



# HEALTH IMPACT ASSESSMENT

## WORCESTERSHIRE FOURTH LOCAL TRANSPORT PLAN

November 2017

Report Prepared By: **DR MARCUS CHILAKA, Ph.D, MBA, FRSPH**

Commissioned by



## ***Foreword***

It is now widely recognised that various factors combine in different ways to determine the health and wellbeing status of individuals and population groups. Included among these determinants of health are socio-economic, environmental, biological and lifestyle factors. Health impact assessment (HIA) seeks to make projections, in a systematic way, about the ways (and pathways) in which any human endeavour can affect the health and wellbeing of a given population. The overall aim of such assessments is to promote public health through maximising identified positive impacts and also recommending steps for mitigating possible negative impacts.

This HIA has been commissioned by Worcestershire County Council. It gives indications of the likely general health impacts of the infrastructure, services and technology which comprise the proposed Worcestershire Fourth Local Transport Plan.

Appreciation goes to the Transport Strategy Team and Public Health Directorate of Worcestershire County Council who facilitated the HIA project; and to members of the GHEM Assessment team.

### ***For Information contact:***

#### **Dr Marcus Chilaka**

Global Health, Environment and Management (GHEM) Consultants  
Herbert Minton Building  
79 London Road  
Stoke-on-Trent  
ST4 7QE  
Tel: 01782 746611  
Email: [marcus@ghemconsultants.co.uk](mailto:marcus@ghemconsultants.co.uk)

November 2017

*Cover Photograph: Illustrative images from Worcestershire's Local Transport Plan, Courtesy of Worcestershire County Council*

## CONTENTS

	Page
List of Abbreviations	5
<b>Introduction</b>	<b>6</b>
<b>Chapter 1 What is Health Impact Assessment?</b>	<b>7</b>
1.1 Introduction	7
1.2 Methodology and Scope	9
1.3 General steps in HIA	9
1.3.1 Screening	9
1.3.2 Scoping	10
1.3.2.1 Study population	10
1.3.2.2 Determinants of health considered	11
1.3.3 Baseline assessment and community profile	11
1.3.4 Stakeholder consultation and involvement	12
1.3.5 Evidence and Analysis	12
1.4 Recommendations	13
1.5 Limitations of this HIA	14
<b>Chapter 2 Background and Description of Project</b>	<b>15</b>
2.1 Background	15
2.2 Vision for the proposed Plan	16
2.3 Indicative delivery of proposed Plan	16
2.4 Proposed facilities and services	17
2.5 Forecasts and assumptions	17
2.6 Worcestershire Community profile	27
2.6.1 Health and well-being in Worcestershire	28
2.6.2 Economy and Transport	29
<b>Chapter 3 Policies relevant to Worcestershire LTP</b>	<b>30</b>
3.1 National policies	30
3.1.1 Local Transport Act	30
3.1.2 Building sustainable transport into new development	30
3.1.3 Planning Policy Statements	31
3.1.4 The Public Health (Choosing Health) White Paper	32
3.2 Worcestershire Local Policies	33
3.2.1 Worcestershire Strategic Economic Plan (up to 2020)	33
3.2.2 Worcestershire Joint Health and Wellbeing Strategy (2016-21)	34
3.3 Health Inequalities	36
3.4 Policy Analysis	37

<b>Chapter 4</b>	<b>Evidence on the health impacts of transport schemes</b>	<b>39</b>
4.1	Introduction	39
4.2	Mobility across the life course among different social groups	41
4.2.1	Influence of Income, Ethnicity and Gender	42
4.2.2	Influence of Age and Disability	43
4.2.3	Public travel patterns in the UK relevant to the WLTP	44
4.2.3.1	Walking	44
4.2.3.2	Cycling	45
4.2.3.3	People with mobility problems	45
4.2.3.4	Public Transport	45
4.2.3.5	Public attitudes to bus services	47
4.2.4	Physical activity	48
4.2.5	Access to services and amenities; and social exclusion	50
4.2.6	Air pollution	51
4.2.7	Road traffic injuries and death	51
4.2.8	Noise pollution	52
4.2.9	Community severance	52
4.2.10	Equity/ Inequalities	52
4.3	Limitations of evidence review	52
4.4	Conclusion	53
<b>Chapter 5</b>	<b>Health impacts of Worcestershire LTP</b>	<b>54</b>
5.1	Introduction	54
5.2	<b>Positive health impacts</b>	<b>56</b>
5.2.1	Good transport leads to good health	56
5.2.2	Outdoor environment, access to quality green space	57
5.2.3	Economic empowerment and health	60
5.2.4	Community cohesion, Social capital and health	62
5.2.5	Impact of leisure and recreational facilities	62
5.2.6	Small and medium Enterprises (SMEs) and health	63
5.2.7	Sustainable development within Worcestershire LTP	63
5.3	<b>Negative health impacts</b>	<b>65</b>
5.3.1	Construction related injuries during construction phase	65
5.3.2	Traffic congestion and air pollution	66
5.3.3	Noise pollution and risk of accidents	67
5.3.4	Transport and climate change	68
5.4	Conclusion on health impacts	68
<b>Chapter 6</b>	<b>Recommendations</b>	<b>70</b>
6.1	Measures to optimise potential health outcomes	70
<b>Appendix 1</b>	<b>HIA Impact Matrices</b>	<b>73</b>

## LIST OF ABBREVIATIONS

ATNIP	: Active Travel Network Investment Programme
AQMA	: Air Quality Management Area
CCG	: Clinical Commissioning Group
CHD	: Coronary Heart Disease
COPD	: Chronic Obstructive Pulmonary Disease
CSR	: Corporate Social Responsibility
CVD	: Cardiovascular Disease
DOH	: Department of Health
GHEM	: Global Health, Environment and Management
JHWB	: Joint Health and Wellbeing Board
JSNA	: Joint Strategic Needs Assessment
HIA	: Health Impact Assessment
IPCC	: Intergovernmental Panel on Climate Change
HPP	: Healthy Public Policy
LTP	: Local Transport Plan
NHS	: National Health Service
ODPM	: Office of Deputy Prime Minister
PCT	: Primary Care Trust
RTC	: Road Traffic Collision
SME	: Small and Medium Enterprise
WHO	: World Health Organisation
WLTP4	: Worcestershire Fourth Local Transport Plan

## Introduction

---

This Health Impact Assessment (HIA) has been commissioned by Worcestershire County Council, to assess the potential health and wellbeing impacts that may result from the proposed Fourth Local Transport Plan (LTP). The overall aim is to identify opportunities for maximising the potential positive health & wellbeing impacts and minimising any potential negative impacts.

The specific objectives of this impact assessment are to:

**1. Identify health and wellbeing impacts of the Local Transport Plan:**

Specifically, to identify and prioritise the potential direct and indirect health impacts on the users of the Worcestershire Fourth Local Transport Plan, employees and local people (those living along the transport routes) during the construction and operational phases of the aspects of the Plan.

**2. Develop a set of recommendations for optimising the impacts on health and wellbeing:**

Specifically, to develop a range of mitigation and enhancement measures to minimise any potential negative health impacts and maximise the positive health benefits of the Transport Plan. Measures must be feasible, financially viable and deliverable; and able to be incorporated into the on-going design and implementation of the Worcestershire LTP.

The HIA draws on previous and current work on developing healthy, viable and sustainable transport and urban regeneration schemes.

## Chapter 1

# **WHAT IS HEALTH IMPACT ASSESSMENT?**

---

### 1.1 INTRODUCTION

The international Gothenburg Consensus defines Health Impact assessment (HIA) as “a combination of procedures, methods and tools by which a policy, program or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population.”<sup>1</sup> HIA is a systematic approach to identifying the differential health and wellbeing impacts, both positive and negative, of plans and projects.

HIA uses a range of structured and evaluated sources of qualitative and quantitative evidence that includes public and other stakeholders' perceptions and experiences as well as public health, epidemiological, toxicological and medical knowledge. It is particularly concerned with the distribution of effects within a population, as different groups are likely to be affected in different ways. Therefore, HIA looks at how health and social inequalities might be reduced or widened by a proposed plan or project.

The primary aim of HIA is to add value to the decision making process by making available a systematic analysis of the potential impacts as well as recommending options, where appropriate, for enhancing the positive impacts, mitigating the negative ones and reducing health inequalities. This is especially so given the increasing realisation that enabling healthy lifestyles can mean long-term savings in the costs of health treatment.<sup>2</sup>

HIA applies both the biomedical and social definitions of health, and therefore recognises that although illness and disease (mortality and morbidity) are useful ways of understanding and measuring health, they need to be fitted within a broader understanding of health and wellbeing in order to be properly useful. A range of factors are known to influence the health status of individuals and groups within a given population. The factors range from individual genetic make-up to lifestyle and wider

---

<sup>1</sup>WHO European Centre for Health Policy; Health impact assessment: main concepts and suggested approach; Gothenburg consensus paper; WHO Regional Office for Europe; 1999.

<sup>2</sup> CABI 2000. Future health: sustainable places for health and well-being. Commission for Architecture and the Built Environment (CABI).

socio-economic conditions. In other words, good health is determined by a range of factors and conditions, many of which are linked to the quality, accessibility and sustainability of the physical environment; these factors are collectively referred to as the determinants of health, some of which are illustrated in figure 1<sup>3</sup>.

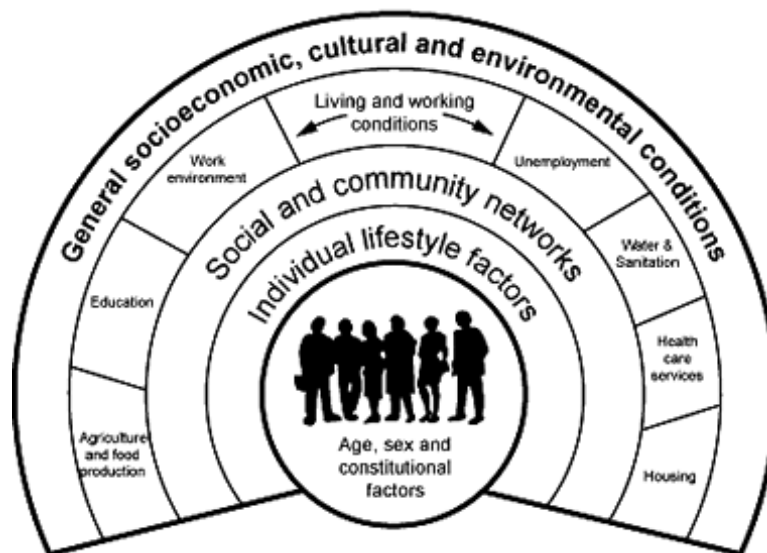


Figure 1: Wider determinants of health

Health Impact Assessment consequently use the following broad World Health Organization (WHO) psycho-social definition of health as: “the extent to which an individual or group is able to realise aspirations and satisfy needs, and to change or cope with the environment. Health is therefore a resource for everyday life, not the objective of living; it is a positive concept, emphasising social and personal resources, as well as physical capacities.”<sup>4</sup>

The above definition builds on, and is complementary to the longer established World Health Organization definition that “Health is a state of complete physical, social and mental wellbeing and not simply the absence of disease or infirmity”<sup>5</sup>.

<sup>3</sup> Dahlgren G and Whitehead M 1991: Policies and Strategies to Promote Social Equity in Health. Stockholm, Institute for Future Studies

<sup>4</sup> WHO 1984: Health Promotion: A Discussion Document on the Concepts and Principles; WHO Regional Office for Europe; Copenhagen

<sup>5</sup> WHO 1946: Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June 1946, and entered into force on 7 April 1948.



## 1.2 Methodology and Scope

The methodology used in this assessment and report is based on established good practice guidance on HIA developed by the Department of Health; it also incorporates procedures outlined in the Urban Health Impact Assessment Methodology (UrHIA) and the Health Development Agency guide for Health Impact Assessment<sup>6,7,8</sup>

This HIA therefore takes a holistic approach or ‘systems view’ of potential health impacts in conceptualising the general links between transport and regeneration programmes and their possible health and wellbeing impacts.

## 1.3 GENERAL STEPS IN HIA

### 1.3.1 Screening

This stage assesses the value of carrying out an HIA by examining the importance of a plan or project and the significance of any potential health impacts. The following were some of the considerations that pointed to the added value derivable from undertaking a HIA of the Worcestershire Fourth Transport Plan:

- The scale of the development – Major transport schemes involve substantial investment in infrastructure and services.
- The large population under consideration, and who are likely to be affected by the project – Worcestershire has a population of 583,000 (mid-2016 estimate) at the time of this assessment.
- The long-term nature of the project – spanning a period of 13 years, 2017 – 2030.
- The necessity of addressing established health needs of the population in the surrounding neighbourhoods, and Worcestershire County in general; as well as identified issues relating to health inequalities; and

---

<sup>6</sup> Health Development Agency (2002), *Introducing health impact assessment (HIA) informing the decision-making process*, England

<sup>7</sup> Dreaves H, Pennington A, Scott-Samuel A (2015): *Urban Health Impact Assessment Methodology (UrHIA)*. Liverpool: IMPACT, University of Liverpool. [www.healthimpactassessment.co.uk](http://www.healthimpactassessment.co.uk)

<sup>8</sup> Douglas M, Thomson H, Jepson R, Hurley F, Higgins M, Muirie J, Gorman D (eds) *Health Impact assessment of Transport Initiatives: A Guide*, NHS Scotland Edinburgh 2007.

- The need to strengthen the Healthy Public Policy (HPP) Initiative being championed by the World Health Organisation (WHO);<sup>9</sup> and considering that the Worcestershire Joint Health and Well-being Strategy (2016-21)<sup>10</sup> promotes the health and wellbeing of residents and support efforts to reduce health inequalities by creating enabling economic, physical and social environment which promotes and facilitates healthy lifestyles.

