

Calderdale Local Cycling and Walking Infrastructure Plan: Phase 1



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1 Introduction

Background

- 1.1 In 2017 the Government published its first Cycling and Walking Investment Strategy, which sets out an ambition to make cycling and walking the natural choices for shorter journeys or as part of a longer journey. The Strategy's objectives are to:
- Increase cycling activity; doubling the number of cycle stages made each year from 0.8 billion in 2013 to 1.6 billion in 2025
 - Increase walking activity to 300 walking stages per person per year
 - Reduce the rate of cyclists being killed or seriously injured on England's roads
 - Increase the percentage of children aged 5 to 10 that usually walk to school from 49 per cent in 2014 to 55 per cent in 2025
- 1.2 Local Cycling and Walking Infrastructure Plans (LCWIPs) form part of the Strategy and set out a new, strategic approach to identifying cycling and walking improvements required at the local level. They enable a long-term approach to developing cycling and walking networks so that the Government's objectives can be achieved. The key outputs of LCWIPs are:
- A network plan for cycling and walking, which identifies preferred routes and core zones for further development;
 - A prioritised programme of infrastructure improvements for future investment; and
 - A report that sets out the underlying analysis carried out and a narrative to support the identified improvements.

The West Yorkshire LCWIP

- 1.3 Development of the West Yorkshire LCWIP is being co-ordinated by West Yorkshire Combined Authority (The Combined Authority), which has commissioned Steer to support the process.
- 1.4 Development of LCWIPs in West Yorkshire forms part of objectives and proposed policies to increase levels walking and cycling set out in the West Yorkshire Transport Strategy. This includes a target of increasing levels of cycling by 300 per cent by 2027 and a target of increasing walking by 10 per cent by 2027.
- 1.5 LCWIPs also support Transport Strategy Road Network Policy 11 to provide improved cycling infrastructure, and Places to Live and Work Policy 28 to provide safe and convenient walking and cycling networks. The West Yorkshire LCWIP is made up of individual LCWIPs for the five West Yorkshire Partner Councils. They will function and act as standalone LCWIPs, and be brought together into the West Yorkshire LCWIP.
- 1.6 The West Yorkshire and constituent Partner Council LCWIPs are expected to meet the following overarching objectives:

- To identify the highest-priority local cycling and walking improvements within target areas to enable subsequent scheme development and delivery, as part of a long-term approach to developing local cycling and walking networks
- To support investment that will:
 - help achieve Transport Strategy targets to increase the numbers of people walking and cycling and enable people to make shorter journeys on foot or by bike, offering convenient, healthy and affordable travel options as part of healthy living plans.

1.7 The full development of a comprehensive West Yorkshire LCWIP, with five constituent LCWIPs covering the urban and rural areas of the region, will involve a significant amount of resource and time to deliver. The resources currently available (including support from DfT) will enable some, but not all, of the work required to carry out the development of a comprehensive Network Plan that provides networks of suitable density and coverage for the whole of West Yorkshire. Development of a West Yorkshire and individual Partner Council LCWIPs is therefore expected to be delivered through several phases of work. Individual Local Authorities may provide additional detail to this report to support the various phases of work.

1.8 This initial phase will focus on specific geographic areas of each Partner Council area, within which Core Walking Zones, routes and cycling network desire lines will be identified, and resulting schemes assessed as part of a prioritisation process.

LCWIP phase 1: focus

1.9 A separate scoping report is available which outlines the process undertaken to identify the initial areas of focus for phase 1 of LCWIP development in Calderdale.

1.10 Identifying an area of focus for cycling was informed by initial analysis using the Propensity to Cycle Tool (PCT) and Steer's Cycling Potential Index (CPI).

1.11 The PCT assumes potential levels of cycling based on trip distances, hilliness and age profiles. It does not take account of existing or planned infrastructure and therefore to achieve the potential indicated, the necessary quality of cycling infrastructure would need to be in place.

1.12 The PCT can also map different scenarios of change. The "Go Dutch" scenario was used for initial scoping to understand which areas of Calderdale district have the greatest potential to increase cycling. This scenario assumes that people will be willing to travel a wider range of trip distances and that greater numbers of old and young people will cycle, which is likely to result from cycling infrastructure being introduced to Dutch standards. The key inputs to this tool developed for the DfT are origin destination journey to work data from the 2011 census, route distance and hilliness.

1.13 The Cycling Potential Index takes into account the socio-demographic profile of the population, as well as hilliness and trip length. This was used to identify the population segments that are most likely to take up cycling in Calderdale.

