Dartford Local Cycling and Walking Infrastructure Plan

(LCWIP)

June 2023

DARTFORD
BOROUGH COUNCIL

Contents

1. Introduction

1.1 Summary and Document Purpose

The Local Cycling and Walking Infrastructure Plan (LCWIP) is a strategic document for Dartford Borough Council (DBC) to identify cycling and walking infrastructure improvements and to help deliver these in sections/routes, as identified in the network strategy. The document compiles evidence suggesting which stretches of paths and roads may have the greatest potential for improvements to encourage cycling, wheeling and walking.

DBC aims to increase the number of trips made on foot, wheel or by cycle[1]. The development of an LCWIP will enable DBC to identify potential infrastructure improvements and to make sure that adequate consideration is given to cycling and walking. The LCWIP can be used to inform development proposals and planned regeneration, secure funding and provide an evidence base for prioritising Community Infrastructure Levy (CIL) projects that encourage travel through active means (active travel).

LCWIPs are produced with a ten year timeframe for delivery, however the DfT's intention is that the documents are flexible and therefore should be considered as 'live' documents. This provides local authorities with the flexibility to update their network plans to reflect local changes, including new development sites, funding opportunities and additional routes.

1.2 National Context and Guidance

Local authorities are encouraged to prepare LCWIPs in order to "take a more strategic approach to improving conditions for cycling and walking…" by:

- understanding existing and future travel patterns, and the barriers and enablers to increasing cycling and walking
- identifying and mapping recommended cycling network and walking zones that will become the primary focus of infrastructure improvements

[1] References to "walking" includes the use of wheelchairs, mobility scooters or other mobility aids, references to 'wheels' refer to scooters and references to "cycling" includes the use of bicycles, e-bikes, hand cycles and other adapted cycles for disabled people.

- creating a prioritised pipeline of enhancements to ensure infrastructure effectively supports growth in cycling and walking, and contributes towards meeting broader local goals[2]

The suggested process and the tools available for the development of LCWIPs is set out in DfT's *Local Cycling and Walking Infrastructure Plans Technical Guidance for Local Authorities*. This guidance notes that LCWIPs "enable a long-term approach to developing local cycling and walking networks, ideally over a ten year period…" and that "While the preparation of LCWIPs is non-mandatory, LAs who have plans will be well placed to make the case for future investment".

In an update to their key vision document *Gear Change: A bold vision for cycling and walking (2020)* DfT reiterates the message in *Gear Change: One Year On (2021)* that "an authority's performance on active travel will help determine the wider funding allocations it receives, not just on active travel". To this effect DfT states that they "will reduce funding to councils which do not take active travel seriously, particularly in urban areas". This would impact Kent County Council (KCC) as the highways authority for DBC. However, having an LCWIP in place will put DBC in a better position to seek funds from KCC for active travel projects and to work with KCC in improving the infrastructure across the identified network.

1.3 Dartford Context and Objectives

Needs and Opportunities

The particular need for increasing active travel in DBC relative to the rest of Kent (and to and England more widely), can be understood through data from Office for Health Improvement and Disparities (OHID), which can be found in Appendix 2:

- percentage of adults cycling for travel at least three days per week in DBC is **0.2%** (Kent average is 1.1% and England average is 2.3%)
- percentage of physically active adults in DBC is **63.5%** (Kent average is 68.3% and England average is 65.9%)
- percentage of adults classified as overweight in DBC is **70.4%** (Kent average is 63.2% and England average is 63.5%)
- percentage of physically active children and young people in DBC is **39.3%** (Kent average is 42.1% and England average is 44.6%)
- prevalence of overweight children at Year 6 in DBC stands at **37.1%** (Kent average is 34.5% and England average is 35.2%)
- percentage of 'Killed and seriously injured (KSI) casualties in DBC is **60.5%** (Kent average is 52.3% and England average is 42.6%)

It should be noted that part of the reason for these statistics in DBC, in particular in relation to traffic and vehicles, is due to: two busy strategic routes running across the Borough; some complex junctions; and many of the roads being over capacity.

[2] Local Cycling and Walking Infrastructure Plans Technical Guidance for Local Authorities, DfT, April 2017

DfT's Technical Guidance[3] states that "Cycling has the potential to replace trips made by other modes, typically up to 10km, although some people will cycle greater distances. For walking, the distances travelled are generally shorter, typically up to 2km." In this sense, given that Dartford covers a relatively small area of 7,600 hectares - ranging from approximately 7 to 12 km west-east and from 5 to 9 km south-north - there should be great potential for more journeys (both within and extending beyond the borough) to be made by foot or by cycle.

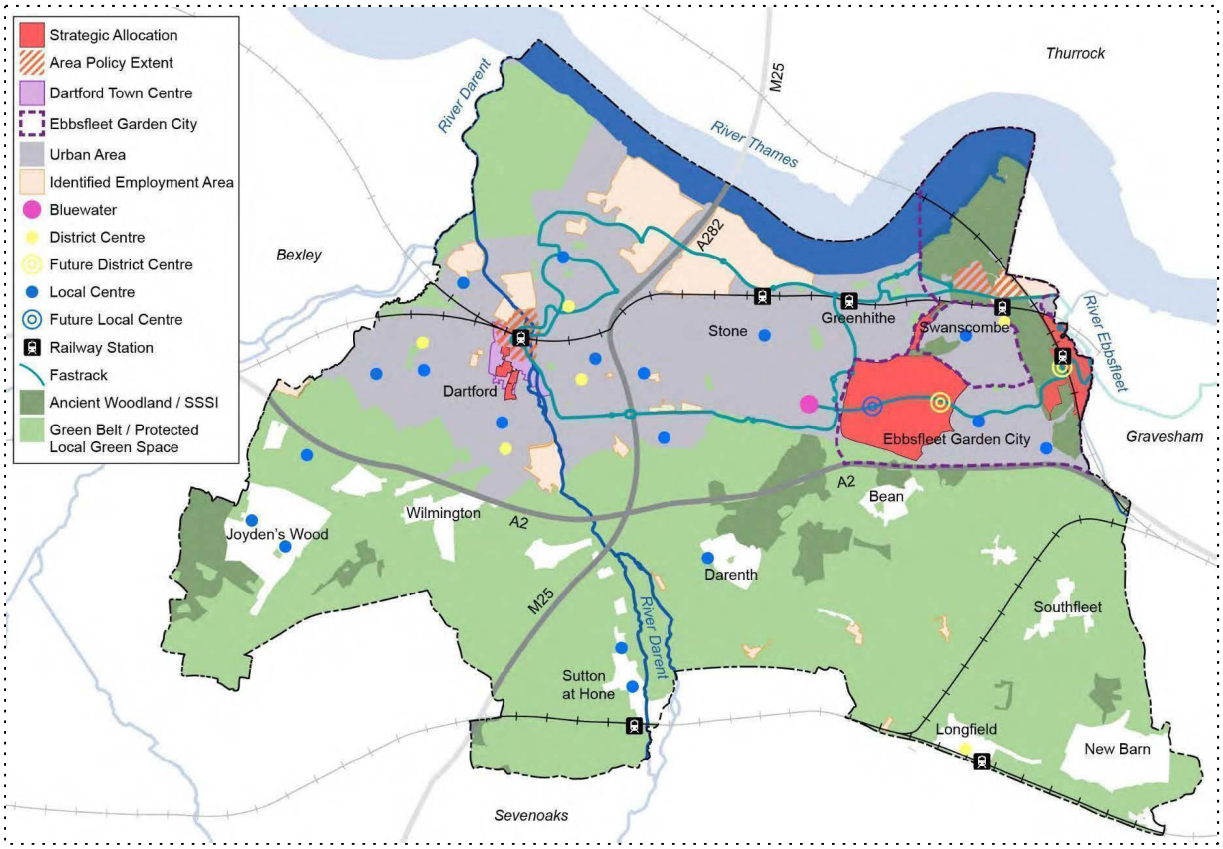


Figure 1: Pre Submission Dartford New Local Plan - September 2021 - Key Diagram

[3] Local Cycling and Walking Infrastructure Plans Technical Guidance for Local Authorities, DfT, April 2017

Figure 1 (above) shows how Dartford's geography is strongly defined by its strategic road network in that it is bisected by the A2 which runs west-east, and by the M25/A282 which runs south-north towards the Dartford Crossing. To the north of the A2 are the largely built up areas of Dartford (to the west) and the smaller settlements of Stone, Greenhithe and Swanscombe (to the east). The eastern part of the urban area also contains much of Ebbsfleet Garden City. The area to the south of the A2, mostly designated as Metropolitan Green Belt, consists of open countryside with 12 villages and a small number of hamlets.

Between 2004 and 2020, the population of Dartford Borough increased by 29%, the largest increase across the Kent districts and a much higher increase than averages across the South East and England[4]. The majority of the borough's population (70%)[5] live in the northern urban area which is where the emerging sustainable transport network is mostly concentrated (see Figure 2 below). Most of this concentration of population is to the west in the Dartford Town Area[6] where Dartford railway station - the busiest station in Kent - is also located.

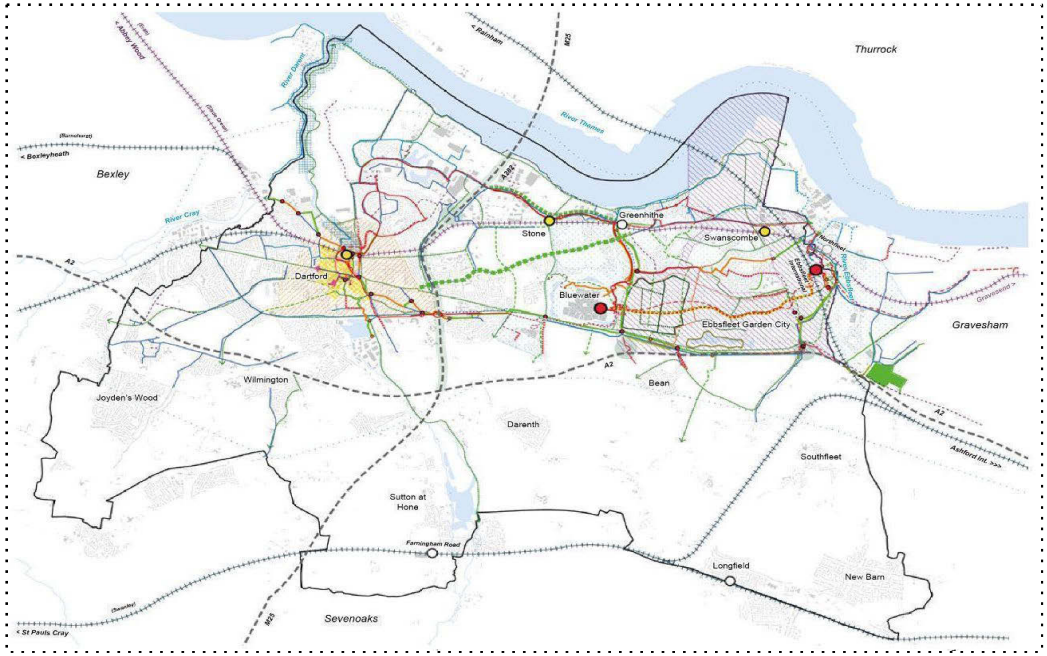


Figure 2: Draft Dartford Sustainable Transport Strategy (DSTS) Diagram

[4] Dartford Local Plan to 2037 Pre-Submission (Publication) Document September 2021 / ONS
[5] A Sustainable Transport Strategy for Dartford 13th September 2021 / 2011 Census
[6] Dartford Town Area - Area Profile 2018 (Covering the wards of Town, West Hill, Princes, Newtown, Littlebrook, Joyce Green, Heath and Brent).

2. Vision and Objectives

Dartford's new Local Plan[7] outlines the council's vision for the borough, summarised below. The LCWIP will contribute in achieving these objectives.

[7] Dartford Local Plan to 2037 Pre-Submission (Publication) Document September 2021, page 16. Also see Appendix 1

3. Policy and Scope

3.1 Policies and Strategies

National Policy Context

The national policy context for active travel changed significantly in 2020 with the DfT's publication of '**Gear Change**' and the revised Local Transport Note 1/20 '**Cycle Infrastructure Design**'. These two policies outline significant changes for the future of transport planning and design in the UK and the prioritisation of measures that encourage increased levels of walking and cycling. Active Travel England (ATE) is the government's executive agency for making walking, wheeling and cycling the preferred choice for everyone to get around England. They have been instrumental in the publication of these documents, and are now a statutory consultee on all large planning applications.