### **1.3.2 Scoping**

This stage outlines the modalities for carrying out the HIA by setting the 'terms of reference' for the HIA i.e. the aspects to be considered, geographical scope, population groups that might need particular focus, what will be excluded from the HIA, how the HIA process will be managed and so on.

The scope of this HIA was the proposed infrastructure, services and technology which are included in the Worcestershire Fourth Local Transport Plan. Also included are the residential and commercial areas around the various development sites connected with the Transport Plan.

#### **1.3.2.1 Study population**

The population scope of this HIA was:

- Users of the transport facilities
- Workers (builders, contractors, administrators etc.) who will be engaged in constructing and managing the transport infrastructure and facilities when they become operational
- Local residents, tourists and visitors to various places of interest in Worcestershire.

---

<sup>9</sup> WHO 1988. Adelaide Recommendations on Healthy Public Policy; Second International Conference on Health Promotion, Adelaide, South Australia, 5-9 April 1988.

<http://www.who.int/healthpromotion/conferences/previous/adelaide/en/index1.html> (accessed 15/1/11)

<sup>10</sup> Worcestershire Health and Well-being Board: Joint Health and Well-being Strategy (2016-21).

[file:///C:/Users/Owner/Downloads/Joint\\_Health\\_and\\_Well\\_being\\_Strategy\\_2016\\_to\\_2021.pdf](file:///C:/Users/Owner/Downloads/Joint_Health_and_Well_being_Strategy_2016_to_2021.pdf)

The key population sub-groups that this HIA focused on were men, women, older people; people with disabilities, children and young people; people from minority ethnic backgrounds and those on low incomes or unemployed.

#### **1.3.2.2 Determinants of health considered**

The key determinants of health and wellbeing considered were:

1. Infectious and non-infectious/ chronic diseases and other health conditions that were of concern to the study population
2. Physical injury
3. Mental health and wellbeing (including nuisance and annoyance effects)
4. Employment and enterprise
5. Transport and connectivity
6. Learning and education
7. Crime and safety
8. Health and social care
9. Social capital and community cohesion
10. Culture and leisure
11. Lifestyle issues
12. Energy and waste

#### **1.3.3 Baseline assessment and community profile**

This stage uses routine national and local datasets (e.g. national census, local surveys, area profiles, and other demographic, social, economic, environmental & health information) to develop a community profile with a strong focus on health and wellbeing issues, and identification of vulnerable groups. The community profile serves as a baseline from which to assess the potential positive and negative impacts on health and any health inequalities.

This HIA utilised already existing health and community profiles available from the national census, NHS Worcestershire and the Worcestershire County Council.

### 1.3.4 Stakeholder consultation and involvement

This stage uses workshops, questionnaires, interviews, surveys and other methods of consultation and involvement to engage key stakeholders, with a local context of the area, in the identification and appraisal of the potential health and wellbeing impacts; in the development of mitigation and enhancement measures; and in developing options for monitoring and evaluating the identified impacts.

Stakeholder involvement for this HIA utilised the *LTP4 Consultation Report* (Autumn 2017)<sup>11</sup> compiled by the Worcestershire County Council and Worcestershire Local Enterprise Partnership. It was a comprehensive 432 page report produced from the evaluated responses from the consultation on the Local Transport Plan.

### 1.3.5 Evidence and Analysis

Being a rapid assessment, evidence was gathered from a variety of sources including published and web-based literature, other HIA reports, consultation with stakeholders in the Worcestershire LTP4 and projects documents relating to WLTP4, including the Network Management Plan.

The HIA used matrix tables (appendix 1) to analyse the potential positive and negative health and wellbeing impacts. The identified impacts were then classified using the levels defined in Table 1. Actual quantification of health impacts was outside the scope of this assessment; consequently, the health impacts were described in broad generic and descriptive terms.

Significance level	Criteria
Major +++/-- (positive or negative)	Health effects are categorised as major if the effects could lead directly to mortality/death or acute or chronic disease/ illness. The exposure tends to be of high intensity and/or long duration and/or over a wide geographical area.
Moderate ++/-- (positive or negative)	Health effects are long term nuisance impacts or may lead to exacerbation of existing illness. The exposure

---

<sup>11</sup> Worcestershire County Council. LTP4 Consultation Report (Autumn 2017).

	tends to be of moderate intensity and/or over a relatively localised area.
Minor/ Mild +/- (positive or negative)	Health effects are generally nuisance level/ quality of life impacts e.g. noise, odour etc. The exposure tends to be of low intensity and/or short/intermittent duration
Neutral/ No effect ~	No effect or effects within the bounds of normal/ accepted variation

Table 1: Classification of impacts<sup>12</sup>

For each potential health impact ten key issues were considered

- Which population groups are likely to be affected and in what way?
- Is the effect reversible or irreversible?
- Does the effect occur over the short, medium or long term?
- Is the effect permanent or temporary?
- Does it increase or decrease with time?
- Is it of local, regional or national importance?
- Is it beneficial, neutral or adverse?
- Are health standards or environmental objectives threatened?
- Are mitigating measures available and is it reasonable to require these?
- Are the effects direct, indirect and or cumulative?

#### 1.4 Recommendations

A set of general recommendations were developed for the construction and operational phases of Worcestershire LTP4, with the purpose of furthering positive health impacts and mitigating possible negative health impacts.

---

<sup>12</sup> Institute of Occupational Medicine (IOM) 2008: Strategic Consulting Report: 644-002061. London

## **1.5 Limitations of this HIA**

The main limitations of this HIA were:

- The use of ward level data as being representative of the employees and existing residents living in and around the proposed Plan and transport infrastructure;
- The difficulty in considering the positive and negative impacts on tourist and visitors to the areas given that we do not know anything about their health, demographic, socio-economic, or cultural characteristics; and
- Lack of detailed consideration of the equipment, activities and processes that will be undertaken during the construction phase.

These limitations have not affected the overall and general accuracy of the findings of the HIA but have made it more difficult to be precise about the types and levels of impact and the specific population groups that are likely to be affected.

## Chapter 2

# BACKGROUND AND DESCRIPTION OF PROJECT

---

## 2.1 Background

The fourth Worcestershire LTP represents an ambitious investment programme in the county's transport networks, including infrastructure, technology and services which are essential to support planned growth, to ensure continued social and economic success of the county as a highly desirable place to live, work and visit. The Local Transport Plan sets out the issues and priorities for investment in transport infrastructure, technology and services to support travel by all relevant modes of transport, including walking, cycling, rail, highways (car, van, freight and motorcycles), bus and community transport<sup>13</sup>.

The LTP is underpinned by Worcestershire County Council's Corporate Plan "*Shaping Worcestershire's Future 2017-2022*" with its four key priorities:

1. Open for Business;
2. The Environment;
3. Children and Families;
4. Health and Well-being

The LTP also reflects the Worcestershire Local Enterprise Partnership's vision for the county, which is: "*To build a connected, creative, dynamic economy that delivers increased prosperity for all those who choose to live, work, visit and invest in Worcestershire.*" The Worcestershire LEP is working to:

1. Create 25,000 jobs;
2. Increase Gross Value Added (GVA) by £2.9bn;
3. Contribute towards the delivery of 21,500 new homes by 2025

The summaries of the major schemes/ projects of the LTP are shown in tables 2-5, while spatial locations of the development components are shown in figures 2.1 – 2.3

---

<sup>13</sup> Worcestershire City Council. Worcestershire's Local Transport Plan (LTP) 2017-2030

## **2.2 Vision for the proposed Plan**

The principal aim of the Worcestershire LTP is to deliver the greatest possible benefits through the delivery of cost effective transport infrastructure and services, or in other words, achieving best value for money. And in support of the themes of the Worcestershire Corporate Plan, a series of Local Transport Plan objectives have been identified, which align with these key themes and wider national objectives for transport<sup>14</sup>.

Better access (transport) is seen as a key component of a successful modern economy. Worcestershire benefits from a comprehensive multimodal transport network of railways and highways. It is a major determinant of the quality of place for people to live, work, visit and invest. Investments to improve the efficiency and capacity of existing networks can deliver greater economic yields at lower societal costs. The Worcestershire LTP focuses specifically on this, with a range of schemes which seek to strengthen the integrity (resilience), reliability and functionality of the transport networks to support planned growth. The quality, location and capacity of the transport infrastructure impacts directly on business investment decisions. Congested infrastructure networks with poor journey time reliability can restrict growth. Tackling these issues can unlock development and boost private sector investment, with multiplier effects far exceeding original costs.

## **2.3 Indicative delivery of proposed Plan**

The Transport Plan will come forward over an anticipated 13-year (2017-2030) timeframe. Worcestershire County Council recognises that the scale of proposed transport schemes in this Plan cannot be delivered concurrently, as scheme development requires significant resources, including funding. To manage this, transport schemes will be prioritised for delivery, based on their ability to meet the aims and objectives of the Local Transport Plan and those of local and national funding bodies. For larger schemes, it may be necessary to develop and deliver schemes using a phased approach

---

<sup>14</sup> Worcestershire City Council. Worcestershire's Local Transport Plan (LTP) 2017-2030



The schemes have been broadly prioritised according to their current development status. Some schemes are either about to be or in construction; others are schemes at the stage of business case development/scheme design - funding required. Others are at the stage of responding to plans - funding required; and still others are at the more preliminary stages of being emerging concepts - funding required.

## **2.4 Proposed facilities and services**

Proposed major transport schemes within the LTP4 include:

Southern Link Road Phase 4 (Ketch to Powick Hams);  
Worcestershire Parkway;  
Redoubling of the Cotswold line;  
A38 Bromsgrove Key Corridor;  
Persore Northern Access Improvements;  
Kidderminster Transport Strategy;  
Worcester Western Link Road;  
Hartlebury Railway Station Parkway Enhancement;  
Blakedown Railway Station Parkway Enhancement;  
Fernhill Heath New Parkway Railway Station;  
Rushwick New Parkway Railway Station.

In addition, Worcestershire County Council will work with Highways England to bring forward nationally significant schemes within the county, which include:

M42 Junction 1;  
A46 Evesham to Tewkesbury;  
M5 Junction 6.

## **2.5 Forecasts and Assumptions<sup>15</sup>**

- There is growth in vehicular traffic, together with population growth in Worcestershire
- Without proper management, the factors above would result in many of the county's main urban and interurban arterial routes to become increasingly congested beyond traditional peak times.

---

<sup>15</sup> Project documents and briefs from Transport Strategy Team at Worcestershire County Council

- Demand to travel in Worcestershire will continue to grow over the life of this Plan
- Residents, stakeholders and businesses consistently cite congestion as a key concern that needs to be managed wherever possible.
- Whereas 85% of the population in Worcestershire live in the urban areas and on interurban corridors, yet car usage, particularly for shorter trips of up to 3 miles, is at the highest it has ever been in the county's history (Census 2011).
- Worcestershire County Council recognises that the majority of people choose the car as the primary mode of travel, and will continue to do so throughout the life of this Local Transport Plan.
- Rail/ station improvement wherever indicated would include some or all of the following:
  - Improvements to passenger information and station facilities for passengers;
  - Facilities that will cater for current and future demand growth;
  - Improvements to walking /cycling routes to the station;
  - Improvements to access arrangements for cyclists and provide additional new cycle storage facilities;
  - Set-down and pick-up facilities for taxi users and operators;
  - Improve facilities for passengers with disabilities or who experience difficulty using the railway station facilities;
  - Improvement to car parking;
  - Working with Train Operating Companies to improve services.
- Number of people employed directly within the transport, transport hire and travel agency activities in Worcestershire is about 4,505<sup>16</sup>
- There will be extensive network of footpaths, cycleways and green corridors to enhance permeability across the transport network through the Active Travel Network Initiative programme (ATNIP).

Worcestershire County Council acknowledges the critical importance of rail as a key enabler of economic activity and growth, directly connecting economies and strengthening network resilience. It is unsurprising that trends in rail patronage have

---

<sup>16</sup> Worcester Research 2013. The Value of Tourism in Worcestershire.  
<http://www.wlep.co.uk/assets/The-Value-of-Tourism-in-Worcestershire-Final-Report-March-2013.pdf>

exhibited significant growth over recent years. Recognising this, rail plays an essential role in Worcestershire's future transport strategy

Whilst there is no airport within Worcestershire itself, Birmingham International airport is only 40 minutes drive and less than 90 minutes by railway.