1.14 For cycling, this LCWIP focuses on the town of Brighouse. The Calderdale Local Plan includes significant development plans for Brighouse including housing and employment developments to the east and south east of the town. Brighouse is located centrally between Halifax, Bradford and Huddersfield with significant travel to those areas and to Leeds slightly further to the east. There is a potential to use the LCWIP

process to identify infrastructure improvements which ensure good provision for existing residents and future residents and employees at the new development sites. There may also be a future funding source for identified improvements through the planning process.

- 1.15 The LCWIP process requires the identification of a 'Core Walking Zone' which should typically include significant trip generators such as key employment sites and transport interchanges. For walking journeys, distances travelled are short (typically up to 2km). The scoping discussion sought to define a suitable Core Walking Zone of around 400 metres in diameter that could be connected by key walking routes of up to 2km in length.
- 1.16 For walking, Halifax town centre was chosen as the first Core Walking Zone for Calderdale. There has been investment in the pedestrian environment of Halifax town centre through partial pedestrianisation in recent years. There remains significant issues of severance of the town centre from local communities, caused in part by transport infrastructure. In particular, the A58 (Burdock Way / Aachen Way) dual carriageway acts as an east to west bypass of the town centre and forms a physical barrier between some deprived communities (particularly Park ward) and the town centre
- 1.17 While there are crossing points, walking journeys to the town centre which cross the A58 could be facilitated by improvements to pedestrian infrastructure. There are also proposals for regeneration of the Beech Hill area including new housing which is likely to generate additional pedestrian trips.
- 1.18 Calderdale College is also located to the West of Halifax town centre and attracts a significant number of walking trips from the town centre, crossing the A58. To the south west of Halifax, Kings Cross Road is a popular local centre located close to the junction of the A58 and A646 that could also form a future Core Walking Zone. A separate scoping report is available which outlines the process undertaken to identify these initial areas of focus for phase 1 of LCWIP development in Calderdale.

Structure of this report

- 1.19 Section 2 provides the main body of this LCWIP. Mapping has been provided to Calderdale Council separately, in order that it can be incorporated into the Council's plans and policy documents. Section 2 incorporates:
- For Brighouse, the initial area for LCWIP development in this first phase
 - A cycling network map showing prioritised desire lines and proposed route alignments for the high priority desire line identified;
 - An initial prioritised list of potential improvements for these routes to help guide future investment when opportunities arise; and
 - Core design outcomes for cycling network development;
 - For Halifax town centre, the Core Walking Zone in this first phase of LCWIP development,
 - A walking network map showing key walking routes from the west;
 - An initial prioritised list of potential improvements for these routes to help guide future investment when opportunities arise; and
 - Core design outcomes for walking infrastructure.

- 1.20 Section 3 present the stages of analysis that informed the proposed cycling and walking network maps.

2 Calderdale LCWIP: Phase 1

2.1 The first phase of the Calderdale LCWIP covers:

- An initial area of cycling network development in Brighouse;
- A Core Walking Zone in Halifax; and
- Lists of potential infrastructure improvements for walking and cycling.

