers)	Increased anxiety; Exacerbated claustrophobia				Yes
Train service attributes (e.g. train delays; changes to route; lack of control)	Increased anxiety				Yes

Participants identified positive impacts of travel on their mental health. Significantly these were linked only to walking and cycling, not bus or train, highlighting the benefits of active travel that have been identified in the literature. They reported decreased anxiety and generally improved mental health.

Participants identified many interventions across all modes discussed that would help to overcome the barriers they had identified. Solutions covered vehicle design, highway infrastructure, information provision, enforcement and awareness of driving rules, and improved reliability of services. Some interventions were specific to the needs of people with mental health conditions; however, the majority could be considered to reflect good practice in the provision of transport services and a good quality and safe street environment for all road users.

People with mental health conditions suffer disproportionately from the sorts of barriers and inconveniences that all transport and road users experience, so are more likely to be put off completely by situations that others might put up with, leading to total avoidance of certain modes of transport. On the other hand, this means that interventions designed to make travel more comfortable and attractive to people with mental health conditions will have the benefit of improving transport services and the environment for all users.

1 Introduction

1.1 This document

This document forms a Technical Annex to the report *Accessible Public Realm: Updating Guidance and Further Research* prepared by TRL for DfT. It sets out the detailed methodology, findings and recommendations from Research Question 3 (RQ3) of the project which considered the inclusion of mental health in the government's guidance on the accessible public realm.

1.2 Background to the research

It is estimated that over one billion people globally have a mental, neurodevelopmental or substance use disorder (Vos et al., 2017). These recent estimates provide a clear account of the prevalence of mental health globally and the need for urgent attention into how mental health affects our day to days lives. Statistics in the UK paint a similar picture with at least one in six adults in England reporting symptoms of common mental health disorders in any given week (McManus, Bebbington, Jenkins & Brugha, 2016). Initial research looking at the relationship between mental health and transport has identified a range of different difficulties ranging from anxiety, stress and depression to cognitive impairments such as dementia, as well as neurodevelopmental conditions such as autism that can affect our travel behaviour. For those living with such 'non-visible disabilities'¹ there are several issues associated with travel by specific modes of transport leading to individuals making fewer journeys all together (Posner, 2017; Mackett, 2017). While mental health is widely recognised to impact day to day functioning the ways in which it interferes are vast and vary between individuals and across mental health conditions.

As a result of this heterogeneity the extent to which mental health impacts an individual's ability to navigate and interact fully with the built environment is not fully understood, making it impossible to develop guidance and recommendations to achieve inclusive mobility.

To date the *Inclusive Mobility* and *Guidance on the Use of Tactile Paving Surfaces* documents have primarily focused on physical mobility and visual impairment. While the introduction of the guidance has ushered in far-reaching changes to the built environment the type of changes which might be needed relating to mental health conditions are unknown. Determining this is the focus of this research. Due to the vast number of mental health conditions and variations in their specific requirements, it was necessary to understand the prevalence of each of the categories in order to support in the prioritisation of any recommendations. This stage of the research, Research Question 3, will focus on mental health conditions only, as 'other disabilities' are covered by Research Question 6.

¹ Non-visible disabilities are defined as disabilities that are not immediately apparent, these can include mental health conditions, visual impairments as well as physical disabilities such as chronic pain.

To achieve this the research:

- Categorised the types of mental health conditions experienced in England and Scotland
- Determined the prevalence rate² of each of these mental health conditions in England and Scotland
- Identified the barriers and needs of each mental health condition in navigating the built environment and determine which can be addressed through infrastructure changes³

² We anticipate this to be an estimate of the current prevalence rates of each mental health condition due to the limitations in reporting and identifying those currently experiencing poor mental health conditions. These include well-evidenced socio-demographic biases in reporting and seeking support for poor mental health, as well as social desirability biases that impact people's responses when talking about such topics.

³ It should be cautioned that the outcome of this research may conclude that there is currently insufficient information available to develop comprehensive guidance on how to mitigate the mobility impacts for some categories. For these cases we will suggest what further research is required.

2 Categorisation of mental health conditions

The aim of this task was to identify the current mental health conditions experienced in England and Scotland. To do so a review of the literature was carried out. As the review aimed to identify a breakdown of the different types of mental health conditions the focus was on national reports and reviews (e.g. NHS reports).

Following an initial search, it was identified that there were various limitations in the current reporting of mental health conditions, predominantly that reports did not distinguish between different types of mental health conditions. As a result of this the scope of the review was extended to include reports from national charities.

While a diagnosis of poor mental health can be established through several different scales *The Diagnostic and Statistics Manual* (DSM) is one of the most commonly used handbooks with mental health professionals worldwide. The DSM-V (American Psychiatric Association, 2013), the most updated version, consists of three major components:

- The diagnostic classification which includes the official list of recognised mental health disorders, each of which includes a diagnostic code
- The diagnostic criteria sets that indicate which symptoms that must be present and how long for, as well as list of other symptoms, disorders and conditions that must first be ruled out
- Descriptive text that accompanies each of the disorders including information about prevalence rates, development and courses, risk, subtypes

While several different diagnostic tools are used in the UK, the DSM is one of the main sources reporting all currently recognised mental health conditions. For this reason, all mental health conditions reported in the identified literature were cross-checked with the DSM. This ensured that only recognised mental health conditions were included in the list and not symptoms of mental health conditions as were occasionally reported (e.g. panic attacks are often reported although they are a symptom of mental health conditions, such as panic disorder or anxiety, and not a mental health condition in their own right). These findings were supplemented with engagement with the project's steering and stakeholder group.

The list of mental health conditions can be found in Table 1. The list includes a comprehensive list of the mental health conditions currently experienced in Britain. It is important to note that this list does not include more neurological mental health conditions, such as dementia as these are not in the scope of this research question and are covered in RQ6. Similarly, mental health conditions that did not have a direct impact on transport (e.g. gaming disorder; kleptomania), or which are characterised as childhood mental health conditions (e.g. separation anxiety disorder) or that could not be, obviously, addressed by changes to transport systems themselves (e.g. sleep disorders) were excluded. While we believe this list to be exhaustive, it could be that some additional mental health conditions are experienced in Britain but are currently not reported in the identified literature, do not fall in the criteria for this project, as mentioned previously, or have not yet been defined.

Table 1: Initial list of mental health conditions

Category (where possible)	Mental health condition	Source where mental health condition was referenced	Notes
Anxiety	Generalised anxiety disorder	Anxiety UK, McManus et al. (2016), Mind	
	Anxiety	McLean, Christie, Hinchliffe and Gray (2018), Mind, Scottish Association for Mental Health (SAMH), <i>Time to change</i>	
	Social anxiety disorder	Mind	
	Panic disorders	Anxiety UK, McManus et al. (2016), Mind	
	Phobias	Anxiety UK, McManus et al. (2016), Mind, SAMH	Includes Agoraphobia and Claustrophobia which are particularly relevant to navigating the built environment
	Post-traumatic stress disorder	Anxiety UK, McManus et al. (2016), Mind, <i>Time to change</i>	
	Obsessive Compulsive disorders	Anxiety UK, McManus et al. (2016), Mind, SAMH, <i>Time to change</i>	
	Health anxiety	Mind, Anxiety UK	
	Body dysmorphic disorder	Anxiety UK, Mind	
	Seasonal Affective disorder	Anxiety UK, Mind	
	Perinatal anxiety or perinatal OCD	Anxiety UK, Mind	
Psychotic disorder	Psychotic disorder	McManus et al. (2016)	In the APMS regroups schizophrenia and affective psychosis
	Psychosis	<i>Time to change</i>	<i>Time to change</i> website, national UK charity, separates psychosis and schizophrenia
	Schizophrenia	Mind, SAMH, Scottish Government (2018), <i>Time to change</i>	<i>Time to change</i> website, national UK charity, separates psychosis and schizophrenia
	Schizoaffective disorder	Mind	

Category (where possible)	Mental health condition	Source where mental health condition was referenced	Notes
	Delusional disorder	Scottish Government (2018)	Characterised as 'delusional disorders' includes schizotypal and psychotic disorders
	Hypomania and mania	Mind, Scottish Government (2018)	Scottish inpatient census (Scottish Government, 2018) refers to these as 'manic episode'
	ADHD	McManus et al. (2016)	
Learning difficulties	Learning disability	Scottish Government (2018)	No breakdown of what is included in this category
Developmental disorder	Autism	McManus et al. (2016), Scottish Government (2018)	
Bipolar	Bipolar	McManus et al. (2016), Mind, SAMH, Scottish Government (2018), <i>Time to change</i>	
	Bipolar I	McManus et al. (2016)	
	Bipolar II	McManus et al. (2016)	
	Cyclothymia	McManus et al. (2016)	
	Dissociation and dissociative disorders	Anxiety UK, Mind	
Substance dependence	Drug dependence	McManus et al. (2016), Scottish Government (2018)	
	Alcohol dependence	McManus et al. (2016), Scottish Government (2018)	
	Self-harm	McLean et al. (2018), McManus et al. (2016), <i>Time to change</i>	
Depression	Depression	McLean et al. (2018), McManus et al. (2016), Mind, SAMH, Scottish Government (2018), <i>Time to change</i>	
	Seasonal affective disorder	Mind	
	Dysthymia	Mind	
	Prenatal depression	Mind	

Category (where possible)	Mental health condition	Source where mental health condition was referenced	Notes
	Post-natal depression	Mind	
Personality disorder	Borderline personality disorder	McManus et al. (2016), Mind	Adult psychiatric morbidity survey (McManus et al., 2016) only includes 2 personality disorders because of the prevalence in the UK
	Antisocial personality disorder	McManus et al. (2016)	Adult psychiatric morbidity survey (McManus et al., 2016) only includes 2 personality disorders because of the prevalence in the UK
	Personality disorder	Mind, SAMH, Scottish Government (2018), <i>Time to change</i>	<i>Time to change</i> and SAMH do not distinguish between different types of personality disorders. Mind regroups several personality disorders including: paranoid personality disorder; schizoid personality disorder; schizotypal personality disorder; antisocial personality disorder; borderline personality disorder; histrionic personality disorder; narcissistic personality disorder; avoidant/anxious personality disorder; dependent personality disorder; obsessive compulsive personality disorder. These 10 personality disorders match the ones recognised by the DSM-V.
	Common-mental health disorders not otherwise specified	McManus et al. (2016)	
	Stress	Anxiety UK, McLean et al. (2018)	
	Eating disorders	Mind, SAMH, Scottish Government (2018), <i>Time to change</i>	Mind includes: anorexia nervosa, bulimia nervosa, binge eating disorder, other non-specified feeding or eating disorders. These are likely to fall out of the scope for this project since they are unlikely to be addressed by changes to transport systems themselves.
	Neurotic, stress-related, somatoform	Scottish Government (2018)	No breakdown of what is included in this category - somatoform includes mental health conditions/disabilities

Category (where possible)	Mental health condition	Source where mental health condition was referenced	Notes
			that manifest through physical symptoms

The mental health conditions presented in Table 1 represent the list that will be included in the next stage of the project which will aim to quantify the prevalence rates of each of the categories listed.

3 Prevalence rates of mental health conditions

Following the development of the list of mental health conditions currently experienced in England and Scotland (Table 1), this next task will aim to provide an understanding, where possible, of the prevalence rates for each of these mental health conditions. Due to the wide range of mental health conditions identified in Task 1 it is necessary to understand the scale of each of the mental health categories identified for us to:

- Identify which mental health conditions are identified as most prevalent in both England and Scotland
- Identify which mental health conditions do not currently have reliable statistics allowing us to determine their prevalence in Britain OR where mental health conditions have been grouped together due to similarities in the ways they impact day to day life or the symptoms they present
- Identify gaps in reporting where no statistics could be identified for specific mental health conditions

To do so a review of the most up to date NHS data was conducted for England and Scotland, this included NHS digital reports such as inpatient records for England (NHS England, 2019) and the Scottish inpatient census (Scottish Government, 2018). According to the most recent Scottish inpatient census 3,433 adults occupied a psychiatric, addiction or learning disability facility (Scottish Government, 2018). In England, according to the latest NHS data, this number was 16,378 for mental illnesses alone (NHS England, 2019). However, our review highlighted several limitations. Firstly, reports for both England and Scotland often only reported the bed occupancy, only providing an indication of those who have sought a diagnosis (voluntarily or not) and met the threshold for inpatient admittance therefore not providing an indication of those simply receiving talking-therapies or using out-patient services. While these figures could be identified for both England, where the latest NHS data indicate that in 2017/2018 1.44 million (Community and Mental Health Team, NHS Digital, 2018) adults were referred for talking therapies and Scotland, where in the last quarter of 2018 16,742 started receiving psychological therapies⁴ (Scottish Government, 2019) these figures still have a number of limitations. Firstly, these figures only refer to those who are currently receiving or have sought mental health support failing to provide a generalizable understanding of current prevalence rates. In addition, while the Scottish inpatient census distinguishes between different mental health conditions, no other reports do, making it impossible to determine the prevalence for each of the mental health conditions identified in Task 1.

The APMS aims to provide an assessment of the current trends in mental health and treatment access in England. However, unlike other NHS reports, the APMS does not rely on in-patient data but instead uses a representative sample of the household population (7,500

⁴ While England and Scotland used different terms to refer to therapies, talking therapies and psychological therapies respectively, these terms refer to the same type of treatment and are often used interchangeably. The terms included in this document as the ones used in the documents referenced.

people) including those who do not access mental services. It also distinguishes between different types of mental health conditions. While the APMS is used as a representative indication of the current state of mental health and wellbeing in England, just like other surveys it is subject to limitations as the authors themselves report⁵. In addition, the APMS is carried out every seven years, which the latest survey results published in 2016, it is therefore possible that the current prevalence rate of mental health conditions may have changed since its publication. However, more recent governmental and charity reports still refer to these statistics in their publications indicating that these are the most up to date figures regarding the prevalence rates of mental health conditions in England. As the APMS only provides data for England, this was supplemented by the Scottish Health Survey (McLean et al., 2018) which collects data on some mental health conditions. While most reports referred specifically to prevalence rates in either England or Scotland, some referred to prevalence rates for the UK. In those instances, this has been specified.

These reports were supplemented with national charity report, where more recent and reliable data was available (e.g. Mental Health Foundation, 2016), as well as reports, or findings from national bodies such as the Royal College of Psychiatrists or other governmental reports. While most reports referred specifically to prevalence rates in either England or Scotland, some referred to prevalence rates for the UK. In those instances, this has been specified. The figures presented in Table 2 and Table 3 are the best estimate of the current mental health conditions experienced in England and Scotland.

⁵ The authors reported that a number of the surveys were not returned, and provided a number of possible explanation for these non-responses including participants declining to take part, or experiencing mental health conditions that could have impacted their cognitive capabilities or motivations to respond to the survey. Other limitation included socio-desirability bias in responses.

