



Local Cycling and Walking Infrastructure Plan

Watford Borough Council & Three Rivers District
Council

December 2021

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Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
1	01/12/21	AK	EJ	NW	Draft Report
2	12/01/2022	AK	EJ	NW	Final report – following Client comments
3	13/01/2022	AK	EJ	NW	Final report – following Client comments – minor updates

Document reference: 100411717-AE |

Information class: Standard

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Contents

1	Introduction	5
1.1	LCWIP background	5
1.2	Report Structure	6
1.3	The LCWIP process	6
2	Determining scope – LCWIP Stage 1	8
2.1	Overview of the joint LCWIP	8
2.1.1	Objectives	8
2.2	Establishing the geographical extent	8
2.3	LCWIP governance structure	9
2.4	Stakeholder Engagement Approach	10
3	Background context and gathering information – LCWIP Stage 2	11
3.1	Policy context	11
3.1.1	Watford Borough Council Draft Local Plan 2020-2036	11
3.1.2	Watford High Street (North) and Cultural Hub Masterplan 2019 – Watford Borough Council	12
3.1.3	Major scheme developments in Watford and Three Rivers	13
3.1.4	Hertfordshire’s Local Transport Plan 2018 – 2031	13
3.1.5	Hertfordshire County Council, Adoption of the Place & Movement Approach	16
3.1.6	Hertfordshire County Council Active Travel Strategy 2013	17
3.1.7	South West Hertfordshire Cycle Study 2013	17
3.1.8	South West Hertfordshire Growth and Transport Plan Prospectus 2019	19
3.1.9	A414 Corridor Strategy, 2018	19
3.1.10	Emergency Active Travel Fund and Active Travel Funding, 2020- 2021	20
3.1.11	Other LCWIPs in Development	20
3.2	Baseline Travel and Transport Context	21
4	Network planning for cycling – LCWIP Stage 3	29
4.1	Propensity to cycle analysis	29
4.1.1	What is the PCT tool?	29
4.1.2	PCT Analysis for Watford and Three Rivers	30
4.2	Origin and destination analysis	32
4.2.1	Long list of identified corridors	33
4.2.2	Key corridors	34
4.3	Cycle demand mapped onto the road network using both PCT and origin- destination data	35

4.4	Pre-prioritisation	36
4.4.1	Methodology	36
4.4.2	Results	37
4.5	Priority routes	38
4.6	Cycling network assessment	39
4.6.1	RST baseline audits	40
5	Network planning for walking – LCWIP Stage 4	42
5.1	Core walking zones	42
5.1.1	Watford	43
5.1.2	WRAT baseline audits	44
6	Interventions	46
6.1	Types of cycling interventions	46
6.2	Identified cycling interventions	47
6.2.1	Watford	48
6.2.2	Stakeholder Feedback	49
6.3	Types of walking intervention	52
6.3.1	Watford	53
6.3.2	Stakeholder Feedback	54
7	Prioritising Improvements – LCWIP Stage 5	56
7.1	Deliverability assessment	56
7.1.1	Criteria	56
7.1.2	Assessment	57
8	Integration and application – LCWIP Stage 6	58
8.1	Timescales and Review	58
8.2	Funding	58
8.3	Policy Integration and application	58
A.	Cycling interventions	67
B.	Walking Interventions	678
C.	Prioritisation Tables	68
Tables		
	Table 1.1: DfT Cycling and Walking Long Term Aspirations	5
	Table 1.2: The LCWIP Process	7
	Table 3.1: Major scheme developments in Watford and Three Rivers	13

Table 3.2: Active travel long term objectives	17
Table 3.3: Proposed schemes for Watford	18
Table 3.4: Tranche 1 and Tranche 2 EATF Schemes for Watford and Three Rivers	20
Table 3.5: 2011 Census travel to work mode	21
Table 3.6: HCC cycle targets	24
Table 3.7: HCC walking targets	26
Table 4.1: PCT Scenarios	29
Table 4.2: Watford baseline RST results summary	40
Table 5.1: Watford Core walking zones – Existing conditions WRAT results summary	44
Table 5.2: Watford Key walking routes – Existing conditions WRAT results summary	45
Table 6.1: Core walking zone - WRAT results summary (with interventions)	54
Table 6.2: Key walking routes - WRAT results summary (with interventions)	54
Table 7.1: Deliverability Criteria	56
Table 7.2: Watford Cycle Route Prioritisation	57
Table 7.3: Watford Walking Route Prioritisation	57

Figures

Figure 1.1: Benefits of the LCWIP process	6
Figure 2.1: Geographical scope	9
Figure 2.2: Governance structure for the Watford and Three Rivers LCWIP	10
Figure 3.1: Watford local context	12
Figure 3.2: LTP walking and cycling policies	16
Figure 3.3: Hertfordshire Place and Movement Matrix	16
Figure 3.4: Hertfordshire Cycling Map for Travel and Leisure	23
Figure 3.5: Journeys less than 3 miles 2018 and 2019	24
Figure 3.6: Cycle Level Trends in Hertfordshire	25
Figure 3.7: Mode share of journeys less than 1 mile in length in Hertfordshire	26
Figure 3.8: Cycle to work mode share	27
Figure 3.9: Walk to work mode share	27
Figure 4.1: PCT Outputs for Watford and Three Rivers (Go Dutch and Government Target Scenarios)	31
Figure 4.2: PCT Analysis – cycle demand mapped onto the route network (trip assignment)	32
Figure 4.3: Key trip origins and destinations in Watford and Three Rivers	33
Figure 4.4: Connecting origins and destinations	34
Figure 4.5: Identification of key corridors of demand	35
Figure 4.6: Cycle demand mapped onto the network	36
Figure 4.7: Watford route prioritisation	38
Figure 4.8: LCWIP priority routes	39
Figure 5.1: Core walking zones	43
Figure 5.2: Key walking routes around Watford town centre	44

1 Introduction

This document is the Local Cycling and Walking Infrastructure Plan for Watford Borough Council (WBC) and Three Rivers District Council (TRDC), developed with these two local authorities and in partnership with Hertfordshire County Council (HCC) as the Highway Authority. This version of the document focusses on the routes within Watford Borough as schemes are still being developed in Three Rivers. A second version of the document will combine the schemes for both districts.

1.1 LCWIP background

In April 2017, the Department for Transport (DfT) published the first National Cycling and Walking Investment Strategy (CWIS)¹.

The CWIS is based around the ambition to make cycling and walking ‘the natural choices for shorter journeys, or as part of longer journeys’. The strategy is seeking to support the transformation of local areas where the dominance of the motorised vehicle will be reduced to tackle congestion, support local economies and improve physical and mental health.

The CWIS identified short to long term objectives for cycling and walking, with short term targets focusing on increased journeys by active modes, including an increase in the percentage of children that walk to school. Short term safety targets have also been identified, which will reduce the rate of cyclists killed or seriously injured on England’s roads.

Table 1.1 presents the long term (by 2040) DfT aspirations relating to cycling and walking.

Table 1.1: DfT Cycling and Walking Long Term Aspirations

Government Ambition	Objectives
Better Safety – ‘A safe and reliable way to travel for shorter journeys’	<ul style="list-style-type: none"> • Streets where cyclists and pedestrians feel they belong and are safe • Better connected communities • Safe traffic speeds, with low speed limits where appropriate • Cycle training opportunities for all children
Better Mobility – ‘More people cycling and walking – easy, normal and enjoyable’	<ul style="list-style-type: none"> • More high quality cycling facilities. • More urban areas that are considered walkable. • Rural roads which provide improved safety for cycling and walking. • More networks of routes around public transport hubs and town centres. • Better links to schools and workplaces. • Technological innovations that can promote more and safer cycling and walking. • Behaviour change opportunities to support increased walking and cycling. • Better integrated routes for those with disabilities or health conditions.
Better Streets – ‘Places that have cycling and walking at their heart’	<ul style="list-style-type: none"> • Places designed for people of all abilities and ages. • Improved public realm. • Better planning for walking and cycling. • More community based activities such as led rides. • A wider green network of paths, routes and open spaces.

Source: Department for Transport Local cycling and walking infrastructure plans technical guidance

¹https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/603527/cycling-walking-investment-strategy.pdf

To achieve the objectives set out within the CWIS, it is imperative that local bodies across England develop high quality cycling and walking infrastructure to encourage mode shift towards active modes. To achieve the Government's ambition to normalise both modes of active travel, guidance has been developed to support local authorities produce Local Cycling and Walking Infrastructure Plans (LCWIP).

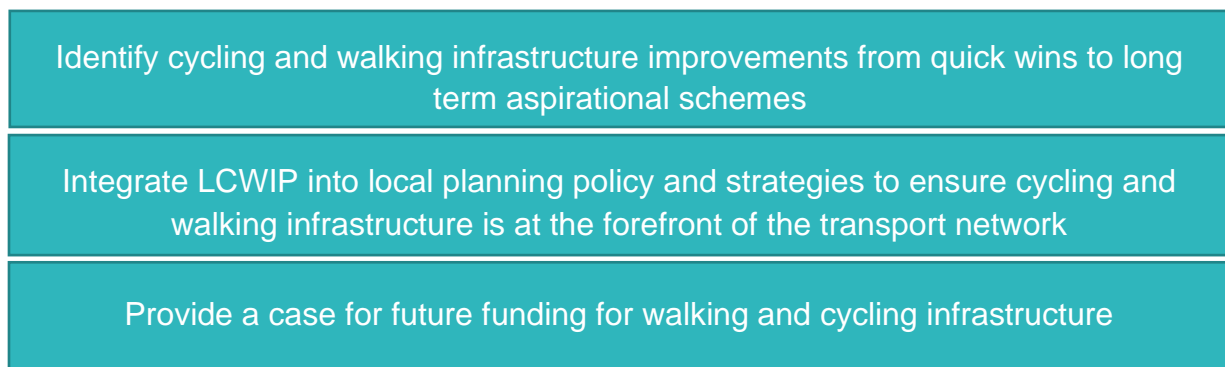
LCWIPs are a new, strategic approach developed to support the aims and objectives of CWIS. The LCWIP process enables the identification of cycling and walking improvements required at the local level. The process enables a long-term approach to developing local cycling and walking networks, ideally over a 10 year period, and form a vital component of the Government's strategy to increase the number of trips made by both forms of active travel.

The key outputs of LCWIPs are²:

- A network plan for walking and cycling which identifies preferred routes and core zones for further development
- A prioritised programme of infrastructure improvements for future investment
- A report which sets out the underlying analysis carried out and provides a narrative which supports the identified improvements and network

Figure 1.1 shows the key benefits of local bodies developing a strategic approach to cycling and walking infrastructure through LCWIPs.

Figure 1.1: Benefits of the LCWIP process



Source: Mott MacDonald

1.3 The LCWIP process

The recommended process for creating an LCWIP is set out in the LCWIP Guidance from DfT, and comprises six stages, outlined in Table 1.2. This broadly reflects the process undertaken for Watford and Three Rivers. This report follows this structure and explains how it has been applied in the development of this document.

²https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/607016/cycling-walking-infrastructure-technical-guidance.pdf

Table 1.2: The LCWIP Process

Stage	Name	Description
1	Determining Scope	Establish the geographical extent of the LCWIP, and arrangements for governing and preparing the plan.
2	Gathering Information	Identify existing patterns of walking and cycling and potential new journeys. Review existing conditions and identify barriers to cycling and walking. Review related transport and land use policies and programmes.
3	Network Planning for Cycling	Identify origin and destination points and cycle flows. Convert flows into a network of routes and determine the type of improvements required.
4	Network Planning for Walking	Identify key trip generators, core walking zones and routes, audit existing provision and determine the type of improvements required.
5	Prioritising Improvements	Prioritise improvements to develop a phased programme for future investment.
6	Integration and Application	Integrate outputs into local planning and transport policies, strategies, and delivery plans.

Source: LCWIP Guidance, DfT, 2017

2 Determining scope – LCWIP Stage 1

2.1 Overview of the joint LCWIP

Taking advantage of the strong geographical links between Watford and Three Rivers, the LCWIP considers the route network across both authorities. This version of the document focusses on the Watford routes. A second version which will comprise a full joint LCWIP will be produced once Three Rivers routes are fully assessed.

This LCWIP includes a study detailing the existing walking and cycling networks and the existing infrastructure, to inform a programme of walking and cycling network improvements.

2.1.1 Objectives

In addition to the production of an LCWIP setting out the strategic walking and cycling networks in the study area, the following supplementary objectives and aspirations were identified by the HCC, WBC and TRDC at the project inception meeting on 6th April 2020:

- The LCWIP needs to build up ‘a bigger picture’ of the cycling network to ensure that local areas are ultimately connected into the strategic LCWIP network.
- A ‘whole network’ approach to ensure that the network is completely joined up.
- Key routes leading to Watford town centre (Clarendon Road, St Albans Road and Vicarage Road) must be included as they have been identified as political priorities.
- WBC has aspirations to increase walking and cycle for all and to reduce car use.

2.2 Establishing the geographical extent

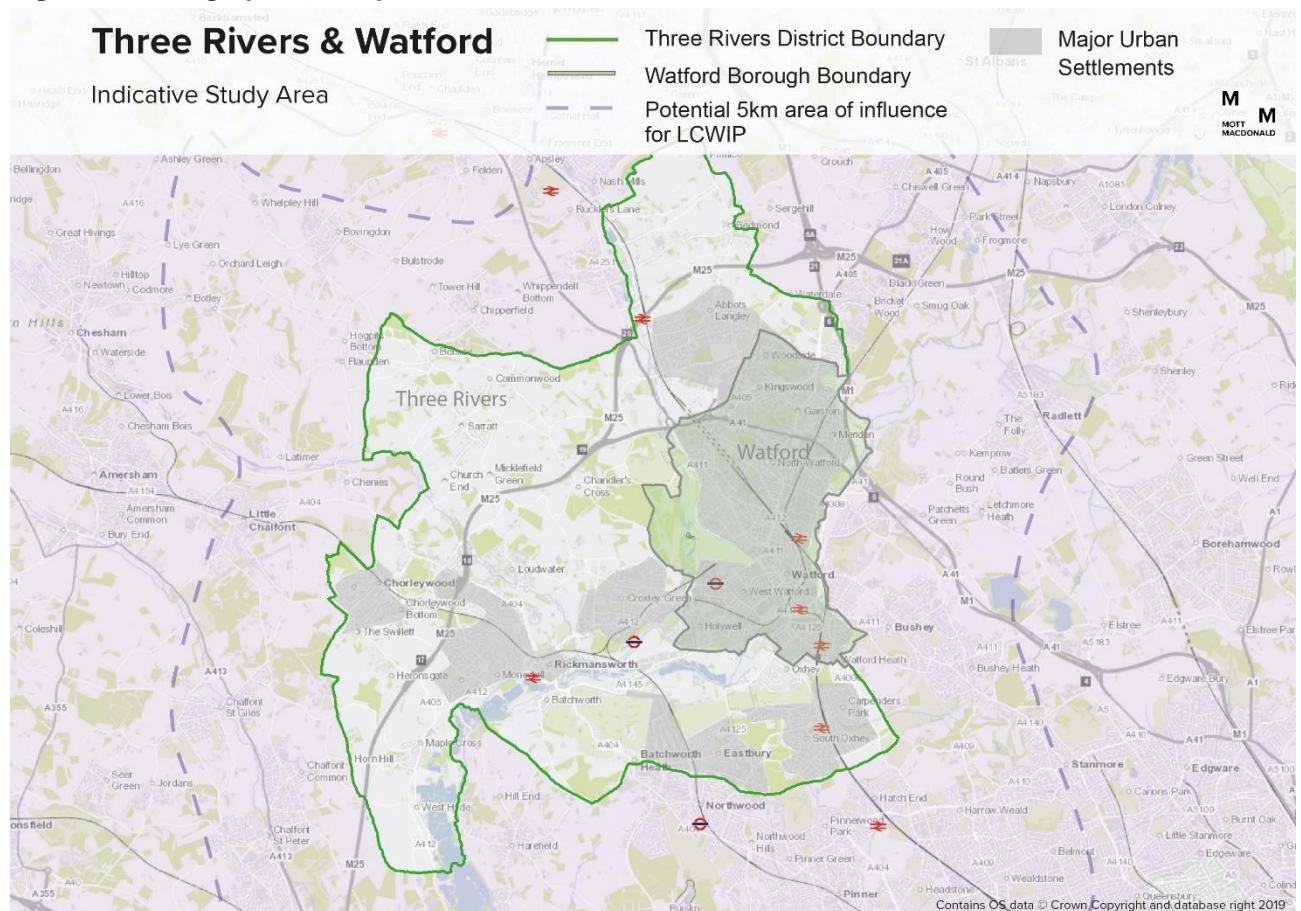
The joint LCWIP is for WBC and TRDC local authorities. These two local authorities sit within the County of Hertfordshire, with the County Council responsible for the management of the highway network.

Watford is located to the East of the study area and has a large population of over 96,000 people within 8.3 square miles. Three Rivers District is located to the West of the study area and has more suburban and rural characteristics with strategically important transport corridors. Both Three Rivers and Watford have high transport accessibility with a high proportion of commuter travel.

When defining the geographical scope of the LCWIP, origins and destinations within a reasonable cycling distance (approximately 5km) have been included. Therefore, some of these origins and destinations are beyond the immediate local authority boundaries.

Figure 2.1 sets out the geographical extents of the LCWIP.

Figure 2.1: Geographical scope



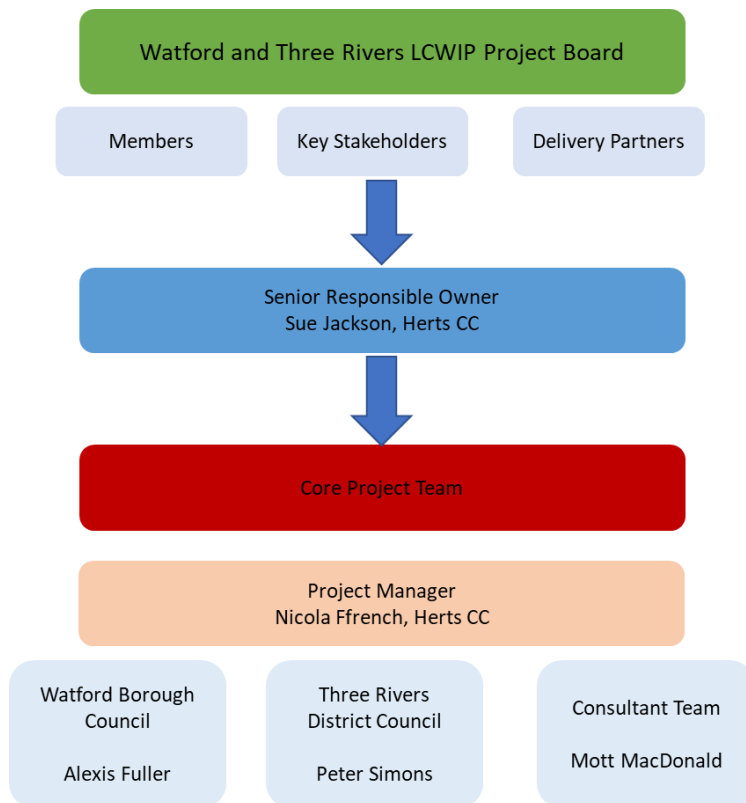
Source: Mott MacDonald

2.3 LCWIP governance structure

As outlined in the DfT's LCWIP guidance, the governance and delivery arrangements need to be proportionate to the scale and complexity of the LCWIP. This LCWIP is categorised within the LCWIP guidance as a joint local authority delivery model, as there are a significant number of potential trips occurring between neighbouring authorities.