Tables 2-5 are summaries of the key features and main schemes of the WLTP4, while figures 2.1-2.3 are maps showing the spatial locations of the main schemes within the development sites

Table 2: Hierarchical definition of passenger transport (Policy IPT1)<sup>17</sup>

The following table sets out Worcestershire County Council's approach to the delivery of passenger transport, taking account of demand, performance and costs (capital and revenue):

Name	Description	Role	Average speed	Demand	Infrastructure costs	Operating costs
<b>HEAVY RAIL</b>	Fully segregated, high capacity passenger railway	Major inter-city and inter-urban corridors	High (40+ mph)	Very high	Very high for new build	Very high
<b>TRAM RAIL</b>	Fully segregated, medium capacity passenger railway	Major urban and inter-urban corridors	Medium - High (20-40+ mph)	High	High (unless built upon committed investments which deliver the infrastructure needed for tram train)	Medium to High
<b>LIGHT RAIL/ TRAMWAY</b>	Mainly segregated, medium capacity passenger railway	Major corridors in large cities	Medium (20-40 mph)	High	High (very high for new segregated sections)	Medium to High
<b>BUSWAY/ BUS RAPD TRANSIT</b>	High quality and capacity bus system	Major corridors in towns and cities and interurban transport corridors	Medium (20-40 mph)	Medium-High	Medium-High (Dependent on extent of segregated busway)	Medium to High
<b>BUS</b>	Conventional bus service	Urban and interurban transport corridors	Low-Medium (10-30 mph)	Medium	Low to Medium	Low to Medium
<b>DEMAND RESPONSIVE TRANSIT</b> (including Community Transport)	Similar to conventional taxi service, although specialist vehicles often provided	Urban/ rural areas and times of day not served by conventional passenger transport services	Low-Medium (10-30 mph)	Low	Low	Low to Medium
<b>TAXI</b>	Conventional taxi service	Urban/ rural areas and times of day not served by	Low-Medium (10-30 mph)	Low	Low	Low to Medium

<sup>17</sup> Worcestershire Local Transport Plan: Transport Policies

		conventional passenger transport services				
--	--	-------------------------------------------	--	--	--	--

**Summary of key features of Strategic Transport Schemes for North East Worcestershire**

<b>Road Transport &amp; Network projects</b>	The area benefits from good access to the national Strategic Road Network, including the M42, A46 and M5. The A38, A456, A491, A448, A441 and A435. Lickey End (M42 Junction 1) is a major Junction Enhancement Scheme. Bromsgrove A38 Strategic Corridor is another major scheme.
<b>Rail Networks and Services</b>	The area benefits from a number of rail stations located at Hagley, Wythall, Barnt Green, Alvechurch, Redditch (the third busiest station in terms of passenger numbers in Worcestershire) and a newly constructed station at Bromsgrove. Wythall Rail Station Enhancement Scheme; Hagley Rail Station Enhancement Scheme; Alvechurch Rail Station Enhancement Scheme
<b>Bus Services and Community Transport</b>	The main centres of Bromsgrove and Redditch have bus interchanges and the area is served by a bus network of prime, core and tributary routes, supported by community transport linking rural areas to Bromsgrove and Redditch. Alexandra Hospital Bus Interchange Scheme which would involve the development of a multi-modal interchange.
<b>Active Travel</b>	Active Travel Network Investment Programme which is a systemic investment in walking and cycling links across the Redditch area to create a comprehensive, integrated off-road network linking residential areas with key trip attractors, including schools, rail stations, town centres and employment locations. This will include surfacing, signage, lighting and public realm improvements to create an attractive and coherent network.
<b>Air Quality Management</b>	There are a number of Air Quality Management Areas (AQMA) in North East Worcestershire: one at Hagley at the junction of the A456 and A491 and three around Bromsgrove on the A38 at Stoke Heath and J1 of the M42, where the A38 crosses the motorway and Worcester Road in Bromsgrove Town Centre. Lickey End ( M42 Junction 1) is a major AQMA Remediation scheme.
<b>General Issues</b>	Parking Strategy: A strategic review to improve parking for cars, motorcycles and covered parking for bicycles

**Table 3: Summary of key features of strategic transport schemes for North East Worcestershire**



Figure 2.1: Strategic Transport schemes for North East Worcestershire

**Summary of key features of Strategic Transport Schemes for South Worcestershire**

<b>Road Transport &amp; Network projects</b>	The area benefits from good access to the National Strategic Highway Network, including the M5, M50, and A46. The A38, A44, A4440, A422, A449, A456, A443 and A4103 and A4104. M5 Junction 6 is one of the major Capacity Enhancement Schemes.
<b>Rail Networks and Services</b>	The area benefits from a number of rail stations located in all the major urban areas including Great Malvern, Worcester, Droitwich Spa. One major scheme is the new Worcestershire Parkway station at the intersection of the Bristol to Birmingham and the Worcester - London (Cotswolds Line) main line railways. There are several Rail Station Improvement Schemes such as in Evesham.
<b>Bus Services and Community Transport</b>	There are bus interchanges and the area is served by a bus network supported by community transport.
<b>Active Travel</b>	Active Travel Network Programmes such as Worcester to Malvern Wells (NCN41) Active Travel Corridor; Vale West Active Travel Corridor; Pershore to Pinvin Active Travel Corridor.
<b>Air Quality Management</b>	There is the designation of three Air Quality Management Areas in Worcester (Dolday/ Bridge Street, Lowesmoor and Rainbow Hill and St John's), with a number of other parts of the city being monitored..
<b>General Issues</b>	South Worcestershire Transport Telematics Investment Package that involves a comprehensive programme of investment in transport telematics, including Variable Message Signs, Real Time Information System displays, Traffic Signalling Improvements and Traffic Monitoring and Information Dissemination Devices to improve access to journey information and enhance the efficiency of Worcestershire's transport networks.

**Table 4: Summary of key features of strategic transport schemes for South Worcestershire**

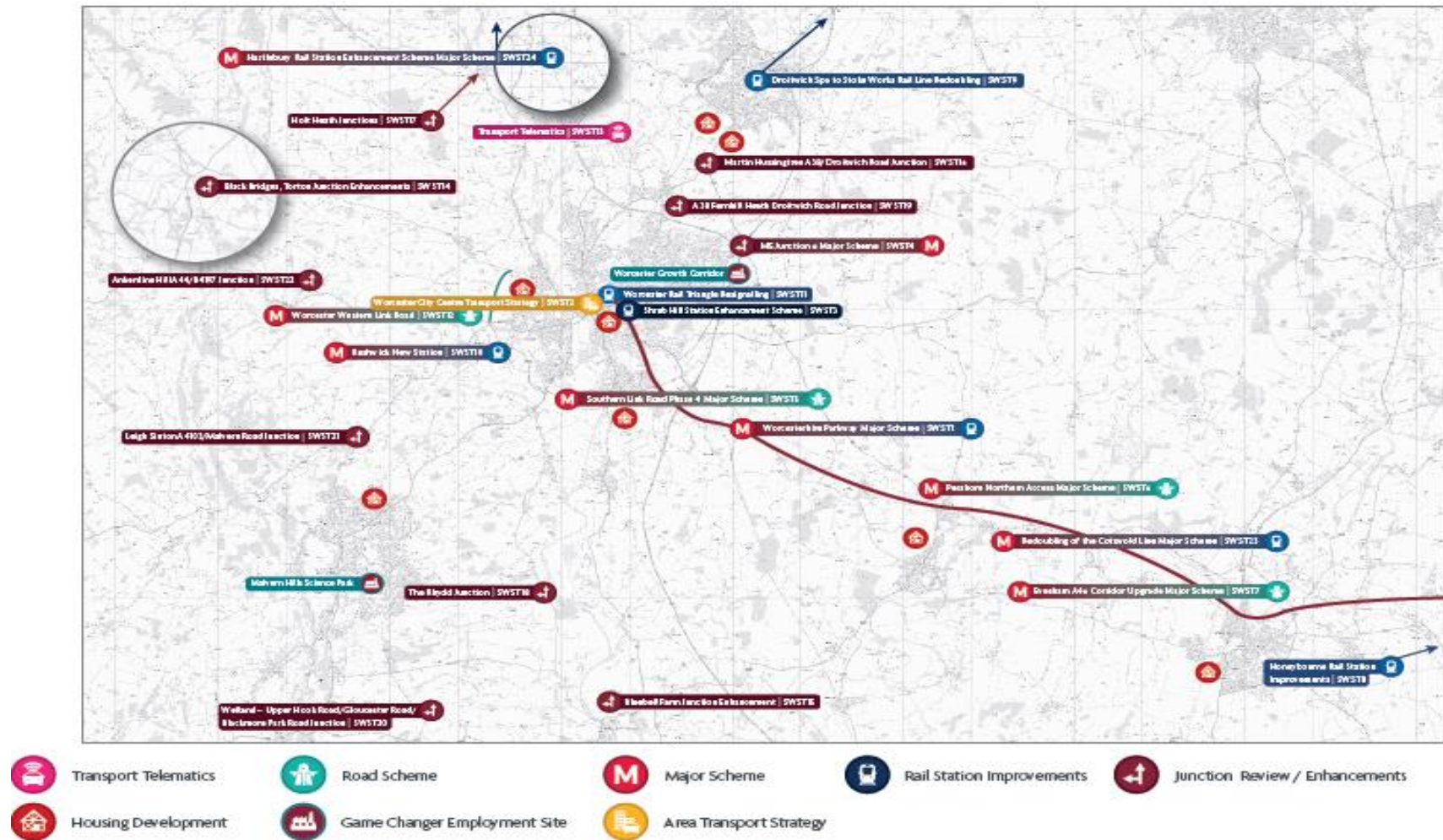


Figure 2.2: Strategic Transport schemes for South Worcestershire



### Summary of key features of Strategic Transport Schemes for Wyre Forest

<b>Road Transport &amp; Network projects</b>	The District does not benefit from local access to the motorway network but has good connections provided by the local principal road network, made up of the A448, A449, A450, A451, A456 and the A4025. Mustow Green Junction Enhancement Scheme. Ring Road Junction and Public Realm Improvement Scheme in Kidderminster
<b>Rail Networks and Services</b>	The district has only two railway stations on the national rail network at Kidderminster and Blakedown. Blakedown Rail Station Enhancement Scheme is a major scheme in the area
<b>Bus Services and Community Transport</b>	There is a poor quality bus station in Kidderminster Town Centre which is not fit for purpose, and will need to be replaced with more suitable passenger transport stopping and interchange facilities. This is supported by a community transport service linking rural areas to the Wyre Forest towns.
<b>Active Travel</b>	Bewdley to Wyre Forest (Dowles Link) is an Active Travel Corridor. Active Travel Network Investment Programme is a systemic investment in walking and cycling links across an area to create a comprehensive, integrated off-road network linking residential areas with key trip attractors, including schools, rail stations, town centres and employment locations. This will include surfacing, signage, lighting and public realm improvements to create an attractive and coherent network.
<b>Air Quality Management</b>	There are two Air Quality Management Areas in the Wyre Forest District: one at Welchgate in Bewdley Town Centre and one on the Kidderminster Ring Road at the Horsefair. Both locations are particularly challenging to mitigate; the former because of historic, dense street patterns and the latter because of traffic volumes.
<b>General Issues</b>	All towns: Transport Telematics Investment Package which would include Variable Message Signs, Real Time Information Systems, Signalling Improvements and Traffic Counters.

**Table 5: Summary of key features of strategic transport schemes for Wyre Forest**



Figure 2.3: Strategic Transport schemes for Wyre Forest

## **2.6 Worcestershire Community Profile**<sup>18,19,20,21</sup>

Worcestershire is a uniquely beautiful, vibrant place with a fascinating history and an exciting future. It is also blessed with a variety of idyllic rural landscapes and attractive urban areas rich in culture and heritage. The county has a population of 579,000 (mid-2015 estimate), with 3.5% comprised of people from ethnic minority group (much lower than the England average of 13.2%). In 2015 the Worcestershire had 351,6172 residents of working age (16-64); and a lower proportion of young children (0-4) and young adults (18-34) and a higher proportion of people aged 45-plus than are seen regionally and nationally. In addition, 21.6% of the population is over the age of 65 which is higher than the West Midlands and England averages. Life expectancy for at birth for men (79.7) and women (83.5) are both slightly higher than the England average of 79.5 and 83.1 respectively

Migration into and out of the county, as well as between districts within Worcestershire, conforms to the established national pattern of migration, with most movement being from rural to urban areas (urbanisation). Over 85% of Worcestershire's population live in the main urban areas, or the main transport corridors that link them together. Much of the projected household growth (over 33%) is due to an increase in one-person households. The number of such households is projected to rise by almost 5,500 over the 10-year period from 2014 to 2024, increasing the county's total by almost 8%. The number of couple households with no children is also projected to rise steeply, by almost 30% over the same time period.

Over the last five years, the economy and development industry have seen unprecedented changes, significantly affecting the public and private sectors' ability to invest and grow. Worcestershire has emerged from the recession in a strong position with the 3rd fastest growing economy of all the UK's Local

---

<sup>18</sup> ODPM (2007): Indices of multiple deprivation. Office of the Deputy Prime Minister

<sup>19</sup> Worcestershire Health and Well-being Board; Joint Health and Well-being Strategy. file:///C:/Users/Owner/Downloads/Joint\_Health\_and\_Well\_being\_Strategy\_2016\_to\_2021.pdf

<sup>20</sup> Public Health England. Health Profile for Worcestershire County. July 2017

<sup>21</sup> Worcestershire County Council; Worcestershire Local Transport Plan (2017-30)

Enterprise Partnership (LEP) areas with prospering employment specialities in Advanced Manufacturing, Cyber Security, Defence, IT and Agritech.

Data from the Office for National Statistics show there were 280,600 employed workers in Worcestershire in the period July 2015 to June 2016. According to Worcestershire's Economic Summary, in October 2016 Worcestershire had 4,355 unemployed residents, which equates to 1.2% of the working age population. In percentage terms, fewer of Worcestershire's residents are unemployed compared to the West Midlands regional average of 2.3% and the England average of 1.8%.

### **2.6.1 Health and well-being in Worcestershire**

The county's population is ageing with a greater proportion of older people resident than the nation in general. The population of Worcestershire is projected to increase to around 591,000 by 2020 with the biggest increase projected to be in the older age groups. The forecast increase in numbers of older people is due to increased life expectancy resulting in greater numbers of older people, surviving to very old age.

Overall health in Worcestershire is better than the England average. The average number of years a person born in Worcestershire would expect to live in good health is 66.4 years for women and 66 years for men compared to 63.9 and 63.3 nationally. Death rates from causes that could potentially be avoided by public health interventions in the broadest sense are below national rates and have been declining.

There are also some serious ongoing challenges to health and well-being:

- An ongoing burden of avoidable ill-health related to lifestyles - about two thirds of adults are overweight or obese, a third of men and half of women don't get enough exercise, about a third of people drink too much alcohol, and one in six adults smoke;
- Persistent inequalities between the most disadvantaged and the most affluent communities - the average number of years a person born in Worcestershire would expect to live in good health is 15.4 years lower

for men and 14.3 years lower for women in the most disadvantaged 10% of communities compared to the 10% most affluent.