2.2 Figure 2.1 shows the initial areas of focus for cycling and Figure 2.2 shows the initial area of focus for walking.

Figure 2.1: LCWIP initial area of focus for cycling: Brighouse

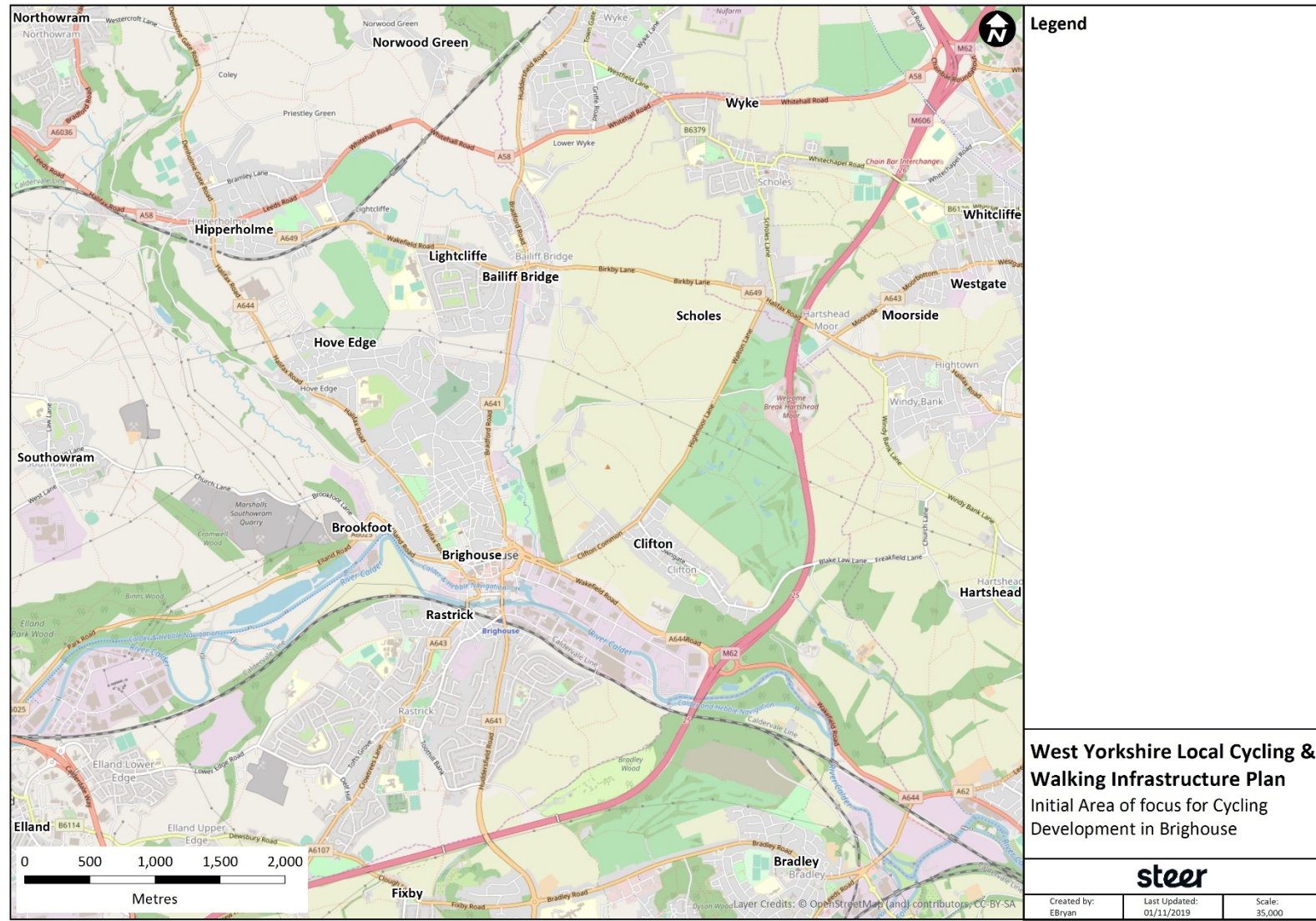
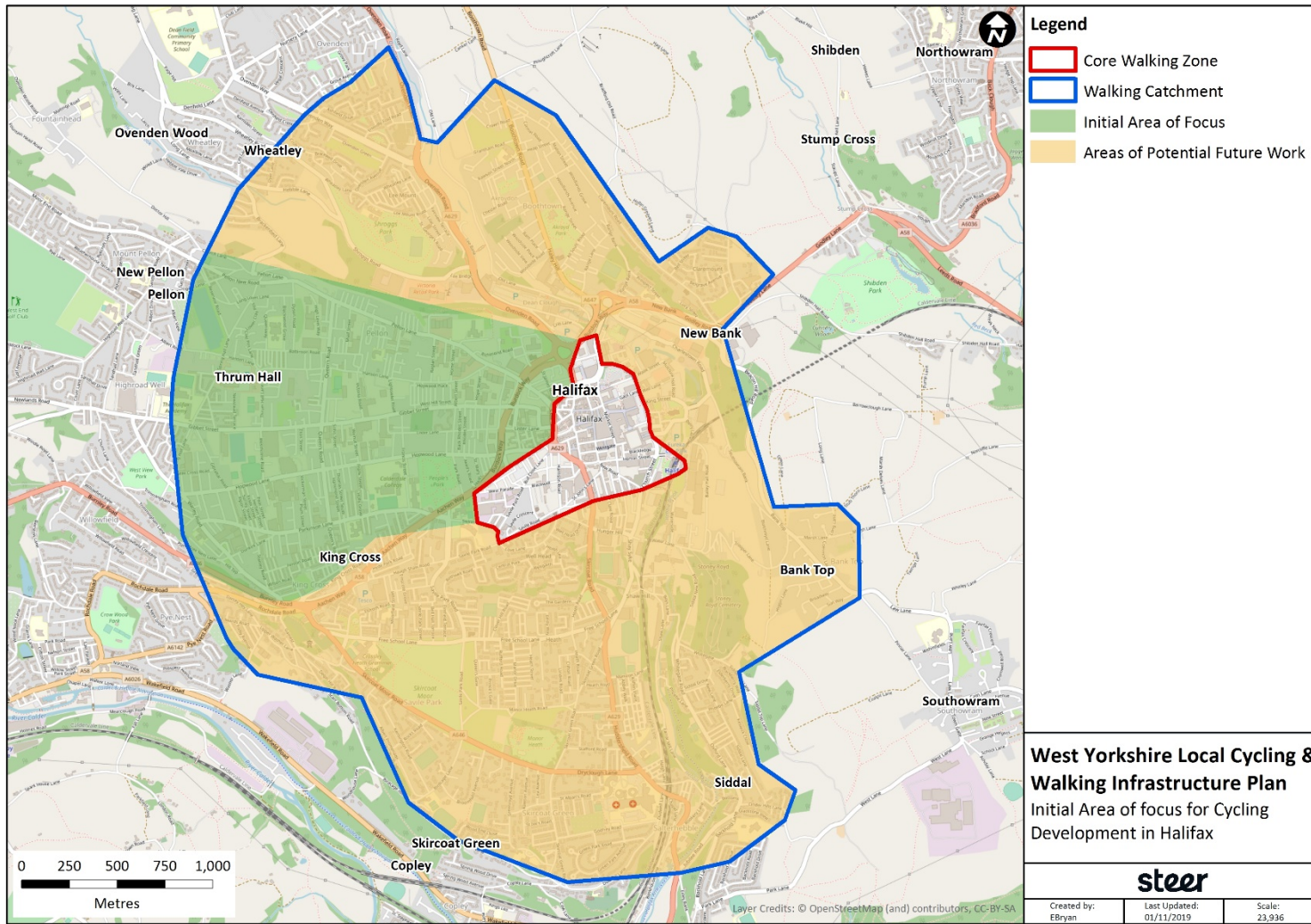