The delivery model for Watford and Three Rivers LCWIP is shown in the Figure 2.2 below.

Figure 2.2: Governance structure for the Watford and Three Rivers LCWIP



Source: Mott MacDonald

2.4 Stakeholder Engagement Approach

Engagement with local stakeholders is an important element of developing a robust LCWIP, with feedback from local authority officers, members and stakeholder groups a vital way of incorporating local experience into the plan.

Two rounds of stakeholder engagement were held during the LCWIP development;

October 2020 – An introductory workshop with key stakeholders, setting out the context for the work, the process of the LCWIP, and outlining the work completed as part of LCWIP stages 1 and 2, and introducing the emerging walking and cycling networks.

June/October 2021 – An update workshop on the Watford (June) and Three Rivers (October) network planning stages, including an overview of the pre-prioritisation process, and discussion of the audited routes in both areas.

Closer engagement with local Members has been carried out during the LCWIP development by the local authority officers and fed back into the LCWIP development.

The engagement has allowed the project team to better understand the views of the people who are likely to use the networks under development and gather local knowledge on routeing and prioritisation.

3 Background context and gathering information – LCWIP Stage 2

This first part of this section provides an overview of recent documents which have been produced by HCC, WBC and TRDC and are of material consideration for the development of the Watford and Three Rivers LCWIP. The second part of the section considers the baseline conditions for active travel – reviewing existing demand and networks.

3.1 Policy context

The LCWIP advances the strategic walking and cycling network planning in the study area and takes into account work completed to date. Key documents, including the local authority Local Plans which set out the local development aspirations, and existing active travel strategies have influenced the development of the walking and cycling networks, and are considered in this section. The LCWIP supports the new Transforming Travel in Watford: the strategy for 2021-2041 (TTIW) which seeks to develop the active travel network in the town as part of a range of transport improvements.

3.1.1 Watford Borough Council Draft Local Plan 2020-2036

The Watford Local Plan 2018-2036 sets out the growth strategy for the borough and identifies how much development will take place and where it should be delivered. Figure 3.1 shows the local context. From a current population of 96,000 the Plan makes provision for 14,988 new homes and the creation of 11,500 new jobs. Reducing reliance on the car and increasing the number of people walking and cycling has been identified as a key aspiration for sustainable development. There are strategic transport, mobility and infrastructure objectives, and three Strategic Development Areas have been identified within a Core Development Area, at the following locations:

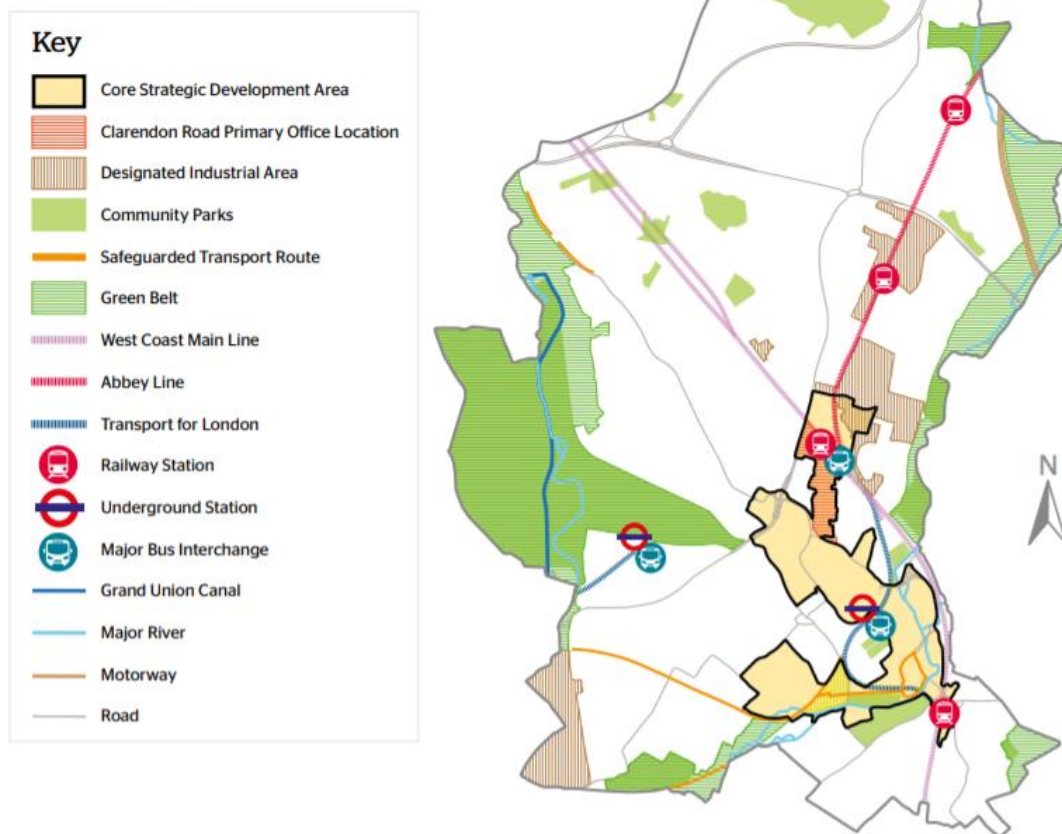
- Watford Gateway
- Town Centre
- Colne Valley

Allocated development sites have been considered in the origin-destination analysis in Chapter 4.

Figure 3.1: Watford local context

 A Spatial Strategy for Watford

Figure 1.2: Key Diagram



Source: Watford Borough Council Draft Local Plan

3.1.2 Watford High Street (North) and Cultural Hub Masterplan 2019 – Watford Borough Council

The Watford High Street (North) and Cultural Hub Masterplan was developed to regenerate and enhance the stretch of the town centre that runs from the ring road flyover to the Town Hall and surrounding area. Connectivity improvements have been proposed as part of the strategy. These include:

- new shared use surface on Hempstead Road gyratory;
- improved public space between Town Hall and Library ;
- new surface level crossing to improve route for pedestrians and cyclists between the High Street and Town Hall area; and
- upgrading the environment on side streets connecting to the parade and high street.

These proposals are considered in the development of the networks in stages 3 and 4 of the LCWIP.

3.1.3 Major scheme developments in Watford

Table 3.1 summarises some of the recent major scheme developments in Watford³. These proposals are considered in the network development in LCWIP stages 3 and 4.

Table 3.1: Major scheme developments in Watford

Scheme Name	Details	Status
Watford High Street Improvements	Led by WBC in partnership with HCC and Watford BID - the scheme provides better access for everyone to fully enjoy the town centre, as well as making it brighter and more spacious by laying attractive new paving, upgrading the bus shelters, removing clutter. Bollards are now in place to prevent vehicles from illegally driving through the town centre, which has also allowed the bus services to provide smoother and quicker travel for residents and visitors to the town.	Completed
Watford Junction Station Area Upgrade	The station will be significantly updated by Watford Borough Council and its partners (Halkin, Network Rail, London North Western Railways and HCC) to create a new multi-mobility hub. An exciting and vibrant quarter will be created around the town's main station, providing around 3,900 new homes alongside floor space for 7,000 jobs. Plans include a new facade, new shopping facilities, new bus stops, better walking routes and a brand new pedestrian and walking bridge to significantly reduce severance caused by the railway line. A second entrance to the station, a new ticket hall, a new bus station and a multi-storey car park for station users are also planned.	Ongoing
Clarendon Road	This improvement scheme will create an important gateway into Watford, significantly enhancing the conditions for walking between Watford Junction and the High Street.	Completion 2025
St Albans Road	WBC, working closely with local councillors, local businesses, residents and HCC made improvements to St Albans Road. These include £400,000 of investment on new street furniture, improved paving, tree planting, more cycle friendly routes and other changes to the look and feel of the area.	Completed
Cycle Hire	The Beryl Bike Share scheme now operates in Watford, providing 24/7 access to hire bikes around the borough. The scheme provides both traditional and e-bikes, which are bookable via the Beryl app.	Commenced

3.1.4 Hertfordshire's Local Transport Plan 2018 – 2031

The key policy document guiding transport strategy in Watford and Three Rivers is Hertfordshire's Local Transport Plan 4 (LTP4) for 2018 to 2031. This sets out how transport can play a positive role in the future development of Hertfordshire, through improving economic growth, public health, meeting housing needs and having a sustainable impact on the environment.

The key challenges and opportunities identified on the LTP are:

³ <https://www.watford.gov.uk> and www.threerivers.gov.uk

- there is predicted to be a 21% increase in population by 2039 (some 250,000 extra people) which will likely increase the demand for transport and travel over time.
- improving transport can support economic growth, support regeneration and improve the health and wellbeing of the population and environment.
- transport has an important role in tackling health issues such as obesity and air pollution, and in improving overall quality of life.
- the solutions to these issues must be delivered against a backdrop of public spending pressures.

The LTP sets out objectives across three themes of People, Place and Prosperity. The LTP objectives which the LCWIP can most effectively support are;

- 2 - Enhance connectivity between urban centres in Hertfordshire;
- 3 - Improve accessibility between employers and their labour markets;
- 4 - Enhance the quality and vitality of town centres;
- 7 - Reduce carbon emissions;
- 8 - Make journeys and their impact safer and healthier; and
- 9 - Modal shift and encouraging active travel.

Support Documents and Transport Improvements

Documents supporting LTP4 which are also relevant to the development of the LCWIP include, most notably, the emerging Active Travel Strategy and the Sustainable Modes of Travel Strategy 20/21.

As part of LTP4, several flagship transport improvements have been proposed across Hertfordshire including: Sustainable Travel Towns; an east-west Rapid Transit system between Hemel Hempstead and Welwyn Garden City; and highway improvements on the A414.

The proposed strategic transport improvements that are specific to the Watford and Three Rivers area, include:

- Use of former Croxley Rail Link as a public transport corridor.
- Cycling infrastructure improvement for Rickmansworth and Watford.

Transport Context and Issues for Hertfordshire

The LTP4 sets out the transport context for the County and identifies the following transport context and issues that are considered relevant to this LCWIP:

- there is a good north – south transport network but east–west links are weaker especially for passenger transport.
- there is a high level of cross-boundary commuting, including 118,000 Hertfordshire residents working in London.
- movement patterns in the county are complicated due to the numerous medium-sized urban areas.
- there are significant road congestion issues and capacity constraints on the rail network.
- there is significant scope for improving the attractiveness of walking, cycling and bus use in the county, and encouraging more car users to take these modes.
- peak hour car trips are forecast to increase by 18% by 2031, which will impact on the environment, quality of life and put pressure on the council to respond with increases in highway capacity. A number of rail lines are forecast to be over capacity in future.

Tackling these issues will require a combination of support for walking, cycling and passenger transport provision, behaviour change initiatives and traffic demand management, as well as infrastructure provision to cater for an increase in motor traffic.

Future Scenario

The LTP includes some testing of proposed interventions against future uncertainty, and finds from scenario testing that active travel schemes, particularly those in urban areas, are likely to be more resilient to future uncertainty. This is of particular relevance given the future uncertainties that the Covid-19 pandemic has brought, including the short term reduction in public transport demand and corresponding increase in car travel as the public are deterred from using public transport, and an increase in demand for active travel during lockdowns. The lasting impact of the pandemic on travel behaviours remains uncertain, but schemes such as the DfT's Emergency Active Travel Fund (EATF) have allowed local authorities to make changes to the network to capitalise on a shift towards active travel and lock in changed behaviours.

Active Travel

- The Transport User Hierarchy is a LTP policy which sets the scene for the rest of the policy framework, and pedestrians and cyclists are identified as high priority in the hierarchy. It represents a shift in emphasis to increase rates of travel by more sustainable modes than previous LTPs. To support the creation of built environments that encourage greater and safer use of sustainable transport modes, HCC will in the design of any scheme and development of any transport strategy consider in the following order:
 - opportunities to reduce travel demand and the need to travel
 - vulnerable road user needs (such as pedestrians and cyclists)
 - passenger transport user needs
 - powered two wheeler (mopeds and motorbikes) user needs
 - other motor vehicle user needs.

The following active travel context and issues are set out within LTP4:

- In Hertfordshire, for trips less than 1 mile, the mode share for walking is 76.5%, which means that a quarter of these short trips are made by other modes including motor vehicles.
- In contrast cycling has a much lower mode share (1.7% for trips less than 1 mile, 4.8% for trips of 1-3 miles, 3.1% for trips of 3-5 miles) at distances that can be readily cycled. Given this current low mode share and the greater realistic range of cycling, there is significant potential in the county to increase cycling activity.
- Barriers to walking and cycling include safety and security factors, lack of physical infrastructure, social and cultural attitudes, weather conditions, purpose of the journey (e.g. carrying shopping), topography, health and a lack of knowledge, awareness, training or education.
- Currently provision of cycling infrastructure in the county is variable. However, the provision of cycling infrastructure in many other areas is patchy, with short, broken linkages. Much of the current cycling network is not conducive to use by less confident cyclists. By embracing opportunities to improve cycling infrastructure as endorsed by the Government's Cycling and Walking Investment Strategy (CWIS), cycling can become a much more attractive travel option in more areas and for a wider range of people.

HCC's LTP4 Walking and Cycling Policies are shown in Figure 3.2. The LCWIP supports the infrastructure aspects of the policies, developing key routes and improving safety for all active travel users.

Figure 3.2: LTP walking and cycling policies

Policy 7: Active Travel - Walking	Policy 8: Active Travel - Cycling
<p>The county council will seek to encourage and promote walking by:</p> <ul style="list-style-type: none"> a) Implementing measures to increase the priority of pedestrians relative to motor vehicles, especially in town centres, and creating walking friendly town and neighbourhood centres. b) Delivering infrastructure to provide safer access to key services, and pedestrian facilities to enable and encourage walking. c) Identifying and promoting networks of pedestrian priority routes. d) Promoting walking as a mode of travel and for recreational enjoyment. e) Supporting the implementation of the Rights of Way Improvement Plan. 	<p>The county council aims to deliver a step change in cycling, through:</p> <ul style="list-style-type: none"> a) Infrastructure improvements, especially within major urban areas to enable and encourage more cycling. b) Implementing measures to increase the priority of cyclists relative to motor vehicles. c) Improved safety for users including delivery of formal and informal cycle training schemes. d) Supporting promotion campaigns to inform, educate, reassure and encourage cycling provision and education, such as Bikeability. e) Facilitating provision of secure cycle parking.

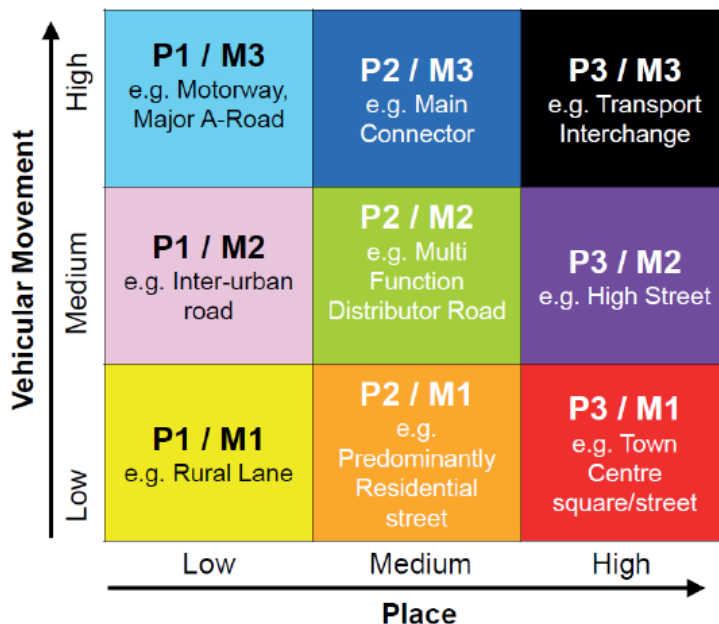
Source: HCC LTP4

3.1.5 Hertfordshire County Council, Adoption of the Place & Movement Approach⁴

HCC has adapted Transport for London’s (TfL) Street Types matrix⁵ to develop a Place and Movement matrix as a way of categorising each section of the highway by the needs of different roads users, by understanding how people interact with the space around them.

HCC has created nine categories based on factors such as road type and rural or urban areas. Modifications to the TfL matrix have been undertaken to reflect the more diverse nature of Hertfordshire’s highway networks, such as ‘Rural Lane’, this is shown in Figure 3.3.

Figure 3.3: Hertfordshire Place and Movement Matrix



Source: Hertfordshire County Council, Adoption of Place and Movement Approach

⁴ Discussed at Cabinet meeting 24th February 2020

⁵ TfL Streetscape Guidance, <https://content.tfl.gov.uk/streetscape-guidance-pdf>

All of HCC’s highway network has been categorised into these nine categories. This was then validated through a series of workshops involving officers from different services across the Highways Department.

Through categorising the highways network, a standard design toolkit can be developed for each of the nine categories. Appropriate design solutions are incorporated into the new version of the ‘Roads in Hertfordshire’ design guide that is currently under review.

This approach is also being used to support the Highway strategy work through identifying where there are ‘clash points’ of differing movements and place functions. User prioritisation is being reviewed at these sections of the highway and helps to inform scheme identification for these areas.

This categorisation has helped to inform the network assessments in section 4.

3.1.6 Hertfordshire County Council Active Travel Strategy 2013

HCCs Active Travel Strategy (ATS) has been developed to identify and promote the increase use of active travel in Hertfordshire. Its overarching aim is:

“To increase the proportion of journeys made by walking or cycling to improve individual health, quality of life, the environment and the economy”

The previous Local Transport Plan 3 (2011 -2031) set out long term targets for increasing active travel levels, as set out in Table 3.2. These targets have been adopted by the ATS.

Table 3.2:Active travel long term objectives

Hertfordshire LTP3 Indicator	LTP 3 Baseline Level (2011)	LTP3 2015/6 target	LTP3 2030/31 target
Percentage of all journeys under 1 mile in length by walking	58.9%	64%	77%
Percentage of all journeys under 3 miles in length by cycling	2.7%	3%	11%

Source: Hertfordshire County Council Active Travel Strategy 2013

The measures detailed in the ATS can be split into two categories;

- implementation of physical measures – highways, right of way, maintenance – such as new walking and cycling routes. The LCWIP helps to identify such routes.
- education, promotion, incentives and information – behavioural change interventions in school, education and information to encourage and increased participation in active travel.

The 2013 ATS is in the process of being updated by HCC. It is anticipated this will have a strong public health emphasis and will be a more ambitious document in line with LTP4. In addition, the updated ATS will support the development of LCWIPs throughout Hertfordshire.