### **2.6.2 Economy and Transport**

Gross Value Added (GVA) is a measure of the value of goods and services produced in an area. As a rule of thumb: as GVA rises, so too does the strength of the economy. GVA in Worcestershire has continued to rise, despite the major 2009 recession. Although the latest available data is from 2014, it shows a positive upwards trend. New business start-ups (business birth rates) also increased in Worcestershire between 2011 and 2014. There were 2,665 new businesses in 2014, an increase of 15% from 2011. Alongside this, the number of businesses closing down (business deaths) decreased by 5%, from 2,230 in 2013, to 2,125 in 2014.

Whereas 85% of the population in Worcestershire live in the urban areas and on interurban corridors, yet car usage, particularly for shorter trips of up to 3 miles, is at the highest it has ever been in the county's history (Census 2011). Worcestershire County Council recognises that the majority of people choose the car as the primary mode of travel, and will continue to do so throughout the life of this Local Transport Plan.

Better access (transport) is seen a key component of a successful modern economy. Worcestershire benefits from a comprehensive multimodal transport network of railways and highways. It is a major determinant of the quality of place for people to live, work, visit and invest. The Worcestershire LTP focuses specifically on this, with a range of schemes which seek to strengthen the integrity (resilience), reliability and functionality of the transport networks to support planned growth.

### Chapter 3

## ***POLICIES RELEVANT TO WORCESTERSHIRE FOURTH LOCAL TRANSPORT PLAN***

---

This section summarises the key policy context in relation to the Worcestershire LTP and the connection with the health impact assessment.

### **3.1 National Policies**

#### **3.1.1 Local Transport Act 2008:**

The maintenance of a valid Local Transport Plan is a statutory requirement under the Transport Act 2000 and amended by the Local Transport Act 2008. Its role is to set out local transport policies and a strategy for investment in transport infrastructure, technology and services to deliver against a range of objectives. This piece of legislation looks at important areas of public transport like local bus services and sets out proposals for a more consistent approach to local transport planning. The Act reforms the arrangements for local transport governance in the major conurbations and aims to encourage stronger local leadership and a coherent approach to transport across individual local authority boundaries and across different transport modes. It also reforms the existing legislation relating to local road pricing schemes. This would ensure that, where local authorities wish to develop local schemes, they can do so in a way that best meets local needs - while ensuring that any schemes are consistent and interoperable<sup>22</sup>.

#### **3.1.2 Building Sustainable Transport into New Developments: Options for Growth Points and Eco Towns**<sup>23</sup>

This document recommends that new developments must be well connected via public transport from the outset and that development proponents should seek to provide direct connections to key destinations such as urban centres and major employment and leisure zones. Additionally, in order to encourage a reduction in car use, it recommends that public transport should be frequent,

---

<sup>22</sup> UK Parliament. Local Transport Act 2008

[http://www.legislation.gov.uk/ukpga/2008/26/pdfs/ukpga\\_20080026\\_en.pdf](http://www.legislation.gov.uk/ukpga/2008/26/pdfs/ukpga_20080026_en.pdf)

<sup>23</sup> Department for Transport 2008. Building Sustainable Transport into New developments. <https://laqm.defra.gov.uk/documents/sustainabletransnew.pdf>

reliable and easily accessible with early morning and night time transport facilities being considered in order to provide for residents without cars.

### 3.1.3 Planning Policy Statements<sup>24</sup>

Planning Policy Statements (PPSs) set out the Government's national policies on different aspects of land use planning in England. The policies set out in PPSs need to be taken into account by regional planning bodies in the preparation of regional spatial strategies and by local planning authorities in the preparation of local development documents. They can be a material (important) consideration in individual planning applications.

#### 3.1.3.1 *Planning Policy Statement 1: Sustainable Development*

PPS 1 states that plans and proposals should:

- ensure that the impact of development on the social fabric of communities is considered and taken into account;
- seek to reduce social inequalities;
- address accessibility (both in terms of location and physical access) for all members of the community to jobs, health, housing, education, shops, leisure and community facilities;
- take into account the needs of all the community, including particular requirements relating to age, sex, ethnic background, religion, disability or income;
- deliver safe, healthy and attractive places to live; and,
- support the promotion of health and well being by making provision for physical activity.

#### 3.1.3.2 *Planning Policy Statement 6: Planning for Town Centres*

PPS 6 states that:

The Government is seeking to reduce the need to travel, to encourage the use of public transport, walking and cycling and reduce reliance on the private car, to facilitate multipurpose journeys and to ensure that everyone has access to a

---

<sup>24</sup> Department for the Environment 2017. Planning Policy Statements and supplementary Guidance. [https://www.planningni.gov.uk/index/policy/planning\\_statements\\_and\\_supplementary\\_planning\\_guidance.htm](https://www.planningni.gov.uk/index/policy/planning_statements_and_supplementary_planning_guidance.htm)

range of facilities. Good access to town centres is essential. Jobs, shopping, leisure and tourist facilities and a wide range of services should therefore be located in town centres wherever possible and appropriate, taking full advantage of accessibility by public transport.

#### 3.1.4 The Public Health (Choosing Health) White Paper<sup>25</sup>

The Public Health White Paper sets out the key principles for supporting the public to make healthier and more informed choices in regard to their health. It emphasized the need to step up action across government and throughout society to tackle the causes of ill-health and reduce inequalities. There is a holistic approach to health with the aim for everyone to achieve greater health and mental wellbeing by making healthier choices. That means ensuring that those people in disadvantaged areas and groups have the opportunity to live healthier lives.

The Public Health White Paper also stresses the imperatives for a multi-agency (partnership) approach to health care delivery that would involve government and non-governmental organisations working together to provide services and tackle the various factors that contribute in determining the health status of individuals and communities.

The Choosing Health White Paper refers to the need to undertake HIA of both local and national policies and projects, such as the Worcestershire LTP, which has the potential for impacting on the built environment, outdoor environment/activities, and local social and community facilities and services. It is, therefore, important that a HIA be carried out on the Transport Plan projects to evaluate their potential impacts on the health of the people who will use it or be connected with it directly or more remotely.

---

<sup>25</sup> DOH 2004: Public Health White Paper. TSO, London



## 3.2 Worcestershire Local policies

### 3.2.1 Worcestershire Strategic Economic Plan (SEP) – up to 2020<sup>26</sup>

Worcestershire's Strategic Economic Plan (SEP) sets out an ambitious vision to grow the local economy by a third, creating over 25,000 jobs and to increase Gross Value Added (GVA) by £2.9 billion. To date, of the headline indicators of economic performance, Worcestershire performs above the national average; GVA in Worcestershire has grown by 3.2% in the last five years, the third highest rate of any LEP in England. The vision of the Worcestershire Local Enterprise Partnership for the county is *"To build a connected, creative, dynamic economy that delivers increased prosperity for all those who choose to live, work, visit and invest in Worcestershire."*

The Worcestershire SEP's investment plan covers the period up to 2020 and has three over-arching objectives:

- To create a world class business location;
- To provide individuals with world class skills;
- To develop world class competitive and innovative business.

The availability of suitable sites and premises is essential to ensure that firms can expand and inward investment can be attracted. The 'Game Changer Programme' has been set up to identify key development opportunities. This Programme will focus on the delivery of sites of regional significance, which occupy strategic locations within their markets and provide major opportunities to lever market-led investment and deliver growth and jobs. Four initial sites have been selected because of their scale, economic impact potential and deliverability:

1. *Worcester Growth Corridor* - Land on the eastern fringe of the city alongside the M5 motorway between Junction 6 and 7, including Worcester Six Business Park, for commercial uses to create an attractive gateway to the city. The development is anticipated to be attractive to advanced engineering and other technology rich activities;

---

<sup>26</sup> Worcestershire County Council; Worcestershire Local Transport Plan (2017-30)

2. *Malvern Hills Science Park Expansion* - The Malvern Hills Science Park is highly successful and fully occupied, playing a strong role in Worcestershire's economy. It is proposed to accommodate further phases of development to support existing investors through the provision of 'grow on' accommodation. One of the key sectors here is cyber security/defence/IT.
3. *Redditch Eastern Gateway* - This involves the development of a new high-quality business park to attract and safeguard investment and employment, with a target being advanced engineering businesses. This will satisfy an identified need for a new employment facility in the area;
4. *South Kidderminster Enterprise Park* - This will support the ongoing development of an existing employment scheme in attracting new investment in this location. Again, a target would be advanced engineering businesses.

It is vital to note that all of these sites will require the necessary transport infrastructure to facilitate their delivery. A number of funding streams are needed to support the delivery of the Worcestershire LTP proposals. These include development funding through S106 agreements, central government funding streams (for example the Local Growth Fund) and others. The LTP is closely aligned with the Worcestershire Local Planning Authorities' Local Development Plans, to link new developments with appropriate investment in transport infrastructure, technology and services, acting to preserve and enhance Worcestershire's economy, environment and quality of life.

### 3.2.2 Worcestershire Joint Health and Well-being Strategy 2016-21<sup>27</sup>

Local authorities and local health services are required to undertake Joint Strategic Needs Assessments (JSNA) of health and well-being. This work is a continuous process of assessment designed to inform decisions made locally about what services are commissioned. The core aim is to improve the public's health and reduce inequalities. The Worcestershire Joint Health and Well-being

---

<sup>27</sup> Worcestershire Health and Well-being Board; Joint Health and Well-being Strategy.  
file:///C:/Users/Owner/Downloads/Joint\_Health\_and\_Well\_being\_Strategy\_2016\_to\_2021.pdf

Strategy is a statement of the Health and Well-being Board's vision and priorities for the five years period 2016-2021. It is based on the findings of the JSNA and on consultation with our key stakeholders. And the vision enunciated in the Strategy is: *"that Worcestershire residents are healthier, live longer, and have a better quality of life, especially those communities and groups whose health is currently poorest."*

Key principles for achieving the vision include:

- Working in partnership - To facilitate partnership and ensure that organisations work together across the public, voluntary and private sectors to maximise their contribution to health and well-being.
- Empowering individuals and families to take responsibility and improve their own health and well-being
- Recognising local assets and strengthening the ability of communities to look after themselves.

Similarly, the Joint Health and Well-being Strategy identified three overarching priorities for work over the five years, which are:

- **Improving mental health and well-being**; in recognition of the fact that people who are more resilient do better in life, being happier, more able to cope with adversity and less at risk of developing mental health conditions such as anxiety and depression.
- **Increasing physical activity** - being inactive is a major cause of ill health throughout life - including heart disease, diabetes and some cancers. The negative health impact of being inactive is both avoidable and in some cases reversible. In Worcestershire at least a third of people do not meet the recommended guidelines for being physically active.
- **Reducing the harm caused by alcohol** - Alcohol is ranked by the World Health Organisation as the third leading cause of death and disability in the developed world. Drinking too much also has long-term social consequences such as family break-up, domestic abuse, unemployment, homelessness and financial problems. In Worcestershire 85,000 people drink more alcohol than the

recommended limit, which puts their physical and mental wellbeing at risk.

The Joint Health and Well-being Strategy recognises that meeting the health and well-being challenges in the county will require renewed emphasis on prevention with action in the long term to address the wider influences on health and well-being, as well as more immediate action to continue to improve the quality and value for money of health and social care; and to make sure that prevention is embedded in care pathways. One of the approaches to prevention is to create a health promoting environment by developing and enforcing healthy public policy and taking health impact assessments into account systematically in decision making.

Factors such as access to green spaces, housing quality, social networks and good quality transport and other services are known to be as important to creating good health and well-being as the behaviour of individuals. The Strategy seeks to create environments which address, promote and sustain good health and well-being through working in partnership with communities and families to build resilience and identify and value community assets.

### **3.3 Health Inequalities**

Health Inequality can be defined as “*differences in health status or in the distribution of health determinants between different population groups*”<sup>28</sup>. An example of health inequality is the differences in mortality rates between people from different social classes<sup>29</sup>. Consequently, tackling health inequalities requires deliberate and concerted efforts from all those within the political, health and socio-economic spheres of society.

---

<sup>28</sup> Taylor L, Gowman, and Quigley (2003): Addressing inequalities through health impact assessment. Health Development Agency, London

<sup>29</sup> Wilkinson R (1996): Unhealthy Societies: the Affliction of Inequality. Routledge, London

About 16% (15,800) of children in Worcestershire live in low income families, while life expectancy is 7.7 years lower for men and 6.4 years lower for women in the most deprived areas of Worcestershire than in the least deprived areas<sup>30</sup>.

The report by Lord Acheson in 1998<sup>31</sup> attached great importance to addressing the underlying determinants of health, and saw HIA as key to achieving this. The report emphasised the need to evaluate and implement policies and programmes in such a way that they can reduce, rather than worsen health inequalities. The report specifically recommends that policies *"should be formulated in such a way that by favouring the less well-off they will, wherever possible, reduce such (health) inequalities"*.

In the same vein, the Strategic Review of Health Inequalities in England post-2010 (The Marmot Review)<sup>32</sup> proposes a more encompassing strategy for reducing health inequalities from 2010, based on policies and interventions that address the social determinants of health inequalities. The Review argues that previous attempts to reduce health inequalities have not been successful because there has been a focus on mortality and morbidity to the exclusion of the wider determinants of health.

### **3.4 Policy Analysis**

Overall, the proposed Worcestershire Fourth Local Transport Plan is strongly aligned with national and local policies in relation to improving local health status, and tackling the wider socio-economic and environmental determinants of population health.

The Worcestershire LTP will form an important part of the wider regeneration and development agenda for the benefit of the County; and improving the health and general well-being of all the residents of Worcestershire. The WLTP4 demonstrates the credentials to contribute meaningfully to the quest for a more

---

<sup>30</sup> Public Health England. Health Profile for Worcestershire County; July 2017

<sup>31</sup> Acheson D (1998): Independent Inquiry Into Inequalities in Health: Report. TSO, London

<sup>32</sup> Marmot et al (2010): Fair Society, Healthy Lives: The Marmot Review.  
<http://www.marmotreview.org/AssetLibrary/pdfs/Reports/FairSocietyHealthyLivesExecSummary.pdf>

sustainable, inclusive and cohesive Worcestershire where everyone is proud to belong.