Figure 2.2: LCWIP areas of focus for walking: Halifax



Cycling

Identifying desire lines

- 2.3 To develop a cycling network, the first step was to identify the key desire lines between the places that people want and need to travel in Brighouse. It should be noted that these are not routes themselves, simply an indication of the most important trip origins and destinations. There may be various possible route alignments between them that should be considered at a subsequent stage of analysis.
- 2.4 The desire lines identified for Brighouse are shown in Figure 2.3. These reflect data analysis and stakeholder input to identify existing demand for cycling, potential demand for cycling and links to future growth sites within the cycling catchment area (as described in the supporting analysis section later in this document).
- 2.5 Data analysis included consideration of population density, employment density, car ownership, journeys to work under 5km, proposed growth areas, location and clustering of key trip generators, propensity and potential for cycling, existing and proposed cycling network provision and results of a stakeholder network planning workshop. Table 3.3 in the supporting analysis provides a full account of the data used to identify and prioritise desire lines.
- 2.6 Previous work to identify cycling desire lines that was undertaken on behalf of Calderdale was also considered. The identified desire lines in this work closely matched desire lines that had been identified from this LCWIP analysis and stakeholder input. Therefore, the previous work did not identify any further origins-destinations to be included and provided further confidence in those already identified.
- 2.7 The desire line between Bradley and Brighouse (10) has previously been identified as a priority by Calderdale Council and work is in progress to make improvements to this route.

Prioritising desire lines

- 2.8 The same data was used to rank these desire lines from 1 to 10 (1 being the highest priority) in order of both existing and potential cycle demand.
- 2.9 In order to determine routes to take forward for further analysis, it was necessary to consider where desire lines might converge. For example, many desire lines run closely in parallel and will therefore use the same corridors to cater for cycling demand in some locations.

Selection of desire lines for detailed assessment

- 2.10 Two priority desire lines were selected for further investigation in Brighouse, which can be joined together to form one route, based on consideration of the analysis and Calderdale Council's aspirations:
1. Bailiff Bridge to Brighouse (to meet desire line 1 and partially 9)
 2. Rastrick to Brighouse (to meet desire line 2)
- 2.11 Two alignment options were identified for each of these potential routes, which are shown in Figure 2.3. Option 1 provides the most direct alignment, which normally utilises primary transport corridors and requires a higher level of intervention. Option 2

provides a less direct route – or route sections – that makes use of secondary transport corridors, back streets, green spaces and waterways.