3.1.7 South West Hertfordshire Cycle Study 2013

This cycle study was developed as part of LTP3 supports the wider HCC ATS. The vision set out within this plan is for:

“a sustainable, innovative transport system that seeks to make travel within South West Hertfordshire area easier through the full utilisation of different transport modes and the better management of the existing network”

Increasing levels of cycling within south west Hertfordshire are expected to:

- reduce levels of congestion, especially localised congestion related to shorter journeys;
- improve levels of health and tackling obesity, particularly within children; and
- help to reduce levels of carbon emissions and improving quality of life.

This cycle study set out several cycle schemes identifying where there are gaps in the network and where cycle provisions should be improved based on cycle audits which have been undertaken. The cycle audits have identified where there are hotspots for cycle collisions, where other cycle schemes are already being implemented, stakeholder aspirations, and the cycle objectives set out in prior documents for Hertfordshire.

Proposed schemes for Watford

The proposed schemes (Table 3.3) include improved access to Watford Town Centre, Watford Junction Station, Ebury Way retail park and links to off road routes to the North of Watford. Some of these schemes complement those proposed as part of the LCWIP Strategic Cycle Network.

Table 3.3: Proposed schemes for Watford

Scheme	Status 7 th July 2020
W24 - Watford Junction - Watford Town Centre link via Woodford Rd, Queens Rd and The Broadway. Improve signage, improve exit from station for cyclists wanting to go to town centre	Part done
W27 - Off road link to North. Cyclist movements further north are restricted due to significant roundabout with no cyclist facilities	Part done
W9 - Greater cyclist permeability in southern business park/retail park - Ebury Way (Watford)	Not done
W28 - Market Street - Eastern access to Town Centre. Route could be improved through a combination of cycle lanes, ASLs and upgrade of existing crossing facilities	Done
W8 - Southern access to town centre. From end of High Street to Lower High Street, potential to create a high-quality contra flow lane for cyclists to get direct access to and from Watford town centre from the junction of the Ebury Way and Lower High Street	Done
W3 - Wiggenghall Road/the Hornets gyratory around pedestrian zone. Concerns about cyclist safety and hazard of merging vehicles. Junction was reviewed in a previous study (Watford Network Congestion Study)	Part done
W25 - Watford Junction - Watford Town Centre link via Clarendon Rd and Beechen Grove Junction. Potential to provide alternative route, and also connection from north to Watford centre via Woodford Rd, Queen's Rd, The Broadway (or Loates Lane) then under Beechen Grove to Watford Centre via underpass	Not done
W4 - Hospital access/parking. Build in cycle lane into hospital and to high quality cycle storage	Not done
W12 - Watford inner ring road. Look into building safer links across the road for cyclists and make the ring road cyclist friendly - especially for movements to the west	Not done

The integration of these proposals into the LCWIP network is considered in stages 3 and 4 of the LCWIP.

3.1.8 South West Hertfordshire Growth and Transport Plan Prospectus 2019

According to the Prospectus, Hertfordshire is experiencing significant levels of housing and employment growth which impacts the transport system in the short, medium and long term. The Growth and Transport Plan (GTP) has therefore been developed as a sub-county transport planning approach with South West Hertfordshire being the sub-area. The purpose of the document is to promote shift away from the private vehicles towards more sustainable modes of transport, and an improved modal choice.

The South West Hertfordshire GTP supersedes the South West Hertfordshire Transport Plan.

Seven objectives have been developed for the South West Hertfordshire GTP. These are:

1. support sustainable economic growth in South West Hertfordshire through improving sustainable modes of travel;
2. ensure new infrastructure is resilient to future change;
3. provide greater attractiveness and choice of alternatives to the private car with a better network resilience;
4. improve health and quality of life through reduced noise and pollution;
5. encourage walking and cycling networks to improve the environment and create vibrant communities;
6. improve the safety and perception of safety for walking and cycling; and
7. reduce transport emissions through embracing new technologies and encouraging sustainable travel modes.

The LCWIP process can help deliver on all seven objectives through the planning and development of improved, safe cycling and walking networks that will promote mode shift and sustainable travel.

The GTP includes a number of active travel proposals contained within 'packages' of interventions, with several of these falling within the Watford and Three Rivers LCWIP area:

- St Albans to Watford Corridor - Enhanced cycling facilities along the A405 linking St Albans and Leavesden.
- Western Gateway (Watford) - Enhanced cycleways and facilities linking the Western Gateway area to Watford Junction.
- Watford- Hemel Hempstead - Enhanced cycleways and facilities along the Grand Union Canal Towpath and the A411 from Hemel Hempstead to Watford town centre. Watford Junction and Town Centre public realm enhancements.
- Watford Central - Significant public realm enhancements and improvements to movement and permeability for sustainable modes on Watford Ring Road. Improved walking and cycling environment on routes to Watford Junction Station and a new foot, cycle and bus link bridge at Colonial Way.
- Watford South - Cycling links in Oxhey, South Oxhey, Carpenders Park, and Bushey.
- Rickmansworth - Enhanced cycleways and facilities towards Rickmansworth railway station and town centre.

3.1.9 A414 Corridor Strategy, 2018

The A414 corridor is an east-west multi-modal corridor extending from Hemel Hempstead to the M11 through Hertfordshire, but also includes the A405 link to Watford, in the north of the LCWIP study area. The corridor experiences traffic congestion on sections of the road, poor public transport, and walking and cycling provision increases the dependency on private vehicles. Planned growth of new homes and jobs will create additional travel demand on this section of the network. A £1.8bn package of interventions has been proposed which includes enhancing walking and cycling links and enhancing the urban realm.

Eleven objectives have been developed for the Corridor Strategy. The ones which align with the LCWIP include:

- Support sustainable growth – through improving provision of journeys made by public transport and bicycle.
- Improve inter-urban connectivity – consistency of travel options from different modes between links.
- Enable modal shift to active travel – improve infrastructure and routes for active travel to be a more attractive alternative to the private car for shorter distance trips.

These proposals are considered in stages 3 and 4 of the LCWIP.

3.1.10 Emergency Active Travel Fund and Active Travel Funding, 2020-2021

3.1.10.1 Emergency Active Travel Fund

Over the summer of 2020, the DfT has provided HCC with an Emergency Active Travel Fund (EATF) grant to support the development of local cycling and walking facilities across the County during the Covid-19 pandemic. This has been provided over 2 tranches:

- Tranche 1 supported the installation of temporary projects for the COVID-19 pandemic
- Tranche 2 supports the creation of longer-term projects

A number of schemes were identified as being potentially suitable for this fund. Following a shortlisting procedure, the following schemes were submitted as part of the bid, which are relevant for the development of the LCWIP, as set out in Table 3.5.

Table 3.4: Tranche 1 and Tranche 2 EATF Schemes for Watford and Three Rivers

Location	Intervention Type
Tranche 1	
Wiggenhall Road, Watford	'Pop-up' contraflow cycle lane Watford High Street added - traffic restrictions and contraflow cycle lanes.
Rickmansworth High Street, Three Rivers	Timed closure to traffic as social distancing measure
Tranche 2	
Cassiobury Estate & Stratford Way/Hempstead Road, Watford	Trial point closures and junction improvement for pedestrians and cyclists. Scheme is currently paused.
Wiggenhall Road, Watford	Conversion of pop-up cycle lane to permanent two-way cycleway.

3.1.10.2 Active Travel Fund, 2021

In Summer 2021 there was a further opportunity to bid for the Active Travel Fund. As part of this process, a scheme was included to make the contraflow cycle lane along Watford High Street into a permanent separated facility in the vicinity of Water Lane.

3.1.11 Other LCWIPs in Development

When developing an LCWIP for Watford and Three Rivers it is important to understand if there are any neighbouring authorities that have developed or are developing an LCWIP. This will establish if there are any plans to connect walking and cycling routes into the area, ensuring there is consistency across the local network.

During the development of this LCWIP, there were no completed and published LCWIPs for neighbouring local authorities or boroughs to Watford or Three Rivers, nor are there any TfL Cycleway schemes connecting the London Boroughs of Hillingdon or Harrow to the study area.

LCWIPs are being developed across Hertfordshire, including by;

- St Albans City & District Council,
- Welwyn Hatfield Borough Council,
- North Hertfordshire District Council,
- Aylesbury Garden Town, and
- Stevenage.

These emerging plans are not considered to impact on this document.

3.2 Baseline Travel and Transport Context

Understanding how people travel within Hertfordshire, specifically in Watford and Three Rivers, is an important aspect of developing the LCWIP. This can provide an understanding of the most popular modes of travel within and outside of the boroughs. This section brings together publicly available information on existing travel patterns within Hertfordshire.

The LTP4 indicates that Hertfordshire's population is estimated to grow to 1.43 million people by 2039, up from 1.18 million people in 2016, an increase of 21% in 23 years. Household growth is also predicted to grow in each of the ten districts within Hertfordshire, with significant housing development planned. This is in addition to housing development planned in neighbouring authorities, such as Aylesbury Vale, Luton, Central Bedfordshire, South Cambridgeshire, Enfield and Barnet.

118,000 Hertfordshire residents work in Greater London, with 51% of these residents travelling there by rail or tube. The proximity of Hertfordshire to London is an important aspect of understanding travel to work within the county, with many people commuting into London, particularly from St Albans, Watford, Cheshunt, Harpenden, Welwyn Garden City, Hemel Hempstead, Borehamwood and Stevenage. Prior to the pandemic, much of the county's rail network operated at full capacity at busy times due to the high demand.

The 2011 Census collected travel to work data by mode and by district. This is shown in Table 3.5. It is clear in both Watford and Three Rivers driving in a car or van to work is the most common mode of travel to work, as well as for the whole of Hertfordshire. Travel to work by rail/underground is the next most popular mode, which is expected due to the number of commuters into London from Hertfordshire. There are low levels of active travel modes to work, particularly by cycle in Three Rivers. Watford has a relatively high walk to work mode share.⁶ Travel to work mode shares are likely to have been impacted by the Covid-19 pandemic, which saw an increase in home working for many people, a sharp reduction in the use of public transport, and an increase in the use of active travel across the UK. The lasting impacts of the pandemic on travel behaviour remains unclear.

Table 3.5: 2011 Census travel to work mode

Location		Work mainly at or from home	Underground, metro, light rail, tram & train	Bus, minibus or coach	Driving a car or van	Passenger in a car or van	Bicycle	On foot	Other
		Number							
Three Rivers	Number	5,416	7,000	960	25,508	1,582	532	2,376	625
	%	12.3%	15.9%	2.2%	58.0%	3.6%	1.2%	5.4%	1.4%

⁶ 2011 Census: Method of travel to work (2001 specification), local authorities in England and Wales

Location		Work mainly at or from home	Underground, metro, light rail, tram & train	Bus, minibuss or coach	Driving a car or van	Passenger in a car or van	Bicycle	On foot	Other
Watford	Number	4,048	7,127	2,217	24,369	1,725	1,066	6,296	786
	%	8.5%	15.0%	4.7%	51.2%	3.6%	2.2%	13.2%	1.7%
Hertfordshire	Number	62,439	75,881	17,705	320,547	22,689	9,175	48,180	8,416
	%	11.1%	13.4%	3.1%	56.7%	4.0%	1.6%	8.5%	1.5%

Source: 2011 Census

Existing cycle network in Watford and Three Rivers

Five National Cycle Network (NCN) routes pass through Hertfordshire - NCN 1, 6, 12, 57 and 61 - however, some are incomplete and are a mixture of quality and type. NCN 6 is the only route which passes through WBC and TRDC, following the Ebury Way. The route is largely off-road through the study area.

These routes link with urban and rural cycle links within the county. There are two waterways in Hertfordshire which are cyclable, including the Grand Union Canal in the Watford and Three Rivers area. They are used predominantly for leisure purposes for both pedestrians and cyclists.⁷

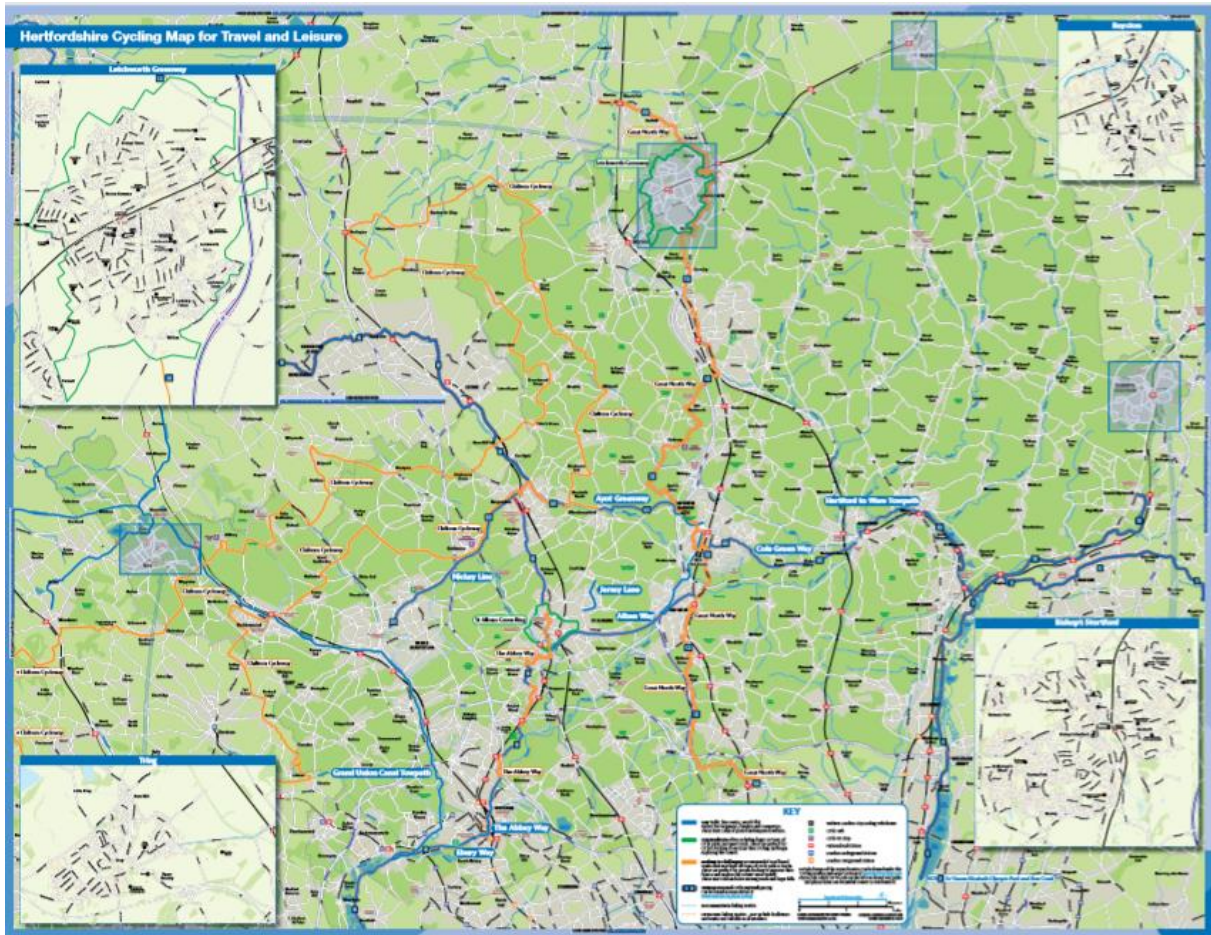
HCC has produced a cycle network map for the County - see Figure 3.4⁸, focussing mainly on leisure routes, rather than cycle routes for utility journeys.

A high-level assessment of the extent and quality of the existing cycle network is set out in Chapter 4.

⁷ <https://www.hertfordshire.gov.uk/media-library/documents/about-the-council/consultations/tp4-local-transport-plan-4-complete.pdf>

⁸ <https://www.hertfordshire.gov.uk/media-library/documents/public-health/health/cycle-routes-in-hertfordshire-map.pdf#>

Figure 3.4: Hertfordshire Cycling Map for Travel and Leisure



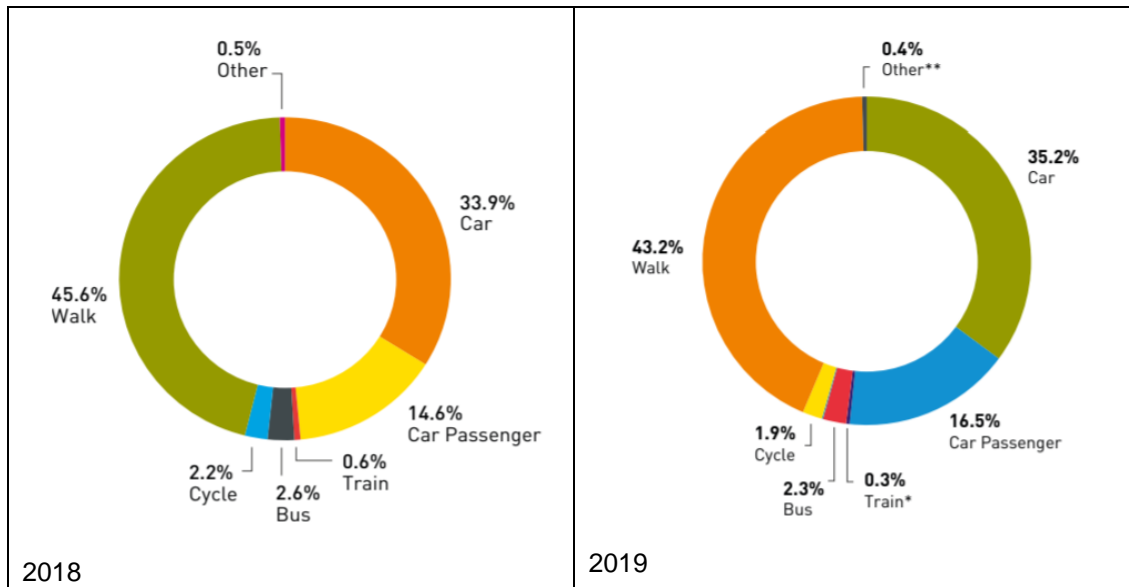
Source: HCC, <https://www.hertfordshire.gov.uk/media-library/documents/public-health/health/cycle-routes-in-hertfordshire-map.pdf#>

Cycling Trends and Targets

The 2019 Hertfordshire Traffic and Transport Data Report indicates that current cycling mode share is 1.9% for all trips that are less than 3 miles in length in Hertfordshire. This is slightly lower than the mode share of 2.2% in 2018, see Figure 3.5.

HCC has set out ambitious cycle targets for all trips under 3 miles, these being 5% by 2021, 8% by 2026 and 11% by 2031, as shown below in Table 3.6.