## Chapter 4

# EVIDENCE ON THE HEALTH IMPACTS OF TRANSPORT SCHEMES

---

### 4.1 Introduction

This chapter provides a summary of the key evidence on the health impacts of Transport Schemes. The chapter starts by examining the current research on how people across the life course and different social groups use public transport. It then goes on to explore current public transport travel patterns and current public perceptions of bus travel. It then moves on to consider the evidence for the health impacts of public transport.

Summaries and findings from the review of the literature that cover the key areas of relevance to this HIA as presented in the sections following.

The general health impacts of transport are through:

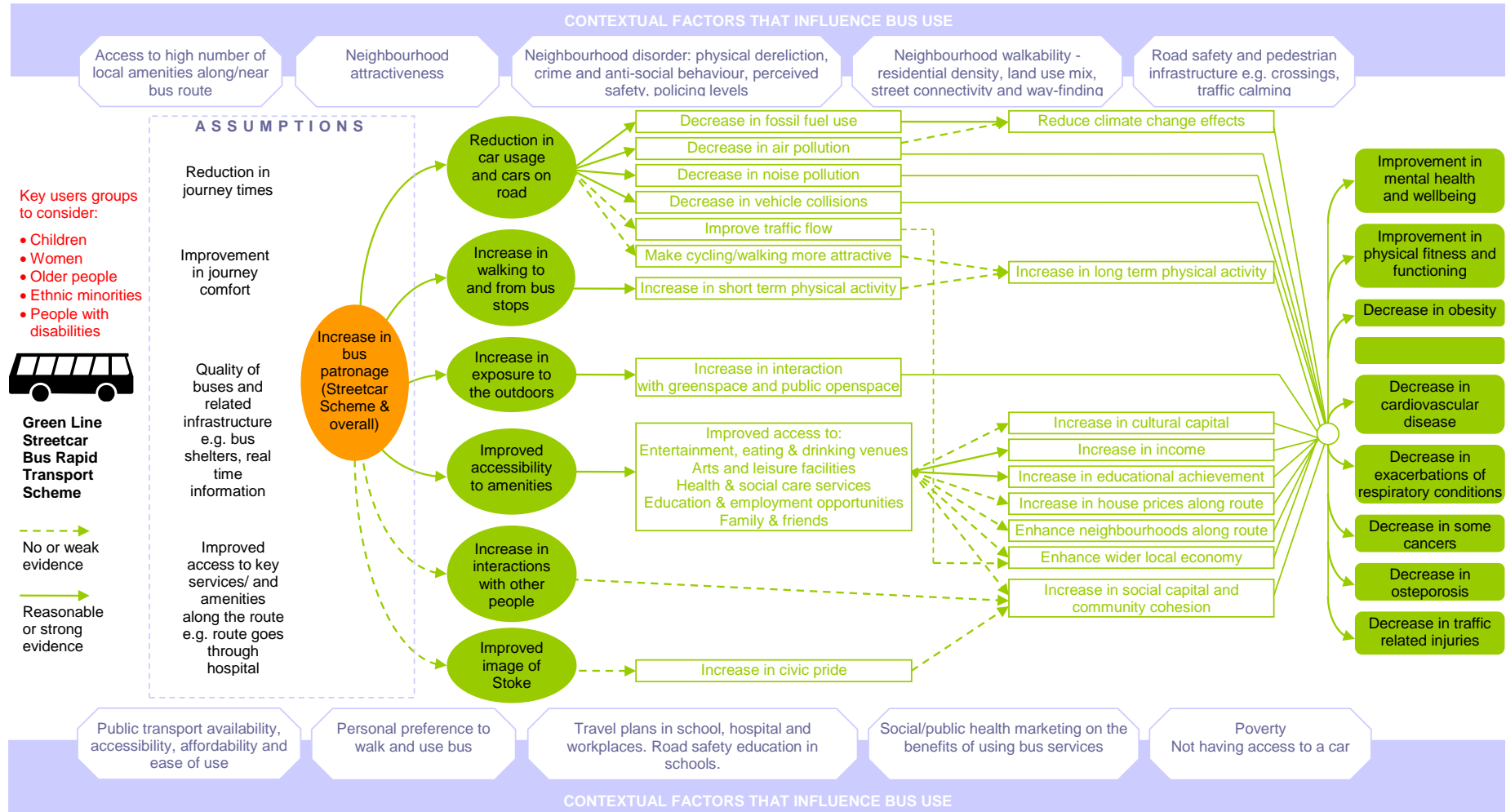
- Physical activity
- Access to services and amenities
- Emissions and air pollution
- Injuries and deaths
- Noise pollution
- Safety and perceptions of safety
- Community severance
- Social inclusion
- Equity/ inequality

Figure 4.1 shows a causal pathway diagram of the likely pathways of health impact for a transport scheme which has been modified for this HIA project<sup>33</sup>.

---

<sup>33</sup> Vohra S, Chilaka M, Ball J and Amo-Danso G (2009). North Staffordshire Streetcar Bus Rapid Transit Scheme Health Impact Assessment. Institute of Occupational Medicine.

Figure 4.1 Causal Pathway diagram of the potential health impacts of transport schemes (Vohra S, Chilaka M, Ball J and Amo-Danso G (2009))





#### 4.2 ***Mobility across the life course and among different social groups***<sup>34</sup>

People's **relationship with transport is dynamic and changes across the life course** from child, young adult, adult and older person because of changes in lifestyle.

**Primary school children's travel is supervised and constrained by their parents/caregivers concerns about safety.** They most likely get to school or other amenities by walking or by car. Parent's use of a car generally reflects the time pressures they have in taking their children to school before heading off for work.

**Older primary and secondary school children become more independent and can use local buses independently.** The younger age groups tend to find bus journeys positive, exciting and adventurous. For the older age groups, as their travel experiences and transport needs develop, they tend to become dissatisfied with the quality and provision of public transport services. This marks an important shift in perceptions towards public transport.

**In their late teens (16 years and above) young people's transport needs expand to encompass work, training, further education, leisure, social and other activities.** Their needs become more complex. And they are likely to travel further and at night. It is at this time that they begin to see car driving as the optimum mode of travel. Key barriers for young people were personal safety, school policies and the availability, reliability and cost of public transport.

**In adulthood, travel is largely focused around responsibilities such as the need to travel to work, escort children, do the shopping and other household chores.** There is a decline in younger adults (20s – 50s) making trips to visit friends and a greater use of the car while there is an increase in visits to friends and a reduction in the use of the car in older adults over the age

---

<sup>34</sup> Department for Transport. 2006. Evidence base review on mobility: choices and barriers for different social groups. Centre for Research in Social Policy.

of 50. However, there are important differences across different social groups as described in the following paragraphs.

#### 4.2.1 Influences of Income, Ethnicity and Gender

There is strong support for public transport with 17% of people feeling that better public transport would improve their job prospects and 29% that it would positively impact on their social life. However there is also some resistance to public transport use among some adults. Key mediating factors include range of services, journey times, quality and perceived safety of facilities and cost. 20% of households without access to a car reported some difficulty in accessing medical care and supermarkets.

**Adults on low incomes are more likely to be dependent on public transport and hence more vulnerable to public transport problems particularly the unavailability of public transport services** (this tends to be rated as more important than the cost of public transport). 13% of people of working age said that they had decided not to apply for a particular job in the last 12 months because of transport problems.

**Adults from black and minority ethnic (BME) groups are more likely to be dependent on public transport and less likely to find that bus services fit into their daily and yearly activity patterns.** Older people from BME groups may also have additional information and language needs. Fear of racial violence can be a key barrier to access.

**Women are more likely to travel for social, family and personal reasons.** Women are less likely to have access to a car and more likely to travel by bus than men. Key barriers to the use of public transport are the difficulties of getting on and off public transport with children and the unreliability of bus services. Women are also more likely to be concerned about personal safety. Public transport is often seen as a last resort and not convenient. One key barrier identified was the unhelpful attitude of public transport staff alongside difficulties with getting on and off with children, unreliability and personal safety concerns. Lack of transport can be a major barrier for women to access healthcare

services and leisure amenities e.g. missing appointments or prioritising children's healthcare needs and foregoing their own need for healthcare visits.

#### 4.2.2 Influences of Age and Disability

**Adults with disabilities are less likely to drive and more dependent on public or community transport and lifts from family and friends** (escorted travel). However, 43% travel by local bus. Disabled people often find public transport inaccessible and can find a lack of flexibility in services e.g. having to ring in advance for assistance or negotiating with other passengers who take up the wheelchair space. There can also be concerns about being able to complete the whole journey safely and with good accessibility including through the wider street environment.

**For older people travel needs focus on shopping, personal business (notably healthcare) and on visiting friends.** Older people become less likely to drive and more likely to use public transport. Maintaining independence and accessing essential services and social opportunities are crucial to older people's quality of life. A lack of transport can mean difficulty in accessing essential services and facilities, e.g. healthcare, and can lead to loneliness and social isolation. As people become elderly, use of public transport and car driving becomes difficult due to declining physical fitness. They therefore become more dependent on assisted forms of transport e.g. special mobility schemes, regular visits from family and friends.

### 4.2.3 Public travel patterns in the UK relevant to the Worcestershire Local Transport Plan<sup>35 36 37 38 39 40 41</sup>

#### 4.2.3.1 *Walking*

**Women make 15% more walking trips on average than men, though the distance travelled is similar.** Except women in the 30-39 age group who make 86% more walking trips than men in the same age group.

**People living in poorer households do more walking on average.**

**The four main reasons people walk are: shopping (21%), education including escorting children (20%), leisure and social purposes (20%) and just to walk e.g. walking the dog (17%).**

People generally have **positive attitudes to walking and agree that it has health benefits.** Most people also feel safe on their local streets (72%) and agree that their local area is a pleasant place to walk (74%).

**However, in the most deprived areas only 55% of people feel safe walking their local streets and only 57% consider their local streets a pleasant**

---

<sup>35</sup> Department for Transport. 2007. Cycling Personal Travel Factsheet.

<sup>36</sup> Department for Transport. 2007. Health Related Difficulties Personal Travel Factsheet.

<sup>37</sup> Department for Transport. 2007. Shopping Personal Travel Factsheet.

<sup>38</sup> Department for Transport. 2007. Travel in Rural Areas Personal Travel Factsheet.

<sup>39</sup> Department for Transport. 2007. Travel to School Personal Travel Factsheet.

<sup>40</sup> Department for Transport. 2007. Travel to Work Personal Travel Factsheet.

<sup>41</sup> Department for Transport. 2007. Walking Personal Travel Factsheet.

**place to walk.** This compares to 79% and 88% of the residents of the least deprived areas.

#### 4.2.3.2 *Cycling*

In terms of cycling, the key concern is the danger of cycling on busy roads particularly for women.

#### 4.2.3.3 *People with mobility problems*

There is a strong link between health-related mobility difficulties and household income; with adults living in the poorest 20% of areas being five times more likely to have mobility difficulties than those in the wealthiest 20%. This pattern broadly holds across all age groups. Similarly adults with mobility problems were more than twice as likely to live in a household with no car.

In terms of walking for 20 mins or more, 29% of adults with mobility problems but who do sometimes go out on foot and said they did so at least once a week. 61% said that they did so less than once a year or never.

Of those that did go out 69% said that they did not use local buses at all; 66% of adults with mobility difficulties have difficulty getting to a bus stop and/or getting on and off buses; and over 50% had difficulty waiting at a bus stop. 80% of adults with mobility problems are aware of at least one special mobility service.

#### 4.2.3.4 *Public Transport*

In terms of **adults travelling to work the difficulties for existing public transport users are unreliable public transport (19%), traffic congestion/road works (7%) and public transport being 'unpleasant' (4%).**

In terms of the **potential for modal shift from car to public transport the key barriers were: not believing it is possible to do a journey by public**

**transport (47%), the distance being too far (30%), poor public transport connections (29%) and unreliable public transport (19%).**

**Only 8% of shopping journeys are made by bus with 25% made on foot. The major difficulties experienced when using public transport for shopping are difficulties in carrying the shopping (15%), personal disability (5%) and unreliable public transport (3%).**

In terms of travel to school, 24% of secondary schoolchildren aged 11 to 16 travel by local buses with 41% walking. For primary school children the figures are 3% and 52% respectively.

In terms of the awareness and use of concessionary passes among older people, in 2008 83% of older people were aware of the concessionary scheme and 73% had received or requested a new pass. Overall passholders were using their passes more than in 2007.

#### 4.2.3.5 *Public attitudes to bus services*

The Commission for Integrated Transport conducted a MORI study on public attitudes to transport in 2002.<sup>42</sup> This found that:

**If bus times were cut by a quarter, about a quarter of motorists may be encouraged out of their cars.**

82% are in support of park and ride schemes with more than 40% believing it will have most impact on improving the transport system.

**Over 7 in 10 (78%) of respondents want an increased frequency of bus services as well as increased peak / night buses (73%).**

**32% believed more dedicated school bus services would make parents consider using their cars less for taking children to school.**

The National Centre for Social Research Omnibus Survey in 2008 examined experiences and perceptions of anti-social behaviour and crime on public transport.<sup>43</sup> The survey found that:

**Most respondents (84 per cent) said they would feel safe travelling on public transport, though respondents were more concerned after dark than during the day.**

**Only a small proportion said they did not make more use of public transport because of concerns about anti-social behaviour or crime (3 per**

---

<sup>42</sup> Commission for Integrated Transport. 2002. Public attitudes to transport in England.

<sup>43</sup> UK Department for Transport. 2008. Experiences and perceptions of anti-social behaviour and crime on public transport.