Figure 3 - 'We want – and need – to see a step change in cycling and walking in the coming years. The challenge is huge, but the ambition is clear. We have a unique opportunity to transform the role cycling and walking can play in our transport system'

These new documents both fully endorse LCWIP approaches as means to help improve conditions for walking and cycling. According to the DfT's LCWIP Technical Guidance of 2017, a fundamental aim of an LCWIP should be to help meet the government's aspiration of doubling the number of journeys undertaken by walking or cycling. No specific target regarding modal shift is set in this LCWIP however the network development and prioritisation processes (Stages 3-5) are informed by geographic data analysis including consideration of population densities and locations of employment and education etc.

Within Chapter 9 'Promoting sustainable Transport' of the National Planning Policy Framework 2022, Paragraph 110 is of particular relevance requiring the design of streets, parking areas, other transport elements and the content of associated standards reflects current national guidance, including the National Design Guide and the National Model Design Code. Paragraph 106 makes specific reference to LCWIPs as a means for providing attractive and well-designed walking and cycling networks. Chapter 8 *'Promoting healthy and safe communities' also recommends promoting social interaction with 'street layouts that allow for easy pedestrian and cycle connections within and between neighbourhoods, and active street frontages'.*

Building on the 2019 National Design Guide, the **National Model Design Code** (2021) is intended to inform local design guides and codes or, in the absence of local guidance, act in their stead. It places local communities at the heart of plans to make sure that new developments reflect the history and unique character of their areas and are beautiful and well-designed. The code places great weight on Manual for Streets and Manual for Streets 2, which continue to represent good practice on street design. Paragraph 58 outlines that *'a connected network of streets, good public transport and the promotion of walking and cycling as key principles'.*

The **Clean Air Strategy** (2019) was published by the Department for Environment, Food and Rural Affairs (DEFRA) and sets out the Governments aspirations in reducing emissions, including from the transport sector. A revised Air Quality Strategy draft was issued for consultation by DEFRA in April 2023. The policy will set a framework for local authorities to deliver for their communities and contribute to the government's long term air quality goals.

<u>KCC Policy and Baseline Data</u>

KCC published the **Local Transport Plan 4: Delivering Growth without Gridlock 2016-2031**. The document identifies active travel as a Countywide Priority. KCC's **Active Travel Strategy** also sets out the aspiration for making active travel more attractive for complete or parts of journeys in Kent, which can also improve health, reduce congestion, reduce pollution and provide savings to individuals. The document identifies

three actions in achieving improved active travel: (1) Integrate active travel in planning; (2) Provide and maintain appropriate routes for active travel; and (3) Support active travel in the community.

3.2 Scope and Methodology

The LCWIP presents an opportunity to identify and improve routes for cycling/wheeling/walking (active travel) across Dartford. It focuses on the infrastructure improvements required to encourage active travel and proposes the development of a strategic network across the Borough. Aspects relating to education and safety training on active travel do not form part of the scope of the LCWIP.

DfT's Technical Guidance sets out six stages for the production of an LCWIP which are described in Table 1 below. Stages 1-6 essentially form the methodology for this LCWIP. The first stage was to determine the scope of the study, as outlined in the 'Stage 1 – Determining Scope' section below. The second stage involved gathering of baseline information. This is set out in detail in Chapter 4 of this document. The 3rd and 4th stages involve the identification of likely walking and cycling routes. These are outlined in Chapters 5 (Cycling) and 6 (Walking) of this report in more detail. Stage 5 analyses the proposed routes and is detailed in Chapter 7. The final stage (6) is Integration and Application, outlined further in Chapter 8 of this document.

Table 1

Stages	Details / Activities
1. Determining Scope	• Establishing the geographical extent and identifying the best delivery model. • Setting out governance arrangements and an approach to engagement. • Agreeing timescales.
2. Gathering Information	• Reviewing policies and strategies with which the LCWIP should align. • Collating information and data on existing cycling and walking networks. • Identifying trip generators both existing and planned.
3&4. Network Planning for Cycling and Walking	• Identifying and clustering trip origin and destination points. • Identifying and classifying desire-lines, routes and barriers. • Auditing main routes, planning the network and identifying potential improvements.
5. Prioritising	• Developing timescales for delivery over short, medium and long term. • High level appraisal and costing of schemes.

Improvements	• Prioritising improvements considering effectiveness cost and delivery.
6. Integration and Application	• Integrating the LCWIP within local policies and plans. • Using the LCWIP to prepare bids and delivery plans. • Reviewing and updating the LCWIP in line with plans and developments.

The key output of the first stage was a Scoping Report, which was presented to DBC Cabinet in July 2022 and which set out the proposed geographical extent, delivery model, governance arrangements, approach to engagement and timescales (Stage 1). These aspects are summarised below and set out in full in Appendix 3.[8]

3.3 Stage 1 – Determining Scope

Geographic Extent and Delivery Model

The technical guidance states that "In most cases a LCWIP will be focussed on a particular town or regional centre. For larger geographic areas, such as larger cities, authorities may wish to prepare a LCWIP for a number of sub-areas, enabling the development of the LCWIP to be phased." To establish geographic extent the following factors are to be taken into account:

- Cycling has the potential to replace trips made by other modes, typically up to 10km, although some people will cycle greater distances.
- For walking, the distances travelled are generally shorter, typically up to 2km. An approximate five minute walking distance of 400m can be used as a guide to the minimum extents (diameter) of Core Walking Zones (CWZs) with a surrounding 2km radius of influence in addition.
- Travel to work areas should be considered, as well as the location of significant trip generators such as key employment sites, transport interchanges, schools and new housing developments.

[8] DBC LCWIP Scoping Report July 2022

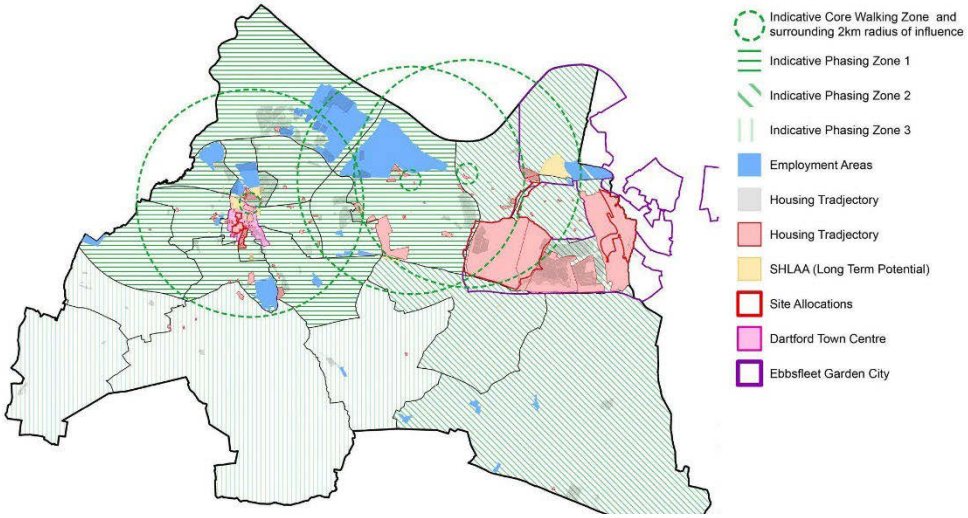


Figure 4 - Proposed Borough-e Geographical Extent with examples of trip generator data (PJA) – Appendix 5

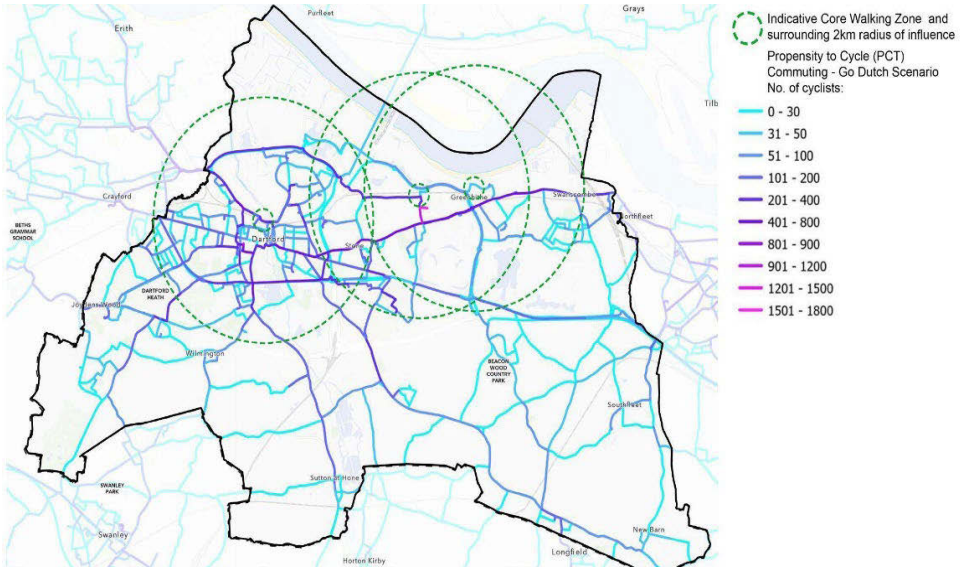


Figure 5 - Propensity to Cycle map by PJA - Appendix 5

Figures 4 and 5 (left) the DfT guidance distances for walking and cycling in a scale bar and how they relate to the borough as a whole. For purposes of illustration in Figure 5, three indicative core walking zones of 400m diameter with their 2km radius of influence (shown as overlapping green circles, centred on Dartford, Stone and Greenhithe rail stations as examples) are overlaid against a cycle network generated by a 'Go Dutch' scenario of the Propensity to Cycle Tool (PCT) showing the theoretical potential for cycling. The PCT is a free tool for transport planners and policy makers to assist them in prioritising investment and interventions to encourage cycling. It considers where cycling is currently common and where it has the greatest potential to work. The scale bar shows how the 10km cycling distance (DfT) is roughly equivalent for example to the distance from Dartford to Northfleet or from Bexley to Greenhithe. Considering the relatively small size of the Borough and the DfT guidance distances, the LCWIP Geographical scope has been done to a **full borough-wide extent**, with all areas across DBC being considered for active travel improvements.

However, the majority of the routes identified in this first iteration of the LCWIP are focused around the northern urban areas of the borough for a variety of reasons, including the existing infrastructure already in place and the likelihood of short active travel journeys being undertaken in areas of higher density and the focus of development (Figure 4).

This LCWIP focuses on Dartford Borough, with appropriate liaison with London Borough of Bexley, Sevenoaks District Council, Gravesham Borough Council, Ebbsfleet Development Corporation and Kent County Council for key cross-boundary links. Discussions are taking place with others, including outside of the LCWIP production (for

example in relation to the DBC Local Plan) and will continue and broaden as part of the LCWIP ongoing process.

DfT recommends a long-term approach for LCWIPs, and that in order to assist with delivery, schemes should be divided into three delivery periods: Short term (< 3 years), Medium term (< 5 years), Long term (> 5 years).

It is suggested that the LCWIP for Dartford Borough should cover an initial **ten-year period 2023-2033**. However, as mentioned above, the LCWIP is envisaged as a 'live' document, so will be updated accordingly during this 10 year period.

Engagement

Engagement on the initial baseline information gathering and assessment was carried out in various ways following identification of potential Public and Interest Groups, Delivery Partners and other organisations.

The most extensive and detailed engagement was during the network development stages for cycling and walking (DfT 3 and 4) which included meetings online and in person to identify routes, analyse their present condition and consider potential improvements. Engagement through meeting in person continued into the prioritisation stage (DfT 5), in particular with Dartford and Gravesham Cycling Forum, Dartford Community Cycle Training, Dartford Health Walks, Stone Parish Council (following the Stone Neighbourhood Plan).

Future consultation and stakeholder engagement will continue to take place with interested parties, delivery partners and organisations, as the LCWIP continues to be updated over the period of the next 10 years and beyond. Further consultation will take place at a local level when schemes come forward for design or delivery through this LCWIP.

Governance

Following the DfT guidance and from initial discussions with KCC the suggested governance is set out in Figure 6.