Figure 3.5: Journeys less than 3 miles 2018 and 2019⁹



Source: Hertfordshire Traffic and Transport Data report

Table 3.6: HCC cycle targets

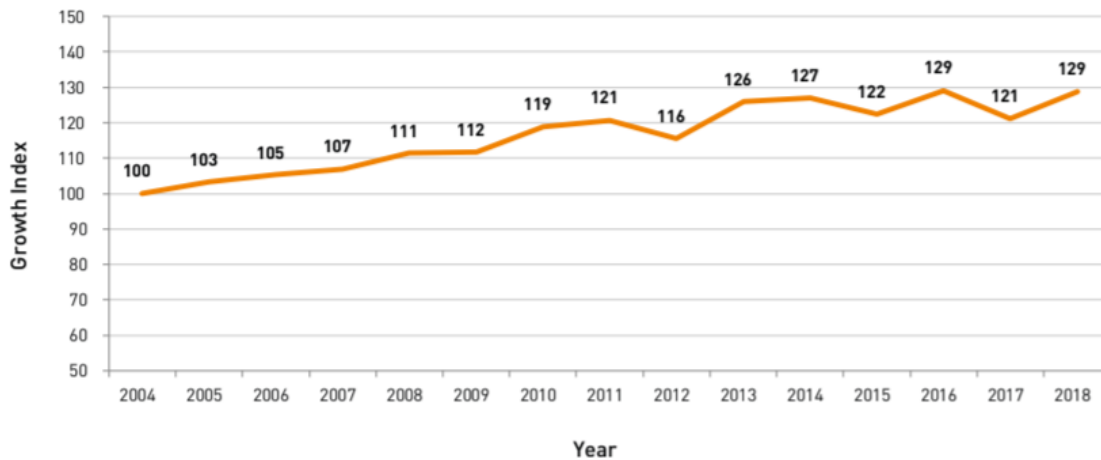
Performance Indicator	2018 Current Level	2021 Target	2026 Target	2031 Target
% of all trips (under 3 miles) made by cycling	1.9%	5%	8%	11%

HCTS 2018 Table 49: Mode by trip distance

Figure 3.6 shows the cycle level trends for Hertfordshire since 2004, when cycle monitoring was first introduced. Cycling has increased at the HCC monitoring sites since 2004 and are 20% busier now in 2018. Over the last 5 years, cycling has fluctuated but increased by 8% in 2018 compared to the previous year.

⁹ 2018 and 2019 Hertfordshire Traffic and Transport Data Report

Figure 3.6: Cycle Level Trends in Hertfordshire



Source: Hertfordshire Traffic and Transport Data report

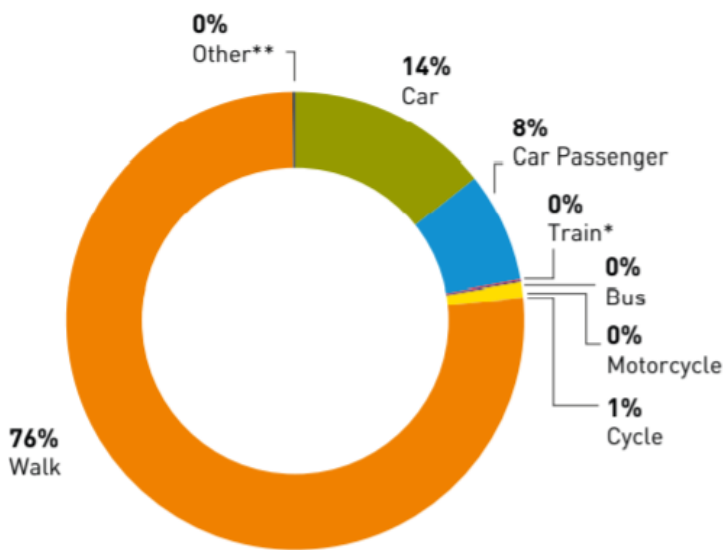
Walking Trends and Targets

The 2019 Hertfordshire Traffic and Transport Data Report suggests that in 2018, journeys of less than 1 mile were mostly undertaken on foot (76%), with some 22% of journeys less than 1 mile undertaken by car¹⁰ (see Figure 3.7).

HCC has set out targets for achieving 77% of all trips less than 1 mile to be undertaken by walking across the whole of Hertfordshire. Although the 2018 baseline was 76% (see Table 3.7), there were some local authorities across Hertfordshire with significantly lower mode shares, impacting the overall statistic.

¹⁰ Car driver (14%) plus car passenger (8%)

Figure 3.7: Mode share of journeys less than 1 mile in length in Hertfordshire ¹¹



Source: Hertfordshire Traffic and Transport Data report

Table 3.7: HCC walking targets

Performance Indicator	2018 Current Level	2021 Target	2026 Target	2031 Target
% of all journeys by walking under 1 mile in length	76.3%	68%	73%	77%

HCTS 2018 Table D.52 Trip distance by Mode Used by District (Col %)

Cycle to work mode share in Watford and Three Rivers

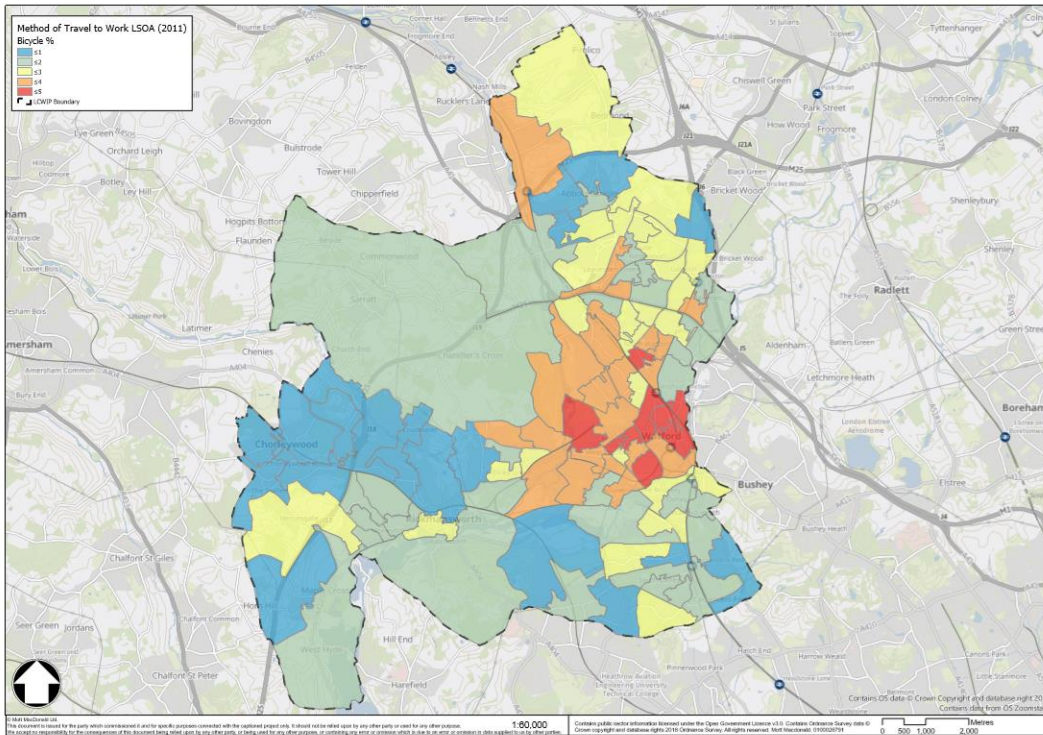
Figure 3.8 sets out a summary of the cycle to work mode share from the 2011 Census broken down to Lower Layer Super Output Areas (LSOA). This shows that there is a wide variation between 0 and 5% cycle mode share in specific LSOA areas across the Watford and Three Rivers area. Cycle to work share is highest (4-5%) in LSOA areas around the centre of Watford, Croxley Park and Nash Mills/Kings Langley. Cycle to work mode share is particularly low in the Three Rivers settlements of Rickmansworth (3%), Carpenters Park (2%) and Chorleywood (1%).

Walk to work mode share in Watford and Three Rivers

Figure 3.9 sets out a summary of the walk to work mode share from the 2011 Census broken down to LSOA. The LSOAs with the highest walk to work modes shares are in Watford Town Centre and North Watford (largely 30-40%). The walk to work modes shares for the key centres in Three Rivers are lower than in Watford (c 20% or lower), with the Eastbury LSOA having the highest share (30%). Rickmansworth (c20%). Carpenters Park and Chorleywood LSOAs typically have 10% or lower walk to work mode share.

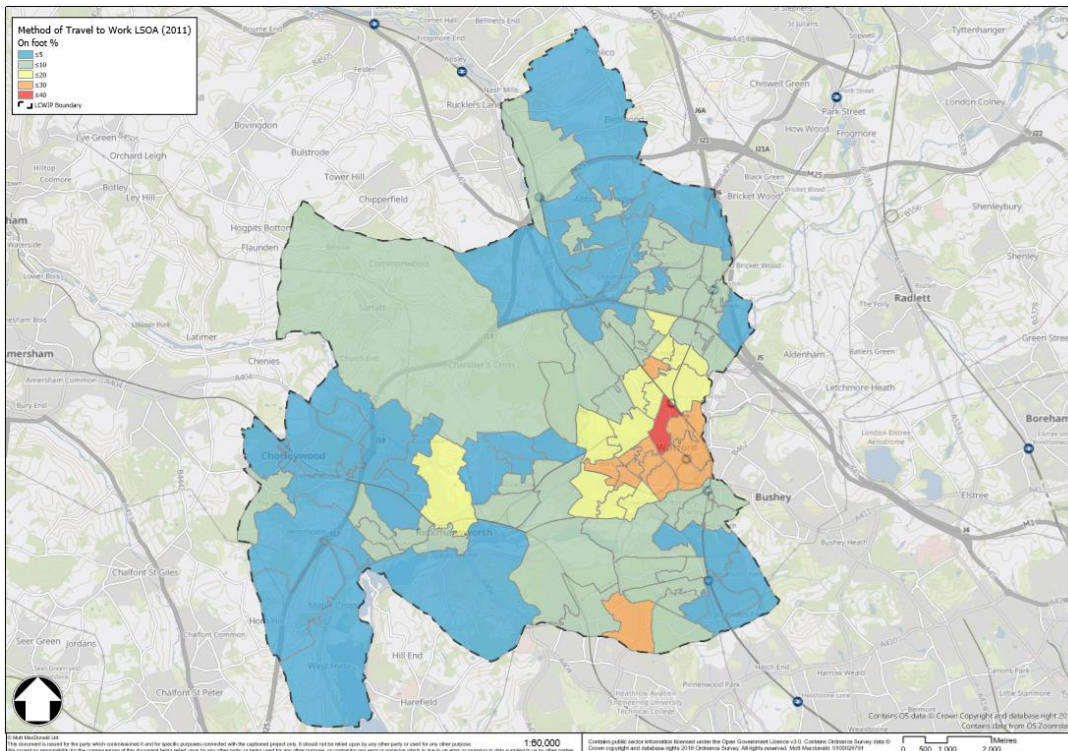
¹¹ 2019 Hertfordshire Traffic and Transport Data Report

Figure 3.8: Cycle to work mode share



Source: Census 2011

Figure 3.9: Walk to work mode share



Source: Census 2011

The LCWIP study area experiences varying levels of cycling and walking, with mode shares differing with the character of the areas. The more urban Watford town centre experiences the highest active travel mode share, and the more rural Three Rivers District has much lower levels of active travel, although there are smaller areas of higher active travel mode share around Rickmansworth town centre.

Data from the wider county of Hertfordshire shows that many shorter journeys are undertaken on foot, with a small proportion undertaken by bike, but a significant minority of short journeys are undertaken by car, suggesting that with appropriate network improvements through the LCWIP, there is scope for several of these short journeys to shift to active modes.

4 Network planning for cycling – LCWIP

Stage 3

This section sets out the findings from the evidence collected and analysed for the information gathering information stage of the LCWIP (Stage 2). These findings aid in the identification and prioritisation of a cycling network in Watford and Three Rivers.

4.1 Propensity to cycle analysis

The LCWIP guidance recommends that the Propensity to Cycle Tool (PCT) is used as one method to understand the potential for cycling alongside other locally important evidence.

4.1.1 What is the PCT tool?

The PCT¹² is a DfT tool which shows the current and potential future distribution of commuter cycling trips under different growth scenarios. It estimates the amount of cycling in an area along straight desire lines (trip distribution) as well as allocating cycling trips to specific routes (trip assignment). The PCT uses open source data, such as the 2011 census.

The PCT, while a useful tool, has limitations and outputs should be interpreted as an indicative representation of potential demand only. The data underpinning it is for example based on the 2011 census journey to work data, and so does not take into account other journey types such as leisure trips. Proposed future development sites are also not included, so collectively this means that future demand for cycling is likely to be underestimated both in quantum and in distribution. The PCT is therefore used as just one input tool for the LCWIP.

Within the PCT, several different scenarios have been developed for commuting trips by cycle. These scenarios are summarised in Table 4.1 below.

The outputs from the PCT are expressed in terms of one-way daily cycling flows, and the outputs can be shown as:

- Straight Lines - representing the desire lines or origin-destination pairs. Each line has information showing the distance between the origin-destination point, how many commuters in total take this route, how many of these commuters currently cycle and what the propensity for cycling is.
- Route Network – aggregates all the cycling flows using the fastest legally cyclable routes (or alternative quieter streets) derived from Cyclestreets journey planner. This prioritises the fastest and most direct routes which have greatest potential for cycling. Using the LSOA's provides a higher accuracy in the detail of the origins and destinations.

Table 4.1: PCT Scenarios

PCT Scenario	Details
Government Target	The Government Target scenario models a doubling of cycling nationally, corresponding to the proposed target in the English Department for Transport's draft Cycling Delivery Plan to double cycling in England between 2013 to 2025.
Go Dutch	The Go Dutch scenario is an ambitious vision for what cycling in England and Wales could look like. People in the Netherlands make

¹² <https://www.pct.bike/>

PCT Scenario	Details
Ebikes	<p>28% of trips by bicycle, fifteen times higher than the figure of 1.6% in England and Wales. In addition, cycling in England and Wales is skewed towards younger, male cyclists. By contrast in the Netherlands cycling remains common into older age, and women are more likely to cycle than men. This means that the difference between England and the Netherlands is particularly large for women and older people.</p> <p>The Ebikes scenario models the additional increase in cycling that would be achieved through the widespread uptake of electric cycles ('ebikes'). This scenario is built as an extension of the Go Dutch scenario, making the further assumption that all cyclists in the Go Dutch scenario own an ebike. It builds on the Go Dutch scenario by applying three additional ebikes scaling factors to account for the increased willingness of ebike users to cycle long distance, hilly and simultaneously long distance and hilly routes.</p>
Gender Equality	<p>In the 2011 Census, women accounted for 48% of all English and Welsh commuters but only 27% of all cycle commuters. This gender disparity is seen across the country, with no local authority having a proportion of female cyclists greater than 50%. Places in England and Wales with higher overall levels of commuter cycling also tend to have smaller gender inequalities in commuter cycling.</p> <p>It does not use distance and hilliness data to model propensity to cycle. Instead, it assumes that male propensity to cycle remains unchanged – i.e. there is no change in the number of male cycle commuters – and that female propensity to cycle rises to match male propensity. This scenario has the greatest relative impact in areas where the rate of cycling is highly unequal across gender.</p>

Source: Propensity to cycle tool

For the purposes of the Watford and Three Rivers LCWIP, the 'Government Target' and 'Go Dutch' scenarios have been used. This combination helps to illustrate the most likely local scenario for potential cycle demand, and what could be achieved with high levels of ambition and mode share.

4.1.2 PCT Analysis for Watford and Three Rivers

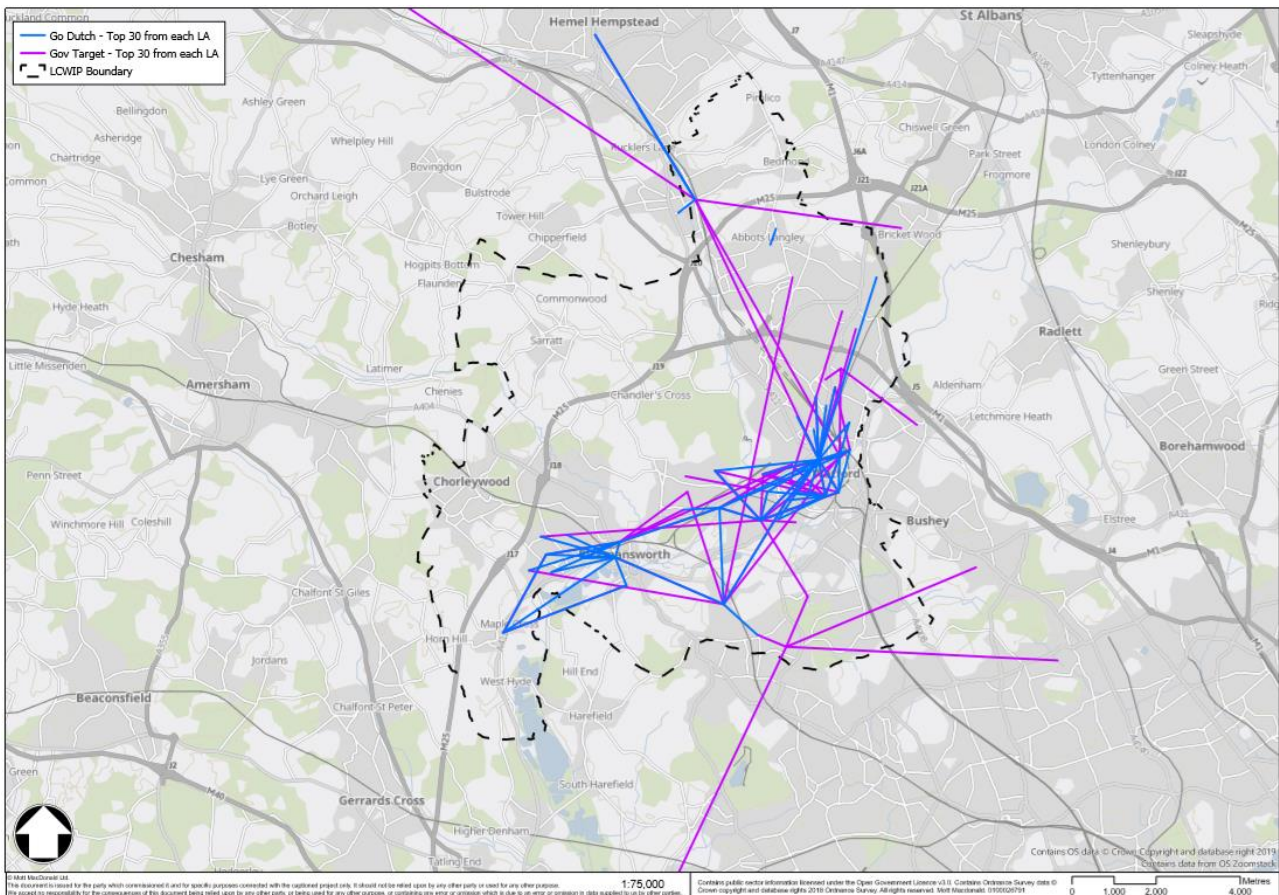
Trip distribution

The PCT has been used to show where existing cycle trips are and where there is potential to increase cycle trips to replace short trips made by other transport modes.

Figure 4.1 below shows, for each authority, the straight 'desire' lines when the Government Target and the Go Dutch scenarios are modelled in the PCT.