Table 2: Prevalence rate estimates of mental health conditions in England

Category (where possible)	Mental health condition	Prevalence rate	Source	Notes
Anxiety	Generalised anxiety disorder	5.9%	McManus et al. (2016)	
	Anxiety	18.2%	Mental Health Foundation (2016)	Data is from 2010 and regroups all recognised forms of anxiety, including some of the more specific types of anxiety mentioned in this table that may not have official prevalence rates. The prevalence rates refer to the UK.
	Social anxiety disorder			No large-scale epidemiological surveys on social anxiety, but up to 7% in 2005 (Kessler, Chiu, Demler, Merikangas & Walters, 2005)
	Panic disorders	.6%	McManus et al. (2016)	
	Phobias	2.4%	McManus et al. (2016)	Includes Agoraphobia and Claustrophobia which are particularly relevant to navigating the built environment
	Post-traumatic stress disorder	4.4%	McManus et al. (2016)	
	Obsessive Compulsive disorders	1.3%	McManus et al. (2016)	
	Health anxiety			No official prevalence rates identified

	Body dysmorphic disorder	.5%	Royal College of Psychiatrists (2015a)	Very limited data, current statistics available are from 2009. The prevalence rates refer to the UK.
	Seasonal Affective disorder	3%	Royal College of Psychiatrists (2015c)	The prevalence rates refer to the UK.
	Perinatal anxiety or perinatal OCD			No official prevalence rates for this specific type of anxiety identified.
Psychotic disorder	Psychotic disorder	.7%	McManus et al. (2016)	In the APMS regroups schizophrenia and affective psychosis
	Psychosis			No distinction between different types of Psychotic disorders in the APMS, and no other reliable statistics could be identified
	Schizophrenia	1%	Royal College of Psychiatrists (2015b)	No distinction between different types of Psychotic disorders in the APMS. Royal College of Psychiatrists suggest 1 in 100 will experience schizophrenia over the course of their life (other statistics report prevalence rates in any given year). The prevalence rates refer to the UK.
	Schizoaffective disorder			Difficult to estimate due to similarities with other mental health conditions, particularly schizophrenia, psychosis and bipolar. No statistics on the prevalence rates in Britain could be identified.
	Delusional disorder			No official prevalence rates identified
	Hypomania and mania			No official prevalence rates identified, these are often seen as symptoms of other mental health conditions such as bipolar.
	ADHD	9.7%	McManus et al. (2016)	

Learning difficulties	Learning disability	1.4 million	Mencap (2017)	1.4 million people in the UK with a learning disability. Learning disabilities more generally are included in RQ6 of this research and therefore no breakdown is given here. The prevalence rates refer to the UK.
Developmental disorder	Autism	.5-1.3%	McManus et al. (2016)	
Bipolar	Bipolar	2%	McManus et al. (2016)	
	Bipolar I			No distinction between different types of Bipolar in statistics
	Bipolar II			No distinction between different types of Bipolar in statistics
	Cyclothymia			No distinction between different types of Bipolar in statistics
	Dissociation and dissociative disorders			No official prevalence rates identified
Substance dependence	Drug dependence	3.1% of adults showed signs of dependence on drugs, with 2.3% showing signs of dependence on cannabis only and 0.8% with signs of dependence on other drugs	McManus et al. (2016)	
	Alcohol dependence	16.6% of adults were hazardous	McManus et al. (2016)	Men were more likely than women

		drinkers, 1.9% were harmful/mildly dependent and 1.2% dependent drinkers		
	Self-harm	6.4%	McManus et al. (2016)	Significant differences with age: 25.7% of young women aged 16-24 reported having self-harmed at some point (Twice the rate for men in that age group)
Depression	Depression	3.3%	McManus et al. (2016)	
	Seasonal affective disorder	3%	Royal College of Psychiatrists (2015c)	The prevalence rates refer to the UK.
	Dysthymia			No official prevalence rates identified
	Prenatal depression	10%	Royal College of Psychiatrists (2018a)	The prevalence rates refer to the UK.
	Post-natal depression	10%	Royal College of Psychiatrists (2018c)	The prevalence rates refer to the UK.
Personality disorder	Borderline personality disorder	2.4%	McManus et al. (2016)	
	Antisocial personality disorder	3.3%	McManus et al. (2016)	
	Personality disorder	13.7%	McManus et al. (2016)	
	Common-mental health disorders not	7.8%	McManus et al. (2016)	

	otherwise specified			
	Stress	74%	Mental Health Foundation (2018)	Research carried out by the Mental Health Foundation identified that 74% of people have felt stressed to the extent that they have been overwhelmed or unable to cope. The prevalence rates refer to the UK.
	Eating disorders	2%	National Institute for Health and Care Excellence (NICE; 2017)	2% is an average of the four main recognised eating disorders (Anorexia-nervosa, Bulimia-nervosa, Binge Eating disorder, Other specified feeding and eating disorders). The prevalence rates refer to the UK.
	Neurotic, stress-related, somatoform			No official prevalence rates identified

Table 3: Prevalence rate estimates of mental health conditions in Scotland

Category (where possible)	Mental health condition	Prevalence rate	Source	Notes
Anxiety	Generalised anxiety disorder			No reported statistics identified. Reports in Scotland do not distinguish between different types of anxiety.
	Anxiety	11%	McLean et al. (2018)	Reports in Scotland do not distinguish between different types of anxiety which explains the higher prevalence rates for anxiety. These figures refer to those displaying two or more symptoms of anxiety. When considering those displaying any symptoms of anxiety the prevalence rates increase to 25%.
	Social anxiety disorder			No reported statistics identified. Reports in Scotland do not distinguish between different types of anxiety.
	Panic disorders	0.7%	Scottish Parliament Information Centre (SPICe; 2014)	The prevalence rates refer to the UK.
	Phobias	2%	SPICe (2014)	The prevalence rates refer to the UK.
	Post-traumatic stress disorder			
	Obsessive Compulsive disorders	1.2%	SPICe (2014)	The prevalence rates refer to the UK.
	Health anxiety			No reported statistics identified. Reports in Scotland do not distinguish between different types of anxiety.

	Body dysmorphic disorder	.5%	Royal College of Psychiatrists (2015a)	Very limited data, current statistics available are from 2009. The prevalence rates refer to the UK.
	Seasonal Affective disorder	7%	SPICe (2014)	The prevalence rates refer to the UK.
	Perinatal anxiety or perinatal OCD			No reliable statistics identified. Report by the Mental Health Foundation (2016) suggest that up to 40% of women are affected by perinatal problems but there is no specialist perinatal mental health provision in Scotland.
Psychotic disorder	Psychotic disorder			No official prevalence rates identified
	Psychosis			No official prevalence rates identified
	Schizophrenia	1%	Royal College of Psychiatrists (2015b)	Royal College of Psychiatrists suggest 1 in 100 will experience schizophrenia over the course of their life (other statistics report prevalence rates in any given year). The prevalence rates refer to the UK. Only prevalence specific to Scotland identified were statistics reported as part of the Scottish inpatient census (Scottish Government, 2018) which reports the number of individuals who have met the threshold for inpatient admittance (927 people) and we do not expect these numbers to be representative of the prevalence rate in Scotland.
	Schizoaffective disorder			Difficult to estimate due to similarities with other mental health conditions, particularly schizophrenia, psychosis and bipolar. No statistics on the prevalence rates in Britain could be identified.
	Delusional disorder			Only prevalence specific to Scotland identified were statistics reported as part of the Scottish inpatient census (Scottish Government, 2018) which reports

				the number of individuals who have met the threshold for inpatient admittance (337 people) and we do not expect these numbers to be representative of the prevalence rate in Scotland.
	Hypomania and mania			No official prevalence rates identified, these are often seen as symptoms of other mental health conditions such as bipolar.
	ADHD	2.5-4%	Royal College of Psychiatrists (2017)	Very limited data, current statistics available for ADHD in adults are from 2005. The prevalence rates refer to the UK.
Learning difficulties	Learning disability	1.4 million	Mencap (2017)	1.4 million people in the UK with a learning disability. Learning disabilities more generally are included in RQ6 of this research and therefore no breakdown is given here. The prevalence rates refer to the UK.
Developmental disorder	Autism	1.1%	National Autistic Society, 2011	Only prevalence specific to Scotland identified were statistics reported as part of the Scottish inpatient census (Scottish Government, 2018) which reports the number of individuals who have met the threshold for inpatient admittance (132 people) and we do not expect these numbers to be representative of the prevalence rate in Scotland.
Bipolar	Bipolar	1-2%	SPICe (2014)	The prevalence rates refer to the UK. Only prevalence specific to Scotland identified were statistics reported as part of the Scottish inpatient census (Scottish Government, 2018) which reports the number of individuals who have met the threshold for inpatient admittance (205 people) and we do not expect these numbers to be representative of the prevalence rate in Scotland.
	Bipolar I			No distinction between different types of Bipolar in statistics

	Bipolar II			No distinction between different types of Bipolar in statistics
	Cyclothymia			No distinction between different types of Bipolar in statistics
	Dissociation and dissociative disorders			No official prevalence rates identified
Substance dependence	Drug dependence	1.62% had problem use in Scotland in 2015/2016	NHS National Services Scotland (2019)	
	Alcohol dependence	16% drank at hazardous levels based on the AUDIT scale	McLean et al. (2018)	
	Self-harm	6%	McLean et al. (2018)	
Depression	Depression	11%		These figures refer to those displaying two or more symptoms of anxiety. When considering those displaying any symptoms of anxiety the prevalence rates increase to 20%.
	Seasonal affective disorder	3%	Royal College of Psychiatrists (2015c)	The prevalence rates refer to the UK.
	Dysthymia			No official prevalence rates identified
	Prenatal depression	10%	Royal College of Psychiatrists (2018a)	The prevalence rates refer to the UK.
	Post-natal depression	10%	Royal College of Psychiatrists (2018c)	The prevalence rates refer to the UK.
Personality disorder	Borderline personality disorder			No distinction between different types of Personality Disorders in statistics
	Antisocial personality disorder			No distinction between different types of Personality Disorders in statistics

	Personality disorder	6-10%	Royal College of Psychiatrists (2018b)	Additional prevalence identified were statistics reported as part of the Scottish inpatient census (Scottish Government, 2018) which reports the number of individuals who have met the threshold for inpatient admittance (338 people) and we do not expect these numbers to be representative of the prevalence rate in Scotland.
	Common-mental health disorders not otherwise specified			No official prevalence rates identified
	Stress	74%	Mental Health Foundation (2018)	Research carried out by the Mental Health Foundation identified that 74% of people have felt stressed to the extent that they have been overwhelmed or unable to cope. The prevalence rates refer to the UK.
	Eating disorders	2%	NICE (2017)	2% is an average of the four main recognised eating disorders (Anorexia-nervosa, Bulimia-nervosa, Binge Eating disorder, Other specified feeding and eating disorders). The prevalence rates refer to the UK.
	Neurotic, stress-related, somatoform			Only prevalence identified were statistics reported as part of the Scottish inpatient census (Scottish Government, 2018) which reports the number of individuals who have met the threshold for inpatient admittance (161 people) and we do not expect these numbers to be representative of the prevalence rate in Scotland.

Table 3 provides an estimate of the current prevalence rates of each mental health condition identified and included in Table 1. While these tables provide insight into the current state of some mental health conditions in Britain, they also demonstrate several limitations primarily that to this date the prevalence of numerous mental health conditions are still unknown. The absence of reliable statistics for these mental health conditions that are known to be experienced by the general public is a barrier to understanding the ways in which mental health and the built environment interact, and consequently in designing a built environment that is truly inclusive and ensures safe mobility for all. Where reliable statistics were identifiable, these had grouped several more specific mental health conditions that are known to have the same underlying symptoms, such as anxiety disorders and Bipolar. However, while the underlying symptoms may be the same it is unclear whether the barriers that they present to navigating the built environment are also similar.

The next stage of the research aimed to engage members of the public to understand more clearly the experiences of those living with mental health conditions. Based on the findings from Tasks 1 and 2 two possible approaches to Task 3 were considered:

- Option 1: Include all mental health conditions in Table 1 and engage with individuals and charities across Britain who have experiences of those mental health conditions even though it may not be possible to identify or engage with individuals from each category. This was an exploratory stage and aimed to identify all barriers that mental health can pose to navigating the built environment, as a result of which the project should engage with those who are experiencing any mental health condition regardless of prevalence rates.
- Option 2: Include only those mental health conditions identified in Table 1 AND for which a prevalence rate was identified in Table 2 or Table 3 (including grouping of mental health conditions where relevant). Although the research is exploratory, unknown prevalence rates of specific mental health conditions means that it would not be possible to determine whether the sample of respondents and their experiences are representative of the population.

Overall, it was decided that option 1 provided a more evidence grounded, and inclusive, approach to Task 3. This research aimed to identify the barriers experienced by those with mental health conditions in order to update the current guidance on inclusive mobility. Therefore, to be truly inclusive, this research engaged with those experiencing all forms of mental health conditions. As raised previously, there are various limitations in the current statistics including several recognised mental health conditions where reliable prevalence rates could not be identified. However, these limitations should not be a justification for excluding any mental health condition from this review – only by looking to engage with those experiencing all mental health conditions will we be able to provide a truly inclusive guidance. While this was the preferred approach, it did not allow the researchers to determine whether the obtained sample was representative of each mental health condition and therefore their experiences. This was considered when analysing the data and making recommendations.

4 Barriers to accessing the built environment

4.1 Introduction and background

Following the completion of Task 2 and identifying the prevalence rate of mental health conditions across both England and Scotland, this next task aimed to provide a more in depth understanding of the barriers experienced by members of the general public when travelling and navigating the built environment. This task aimed specifically to:

- Engage with members of the general public who have experience of living with a mental health condition to understand their experiences and barriers faced when travelling and navigating the built environment
 - Explore whether this varies across different types of mental health condition
 - Explore these barriers across a range of different modes of transport
- Understand the impact that travelling and navigating the built environment can have on an individual's mental health
 - Explore whether this varies across different types of mental health condition
 - Explore whether this varies across a range of different modes of transport
- Identify potential solutions to address these barriers

To do so a survey was designed aimed at engaging in depth with members of the general public who were currently experiencing or had experienced a mental health condition.

It should be cautioned that the outcome of this research may conclude that there is currently insufficient information available to develop comprehensive guidance on how to mitigate the mobility impacts for some categories. For these cases we will suggest what further research is required.

4.2 Method

The survey consisted of five key sections:

- Section 1: Mental health conditions experienced
- Section 2: The impact that mental health has on travelling as a pedestrian, cycling, by bus, by train and in general
- Section 3: The impact of transport systems on mental health when travelling as a pedestrian, cyclist, by bus, by train and in general
- Section 4: Solutions to addresses the barriers experienced when travelling as a pedestrian, cyclist, by bus, by train and in general
- Section 5: Demographics, including travel behaviour

Sections 2 to 5 included a series of qualitative questions providing participants with an opportunity to explore in depth their personal experiences.

Due to the sensitive nature of the topics discussed the survey was reviewed extensively by both the projects' steering group and a wide range of stakeholders group⁶. In addition, the project was reviewed by TRL's full ethics panel⁷. The panel reviewed all the materials developed and granted ethical approval to conduct this research.

The survey was hosted on SmartSurvey. The survey links were posted on social media using TRL's LinkedIn, Facebook, and Twitter accounts. The TRL participant database⁸ was also used as a recruitment tool. Stakeholder organisations that were engaged with at the design stage were also contacted to support with recruitment. The questionnaire text is provided in Appendix A.

4.3 Findings

4.3.1 Quantitative data

In total 81 people responded to our survey, 70.5% identified as female and 21.3% were male (6.6% chose not to provide a gender, and one participant identified as non-binary). A wide range of ages were represented in the sample as shown in Figure 1 with the majority being in the middle age groups (40-59).

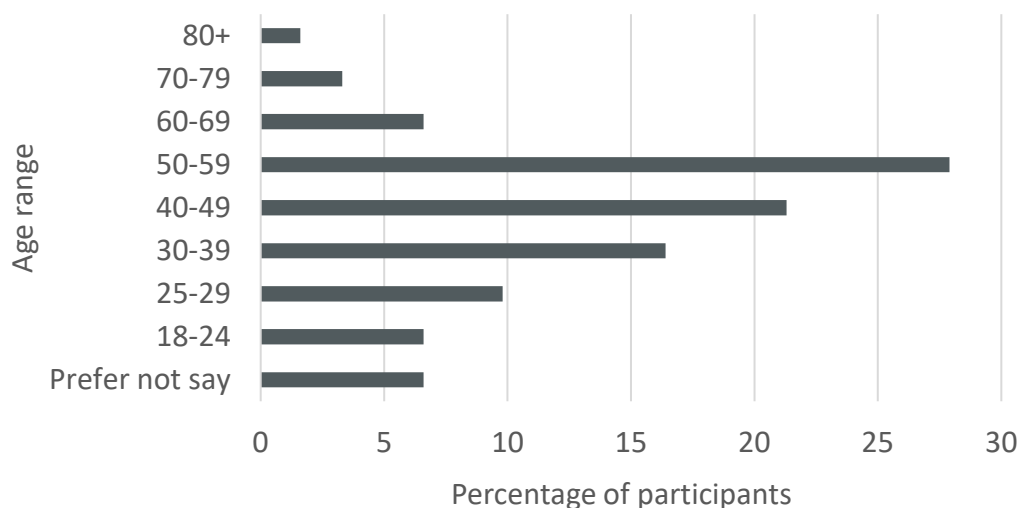


Figure 1: Sample age

⁶ The stakeholder group included members of the Department for Transport, Transport for London, Transport Scotland, members of the Disabled Persons Transport Advisory Committee, UK charities, including Anxiety UK, Academics with experience of working with adults with mental health conditions or vulnerable adults in relation to transport).

⁷ TRL's full ethics panel consists of TRL's Academy Director, TRL's chief scientist, two senior technical staff who are experts in ethical procedures, the project's technical reviewer, as well as an external panel member who has considerable experience in the field.

⁸ This is a database consisting of a list of people who have agreed to be contacted for any surveys conducted by TRL.

Most of the participants were either in full time (36.1%) or part-time (21.3%) employment, 13.1% were retired and 11.5% were unable to work due to health condition (for a full breakdown see Appendix B). Overall 86.9% lived in England (two participants resided in Scotland, one in Wales and a further 5 chose not to disclose where they lived). Participants were asked to report the frequency with which they used a range of mode of transport (the full table can be seen in Appendix B). Participants main mode of transport was driving and walking (36.1% reported using each of these modes of transport daily). Participants had experienced a wide range of mental health conditions, as can be seen in Figure 2 and Table 4. The most frequently reported mental health conditions were anxiety, depression and stress. As expected, we were unable to engage with a representative number of each mental health condition, especially the sub-categories identified during the review stage, but all the mental health conditions identified in stages 1 and 2 were represented in some capacity. It is important to note therefore that the findings may not be representative of the general population but provided an indication of the barriers experienced.