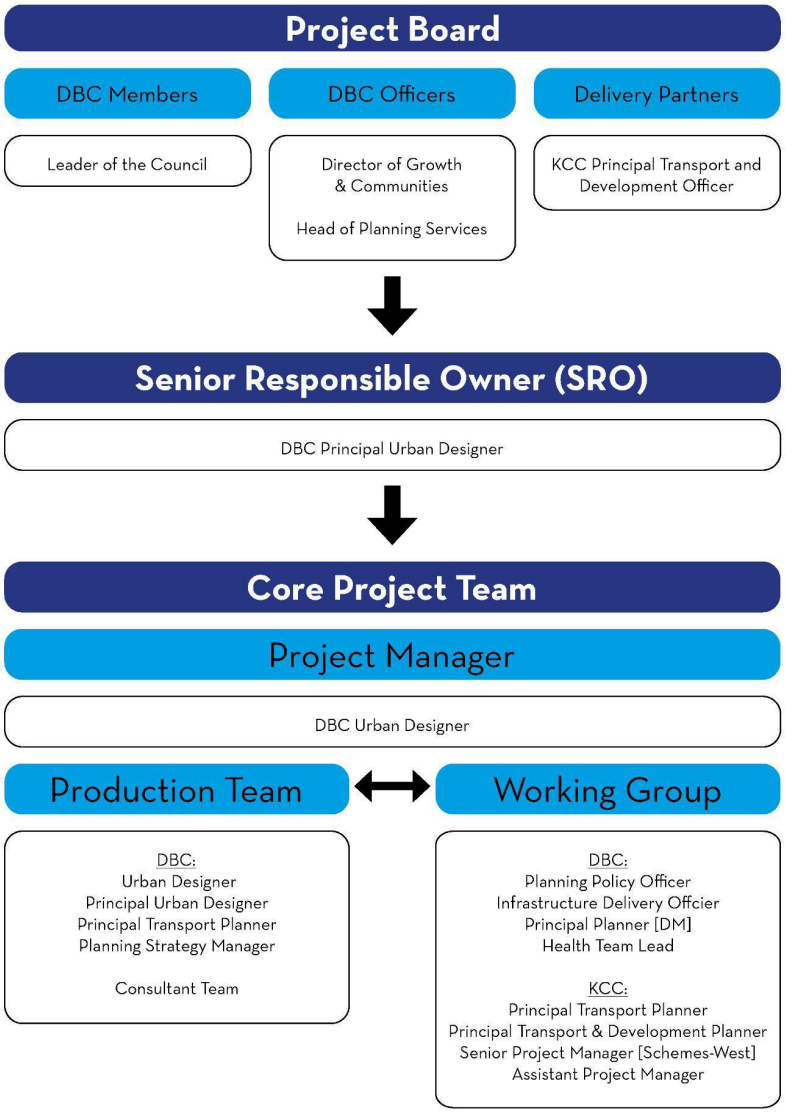


Figure 6 - Governance structure diagram

4. Gathering Information

4.1 Local Policies

Local Policy and Baseline Data

Dartford's Sustainable Transport Strategy forms part of the evidence base for the New Local Plan which is reaching completion of the process of examination with potential adoption in late 2023. The New Local Plan promotes increased active travel, including through identifying strategic links and as part of a Green Grid – see Figure 8 below.

The Strategy is included in a detailed literature review (see Appendix 4) along with the following key local policy and strategy documents:

- Pre Submission Local Plan
    - Infrastructure Delivery Update
    - Future Infrastructure Statement (FIS), see Figure 9 extracts below
    - Economic Land Report
- Neighbourhood Plan for Stone Parish
- Dartford Town Centre SPD

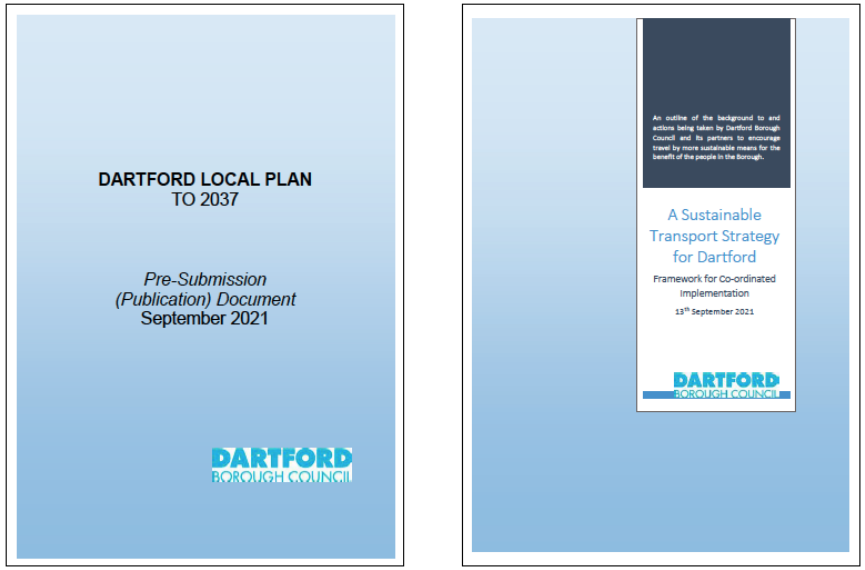


Figure 7 - Pre Submission Local Plan

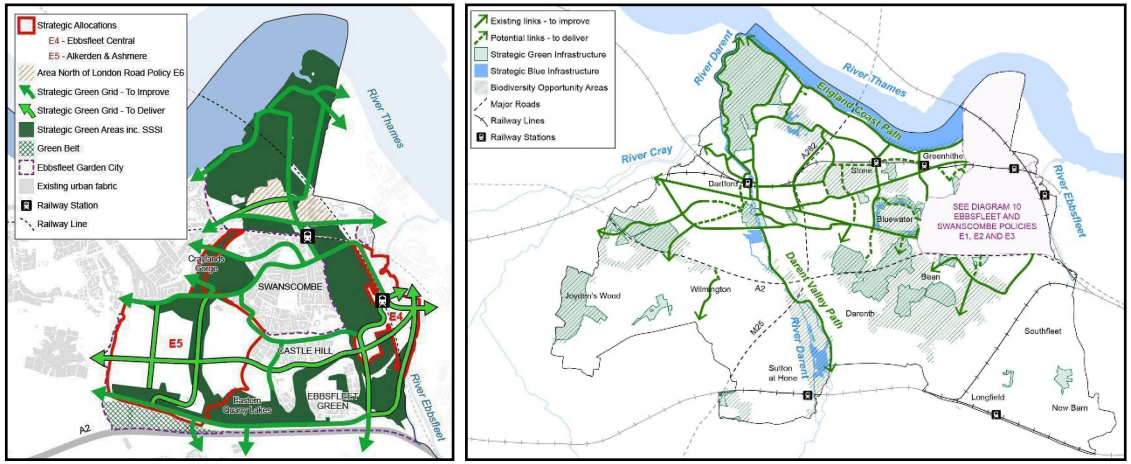


Figure 8 - Strategic Green Grid Diagram and Ebbsfleet as a Garden City from the DBC Local Plan (Pre-submission 2021)

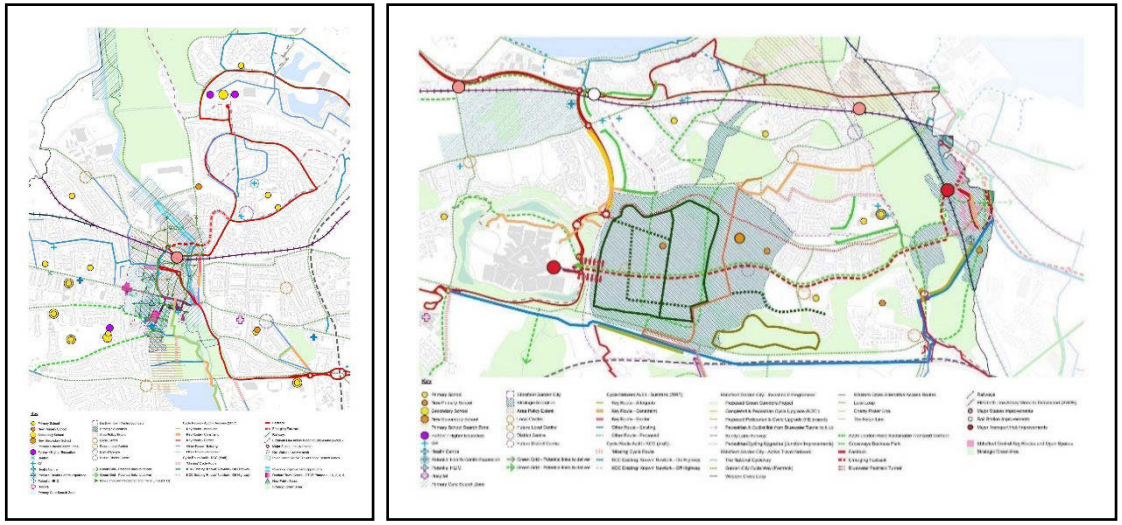


Figure 9 - Diagrams for Central Dartford and Ebbsfleet and Swanscombe from the Future Infrastructure Statement (2021)

Network Development Study 2017 by Sustrans

Sustrans published the ‘Cycle Network Development Study’ for Dartford in 2017. The scope of the document was to identify the existing trip generation and cycle provision in Dartford and make recommendations for potential individual improvements to parts of existing cycle routes/ infrastructure. The document includes the existing travel patterns and network and then sets out network wide recommendations, such as avoiding substandard shared use, tackling the lack of provision at busy roads and junctions and avoiding poor quality crossing provisions. The document also makes key recommendations specifically aimed at the Town Centre, including ‘addressing barriers and severance’ and ‘catering for pedestrian and cycle desire lines’ and provides some concept designs for key junctions in the Town Centre. Finally, it analyses four cycling corridors (National Cycle Route 1, NCR125 Town Centre, B255 North/South Link and Riverside East/West Route) and offers improvement recommendations, cost estimates and a prioritisation table. This document has been very useful in informing the LCWIP process and analysis. The LCWIP scope is broader and more ambitious and attempts to address walking and cycling route improvements strategically across the whole of the Borough and should be now used in place of the Sustrans study.

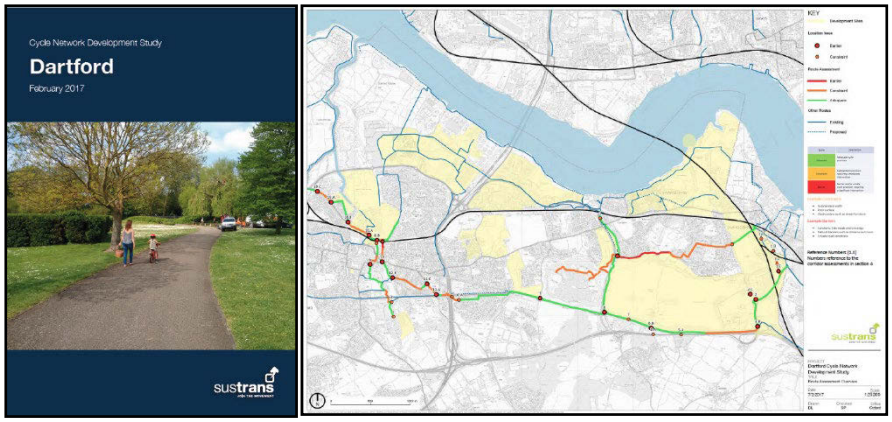


Figure 10 - Sustrans Network Development Strategy front cover and network map

4.2 Existing Active Travel Network

As described in both the ‘Future Infrastructure Statement and the ‘Sustainable Strategy for Dartford’ documents, there is an active travel network already in place in parts of the Borough, in particular in Central Dartford and Ebbsfleet and Swanscombe. As shown in Figure 11 below, the existing active travel network is fragmented at points making some journeys harder for pedestrians and cyclists to navigate at points.

Active Travel Measures providing a comprehensive network across Central Dartford are being delivered through the Town Centre Regeneration project and have been provided through all the larger development sites and continued improvement will also be delivered through planned development directly.