For Watford Borough, the demand is more extensive than Three Rivers, particularly from all compass points into Watford Town Centre, West Watford and North Watford. Within Three Rivers, there are key desire lines into and out of Rickmansworth in particular, but there are also desire lines from Kings Langley/Nash Mills, Eastbury and Moor Park. There are a number of desire lines linking to external areas from Watford and Three Rivers, notably Hemel Hempstead, Berkhamsted, Bushey, Stanmore and North Hillingdon.

Figure 4.1: PCT Outputs for Watford and Three Rivers (Go Dutch and Government Target Scenarios)



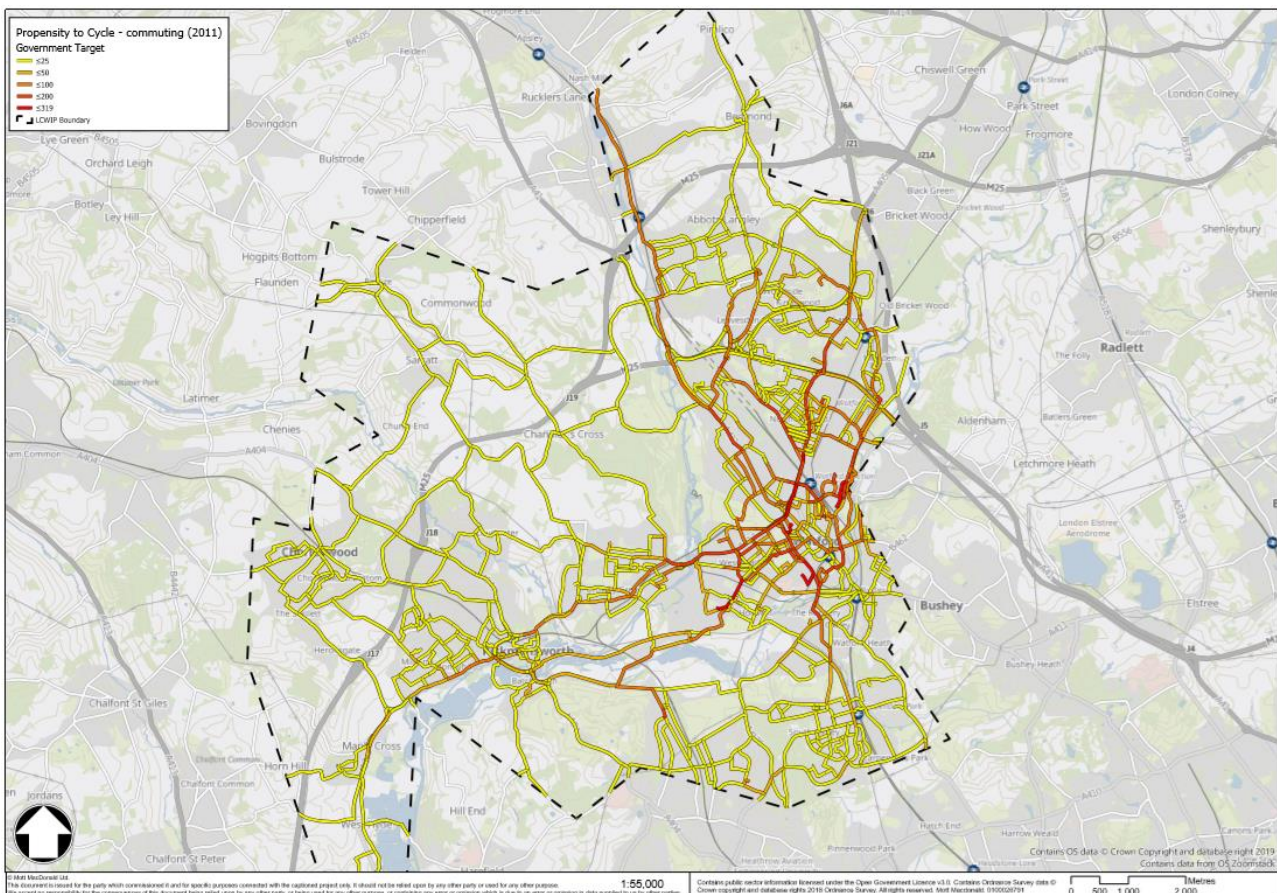
Source: Mott MacDonald, Propensity to Cycle Tool

Trip assignment

Figure 4.2 below matches these desire lines onto the existing road network in Watford and Three Rivers. This shows particular hotspots of cycling potential:

- West - east demand between Rickmansworth and Watford Centre via Croxley and West Watford (A412 and Tolpits Lane)
- North-south demand between Kings Langley/ Nash Mills and Watford Centre (A411)
- North-south demand between North Watford and Watford Centre (A412)
- North-south demand between Garston and Watford Centre
- North-south demand between Leavesden and Watford Centre

Figure 4.2: PCT Analysis – cycle demand mapped onto the route network (trip assignment)



Source: Mott MacDonald, Propensity to Cycle Tool

4.2 Origin and destination analysis

This section sets out the analysis of the origins and destinations in and around Watford and Three Rivers, including the method used.

Origins are identified as trip attractors, which are largely residential areas. LSOA residential population weighted centroids were selected to represent existing residential areas in Watford and Three Rivers. In addition, new and draft allocated development sites have also been taken into consideration. Any developments planned to provide over 50 dwellings have been included in this analysis.

Destinations have been identified as trip attractors, which include the following:

- Town and district centres;
- Employment sites, business parks or large employers;
- Secondary schools;
- Hospitals with accident and emergency departments;
- Retail facilities including out of town sites; and
- Leisure, including major visitor attractions such as Warner Brothers Studios.

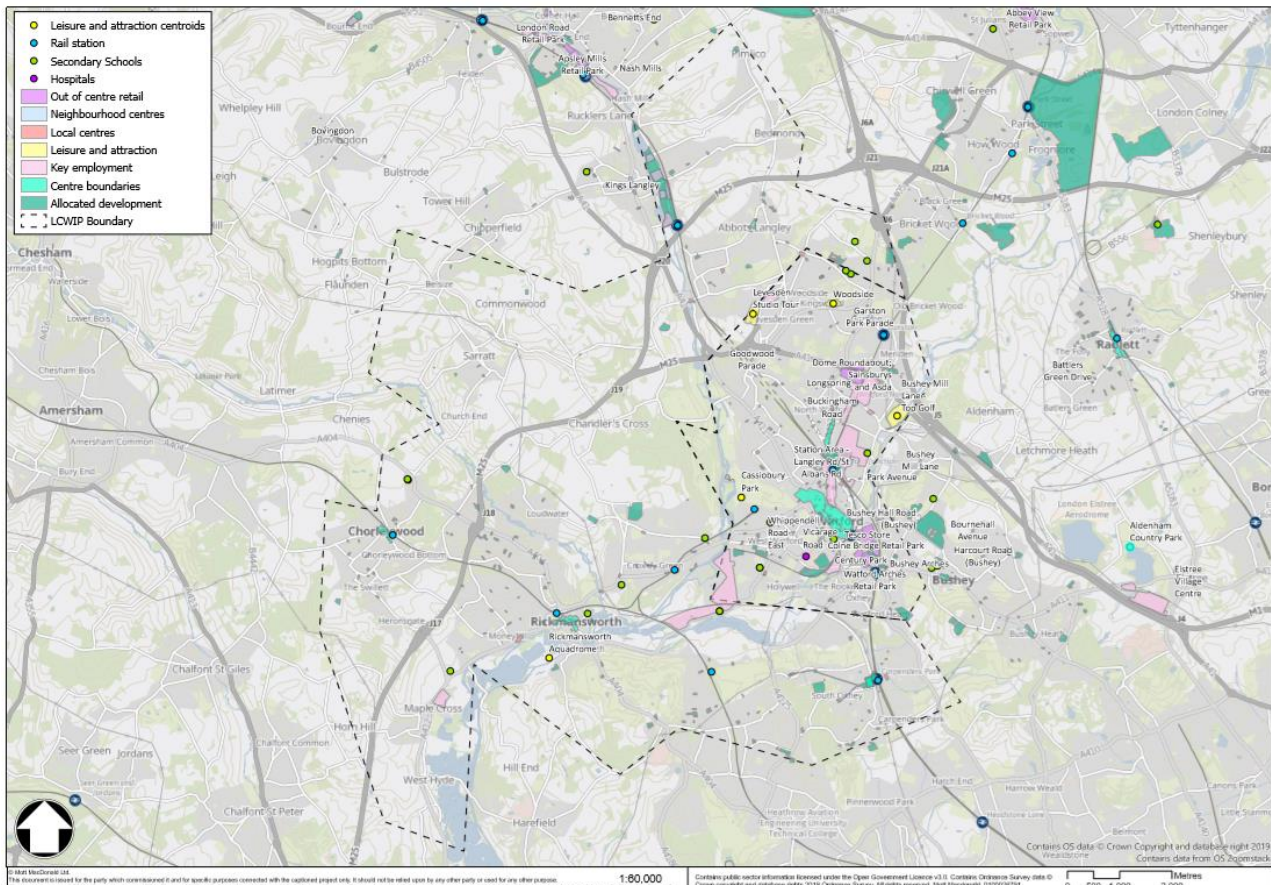
The identification of origins and destinations has been developed through an iterative process with officers at HCC, WBC and TRDC.

The information was initially provided as GIS polygons of the origin and destination points, which has then been sense checked by the project team and supplemented with further information including local promotional maps. For the purposes of the analysis, the geographical centre of a development has then been used as the origin point.

A full list of agreed key destination points assumed is set out at the end of the report.

Figure 4.3 shows a summary of the origins and destinations in Watford and Three Rivers.

Figure 4.3: Key trip origins and destinations in Watford and Three Rivers



Source: Mott MacDonald

4.2.1 Long list of identified corridors

Figure 4.4 shows the origins connected to destinations, and the representation of potential cycling corridors. This analysis has been undertaken using a GIS model, based on the following assumptions:

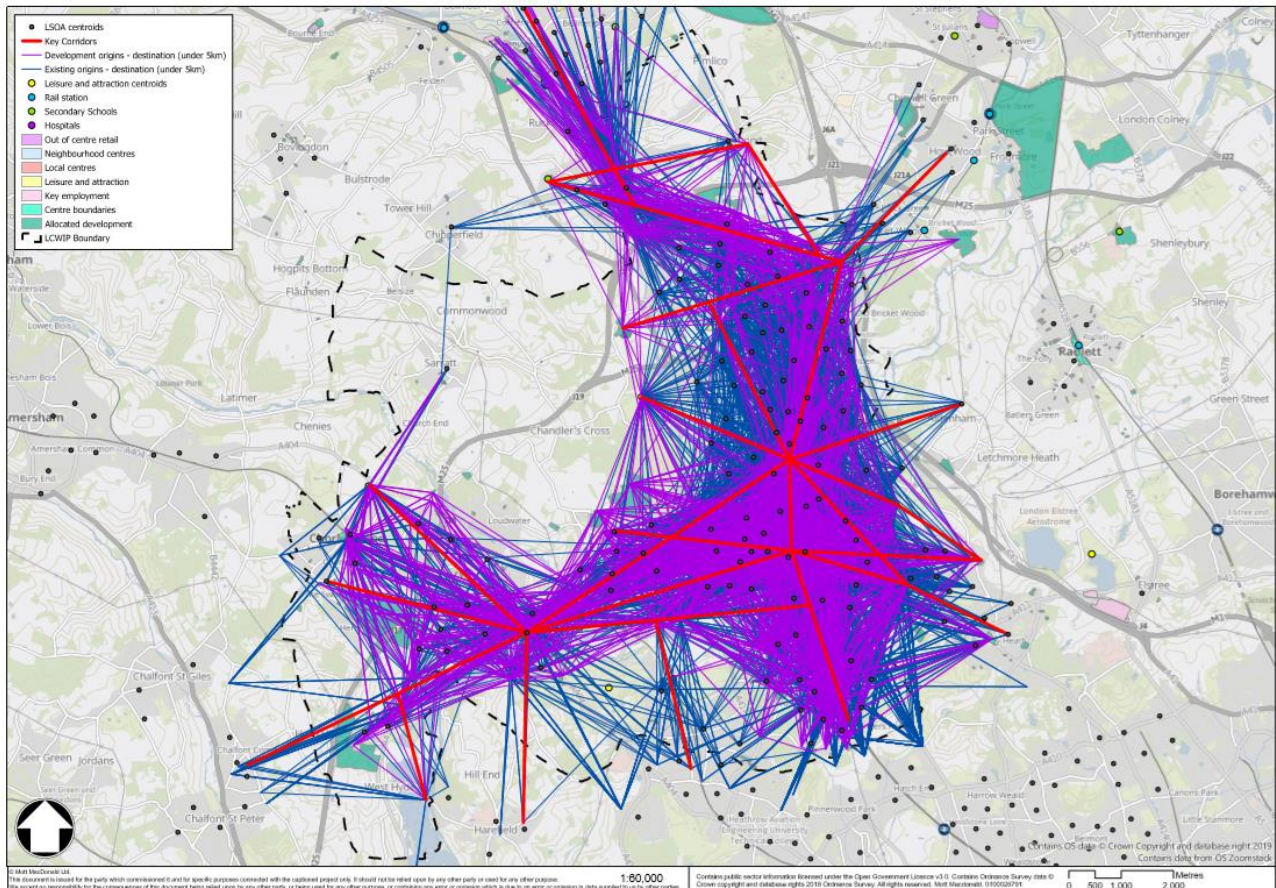
Every origin connects to every destination within a 5km distance (approximately a 25-minute cycle) which is considered a reasonable cycle distance. The exception is at local centres, hospitals and rail stations where there is an assumption that an individual would typically travel to the closest of these amenities¹³.

Origins and destination corridors are shown in blue and purple on the map, with key corridors of demand shown in red. The blue lines show the connections between existing origins and destinations, with the purple showing connections from allocated developments and

¹³ Approach agreed at scoping stage.

destinations. The key corridors, shown in red, were identified by looking at the trends from the desire lines. Where a number of desire lines appeared to travel in a similar direction, this was seen as a key corridor, which was then sketched onto the map.

Figure 4.4: Connecting origins and destinations



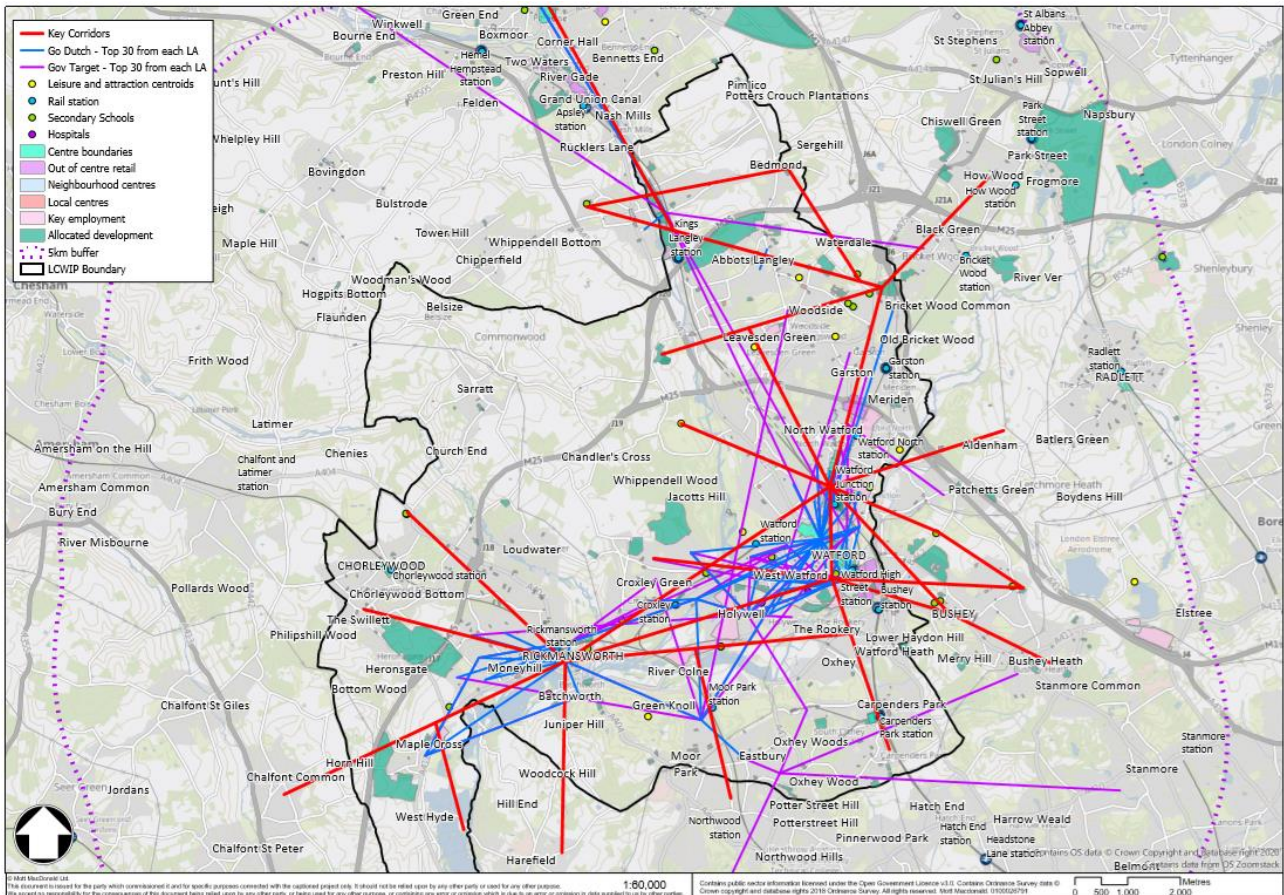
Source: Mott MacDonald

4.2.2 Key corridors

Figure 4.5 shows a summary of the key corridors identified for Watford and Three Rivers based on this origin and destination analysis. The key corridors of demand are focussed in particular into and out of Watford Town Centre, North Watford, Rickmansworth and Garston.

In addition, the PCT outputs drawn from the previous section are also shown to provide a comparison between the datasets. The PCT demand shows additional desire lines north-south which were not designated as a key corridor. It should be noted, the PCT shows only commuting trips, whereas the origin-destination analysis takes into consideration a wider spread of trips, including commuting, travel to school, leisure and shopping.