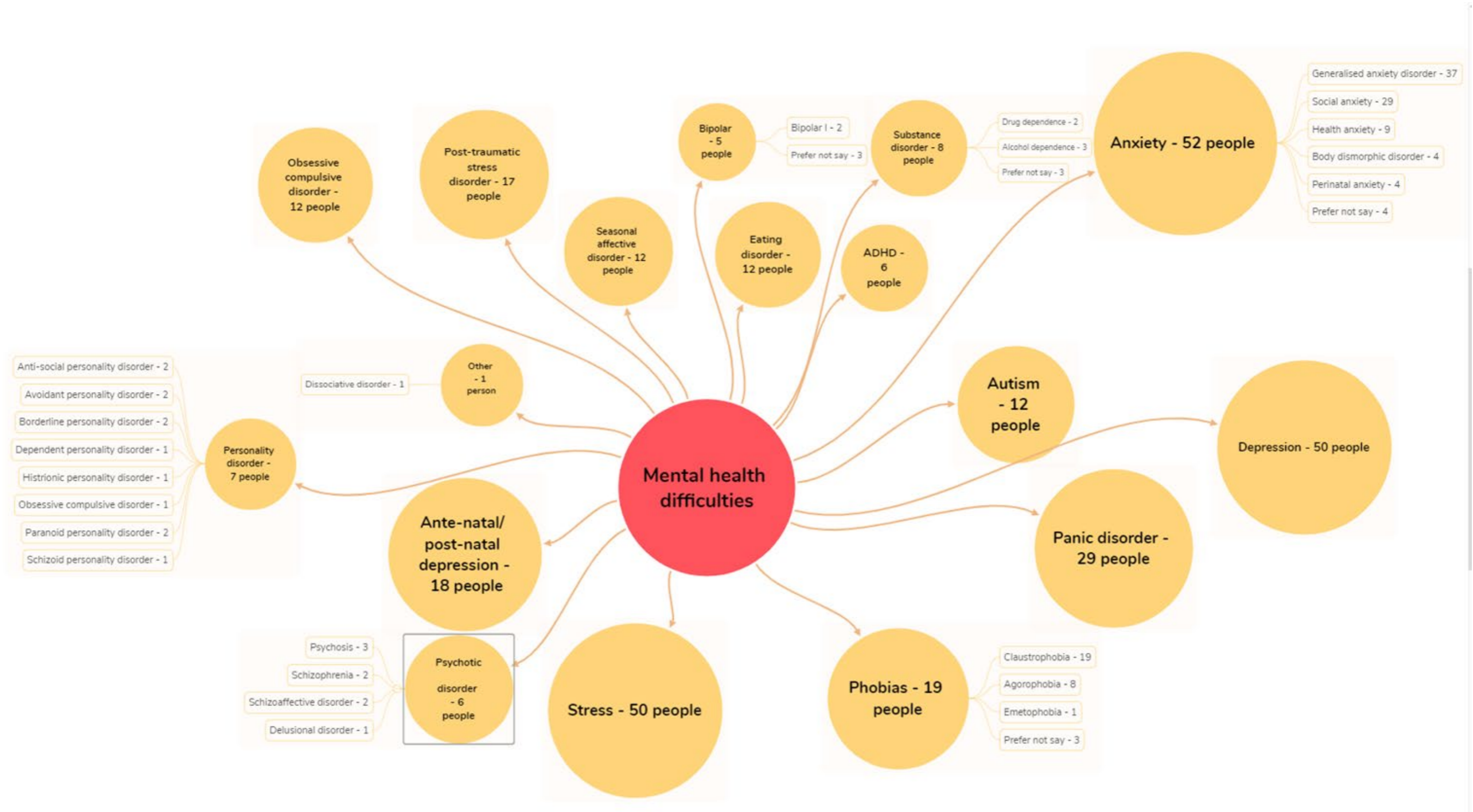


Figure 2: Mental health conditions experienced by the sample

Table 4: Mental health conditions experienced by the sample

Mental health condition difficulty	Number of respondents affected	Sub category (number of respondents affected in parenthesis)
Anxiety	52	Generalised anxiety disorder (37) Social anxiety (29) Health anxiety (9) Body dysmorphic disorder (4) Perinatal anxiety (4) Prefer not to say (4)
Depression	50	
Stress	50	
Panic disorder	29	
Phobias	19	Claustrophobia (19) Agoraphobia (8) Emetophobia (1) Prefer not to say (3)
Ante-natal/post-natal depression	18	
Post-traumatic stress disorder	17	
Autism	12	
Seasonal affective disorder	12	
Obsessive compulsive disorder	12	
Eating disorder	12	
Substance disorder	8	Alcohol dependence (3) Drug dependence (2) Prefer not to say (3)
Personality disorder	7	Anti-social personality disorder (2) Avoidant personality disorder (2) Borderline personality disorder (2) Paranoid personality disorder (2) Dependent personality disorder (1) Histrionic personality disorder (1) Obsessive compulsive personality disorder (1) Paranoid personality disorder (1) Schizoid personality disorder (1)
ADHD	6	Psychotic disorder (6)
Psychotic disorder	6	Schizophrenia (2) Schizoaffective disorder (2) Delusional disorder (1)
Bipolar	5	Bipolar I (2) Prefer not to say (3)
Other	1	Dissociative disorder (1)

When looking at travel behaviour across the different mental health conditions there were differences in the modes of transport used, and the frequency of use (See Table 21 and Table 22 in Appendix B). This shows that there were slight differences across the different mental health conditions regarding the modes of transport used, as well as the frequency of use. However, across all groups car use and walking were the most common modes of transport. Table 5 shows how frequently mental health affected a person's ability to travel by a specific mode of transport. It is important to note that those who selected 'never' could be due to the fact they never travelled by that mode of transport and therefore their mental health could not affect their behaviour. When looking at the whole data, it is evident that mental health had the greatest impact on travelling by bus, followed by the train. These findings are in line with those of previous research carried out on in this area (Posner, 2017; Posner, Durrell, Chowdhury & Sharp, 2018; Mackett, 2019).

Table 5: Impact of mental health conditions on ability to travel

Mental health condition	Pedestrian					Cyclist					Bus					Train							
	All the time	Frequently	Sometimes	Only rarely	Never	All the time	Frequently	Sometimes	Only rarely	Never	Not applicable	All the time	Frequently	Sometimes	Only rarely	Never	Not applicable	All the time	Frequently	Sometimes	Only rarely	Never	Not applicable
Anxiety	2	7	6	7	5	3	0	4	3	1	0	7	5	4	6	5	2	5	3	8	7	4	0
Panic disorder	1	2	2	3	2	1	0	1	1	2	5	3	2	2	0	2	1	3	2	0	3	2	0
Phobias	2	0	3	3	2	2	0	1	1	3	3	4	0	3	1	1	1	3	0	3	3	1	0
PTSD	3	1	3	0	1	3	0	1	0	1	3	2	1	4	1	0	0	1	2	3	3	1	0
OCD	0	0	4	2	0	2	0	0	1	2	1	2	1	1	1	1	0	1	1	1	2	1	0
SAD	1	0	0	1	1	0	0	0	0	3	0	2	0	0	0	0	1	2	0	0	0	1	0
Bipolar	2	0	0	0	0	1	0	0	0	1	0	2	0	0	0	0	0	1	0	1	0	0	0
ADHD	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
Depression	3	5	5	4	8	2	1	2	2	1	0	8	6	4	6	4	4	1	4	3	8	7	3
Personality disorder	2	0	0	1	0	1	0	0	1	1	0	2	1	0	0	0	0	1	1	1	0	0	0
Stress- Now	2	4	8	5	7	2	0	2	3	1	1	8	5	4	6	6	3	2	6	2	5	9	4
Eating disorder	2	0	2	0	2	1	1	0	0	4	0	2	2	1	0	0	1	2	1	2	0	0	0
Substance dependence	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0
Autism	0	1	2	0	2	1	0	1	0	2	1	3	0	0	0	2	0	1	0	2	0	2	0
Perinatal depression	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Psychotic disorder	2	0	0	1	0	1	0	0	1	1	0	2	1	0	0	0	0	1	1	1	0	0	0
Total	22	21	36	27	30	20	2	13	13	52	36	40	20	29	20	18	9	31	17	35	35	19	0

4.3.2 Qualitative data

The tables below provide a summary of the qualitative findings across each of the modes of transport explored. The tables in Appendix C provide a further breakdown of the below qualitative findings per mental health condition.

4.3.2.1 Effects of mental health on travel behaviours and navigating the built environment

Tables 6 to 9 provide details of the barriers that those living with mental health experience when travelling and navigating the built environment. Each table provides detail of the types of barriers experienced, the frequency with which these were reported as well as quotes to illustrate respondents' experiences.

Table 6: Effects of mental health on travel behaviours as a pedestrian

Main themes	Sub-themes	No. of participants	Example(s)	Participants quote(s)
Journey issues	Route planning difficulty	6	Planning a route to a destination; Fear of getting lost	"If I don't know where I am going and am totally new to the environment, I become panic stricken as I fear being late"
	Navigation difficulty	2	Following a map; Walking to a destination for the first time	"I need clear mapping/google imaging to reduce fears of being in the wrong place"
Avoidance	Avoids crowds	9	Volume of people; Travelling in rush hour; Anxiety being around others; Walking along pavement edges to avoid interaction	"Large crowds in close proximity can drastically increase my feelings of anxiety"
	Avoids noisy environments	1	Overwhelmed by noise level	"Difficult in crowded or noisy circumstances"
	Avoids travelling when dark / at night	3	Not visible; Fear of being followed	"I get anxious about walking alone, especially when it is dark or I don't know the area well"

Main themes	Sub-themes	No. of participants	Example(s)	Participants quote(s)
	Avoids travel	4	Not wanting to leave the house; Only essential journeys; Avoiding particular places	“Anxiety about going to places and when passing certain places, also when depressed not wanting to even go out”
	Avoids new places / environments	3	Fear of unknown / new environments	“I struggle to go out, and won't go for walks on my own, definitely not to places that I don't know or haven't been before”
Unsafe practises	Difficulty concentrating	9	High anxiety level occupying thoughts; Paranoia; Hypervigilant due to PTSD	“Intrusive thoughts pop into my head as a pedestrian” “I am constantly looking over my shoulder”
	Dangerous behaviours	1	Walking into traffic / busy roads	“I was suicidal and kept walking out into traffic - walking out onto zebra crossings, regardless of whether it was safe was a common occurrence”
Infrastructure design	Confined spaces	1	Walking through underground stations; Large crowds; Busy streets	“Occasionally I can become anxious in cities as a pedestrian due to enclosed spaces and large numbers of people”
Accessibility	Physical difficulty	3	Stumbling / wobbling whilst walking on the pavement	“Anxiety, Depression & Stress, combined with Migraines & Vertigo make even walking let alone anything else difficult”
	Distressing / discomfort	3	Anxiety about going to certain places; Struggle to walk	“I usually also walk faster than most people as I do not often feel relaxed whilst walking”

The most common behaviours reported related to avoidance of certain environment, specially avoiding crowded environments due to the anxiety experienced by being around others. Other types of environment included ones that were particularly noisy or dark through fear of being followed or overwhelmed. This led to some avoiding new environments or travelling as a pedestrian all together. Other regular

behaviours that were reported were ‘unsafe practices’ particularly relating to difficulties concentrating when travelling as a pedestrian, this included intrusive ‘what if’ thoughts for those experiencing anxiety and being hypervigilant for those experiencing PTSD.

Table 7: Effects of mental health on travel behaviours as a cyclist

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)
Personal effort	Lack motivation	1	Leaving the house; General effort associated	“Sometimes I do not have the motivation to cycle”
	Self-conscious	2	Lack of confidence on the road; Judged by other road users	“Concerned about what motorists, pedestrians and other cyclists are thinking. Am I abiding by the rules?”
Avoidance	Avoids open spaces	1		“Across empty spaces e.g. parks”
	Avoids travelling when dark / at night	2	Lack of visibility	“I would also never cycle in the dark as I would still have a fear of not being visible enough or not being able to see where I am going”
	Avoids leaving the house	2	Depression leading to difficulty leaving the house;	“Anxiety can stop me leaving the house at all sometimes, but cycling is generally better than walking or taking public transport because it requires minimal interaction with other people”
Safety	Fear of falling off	4	Doesn’t feel safe; Low confidence; Too many vehicles	“Don't feel safe, that something or someone will do something to me to knock me off it”
	Fear of crashing into others	1		“Anxiety combined with the effects of Vertigo make it almost impossible for me be in control of any vehicle for fear of crashing, hurting others in the process”

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)
	Previous personal injury / family tragedy	2	Fallen off before; Bumps and bruises	"I don't cycle because my cousin was knocked off his bike and killed. My fear of cycling on roads is overwhelming"
Accessibility	Physical difficulty	5	Anxiety shakes; Health conditions limit ability; Struggle to balance	"Very wobbly" "Don't have mental capability to learn how to balance a bike"
	Distressing / discomfort	1	Not on main road, but would cycle on marked trails	"I don't cycle, I don't feel comfortable on a bike and just think someone would knock me down even if I did go cycling"
No issue	Enjoys cycling	5	Wellness benefits; Doesn't require interaction with other people	"Cycling is my means to relax; helping with my physical and mental health"
Issue	Never cycles / hasn't cycled recently	10		"I have not tried to cycle for many years ... and would only cycle on protected cycleways"

Overall very few respondents cycled and therefore fewer barriers were reported. In line with this the most frequent barrier was accessibility, particularly physical difficulties that they might experience as a result of their mental health conditions.

Table 8: Effects of mental health on travelling by bus

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)
Journey issues	Route planning difficulty	3	Need to practise routes; Multiple consecutive stops; Unknown routes	"If I'd not had the time to practice going on the bus to somewhere totally new, I would most likely get lost"

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)
Avoidance	Avoids crowds / interaction with others	9	Sitting adjacent to someone; Asking questions if bus is delayed or diverted	"If I'm too anxious I can't take familiar buses because of having to interact with other people"
	Avoids noisy environments	1	Noise level during rush hour	"Difficult in crowded or noisy environments"
	Avoids dark / late at night	3	Late or delayed service; Worry of being attacked	"Bus often late and so left alone at night at the bus stop is sometimes worrying"
	Avoids travel/ leaving the house	1		"Not wanting to go anywhere"
	Avoids new places / environments	2	Certain areas; Approaching particular places	"I have minor seizures, and can go past my stop and be uncertain where I am if the bus has moved into unknown territory"
Associated activities	Concern over paying / ringing the bell	2	Having correct payment; Choice of seat; Not knowing the cost of a journey	"Anxiety about saying where I'm going, about having the exact money, about where I'm going to sit, getting off at the correct stop. Do I press the button, or hope someone else will?"
	Concern over getting off at the correct stop	5	Missing the correct stop	"I forget where I'm going and what it's called" "simply struggling to know what stop to get off at. There's basically far too many stressful variables for me to take unfamiliar bus routes alone"
	Concern over waiting alone at the stop	2	Remote or quiet stops	"Not actually being on the bus but waiting for the bus. I end up paying more for a taxi as I don't want to wait alone"
	General discomfort	2	Difficulty relaxing in public place	"My mental illness would prevent me being comfortable on a bus for a long period"

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)
	Previous negative experience	1		"If when I am required to use a bus, I feel very on edge, having witnessed violence during my journey"
Infrastructure design / environment	Concern over cleanliness	1	Germs spread through close proximity to others; Shared handrails / seats	"Anxiety about public and germs due to immunosuppression"
	Confined space	1	Sitting in close proximity	"[I dislike it] if I get pinned in a corner"
Accessibility	Physical difficulty	3	Boarding and disembarking; Taking time; Bus stops inaccessible	"[I worry about] walking to and from my seat, bumping into people and the other seats [along the way]"
No issue	Will ride the bus	7		"As I would be able to get off the bus at any point, it wouldn't worry me"

Once more the main behaviour reported was avoidance, particularly of crowded environments or situations where it is necessary to interact with others. The latter is particularly relevant to bus use, where engaging with another individual is often unavoidable (e.g. purchasing a ticket). Similarly, to pedestrians, many chose to avoid being in environments that were dark (e.g. poorly lit bus stops) or travelling at night. Other barriers related to very specific behaviours that could occur while travelling these included concerns over getting off at the right bus-stop and having the correct money for the fare.

Table 9: Effects of mental health on travelling by train

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)
Journey issues	Route planning difficulty	3	Boarding the wrong train; Finding the correct platform; Alighting at the correct stop; Navigating an unfamiliar station to change trains	"[I would need to] remember where the train stops and process the information, having the chance to write down all the relevant information according to my journey"
Avoidance	Avoids crowds / interaction with others	7	Overcrowded carriages; Asking someone to move to alight the train or use the bathroom; Need for a seat	"Crowded trains can also cause issues, I need to be able to sit down, otherwise I can begin to feel anxious and potentially have panic attacks"
	Avoids noisy environments	2		"Difficult in crowded or noisy environments"
	Avoids dark / late at night	2	Quiet carriages at night; Isolated stations	"Normally anxious about the waiting environment, especially if it is isolated or dark outside"
	Avoids travelling alone	5	Isolated waiting area; Being alone on the platform; Finding station exit	"I would only go on a train journey with someone else as I would prefer the sense of comfort being with someone else"
Associated activities	Concern over time - missing the train or stop	5	Stress of getting to the correct platform; Boarding the correct train; Being on time to the station	"I worry about missing the train or missing my stop and I worry about people sitting next to me and blocking me in my seat when I need to get off"
	Difficulty buying tickets	5		"I've never travelled alone on a train so rely on other people to help me with buying tickets, getting to the right platform etc"
	Concern over luggage	1	Leaving luggage away from seat; Stolen luggage	"I get anxious about storing my bags in luggage areas or above the seats in case

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)
				someone might steal them or I might not be able to lift them down”
	Lack of personal control	5	Unexpected train cancellations; Platform changes; Another passenger sat in their pre booked seat	“I don’t like the fact that I cannot get off the train at any point. I have to wait until it stops”
	Fear of waiting on the platform	1	Large height of platform	“Fear being on the platform, not on the train itself”
Infrastructure design / environment	Concern over cleanliness	1	Germs spread through close proximity to others; Shared handrails / seats	“Anxiety about public and germs due to immunosuppression”
	Confined space	2	Lack of personal space; Enclosed carriage	“Siting in physical proximity to other people with no leg space is massively stressful”
Accessibility	Physical difficulty	2	Difficulty boarding/ alighting; Getting restless on long journeys due to physical condition; Coordination required to stand whilst the train is moving	“Stations being accessible [is not always the case]”
Previous experience	Distraction	1	Overwhelming anxiety; Fear of feeling unwell	“Intrusive thoughts occasionally occur at train stations”
	Safety concern	1	Large cities; Busy crowded stations	“If I am passing through a big city, I worry that I might see the man who attacked me as I have seen him before in train stations in London and Birmingham”
No issue	Will ride the train	3		n/a

Once more the most common reported behaviour was avoidance, particularly of crowded environments or situations where it is necessary to interact with other people. Many reported that any engagement with other passengers was a barrier to use, including asking them to move in order to alight from the train or to access the toilet. In addition, respondents reported that they were unable to use this mode of transport due to overcrowded carriages. In addition, several more specific behaviours that could occur during travel were also reported many related to the absence of control experienced when travelling by train. These related to concerns over time particularly about missing the train (e.g. finding the correct platform in time, not having enough time to change trains...), unexpected events that occur during a journey (e.g. train cancellations), and difficulties in purchasing tickets.