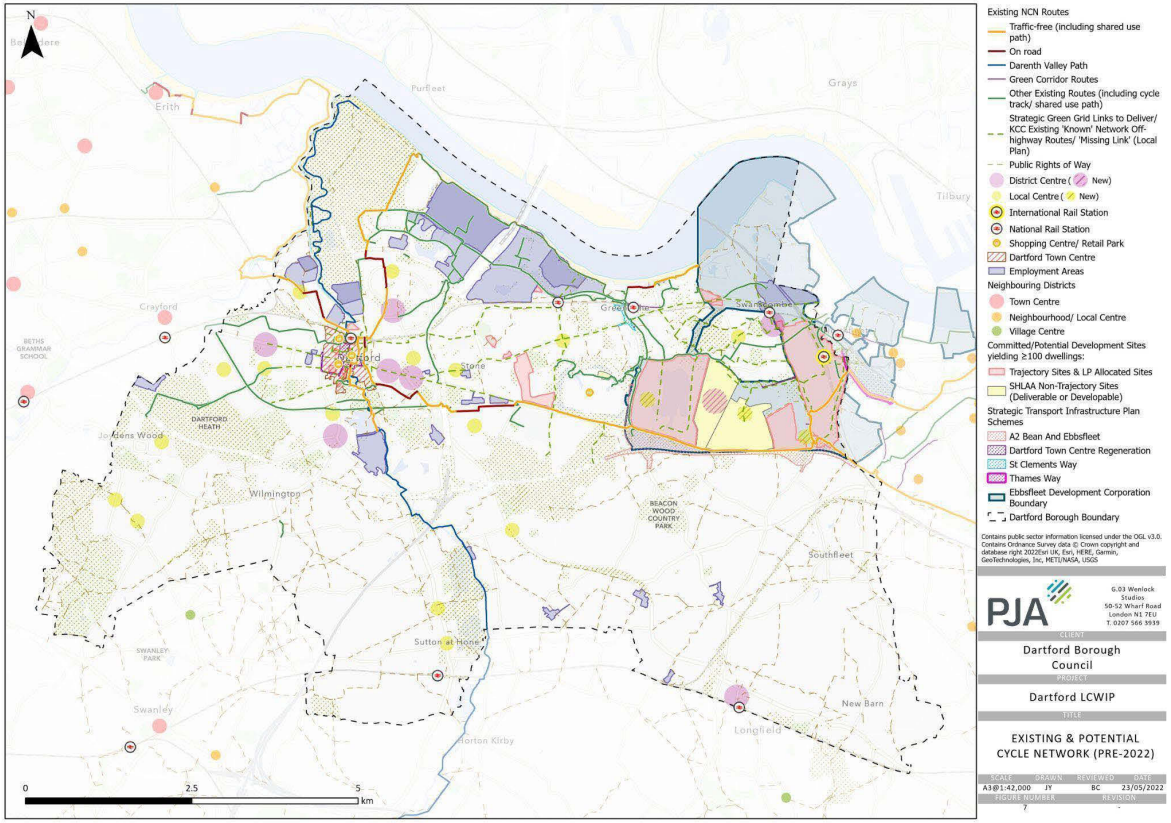


Figure 11 - Existing Cycle Network (pre-2022) by PJA

Similarly, the current networks do not create an enabling environment for walking and cycling, with obstruction on footways, narrow paths and many junctions prioritising cars over other users (see examples at Figure 12 below). The existing network also lacks clear signposting and is rather disjointed at points.

Figure 12 - Examples of existing conditions in DBC prioritising cars and creating obstructions for walking and cycling.

4.3 Existing and Potential Travel Patterns

Existing travel patterns have been generated, and potential travel patterns can be modelled, on the basis of particular attractors in areas, such as schools, workplaces, retail, community facilities, healthcare and others. The provision of infrastructure such as car parking, cycle parking, safe routes etc, can also determine the likelihood of travel patterns. An example of the scale of opportunity for active travel to increase is illustrated in Dartford's Sustainable Transport Strategy as follows: "The 2011 Census shows that for journeys to work made by Dartford residents wholly within Dartford, 66% were made by vehicles, 22% by active travel modes and 12% by public transport. For journeys to work outside of Dartford 65% were made by vehicles, 33% by public transport and only 2% by active travel modes".[9] The 2021 census data was not fully available at the time of writing the LCWIP (June 2023) and has therefore not been included in this version. The 2011 census travel patterns may be changing due to the increase in hybrid working and also the availability of electric bikes making cycling more of an option across challenging topography, as in Dartford. Through this LCWIP the Council can start enabling active travel infrastructure further, in order to redress these numbers.

Supplementing nationally available data like census information, data gathering was undertaken from sources within DBC and KCC according to three categories as follows:

Current & Future Trip Attractors:

- Car parks
- District/Town/Local/Neighbourhood Centres
- Schools and further/higher education establishments
- Healthcare facilities (including hospitals, pharmacies, GPs, dentists)
- Retail parks / shopping centres
- Community facilities/amenities (including community centres, libraries, leisure centres, play and sports facilities, pubs, open spaces and visitor attractions)
- Employment areas
- Committed and potential developments (including residential, employment, commercial, mixed use and amenities mentioned in masterplans)

Existing Trips and Infrastructure:

- Collision data
- Cycling network and provision
- Walking provision

[9] A Sustainable Transport Strategy for Dartford 13th September 2021.

- Existing flow data (including cycle pedestrian and motor traffic counts)
- Through traffic data*
- Strava data
- Speed (including averages and limits)
- Traffic management measures and traffic calming

Future Proposals:

- New roads
- Urban realm/road safety (e.g. 20mph limit extents)
- Pedestrian and cycle schemes (e.g. school streets)
- Strategic Transport Investment Programmes (STIP)
- Local Transport Improvement Programmes (LTIP)
- Local and Neighbourhood Plan designations

The consultancy Phil Jones Associates (PJA), appointed by DBC using funding allocated from government, conducted further research for DBC into existing and potential travel patterns in the Borough. They modelled sets of data and projections and produced a series of 37 drawings, which can be found in Appendix 5 – Technical Report. (For reference 'Go Dutch' scenarios are estimates on what the cycling levels would be if Dutch cycling infrastructure and culture were acquired.) Data modelled included:

- Key Destinations and Future Developments (both Borough-wide and for the Town Centre Area),
- Collisions involving Pedestrians and Cyclists between 2017 and 2021 (both Borough-wide and for the Town Centre Area),
- Propensity to Cycle – commuting (Go Dutch scenario),
- Propensity to Cycle – School Travel (Go Dutch scenario),
- Existing/Potential Cycle Network for pre-2022 data (both Borough-wide and for the Town Centre Area),
- Air Quality NO2 Estimated Annual Mean for 2022 (both Borough-wide and for the Town Centre Area),
- Deprivation Levels,
- Propensity to Cycle – Commuting (E-bike scenario for Borough-wide, Town Centre Area and the Ebbsfleet area) with scenarios covering 'straight line' trips and 'applied network' trips,
- Combined Cycling Desire Lines

amongst others. This analysis on baseline and projected data, which can be found in full in Appendix 5 helped build a thorough understanding of the existing use and future needs for cycling and walking infrastructure improvements in the Borough.

Infrastructure interventions that support growth of active travel include segregated cycle lanes, wider paths, wider footways, raised table crossings, contra flow cycling, green landscaping (not just grass verges), pedestrian and cycle desire lines, crossing facilities on desire lines and prioritising pedestrian and cycling users, some examples of which are shown in Figure 13 below from various locations across England.

Figure 13 - Infrastructure interventions that encourage active travel

5. Network Planning for Cycling

5.1 Cycle Network Development - Process

In order to map a future cycle network and identify cycling infrastructure improvements, three essential steps are recommended in the DfT guidance:

1. Identifying and clustering origin and destination points
2. Establishing desire lines for cycle movement
3. Planning the network and identifying improvements

The first two steps involve data analysis and consistent interpretation, the third step involves a series of activities being undertaken, at the core of which is the auditing of cycle routes.

Data analysis

Drawings produced by PJA (Appendix 5) are key extracts of the analysis undertaken, illustrating the identification of origin and destination points and the establishment of desire-lines for cycle movement. This analysis is set out in full in Appendix 5 / Technical Report.

Auditing, Engagement and Working Group activities

Auditing has been undertaken through a combination of desk based and primary research including engagement with key stakeholders. The DfT recommended Route Selection Tool (RST) has been employed for this process, results from which are summarised in section 5.2 (Table 2 LCWIP Corridors Overview).

The RST uses five themes to assess existing conditions and potential improvements. These criteria and their parameters of consideration are listed and illustrated below. The illustrated explanations are extracted from a handbook produced by consultants PJA for DBC. Appendix 5 includes the record sheets of audits undertaken.

- **Directness** - considering length of the route by bike versus by car

- **Gradient** - considering steepness and extent of maximum slopes
- **Safety** - considering traffic speed and volume as well as levels of segregation*
- **Connectivity** - considering the number of connections relative to route length
- **Comfort -** considering the surface type/quality and available width **

*In the case of fully segregated routes, surveillance and lighting are also considered
** In the case of on-road routes, motor traffic volume is also considered

Directness

Directness compares the length of the LCWIP cycle route against the nearest alternative car route, which generates a ratio score for comparison.

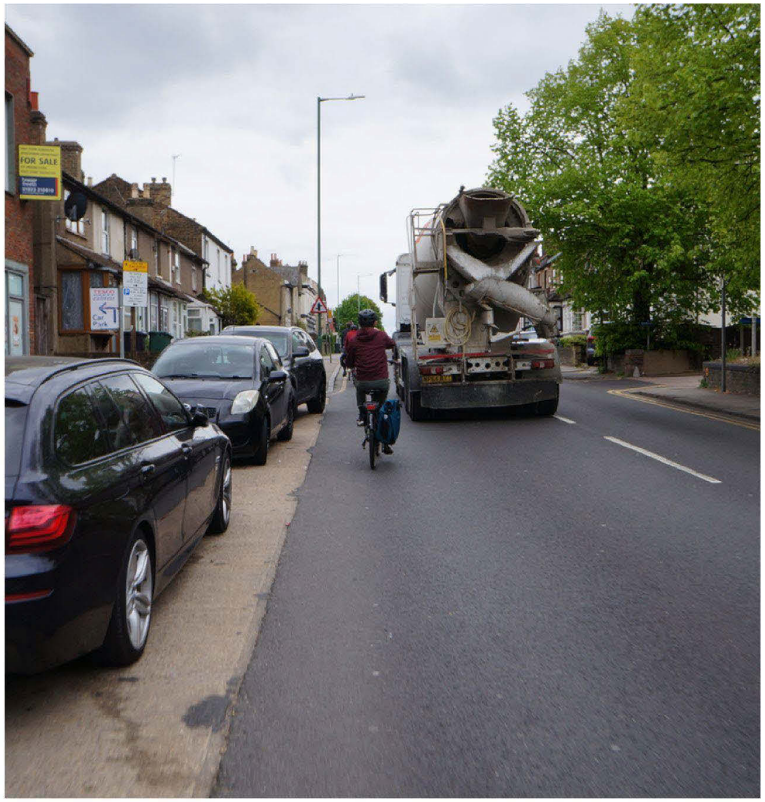
To achieve a higher score, the proposed cycle route needs to be shorter than the equivalent car route. There are several design approaches for achieving this, including: modal filters, use of public/ open spaces, contraflow cycle facilities and overcoming severanve features i.e. bridges.

SLIDE 13

Gradient

The Gradient criteria assesses the steepest section of route within each route segment based on the gradient (%) and Maximum Slope.

The purpose of the criteria is to highlight sections with particualrly steep gradients - which are generally considered >5% and/or over a 50m distance. Steep sections of route are not always avoidable, and so the LCWIP's design development might need to consider techniques to help manage the gradient and make it more comfortable.



SLIDE 14

Safety

The Safety criteria focusses on general traffic speeds and traffic volumes along a route.

Routes which physically protected cyclists from general traffic automatically achieve a top score of 5 - this can be an issue when considering poor quality protected/shared use facilities.

Routes which achieve the highest scores should have traffic volumes of <2500 vehicles per day and 20mph speed limits in place. Routes which are lit and have passive surveillance also score higher.

The Safety criteria is closely related to the Comfort criteria.






SLIDE 19

Connectivity

This criteria identifies the number of access points along the route to score Connectivity. The number of connections per KM is measured to generate a score. Connections are identified as any adjoining link which could connect to the route including roads, paths, open spaces etc.

Routes in urban settlements typically score highest as they offer the highest potential for connectivity.

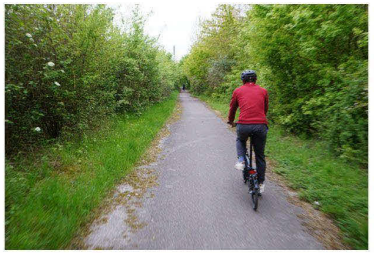
SLIDE 14

Comfort

The Comfort criteria is closely related to the Safety criteria. It considers the width of cycle facility (if available), surface type, and flows of pedestrians and vehicles.

The highest scoring routes will either: provide sufficiently wide cycle tracks, and/or low traffic conditions with smoot surfacing, and ideally without compromising conditions for walking.

(The criteria specifically mentions pedestrian flows and shared use paths to help offset the issue identified in the Safety criteria previously)



SLIDE 17

Routes were analysed using the RST method, as well as through high level appraisal that was undertaken through either primary or secondary research.

Focussed stakeholder engagement as part of the auditing process itself has been carried out in parallel with focussed meetings with key groups, for example Stone Parish Council in relation to key routes in Corridor D. Recommendations for potential future engagement going forward are set out in Chapters 7 and 8.