Figure 4.5: Identification of key corridors of demand



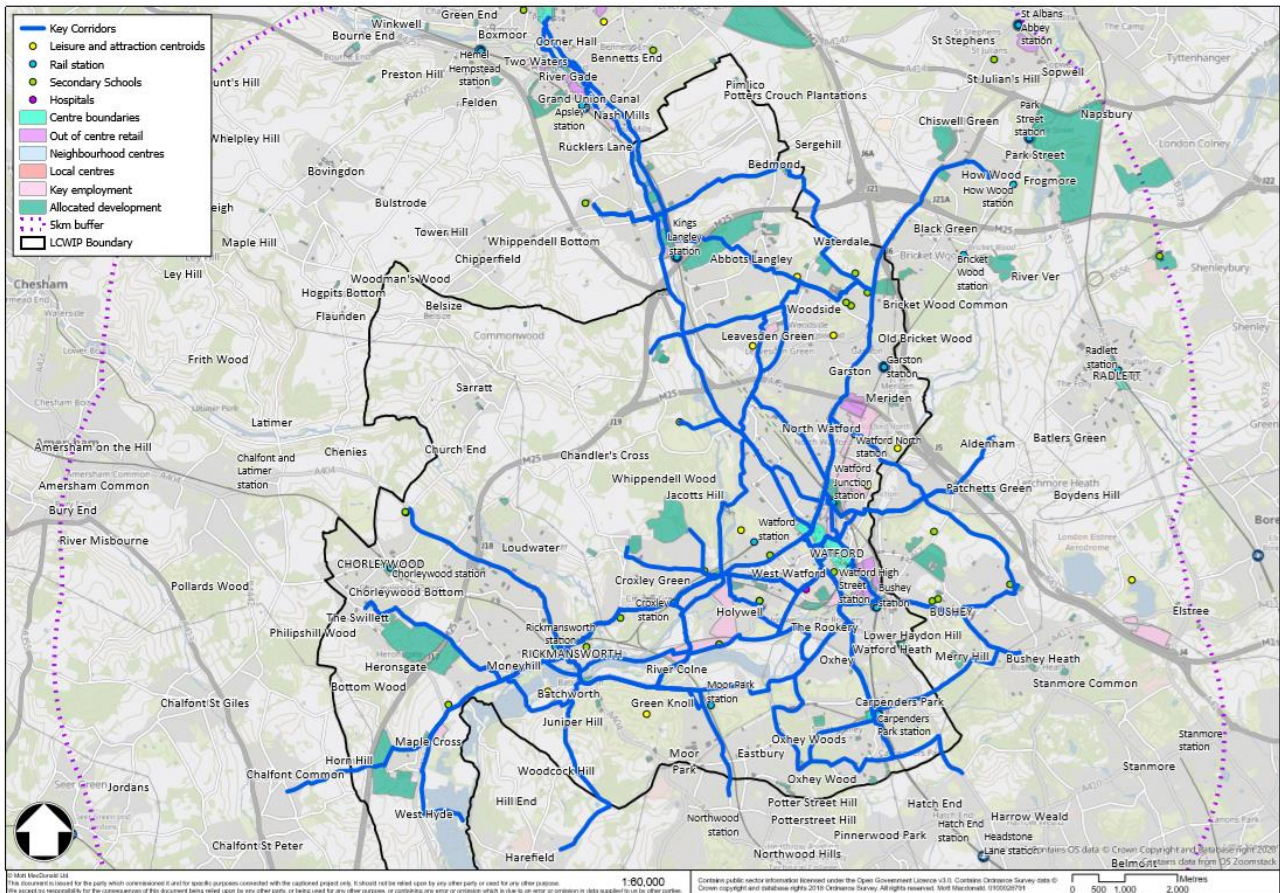
Source: Mott MacDonald

4.3 Cycle demand mapped onto the road network using both PCT and origin-destination data

The corridors identified by the PCT analysis in section 4.1 and the origin-destination analysis in 4.2 have been mapped onto the road and path network in GIS using the shortest possible route, to illustrate what the straight-line network would look like when mapped to the road network across Watford and Three Rivers (see Figure 4.6). It should be noted that these initial outputs are purely indicative at this stage, with the exact alignments of shortlisted priority routes determined in the next stages of the LCWIP.

The network identified in Figure 4.6, and the process to arrive at this network, was presented at the stakeholder engagement session in October 2020. Stakeholders fed back on desire lines and the use of background data to inform the network of routes.

Figure 4.6: Cycle demand mapped onto the network



Source: Mott MacDonald

4.4 Pre-prioritisation

The LCWIP process includes an element of prioritisation, in recognition of the long term nature of the LCWIP, and that it will not be feasible to improve all routes in the immediate future.

As a large number of routes were identified through the network planning process, the decision to ‘pre-prioritise’ the network was taken at LCWIP stage 3, allowing the more detailed work to focus on those higher priority routes. The rationale for this pre-prioritisation was that:

- Assessing/auditing all routes would be time-consuming and would likely extend the programme and budget required significantly
- There is unlikely to be sufficient future funding available to implement all routes over the short term, therefore there is a need to focus on those that will provide the most benefit

Therefore, the purpose of pre-prioritisation is to identify the routes that are most likely to score highly in stage 5, so that time and effort is focused on auditing and assessing those routes that will provide the most benefit. It is envisaged that all routes will eventually be audited and assessed but this will need to be undertaken over time as part of future iterations of the LCWIP, and as funding becomes available.

4.4.1 Methodology

The LCWIP Guidance recommends three elements should be considered when looking at the prioritisation of schemes;

- Effectiveness
- Policy
- Deliverability

The effectiveness and policy aspects of prioritisation were considered in the pre-prioritisation exercise.

A number of datasets were gathered to inform the effectiveness of the routes, these datasets were decided upon by WBC and TRDC and informed by Mott MacDonald:

- Indices of multiple deprivation (IMD)
- PCT Government Target
- HCC's Place and Movement dataset
- Key severance factors (major roads, rail, waterways)

All of the above datasets were analysed in GIS and scored on the basis of how effective improvements to the cycle network would be in improving these aspects of the route.

The IMD dataset is classified by Lower Super Output Area (LSOA) and therefore covers the whole LCWIP area. The areas with higher indicators of deprivation are considered a higher priority.

The PCT was used to establish the links which could potentially attract the largest numbers of users for both commuting and school travel.

The Place and Movement scores for links proximate to the routes were assessed, with P2 and P3 links – those with a higher Place function – given a higher priority.

Severance was assessed through the number of severance points per kilometre on links, with sections overcoming the greatest number of severance points scoring most highly.

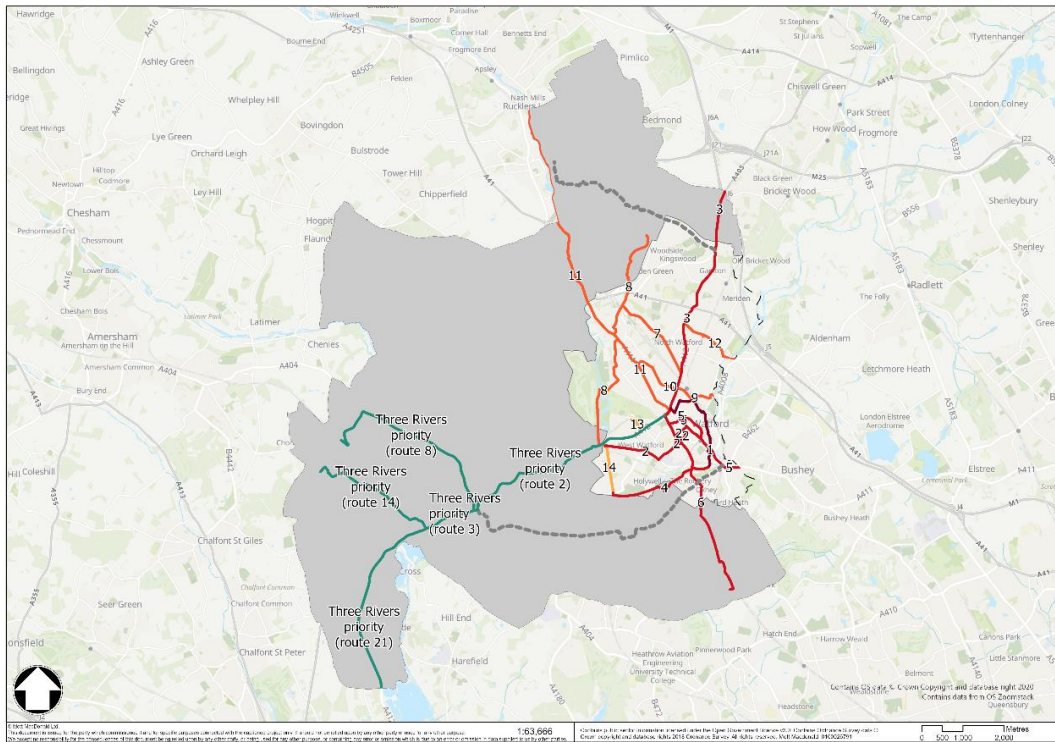
The proposed cycle network was broken into sections, and a new section was created at every junction. For each section, a score was calculated for each of the four datasets. A final score was then derived for each section based on the cumulative score of all datasets.

In order to form routes out of the sections, the highest scoring section was selected first. The adjacent sections were included as part of the route until it came to a logical end. This means that the priority of the route at a different point can be much lower than the highest priority section. The next priority section was then selected to create the next priority route.

4.4.2 Results

The pre-prioritisation of the strategic cycling network was undertaken separately in Watford and Three Rivers, providing a network across the two local authority areas. The pre-prioritisation results for Watford are shown in Figure 4.7.

Figure 4.7: Watford route prioritisation



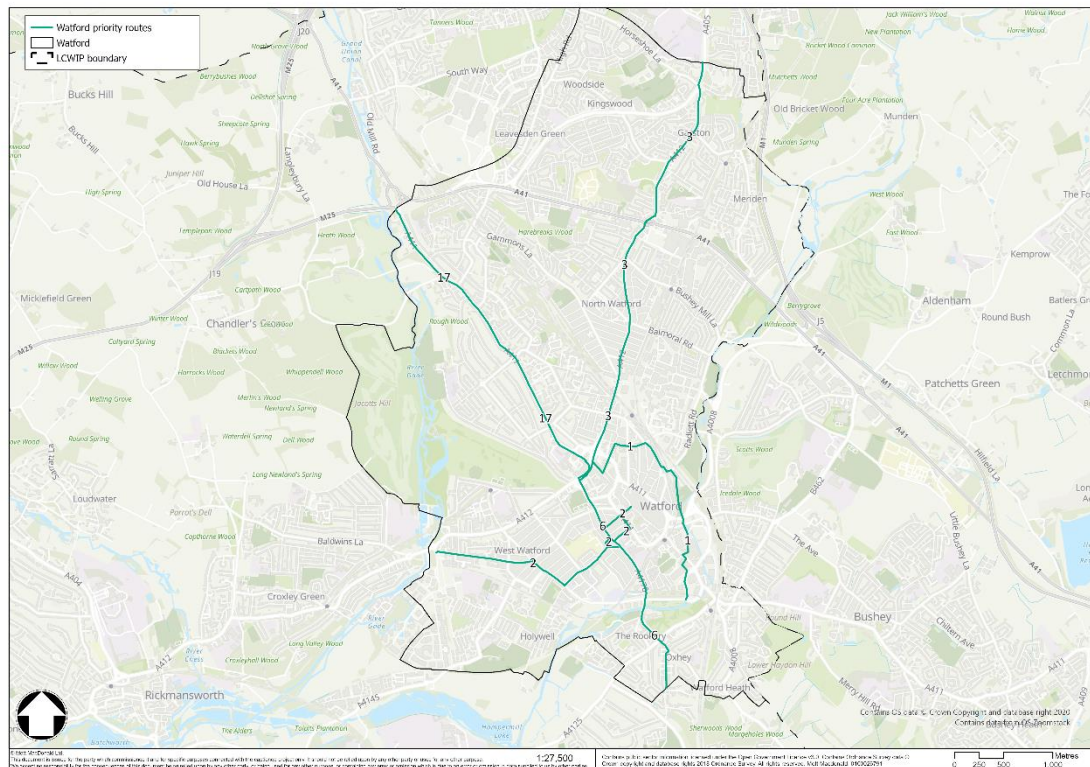
Source: Mott MacDonald

4.5 Priority routes

The following routes were identified through the pre-prioritisation process and incorporating local Officer feedback. Five routes have been prioritised for each authority after further detailed assessments. These are shown in Figure 4.8 below.

Non-prioritised routes remain under consideration and may be progressed later or through separate workstreams. The Ebury Way route, for instance, is a higher profile route not selected for prioritisation, and although the need for resurfacing the route is noted, no significant work on interventions is needed. Similarly, improvements to Watford town centre and the ring road is a key focus for the Transforming Travel in Watford workstream, so will be progressed separately.

Figure 4.8: LCWIP priority routes



Source: Mott MacDonald

Although more detailed assessments have been undertaken to prioritise the five routes for each LA, the other routes initially identified remain important as schemes to be delivered in the longer-term. In some cases, there may be opportunities to progress elements of these sooner alongside other transport schemes, including in conjunction with highways maintenance and signal upgrade programmes, or as developments are progressed.

Watford

- Route 1- Green Loop East
- Route 2 – Whippendell Road
- Route 3 – St Albans Road
- Route 6 – Watford to Carpenders Park
- Route 17 – Hempstead Road (Watford North River Route)

4.6 Cycling network assessment

Each of the prioritised routes has been assessed using the LCWIP Route Selection Tool¹⁴ (RST) which scores the route against five key criteria:

- **Directness:** How direct a cycle route is in relation to the route travelled by private motor vehicles.
- **Gradient:** How steep a route is.

¹⁴ <https://www.gov.uk/government/publications/local-cycling-and-walking-infrastructure-plans-technical-guidance-and-tools>

- **Safety:** How safe a route is, taking account of separation between cyclists and vehicles and motor vehicle speed and volumes.
- **Connections:** The number of points at which a route can be joined.
- **Comfort:** How comfortable the space is for cycling based on width and surface treatment.

The RST also considers the number of junctions along the route considered to be particularly hazardous or unattractive for cyclists, usually due to high traffic volumes or speeds, and a lack of separated cycling facilities. These are defined as ‘critical’ junctions.

The RST was applied firstly to consider the baseline conditions across the five criteria, with each route broken down into sections of distinct character. An overall baseline score of 0-5 for each criterion across the route is established.

The route is then re-assessed based on the potential conditions across the five criteria – scoring the route sections on the basis that they were improved, where possible, to standards identified in the DfT’s Local Transport Note 1/20 (LTN 1/20) – the latest design guidance for cycle infrastructure. More detail on the LTN 1/20 principles is provided in section 6 – Interventions.

DfT’s LCWIP Guidance states that the aim is to achieve a score of at least three and significantly reduce the number of critical junctions, potentially removing these completely.

Owing to COVID-19 restrictions, the RST assessment has been largely desktop based with assessment sheets completed remotely using online mapping and satellite imagery. However, spot checks were undertaken on site in June 2021 at locations where information was not readily available, or more detail was required to complete the audits.

Scores were assigned using the DfT’s LCWIP Route Selection Tool, with gradient calculated using online mapping as recommended in this guidance. In cases where traffic data was not available for a specific street, the road characteristic has been used as a proxy for daily vehicle flows. Speed limit was based on the posted speed limit for all routes.

4.6.1 RST baseline audits

The summary of the baseline audits is shown in Table 4.2 (Watford). The scores for the five core design principles are a function of the conditions across the whole route. The number of critical junctions on each route are also listed.

Watford

Table 4.2: Watford baseline RST results summary

Route No.	Name	Directness	Gradient	Safety	Connectivity	Comfort	Critical Junctions (no)
1	Green Loop East	4.0	4.8	3.4	4.6	2.5	2
2	Whippendell Road	5.0	4.5	1.5	5.0	0.1	7
3	St Albans Road	4.0	5.0	2.0	4.6	2.2	8
6	Watford to Carpenders Park	5.0	2.9	2.0	4.5	0.0	5

Route No.	Name	Directness	Gradient	Safety	Connectivity	Comfort	Critical Junctions (no)
17a	Hempstead Road	5.0	4.2	1.7	4.5	2.0	8

This assessment indicates that these routes generally score highly for directness – following the main roads or taking advantage of direct quieter routes. The gradient scores are generally high, reflecting the generally flat terrain – with a slightly steeper gradient on sections of route 6 contributing to a slightly lower score. Safety scores are generally low, due to cyclists currently being required to mix with general traffic at speeds above 20mph. The dense network of the urban area is reflected in the high connectivity scores, with slightly lower scores on route 17 which is constrained by waterways and motorways at the northern end. Very low comfort scores reflect the lack of cycle infrastructure on most routes – with the lowest scores applied where cyclists are required to mix with general traffic.

5 Network planning for walking – LCWIP

Stage 4

This section sets out the process for identifying core walking zones across the LCWIP area and identifying the most appropriate areas for walking interventions. It should also be noted that walking improvements will also be made alongside the cycling improvements across the strategic network identified in section 4.

5.1 Core walking zones

The first stage of the development of a walking network is to identify the Core Walking Zones (CWZ). The LCWIP guidance recommends that:

- CWZs should consist of a number of walking trip generators that are located close together - such as a town centre or business parks.
- An approximate five-minute walking distance of 400m should be used as a guide to the minimum extents of CWZs.
- All pedestrian infrastructure should be deemed as important within the CWZs.
- Once the CWZs have been identified, the important pedestrian routes (key walking routes) that serve them should then be located and mapped.

The origin and destination analysis undertaken in section 4 has helped to identify the key walking trip generators in Watford and Three Rivers. From this analysis the following CWZs have been identified, these are shown in Figure 5.1:

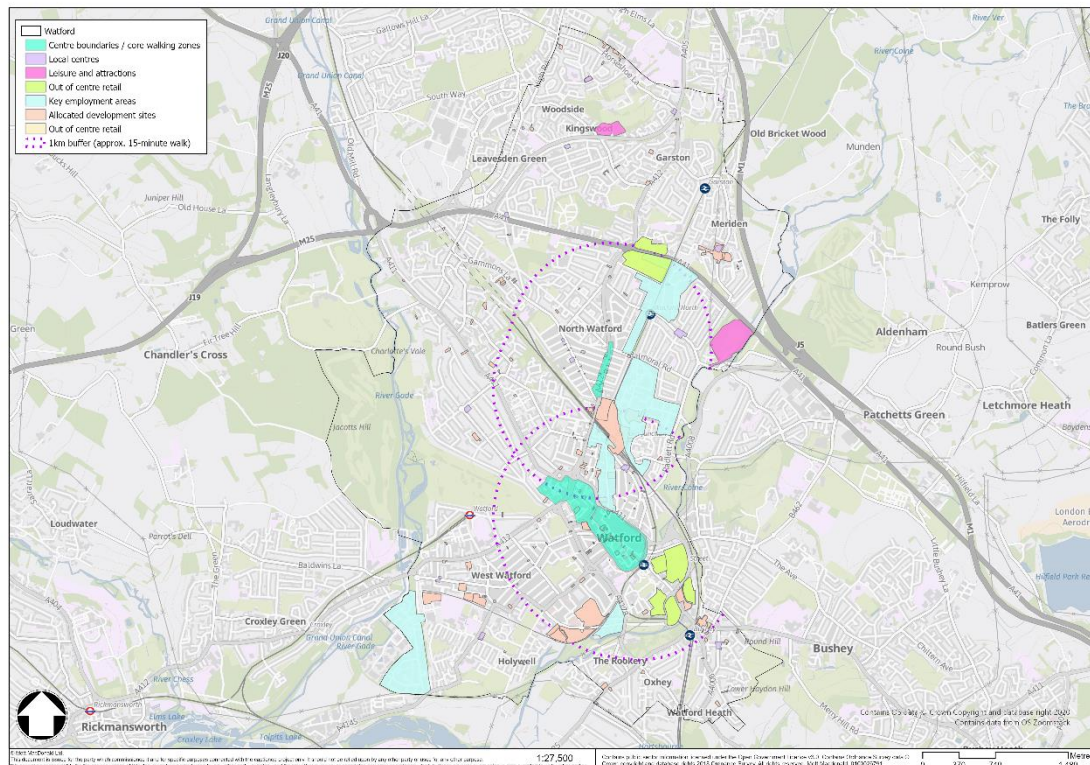
Watford Borough

- Watford Town Centre
- North Watford

These CWZs align with the designation of these locations in Watford as 'designated key centres' within the districts, and therefore these have been assigned as the initial set of core walking zones. It is envisaged that as the LCWIP is revised, more core walking zones will be identified to help to create a more comprehensive, coherent walking network.