Overall the findings highlight that the main impact of mental health on transport is avoidance, with some choosing not to use certain modes of transport altogether while others chose not to at specific times of day or avoiding certain environments (e.g. not travelling at nights, not using poorly light routes...). Other barriers were linked to the absence of control on certain modes of transport, particularly bus and train, and the lack of certainty that arose while using these modes of transport.

4.3.2.2 *Effects of the built environment on mental health*

Tables 10 to 16 show the impact, both positive and negative, that travelling by specific modes of transport can have on mental health. Each table provides detail of the type of barriers experienced, the reported impact on mental health, the frequency with which these were reported as well as quotes to illustrate respondents' experiences.

Table 10: Negative effects of travelling as a pedestrian on mental health

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)	Reported effect on mental health
Other people	Busy environments	8	Too many people; People rushing around	"When the environment is very busy, it can raise anxiety levels and make me feel uncomfortable"	Increased anxiety
	Overcrowded	6	Crowded streets; Lack of personal space	"... crowded streets/ public places all increase anxiety"	Increased anxiety
	Presence of other people	4	Fear of unexpected interaction with acquaintances	"There are some places I will avoid, for the fear of seeing certain people"	
	Unpredictable behaviour of other people	4	Fear of being followed/ watched/ attacked by others; Difficulty judging whether a driver will give way to pedestrians	"Don't know what traffic will do especially at big junctions" "I have to look over my shoulder after I have passed someone to ensure they're not following me"	Increased anxiety
	Unsafe behaviour of other people	4	Drivers failing to stop at pedestrian crossings; Pedal cyclists disobeying road traffic regulations; Other road users not paying attention	"Zebra crossing, if car deliberately doesn't stop" "Cyclists terrify me as they don't obey the rules"	Increased anxiety

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)	Reported effect on mental health
	Lack of travel companion	2		"I certainly won't go anywhere if... on my own"	
	Presence of vehicles	2	Too many vehicles in pedestrian environment	"Too much traffic"	
Infrastructure design/maintenance	Confined spaces	5	Subways; Tunnels; Lifts	"Enclosed walkways, subways... etc. make me vigilant"	Increased anxiety
	Inadequate lighting	4	Dark walkways; Poorly-lit streets	"Poorly lit streets at night make me more anxious"	Increased anxiety
	Artificial environments	3	Too much concrete; Lack of windows to see outside	"Too much concrete"	Increased anxiety
	Unsafe environments	2	Low handrails/ barriers on bridges	"Bridges with low railings"	
	Tall buildings	1		"The... sky scraper type buildings... do not make me feel safe when walking near them"	
	Obstructed walkways	1	Vegetation obstructing walkways	"Uncut vegetation which prevents visibility"	
	Lack of pavements	1		"Pavements that start out on one side of the road but that then require you to cross to the other side"	
	Lack of rest areas	1	Lack of seating	"[Lack of] seats to rest"	
	Uneven surfaces	1		"Uneven surfaces"	
	Lack of pedestrian crossings	1		"We need more traffic light crossings"	

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)	Reported effect on mental health
Atmosphere	Noise	7	Loud vehicles/ people/ music	"I had a panic attack... [I was] overwhelmed with the noise"	Increased anxiety
	Poor air quality	1	Air pollution	"[Poor] air quality"	
	Bright/ flashing lights	1		"Bright lights, strobe/ flashing lights"	
Route planning and navigation	Unfamiliar routes/ environments	4	Walking to/ in a new environment	"I tend to only walk near to home/ familiar areas"	Increased anxiety
	Navigation difficulties	1	Wayfinding difficulties; Getting easily lost	"If I feel I can't find my way I can start to panic"	Increased anxiety
	Route-planning difficulties	1	Barriers to practising a route	"If I'm unable to check things out beforehand I will find it very stressful"	Increased stress
Provision of information	Large volume of information	2	Too much information to process at once	"Too much information to process"	Increased anxiety
	Inadequate signage/ signals/ road markings	2	Poorly-positioned/ easily-obstructed signage/ signals; Lack of audible signals at pedestrian crossings; Lack of signals instructing drivers at pedestrian crossings; Lack of directional signage	"Pedestrian crossing lights where the green man is next to you instead of across the road, it means that if someone's stood in front of it, I can't see it" "Inadequate signage aimed at pedestrians, e.g. not signposting the pedestrian route to the train station"	

The factor most commonly reported was ‘other people’. Travelling at very busy times or in crowded environments could lead to increased anxiety. This was often due to the feeling of being in a confined space and the increased noise levels that came with being in a busy or crowded environment. Unpredictable behaviour of other people was also reported, this included not knowing what other road users were going to do particularly motorised vehicles. Infrastructure was also frequently mentioned, confined spaces such as enclosed walkways or underpasses, often lead to increased anxiety.

Table 11: Positive effects of travelling as a pedestrian on mental health

Sub-theme	No. of participants	Example(s)	Example quote(s)	Reported effect on mental health
Navigation tools	2	Maps; Navigation apps	“I’m confident to use maps, apps etc. to find my way around transport systems. In fact, it takes my mind off my anxiety”	Decreased anxiety

Table 12: Negative effects of travelling as a cyclist on mental health

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)	Reported effect on mental health
Other people	Presence of other vehicles	4	Cycling alongside other vehicles; Fear of colliding with other vehicles	“Fear of... vehicles driving to close”	Increased anxiety
	Unsafe behaviour of other people	4	Drivers driving too close to pedal cyclists; Drivers failing to notice pedal cyclists; Other pedal cyclists disobeying road traffic regulations	“Nearly getting hit by cars pulling out without looking is a large cause of anxiety”	Increased anxiety

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)	Reported effect on mental health
	Presence of other people	2	Fear of unexpected interaction with acquaintances	“The built environment has little impact on me, it is the people or expectations”	
	Busy environments	1	Too many people	“I certainly won't go anywhere if it's too busy”	
	Lack of travel companion	1		“I certainly won't go anywhere if... on my own”	
Infrastructure design/ maintenance	Artificial environments	2	Built-up environments; Lack of countryside	“I do not go anywhere near built up areas on my bike”	
	Lack of designated cycle lane/ space	2	Having to cycle on the road	“Riding on the road can be stressful”	Increased stress
	Inadequate lighting	1	Poorly-lit streets	“Lack of security... dark or badly lit etc.”	
	Lack of safe place to leave pedal cycle	1		“Mainly lack of security of the places to lock a bike”	
Route navigation	Unfamiliar environments	1	Cycling to/ in a new environment	“I certainly won't go anywhere... if I don't know the place or not used to going”	
	Responsibility for following road traffic regulations	1	Fear of cycling in the wrong lane	“Fear of... getting in wrong lane”	

Table 13: Positive effects of travelling as a cyclist on mental health

Sub-theme	No. of participants	Example(s)	Example quote(s)	Reported effect on mental health
Improves health	3	Improves physical and mental health	"[Cycling helps] with my physical and mental health"	Generally improved mental health
Enjoyment	1		"I tend to cycle for fun"	
Relaxation	1		"Cycling is my means to relax"	

Once again 'other people' was the most commonly reported factor. When travelling as a cyclist the presence of other vehicles and unsafe behaviour were the most commonly mentioned factors. This included drivers driving too close or failing to notice cyclists, both of which led to increased anxiety, and often avoidance of this mode of transport. Infrastructure, or the lack of, was also mentioned, particularly the lack of designated cycle lanes or spaces. Cycling was the mode of transport that had the most positive effects mentioned, particularly that it improved overall health through being outdoors and provided an opportunity to relax.

Table 14: Negative effects of travelling by bus on mental health

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)	Reported effect on mental health
Other people	Presence of other people	6	Being observed by other people; Fear of unexpected interaction with acquaintances; Invasion of personal space by others	"Fear of someone undesirable sitting next to me"	Increased anxiety
	Overcrowded buses	4		"How tightly packed [a bus] is"	Increased anxiety

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)	Reported effect on mental health
	Busy environments	3	Too many people on a bus	"If the bus gets busy, I get stressed"	Increased stress
	Lack of travel companion	1		"I certainly won't go anywhere if... on my own"	
	Having to interact with other people	1	Having to talk to bus driver/ other passengers	"Fear of... someone just talking to me"	Increased anxiety
	Unpredictable behaviour of other people	1	Fear of being attacked by others	"Areas where assaults [or] bad experiences happened"	
	Unsafe behaviour of bus drivers	1	Driving too fast/ close to other vehicles	"Driving too fast/close to other vehicles increases anxiety"	Increased anxiety
	Bus design	Lack of escape during transit	2		"Being enclosed and no control over my exit"
Confined spaces		2	Being confined to a bus	"Being enclosed [on a bus]"	
Inadequate seating		2	Having to stand for long journeys due to lack of seating; Difficulty accessing exit due to lack of aisle seating/ seating near the door	"I prefer to sit on the aisle and near the front so I can exit easily when the bus stops, but if there are no spaces I will move further down the bus and become anxious"	Increased anxiety
Difficulties with alighting		1	Lack of 'Stop' buttons on buses; Unreachable 'Stop' buttons	"There aren't enough bells, or you can't reach them"	
Inadequate ventilation		1		"Lack of sufficient ventilation"	
Bus service attributes	Unstandardised customs	2	Various accepted payment methods (e.g. cash, debit/ credit	"Don't know if [I need to] to stick [my] arm out to stop the bus"	

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)	Reported effect on mental health
			card, Oyster card); 'Stop' buttons in various places; Various ways of alighting buses (e.g. using the same door to enter and alight compared with using two different doors); Requirement to hail some buses	<p>"Different buses on different routes (and between companies) all having different ways to use them"</p> <p>"Some buses you have to get off using a different door to when you got on"</p>	
	Lack of control	1	Less control over travel compared with driving a private car	"I am much happier and feel safer driving myself to places, as [I] feel in control"	
Atmosphere	Noise	2	Noisy roads	"I hate noisy roads"	
	Congested roads	1		"I... loathe congestion"	
	Poor air quality	1	Air pollution	"Air quality... makes me hateful of cities"	
	Bright lights	1		"Bright lights"	
Bus stop design	Inadequate lighting	2		"Unlit bus stops contribute to me feeling anxious"	Increased anxiety
	Secluded bus stops	1		"If the bus stop is in a secluded area"	
	Inadequate seating	1	Having to stand whilst waiting for a bus	"Waiting at stops as cannot stand for long periods"	
	Lack of shelter	1		"Bus stops with no shelter so you have to stand in the cold feeling rotten"	

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)	Reported effect on mental health
Route planning and navigation	Unfamiliar routes/ environments	2	Travelling to a new environment; Taking an unfamiliar bus route	"I certainly won't go anywhere if... I don't know the place or not used to going"	Increased anxiety
	Navigation difficulties	1	Wayfinding difficulties; Getting easily lost	"If I feel I can't find my way I can start to panic"	Increased anxiety
	Responsibility for taking the correct bus	1	Fear of taking the wrong bus	"[Fear of] getting on wrong bus and getting lost"	
Provision of information	Inadequate information/ signage	3	Lack of provision of bus stop names when on the bus; Lack of signage at bus stops in rural areas; Lack of information on delayed/ cancelled services; Lack of timetables at bus stops; Outdated timetables	"Lack of updates [on] delayed and cancelled services"	

Once again, 'other people' was the most common factor reported. The presence of other people often leads to increased anxiety as people reported feeling observed, were concerned about unexpectedly seeing acquaintances and particularly invasion of personal space. Overcrowded buses were also mentioned. Bus design was frequently mentioned, particularly the lack of escape during transit, inadequate or insufficient seating and confined spaces.

Table 15: Negative effects of travelling by train on mental health

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)	Reported effect on mental health
Other people	Busy environments	9	Busy train stations/ platforms; Too many people; Lots of people walking in different directions	“Stations designed so that streams of people cross, or are walking in different directions” “In busy periods, I get so anxious I look around at everyone, start shaking and go quiet”	Increased anxiety
	Overcrowded	7	Overcrowded train carriages/ stations; Overcrowding at barriers to enter/ exit a train station	“If a train was full, I may well not get on and wait as long as is needed to get a less crowded one” “[Having] to bunch together to go through barriers can make me panic”	Increased anxiety
	Lack of travel companion	2		“I certainly won't go anywhere if... on my own”	
	Presence of other people	2	Being observed by other people; Fear of unexpected interaction with acquaintances	“There are some places I will avoid, for the fear of seeing certain people”	
	Unpredictable behaviour of other people	2	Fear of being approached/ attacked by others	“I am people watching all the time, checking them out to ensure they won't come near me”	Increased anxiety
	Unsafe behaviour of other people	2	Being pushed by other people in crowds	“Anxiety about... being jostled” “Being pushed forward”	Increased anxiety
	Having to interact with other people	1	Having to talk to staff/ other passengers	“Talking to strangers”	

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)	Reported effect on mental health
Train station design	Confined spaces	2	Tunnels; Lifts	“Tunnels and... lifts at train stations”	Exacerbated claustrophobia
	Unsecure environments	2	Lack of security staff; Lack of secure waiting areas	“More transport police required to make me feel safe”	
	Difficulties with entry/ exit barriers	2	Narrow barriers; Difficulties using turnstiles	“Small exit barriers... increase anxiety”	Increased anxiety
	Gap between the train and platform edge	2	Fear of falling through the gap	“Anxiety about... falling down the gap”	Increased anxiety
	Narrow platforms	1		“Narrow platforms”	
	Inadequate lighting	1		“Lack of... lit waiting facilities”	
	Heights	1	High bridges	“High bridges [at train stations]”	
	Inadequate seating	1	Having to stand whilst waiting for a train	“Not enough seats on the platforms”	
	Lack of toilet facilities	1	Lack of easily-accessible toilets	“Lack of easy access to toilets, particularly on the underground”	
	Lack of lifts	1		“Could do with more lifts”	
Route planning and navigation	Route-planning difficulties	3	Finding connecting trains; Planning a route requires a lot of time/ effort; Responsibility for purchasing the correct train ticket	“Getting right ticket on or off peak”	
	Responsibility for being on-time for a train	3	Fear of missing a train	“Anxiety about missing the train” “The ability to connect on time, should a change be required”	Increased anxiety

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)	Reported effect on mental health
	Unfamiliar routes/ environments	2	Travelling to a new environment; Taking an unfamiliar train route	"I certainly won't go anywhere if... I don't know the place or not used to going"	Increased anxiety
	Navigation difficulties	2	Wayfinding difficulties; Getting easily lost	"If I feel I can't find my way I can start to panic"	Increased anxiety
	Responsibility for taking the correct train	2	Fear of taking the wrong train	"Getting in the wrong train"	
Train service attributes	Train delays	3		"Worrying that the train will be delayed"	Increased anxiety
	Changes to routes	2	Mid-journey changes to train stops can result in not reaching a desired destination	"Station stops can change mid journey, so all journeys are spend anxiously waiting in case they cancel your stop"	Increased anxiety
	Lack of control	1	Less control over travel compared with other travel modes	"I am much happier and feel safer driving myself to places, as [I] feel in control"	
Provision of information	Large volume of information	2	Too much information to process at once	"Overwhelmed with the... volume of information I was trying to acquire, i.e. train times, platforms etc."	Increased anxiety
	Complex information/ signage	1	Technical information/ signs that are difficult to read/ understand	"There is lots of visual information at a train station that can be displayed in a technical fashion and is not user friendly for infrequent users"	
	Lack of information	1	Lack of easily-accessible information about which	"[Having to ask] what no. platform needed to return, where it is, check	

Main themes	Sub-themes	No. of participants	Example(s)	Example quote(s)	Reported effect on mental health
			platform to use/ the location of a platform/ train stops	train stops where I want, trying to remember everything”	
Train design	Lack of escape during transit	1		“Feeling trapped”	
	Inadequate ventilation	1	Lack of fresh air	“I can’t get fresh air”	
Atmosphere	Noise	1		“Overwhelmed with the... noise”	Increased anxiety

Table 16: Positive effects of travelling by train on mental health

Sub-theme	No. of participants	Example(s)	Example quote(s)
Layout of trains	1		“Trains themselves are also generally fairly well laid out”
Layout of train stations	1		“Train stations are usually fairly well laid out”
Adequate signage	1	Directional signage is helpful	“Train stations are usually fairly well... signposted”

Once again, 'other people' was the most common factor reported. Busy environments and particularly overcrowded train carriages and stations were a source of anxiety for those using trains. Train station design was also mentioned, particular aspects that were mentioned included entry and exit barriers which could be very narrow or where bottle necks could form at peak times; narrow platforms and gaps between the train and the platform edge. Route planning and navigation was another factor reported, particularly accessing information during the journey itself. Specific behaviours mentioned related to finding connecting trains and the relevant platforms, travelling in a new environment or taking an unfamiliar train route were also causes of increased anxiety.