- 2.12 Proposed cycling infrastructure improvements and indicative costs for each of these routes and alignment options are provided in Table 2.1. These provide an initial understanding of requirements, based on a desktop review and site visit at key locations. **Delivery of proposed infrastructure will require further feasibility and detailed design work to be undertaken to develop more accurate costs.**
- 2.13 For the desktop review, the proposed cycling infrastructure required was informed by Table 1.3 of LTN 2/08, which is an approximation based on traffic volumes and speeds. Transport engineers from Steer and Calderdale Council then assessed potential requirements at key locations, such as critical junctions.
- 2.14 Estimated infrastructure costs were informed by Taylor and Hiblin (2017) *Typical costs of cycling interventions: interim analysis of Cycle City Ambition schemes*, which provides guidance on the typical costs of implementing various types of cycling infrastructure in towns and cities across the UK. It was this research that informed the costs provided in the LCWIP guidance. Local costs were used for reference where available.
- 2.15 Professional judgement was used to gauge the level of intervention required and the associated costs, based on the guidance. Until further feasibility and design work is carried out, these costs should be treated as estimates only, which could be higher or lower when taken forward for delivery. In this document, cost estimates of individual infrastructure elements have been rounded to the nearest £10k and total costs have been rounded to the nearest £100k, which was seen as a suitable level of estimation until further work is carried out.
- 2.16 It should be noted that costs may differ depending on whether the infrastructure is being delivered as a stand-alone project or as part of a wider package of measures. For instance, there may be cost-savings by delivering complimentary schemes at the same time to minimise project management and construction costs. This is beyond the scope of the LCWIP and should be considered when proposals are taken forward for delivery.
- 2.17 The districts in West Yorkshire – including Calderdale – may update costs in their LCWIP using more accurate local precedents where available.
- 2.18 The proposed cycling infrastructure may also be accompanied by a range of complementary measures to be defined in further stages of LCWIP development. Complementary measures may include:
- New waiting/loading restrictions
 - Improved enforcement of existing waiting/loading restrictions
 - Behaviour change programmes to raise awareness of infrastructure improvements and encourage walking and cycling
 - Restrictions to general traffic
 - Improved landscaping and lighting
 - New and improved cycle parking.
- 2.19 The core design outcomes for cycling infrastructure set out in the DfT’s LCWIP guidance have been provided in Table 2.2 . These are well established principles for

cycling infrastructure set out in the LCWIP guidance, which have informed the proposed infrastructure improvements and associated cost estimates, to ensure that proposals meet the appropriate quality of infrastructure provision needed to increase cycling. A set of principles for walking and cycling design is being developed locally by West Yorkshire partners which will form the basis of development of the schemes identified through this LCWIP.

- 2.20 More detail on each stage of this process is provided in section 3 – Supporting Analysis.