The network development was also refined through workshops meetings and collaboration with other officers in DBC Planning Services, with officers in KCC and EDC, for example at meetings of the cross-authority Sustainable Transport Working Group covering the EDC area in the main.

5.2 Cycle Network Development - Overview of Corridors

The cycling network has been broken down into 13 geographic elements: 'Corridors 'A-M' shown on Figure 14 below. These connect with (but do not include) the emerging network of EDC (shown in the grey area on Figure 14). Following the process described above, five key corridors 'A-E' were identified for further investigation focussing on the areas of Dartford Town Centre and the Stone Neighbourhood Area with a combined length of approximately 64 km.

Focus Corridors	Other Corridors for Future Consideration
A: Dartford Town Centre - West	F: Greenhithe - EDC
B: Dartford Town Centre - North	G: Swanscombe
C: Dartford Town Centre - Stone	H: Bluewater and EDC South
D: Stone - Greenhithe & Bluewater	I: Crossways (Littlebrook - Greenhithe)
E: Dartford Town Centre - Wilmington	J: Princes Rd
	K: England Coast Path & Links
	L: Darent Valley Path
	M: Green Belt Links

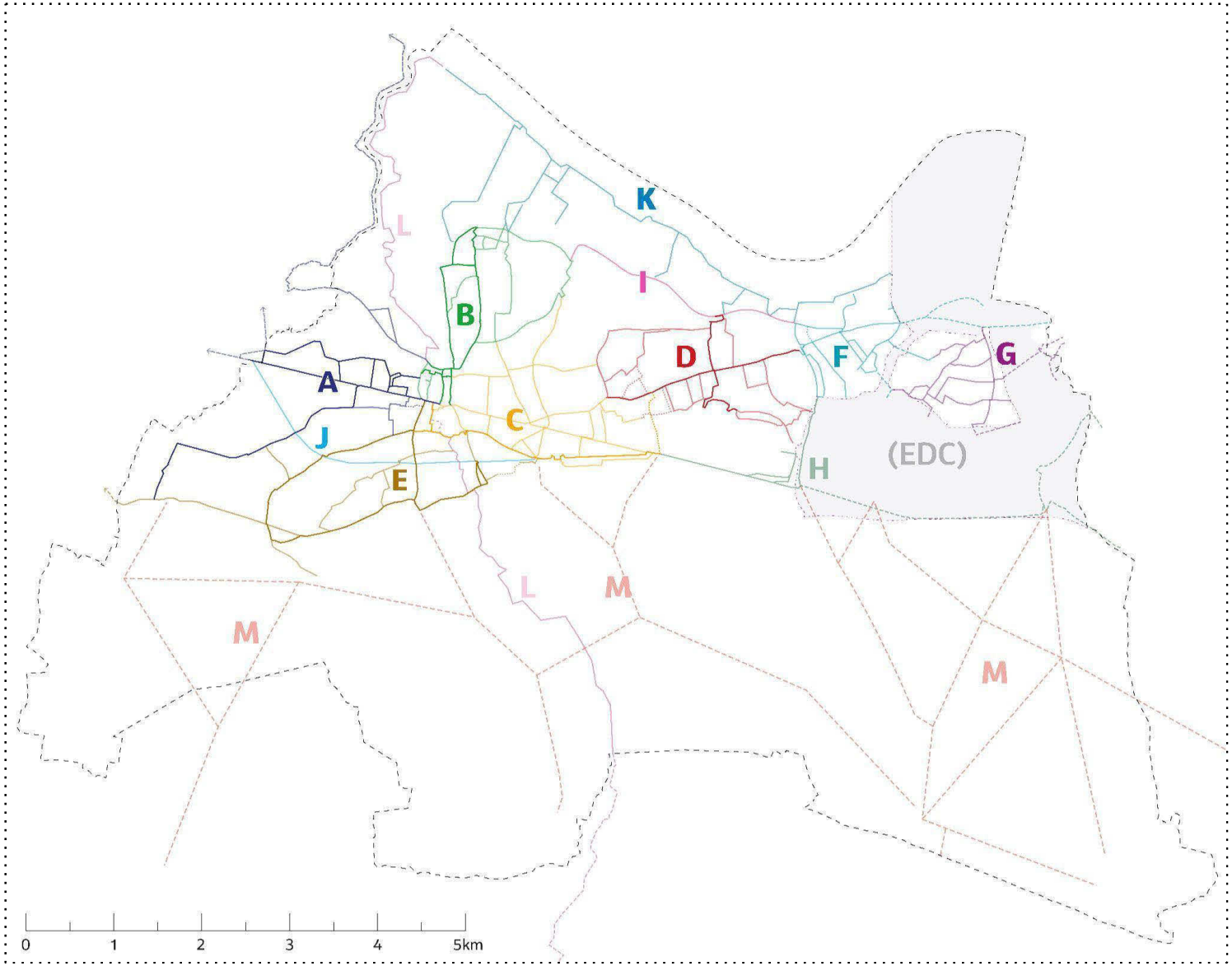


Figure 14 – LCWIP Cycling Corridors Overview

The key corridors A-E constitute a collection of 39 identified routes which have themselves been broken down further into a series of 63 '*route sections*' for the purpose of accurate analysis and comparison. A total of 36 route sections (combined length approximately 32 km) have been audited using the RST methods, resulting in an understanding of existing conditions and potential improvements which could enhance how they function. The routes audited were primarily the ones that high cyclist numbers in the Propensity To Cycle scenario by PJA (Figure 5), along with shorter, local routes. The table below (Table 2) outlines the number of routes per corridor audited, as well as the audit score range and average. The higher the score the better the directness/gradient/safety/connectivity/comfort of the route.

Table 2: LCWIP Corridors Overview

Corridor Name	Network length (Km)	R. Sections (No.)	R.S. Audited (No.)	Audit score range %	Audit score average %
A: DTC – West	11.7 Km	13	8	50-86%	72 %
B: DTC – North	12.9 Km	16	8	65-90%	77 %
C: DTC – Stone	16.5 Km	15	7	65-87%	72 %
D: Stone - Greenhithe & Bluewater	12.1 Km	12	5	61-78%	68 %
E: DTC – Wilmington	13.2 Km	13	8	51-77%	67 %
F: Greenhithe – EDC		6	0	N/A	N/A
G: Swanscombe		3	0	N/A	N/A
H: Bluewater and EDC South		3	0	N/A	N/A
I: Crossways (L'brook - Greenhithe)		2	0	N/A	N/A
J: Princes Rd		3	0	N/A	N/A
K: England Coast Path & Links		1	0	N/A	N/A
L: Darent Valley Path		(2)	0	N/A	N/A
M: Green Belt Links		N/A	0	N/A	N/A
All / Totals		89 (+M)	36		

5.3 Summary of Potential Improvements for Cycling

Potential improvements for cycling and design ambitions

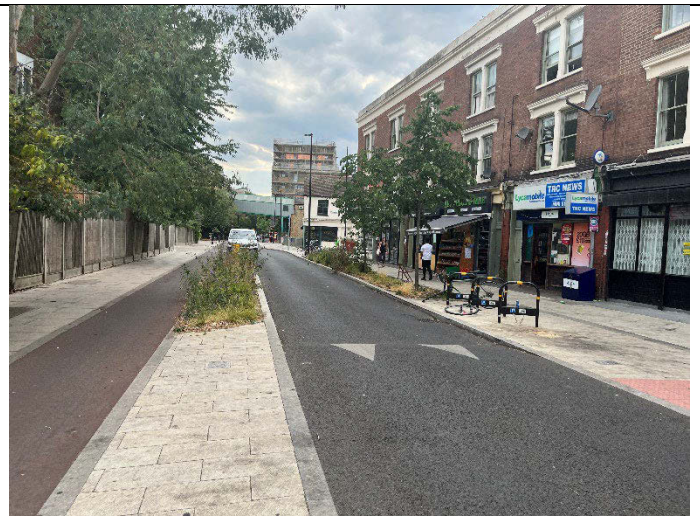
The detailed analysis of the cycling network in Corridors A-E (Appendix 5) has demonstrated great potential for a wide range of improvements. These are combined with potential improvements for walking infrastructure (identified in the following Section 6) and in Section 7 scoring is considered according to issues of timescale and cost as well as to other factors grouped into three themes: *Effectiveness*, *Policy* and *Deliverability*.

While the purpose of the LCWIP is to provide a set of high level options rather than specific designs, a set of ambitions regarding design standards / best practice regarding cycling is shown in Table 3, below.

Table 3: Types of Potential Cycling Improvements

Raised Tables: Raised Tables at junctions give pedestrian users priority, as they visually and physically extend the pavement across the junction. This encourages reduced car speeds.	

At-grade crossing facilities: At-grade crossing facilities can slow car speeds down, while also providing a safer surface for cyclists/wheel users.	
Segregated cycle paths: Segregated cycle paths give cyclists clear space to cycle on and provide a safer cycling environment, encouraging less experienced cyclists on the road.	

Traffic Calming measures, including greening: There are lots of different design interventions for traffic calming, one of which is increased greening along the highway. These can both increase the visual amenity of a place, while also giving the perception of a narrower highway, encouraging lower speeds.	

6. Network Planning for Walking

6.1 Walking Network Development - Process

Similar to the process for cycling, in order to map a future walking network and identify infrastructure improvements, three essential steps are recommended in the DfT guidance:

1. Identifying and clustering origin and destination points
2. Establishing core walking zones and walking routes
3. Auditing the main routes and identifying barriers

Auditing, Engagement and Working Group activities

Auditing has been undertaken through a combination of desk based and primary research including engagement with key stakeholders. The DfT recommended Walking Route Audit Tool (WRAT) has been employed for this process, results from which are summarised in section 6.2 (Table 4 LCWIP Walking Zone 1) and set out in full in Appendix 5.

The WRAT uses five themes to assess existing conditions and potential improvements. These criteria and their parameters of consideration are listed and illustrated below. The illustrated explanations are extracted from a handbook produced by consultants PJA for DBC.

- **Attractiveness** – maintenance, fear of crime, traffic noise, pollution
- **Comfort** – condition, footway width, width of crossings, gradient
- **Directness** – footway provision, location of crossing in relation to desire lines, gaps in traffic, impact of controlled crossings on journey time
- **Safety** – traffic volume, traffic speed, visibility
- **Coherence** – dropped kerbs, tactile paving

Attractiveness

High scoring attractive links will generally be well maintained, overlooked by adjoining properties, have street lighting, and vehicular traffic will not adversely affect the route's attractiveness. The extent to which a route is integrated into the wider urban fabric is often a key influence on factors such as isolation, provision of lighting, and general maintenance.

The criteria also considers the impact of street clutter, such as pedestrian guardrailing, bollards, and whether this impacts on the route's attractiveness.

- Maintenance
- Fear of Crime
- Traffic Noise

Example of maintenance and limited surveillance reducing attractiveness

Seating, planting and high quality materials help create an attractive environment

Example of an attractive pedestrianised environment

Rural links are generally unlit which impacts on usability at night-time

High levels of surveillance and minimal traffic impact increases attractiveness

Large volumes of vehicular traffic is likely to reduce attractiveness

SLIDE 7

Comfort

The Comfort criteria assesses the condition and availability of footways. The effective width available on footways is a key consideration for Comfort - ideally a 2m free width will be provided on all footways on both sides of the carriageway.

However, issues such as street clutter, footway parking, bus stops etc. can reduce the space available for walking. The criteria also considers whether slopes/gradient caused by topography and adjoining land uses (e.g. driveways) impacts on Comfort.

- Condition
- Footway Width
- Width on Staggered Crossings
- Footway Parking
- Gradient

Example of footway parking reducing comfort

Example of street clutter reducing comfort and accessibility

Example of a high-quality and comfortable walking route

Street clutter can significantly reduce the effective width of footways

Narrow footway creates uncomfortable walking environment

Shared walking and cycling facilities can reduce the comfort of walking routes

SLIDE 8

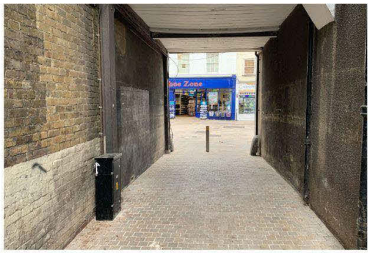
Safety

The key focus of Safety is on the extent to which vehicular traffic impacts on the streetscape. High traffic volumes and speeds are likely to create a less attractive walking environment - the criteria in Safety are complementary to the points considered in Attractiveness.