Through collaboration with the client team, it was agreed that the extents of the important routes that serve the CWZs should be within 1km of the CWZs. These extents are visible on Figure 5.1.

Figure 5.1: Core walking zone - Watford

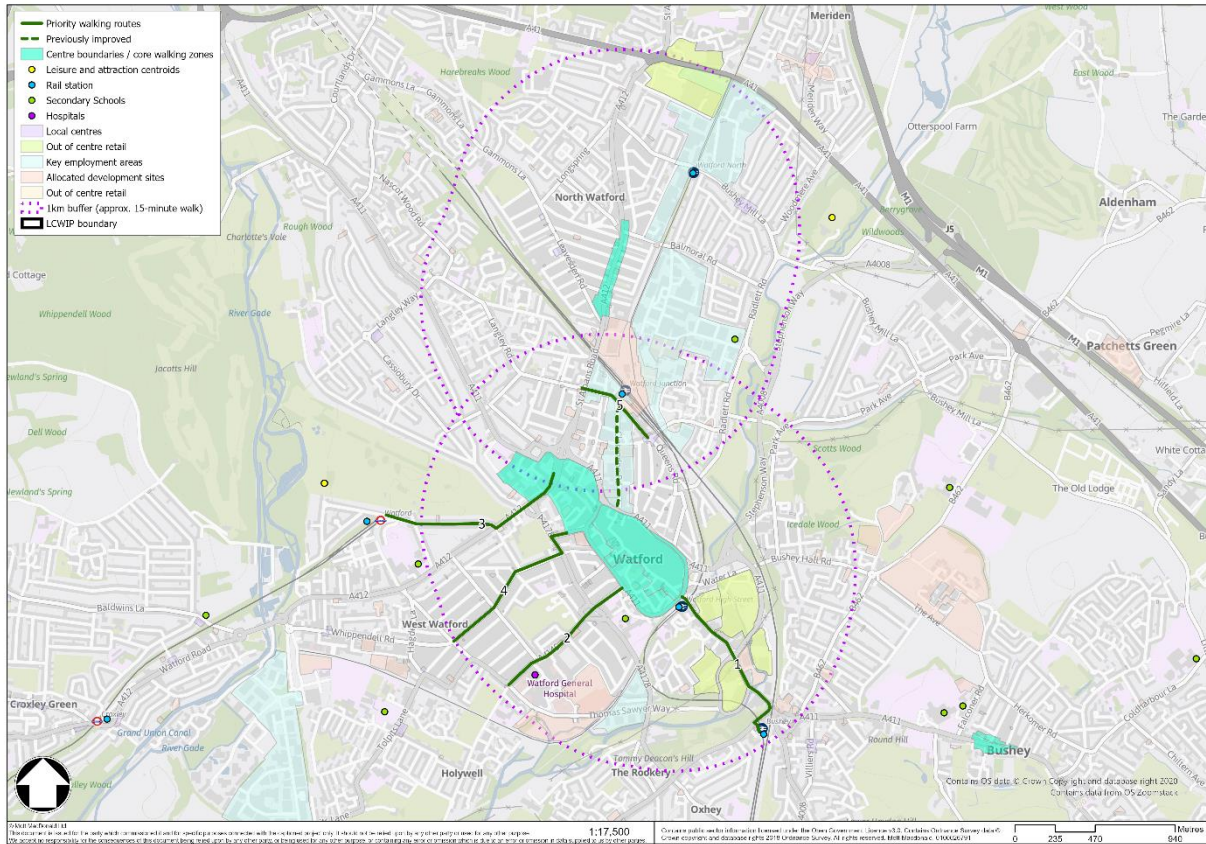


5.1.1 Watford

Watford Town Centre CWZ was selected by WBC as the priority area for further initial investigation. A number of key walking routes (KWRs) were identified based on the connections to interchanges or other key trip attractors in the area such as Watford Football Club and Watford General Hospital. Figure 5.2 shows the identified key walking routes, and can be summarised as follows:

- Watford Town Centre Core Walking Zones (all streets within this zone)
- Key Walking Route 1- Watford Town Centre to Bushey Station (Lower High Street and Eastbury Road)
- Key Walking Route 2 – Watford Town Centre to Watford General Hospital (Vicarage Road)
- Key Walking Route 3 – Watford Town Centre to Watford Underground station (Rickmansworth Road and Cassiobury Park Road)
- Key Walking Route 4 – Watford Town Centre to West Watford (Whippendell Road)
- Key Walking Route 5 – Station Road/ Woodford Road

Figure 5.2: Key walking routes around Watford town centre



Source: Mott MacDonald

5.1.2 WRAT baseline audits

A summary of the Walking Route Assessment baseline audits is shown in Table 5.1, Table 5.2 (Watford) with the scores indicating the existing conditions across the whole route.

5.1.2.1 Watford

Table 5.1: Watford Core walking zones – Existing conditions WRAT results summary

Route Name	Attractiveness %	Comfort %	Directness %	Safety %	Coherence %	Overall score %
A High Street (Peace Prospect – Clarendon Road)	94	85	83	-	-	88
B Rosslyn Road	67	60	33	83	0	53
C Clarendon Road	100	90	100	100	100	97
D Market Street	83	67	100	83	0	76
E King Street	75	60	80	83	0	78
F High Street (Clarendon Road – Exchange Road)	75	78	90	92	100	82

Route	Name	Attractiveness %	Comfort %	Directness %	Safety %	Coherence %	Overall score %
G	Albert Road South	83	70	63	83	0	69

Table 5.2: Watford Key walking routes – Existing conditions WRAT results summary

Route No.	Name	Attractiveness %	Comfort %	Directness %	Safety %	Coherence %	Overall score %
1	Watford Town Centre to Bushey Station	46	64	47	67	67	57
2	Watford Town Centre to Watford General Hospital	53	62	61	67	50	60
3	Watford Town Centre to Watford Underground station	83	50	50	50	0	53
4	Watford Town Centre to West Watford	83	42	55	50	100	57
5	Station Road / Woodford Road	75	50	58	83	100	68

The Core Walking Zone and Key Walking Route scores reflect the general condition of the routes – with the CWZ scores generally higher, as these links are already more pedestrian-orientated sections in the town centre. The lower coherence scores in the CWZ are generally due to missing tactile paving or dropped kerbs at crossings. Rosslyn Road scores poorly on directness due to the lack of a crossing of the A412 at the northern end.

The Key Walking Route scores are generally lower as they serve routes away from the pedestrianised centre of the town. Lower attractiveness scores on routes 1 and 2 reflect generally poorer ambience on these routes – including traffic noise and littering. Lower comfort scores on routes 3-5 are a result of narrow footways on some sections, and lower directness scores on these routes are generally due to circuitous or longer routes that deviate from pedestrian desire lines. The speed and volume of traffic on the routes directly influences the safety scores, while the coherence of the routes is a reflection of the provision of dropped kerbs and tactile paving, which is generally absent from route 3.

6 Interventions

This section provides a brief overview of the type of infrastructure which should be considered in order to help achieve a transformational change in active travel on the routes established above. The purpose is to provide background for the interventions identified.

As the LCWIP is a high-level network planning document, the interventions that have been detailed in this section are at high level only and only indicate what could potentially be delivered in accordance with best practice and current guidance. Further feasibility studies will be needed to develop these interventions further and to ensure that they can be implemented.

6.1 Types of cycling interventions

The Department for Transport's (DfT) Local Transport Note (LTN) 1/20 Cycle Infrastructure Design guidance¹⁵ was introduced in 2020 and should be referred to for detail on cycling infrastructure.

LTN 1/20 states that cycling infrastructure should meet five core design principles as follows:

- **Coherent:** Routes are consistent and simple to follow from origin to destination.
- **Direct:** Routes are at least as direct as those for private vehicles and do not require cyclists to stop and start at junctions.
- **Safe:** Infrastructure should be safe, and people should feel safe using it.
- **Comfortable:** Good quality, wide routes.
- **Attractive:** Infrastructure is well designed.

In addition, the guidance provides more specific principles including:

- Cycle infrastructure should be inclusive and usable by people of all ages and abilities.
- Cycles must be treated as vehicles and not as pedestrians with physical separation provided between pedestrians and cyclists, including at junctions.
- Physical separation from high traffic volumes, including at junctions.
- Widths should cater for high growth and non-standard cycles.
- All highway schemes should include consideration of opportunities to improve provision for cycling.
- Schemes should be more than cosmetic public realm schemes and include restrictions to traffic or reallocation of road space.
- Cycle infrastructure should form a connected and holistic network.
- Cycle parking should be included in large schemes.
- Schemes must be legible and understandable.
- Clear and comprehensive wayfinding should be provided.
- Flagship infrastructure such as new cycle bridges should form part of a joined-up network.
- Schemes should be properly maintained which is as important as the infrastructure itself.
- Surfaces must be smooth and durable.
- Trials may be important in making sure a permanent scheme works from the start; however, good design is still required for trial schemes to maximise their chances of success.

¹⁵ <https://www.gov.uk/government/publications/cycle-infrastructure-design-ltn-120>

- Access controls such as barriers should not be used.
- Lower cost, pragmatic schemes such as bollards to close a road are preferred where they can be effective.
- Routes must be direct and logical.
- Cycle routes should be comfortable to ride, minimising the need to stop and start and the need for traffic calming with vertical deflection (e.g. speed humps).
- Schemes must be consistent and not switch between different types of provision such as carriageway lane and footway.

The fact that the LTN 1/20 guidance was introduced so recently means that, in common with most of the country, much existing cycling infrastructure in the study area would not meet the latest requirements. The prioritisation of interventions in the LCWIP process takes account of which improvements are most urgently required.

The level of design for the LCWIP is necessarily high-level. For example, at this stage, the plans indicate where there is potential for protected cycle facilities; however, the exact nature of the facility would be subject to further design work and will be subject to circumstances specific to the route. Types of facility include:

- Hybrid stepped track.
- Kerb separated track.
- Separation provided by locating parking on the outside of the cycle lane (note LTN 1/20 also recommends kerb or light separation).
- Bi-directional track.
- Light separation such as wands, as have been used in the recent temporary schemes.

It is, however, recommended that the type of design is consistent within each scheme.

6.2 Identified cycling interventions

In identifying measures, the interventions that have been suggested reflect the aspirations outlined in LTN 1/20. This is necessary in order to provide the quality of infrastructure that will have the greatest chance of achieving mode shift.

The LCWIP is intended to provide a high-level overview of potential designs only. The deliverability of the schemes has been considered; however, in all cases, the measures identified will need to be subject to a full feasibility assessment, safety review and detailed consideration of the impacts on other road users, including buses and emergency vehicles. On some sections of the routes, very constrained pinch points have been identified which has meant that potential interventions have not been able to be assessed at this stage – in these cases further study is required to identify potential solutions for continuing the cycle route. The deliverability of the schemes is considered in LCWIP Stage 5 – Prioritising Improvements.

Appendix A provides a detailed breakdown of potential measures for the priority routes in the Watford area.

The measures proposed focus on the main links and junctions. In addition, it is recommended that the following interventions be included when designing schemes in more detail:

- Side road entry treatments, including priority for cyclists, reducing radii and providing raised tables or continuous footways for pedestrians. The plans provided in Appendix A provide some particular examples; however, as it is recommended that this would be a standard design consideration, the majority of locations are not highlighted.
- Modal filters to complement the introduction of cycle schemes on strategic routes and provide a series of connector routes from residential areas. Some potential examples are

given in Appendix A; however, it is recommended that modal filters be given more wider consideration when developing designs.

- Permitting of two-way cycling on one-way streets to improve permeability to and from the core network, subject to individual safety assessment.
- Signalised junctions should be reviewed on a case-by-case basis at feasibility stage, but dedicated signal stages for cycles should be the first consideration in most cases, with other options considered during the review, depending on space, junction capacity and safety factors.
- Cycle parking, including secure storage in residential areas and at destinations.
- Signage and wayfinding to provide for easy understanding of cycle facilities for cyclists, pedestrians, and other road users, especially at more complex junctions, and to provide navigation and route reassurance. Redundant signage – particularly ‘Cyclists Dismount’ – should be removed.
- Decluttering of spaces to provide suitable useable widths and remove obstructions where possible should be carried out on all routes.

6.2.1 Watford

Table 6.2 provides the revised RST scores assuming the measures identified are implemented along these cycle routes. This indicates that there is significant potential to address the current issues and provide high quality cycle routes. There is expected to be scope to introduce facilities which can achieve at least the minimum standard against most criteria.

Table 6.2: RST results summary (with interventions)

Route No.	Name	Score	Directness	Gradient	Safety	Connectivity	Comfort	Critical Junctions (no)
1	Green Loop East	Existing Score	4.0	4.8	3.4	4.6	1.9	2
		Potential Score	4.0	4.8	4.0	4.6	4.5	0
2	Whippendell Road	Existing Score	5.0	4.6	1.4	5.0	0.1	7
		Potential Score	5.0	4.6	4.6	5.0	3.5	0
3	St Albans Road	Existing Score	4.0	5.0	2.0	4.6	2.2	8
		Potential Score	4.0	5.0	5.0	4.6	4.4	0
6	Watford to Carpenders Park	Existing Score	5.0	2.9	2.0	4.5	0.0	5
		Potential Score	5.0	2.9	4.8	4.5	4.3	0
17a	Hempstead Road	Existing Score	5.0	4.2	1.7	4.5	2.0	8
		Potential Score	5.0	4.2	4.4	4.5	4.0	0

6.2.2 Stakeholder and Consultation Feedback

Following the initial stakeholder session in October 2020, the Watford cycle route interventions were presented to a stakeholder group meeting in June 2021 (which included representatives from local cycle groups) and a subsequent session with local council members.

Comments received on the Watford cycle routes through these processes are summarised as follows:

Route	Comment	Response
Route 1	Route incorporating the Green Ring generally supported, with greater priority for cycling suggested on some key junctions. Suggestion to link route to Watford Junction	Detail on junction priority will be picked up at feasibility design stage. Link to Watford Junction is provided by St John's Rd/Clarendon Rd improvements.
Route 2	Some concern over the proposal to provide shared use paths on the more constrained streets – with separated cycle provision preferred by several stakeholders. Likely objection to removal of parking spaces – problems of enforcing parking restrictions. Alternative route via Tom Sawyer Way/Vicarage Ed/Charlock Way proposed. Alternative route via Chester Rd also proposed.	Noted that this is a challenging route due to many constraints, but valuable as it serves major destinations including the hospital. Next design stage to consider practical available width and key pinch points. Enforcement of parking always a problem, but design techniques can be used to minimise parking loss and discourage pavement parking. Alternative routes proposed would not serve the destinations that this route aims to serve.
Route 3	Generally supported, with some stakeholders suggesting increased separation from motor traffic, and some concerns over the on-road section through the North Watford Local Centre and cycle facilities at major junctions.	Separated cycle lanes are proposed for most of this route. Section through North Watford Local Centre has recently had footway and urban realm improvements, so will need further consideration at feasibility stage to provide a continuous route.

Route	Comment	Response
	Parallel route via Bradshaw Rd proposed, including potential access to Watford Junction via TK Maxx car park.	Parallel route would deviate considerably from the desire line for a relatively short section, and sever some links to other routes, so the main road is the preferred direct route.
Route 6	Some concern over the proposed provision for cycling on the northern part of the route on the more constrained town centre streets. Greater support for the long term proposals further south towards Oxhey. Proposal to avoid Green Lane/part of Deacon's Hill by using parallel route. Route links to schools, which is important.	Noted that northern section is constrained – similar area to route 2 with the same challenges. An alternative, parallel route via St James Rd should be considered to avoid some of the more constrained sections. Green Lane is 20mph and traffic calmed, so should be a reasonable route. Deacon's Hill is constrained, but is direct and has less frontage/on street parking than the alternative route.
Route 17	Broad support for the route with some comments on individual junction arrangements and the type of facility provided on some more constrained sections. Main comments on Three Rivers section (between Grove Mill Lane and the A41 is challenging). The towpath section to the north is available, but unsuitable for cycling in all conditions. Access to Kings Langley Station is important.	The route is largely separated, including the section between Grove Mill Lane and the A41. Stepped tracks would provide appropriate separation from traffic and can be designed to cater for driveways. An alternative to the towpath has been proposed which is slightly less direct, but more suitable for cycling. The towpath is unlit, poorly surfaced and not well overlooked, making it unsuitable for utility trips in most cases.

Wider public consultation was also undertaken on the walking and cycling routes and high level scheme concepts as part of the wider Watford Sustainable Transport Strategy (Transforming Travel in Watford) consultation. There was a separate area on the website [Walking & Cycling Schemes | Future Travel Watford](#) which illustrated the routes and scheme concepts in a map and pictorial format. Respondents were invited to leave comments directly on the plans or submit them by email. The STS consultation was publicised widely and the specific cycling and walking pages were additionally publicised in a members group session and at a forum with local cycle groups.

Many comments relate to details that will be considered at feasibility design stage, as the routes are designed with access to more detailed information, and with reference to design guidance, including LTN 1/20. A summary of the comments by route section is set out below.

Route 1

Comments are broadly supportive of the proposals, with local cycling groups specifying this route as an important addition to the network. Comments largely relate to the detail of the route, including;

- Types of crossing facility at Thomas Sawyer Way/Dalton Way
- Path widths must be suitable for cycling.
- Surface quality through the park.
- Improvement of crossings to be single-stage.
- Different surface types for pedestrians and cyclists.
- Removal of street furniture.

These aspects will be considered in the next stage of design, and the routes will be designed with reference to LTN 1/20. Other comments were received on the indirect nature of the route. The route is, to a large extent, already in existence, and provides a traffic-free route to the town centre for many potential users. The assessment of potential demand shows that the route caters to the desire lines for many users.

Route 2

Comments support the removal of parking to accommodate space for cycling, but express concern at the likely increase in demand as a result of housing development. The proposed use of shared use paths in this constrained area generated some concern, with respondents emphasising that this should be a last resort – as outlined in LTN 1/20.

The relatively narrow streets here, the challenges of managing parking, and the desire for public realm improvements on some sections including Vicarage Road mean that separated cycle facilities of appropriate width may not be achievable in this section. The consistency of the provision for cycling is also a key consideration, with a preference to avoid frequent changes between types of cycle facility. Opportunities for providing alternative facilities can be considered at feasibility design stage, when more information on traffic flows and patterns is available.

Route 3

Comments support the separated cycle facilities on large sections of the route, but others suggest alternative routes making use of back streets which are less heavily used by motor traffic. The need for safe routes through the large junctions on this route is noted by several people. The 'gap' in the route through the North Watford Local Centre is identified as a potential problem, with the need for consistent provision along the route noted.