Figure 2.3: Cycling desire lines in Brighouse

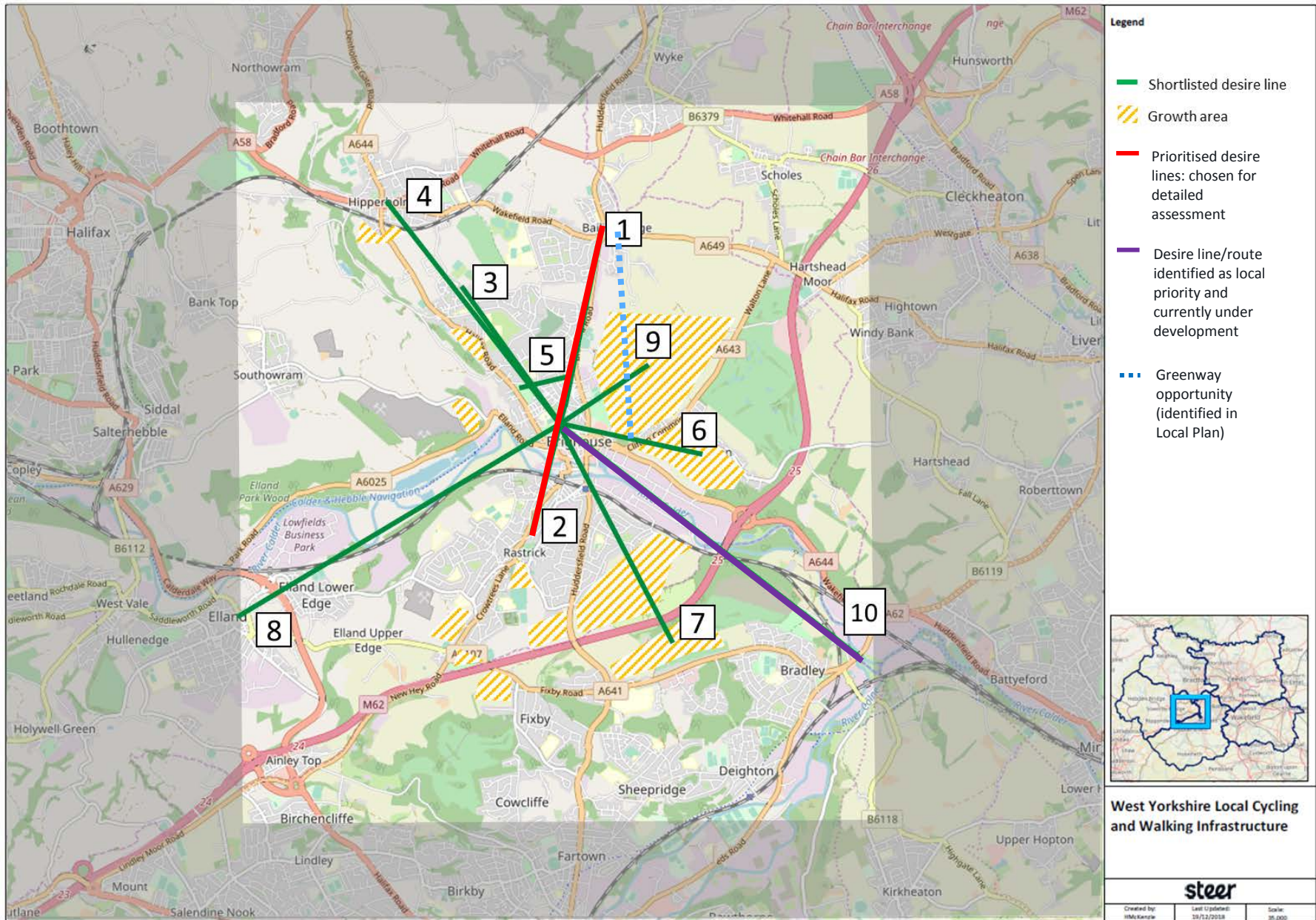


Figure 2.4: Priority cycle route: Bailiff Bridge to Rastrick via Brighouse



Table 2.1: Proposed Cycling Infrastructure Improvements

| Route section | Infrastructure | Indicative cost* (£m) | Infrastructure | Indicative cost* (£m) | |
|---------------------------------------|--|-----------------------|---|-----------------------|------------|
| | Option 1 | | Option 2 | | |
| 1. Bailiff Bridge to Brighouse | Mixed strategic cycle route – 115m from Empire Court to A649 | 0.08 | Mixed strategic cycle route – 3.23km from Empire Court to Bradford Rd | 2.24 | |
| | Cycle Superhighway-level provision – 2.15km along Bradford Road | 2.47 | | | |
| | SUB TOTAL | 2.6 | SUB TOTAL | 2.2 | |
| 2. Brighouse Town Centre | Mixed strategic cycle route – 281m from Bradford Rd to A641/Bethel St roundabout | 0.2 | Mixed strategic cycle route – 281m from Bradford Rd to A641/Bethel St roundabout | 0.2 | |
| | Cycle Superhighway-level provision – 294m from A641/Bethel St roundabout to Cliffe Rd | 0.34 | Cycle Superhighway-level provision – 294m from A641/Bethel St roundabout to Cliffe Rd | 0.34 | |
| | Remodelling of one major junction – A641/Bethel St roundabout | 1.6 | Remodelling of one major junction – A641/Bethel St roundabout | 1.6 | |
| | SUB TOTAL | 2.1 | SUB TOTAL | 2.1 | |
| 3. Brighouse to Rastrick | Mixed strategic cycle route – 396m from Cliffe Rd to Bramston St | 0.28 | Mixed strategic cycle route – 983m from Cliffe Rd to A643 | 0.69 | |
| | Cycle Superhighway-level provision – 963m from Bramston St to A643/Ogden Ln roundabout | 1.11 | Cycle Superhighway-level provision – 250m from A643 to A643/Ogden Ln roundabout | 0.29 | |
| | SUB TOTAL | 1.4 | SUB TOTAL | 1.0 | |
| TOTAL | | 6.1 | TOTAL | | 5.3 |

*Indicative costs were informed by Taylor and Hiblin (2017) *Typical costs of cycling interventions: interim analysis of Cycle City Ambition schemes*, which provides guidance on the typical costs of implementing various types of cycling infrastructure in towns and cities across the UK.

Local reference costs were used where available.

All cost estimates are subject to further feasibility and detailed design, and may be higher or lower when taken forward for delivery.

Costs are based on delivery of individual schemes, which may change if delivered as part of a wider programme of works.

'Cycle Superhighway-level provision' is defined as an extended cycle route that enables direct, rapid, safe cycle trips largely segregated from traffic along an arterial route (e.g. a 10km route following an A-road from outer suburbs to a city centre).

'Mixed strategic cycle route' is defined as an extended cycle route to facilitate cycling along a strategic corridor, comprising a mixture of: signed route without dedicated lanes along quieter roads; on-road lanes without physical segregation; physically segregated cycle lanes along busier roads; marked cycle routes away from roads where such alignments are available.