The criteria does not necessarily require removal of traffic access, and the examples overleaf illustrate how design can be used to dilute the impact of traffic without removing it.

- Traffic Volume
- Traffic Speed
- Visibility

Modal filters used in residential area to remove through-traffic access


High quality streetscape materials reduces impact of vehicles upon walking

20mph speed limits should reduce driver speeds and impact on streets


Timed removal of traffic significantly improves feeling of safety


Driver behaviour can also influence feeling of safety


Combination of street clutter and high vehicle volumes reduces perceived safety

SLIDE 10

Coherence

The provision of suitable dropped kerbs and tactile paving is essential to create a fully accessible walking environment. The provision of these facilities is inherently inconsistent and often missing in more residential settings.

As well as considering dropped kerbs and tactile paving, it is worth noting where other features, such as steps/ ramps/bridges/tunnels, impact on coherence.

- Dropped Kerbs and Tactile Paving

Aldred Road junction missing tactile and dropped kerb information

Example of junction missing both tactile paving and dropped kerbs

Continuous footway treatment further promotes pedestrian crossings

Example of crossing with both tactile information and dropped kerbs

Misaligned crossing points pedestrians in direction of traffic

SLIDE 11

6.2 Walking Network Development - Overview of Walking Zones

Overall the walking zones have been focused in the urban areas of the Borough, as walking journeys are more likely to take place in locations with denser population and within areas with major destinations drawing larger volumes of people. The three Walking Zones are outlined in Figure 15. Walking Zone 1 is described in detail in the following sections, as it is the location where most of the audits have been undertaken to date. Walking Zone 1 incorporates the Dartford Town Centre, which includes the Railway Station, shops, leisure, offices and schools within its radius. Audits and further analysis on Walking Zone 2 (Stone, Greenhithe & Bluewater) and Walking Zone 3 (Swanscombe) will take place within the 10 year timeframe of the LCWIP, as the document is updated.

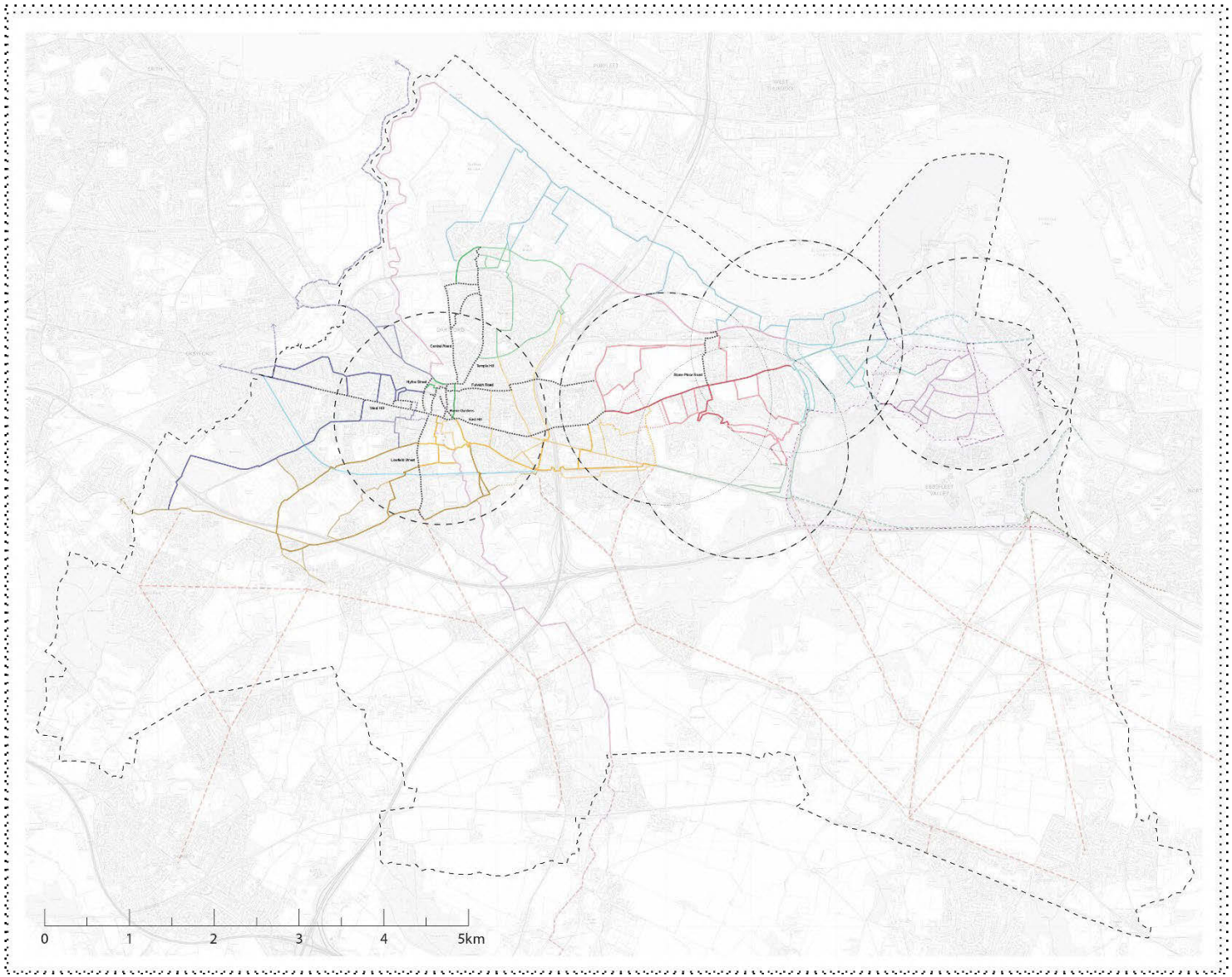


Figure 145 - LCWIP Walking Zones Map, showing the walking zones in dotted line circles

Walking Zones

1: Dartford Town Centre
2: Stone, Greenhithe & Bluewater
3: Swanscombe

Walking Zone 1: Summary of Function

Walking Zone 1 comprises the main walking routes into and through Dartford Town Centre. The centre of any town or city is often seen as the 'heart' of a place. It is where people will often go for leisure, socialising, shopping and work. The 'walkability' of an area or route is of particular importance in meeting needs of people with disabilities and mobility impairments as well as those relying on buggies. Walking area and route assessments can help to facilitate movement and encourage walking for wide user groups. Poor street design, the use of barriers and convoluted crossing facilities can create obstacles for many people.

Walking Zone 1: Summary of Current Conditions

Walking Zone 1 has a mix of conditions, including large popular/ pleasant areas, like the High Street and Dartford Central Park. However many other areas or specific links can present conditions which are at some locations suboptimal in encouraging walking to and through Dartford Town Centre. This may include (for instance) narrow footways, wide 'bell mouth' side road access, staggered pedestrian crossings with long pedestrian waiting times set away from desire lines. For example near the busy Aldi supermarket, Home Gardens lacks a direct shared crossing (such as a Toucan or Parallel crossing) at the location of a desire line for people crossing at the point between Bullace Lane and the County Court. At other locations public realm deficiencies impact on the quality of the pedestrian environment e.g. footway paving in a state of disrepair, and/ or a lack of street trees and seating.

The audit scores for Walking Zone 1 are set out in Table 4 below. In terms of scores, the highest total scores per audited route would be '40'. Each of the 5 audit categories (attractiveness etc) have further subcategories, which can each be scored under a traffic light system either 0 (red), 1 (amber) or 2 (green). The highest possible score for 'Attractiveness' is 8, for 'Comfort' is 12, for 'Directness' is 12, for 'Safety' is 6 and for 'Coherence' 2, altogether adding up to a maximum of 40 points.

Table 4: Walking Zone 1 audit

	Attractiveness	Comfort	Directness	Safety	Coherence	Total
West Hill /Spital Street to Town Centre	2	4	4	2	1	12
Hythe Street	1	5	5	3	2	16
Home Gardens North	3	4	1	0	0	8
Dartford Railway Station/Suffolk Road/Bull Head Lane	2	4	2	2	0	10
Home Gardens/East Hill/Overy Street Junction	0	6	0	1	2	9
East Hill	1	3	3	3	1	11
Lowfield Street	1	6	4	1	1	13

Walking Zone 1: Summary of Potential Improvements

Dartford's town centre in some parts has a historic street pattern has the potential to become a vibrant commercial centre and leisure destination, especially following the recent and ongoing upgrade of the High Street. The town centre is also planned to host more of a resident community, supported by all the local services and infrastructure within easy walking distance. As part of the new Local Plan and this LCWIP's vision Dartford seeks to reduce traffic congestion and improve air quality within the town centre. These ambitions can be supported by providing a pleasant and safe walking environment with direct routes and links. In order to achieve this, Walking Zone 1 has the following main opportunities for improvement (some examples of which are shown in Table 5, below):

- **Side road treatments**
    - continuous footways
    - reduced kerb radii
    - corner build outs

- **Crossings**

    - Controlled (direct, all arms of junctions, simplify)
    - Additional crossings on desire lines on roads with high volumes of traffic
    - Uncontrolled (raised carriageway level, build outs, colourful designs, central median, indicative crossings

- **Walking comfort**
    - Widen footways
    - Regular rest places (seats or benches)
    - Move pedestrian crossings at side roads to desire lines
    - Keep cyclists on road/segregated cycle way whenever possible
    - Create level crossovers/continuous footways with mountable (Dutch) kerbs.
    - Re-pave broken footways
    - Parking/loading bays at footway level with mountable kerbs

- **Street clutter**
    - Remove all unnecessary guard railing
    - Do not install new guard railing unless the need has been substantiated through thorough auditing
    - Simplify traffic signs - conduct sign post audit
    - Minimise boards outside shops
    - Simplify road markings

- **Attractiveness**
    - Street trees
    - SUDS (prioritising biodiversity and amenity where possible)
    - ‘Parklets’ and incidental play spaces

- **Safety**
    - Street lights
    - Safeguard forward views
    - Reduce traffic speeds (in close to town centre, narrow carriageway / lanes
    - Adopt traffic calming features (chicanes, road tables/cushions)

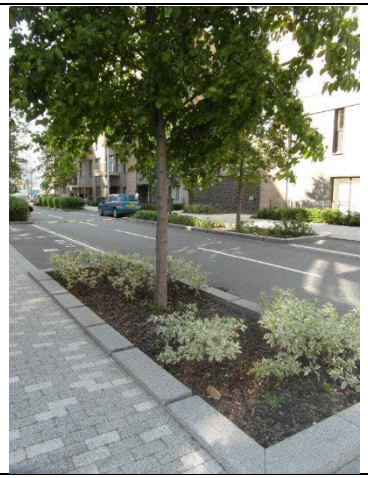
6.3 Summary of Potential Improvements for Walking

Many of the barriers to walkability found in Walking Zone 1 can also be found elsewhere in the Borough. There are a number of key walking trip generators within the Borough including local centres, schools, public transport facilities and employment areas to which the design recommendations outlined above may apply and where improvements in infrastructure are expected to encourage walking. We would like to adopt a site-specific approach to routes to improve the use and quality of the identified strategic network.

The walking routes would generally benefit from wider footways, a tightening of the junction geometry or continuous footways across side roads, better and more frequent crossing facilities and street greening to improve the walking experience. Such measures should be complimented by the removal of guard railing and other street clutter to make the street scene more attractive and support the Borough's ambition for modal shifts to more sustainable and healthier choices. Some examples are shown in Table 5 below.

Rural areas of the Borough are already popular with walkers for leisure activities, though car dependency can be high for commuting and shopping needs. Nevertheless, improvements can be made by providing better access, widening paths, increasing connectivity and extending the offer with the creation of additional Public Rights of Way. When routes are considered for improvements, this should be done in reflection of the wider strategic network and any integration of cycling interventions should be considered.

Table 5: Types of Potential Walking Improvements

Street greening with street trees and rain gardens	

Central median to support incidental pedestrian crossings	
Comfortable street seating for people to rest or socialise	

Continuous footways on minor side roads, which prioritise pedestrians and encourage reduced car speeds	
Incidental suggested crossing areas and minimal road markings, which encourage reduced vehicular speeds	

Simplified road markings to reduce street clutter and create a higher quality townscape	
Footway build-outs to narrow the crossing distance for pedestrians and slow turning traffic	

Street narrowing to slow traffic	
Tight corner radii to slow turning traffic and allow pedestrian crossing on the desire line	

7. Analysis of routes

7.1 Methodology

Timeframes

The DfT recommends a long-term approach for LCWIPs, and that in order to assist with delivery, schemes should be divided into three delivery periods: Short term (< 3 years), Medium term (< 5 years), Long term (> 5 years). On the basis of these timeframes and through considering the scores of the routes, a list of 15 'quick wins' (Figure 17, Section 7.3) has been identified, alongside the overall highest scoring routes taking all scoring categories into account.