The LCWIP aims to identify routes which cater to utility cycling, with direct routes prioritised to minimise journey times to key destinations. Few viable alternative routes exist along this route, and road widths generally mean that space for separated cycle facilities is available. The section through the North Watford Local Centre has recently had urban realm and footway improvements and will need additional consideration at feasibility design stage of how best to provide a consistent and safe route through this section. The interaction of cycle measures with potential bus priority measures also needs consideration.

Route 6

Comments raise similar concerns to route 2 at the northern end of this route, as they serve similar areas and suffer from similar constraints. Shared use sections on narrower parts of the route are likely to be required where roadspace is not available – but an alternative route has been identified where some constraints can be avoided.

Some comments suggest an alternative route to Deacon's Hill/Green Lane in order to provide more space, and avoid a steeper gradient. The route as proposed through this section provides a reasonably direct route following the major desire lines, but will require some improvement. The proposed use of modal filters could reduce traffic significantly making a good on-carriageway environment for cycling.

The southern end of the route is in Three Rivers District and was not consulted on.

Route 17

The Watford section of the route largely comprises of stepped tracks alongside Hempstead Road. This approach is broadly supported, although some respondents prefer line-separated tracks, and one suggestion proposes a quieter route option. The integration of the routes with the town centre is the subject of some comments, with the use of shared use paths on constrained sections not supported by some respondents, and greater priority for cycles is proposed.

This route is direct and follows a main route out of Watford, and stepped tracks provide good protection for cyclists on the most direct route, and in a space-efficient way. The links to the town centre make use of existing facilities and greater priority for cyclists can be considered at feasibility design stage – including improvements to make a smoother cycle journey.

The northern end of the route is in Three Rivers District and was not consulted on.

6.3 Types of walking intervention

6.3.1 Whilst design guidance for walking schemes is more limited than for cycle design guidance, the CIHT Designing for Walking guidance¹⁶ provides a good framework for the principles to apply.

6.3.2 Well-designed walking facilities should enable walking journeys and improve the experience of those already walking by following desire lines, being clutter-free and being legible to all users. They should take into account the volumes of people walking along the streets (actual or desired) or crossing the streets and should take into account the needs of all users. The specific design solutions will therefore depend on a variety of considerations.

Potential interventions could include:

- Increasing the width of footways
- Public realm improvements, including:
 - Continuous level footways
 - Raised tables
- Provision of high-quality street furniture and provision of benches
- Improving of pedestrian facilities at traffic signal junctions, including:
 - Additional pedestrian crossings
 - Reduction in crossing distances
 - Changing 'staggered' to 'straight across' pedestrian crossings
- Street lighting improvements
- Decluttering and maintenance
- Dropped kerbs and tactile paving
- Wayfinding
- Measures to assist with access to/by other modes – i.e. bus stops, stations, disabled parking
- Area wide treatments such as Low Traffic Neighbourhoods.
-

Provision should aim to achieve good design outcomes for pedestrians - routes should be attractive, comfort, direct, safe and connected. See section 4.1 for further details.

There is some overlap between the cycle network and walking routes, and measures proposed for cycling, such as junction improvements, can clearly also benefit pedestrians. It is recommended that all cycle schemes consider the needs of pedestrians and incorporate design measures that will benefit pedestrians as well as cyclists.

¹⁶ https://www.ciht.org.uk/media/4460/ciht_-_designing_for_walking_document_v2_singles.pdf

In identifying measures for walking, the interventions that have been suggested reflect the principles outlined in CIHT's Designing for Walking guidance. This is necessary to provide the quality of infrastructure that will have the greatest chance of achieving mode shift.

As with the cycling interventions, the LCWIP is intended to provide a high-level overview of potential walking designs only. Effort has been made to consider the deliverability of schemes. However, in all cases, the measures identified will need to be subject to a full feasibility assessment, safety review and detailed consideration of the impacts on other road users, including buses and emergency vehicles.

Appendix B provides a detailed breakdown of potential measures for each of the five key walking routes.

The measures proposed focus on the main links and junctions. In addition, it is recommended that the following interventions and measures are also considered, with consideration given to the urban or rural nature of the local environment:

- Usable footway widths of at least two metres in all locations. Where there is high footfall, such as in the town centre, this should be increased further.
- Crossings should be single stage to reduce pedestrian crossing times. Where this is not feasible due to the number of traffic lanes, pedestrian wait times should be minimised and green man time should be maximised.
- Footways should be maintained to the same standard they were designed to. If any works are undertaken, the surface should be replaced to the same standard it was designed to.
- Side road entry treatments, including reducing radii and providing raised tables or continuous footways. These are noted in some circumstances however, it is recommended that this would be a standard design consideration.
- Tactile paving and dropped kerbs should be provided at all points pedestrians are expected to cross the road.
- Car parking should be restricted around formal and informal pedestrian crossing points, and where pedestrian movement is higher (e.g. around bus stops).
- General upkeep and maintenance of the pedestrian environment should be ongoing to ensure the quality of the route does not deteriorate. This includes litter picking, ongoing maintenance of street furniture and surfaces e.g. removal of graffiti on walls, as well as trimming vegetation to maintain useable footway widths and to preserve visibility.

Routes that scored over 70% in the WRAT assessment are not considered to need additional interventions to bring them to a suitable standard.

Potential interventions have been created for the walking routes which scored less than 70% when using the WRAT. However, in many cases it has not been possible to address issues associated with the volume of traffic on the adjacent highway. Reducing traffic on these walking routes would significantly improve the pedestrian environment.

6.3.1 Watford

Core walking zones

Table 6.1 provides the revised WRAT scores assuming the measures identified are implemented along the routes in the core walking zones.

Table 6.1: Core walking zone - WRAT results summary (with interventions)

Route No.	Name	Score	Attractiveness %	Comfort %	Directness %	Safety %	Coherence %	Overall score %
		Existing Score	67	60	33	83	0	53
B	Rosslyn Road	Potential Score	83	70	100	83	100	83
		Existing Score	83	70	63	83	0	69
G	Albert Road South	Potential Score	88	80	100	83	100	88

Key walking routes

Table 6.2 provides the revised WRAT scores assuming the measures identified are implemented along the key walking routes.

Table 6.2: Key walking routes - WRAT results summary (with interventions)

Route No.	Name	Score	Attractiveness %	Comfort %	Directness %	Safety %	Coherence %	Overall score %
		Existing Score	46	64	47	67	67	57
1	Watford Town Centre to Bushey Station	Potential Score	68	83	80	77	100	80
		Existing Score	53	62	61	67	50	60
2	Watford Town Centre to Watford General Hospital	Potential Score	73	80	87	81	100	83
		Existing Score	83	50	50	50	0	53
3	Watford Town Centre to Watford Underground station	Potential Score	83	83	50	100	100	78
		Existing Score	83	42	55	50	100	57
4	Watford Town Centre to West Watford	Potential Score	83	75	90	83	100	84
		Existing Score	75	50	58	83	100	68
5	Station Road / Woodford Road	Potential Score	75	88	78	92	100	84

6.3.2 Stakeholder and Consultation Feedback

The walking routes were discussed in the stakeholder meeting along with the cycle routes and were included in the TTIW consultation.

Few comments were received on the walking routes, and all were supportive. Improvements to pedestrian crossing facilities at Bushey Arches (Walking Route 1) are noted as being important, and are included in the route 1 proposals. The addition of green man facilities on crossings of St Albans Rd at the end of route 5 is also noted, and included in the proposals.

Detailed comments on the walking routes will be considered at the next stage of design.

7 Prioritising Improvements – LCWIP Stage 5

Stage 5 of the LCWIP guidance outlines the approach to prioritising improvements and/or routes. The purpose of prioritisation is to understand the relative importance of each route and how this will lead to the network being developed over time. This process is not intended to delete or discount any routes or improvements, merely to assign it a programme entry against the short, medium, and long-term timescales within the LCWIP.

The LCWIP guidance around prioritisation is limited as it allows authorities to be flexible with the prioritisation process as it should look to meet the individual requirements of each Local Authority. However, the guidance does suggest that three broad factors are used to help understand priorities and these are:

- Effectiveness – the impact on increasing levels of cycling and walking
- Policy – how the scheme meets/addresses key local policy objectives
- Deliverability – how deliverable the scheme is, public acceptability, risk, and constraints

It is suggested that whole routes should be prioritised rather than individual interventions or improvements, as that ensures that the whole route is delivered rather than incremental improvements across multiple routes over time. Primarily routes should first be prioritised by their ability to increase levels of walking and cycling, however other key factors are also important, such as alignment to other schemes/funding streams and deliverability.

The approach to prioritisation in this case has been modified as described in section 4.4, with the Effectiveness and Policy aspects considered in the pre-prioritisation stage.

7.1 Deliverability assessment

7.1.1 Criteria

The pre-prioritisation processes utilised mostly quantitative and available data to prioritise the routes, however the criteria around deliverability are in general more qualitative and based on the best information/knowledge available at the time. But as noted previously, this process is merely to provide an order to delivery, rather than removal of any routes. The criteria agreed with the client team are outlined in Table 7.1 and have been used to inform the prioritisation of the walking and cycling routes.

Table 7.1: Deliverability Criteria

Criteria	How measured/assessed
Technical feasibility	Assessment of feasibility based on following key factors: <ul style="list-style-type: none"> ● Can it be implemented within the highway boundary? ● Does it require additional approvals/negotiations (i.e. other landowners) ● Are there any environmental and/or heritage considerations
Scheme support	How likely is the scheme to be supported by the public and Political Members
Alignment with funding streams and/or other schemes	Assessed against: <ul style="list-style-type: none"> ● Potential alignment/integration with another scheme/development ● Potential for funding/funding stream identified (S278/CIL/EATF/LTP/FHSF etc)

7.1.2 Assessment

Routes have been prioritised based on these criteria, with the technical assessment based on the high-level interventions proposed in this report and detailed in Appendix A, and the scheme support and alignment with funding criteria assessed by local authority officers.

The overall ranking of the prioritised cycling and walking routes for Watford are shown in Table 7.2 and Table 7.3. These prioritisation rankings take into account all aspects of the prioritisation, including the Effectiveness and Policy aspects considered in the pre-prioritisation. The detailed rationale for the prioritisation ranking across all routes is shown in Appendix C.

Prioritisation for the remainder of the cycle routes within the network remains as indicated following the initial pre-prioritisation process, as at this stage, no further assessment has been undertaken on these routes. Once these routes are developed further, they can be prioritised in a similar manner to the top 5 routes as shown below.

Table 7.2: Watford Cycle Route Prioritisation

	Route No	Route Name	Rank
Cycling Prioritised Schemes	1	Green Loop East	1
	2	Whippendell Road	3
	3	St Albans Road	1
	6	Watford to Carpenders Park	5
	17a	Watford to Kings Langley	3

Source: Mott MacDonald

Table 7.3: Watford Walking Route Prioritisation

	Route No	Route Name	Rank
Key Walking Routes	1	Watford Town Centre to Bushey Station	1
	2	Watford Town Centre to Watford General Hospital	2
	3	Watford Town Centre to Watford Underground station	3
	4	Watford Town Centre to West Watford	5
	5	Station Road / Woodford Road	3
Core Walking Zone	B	Rosslyn Road	2
	G	Albert Road South	1

Source: Mott MacDonald

8 Integration and application – LCWIP

Stage 6

Stage 6 of the LCWIP involves the integration of the findings into the wider policy context of the local authorities and embedding the network plans into future schemes and projects.

8.1 Timescales and Review

The LCWIP sets out the ambition for the strategic walking and cycling networks in Watford over the course of the next 10 years. The prioritisation exercise has shown that some elements will likely be brought forward ahead of others, allowing the local authorities to integrate the improvements with other planned works most effectively, and deliver on the councils' priorities.

While this version of the LCWIP reflects the current position and ambition for the networks, the document does not stand still. As local and national circumstances change – the changes in travel patterns brought about by the Covid-19 pandemic is a prime example – the local requirements for infrastructure will also need to be updated. The LCWIP guidance suggests as a guide that the document is refreshed every four to five years, or if there is a significant shift in local circumstances or funding.

8.2 Funding

The LCWIP will position the local authorities effectively to take advantage of future funding opportunities – indications from central government in 2021 have indicated that, while not a requirement, an adopted LCWIP will be increasingly important for local authorities bidding for active travel funds in the future.

The network plans and supporting documents show a clear commitment to improvements on the routes and will also support the direction of funding from other sources, providing a resource for developers to understand routes that may be funded or improved to facilitate future development.

8.3 Policy Integration and application

The integration of the LCWIP into local policy is crucial for the success of the network. The LCWIP will support other local policy positions, particularly the Hertfordshire LTP4, and will form a key part of the Transforming Transport in Watford strategy, which aims to improve active travel as part of a wider programme of transport improvements. As well as supporting transport policies, the plan will also support leisure plans such as the Public Rights of Way Improvement Plan, and health and wellbeing policies.

The LCWIP guidance suggests that the LCWIP could be incorporated into a Supplementary Planning Document (SPD) to provide more guidance to adopted policies in the Local Plan, strengthening its status with developers.

Informing key Council personnel of the LCWIP and its aims will help identify opportunities for elements of the plan to be brought forward in tandem with other schemes led by different parts of the council, potentially accelerating delivery.

Key destinations

Out of town retail

Waterfields Retail Park
Watford Arches Retail Park
Colne Bridge Retail Park
Century Park
London Road Retail Park
Apsley Mills Retail Park
Abbey View Retail Park
Dunelm & Wickes, London Road (London Road)
B&Q, Two Waters Road (Corner Hill)
London Road / Two Waters Way (Two Waters West)
Jarman Fields
Dome Roundabout; Sainsburys and Asda
Tesco Store

Leisure

Jarman Fields
Woodside
Bushey Mill Lane - Top Golf
Warner Bros. Studio Tour
Cassiobury Park
Rickmansworth Aquadrome
Aldenham Country Park
Leavesdon Country Park
Grove Park
Moor Park

Rail stations

Chorleywood London Underground Station, Chorleywood Station
Croxley London Underground Station
Watford High Street Station
Watford Junction Station

Watford North Station

Watford London Underground Station

Carpenders Park Station

Moor Park London Underground Station

Radlett Station

Garston Station

Rickmansworth London Underground Station, Rickmansworth Station

Bushey Station

Park Street Station

Hemel Hempstead Station

Apsley Station

King's Langley Station

Bricket Wood Station

How Wood Station

St Albans Abbey Station

Secondary schools

Adeyfield

Parmiter's

Cavendish (The)

Hemel Hempstead (The)

Bushey Academy (The)

Watford Grammar School for Girls

Westfield Community Technology College

St Michael's Catholic High

Garston Manor

Marlborough School Science College

St Joan of Arc Catholic

Kings Langley

Rickmansworth

Bushey Meads

Francis Combe Academy

St Clement Danes

Queens'

Longdean

Astley Cooper (The)

Watford Grammar School for Boys

Falconer

Watford UTC

Reach Free School (The)

Westfield Academy

Harperbury Free School

Croxley Danes

Croxley Danes

Reach Free School (The)

Adeyfield

Laureate Academy

Laureate Academy

Croxley Danes

Key employment

Maylands Business Park, Hemel Hempstead

Whiteleaf Road, Hemel Hempstead

Bourne End Mills, Bourne End

Park Lane, Hemel Hempstead

Doolittle Meadows, Hemel Hempstead

The Waterfront, Elstree

Centennial Park, Elstree

The Rivers Office Park, Maple Cross

Home Park Estate, Kings Langley

Kingley Park, Kings Langley

Ovaltine, Kings Langley

Kings Park, Kings Langley

Abbots Business Park, Kings Langley

Levesden Park, Watford

Clarendon Road / Station Road / Birdle Path, Watford

Greycaine Road / Odhams / Sandown Road, Watford

Imperial Way / Colonial Way, Watford

Watford Business Park, Watford

Wiggenhall Road / Fishers / Trade City, Watford

Moor Park Industrial Centre, Watford

Clancy Docwra

Thames Water

Neighbourhood centres

Garston Park Parade

Goodwood Parade

Longspring

Station Area - Langley Rd/St Albans Rd

Buckingham Road

Bushey Arches

Vicarage Road

Whippendell Road East

Adeyfield

Apsley

Bennetts End

Boxmoor

Bovingdon

Maylands

Chaulden

Gadebridge

Grovehill

Highfield (Bellgate)

Highfield (The Heights)

Kings Langley

Leverstock Green

Nash Mills

Warners End

Harcourt Road (Bushey)

Bushey Hall Road (Bushey)

Elstree Village Centre

Aldenham Road

Bournehall Avenue

Bushey Mill Lane

Park Avenue

Battlers Green Drive

Verulamium Estate

Main centres

Watford

Watford North

Abbots Langley

Chorleywood

Rickmansworth

South Oxhey

Hemel Hempstead

Hemel Hempstead Old Town

Radlett

Bushey

Bushey Heath

Local centres

Croxley Green (Watford Road)

Croxley Green (New Road)

Mill End (Money Hill Parade)

2-8 Chalfont Road, Maple Cross

57-63 High Street, Bedmond

61-65 Station Road, Kings Langley

15 Bridge Road and 5 Old Mill Road, Hunton Bridge

17-22 School Mead, Abbots Langley

5-7a and Sherwood News, College Road, Abbots Langley

1-14 Katherine Place, Abbots Langley

Sarratt Post Office, The Green, Sarratt

41-55 and 295-309 Baldwins Lane, Croxley Green

193-197 Watford Road, Croxley Green

4-12 Scots Hill, 1-3 The Green and 1-4 New Parade, Croxley Green

1-11 Tudor Parade, Mill End / Berry Lane, Mill End

68-82 Church Lane, Mill End
2-28 Main Avenue, Moor Park
10-24 Hallowes Crescent, South Oxhey
305-317 Prestwick Road, South Oxhey
1-18 The Parade, Delta Gain, Carpenters Park
18-48 Little Oxhey Lane, South Oxhey
46-52 Heronsgate Road, Heronsgate
2-4 Station Approach, Chorleywood
Wyatts House and Shell Filling Station, Rickmansworth Road, Chorleywood
The Brow
Euston Avenue
Leavesden Road
Langley Way
Orbital Crescent
The Gossamers
Tolpits Lane
Tudor Avenue
Villiers Road
Horseshoe Lane
Whippendell Road / Ascot Road
St Johns Road
St James Road
Harwoods / Hagden Lane
Haines Way
Watford Fields
North Approach
Eastbury Road
Woodhall Farm
34-41a Abbey Avenue, St Albans
23-39a Vesta Avenue, St Albans
28-38 Abbots Avenue West, St Albans
81-97 Old Watford Road, Bricket Wood
95-127 Oakwood Road, Bricket Wood

19-27 Blackboy Wood, Bricket Wood

2a Tippendell Lane; 301-305, 337 & 192-204 Watford Road, Chiswell Green

2-30 How Wood

69-71, 68-76 & land south of 84 Park Street; 1-2 Park Street Lane, Park Street

A. Cycling interventions

B. Walking Interventions

C. Prioritisation Tables