Table 2.2: Core Design Outcomes for cycling infrastructure

| Core Design Outcome | Description |
|---------------------|---|
| Coherent | The network must be coherent: it must link all the places cyclists want to start and finish their journeys with a route quality that is consistent and easy to navigate. Abrupt changes in the level of provision for cyclists will mean that an otherwise serviceable route becomes disjointed and unusable by the majority of potential users |
| Direct | Routes for cyclists must provide direct and fast routes from origin to destination. In order to make cycling preferable to driving, routes for cyclists must be at least as direct – and preferably more direct – than that available for private motor vehicles. And indirect route for cyclists may result in some of them choosing the more direct, faster route, even if it is unsuitable for cycling. |
| Safe | Cycle networks must not only improve cyclists' safety, but also their feeling of how safe the environment is. Consideration must be given to reducing the speeds of motor vehicles to acceptable levels, particularly when cyclists are expected to share the carriageway. The needs for cyclists to come into close proximity and conflict with motor traffic must be removed, particularly at junctions, where the majority of crashes occur. |
| Comfortable | Smooth surfaces, with minimal stopping and starting, without the need to ascend or descend steep gradients and which present few conflicts with others users creates comfortable conditions that are more conducive to cycling. The presence of high speed, high volume motor traffic affects both the safety and the comfort of the user. |
| Attractive | Cyclists are more aware of the environment they are moving through than people in cars or other motor vehicles. Cycling is a pleasurable activity, in part because it involves such close contact with the surroundings. The attractiveness of the route itself will therefore affect whether users choose to cycle. |

Source: Local Cycling and Walking Infrastructure Plans Guidance, Department for Transport (2017)

Walking

- 2.21 The LCWIP process aims to identify infrastructure improvements to create a safe, coherent and pleasant walking environment. It includes the creation of a walking network, identification of the issues that prevent people walking and development of specific interventions to overcome local issues.
- 2.22 In order to identify the interventions required, it is essential that the environment is analysed from a perceptual, human perspective, which accounts for issues such as personal safety. This means that the remit of what constitutes ‘infrastructure’ for walking needs to be wider than traditional engineering approaches. It will include infrastructure such as pedestrian crossings and footway improvements, but might also need to include elements such as lighting, wayfinding, removal of graffiti/litter, seating, public realm improvements and planting.
- 2.23 To provide this human perspective, the Calderdale LCWIP was informed by a street audit led by walking charity Living Streets. Street audits are a tool for facilitating a roving public consultation whilst walking with audit participants around a pre-defined route. This allows participants to comment on and capture their live experience of walking the route. A follow up session afterwards with a large scale map captures the most salient points and allows participants to comment on wider areas beyond the audit route.
- 2.24 Comments from participants were used to capture the main barriers to walking and to translate these observations into recommendations for infrastructure improvements to enhance the walkability of the area. The proposed walking network and infrastructure improvements were also informed by data analysis (as described in the supporting analysis section) and additional expert site visits.
- 2.25 The street audit route was agreed in advance and designed to make the most efficient use of stakeholder time by incorporating the key routes and crossing points into Halifax Town Centre from Park Ward, while allowing enough opportunity for meaningful discussion. This means that other routes in the Core Walking Zone and areas of interest within the 2km catchment were not assessed as part of this work. Further assessment would be needed to cover other areas.
- 2.26 This LCWIP identifies a proposed walking network, proposed intervention sites and a list of proposed infrastructure improvements for Halifax.

Proposed walking network

- 2.27 Department for Transport LCWIP guidance recommends identification of primary and secondary walking routes within a 2km catchment of the Core Walking Zone. The proposed network and classification of walking routes to serve the Core Walking Zone is shown in Figure 2.5. The routes were identified through consideration of:
- Permeability of the Core Walking Zone from surrounding residential areas
 - Addressing key severance points for local communities
 - Addressing key safety concerns, including both road and personal safety
 - Key corridors that link residential areas to the Core Walking Zone

Proposed infrastructure improvements

- 2.28 Unlike cycling, the existing walking network is generally comprehensive in terms of provision of segregated routes. The infrastructure interventions focus on improving the walking environment on primary and secondary walking routes into the Core Walking Zone from the Park Ward and Beech Hill areas.
- 2.29 The locations of proposed infrastructure improvements are shown in Figure 2.5 with the detail of the proposals shown in Figure 2.6. Location-specific interventions referenced to the numbered interventions areas and area-wide infrastructure improvements across the Core Walking Zone and its catchment are shown in Table 3.6.
- 2.30 The proposed walking infrastructure may also be accompanied by a range of complementary measures to be defined in further stages of LCWIP development. Complementary measures may include:
- New waiting/loading restrictions
 - Improved enforcement of existing waiting/loading restrictions
 - Behaviour change programmes to raise awareness of infrastructure improvements and encourage walking and cycling
 - Restrictions to general traffic
 - Improved landscaping and lighting
 - Accessible seating.
- 2.31 Core Design Outcomes for walking infrastructure, based on walking audit tools provided by government as part of the LCWIP guidance, are shown in Table 2.4. These have informed the proposed infrastructure improvements and associated cost estimates. A set of principles for walking and cycling design is being developed locally by West Yorkshire partners which will form the basis of development of the schemes identified through this LCWIP