Costs

The analysis undertaken in sections 5 and 6, and shown in detail in Appendix 5, demonstrates the great potential for the Borough on a wide range of improvements for cycling and walking. Essential types of potential improvements are listed below in Table 6 setting out indicative costs for implementation, as sourced from information issued by the DfT.

Table 6: Types of cycle infrastructure improvement and indicative costs, based on a DfT report: "Typical Costs of Cycling Interventions Interim analysis of Cycle City Ambition schemes" (2017).

Scheme Type	Range of costs	Notes / Sub-Types
	£1.15-1.45m /km	two-way physically segregated
Cycle Superhighway	£0.74m /km	two-way lightly segregated
Mixed Strategic Cycle Route	£0.46-0.88m /km	
Resurfaced cycle route	£0.14-0.19m /km	e.g. canalside routes
Cycle Bridge	£0.10-0.50m	bridge upgrades not whole new bridges
	£10,000-15,000 /km	including traffic calming measures
20mph zone	£2,000-3,000 /km	without any traffic calming measures
Remodelled major junction	£1.56-1.61m	cycling-specific schemes

	£0.24m	cycling piggybacking on traffic measures
	£0.14-0.41m	Add single/side vs double lane?
Cycle crossing at major road	£20-50K	parallel crossing
	£50-100K	Toucan crossing
Comprehensive cycle route signage	£12,000 /km	
	£0.20-0.75m	programme cost
Area-wide school and college cycle facilities	£6,000-7,000	cost per workplace grant
	£0.22-1.16m	programme cost
Area-wide workplace cycle facilities	£8,000-110,000	cost per school

Criteria

The criteria on which the routes were scored against, other than timescales and cost, included items under three main categories:

- **Effectiveness**
- **Policy**
- **Economic & Deliverability**

More specifically, some of the criteria within the 'effectiveness' banner included 'forecast increase in trips', 'contribution to overall network' and 'contribution to road safety'. Under the 'policy' category criteria included 'modal shift', 'health' and 'local plan' and under the 'economic & deliverability' category items included 'ability to attract funding', feasibility' and 'timescales'. Full details of the criteria can be found in Appendix 5, with average scores shown in the Table 7 below.

7.2 Combined Analysis List and Map

The map below (Figure 16) identifies the routes that were scored under the criteria mentioned above. Table 7 includes the outcomes of the overall scores including the averages for Effectiveness, Policy and Economic & Deliverability. It therefore represents the combined scoring results. The scores are then ranked both under each individual route section as well as the overall Corridor. For example, Corridor A (Dartford Town Centre West) ranked 1st of all the Corridors (A-M), and route section D1.A-B (Cotton Lane – Horns Cross) ranked 1st as a route section overall. As well as the map shown in this document, there is also an online version of the map, which includes Corridors A-E and can be found following this link https://www.google.com/maps/d/viewer?mid=1xc6emOOOpevM6qiwLCe5BblLVew84Zg&invite=CPHawgk&ll=51.4445984802698%2C0.22317030000000404&z=14 .

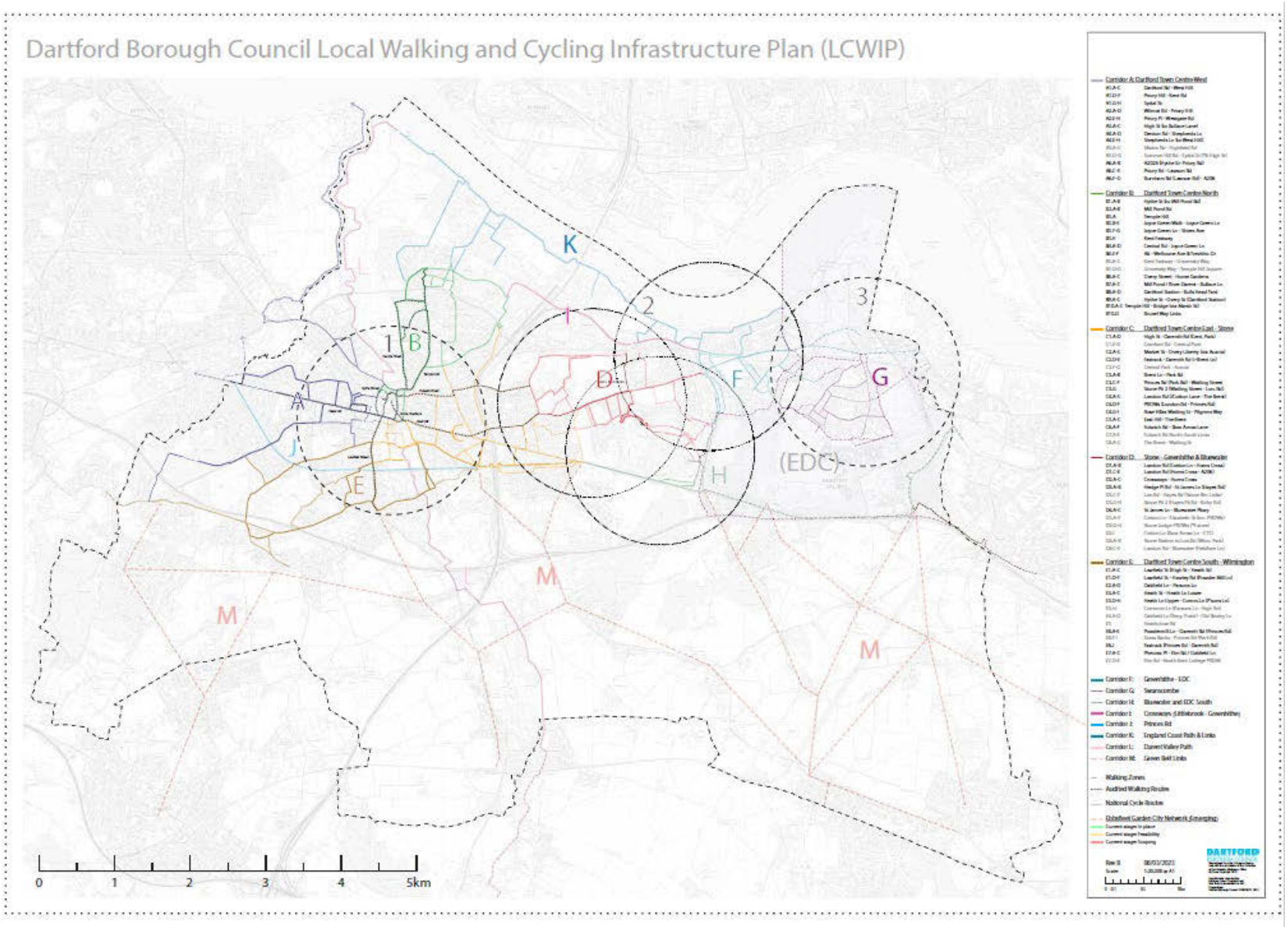


Figure 16 - LCWIP Network Map, showing the cycle corridors in different colours and the walking zones in circular areas

Table 7: Combined analysis and scoring of routes

Route Information			Effectiveness	Policy	Deliverability	Overall	
Ref.	Route Section	L (Km)	%	%	%	%	#
Corridor A: Dartford Town Centre West		**11.76**	**61%**	**80%**	**62%**	**68%**	**1**
A1.A-C	Dartford Rd - West Hill	1.63	**88%**	**82%**	**51%**	73%	**5**
A1.D-F	Priory Hill - Kent Rd	0.36	**65%**	**80%**	**63%**	69%	**7**
A2.A-D	Wilmot Rd - Priory Hill	2.55	**63%**	**64%**	**59%**	62%	**24**
A2.E-H	Priory Pl - Westgate Rd	0.56	**63%**	**80%**	**58%**	67%	**17**
A4.A-D	Denton Rd - Shepherds Ln	1.56	**37%**	**72%**	**32%**	47%	**42**
A4.E-H	Shepherds Ln (to West Hill)	1.64	**87%**	**86%**	**49%**	74%	**3**
A6.A-B	A2026 (Hythe St-Priory Rd)	0.42	**48%**	**86%**	**67%**	67%	**16**
A6.C-E	Priory Rd - Lawson Rd	0.61	**44%**	**84%**	**72%**	67%	**18**
A6.F-G	Burnham Rd Laws.Rd - A206	0.56	**39%**	**84%**	**72%**	65%	**21**
Corridor B: Dartford Town Centre North		**12.93**	**56%**	**70%**	**55%**	**61%**	**3**
B2.A-B	Mill Pond Rd	0.32	**49%**	**80%**	**55%**	61%	**26**
B3.A	Temple Hill	0.75	**47%**	**76%**	**53%**	59%	**32**
B3.B-E	Joyce Green Walk - JG Lane	0.88	**53%**	**56%**	**56%**	55%	**38**
B3.F-G	Joyce Green Ln - Shiers Ave	0.57	**51%**	**52%**	**51%**	51%	**41**
B3.H	Kent Fastway	0.54	**32%**	**54%**	**53%**	46%	**43**
B4.A-D	Central Rd - Joyce Green Ln	1.33	**51%**	**72%**	**65%**	63%	**22**
B6.A-C	Overy Street - Home Gardens	0.44	**68%**	**88%**	**49%**	68%	**10**
B7.A-C	Mill Pond Rd - Bullace Ln (River)	0.43	**63%**	**68%**	**55%**	62%	**25**
B8.A-D	Dartford Station - Bulls Head Yard	0.42	**59%**	**66%**	**49%**	61%	**28**
B9.A-C	Hythe St - Overy St (Dart.Station)	0.46	**53%**	**76%**	**46%**	58%	**33**
Corridor C: Dartford Town Centre Stone		**16.45**	**66%**	**76%**	**55%**	**66%**	**2**
C1.A-D	High St - Darenth Rd (Cent. Park)	1.18	66%	74%	65%	**68%**	**11**
C2.A-C	F'track - Darenth Rd (~Brent Ln)	0.08	58%	76%	63%	**66%**	**19**

C2.D-E	F'track - Darenth Rd (~Brent Ln)	0.34	58%	66%	59%	**61%**	**27**
C3.A-B	Brent Ln - Park Rd	0.87	65%	78%	63%	**69%**	**9**
C3.C-F	Princes Rd (Park Rd) - Wat.Street	1.55	65%	86%	53%	**68%**	**14**
C3.G	Stone Pit 2 (Wat. Street - Lon. Rd)	0.75	83%	68%	70%	**74%**	**4**
C4.A-C	London Rd (Cott.Ln - t/ Brent)	0.68	74%	90%	43%	**69%**	**8**
C4.D-F	PROWs (London Rd - Princes Rd)	0.70	45%	70%	59%	**58%**	**34**
C4.G-I	Rose Villas Wat. St - Pilgrims Way	0.53	65%	64%	59%	**62%**	**23**
C5.A-C	East Hill - The Brent	1.15	76%	84%	42%	**67%**	**15**
C6.A-F	Fulwich Rd - Bow Arrow Lane	1.87	63%	64%	46%	**58%**	**33**
Corridor D: Stone Greenhithe & Bluewater		**12.15**	**51%**	**69%**	**54%**	**58%**	**5**
D1.A-B	London Rd (Cott. Ln - Horns Cross)	1.26	78%	100%	55%	**78%**	**1**
D1.C-E	Lon. Rd (Horns Cross - A206)	1.02	64%	80%	59%	**68%**	**12**
D2.A-C	Crossways - Horns Cross	0.92	47%	82%	51%	**60%**	**29**
D3.A-B	Hedge Pl Rd - SJL (Hayes Rd)	0.41	39%	80%	46%	**55%**	**39**
D4.A-C	St James Ln - Bluewater Pkwy	0.64	40%	62%	57%	**53%**	**50**
Corridor E: Dartford Town Ctr. Wilmington		**13.15**	**61%**	**67%**	**48%**	**59%**	**4**
E1.A-C	Lowfield St (High St - Heath St)	0.37	61%	84%	58%	**68%**	**13**
E1.D-F	Lowfield St - Hawley Rd (PML)	0.94	88%	86%	49%	**74%**	**2**
E2.A-D	Oakfield Ln - Parsons Ln	1.73	63%	68%	46%	**59%**	**31**
E3.A-C	Heath St - Heath Ln Lower	1.04	87%	76%	52%	**72%**	**6**
E3.D-H	Heath Ln Upper - Comm.Ln (Ps Ln)	1.14	59%	70%	40%	**56%**	**36**
E6.A-E	Pow. Ln - Darenth Rd (Princes Rd)	1.14	62%	82%	52%	**65%**	**20**
E6.J	Fastrack (Princes Rd - Darenth Rd)	0.32	50%	60%	59%	**56%**	**37**
E7.A-C	Pheonix Pl - Elm Rd / Oakfield Ln	0.94	62%	58%	59%	**60%**	**30**

7.3 Summary of Analysis

Following the compilation of all the scores and data for the route sections that were scored in the identified network, two separate lists were compiled identifying: overall highest ranking routes and short-term/lower cost projects, in order to allow for flexibility in implementation of the required infrastructure.