**cent did not use buses and 2 per cent did not use trains more often because of these concerns).**

The most common reason for feeling unsafe on buses and trains was anti-social behaviour of young people. 32 per cent were concerned about this on buses and 20 per cent were concerned about this on trains.

**22 per cent said they had been a victim of one or more incidents of anti-social behaviour or crime while on public transport in the preceding year, while 76 per cent had witnessed anti-social behaviour or crime.**

Experiences most often related to intimidating, insulting or disruptive behaviour or environmental anti-social behaviour, such as vandalism and littering. Less than 5 per cent said they had been the victim of a theft or a violent or sexual incident.

**43 per cent of public transport users said they had felt intimidated by the behaviour of other passengers in the last year. This suggests that witnessing certain behaviours even if not directly targeted at the individual, can lead to feelings of intimidation.**

Public transport users who travelled regularly and after 9pm were more likely to have experienced or witnessed anti-social behaviour or crime, as were younger, non-white and London respondents.

**Among bus or rail users, respondents considered a policy of refusing drunk or rowdy people to travel, the presence of staff other than the driver, and CCTV to be particularly effective safety measures.**

#### *4.2.4 Physical activity*

The main individual benefit of public transport comes from the increased physical activity of bus passengers to and from bus stops/halts.

No UK research was found on how much walking regular bus users do on average. One US paper examined walking to and from public transit and found



that the mean total walking time was 24 minutes per day (median 19 minutes) with a single walking trip being on average 4 minutes long.<sup>44</sup>

Regular bus users are therefore likely to meet the minimum daily physical activity requirements for adults. The Chief Medical Officer established the following recommendations for health-enhancing physical activity in 2004: Children and young people should achieve a total of at least 60 minutes of at least moderate intensity physical activity each day. Adults should achieve a total of at least 30 minutes a day of at least moderate intensity physical activity on five or more days of the week.<sup>45</sup> The recommendations for adults are also appropriate for older adults. The recommended levels of activity can be achieved either by doing all the daily activity in one session, or through several shorter bouts of activity of 10 minutes or more.

There is strong evidence for the short and long term benefits of long term increases in physical activity. A dose-response relationship exists between physical activity and all-cause mortality. From a public health perspective, helping people to move from an inactive level to low-to-moderate activity levels will produce the greatest reduction in risk.<sup>46</sup> A study has shown that just under 30% of people walking to and from public transport can achieve 30 minutes of daily physical activity and another that a 5% increase in walkability of a neighbourhood was associated with a 32% increase in time spent in physical activity, a 0.23 point reduction in Body Mass Index (BMI) and 6.5% fewer vehicle miles travelled.<sup>47</sup>

Key positive health outcomes of physical activity include:<sup>48</sup>

- Reduces the risk of dying prematurely.
- Reduces the risk of dying from heart disease.

---

<sup>44</sup> Besser LM and Dannenberg AL. 2005. Walking to public transit: steps to help meet physical activity recommendations. *Am J. of Prev Med.*

<sup>45</sup> Department of Health. 2004. At least five a week: Evidence on the impact of physical activity and its relationship to health'. Report from the Chief Medical Officer. England.

<sup>46</sup> HM Government. 2009. Be active be healthy: a plan for getting the nation moving.

<sup>47</sup> Frank L, Sallis JF et al. 2006. Many pathways from land use to health. *J of the Am Planning Assoc.*

<sup>48</sup> US Department of Health and Human Services. 1996. Physical activity and health a report of Surgeon General.

- Reduces the risk of developing diabetes.
- Reduces the risk of developing high blood pressure.
- Helps reduce blood pressure in people who already have high blood pressure.
- Reduces the risk of developing colon cancer.
- Reduces feelings of depression and anxiety.
- Helps control weight.
- Helps build and maintain healthy bones, muscles, and joints.
- Helps older adults become stronger and better able to move about without falling.
- Promotes psychological well-being.

#### *4.2.5 Access to services and amenities and social inclusion*

There is no direct research on the health benefits derived from public transport improving access to services and amenities.

There is however survey and research evidence as in section 4.2.1 which demonstrates that the lack of reliable, accessible and frequent public transport can limit employment and educational opportunities.

Poor public transport is an additional burden that is likely to widen inequalities for those already suffering others forms of disadvantage. Two Joseph Rowntree Foundation (JRF) research studies identified that poor public transport affected the following and new public transport initiatives improved them<sup>49</sup>

- access to high quality education
- public order, particularly in relation to youth disaffection
- the social integration of older people
- access to adequate health care facilities
- the take-up of employment.

Another JRF study focused on subsidised transport in deprived areas demonstrated that there are indeed benefits of new bus services in terms of: a) supporting people to take up new jobs and maintain existing jobs; b) accessing

---

<sup>49</sup> Joseph Rowntree Foundation. 2001. Transport, the environment and social exclusion.

health and social care services; and c) wider quality of life benefits enabling them to access leisure facilities and do more with their leisure time.<sup>50</sup>

#### *4.2.6 Air pollution*

There is a substantial body of evidence on the adverse health effects of air pollution from motor vehicles.<sup>51 52</sup> There are small but measurable increases in:

- Premature deaths from cardiorespiratory disease
- Exacerbations of existing respiratory illness and any increase in hospital admissions because of it.
- Increase in respiratory symptoms
- Reductions in lung function

Contextual factors e.g. urban/traffic density, climatic factors, barriers between roads and proximity to the road when walking, are likely to be important factors in exposure. Congestion and low average vehicle speeds generally increases the emission of air pollutants. Hence initiatives that reduce congestion and increase average vehicle speeds can reduce local air pollution levels.<sup>53</sup>

#### *4.2.7 Road traffic injuries and deaths*

Rates of bus passenger fatalities and injuries are low. The road users with the highest risk of being killed or seriously injured are cyclists and pedestrians. It is currently unclear whether roads with a higher modal share of buses lead to greater or lesser risks for pedestrians and cyclists.

The areas of highest risk for cyclists and pedestrians generally are where minor roads meet arterial roads. For children, roads near houses and schools are also areas of high risk.

---

<sup>50</sup> Joseph Rowntree Foundation. 2008. Value of transport in deprived areas.

<sup>51</sup> Health Scotland, MRC SPHSU and IOM. 2007. Health impact assessment of transport initiatives: a guide.

<sup>52</sup> World Health Organization. 2005. Health effects of transport related air pollution.

<sup>53</sup> Institute of Public Health in Ireland. 2005. Health impacts of transport: a review.

#### *4.2.8 Noise pollution*

Road traffic noise generally ranges between 50 – 80 decibels. This is enough to cause annoyance, interference with speech and sleep disturbance in some people.<sup>37</sup> These effects are thought to occur as physiological and cognitive responses to the stress caused by hearing the noise from the cars on the road. Noise may also deter some people from walking or cycling on busy roads.

#### *4.2.9 Community severance*

This generally applies to new roads or to increases in traffic on existing roads where the road becomes an actual or perceived barrier to movement across the road. There is currently little evidence on the health impacts of community severance.<sup>37</sup> However there is evidence to suggest that busy roads can reduce the number of social interactions and social relationships across it.<sup>54</sup> This in turn is likely to have some potential adverse effects on wellbeing or opportunities for the enhancement of wellbeing.

#### *4.2.10 Equity/ inequalities*

Lack of access to public and private transport is an equity issue, and can widen and exacerbate health inequalities. It can become an additional burden on already disadvantaged and deprived communities as described in sections 4.2.1 and 4.2.2

### **4.3 Limitations of evidence review**

There are important limitations and methodological variations in the studies conducted in this field which reduce the strength of evidence for the findings.<sup>55</sup> A good number of the studies have been conducted outside of the UK, however there are international studies with similar cultural contexts to the UK that have shown similar findings which provides some evidence for the transferability of

---

<sup>54</sup> Appleyard D. 1981. *Livable Streets*. University of California Press.

<sup>55</sup> Gebel K, Bauman AE and Petticrew M. 2007. The physical environment and physical activity: a critical appraisal of review articles. *Am. J. Prev. Med.*

these findings to a UK context. More recent studies will also shed more light on the issues discussed in this section.

#### **4.4 Conclusions**

Overall the Worcestershire Local Transport Plan is very likely to have several positive and beneficial health impacts on regular users of the services. However, there are contextual factors that are likely to influence the use and take up of bus and other services and the physical activity associated with them as shown in figure 4.1. These factors are likely to be critical in delivering the positive health benefits of the Local Transport schemes.

## Chapter 5

# HEALTH IMPACTS OF WORCESTERSHIRE FOURTH LOCAL TRANSPORT PLAN

---

### 5.1 Introduction

This chapter provides a summary of the likely health impacts of the Worcestershire Fourth Local Transport Plan during the construction and operation of various transport schemes. Health impacts are the direct or more remote consequences that interventions, development policies, programmes, and other human activities can have on the health of other individuals or population groups<sup>56</sup>. While these impacts can affect the health of individuals in very direct (immediate) and clearly comprehensible manners, in other instances the health impacts can touch on populations through indirect influences on the wider determinants of health<sup>57</sup>.

Furthermore, such impacts may be felt immediately, in the short term, or after a longer period. Since health impacts can be either positive or harmful, it is important that a balanced approach is adopted, so that likely positive and negative health consequences of development activities are properly identified and captured through the HIA process<sup>58</sup>.

There are several research reports and evidence bases on transport and urban regeneration schemes and their possible health effects<sup>59,60</sup>. While some of the general findings can apply to some aspects of the Worcestershire LTP, this HIA has been able to relate these and other more specific findings to the people living within Worcestershire County.

---

<sup>56</sup> Scott-Samuel et al (2001): Merseyside Guidelines for health impact assessment. IMPACT, Liverpool

<sup>57</sup> Dahlgren G and Whitehead M (1991): Policies and Strategies to Promote Social Equity in Health. Stockholm, Institute for Future Studies

<sup>58</sup> IMPACT 2004: Introduction to health impact assessment. University of Liverpool

<sup>59</sup> Douglas M, Thomson H, Jepson R, Hurley F, Higgins M, Muirie J, Gorman D (eds) *Health Impact Assessment of Transport Initiatives: A Guide*, NHS Scotland Edinburgh 2007

<sup>60</sup> Health, place and nature – How outdoor environments influence health and well-being: a knowledge base. Sustainable Development Commission.

This assessment focused on the likely positive and negative health impacts of the Worcestershire LTP on the health of the people who will be using the various transport facilities and services, current and future employees within the various establishments and facilities connected with service provision; visitors to the various places of interest within Worcestershire; as well as local residents living in homes which are within the immediate vicinity of roads, rail lines, and other transport routes and facilities.

The general health impacts of the Worcestershire LTP are through:

- Access to services and amenities including education, sports pitches, public open spaces, local retail centres, and health services
- Connectivity across the transport networks
- Social inclusion and community cohesion
- Active transport (including cycle and footways)
- Effects on modal shift
- Emissions and air pollution
- Noise pollution & nuisance effect to surrounding premises
- Risk of Injuries and accident
- Safety and perceptions of safety
- Equity impacts

Figure 4.1 is an illustration of the possible pathways by which buses and other modes of transport can impact on health and wellbeing.<sup>61</sup>

---

<sup>61</sup> Vohra S, Chilaka M, Ball J and Amo-Danso G (2009). North Staffordshire Streetcar Bus Rapid Transit Scheme Health Impact Assessment. Institute of Occupational Medicine.

## 5.2 POSITIVE HEALTH IMPACTS

### 5.2.1 Good transport leads to good health

#### Access to services and associated health benefits

The primary function of transport is to move people and goods between places, thereby enabling access to goods and services. Improved access to services and amenities such as for employment, education, shops & markets can have moderate to high positive impacts on health and wellbeing. Planning policy at a local and regional level has long since recognised the role of the Worcestershire LTP in supporting the county's employment aspirations and the need to improve access to services and amenities. Transport routes and services which lead to hospitals and other health care services make direct positive contribution to health and well-being, for instance ambulance drive to Accident and Emergency (A & E) units which can be life saving for patients and service users.

Access to places of employment contributes to the many social and economic benefits of employment, with their attendant positive health impacts. People who are seeking employment opportunities often require transport to get to the places where they seek such opportunities, thereby raising hopes and aspirations, with mild to moderate positive psychological health impacts. Helping to attract new employment, retain and strengthen existing employment uses in Worcestershire by improving access through transport and the unlocking of additional development sites for employment uses; these lead to economic benefits for individual employees and the communities in general. There is a direct correlation between financial wellbeing and positive health<sup>62</sup>. Unemployment in particular is a major risk factor for low self-esteem, stress, mental health problems and suicide<sup>63</sup>.  
(Economic empowerment and health is discussed further in section 4.2.3).

---

<sup>62</sup> Marmot, M.2004 The Status Syndrome: How Social Standing Affects Our Health and Longevity. London Bloomsbury

<sup>63</sup> American Psychological Association 2012.

<http://www.apa.org/pi/ses/resources/indicator/2012/04/unemployment.aspx>



Access to education through the various means of transportation also contributes to the significant positive impacts of education on health. Education, as with other social determinants of health, plays a major role in a person's overall health and well-being. Education can affect us throughout our lifetime and has been shown to increase healthy behaviours and improve health outcomes, including obesity rates. Early education is especially important because it sets the foundation for a healthy life. Beyond early childhood education, research shows that the more education a person gets the longer they'll live<sup>64</sup>. Education is directly linked to opportunities, employment, income and positive behaviour. Therefore, the contribution which transport facilities make to access to education is an important indirect pathway to positive health.

The above illustrations about the health value of access to health services, employment sites and education apply to other services and amenities which are useful to improving the quality of life of the residents and visitors to Worcestershire.