4.3.2.3 Solutions

Participants provided various solutions to start addressing the barriers experienced across all the modes of transport investigated, as well as some more general solutions. These fell under six broad categories: infrastructure, vehicle design, information provision, travel preparations, improved awareness and other. The following are explored in more detail below. A summary of the types of solutions suggested for each mode of transport is provided in Table 17.

Infrastructure

Pedestrian

Several infrastructure solutions were suggested to address the barriers experienced when travelling as a pedestrian. These centred around the provision of improved pedestrian footpaths. To achieve this, participants reported that attention should be paid to ensuring that paths were maintained clear. They should also be, as far as possible, unshared with other road users, and in greener spaces removed from traffic. In rural areas, ensuring the provision of footpath was essential (i.e. pedestrians should not be expected to simply walk on the carriageway). In addition, improved lighting on footpaths, regardless of location and footfall should be considered. Particular attention could be made to widening streets and pavements to reduce the feelings of crowdedness often experienced in highly built environment. As well as widening the streets, participants mentioned that there should be a strive to remove car parking from pavements and ensuring that pavements were even to remove the likelihood of losing footing.

As well as improved pedestrian footpaths, participants recommended increasing the number of pedestrian crossings, and as often as possible including traffic lights to reduce the feeling of uncertainty when navigating a busy environment and improve the feeling of safety. improved pedestrian crossings.

Participants suggested that the use of under-passes should be discouraged, and instead over-passes should be considered as often as possible as the former often lead to feeling unsafe, trapped and could lead to experiencing intense stress or even panic attacks.

Improved signage was also suggested. Particular attention should be made to ensure the clarity of the signs that are for the attention of pedestrians, these included streets names and direction signs. Effort should be made to ensure that signs are well signposted, at a good height and always kept clear to ensure their visibility. Intrusive advertising should also

be removed to improve the visibility of key signs and reduce the 'busyness' that they can create.

Cyclist

The key recommendation here was improved and increased cycle infrastructure. Participants suggested that dedicated cycle lanes should be a priority, where possible these should be in greener environments removed from the traffic. If this isn't possible, dedicated cycle lanes that are clearly marked and removed from the main traffic should be considered. As well as increasing the availability of cycling infrastructure, attention should be made to ensuring their maintenance and upkeep.

Where cycle lanes as part of a shared pavement, it should be ensured that these are wide enough and do not require cyclists to dismount, or pedestrians to stand aside. In addition, an effort should be made to ensure that cycle paths are not cut up by driveways and ensure that cyclists have the priority over cars if this is the case.

Bus

Fewer suggestions were provided for buses as solutions related to the buses themselves. These related to the number of bus stops provided, particularly in more rural areas, reducing the distance between each stop. As well as the frequency of bus stops improving the lighting available at each one was a frequent recommendation. Bus shelters should also be prioritised over the use of other forms of bus stands, and where these are already in place their maintenance should be improved (e.g. more frequently cleaned). The wider use of electronic billboards was recommended to improve on the provision of real-time information provision. Information provision was a key point for all modes of transport, and this will be discussed later in this report.

Train

Most of the infrastructure changes referred specifically to station and platform changes, many to address the high level of crowding often experienced at train stations. Suggestions included changing the direction of escalators to match peak times at stations and control the crowd more adequately when arriving at a station. This is already the case in certain stations but should be more widespread across the country. This should also be applied to barriers when exiting platforms. In addition, an effort should be made to widen train platforms to reduce the feeling of crowdedness and the associated stress.

Other changes included ensuring that platforms were level with the floor to reduce the likelihood of losing their footing when travelling and ensure that all participants can travel alone as much as possible. Where possible the gap between the train and the platform should also be minimised, this could be achieved by increasing the width of steps that allow participants to board or leave the train. Increasing the number of lifts at stations would also ensure that more individuals are able to travel alone.

One suggestion to reduce the noise created in train stations, that was reported as leading to feelings of stress and anxiety when travelling, was to change the materials used on both platforms and station concourses to address this.

General

Overall participants recommended that a focus should be on increasing and improving the provision of safe footpaths and cycle lanes, ensuring that there are dedicated paths for both, separate from traffic and in green areas as often as possible. The layout and design of stations should also be considered a priority, with many still not being accessible for those with reduced mobility and can leave people feeling unsafe.

Vehicle design

Buses

Several suggestions were provided to improve vehicles themselves. One suggestion was to create 'quiet areas' on buses like the quiet coaches present on trains. These would be a separate area that would allow passengers that felt anxious or distressed to sit away from the louder sections of the bus. These areas should be free from mobile phone use and should discourage passengers having loud conversations.

Where possible it would be beneficial to increase the ventilation in buses to reduce the feeling of 'being trapped', this could be done through increasing the number of windows on buses and ensuring that these can be opened. One of the causes of anxiety was the absence of control in case of an emergency – therefore improving access to emergency exits was another suggestion. This should be supplemented by improving the information available around how to exit safely in the event of an emergency, enabling passengers to feel that they are in control.

As previously mentioned, information provision was an important barrier to travelling by bus, like the announcements made on trains one suggestion would be to announce the next stop out loud, and the presence of screens displaying the next stops should also be more widespread.

While there are good reasons for the difference in vehicle design across the country, these differences could often present a barrier to those trying to navigate an already complex transport system. Therefore, there should be a drive to standardise bus designs across the country to reduce the distress caused by such varying designs.

Trains

Similarly, to buses several suggestions were made to improve trains themselves. Solutions included improving the current quiet coaches or supplementing these with additional coaches to meet the needs of those living with poor mental health. These coaches should have improved ventilation and more natural lighting, or lower lighting if different lighting isn't possible. In addition, there should be an aim to reduce standing capacity on trains, and especially quiet coaches to reduce feelings of over-crowding and the distress that this can cause.

The current train doors can make it difficult to board/leave trains often creating a feeling of being trapped. Where possible doors should be simplified, and automatic doors should be removed, this would speed up the process of opening them and reduce the likelihood of them creating a feeling of distress. This applied to all doors, including toilet doors. There should also be an increased number of toilets on trains.

As well as simplifying the doors exit routes should also be simplified, and information on how to exit trains safely should also be simplified to ensure that information can be

absorbed in the event of an emergency or when someone may be experiencing intense anxiety.

The technology used in trains was reported as a positive step to accessibility, particularly screens providing information however these often didn't work or weren't providing accurate or real-time information leading to more confusion. It is therefore essential to ensure that all screens that are providing information are working, and that the information is accurate.

Respondents were aware that it can be particularly hard to design flaws out, and therefore that it might be more beneficial to build new trains that address these needs.

Information provision

General

Across all modes of transport there was a consensus that effort should be made to improve the ways in which information was provided while people were travelling. While there were some additional specific recommendations per mode of transport, participants suggested that there was a need to improve overall online information provision. An effort should be made to ensure that information is clear and well signposted to make it clear where information can be accessed. Many suggested making better use of technology to improve information provision, this would also remove the need to have to speak to someone, as cause of anxiety for many.

Informing road users of possible alternative routes, that may be safer, away from traffic, well-lit and generally quieter. Having this information clearly sign-posted would provide an opportunity to avoid environments that can lead to 'negative' response. Similarly, an effort should be made to inform road users of the location and whereabouts of available staff, particularly in train or bus stations, and this information should be clearly written and easily visible.

One additional recommendation was a need for consistency in how information is presented and provided across all travel systems across the UK as this would reduce the confusion often experienced by road users (e.g. bus and train timetables, bus and station maps, colours used for different road signs especially ones that are used by pedestrians and cyclists).

Pedestrian

One suggestion to improve the information provision was to include the option to receive the information in an audio format, especially on websites and travel apps. This would allow pedestrians, and other road users, to access the information more discreetly using headphones. This would also enable them to receive the information without having to look down at their phones/a map and therefore match the information provided to their environment more rapidly.

Bus

As well as the suggestions mentioned above an effort should be made to include route maps on all buses, like the ones that can be found on the London underground. These should also be available online. Along with this an effort should be made to make bus stop names

clearer ensuring people can see these when trying to identify the correct bus stop. This will remove the anxiety associated with not knowing the correct bus stop name when boarding a bus. There should also be an effort to clearly indicate bus fares, pricing schemes and how payment should be made (e.g. contactless payment; exact fare). This information should be presented both at buses stops/stations and online to allow people to prepare for their journeys.

In addition, electronic signs providing real-time information about buses (e.g. time until arrival) should be added to as many bus stops as possible to provide users with additional information about the bus services. This should be supplemented with online information, that can be accessed through travel apps. Time-tables should also be kept up to date, both at bus stops and online.

Train

Several solutions were suggested, these focused around better using technology to improve information provision to help manage journeys. This should include tools providing live departures and arrival information as well as platform information. Personalised information provision, informing passengers of the stations that they need to change at and platform information for their subsequent trains should also be considered. Once more train maps, like those found on the London underground, clearly stating the calling points should be available both on trains, at platforms and online that can be accessed ahead of arriving to the station.

Current signage should be made clearer in order to reduce the need for people to seek assistance. This should include making signs less obstructed and easier to read as well as ensuring that key information points and boards are clearly signposted throughout train stations.

Solutions around information provision while on trains were also suggested. These included train guards announcing the next station on a public address system ahead of arrival at the station. While this is a common behaviour on some train lines, this is evidently not always the case. This information should be provided well in advance to allow enough time for passengers to get ready.

Finally, improving ticket definitions (i.e. what trains are included in which tickets) should be a focus and this information should once again be made readily available and presented in a clearer format, both at ticket purchase points and online.

Journey preparation

General

The ability, or the lack of opportunity to prepare ahead of a journey was often sighted as a barrier to travel. In order to address this several solutions were suggested, focusing on improving route planning tools. Once again better use of technology to improve information provision at the planning stage was frequently suggested, solutions included apps that would include information regarding ticketing and fares, alternative routes including ones that are away from the traffic and quieter, and maps, particularly ones of the bus and train routes. maps of train and bus routes.

There was also a need for increased joint up thinking across different transport providers and local authorities to ensure that route suggestions can include a range of mode transports allowing road users to select the route that is most appropriate to their mental health on the day. For buses and trains there should be a focus on have better integration across available apps that may currently provide conflicting information.

Pedestrian

One of the main requirements suggested was the ability and having the opportunity to practice the routes ahead of travel. Some reported that they practiced routes at quieter times in order to prepare themselves to deal with the stress associated with travelling at busier times and ensure they would be able to manage when faced with unexpected events. This practising was often done with trusted peers (often family or friends), allowing road users to slowly build their confidence to travel in complex and demanding environments. Respondents suggested that support around travel training should be encouraged and more widespread to support those with more severe mental health conditions to build the confidence to travel alone as a pedestrian. This should be carried out 1-2-1 where possible and with the same trainer to help build confidence. Alternatively, technology could be used to achieve this, including more immersive tools (e.g. visualisation of routes online using software or tools such as virtual reality headsets).

Improving awareness of mental health conditions

One of the priorities to improve the accessibility of transport systems should be to focus on improving the awareness of the general public as well as members of staff of the barriers faced by those living with mental health conditions. This should include making people aware of the needs and barriers experienced, as well as supporting staff, in the first instance, to identify and recognise the signs of those living with poor mental health and how this might translate when travelling. This could be done through increased training for members of staff and education for members of the general public, as well as well-designed national campaigns.

Overall there needs to be an improved awareness of the barriers faced to enable staff to support and be more conscious of the different needs of different people.

Enforcement and awareness of legislation

Cycling

To improve feelings of safety and reduce the anxiety experienced as a result of the unpredictable behaviour of other road users there should be a focus on improving awareness of the rules of the road that apply to cycling, and where they might differ from that of other road users. There should also be an emphasis on improving car drivers' awareness of how they should behave around cyclist (e.g. required passing distance). There should also be greater enforcement of these requirements.

In addition, some believed that reducing speed limits in environments where there are a lot of cyclists should be considered.

Trains and buses

The use of dedicated seats on buses and trains, as well as dedicated carriages, was viewed as a positive step to improving accessibility, however these were often taken up by members of the public who didn't require them. Respondents suggested that there should be better education of the purpose of these dedicated areas/seats and improved enforcement to ensure that they are respected and that the rules are respected. This could be done in part through improved education and enforcement from either bus drivers or train guards, as well as increased staff on trains to monitor the proper use of dedicated areas.

Other

Many respondents did not provide any real-solutions, this was not due to the absence of problems but simply because many couldn't perceive a solution that could be introduced to the current systems but are aware of the need for something to be done. Many saw these barriers as being personal and attributed them to their own mental or physical health, and therefore no solution would be able to support them to overcome these barriers.

Others provided more general suggestions including a need to tackle and reduce crowding in built environments but did not provide any specific solutions.

There was also a need for additional staff, especially on buses and trains, that could provide support to people when travelling and support with queries/concerns as and when they happen.

Overall there was also a need to improve the reliability of the services provided, particularly in relation to buses and trains, especially in terms of running to time and, where possible, increasing the frequency of both trains and buses.

Table 17: Solutions per mode of transport

	Pedestrian	Cyclist	Bus	Train	General
Infrastructure	Yes	Yes	Yes	Yes	Yes
Vehicle design			Yes	Yes	
Information provision	Yes	Yes	Yes	Yes	Yes
Journey preparation	Yes				Yes
Improving awareness of mental health conditions					Yes
Enforcement and awareness of legislation		Yes	Yes	Yes	
Other:					
Additional staff			Yes	Yes	Yes
Reliability of public transport			Yes		

5 Discussion

The findings from our research provide further evidence for the many barriers experience by those living with mental health conditions when trying to access certain modes of transport. In addition, this starts to shed some light on the types of barriers experienced across a much wider range of mental health conditions and solutions that could begin to address these barriers. Table 18 and 19 summarise the types of difficulties experienced.

Table 18: Effects of mental health on travel behaviour

	Pedestrian	Cyclist	Bus	Train
Journey issues (e.g. route planning difficulty)	Yes		Yes	Yes
Avoidance (e.g. avoiding crowds, noisy environments, travelling at night...)	Yes	Yes	Yes	Yes
Unsafe practices (e.g. dangerous behaviours)	Yes			
Infrastructure design (e.g. confined spaces)	Yes		Yes	Yes
Accessibility (e.g. physical difficulty)	Yes	Yes	Yes	Yes
Personal effort (e.g. self-conscious)		Yes		
Physical safety (e.g. fear of crashing into other, previous personal injury, personal experience)		Yes		Yes
Associated activities (e.g. concern over waiting alone, concerns about having the correct money and purchasing tickets)			Yes	Yes

Table 19: Negative effects of travelling on mental health

Theme	Impact on mental health	Pedestrian	Cyclist	Bus	Train
Infrastructure design/maintenance (e.g. confined spaces; artificial environments; obstructed walkways; lack of dedicated cycling infrastructure/ storage)	Increased anxiety; Increased stress	Yes	Yes		
Atmosphere (e.g. noise, air quality; congested roads; artificial lighting)	Increased anxiety	Yes		Yes	Yes
Route navigation and planning (e.g. unfamiliar routes/environments; navigation difficulties)	Increased anxiety; Increased stress	Yes	Yes	Yes	Yes
Provision of information (e.g. large volume of information; complex information/signage)	Increased anxiety			Yes	Yes
Other people (e.g. unpredictable/unsafe behaviour; lack of travel companion; busy environments)	Increased anxiety; Increased stress	Yes	Yes	Yes	Yes

Theme	Impact on mental health	Pedestrian	Cyclist	Bus	Train
Vehicle design (e.g. lack of escape during transit; difficulties to alight; poor ventilation)	Increased anxiety			Yes	Yes
Bus service attributes (e.g. lack of control; unstandardised customs)				Yes	
Bus stop design (e.g. secluded bus stops; poor lighting; inadequate seating; lack of shelter)				Yes	
Train station design (e.g. Lack of facilities; narrow platforms; difficulties with entry/exit barriers)	Increased anxiety; Exacerbated claustrophobia				Yes
Train service attributes (e.g. train delays; changes to route; lack of control)	Increased anxiety				Yes

There are also several points for consideration that must be discussed when looking at the findings from this research. Firstly, the survey focused identifying the barriers to accessing and navigating the built environment meaning that ‘positives’ were not asked about in the survey, and therefore are not reported here. However, some of the solutions provided did draw on best practice across the UK and examples were provided where relevant. This allowed us to draw on real-world examples us to draw on real-world examples when developing our recommendations.

While our survey aimed to collect in depth data, like that collected in an interview, ensuring that a rich data set could be collected our sample only provides us with a snapshot of the barriers experienced due to the limited sample size. There are several reasons for this slightly smaller sample size. Firstly, mental health is still a sensitive subject, and some may still not be willing to share their experiences even when completing an anonymised survey. The survey however did receive a high interest with over 250 people engaging with the survey, but many were not eligible to take part (under 18, had not experienced a mental health condition). However, all those who were eligible to take part in the survey did complete the survey in full.