Short-term/lower cost routes

The map below (Figure 17) focuses on the routes that scored highly purely under the 'time' and 'cost' criteria, effectively showing the fifteen 'quickest' and/or 'cheapest' routes to be improved within the identified network. Resolving these fifteen routes through best practice interventions could start unlocking other routes, improving the wider connectivity of the network.

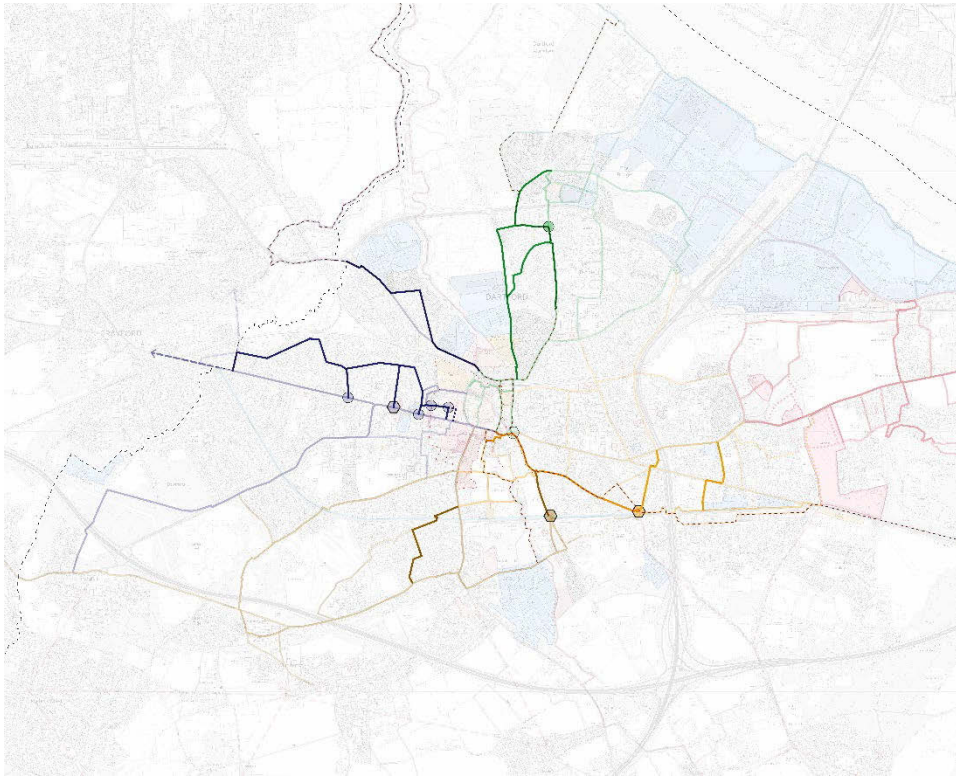


Figure 157 – Map of 'Short-term/low cost routes' with cycling junctions shown in hexagons

A1.D-F	**Priory Hill – Kent Road**
A2.A-D	**Wilmot Road – Priory Hill**
A2.E-H	**Priory Place – Westgate Road**
A6.A-B	**A2026 (Hythe Street – Priory Road)**
A6.C-E	**Priory Road – Lawson Road**
A6.F-G	**Burnham Road (Lawson Road) – A206**
B3.B-E	**Joyce Green Walk – Joyce Green Lane**
B3.H	**Kent Fastway**
B4.A-D	**Central Road – Joyce Green Lane**
B4.E-F	**Wellcome Avenue & Trevithic Drive**
C2.A-C	**Market Street – Overy Liberty (via Acacia)**
C2.D-E	**Fastracl – Darenth Road (Brent Lane)**
C3.A-B	**Brent Lane – Park Road**
C4.D-G	**PROWs (London Road – Princes Road)**
C4.H-J	**Rose Villas Watling Street – Pilgrims Way**

Routes considering all analysis factors

The map below (Figure 18) outlines the routes that scored well overall, showing the highest 12 ranking routes. These might include routes that are higher in cost, but might bring about wider improvements to the proposed network, or scored higher in the categories of 'Effectiveness', 'Policy' or 'Deliverability', thus affecting their score in a positive way.

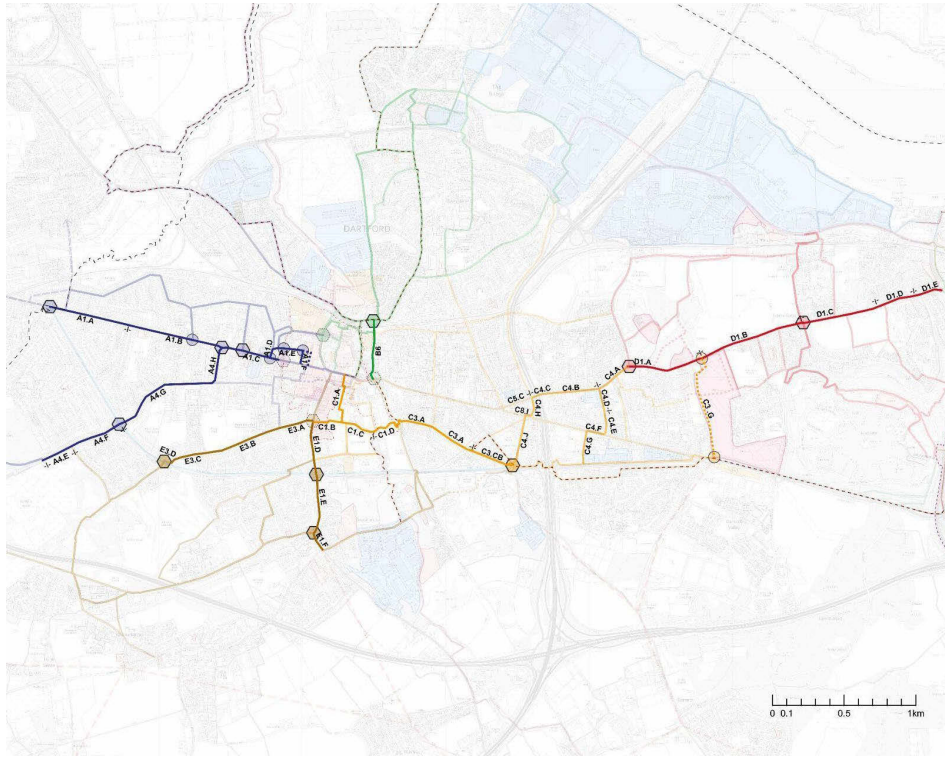


Figure 18 – Map of 'Routes considering all analysis factors' with cycling junctions shown in hexagons

D1.A-B	**London Road (Cotton Lane – Horns Cross)**
E1.D-F	**Lowfield Street (High Street – Heath Street)**
A4.E-H	**Shepherd Lane (to West Hill)**
C3.G	**Stone Pit 2 (Watling Street – London Road)**
A1.A-C	**Dartford Road – West Hill**
E3.A-C	**Heath Street – Heath Lane Lower**
A1.D-F	**Priory Hill – Kent Road**
C4.A-C	**London Road (Cotton Lane – The Brent)**
C3.A-B	**Brent Lane – Park Road**
B6.A-C	**Overy Street – Home Gardens**
C1.A-D	**High Street – Darenth Road (Central Park)**
D1.C-E	**London Road (Horns Cross – A206)**

Design Interventions

As well as identifying routes with improvement potential, the purpose of the LCWIP is to provide a set of high level design interventions and options for implementation. Rather than specific designs, a set of ambitions and best practice options regarding both cycling and walking are set out in Table 8, below, which can be selected from, as appropriate per route, during the design and implementation process.

Table 8: Design Intervention Recommendations

- **Identifying movement desire lines (cycling and walking) and making road layout improvements accordingly (crossings, including toucan crossings or dropped kerbs for example)**
- **Wider pedestrian refuges/islands for safer informal crossings**
- **Improving footpath condition (maintenance)**
- **Improved signage**
- **Redesigning side road junctions with tighter radii to reduce speed of turning vehicles**
- **Design street furniture in appropriate places (benches were people may need a rest, but still in an overlooked location for safety)**
- **Modal filters**
- **Improve lighting conditions on routes**
- **Redesign junctions to allow for continuous footways over side street junctions, ideally set back from the main highway to allow for improved visibility of oncoming traffic and give priority to walking and cycling users**
- **Install dropped kerbs to allow for safer and more comfortable movement, including for wheelchairs and people with pushchairs**
- **Redesigning junctions to make them safer (advanced stop lines for example)**
- **Reducing street clutter, including railing where appropriate**
- **Identifying locations and spaces for improved greening (including trees, Sustainable Drainage Systems (SUDS), and parklets)**
- **Widening footways**
- **Introduce refined speed limits (e.g. 20mph) in appropriate locations**
- **Redesign routes with segregated cycle lanes where appropriate**
- **Improved wayfinding**

Evaluation / Further Work

Overall, the ranking of the routes as per the two categories identified above ('short-term/low cost' and 'routes considering all analysis factors') are a starting point from which this LCWIP can be used to set funding and design of infrastructure improvement projects in motion. Considerations will have to be taken into account when designing and implementing walking and cycling improvement schemes, including:

- the likely interdependency of some route sections and the knock-on effects of particular sections being improved might have
- the need and the opportunity for specific area-based treatments (being site specific)
- the progress of new development, and the impact on changing demand and delivering infrastructure
- the potential for future data, including on traffic flow and speed, to inform measures and further analysis updates
- the importance of engagement (stakeholder/community) to inform designs, measures and future analysis and scoring
- the role of key town centre routes and junctions to inform measures and interdependency with routes beyond
- the integration and cross-collaboration with other projects, including Dartford Town Centre Projects, regeneration areas including Ebbsfleet Garden City, etc.
- the need for schools and disabled users to be included in future data collection, analysis and scoring

Projects should also be evaluated and data recorded in order to build on knowledge from previously implemented schemes.

8. Integration and Application

This LCWIP identifies a network for walking and cycling improvements across the Borough and provides two sets of scoring routes ('short-term/low cost' and 'routes considering all analysis factors') where infrastructure improvements can initially be focused on, based on the methodology followed during the process of compiling this document. It also gives an overview of types of improvements that can be considered for each route, though does emphasise the importance of interventions being site specific.

8.1 Next steps & Funding

The LCWIP is intended to be used in the following ways:

- Contribute to DBC's commitment to active travel
- Collaborate with KCC on infrastructure improvements
- Bid for funding for routes included in this document, including Capability funding, ATE funding, pooled funds including CIL etc
- Recommendations for designs be applied to new and emerging developments guided by the Local Plan and supporting evidence, in collaboration with Development Management
- Investigate further data collection, including traffic data to sharpen measures, analysis and scoring
- Investigate methods for engagement with focussed stakeholder groups (schools, youth groups, businesses) and wider public

Already, through the process of drafting of the LCWIP some funding has been allocated by KCC to produce a feasibility study for improvements on London Road, as it ranked very highly in the 'routes considering all analysis factors' category. This project is seen as a pilot project and once complete, the feasibility study can be instrumental in supporting further funding to implement the scheme.

Through the walking audits process for the LCWIP the route along the Darent riverside (County Court to the railway bridge B7.A) was identified as requiring improvements. CIL funding was allocated to make infrastructure improvements, including clearing and widening the footpath, decluttering, improving lighting and providing improved landscaping.

It is envisaged that through utilising this document more routes will come forward and successfully bid for design and implementation funding.

8.2 Monitoring & Evaluation

The LCWIP is a 'live', evolving document for a period of 10 years. It is recommended that the document is updated regularly and reviewed every 3 years, subject to material changes identified through the following.

Monitoring and Evaluation

- The LCWIP should be reviewed with data as and when it becomes available, including new census data, traffic data etc.
- A database of completed schemes is recommended
- Data collection on changes to the network and impacts of implemented projects is recommended
- The LCWIP's effectiveness should be reviewed against the council's objectives and amendments/adjustments made to the document accordingly

DARTFORD BOROUGH COUNCIL