### **5.2.2 Outdoor environment, access to quality green space**

Evidence points to the fact that exposure to natural spaces such as parks, gardens, green spaces and open countryside has positive health benefits. The pathways for bringing about these benefits include psychological effects and encouragement of physical activities (walking, cycling) and building social capital<sup>65</sup>. The Active Travel Network Investment Programme (ATNIP) components of the Worcestershire LTP will play significant roles in bringing about the exposure of transport users and residents to the outdoor environment and quality green spaces. The ATNIP is a systemic investment in walking and cycling links across several areas covered within the Local Transport Plan to create a comprehensive, integrated off-road network linking residential areas with key trip attractors, including schools, rail stations, town centres and

---

<sup>64</sup> Plan4Health: Education is a Social determinant of Health. <http://plan4health.us/education-is-a-social-determinant-of-health/>

<sup>65</sup> Health, place and nature – How outdoor environments influence health and well-being: a knowledge base. Sustainable Development Commission.

employment locations. This will include surfacing, signage, lighting and public realm improvements to create an attractive and coherent network.

Research from across Europe has found that people living in areas with high levels of green areas and walk-friendly greenery are more likely to be physically active and 40% less likely to be overweight or obese than those living in areas with low level of greenery. Furthermore, the location of shops and services, along with travel connections to them, can influence levels of physical activity and social contact<sup>66</sup>, which in turn can affect the health of people. In this regard, the proposed open spaces and ATNIP components of the Worcestershire LTP will provide quality outdoor environment with potentials for moderate positive health impacts.

Some of the possible ways in which the physical environment aspects of the Worcestershire LTP can positively impact on the health of the residents, workers and users of the facilities include the under listed:

- a) A cleaner and more welcoming environment and facilities such as the ones that form part of the Active Transport Initiatives are less likely to serve as breeding ground for germs and disease vectors. The aesthetic beauty & qualities of the environment can also result in positive mental health impacts.
- b) As part of the wider regeneration of the areas within the Active Transport Initiatives, the new surfacing, signage, lighting and public realm improvements will contribute to higher sense of civic and community pride among the residents within the immediate neighbourhoods (such as Redditch and Dowles Link), and the people of Worcestershire in general. Such feeling of pride and satisfaction are known to have positive mental health impacts<sup>67</sup>.
- c) The modern fit for purpose facilities such as the proposed new Worcestershire Park train stations and Alexandra Hospital bus interchange

---

<sup>66</sup> Department of Health 2004. Choosing Health: Making healthy choices easier. London, TSO

<sup>67</sup> Pretty J, Peacock J et al 2007. Green exercise in the UK Countryside: Effects on Health and Physiological Well-being, and Implications for Policy and Planning. *Journal of Environmental Planning and Management*, **50** (2), 211-231

- (with improved working equipment and infrastructure) can also serve as a positive motivational factor for the employees, and service providers. It may also be a contributory factor in attracting and retaining competent personnel who will in turn render improved services for the benefit of the service users.
- d) Facilitating more sustainable access to services, facilities and other places of interest by walking and cycling, through the Active Travel Network Programmes which include areas of retained open spaces, planting along the spine road and different areas of green infrastructure.

Overall the positive impacts that would arise from the modern physical structures and environmental aspects of the Worcestershire LTP are likely to be major in magnitude, especially when considered over the long term span of the Transport Plan.

With obesity and chronic illnesses being major problems in the UK and Worcestershire where about two thirds of adults are overweight or obese, a third of men and half of women don't get enough exercise<sup>68</sup>, every effort must be made to create an environment that encourages people to be physically active. Obesity is associated with cardiovascular disease, diabetes, osteoporosis, certain cancers and premature death<sup>69</sup>. The prevalence of obesity has increased three-fold over the last two decades with the UK having one of the highest levels of obesity in the EU<sup>70</sup>.

#### *5.2.2.1 Positive mental wellbeing impacts*

Evidence increasingly suggests that people with access to quality green space are healthier and have improved mental well-being; being outside can relieve stress, enhance social cohesion, overcome isolation and alleviate physical problems so that fewer days are lost to ill health. It has been shown that even moderate physical activity can help against cognitive decline. Consequently,

---

<sup>68</sup> Worcestershire Joint Health and Well-being Strategy 2016-21.

<sup>69</sup> Foresight 2007. Tackling Obesities: Future Choices Project – Obsogenic Environments Evidence Review. London, Department of Innovation, Universities and Skills.

<sup>70</sup> Department of Health 2010. Health Profile for England 2010

quality green space should be a goal encompassed in local, regional and national planning processes<sup>71</sup>.

In view of the foregoing, it can be projected that the quality green spaces & outdoor environment included in the Worcestershire LTP are likely to have moderate to major positive mental health impact on residents, visitors and users of the facilities located within it. Along with enhancing physical activities the outdoor value of the Local Transport plan will contribute significantly to 2 of the 3 overarching priorities of Worcestershire's Joint Health and Well-being Strategy (2016-21) which are to improve mental health and well-being, and to increase physical activity.

### **5.2.3 Economic empowerment and health**

The fourth Worcestershire LTP represents an ambitious investment programme in the county's transport networks, including infrastructure, technology and services which are essential to support planned growth, to ensure continued social and economic success of the county as a highly desirable place to live, work and visit. Importantly the companies, services and facilities connected to the Worcestershire LTP provide direct employment to thousands of people including engineers, IT specialists, drivers, administration staff, facilities managers etc. The Worcester Research Report in 2013 puts the number of people employed directly within the transport, transport hire and travel agency activities in Worcestershire at 4,505<sup>72</sup>.

The existing employment and creation of additional jobs over time for people who would work during the infrastructural construction phases and within the transport facilities when they become operational, along with the attendant economic empowerment, have the potential for major positive health impacts on those offered employment as well as their families. This is essentially because poverty has been shown to have major negative influences on health;

---

<sup>71</sup> CABE 2000. Future health: sustainable places for health and well-being. Commission for Architecture and the Built Environment (CABE).

<sup>72</sup> Worcester Research 2013. The Value of Tourism in Worcestershire.  
<http://www.wlep.co.uk/assets/The-Value-of-Tourism-in-Worcestershire-Final-Report-March-2013.pdf>

with a direct correlation between financial wellbeing and positive health<sup>73</sup>. Unemployment in particular is a major risk factor for low self-esteem, stress, mental health problems and suicide<sup>74</sup>. There will also be much opportunities for contractors and suppliers of equipment, products and services to the transport companies and facilities which would contribute to boosting the wider economy of Worcestershire and further afield.

When people are economically poor or less well-off they are unable to afford many of the necessities of life and wellbeing such as good housing, healthy food options, leisure and recreation as well as other health products. The creation of employment and economic opportunities and the resultant economic empowerment is envisaged to be able to have moderate to major positive health impacts.

Furthermore, when people are in employment their self-esteem, aspiration and motivation are raised with positive mental health impacts. It is envisaged that the cycle of poverty can be broken in some families that live in the county, especially in more deprived areas, through the opportunities created by Worcestershire LTP.

Employment also brings people out of social exclusion and isolation, while also distracting from engagement in criminal & anti-social behaviours; all of these can have positive physical and mental health impacts. Such impacts are likely to be enhanced over the mid- to long term operations of the Local Transport Plan; and the magnitude of the impacts arising from employment generation will be closely related to the number of people employed and the types of jobs they are employed to do.

---

<sup>73</sup> Marmot, M.2004 The Status Syndrome: How Social Standing Affects Our Health and Longevity. London Bloomsbury

<sup>74</sup> American Psychological Association 2012.

<http://www.apa.org/pi/ses/resources/indicator/2012/04/unemployment.aspx>

#### **5.2.4 Community cohesion, Social capital and health**

Social capital has been defined as *"the rules, norms, obligations, reciprocity and trust embedded in social relations, social structures and society's institutional arrangements which enable members to achieve their individual and community objectives"*<sup>75</sup>. It accrues from constructive human social relations and has been identified to be an essential strand in sustainable health and general development, with positive health impacts<sup>76,77</sup>.

The Worcestershire LTP will contribute to the overall regeneration and transformation of the immediate neighbourhoods where transport infrastructure and facilities are sited (for example the Evesham Rail Station Improvement Scheme); and Worcestershire County as a whole. This will lead to raised community pride, enhanced social capital and positive mental/ psychological health impacts. Similarly, improved access to arts and leisure amenities, enhancement of travel opportunities (especially to friends and family), and the increased number of people walking through neighbourhoods to get to and from bus stops and train stations are also likely to enhance social capital and community cohesion in the neighbourhoods. The positive health impacts are projected to be moderate to major.

#### **5.2.5 Impact of leisure and recreational facilities**

Leisure and recreation afford opportunities for rest, refreshment, learning, and entertainment; all of which can have minor to moderate positive impact on physical and mental health and wellbeing<sup>78</sup>. There are a number of leisure and recreational facilities and spaces within the Worcester LTP such as the open spaces, public realm improvement areas, waiting areas and café's within train and bus stations, and other relaxation spots that will be within the Transport Plan.

---

<sup>75</sup> Narayan (1997) *Voices of the Poor: Poverty and Social Capital in Tanzania*, World Bank, Washington D.C., USA.

<sup>76</sup> Macinko J and Starfield B (2001). The Utility of Social Capital in Research on Health Determinants. *The Milbank Quarterly*, Vol 79, Issue 3, 387-427

<sup>77</sup> Swan C and Morgan A (2002): Social capital for Health. Insight from qualitative research. Health Development Agency

<sup>78</sup> Health, place and nature – How outdoor environments influence health and well-being: a knowledge base. Sustainable Development Commission.

### **5.2.6 Small and Medium Enterprises (SMEs) and Health**

Although the Worcestershire LTP is a large scale and capital intensive infrastructural development, it is however projected to facilitate the increase in number and growth of small scale enterprises (SMEs) both within some directly associated facilities like bus and train stations; and other outlets located within city centres and other community locations that are serviced by the transport networks. Examples are coffee shops, eateries, newsagents and restaurants located within and close to the stations. Other SMEs to be benefitted are the direct and indirect suppliers to the organisations involved with the development of the LTP. Such SMEs would create further employment and provide essential services to different segments of population groups within and further away from the transport networks and infrastructure.

### **5.2.7 Sustainable Development within Worcestershire LTP and health**

Sustainable development is considered to be an approach to development which *"maintains a strong, healthy and just society, whilst respecting environmental limits, through using sound science responsibly, promoting good governance and achieving a sustainable economy"*<sup>79</sup>. Concern for human health and wellbeing is at the centre of sustainable development. Principle One of the Rio Declaration states that *"Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature"*<sup>80</sup>. Some of the specific activities within this approach include reduction in carbon dioxide (CO<sub>2</sub>) emission, energy conservation, recourse to more renewable energy sources, and optimisation (rather than waste) of resources.

It has been indicated within the Worcestershire LTP documents that high level sustainability approaches will be incorporated into the design, construction and implementation of the Transport Plan. The Plan documents acknowledge that technology is offering increasingly attractive opportunities to help manage

---

<sup>79</sup> Health, place and nature – How outdoor environments influence health and well-being: a knowledge base. Sustainable Development Commission.

<sup>80</sup> World Summit on Sustainable Development (WSSD), Johannesburg, SA, Aug 26-Sep 4, 2002; WHO. <http://www.who.int/wssd/en/> (accessed 9/3/11)

demand on the networks, to tackle congestion and support growth. Modern traffic signals, for example, can intelligently manage traffic flows to respond to variable demand. Improved access to dynamic travel information through a variety of media will enable users of the transport networks to make more informed travel choices.

Another sustainability approach within the Transport Plan is the existence of Air Quality Management Areas (AQMA) such as the one at Hagley (at the junction of the A456 and A491); and three around Bromsgrove on the A38 at Stoke Heath and Junction 1 of the M42. The AQMAs use suitable equipment and other measures to monitor the air quality and to control air pollution which can be exacerbated by emission from vehicles plying the road networks.

Sustainable approaches to development endeavours have financial, health and corporate social responsibility (CSR) benefits to organisations and individuals. The positive health benefits of pollution control through air quality management is predicted to be major because there is a substantial body of evidence on the adverse health effects of air pollution from motor vehicles especially diseases of the lungs and respiratory system.<sup>81,82</sup>

Sustainable approaches to transport management is an integrated way of reducing the contribution of transport to climate change and the harmful consequences on health (section 5.3.4).

---

<sup>81</sup> Douglas M, Thomson H, Jepson R, Hurley F, Higgins M, Muirie J, Gorman D (eds) *Health Impact Assessment of Transport Initiatives: A Guide*, NHS Scotland Edinburgh 2007

<sup>82</sup> World Health Organization. 2005. Health effects of transport related air pollution.



### **5.3 NEGATIVE HEALTH IMPACTS:**

#### **5.3.1 Construction related injuries during construction phase.**

The construction phase of different aspects of the Worcestershire LTP includes the construction, building and installation of the new link roads (e.g. Bromsgrove A38 Strategic Corridor), junction enhancement projects (such as Mustow Green in Wyre Forest), train and bus station buildings (e.g. as planned for Kidderminster Bus interchange), houses, and overhead pedestrian crossings where needed. There will also be some construction work involved in building new bus shelters and putting in place the real-time passenger information systems, and many other associated works. During the extensive building and construction activities for different projects within the Local Transport Plan, there is the risk of construction related injuries to construction personnel and pedestrians through the affected areas. Similarly, disruptions, dust & noise pollution may occur with minor to moderate physical and psychological health impacts.

The various projects within the development will be phased over a period of approximately 10-13 years, with some areas being started, completed and utilised before others can commence, in an interlinked process.

In terms of physical injury outcomes, there is the potential for incidents to occur in and around construction project sites if the site and related traffic are not satisfactorily managed. The presence of construction structures such as scaffoldings, the possibility of load slippage from cranes, lorries and other construction machinery, are likely to pose an increased risk of physical injury. For residents living along the indicative route for construction traffic outside the development site and those operating within the development while construction is on-going, this could have minor to moderate negative health impacts.