In addition, as expected we were not able to get feedback and engagement from people across the full spectrum of mental health conditions identified in Task 1. This does not mean that these individuals do not experience barriers, but simply that these could not be identified at this stage. For this reason, we recommend that further work is carried out to help explore in more detail the barriers faced and the appropriate solutions. This could include reviewing in partnership with key stakeholders and members of the general public a range of solutions to determine the most appropriate changes that should be included in the inclusive mobility guidance.

The findings provide further evidence supporting the need for mental health to be included within the inclusive mobility guidance. The research highlighted a number of ways in which

mental health could impact their travel, with the most common one across all modes of transport being avoidance. While some avoided a specific type of environment (e.g. times of day that would be particularly crowded), other avoided certain modes of transport entirely as a result of the impact it could have on their mental health.

The findings also provided further insight on the types of factors that could impact a person's mental health while travelling. The impact of transport systems on mental health were overwhelmingly negative, only cycling and walking had a positive impact on mental health. Overall mental health seemed to have the greatest impact on an individual's ability to travel by bus or train. Similarly, these modes of transport had the greatest negative impact on an individual's mental health suggesting that these should be a priority as they are currently the ones that are least accessible. These findings apply across all types of mental health conditions. While cycling did not seem to have as much of an impact on mental health, this is partly because this mode of transport was very rarely used. Some respondents suggested that this was because they had no interest in cycling, while others reported too many concerns with this mode of transport to even consider its uptake. This does not mean that improvements to cycling infrastructure should not be a priority. Quite the opposite as participants responses indicate a need to encourage more road users to consider this mode of transport, and therefore changes to support the uptake of cycling should be a priority.

While some changes fall under the remit of the inclusive mobility guidance, many do not are linked to information provision, public perception and awareness, staffing and train/bus design. These have been included in the solutions section for consistency and should be considered as part of the wider realm of inclusive mobility but cannot be addressed by the inclusive mobility guidance.

The findings from this research provide further evidence for the barriers that those living with mental health conditions experience when travelling, as well as the ways in which transport systems can impact their mental health. This could lead to avoidance of certain environments, or certain modes of transport all together. Modes of transport that might have significant benefits for their mental health, health as well as public health more generally. The findings support the need for mental health to be included in the inclusive mobility guidance.

6 Recommendations and next steps

This research question provided several findings, the key recommendations from this research question are:

- The needs of those living with mental health conditions need to be included in the inclusive mobility guidance.
- Mental health must be included as part of the wider realm of inclusive mobility
- The findings from this research were indicative of the barriers experienced, further research should be carried out with a broader sample, particularly the mental health conditions that were less represented in this research, to ensure that these are representative.
- Several solutions were identified, those relating to infrastructure, vehicle design and information provision should be a priority as part of the review of inclusive mobility guidance.
- Other solutions must also be addressed in parallel to ensure the most effective outcome.
- Review and changes need to be made in partnership with key stakeholder and members of the general public.

6.1 Infrastructure recommendations

- Improved pedestrian footpaths:
 - Ensuring that they are maintained and clear
 - Unshared with other road users
 - Where possible in green areas removed from traffic
 - Improving footpaths in rural areas should be a priority
 - Improved lighting regardless of location or footfall
 - Where possible widening streets and pavements
 - Reduce/remove on pavement car parking
- Increased number of pedestrian crossings and where possible to include traffic lights
- Removing/reducing the use of underpasses and enclosed walkways
- Improved signage
 - Clarity of signs that are for pedestrian (including street names)
 - Improving signposting of information
 - Ensuring signs are at a good height and kept clear
 - Reducing intrusive advertising
- For cyclists:

-
- Increased cycle infrastructure
 - Dedicated cycle lanes, where possible in green environments and removed from traffic
 - Improved maintenance and upkeep of infrastructure, including ensuring good road surface
 - Reducing/removing shared pavements
 - When on shared pavements:
 - Increased width of pavements
 - Pavements must not be cut up by driveways and cyclists must have priority over cars
 - Bus stops:
 - Increased number of bus stops in rural areas and reducing the distance between stops
 - Improved lighting
 - Use of bus shelters as opposed to bus stops
 - Improved maintenance of bus stops
 - Use of electronic billboards
 - Trains:
 - Changing direction of escalators to match peak time at stations to improve crowd management and reduce bottle necks. To be used at barriers when exiting train platforms.
 - Reducing the gap between the train and the platform, by increasing the width and length of steps that allow participants to board/leave the train
 - Increasing number of lifts at station
 - Changing the materials used on station concourses and platforms to reduce noise

6.2 Vehicle design recommendations

- Bus:
 - Quiet areas on buses:
 - Separate area
 - Restricted mobile phone use
 - Increased seating
 - Lower deck of buses
 - Close to exit

- Increased ventilation:
 - Increasing the number of windows that can be opened
- Improving access to emergency exits:
 - Supplemented with improved information on how to exit safely
- Information provision:
 - Increasing the number of screens in buses informing of the upcoming stops
 - Information to be shared out loud
 - Standardisation of vehicle design nationally
- Train:
 - Improving or supplementing quiet areas with 'mental health friendly areas':
 - New areas for those living with mental health conditions OR supplementing current quiet coaches
 - Improved ventilation
 - Natural lighting, or lower lighting
 - Increased seating and reducing standing capacity
 - Dedicated tickets
 - Reducing the use of automatic doors (including toilet doors)
 - Increased number of toilets on train
 - Simplified exit routes:
 - Information on how to exit trains should also be simplified
 - Continued and more widespread use of screens to provide information and updates about next stop and arrival times/delays
 - Difficult to 'design flaws out' effort should be made to build new trains to address these needs

6.3 Information provision recommendations

- Across all modes of transport need to improve way information is provided
- Improved online information provision
- Ensure information is clear (simple and easy to understand)
- Improve signposting of information:
 - This must include location of available staff particularly in trains and bus stations
- Improved use of technology

-
- Remove the need to speak to staff
 - Providing information of alternative routes that are quieter, away from traffic, well-lit
 - This must be clearly signposted
 - Consistency in how information is presented across all travel systems in the UK
 - Including bus and train timetables; bus and station maps
 - Consistency in colours used for different road signs, particularly ones for pedestrians and cyclists
 - Train
 - Improved use of technology
 - Tools providing live departure, arrival and platform information
 - Personalised information provision
 - Informing passengers of station changes and platform information for subsequent trains
 - Train maps like the ones found on the London underground
 - Improved signage
 - Clearer to reduce the need to seek assistance
 - Signs to be less obstructed
 - Easier to read
 - Information points and boards to be more clearly signposted
 - Train guards to announce the next station ahead of arrival at stations more consistently
 - Information must be provided well in advance
 - Improving ticket definitions, specifically what trains are included in which tickets
 - Must be presented at ticket purchase points and online
 - Bus
 - Include route maps on buses
 - Like the ones found on London underground
 - These should be made available online
 - Improve visibility of bus stop names
 - Clearly indicate bus fares, pricing schemes and how payment should be made
 - Information to be presented at bus stops, bus stations, on-board and online
-

-
- Use of electronic signs to provide real-time information to be included at bus stops
 - Supplemented with online information that can be accessed through travel apps
 - Time-tables to be kept up to date at bus stops
 - Information to be made available online
 - Pedestrian
 - Opportunities to access information in an audio format
 - Allowing pedestrians to access information more discreetly
 - Allowing pedestrians to receive information without having to look down at phone/map and match information to their environment more rapidly

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Appendix A Questionnaire

The text of the questionnaire is shown below. The survey was conducted using an online survey service so the text below does not reflect the layout shown to respondents.

1. Information

Thank you for showing an interest in our research looking at the relationship between mental health and transport.

What is the survey about?

The aim of this research is to develop a better understanding the relationship between mental health and transport systems. By this we mean the impact that your mental health can have on your ability to travel and the impact that the UK's transport system can have on mental health.

The survey will involve answering questions relating to recent and current experiences of mental health conditions.

Who can take part?

We are looking for adults who are aged 18 or over and have experience of a mental health condition or developmental disorder. Carers responding on behalf of adults aged 18 or over are also welcome.

Who is it for?

The research is being undertaken by TRL (the Transport Research Laboratory) on behalf of the Department for Transport.

How long will it take?

They survey should take around 10-15 minutes to complete.

What if I want to drop out?

You can leave the survey at any time without giving a reason by closing the web browser. If you do this we won't use any of the data that you provided.

What else do I need to know?

All your responses will be completely confidential and stored securely. All data will be anonymised and it will not be possible for anyone to identify who has answered the questions. The data collected will not be shared with any third parties.

If you need to ask further questions about the survey, please contact the lead researcher at inclusivemobilityreview@trl.co.uk.

Please remember that if at any time you feel distressed, or feel that you require support that you can seek mental health support via your GP and/or via contacting any of the

below organisations:

British Association for Counselling and Psychotherapy register:

<http://www.bacpregister.org.uk/public/>

The Health and Care Professions Council register: <http://www.hpc-uk.org/check/>

British Association for Behavioural and Cognitive Psychotherapies register:
<http://www.cbtregisteruk.com/Default.aspx>

Samaritans: By phone: 116 123; By email: jo@samaritans.org; Online:
<http://www.samaritans.org/>

Saneline: By phone: 03003 047000;
Online: http://www.sane.org.uk/what_we_do/support/helpline

The Mix: By phone: 08088 084994; online: www.themix.org.uk/get-support

Anxiety UK: By phone: 03444 775774; By email: support@anxietyuk.org.uk Online:
www.anxietyuk.org.uk

2. Consent form

1. Are you aged 18 or over, or responding on behalf of someone who is aged 18 or over?

Yes No

2. Would you consider yourself as currently having, or having had, a mental health condition (including personality disorder) or developmental disorder (e.g autism) in your adult life (since the age of 18)? OR Are you responding on behalf of someone who is currently experiencing or has experienced a mental health condition or developmental disorder in their adult life?

Yes No

3. Have you read and understand the background information for the study and had the opportunity to ask questions? (Remember you can email inclusivemobilityreview@trl.co.uk if you have any questions).

Yes No

4. Do you understand that your participation is voluntary and that you are free to withdraw at any time, without giving a reason?

Yes No

5. Do you agree to the use of your anonymised quotes in reports?

Yes No

6. Do you consent to take part in this survey?

Please remember that you can leave the survey at any time without giving a reason by closing the web browser. If you do this we won't use any of the data that you provided.

7. How often do you use the following types of transport?

- Car (as a driver)
- Car (as a passenger)
- Bus
- Train
- Tube (London underground or similar)
- Tram
- Taxi
- Cycling
- Walking
- Motorcycling

Tick box options: Never, Less than once a month, About once a month, About once a fortnight, 1-3 days a week, 4 to 6 days a week, every day, Not Applicable

8. You said that you are currently experiencing, or have experienced, a mental health condition or developmental disorder in your adult life (since the age of 18). What type of mental health condition or developmental disorder have you experienced (please select all that apply)?

- Anxiety
 - Panic disorder
 - Phobias
 - Post-traumatic stress disorder (PTSD)
 - Obsessive compulsive disorder (OCD)
 - Seasonal affective disorder
 - Bipolar
 - Attention Deficit
 - Hyperactivity Disorder (ADHD)
 - Depression
 - Personality disorder
 - Stress
-

-
- Eating disorders
 - Substance dependence issues
 - Autism (including Asperger Syndrome)
 - Pre or post natal depression
 - Psychotic disorders
 - Other (if selected please specify in the comment field below)

Tick box options: “Currently experiencing” or “Have experienced”

9 Have you ever experienced any of these specific types of anxiety (please select all that apply)?

- Generalised anxiety disorder
- Social anxiety
- Health anxiety
- Body dysmorphic disorder
- Perinatal anxiety
- Prefer not say
- None of the above
- Other (please specify)

10. Have you ever experienced any of the following types of bipolar (please select all that apply)?

- Bipolar I
- Bipolar II
- Cyclothymia (Bipolar III)
- Prefer not say
- None of the above
- Other (please specify)

11. Have you ever been dependent on any of the following types of substances (please select all that apply)?

- Drug dependence
 - Alcohol dependence
-

-
- Prefer not say
 - None of the above

12. Have you ever experienced any of these specific types phobias (please select all that apply)?

- Claustrophobia
- Agoraphobia
- Emetophobia
- Prefer not say
- None of the above
- Other (please specify)

13. Have you ever experienced any of these specific types of psychotic disorders (please select all that apply)?

- Psychosis
- Schizophrenia
- Schizoaffective disorder
- Delusional disorder
- Prefer not say
- None of the above
- Other (please specify)

14. Have you ever experienced any of the following types of personality disorders (please select all that apply)?

- Anti-social personality disorder
 - Avoidant personality disorder
 - Borderline personality disorder
 - Dependent personality disorder
 - Histrionic personality disorder
 - Narcissitic personality disorder
 - Obsessive compulsive personality disorder
 - Paranoid personality disorder
 - Schizoid personality disorder
 - Schizotypal personality disorder
-

-
- Prefer not say
 - None of the above
 - Other (please specify)

15. Does your mental health developmental disorder ever affect your ability to travel as a pedestrian? If it does, please explain how.

- Never
- Only rarely
- Sometimes
- Frequently
- All the time
- Not applicable

16. Does your mental health or developmental disorder ever affect your ability to travel as a cyclist? If it does, please explain how.

- Never
- Only rarely
- Sometimes
- Frequently
- All the time
- Not applicable

17. Does your mental health or developmental disorder ever affect your ability to travel by bus? If it does, please explain how.

- Never
- Only rarely
- Sometimes
- Frequently
- All the time
- Not applicable

18. Does your mental health or developmental disorder ever affect your ability to travel by train? If it does, please explain how.

- Never
 - Only rarely
 - Sometimes
 - Frequently
-

- All the time
- Not applicable

9. Does your mental health or developmental disorder ever affect your ability to travel more generally? If it does, please explain how.

The next series of question will ask you specifically about travelling around the built environment, by this we mean your experience of using and finding your way around streets and transport networks whether as a passenger, pedestrian or cyclist.

20. Are there any specific elements in the built environment that impact your mental health while travelling as a pedestrian?

21. Are there any specific elements in the built environment that impact your mental health while travelling as a cyclist?

22. Are there any specific elements in the built environment that impact your mental health while travelling by bus?

23. Are there any specific elements in the built environment that impact your mental health while travelling by train (including at train stations) ?

24. Are there any specific elements in the built environment that can impact your mental health when travelling more generally? And if so what are these?

Solutions

25. What solutions would help to address these barriers and make it easier for you to navigate and travel as a pedestrian?

26. What solutions would help to address these barriers and make it easier for you to navigate and travel as a cyclist?

27. What solutions would help to address these barriers and make it easier for you to navigate and travel by bus?

28. What solutions would help to address these barriers and make it easier for you to navigate and travel by train?

29. What solutions would help to address these barriers and make it easier for you to navigate and travel in general?

About you

- Gender
- Age
- Employment status
- Nation of residence

Do you have any additional impairment or any additional travel needs?

(If yes) How would you describe your impairments/additional needs?

- Wheelchair user
- Mobility impaired
- Blind or partially sighted
- Deaf or hard of hearing
- Learning disability
- Prefer not say

Appendix B Further demographic information

The following tables and figure provide more information about the sample characteristics.

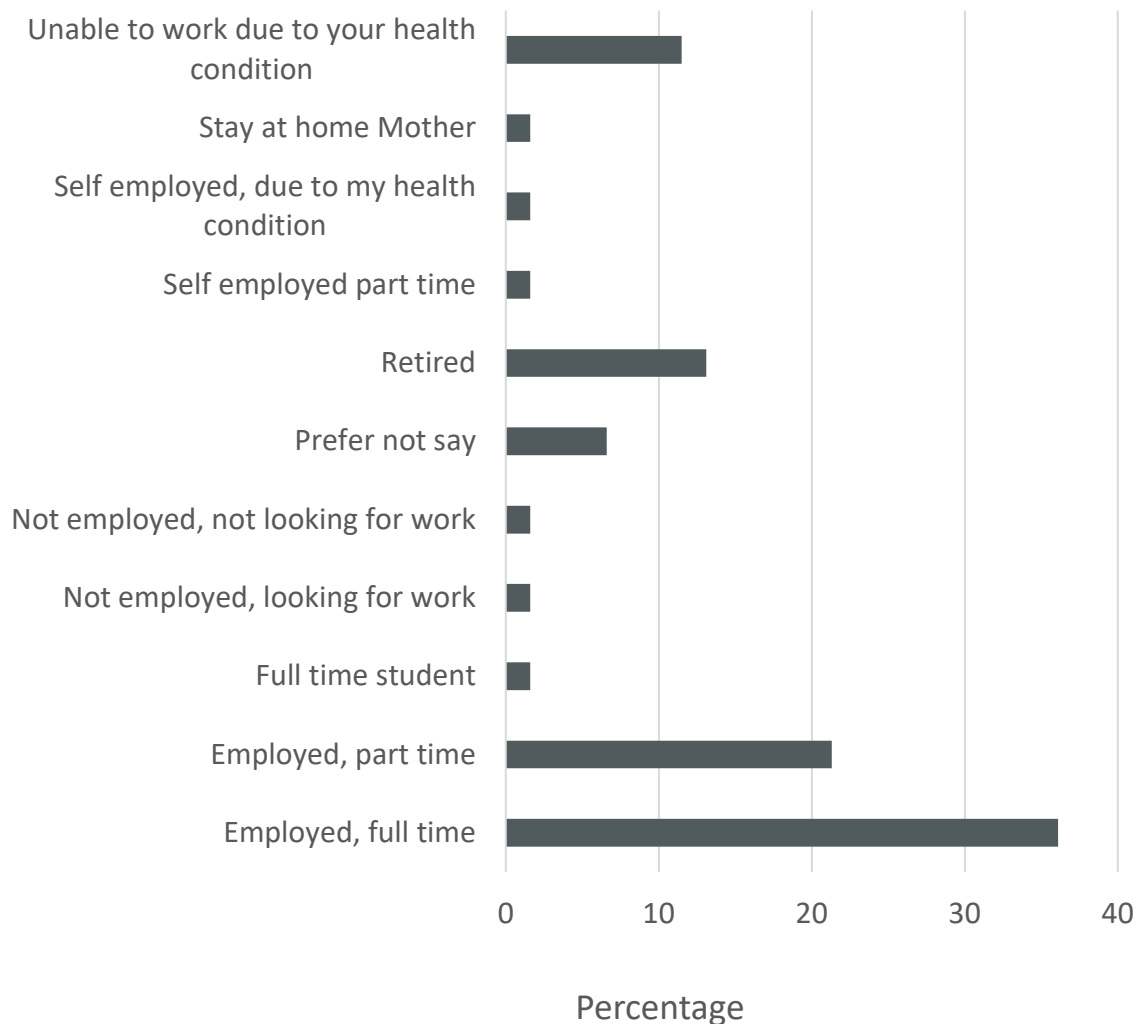


Figure 3: Sample's employment status

Table 20: Sample's travel behaviour

Frequency of travel	Car driver	Car passenger	Bus	Train	Tube	Tram	Taxi	Cycling	Walking	Motorcycle
Everyday	36.1%	1.6%	4.9%	3.3%	0.0%	0.0%	0.0%	0.0%	36.1%	0.0%
1-3 days a week	11.5%	45.9%	11.5%	8.2%	4.9%	0.0%	3.3%	1.6%	14.8%	0.0%
4-6 days a week	29.5%	4.9%	8.2%	0.0%	0.0%	0.0%	0.0%	6.6%	21.3%	1.6%

About once a fortnight	3.3%	14.8%	4.9%	8.2%	3.3%	0.0%	3.3%	1.6%	13.1%	1.6%
About once a month	0.0%	14.8%	6.6%	8.2%	9.8%	1.6%	9.8%	8.2%	8.2%	0.0%
Less than once a month	1.6%	14.8%	36.1%	59.0%	55.7%	16.4%	59.0%	14.8%	4.9%	3.3%
Never	18.0%	0.0%	26.2%	13.1%	23.0%	73.8%	24.6%	62.3%	1.6%	91.8%
Not applicable	0.0%	0.0%	1.6%	0.0%	3.3%	8.2%	0.0%	4.9%	0.0%	0.0%

Table 21: Travel behaviour per mental health condition currently experienced

	Car (driver)					Car (passenger)					Bus					Train					Tube					Tram					Taxi					Cycling					Walking					Motorcycling																				
	Everyday	1-3 days a week	4-6 days a week	About once a fortnight	Less than once a month	Never	Everyday	1-3 days a week	4-6 days a week	About once a fortnight	About once a month	Less than once a month	Everyday	1-3 days a week	4-6 days a week	About once a fortnight	About once a month	Less than once a month	Never	Not applicable	Everyday	1-3 days a week	About once a fortnight	About once a month	Less than once a month	Never	Not applicable	About once a month	Less than once a month	Never	Not applicable	1-3 days a week	About once a fortnight	About once a month	Less than once a month	Never	Not applicable	Everyday	1-3 days a week	4-6 days a week	About once a fortnight	About once a month	Less than once a month	Never	Not applicable	Everyday	1-3 days a week	4-6 days a week	About once a fortnight	About once a month	Less than once a month	Never	Not applicable													
Anxiety	10	2	7	1	1	6	1	4	1	3	3	5	3	3	1	2	1	7	0	0	1	1	4	2	1	5	4	2	1	1	4	7	2	1	4	1	9	3	2	0	2	1	7	6	0	0	1	2	5	1	6	3	1	1	3	6	4	1	2	0	0	0	0	2	6	1
Panic disorder	2	1	4	0	0	3	0	4	2	0	1	3	1	1	0	1	1	3	3	0	1	1	1	0	5	2	0	0	1	4	4	1	0	2	7	1	1	0	1	6	2	0	0	0	1	2	6	1	4	1	3	0	1	1	0	0	0	0	1	0	0					
Phobias	2	1	5	0	0	2	1	3	1	4	0	1	0	1	0	0	1	6	1	0	1	0	1	4	4	1	0	0	4	5	0	0	1	9	0	0	0	1	5	4	0	0	0	1	1	8	0	3	1	1	1	2	1	1	0	0	0	0	1	0	0					
PTSD	3	1	4	0	0	0	0	6	0	2	0	0	0	1	0	2	0	1	3	1	1	0	1	1	4	1	0	0	0	4	3	1	0	0	7	1	1	1	0	2	4	0	1	0	0	0	6	1	3	1	2	0	2	0	0	0	0	0	0	8	0					
OCD	2	1	1	0	0	2	0	1	1	2	1	1	1	0	0	0	1	0	3	1	0	0	1	0	4	1	1	0	0	4	1	0	0	0	6	0	0	0	2	2	2	0	0	0	0	0	1	5	0	2	0	2	0	2	0	1	0	1	0	0	0	6	0			
SAD	1	0	2	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	2	1	0	0	1	0	2	0	0	0	3	0	0	0	0	2	1	0	0	0	1	1	1	0	2	0	0	0	1	0	0	0	0	0	3	0						
Bipolar	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0								
ADHD	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1							
Depression	9	2	8	1	1	4	0	1	3	3	6	2	2	1	2	1	9	8	0	1	2	2	1	1	6	3	0	1	3	1	2	1	4	1	8	2	2	0	3	1	4	6	1	1	1	1	4	1	5	2	1	0	4	6	2	1	1	1	0	0	1	2	4	0		
Personality disorder	0	1	2	0	0	0	0	2	0	0	0	1	0	0	0	0	0	3	0	0	0	0	1	1	1	0	0	0	1	2	0	0	0	3	0	0	0	0	1	2	0	0	0	1	2	0	0	1	1	0	0	0	0	0	0	0	0	0	3	0						
Stress	8	2	8	2	0	6	1	1	4	2	4	3	2	3	1	0	8	9	0	1	2	3	1	1	4	5	1	0	3	1	2	1	3	2	2	2	0	4	1	4	6	1	1	1	1	3	1	7	2	1	2	2	7	2	1	1	1	1	0	0	0	2	6	0		
Eating disorder	1	0	4	0	0	1	0	2	1	2	1	0	0	0	0	1	2	3	0	0	0	0	0	5	1	0	0	1	3	2	0	0	0	6	0	0	0	0	4	2	0	0	0	0	0	1	5	0	1	0	1	0	1	2	1	1	0	0	0	1	5	0				
Substance dependence	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0							
Autism	1	1	0	0	0	3	0	0	1	2	1	1	0	1	0	0	2	1	1	0	0	1	0	0	4	0	0	0	1	4	0	0	0	3	3	0	0	0	1	3	1	0	0	0	1	1	3	0	1	0	1	0	1	2	0	0	1	1	0	0	4	0				
Psychotic disorder	0	1	2	0	0	0	0	2	0	0	0	1	0	0	0	0	0	3	0	0	0	0	1	1	1	0	0	0	1	2	0	0	0	3	0	0	0	0	1	2	0	0	0	0	1	2	0	0	1	1	0	0	0	0	0	0	0	3	0							

Table 22: Travel behaviour per mental health condition previously experienced

	Car (driver)					Car (passenger)					Bus					Train					Tube					Tram					Taxi					Cycling					Walking					Motorcycling																					
	Everyday	1-3 days a week	4-6 days a week	About once a fortnight	Less than once a month	Never	Everyday	1-3 days a week	4-6 days a week	About once a fortnight	About once a month	Less than once a month	Never	Not applicable	Everyday	1-3 days a week	About once a fortnight	About once a month	Less than once a month	Never	1-3 days a week	About once a fortnight	About once a month	Less than once a month	Never	Not applicable	About once a month	Less than once a month	Never	Not applicable	1-3 days a week	About once a fortnight	About once a month	Less than once a month	Never	Not applicable	Everyday	1-3 days a week	4-6 days a week	About once a fortnight	About once a month	Less than once a month	Never	4-6 days a week	About once a fortnight	About once a month	Less than once a month	Never	Not applicable																		
Anxiety	12	5	9	1	0	2	1	13	1	5	4	5	0	3	3	1	2	13	6	4	1	1	3	1	7	4	0	0	2	2	6	1	0	2	4	1	7	6	1	4	0	2	4	1	8	1	0	1	0	1	1	1	1	2	2	6	0	1									
Panic disorder	10	2	6	1	0	3	1	8	1	5	4	3	2	1	1	0	2	8	7	1	0	1	1	3	1	4	3	1	1	2	1	4	0	0	0	2	1	7	3	6	3	2	0	1	1	0	1	1	0	2	1	0	1														
Phobias	3	2	1	1	0	3	0	5	0	0	3	2	2	2	2	0	3	1	0	1	3	2	1	3	0	2	1	2	3	2	0	0	1	9	0	0	0	3	6	1	1	0	0	0	2	7	0	8	0	1	1	0	0	0	0	1	0	0									
PTSD	3	1	3	0	0	2	0	4	1	2	2	0	1	0	1	0	2	5	0	0	1	1	0	4	3	1	0	2	3	3	0	0	1	8	0	0	0	3	5	1	1	0	0	2	1	5	0	5	1	1	1	0	0	1	0	1	8	0	0								
OCD	2	1	4	0	0	1	0	3	2	1	1	1	0	0	0	0	1	1	6	0	0	0	0	2	3	3	0	0	2	2	4	0	0	0	8	0	0	0	1	4	3	0	1	0	1	2	4	0	2	1	2	1	2	0	0	1	0	7	0	1							
SAD	3	0	3	0	0	3	0	3	0	4	2	0	2	1	0	0	2	3	1	1	0	1	2	4	1	1	0	0	5	2	1	0	0	8	1	1	0	2	4	2	0	0	0	0	0	0	8	1	2	1	0	4	1	0	1	0	0	9	0	0							
Bipolar	1	0	2	0	0	0	0	0	1	2	0	0	0	0	0	0	0	3	0	0	0	0	0	1	2	0	0	0	1	2	0	0	0	3	0	0	0	1	2	0	0	0	0	1	0	2	0	1	0	0	1	0	0	3	0	0											
ADHD	1	0	4	0	0	0	0	2	1	2	0	0	0	0	0	0	5	0	0	0	0	0	1	2	2	0	0	2	3	0	0	0	5	0	0	0	1	2	2	0	0	0	1	0	4	0	1	1	0	1	1	0	1	0	0	5	0	0									
Depression	13	6	7	1	0	3	1	13	1	6	3	6	1	3	2	0	2	13	8	1	1	3	2	2	1	7	5	2	1	2	1	7	8	0	0	4	2	4	2	0	1	2	0	7	1	2	0	3	5	1	8	1	9	6	7	4	2	2	0	0	1	2	7	1	0		
Personality disorder	2	1	2	0	0	0	0	0	1	3	0	1	0	0	0	0	0	4	1	0	0	0	0	2	3	0	0	0	2	3	0	0	5	0	0	0	1	4	0	0	0	1	4	0	0	0	1	1	3	0	1	0	1	0	0	5	0	0									
Stress	14	5	8	0	0	3	2	12	0	5	5	6	0	3	3	0	2	14	7	1	0	3	1	3	1	9	4	2	1	3	1	7	7	0	0	5	2	3	2	0	1	2	1	9	8	1	2	0	1	4	2	1	1	0	1	9	7	5	5	2	2	0	1	2	6	1	1
Eating disorder	2	1	2	0	0	2	0	2	2	2	1	0	1	0	0	0	2	0	3	1	1	0	0	1	4	1	0	0	5	2	0	0	0	7	0	0	0	1	3	3	0	1	0	1	0	5	0	2	2	1	0	1	0	1	0	0	7	0	0								
Substance dependence	1	0	4	1	0	1	0	2	1	3	1	0	2	0	0	0	0	5	0	1	0	0	1	3	2	0	0	3	4	0	0	0	7	0	0	0	1	4	2	0	0	0	1	0	6	0	2	1	1	1	1	0	1	0	0	7	0	0									
Ante or post-natal depression	1	0	4	0	0	1	0	3	2	1	0	0	0	0	0	1	1	4	0	0	0	0	1	3	2	0	0	3	3	0	0	0	5	1	0	0	0	3	3	0	0	0	1	0	4	1	1	2	1	1	1	0	0	0	0	0	5	1	0								
Autism	5	3	9	0	0	1	0	11	2	4	0	1	0	2	1	1	4	9	0	1	2	1	2	8	4	0	1	2	8	6	1	0	1	1	6	1	1	1	1	9	6	1	2	0	2	3	9	1	6	4	4	2	1	0	1	0	0	1	8	0	0						
Psychotic disorder	1	1	2	0	0	0	0	0	1	2	0	1	0	0	0	0	4	0	0	0	0	0	0	1	3	0	0	0	1	3	0	0	0	4	0	0	0	1	3	0	0	0	1	1	2	0	1	0	1	1	0	0	1	0	0	4	0	0									

Appendix C Qualitative findings by mental health condition

The tables below provide further information on the findings from the qualitative analysis.

C.1 Effects of mental health on travel behaviours and navigating the built environment

Table 23: Effects of mental health on travel behaviours as a pedestrian

Main theme	Sub-themes	Anxiety (n=52)		Panic disorder (n=29)		Phobias (n=19)		PTSD (n=17)		OCD (n=12)		SAD (n=12)		Bipolar (n=5)		ADHD (n=6)		Depression (n=50)		Personality disorders (n=7)		Stress (n=50)		Eating disorders (n=12)		Substance dependence (n=8)		Autism (n=12)		Antenatal or postnatal depression (n=18)		Psychotic disorders (n=6)		Dissociative disorders (n=1)		Total number of participants	Example Quote(s)	
		Current (n=27)	Previous (n=29)	Current (n=10)	Previous (n=22)	Current (n=10)	Previous (n=10)	Current (n=8)	Previous (n=9)	Current (n=6)	Previous (n=8)	Current (n=3)	Previous (n=9)	Current (n=2)	Previous (n=3)	Current (n=1)	Previous (n=5)	Current (n=25)	Previous (n=30)	Current (n=3)	Previous (n=5)	Current (n=26)	Previous (n=30)	Current (n=6)	Previous (n=7)	Current (n=1)	Previous (n=7)	Current (n=7)	Previous (n=8)	Current (n=0)	Previous (n=18)	Current (n=3)	Previous (n=4)	Current (n=1)	Previous (n=0)			
Affects ability to travel as a pedestrian		21	13	7	14	8	4	7	5	6	4	2	7	2	2	1	4	17	12	3	3	19	12	4	4	1	5	4	5	0	9	3	2	0	0			
Route planning / Navigation	Route planning difficulty	4		1		1		1										2	1			3	2					2	2		1					6	"If I don't know where I am going and am totally new to the environment, I become panic stricken as I fear being late"	
	Navigation difficulty	1	1												1				1				1				1	1									2	"I need clear mapping/google imaging to reduce fears of being in the wrong place"
Avoidance	Avoids crowds	6	3		4	1	1	1	1	2	1	2						2	4		1	2	3		1	1								1	1	9	"Large crowds in close proximity can drastically increase my feelings of anxiety"	
	Avoids noisy environments		1		1						1												1											1	1	1	"Difficult in crowded or noisy circumstances"	
	Avoid travelling when dark / at night	2	2					1							1				2				2				1	1		1						3	"I get anxious about walking alone, especially when it is dark, or I don't know the area well"	
	Avoidance of travel	3	1	1	2	2		2			1		1	1			1	3	1	1		3			1		2	2		1	1						4	"Anxiety about going to places and when passing certain places, also when depressed not wanting to even go out"
	Avoids new places / environments	2		1	2	2		1		1	2		1	1			1	1		1		2		1	2		1	3	3		1	1					3	"I struggle to go out, and won't go for walks on my own, definitely not to places that I don't know or haven't been before"
Unsafe Practises	Difficulty concentrating	5	4	3	3	2	2	2	1	2	2	1		1			1	4	3	2	1	3	5	1			1	1	1		2	2	1				9	"Intrusive thoughts pop into my head as a pedestrian" "I am constantly looking over my shoulder"
	Dangerous behaviours	1	1		1		1												1	1			1	1													1	"I was suicidal and kept walking out into traffic - walking out onto zebra crossings, regardless of whether it was safe was a common occurrence"
Infrastructure	Enclosed spaces	1			1																																1	"Occasionally I can become anxious in cities as a pedestrian due to enclosed spaces and large numbers of people"
General	Physical difficulty	2	1										1						3											1						3	"Anxiety, Depression & Stress, combined with Migraines & Vertigo make even walking let alone anything else difficult"	
	Stressful	1	1	1	1			1	1										3	3										1						3	"I usually also walk faster than most people as I do not often feel relaxed whilst walking"	