However, the risks and possible health impacts would be significantly minimised if construction guidelines are adhered to. As an example, construction companies can be accredited with the Considerate Contractors Scheme. Construction sites, companies and suppliers voluntarily register with the Scheme and agree to abide by the Code of Considerate Practice, designed

to encourage best practice beyond statutory requirements. This includes protecting the environment, respecting the community, securing the safety of people on and off-site, and valuing the workforce. A Construction Management Plan has to be prepared for each development parcel to ensure dust and noise are minimised through mitigation.

### **5.3.2 Traffic congestion and air pollution**

There is a substantial body of evidence on the adverse health effects of air pollution from motor vehicles, including cardiorespiratory disease, reductions in lung function and exacerbation of existing respiratory illness such as asthma.<sup>83,84</sup> Congestion and low average vehicle speeds generally increases the emission of air pollutants; hence initiatives that reduce congestion and increase average vehicle speeds can reduce local air pollution levels.<sup>85</sup> Other contextual factors such as urban/traffic density, climatic factors, and proximity to the road when walking, are important factors in exposure.

Residents, stakeholders and businesses consistently cite congestion as a key concern that needs to be managed wherever possible<sup>86</sup>. Traffic congestion results in delays in commuters reaching their destinations which can cause annoyance and anxiety with mild to moderate negative psychological health impact; the impact is often directly related to the extent of the delay experienced by commuters.

The Worcestershire LTP recognises the need to control both air pollution and traffic congestion through junction improvement schemes (e.g. Mustow Green junction in Wyre Forest) and Air Quality Management Areas (AQMA) such as Dolday/Bridge Street in South Worcestershire. Lickey End (M42 Junction 1) is proposed to be both a junction enhancement project and a major AQMA Remediation scheme. Other measures that can reduce air pollution include

---

<sup>83</sup> Douglas M, Thomson H, Jepson R, Hurley F, Higgins M, Muirie J, Gorman D (eds) *Health Impact Assessment of Transport Initiatives: A Guide*, NHS Scotland Edinburgh 2007

<sup>84</sup> World Health Organization. 2005. Health effects of transport related air pollution.

<sup>85</sup> Institute of Public Health in Ireland. 2005. Health impacts of transport: a review.

<sup>86</sup> Worcestershire City Council. LTP4 Consultation Report, Autumn 2017

reduction in number of private cars and greater use of public transport such as buses (modal shift) and use of hybrid/ electric cars.

Generally, over the medium to long term, levels of air pollution are declining as tighter regulations on vehicle and other emissions are put in place locally and nationally.

### **5.3.3 Noise pollution and risk of accidents**

Road traffic noise generally ranges between 50 – 80 decibels. This is enough to cause annoyance, difficulty in concentrating, and sleep disturbance in some people<sup>87</sup>. Noise may also deter some people from walking or cycling on busy roads. All of these can result in mild negative health impacts.

It is to be noted also that the creation of new roads which bring about increased traffic flow to a given area, can also led to increased chances of road traffic accidents which can impact negatively on people's health and wellbeing. The road users with the highest risk of being killed or seriously injured are cyclists and pedestrians<sup>88</sup>. The extent of such disadvantages largely depends on the effectiveness of traffic management systems.

Each year in Worcestershire there are around 1,500 personal injury road traffic accidents. These accidents result in some 2,000 casualties<sup>89</sup>. For 2013-15, the rate per 100,000 population of people killed or seriously injured on roads in Worcestershire was 32.6, which is lower than the England figure of 38.5<sup>90</sup>. Police Area Collision Data (West Mercia Police) showed there were 287 Road Traffic Collisions (RTC) in North and South Worcestershire between October - December 2010. For the same periods in 2011, 2012 and 2013 the figures were 342, 286 and 265 respectively<sup>91</sup>. These show that RTC and the resultant

---

<sup>87</sup> Cave B, Cooke A, Benson K (2004). Urban Renaissance Lewisham health and social impact assessment

<sup>88</sup> Department for Transport. 2007. Health Related Difficulties Personal Travel Factsheet

<sup>89</sup> Worcestershire County Council; Accident Studies.

[www.worcestershire.gov.uk/info/20007/travel\\_and\\_roads/569/accident\\_studies](http://www.worcestershire.gov.uk/info/20007/travel_and_roads/569/accident_studies)

<sup>90</sup> Public Health England. Health Profile for Worcester County, July 2017

<sup>91</sup> West Mercia Police 2017. Road Traffic Collision (RTC) Statistics.

<https://www.westmercia.police.uk/article/6784/Road-Traffic-Collision-RTC-statistics>

injuries and deaths are important issues in planning and managing transportation, and for which effective safety measures must be in place.

#### **5.3.4 Transport and Climate change**

In 1995, the Department for Transport estimates that transport accounted for no less than 22% of carbon dioxide (CO<sub>2</sub>) emissions in the UK, with road transport accounting for 95% of all transport emissions<sup>92</sup>. The carbon emissions from various sources of human activities collect in the earth's atmosphere to cause complex changes in the climate system<sup>93</sup>.

Climate change is thought to have several negative effects on health and in its Third Assessment Report (2001) the United Nations Intergovernmental Panel on Climate change (IPCC) concluded that '*Overall, climate change is projected to increase threats to human health, particularly in lower income populations, predominantly within tropical/ subtropical countries.*' The health impacts of climate change are global and will arise over a longer-term interval.

The inclusion of sustainable approaches to transport management in the Worcestershire LTP is a commendable approach to minimising the contribution of the transport initiatives to climate change.

#### **5.4 CONCLUSION ON HEALTH IMPACTS**

The Worcestershire Fourth Local Transport Plan has the potential to bring about several positive health impacts on the direct users of the services and facilities, as well as other people who would be remotely connected with it. The Local Transport Plan considers the various aspects of the county's transport networks, including infrastructure, technology and services which are essential to support planned growth, and ensure continued social and economic success of the county.

---

<sup>92</sup> Department for Transport. Section 8: Health and the environment. In Transport Trends. London: Department for Transport, 2006

<sup>93</sup> United Nations Framework Convention on Climate Change. NY, United Nations, 1992

Overall the Worcestershire LTP will have major and significant positive and beneficial health impacts on commuters, residents, employees, visitors and other users of the facilities and services. These will be brought about through employment generation, facilitating access to various services, enhancing social capital and encouraging physical activities (Active Transport).

However, there are some contextual factors that are likely to influence the derivation of maximal positive health impacts, some of which have been identified to be able to have negative health impacts through congestion, air pollution, and risk of injury through construction related activities and traffic accidents. It will be important to ensure on-going maintenance of the transport infrastructure and facilities, Air Quality Management, Active Transport Corridors, and adherence to general and transport safety guidelines, to ensure that the positive health benefits of the proposed Local Transport Plan carry on into the long term.

## Chapter 6

# RECOMMENDATIONS

---

### 6.1 MEASURES TO OPTIMISE POTENTIAL HEALTH IMPACTS

The following are recommendations that would be helpful towards enhancing the identified positive health impacts and also mitigating some of the negative impacts:

#### 6.1.1 Detailed design and planning aspects.

Given that moderate to major positive health impacts are envisaged to arise from the new and functional transport infrastructure and facilities aspects of the Worcestershire LTP, all such facilities should be designed to the latest building and construction regulations that promote high security, energy efficiency/conservation, and access for all. The projected benefits are tied to the proper and effective functioning of the transport system and facilities, such that their malfunction or dilapidation will erode such benefits. Consideration should always be given to less advantaged people, such as the elderly and disabled, in the design and implementation of transport services. This would minimise health and transport inequalities

6.1.2 In order to derive maximal projected benefits from the green spaces and outdoor environment, efforts should be made to manage and monitor the Active Transport Corridors and open spaces to ensure that they do not become sites for litter or anti-social behaviour. If the green spaces are not properly managed, they can discourage usage and the projected benefits will not be achieved.

6.1.4 Robust Health and Safety procedures and guidelines should be put in place and adhered to during construction works to minimise the risks of harm and injury to workers and visitors to the sites during the construction phases of relevant projects. A construction Management Plan is proposed; and all contractors will have to be health and safety compliant. The companies undertaking construction should be accredited with the Considerate Contractors Scheme. Construction sites, companies and suppliers voluntarily register with the Scheme and agree to abide by the Code of Considerate

Practice, designed to encourage best practice beyond statutory requirements. This includes protecting the environment, respecting the community, securing the safety of people on and off-site, and valuing the workforce.

A Construction Management Plan should be prepared for each development parcel to ensure dust and noise are minimised through mitigation. Where noise is likely to have an impact, this should be mitigated with acoustic fences and other sound proofing measures.

6.1.5 In order to maximise the benefits of the sustainability approaches in the development of the Worcestershire LTP, efforts should be made to maintain high environmental performance within the projects and facilities. Undertakings such as proper waste management, recycling, energy efficiency approaches etc should be encouraged among the various organisations that will be involved in providing services for the projects.

The accompanying Worcestershire Network Management Plan document which is part of the Local Transport Plan, covers sustainability and place making credentials of the proposal, to the benefit of users and the surrounding areas. In addition to monitoring the ambient air quality and establishing Air Quality Management Areas (AQMA), the following additional measures will be helpful in reducing traffic related air pollution:

1. Concerted efforts to decreased private car use in preference for public transport such as trains and buses (modal shift)
2. Sustainable (Active) traffic management to decreased traffic congestion as much as possible
3. Greater use of electric or hybrid electric design vehicles with lower emission profile, leading to reduced traffic emissions and improved local air quality along the routes.

It is worth noting that increased exposure to air pollution has the potential to counteract the benefits of increased walking associated with Active Travel programmes.

#### 6.1.6 Increased Mobilisation and Awareness

It would be helpful to take all feasible measures to increase awareness and sensitisation of the residents and general public to the benefits of Active Transport and transport related safety measures, especially road safety. The public should constantly be made aware and reminded of the need to avoid excessive speeding, not to drive when tired & sleepy, the dangers of drink driving, and to avoid the use of mobile phones while driving – all of which contribute to transport related accidents.



Appendix 1: Health Impact Matrices

**WORCESTERSHIRE LTP4 HIA IMPACT MATRIX (1)**

Population groups: Commuters, employees, visitors, local residents, any vulnerable groups?

Intervention / Priority area of focus	Determinants of health	Possible effects on determinant	Likely health impact (+ve/-ve)	Population groups affected	Period of effect (Short-, Mid-, or Long-term)	Occurrence (Certain/ Probable)	Suggestions for improvement
<b>PHYSICAL STRUCTURE, FACILITY LOCATION, PROPOSED SERVICES</b>  - New Link Roads - New train stations - Bus Interchanges - Employment opportunities - Junction improvements - Active Transport Corridors & open spaces - Air Quality Managment - Infrastructure & Facilities	<b>Social &amp; Economic</b> Poverty, employment, social exclusion, benefits, community networks, crime						
	<b>Lifestyle &amp; Behaviours</b> Diet, physical activity, smoking, alcohol, drugs, sexual behaviours, coping skills						
	<b>Access to services</b> Education, health services, transport, Leisure						
	<b>Environment</b> Air, water, housing, pollution, noise, risk of injury, disease vectors						

## WORCESTERSHIRE LTP4 HIA IMPACT MATRIX (2)

Population groups: Commuters, employees, visitors, local residents, any vulnerable groups?

Intervention / Priority area of focus	Determinants of health	Possible effects on determinant	Likely health impact (+ve/-ve)	Population groups affected	Period of effect (Short-, Mid-, or Long-term)	Occurrence (Certain/ Probable)	Suggestions for improvement
<p><b>STRENGTHENING COMMUNITIES AND PARTNERSHIPS</b></p> <ul style="list-style-type: none"> <li>- Proximity to motorways and transport links</li> <li>- Facilities for community/ social functions</li> <li>- Employment for local residents</li> <li>- Impact on local businesses</li> <li>- Social capital</li> <li>- Community severance</li> </ul>	<p><b>Social &amp; Economic</b> Poverty, employment, social exclusion, benefits, community networks, crime</p>						
	<p><b>Lifestyle &amp; Behaviours</b> Diet, physical activity, smoking, alcohol, drugs, sexual behaviours, coping skills</p>						
	<p><b>Access to services</b> Education, health services, transport, Leisure</p>						
	<p><b><u>Environment</u></b> Air, water, housing, pollution, noise, risk of injury, disease vectors</p>						

### WORCESTERSHIRE LTP4 HIA IMPACT MATRIX (3)

Population groups: Commuters, employees, visitors, local residents, any vulnerable groups?

Intervention / Priority area of focus	Determinants of health	Possible effects on determinant	Likely health impact (+ve/-ve)	Population groups affected	Period of effect (Short-, Mid-, or Long-term)	Occurrence (Certain/ Probable)	Suggestions for improvement
<p><b>EQUALITY &amp; DIVERSITY ISSUES</b> + <b>WHAT ABOUT THE VULNERABLE GROUPS?</b></p> <ul style="list-style-type: none"> <li>- People with disabilities</li> <li>- Elderly</li> <li>- Children</li> <li>- Pregnant women</li> <li>- Influence on deprivation in Worcestershire</li> <li>- Any hard to reach groups?</li> </ul>	<p><b>Social &amp; Economic</b> Poverty, employment, social exclusion, benefits, community networks, crime</p>						
	<p><b>Lifestyle &amp; Behaviours</b> Diet, physical activity, smoking, alcohol, drugs, sexual behaviours, coping skills</p>						
	<p><b>Access to services</b> Education, health services, transport, Leisure</p>						
	<p><b>Environment</b> Air, water, housing, pollution, noise, risk of injury, disease vectors</p>						





Herbert Minton Building  
79 London Road  
Stoke-on-Trent  
ST4 7QE  
United Kingdom

Tel: +44 (0)1782 746611  
Mobile: +44 (0)7791218727

Email: [info@ghemconsultants.co.uk](mailto:info@ghemconsultants.co.uk)

Web: [www.ghemconsultants.co.uk](http://www.ghemconsultants.co.uk)