Table 24: Effects of mental health on travel behaviours as a cyclist

Main theme	Sub-themes	Anxiety (n=52)		Panic disorder (n=29)		Phobias (n=19)		PTSD (n=17)		OCD (n=12)		SAD (n=12)		Bipolar (n=5)		ADHD (n=6)		Depression (n=50)		Personality disorders (n=7)		Stress (n=50)		Eating disorders (n=12)		Substance dependence (n=8)		Autism (n=12)		Antenatal or postnatal depression (n=18)		Psychotic disorders (n=6)		Dissociative disorders (n=1)		Total number of participants	Example Quote(s)
		Current (n=27)	Previous (n=29)	Current (n=10)	Previous (n=22)	Current (n=10)	Previous (n=10)	Current (n=8)	Previous (n=9)	Current (n=6)	Previous (n=8)	Current (n=3)	Previous (n=9)	Current (n=2)	Previous (n=3)	Current (n=1)	Previous (n=5)	Current (n=25)	Previous (n=30)	Current (n=3)	Previous (n=5)	Current (n=26)	Previous (n=30)	Current (n=6)	Previous (n=7)	Current (n=1)	Previous (n=7)	Current (n=7)	Previous (n=8)	Current (n=0)	Previous (n=18)	Current (n=3)	Previous (n=4)	Current (n=1)	Previous (n=0)		
Affects ability to travel as a cyclist		21	13	7	14	8	4	7	5	6	4	2	7	2	2	1	4	17	12	3	3	19	12	4	4	1	5	4	5	0	9	3	2	0	0		
Personal effort	Lack motivation	1	1	1						1	1							1	1	1	1	1	1									1	1			1	"I would never cycle in the dark as I fear I will not be visible enough, or not be able to see where I am going"
	Self-conscious	1	1			1													2			1	1													2	"Concerned about what motorists, pedestrians and other cyclists are thinking. Am I abiding by the rules?"
Avoidance	Avoids open spaces		1					1											1										1						1	"Across empty spaces e.g. parks"	
	Avoids travelling when dark / at night	1	1			1													1									1	1		1					2	"I would also never cycle in the dark as I would still have a fear of not being visible enough or not being able to see where I am going"
	Avoids leaving the house	2		1		1												1	1			1					1	1								2	"Anxiety can stop me leaving the house at all sometimes, but cycling is generally better than walking or taking public transport because it requires minimal interaction with other people"
Safety	Fear of falling off	4		1	2	3		2		2	1	1	2			2	3		2		4		1	1		2	1	3		2					4	"Anxiety combined with the effects of Vertigo make it almost impossible for me to be in control of any vehicle for fear of crashing"	
	Fear of crashing into others	1															1				1														1	"Anxiety combined with the effects of Vertigo make it almost impossible for me to be in control of any vehicle for fear of crashing, hurting others in the process"	
	Previous personal injury / family tragedy	1	1			1		1														1					1	1							2	"I don't cycle because my cousin was knocked off his bike and killed. My fear of cycling on roads is overwhelming"	
General	Physical difficulty	2	2	1	2	1		1		2	1		1				3	1		1	2	2	2	2			1	1						5	"Very wobbly" "Don't have mental capability to learn how to balance a bike"		
	Distressing / discomfort	1		1	1	1		1			1	1		1			1	1		1	1					1		1	1						1	"I don't cycle, I don't feel comfortable on a bike and just think someone would knock me down even if I did go cycling"	
No issue	Enjoys cycling	4	1	1	3		1		1	2	1		1					1	2			3	2				1				1				5	"Cycling is my means to relax; helping with my physical and mental health"	
Issue	Never cycles / hasn't cycled recently	5	5	2	3	1	3	2	2			1				1		7	4			6	6	1				1		2					10	"I have not tried to cycle for many years ... and would only cycle on protected cycleways"	

Table 25: Effects of mental health on travelling by bus

Main theme	Sub-themes	Anxiety (n=52)		Panic disorder (n=29)		Phobias (n=19)		PTSD (n=17)		OCD (n=12)		SAD (n=12)		Bipolar (n=5)		ADHD (n=6)		Depression (n=50)		Personality disorders (n=7)		Stress (n=50)		Eating disorders (n=12)		Substance dependence (n=8)		Autism (n=12)		Antenatal or postnatal depression (n=18)		Psychotic disorders (n=6)		Dissociative disorders (n=1)		Total number of participants	Example Quote(s)
		Current (n=27)	Previous (n=29)	Current (n=10)	Previous (n=22)	Current (n=10)	Previous (n=10)	Current (n=8)	Previous (n=9)	Current (n=6)	Previous (n=8)	Current (n=3)	Previous (n=9)	Current (n=2)	Previous (n=3)	Current (n=1)	Previous (n=5)	Current (n=25)	Previous (n=30)	Current (n=3)	Previous (n=5)	Current n (=26)	Previous (n=30)	Current (n=6)	Previous (n=7)	Current (n=1)	Previous (n=7)	Current (n=7)	Previous (n=8)	Current (n=0)	Previous (n=18)	Current (n=3)	Previous (n=4)	Current (n=1)	Previous (n=0)		
Affects ability to travel by bus		21	13	7	14	8	4	7	5	6	4	2	7	2	2	1	4	17	12	3	3	19	12	4	4	1	5	4	5	0	9	3	2	0	0		
Journey issues	Route planning difficulty	2	1		1	1		1										2				2													3	"If I'd not had the time to practice going on the bus to somewhere totally new, I would most likely get lost"	
Avoidance	Avoids crowds / interaction with others	7	3	2	4	2	1	3	3	1		1	2	2				6	3	2		5	3	2	1	1	2	1	2		3	2		1	1	9	"If I'm too anxious I can't take familiar buses because of having to interact with other people"
	Avoids noisy environments		1																1															1	1	1	"Difficult in crowded or noisy environments"
	Avoids dark / late at night	1	2		2		2	1		1			1						1	1			1	1		1									3	"Bus often late and so left alone at night at the bus stop is sometimes worrying"	
	Avoids travel/ leaving the house		1		1			1		1									1				1													1	"Not wanting to go anywhere"
	Avoids new places / environments	1				1																	2	1				1	1							2	"I have minor seizures, and can go past my stop and be uncertain where I am if the bus has moved into unknown territory"
Associated activities	Concern over paying / ringing the bell	2		1					1									1	1			1	1						1						2	"Anxiety about saying where I'm going, about having the exact money, about where I'm going to sit, getting off at the correct stop. Do I press the button, or hope someone else will?"	
	Concern over getting off at the correct stop	4		1					1			1						2	1			3	3						1						5	"I forget where I'm going and what it's called" "simply struggling to know what stop to get off at. There's basically far too many stressful variables for me to take unfamiliar bus routes alone"	
	Concern over waiting alone at the stop		2		1		1	1	1									1	1									1							2	"Not actually being on the bus but waiting for the bus. I end up paying more for a taxi as I don't want to wait alone"	
	General discomfort	1	2	2				1		2	2							1	1	1	1	1	1								1	1			2	"My mental illness would prevent me being comfortable on a bus for a long period"	
	Previous negative experience	1																	1				1												1	"If when I am required to use a bus, I feel very on edge, having witnessed violence during my journey"	
Environment	Concern over cleanliness	1																1				1														1	"Anxiety about public and germs due to immunosuppression"
	Confined space		1		1	1		1		1									1		1		1		1											1	"[I dislike it] if I get pinned in a corner"
Accessibility	Physical difficulty	1	1	1	1					1	1							2				1	1	2	1			1	1							3	"[I worry about] walking to and from my seat, bumping into people and the other seats [along the way]"
No issue	Will ride the bus	5	3	2	2	2	1			1	1					1		1	4			2	4						1							7	"As I would be able to get off the bus at any point, it wouldn't worry me"

Table 26: Effects of mental health on travelling by train

Main theme	Sub-themes	Anxiety (n=52)		Panic disorder (n=29)		Phobias (n=19)		PTSD (n=17)		OCD (n=12)		SAD (n=12)		Bipolar (n=5)		ADHD (n=6)		Depression (n=50)		Personality disorders (n=7)		Stress (n=50)		Eating disorders (n=12)		Substance dependence (n=8)		Autism (n=12)		Antenatal or postnatal depression (n=18)		Psychotic disorders (n=6)		Dissociative disorders (n=1)		Total number of participants	Example Quote(s)
		Current (n=27)	Previous (n=29)	Current (n=10)	Previous (n=22)	Current (n=10)	Previous (n=10)	Current (n=8)	Previous (n=9)	Current (n=6)	Previous (n=8)	Current (n=3)	Previous (n=9)	Current (n=2)	Previous (n=3)	Current (n=1)	Previous (n=5)	Current (n=25)	Previous (n=30)	Current (n=3)	Previous (n=5)	Current n (=26)	Previous (n=30)	Current (n=6)	Previous (n=7)	Current (n=1)	Previous (n=7)	Current (n=7)	Previous (n=8)	Current (n=0)	Previous (n=18)	Current (n=3)	Previous (n=4)	Current (n=1)	Previous (n=0)		
Affects ability to travel by train		21	13	7	14	8	4	7	5	6	4	2	7	2	2	1	4	17	12	3	3	19	12	4	4	1	5	4	5	0	9	3	2	0	0		
Journey issues	Route planning difficulty	2	1			1							1			1		1	1			2	1					1	2							3	"[I would need to] remember where the train stops and process the information, having the chance to write down all the relevant information according to my journey"
Avoidance	Avoids crowds / interaction with others	4	4		4		1	1			1							4	2			3	2					1					1	1	7	"Crowded trains can also cause issues, I need to be able to sit down, otherwise I can begin to feel anxious and potentially have panic attacks"	
	Avoids noisy environments		2		1		1												1																2	"Difficult in crowded or noisy environments"	
	Avoids dark / late at night	1	1		1		1			1	1		1						2			1				1									2	"Normally anxious about the waiting environment, especially if it is isolated or dark outside"	
	Avoids travelling alone	3	2	2	3	2	1	3	2		2	1	1	1		1	4	1	2			3	1	1	1		2		2		4	2			5	"I would only go on a train journey with someone else as I would prefer the sense of comfort being with someone else"	
Associated activities	Concern over time - missing the train or stop	3	1	1	1					1	1		1					2	2	1	1	3	4					1				1	1		5	"I worry about missing the train or missing my stop and I worry about people sitting next to me and blocking me in my seat when I need to get off"	
	Difficulty buying tickets	3	1	1	1					1	1		1					2	2	1	1	3	3					1				1	1		5	"I've never travelled alone on a train so rely on other people to help me with buying tickets, getting to the right platform etc"	
	Concern over luggage	1																					1												1	"I get anxious about storing my bags in luggage areas or above the seats in case someone might steal them or I might not be able to lift them down"	
	Lack of personal control	4		1	1			1										2	1			1	1					1							5	"Fear being on platform, not on the train itself"	
	Fear of waiting on the platform		1			1	1													1															1	"I don't like the fact that I cannot get off the train at any point. I have to wait until it stops"	
Environment	Concern over cleanliness	1																1				1													1	"Anxiety about public and germs due to immunosuppression"	
	Confined space	2				1												1				1	1				1	1							2	"Sitting in physical proximity to other people with no leg space is massively stressful"	
Accessibility	Physical difficulty		1	1	1					1	1							1					1	2	1			1	1						2	"Stations being accessible [is not always the case]" "Require 1:1 support, boarding and disembarking is slow and can get restless on long journeys"	
Previous experience	Distraction	1		1														1				1													1	"Intrusive thoughts occasionally occur at train stations"	
	Safety concern		1					1																											1	"If I am passing through a big city, I worry that I might see the man who attacked me as I have seen him before in train stations in London and Birmingham"	
No issue	Will ride the train	2	1	1	1	2		1										3		1	1	2													3	n/a	

C.2 Effects of the built environment on mental health

Table 27: Negative effects of travelling as a pedestrian on mental health

Main themes	Sub-themes	Anxiety (n=52)		Panic disorder (n=29)		Phobias (n=19)		PTSD (n=17)		OCD (n=12)		SAD (n=12)		Bipolar (n=5)		ADHD (n=6)		Depression (n=50)		Personality disorders (n=7)		Stress (n=50)		Eating disorders (n=12)		Substance dependence (n=8)		Autism (n=12)		Antenatal or postnatal depression (n=18)		Psychotic disorders (n=6)		Dissociative disorders (n=1)		Total no. of participants	Example(s)	Example quote(s)	Reported effect on mental health
		Current (n=27)	Previous (n=29)	Current (n=10)	Previous (n=22)	Current (n=10)	Previous (n=10)	Current (n=8)	Previous (n=9)	Current (n=6)	Previous (n=8)	Current (n=3)	Previous (n=9)	Current (n=2)	Previous (n=3)	Current (n=1)	Previous (n=5)	Current (n=25)	Previous (n=30)	Current (n=3)	Previous (n=5)	Current (n=26)	Previous (n=30)	Current (n=6)	Previous (n=7)	Current (n=1)	Previous (n=7)	Current (n=7)	Previous (n=8)	Current (n=0)	Previous (n=18)	Current (n=3)	Previous (n=4)	Current (n=1)	Previous (n=0)				
Other people	Busy environments	4	3	2	4	2		2		2	4	1	1	2			2	3	3	2		2	5	3	2		2	1	3		4	2			8	Too many people; People rushing around	"When the environment is very busy, it can raise anxiety levels and make me feel uncomfortable"	Increased anxiety	
	Overcrowded	3	3	2	4	2		2	1	1	1		2	1	1		2	5	2	1	1	4	3	1	2		2	1	1		3	1	1		6	Crowded streets; Lack of personal space	"... crowded streets/ public places all increase anxiety"	Increased anxiety	
	Presence of other people	3	2	2	2	1		1		1	2	1		1			1	3	1	2	1	2	2	2			1		1		1	2	1		4	Fear of unexpected interaction with acquaintances	"There are some places I will avoid, for the fear of seeing certain people"		
	Unpredictable behaviour of other people	4	1		2	1		2			1			2	1			1	5		1		4		1			1	2	2		1	1			4	Fear of being followed/ watched/ attacked by others; Difficulty judging whether a driver will give way to pedestrians	"Don't know what traffic will do especially at big junctions" "I have to look over my shoulder after I have passed someone to ensure they're not following me"	Increased anxiety
	Unsafe behaviour of other people	3			1	1			1	1		1							2	1			2				1		2	1					4	Drivers failing to stop at pedestrian crossings; Pedal cyclists disobeying road traffic regulations; Other road users not paying attention	"Zebra crossing, if car deliberately doesn't stop" "Cyclists terrify me as they don't obey the rules"	Increased anxiety	
	Lack of travel companion	2		1	1	2		2			2	1	1	2			2	2		2		2		1	1			2		2	2					2		"I certainly won't go anywhere if... on my own"	
	Presence of vehicles	1	1						1							1			2				2					1								2	Too many vehicles in pedestrian environment	"Too much traffic"	
Infrastructure design/ maintenance	Confined spaces	2	3	1	3	1		1	1		2	1		1		1	1	1	1		1	1	2	1		1		1		1		1			5	Subways; Tunnels; Lifts	"Enclosed walkways, subways... etc. make me vigilant"	Increased anxiety	
	Inadequate lighting	2	2		1		2	1	1	1			1					2				2	1			1									4	Dark walkways; Poorly-lit streets	"Poorly lit streets at night make me more anxious"	Increased anxiety	
	Artificial environments	1	2		2													1	2			1	2			1									3	Too much concrete; Lack of windows to see outside	"Too much concrete"	Increased anxiety	
	Unsafe environments		2			1	1											1	1				2	1											2	Low handrails/ barriers on bridges	"Bridges with low railings"		
	Tall buildings		1		1		1		1										1				1												1		"The... sky scraper type buildings... do not make me feel safe when walking near them"		
	Obstructed walkways		1					1											1										1						1	Vegetation obstructing walkways	"Uncut vegetation which prevents visibility"		
	Lack of pavements	1																1									1								1		"Pavements that start out on one side of the road but that then require you to cross to the other side"		
	Lack of rest areas	1																1					1												1	Lack of seating	"[Lack of] seats to rest"		
	Uneven surfaces	1																1					1												1		"Uneven surfaces"		
Lack of pedestrian crossings																											1								1		"We need more traffic light crossings"		
Atmosphere	Noise	3	4	1	2			1		1					1		3	4				2	6	1			1							7	Loud vehicles/ people/ music	"I had a panic attack... [I was] overwhelmed with the noise"	Increased anxiety		
	Poor air quality		1						1										1				1												1	Air pollution	"[Poor] air quality"		
	Bright/ flashing lights	1																1					1												1		"Bright lights, strobe/ flashing lights"		
Route planning and navigation	Unfamiliar routes/ environments	3	1	1	2	1	1	1	1	1	1	1	2	1		1	2	2	1		4	1	2		1	1		1		2	1			4	Walking to/ in a new environment	"I tend to only walk near to home/ familiar areas"	Increased anxiety		
	Navigation difficulties	1	1		1								1						2			1	2	1				1		1					1	Wayfinding difficulties; Getting easily lost	"If I feel I can't find my way I can start to panic"	Increased anxiety	

RQ3 – Inclusion of mental health



TRL

Crowthorne House, Nine Mile Ride,
Wokingham, Berkshire, RG40 3GA,
United Kingdom

T: +44 (0) 1344 773131

F: +44 (0) 1344 770356

E: enquiries@trl.co.uk

W: www.trl.co.uk

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