Figure 2.5: Halifax Core Walking Zone, key walking routes and proposed improvements

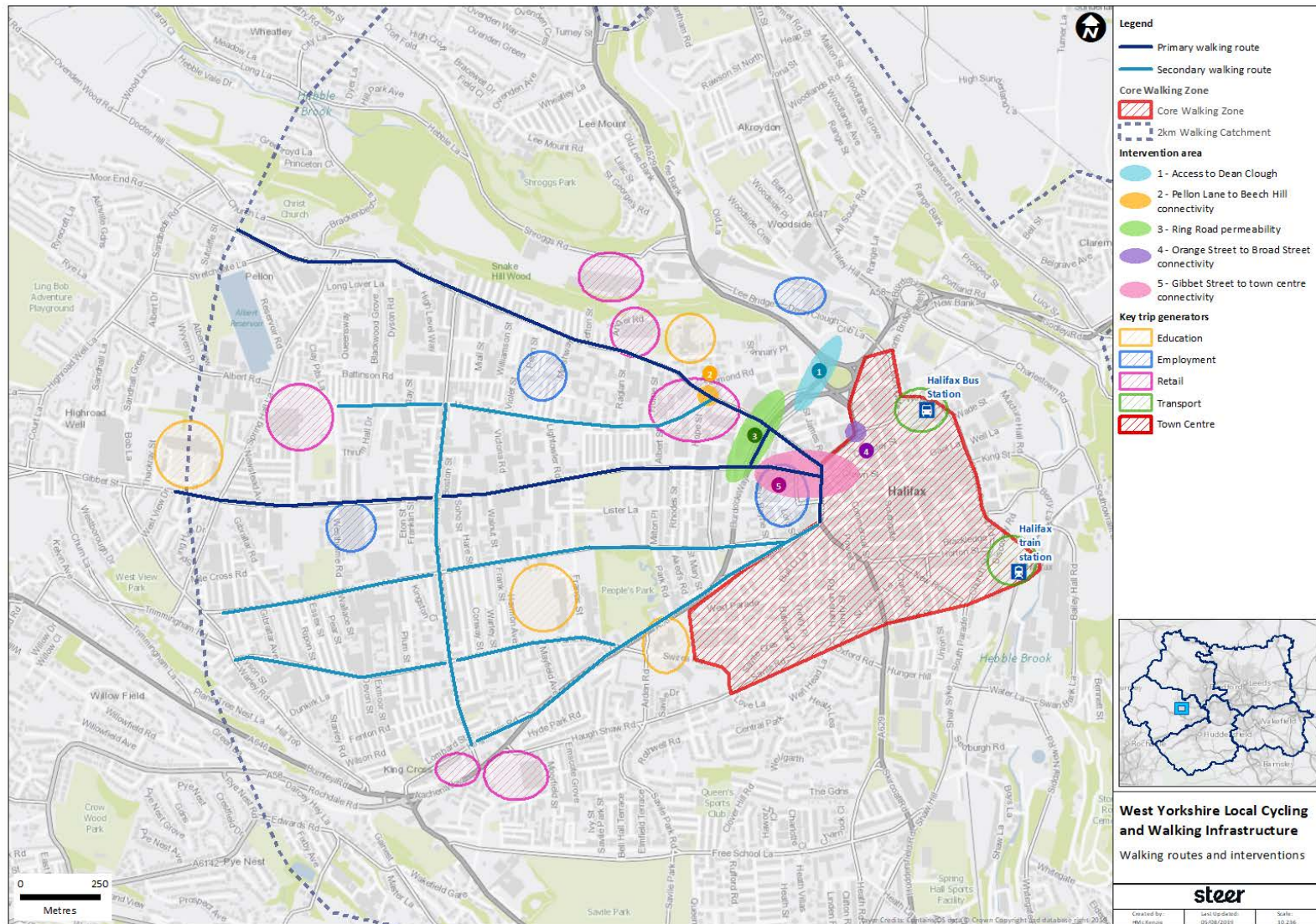


Figure 2.6: Halifax Core Walking Zone and key walking routes: proposed improvements

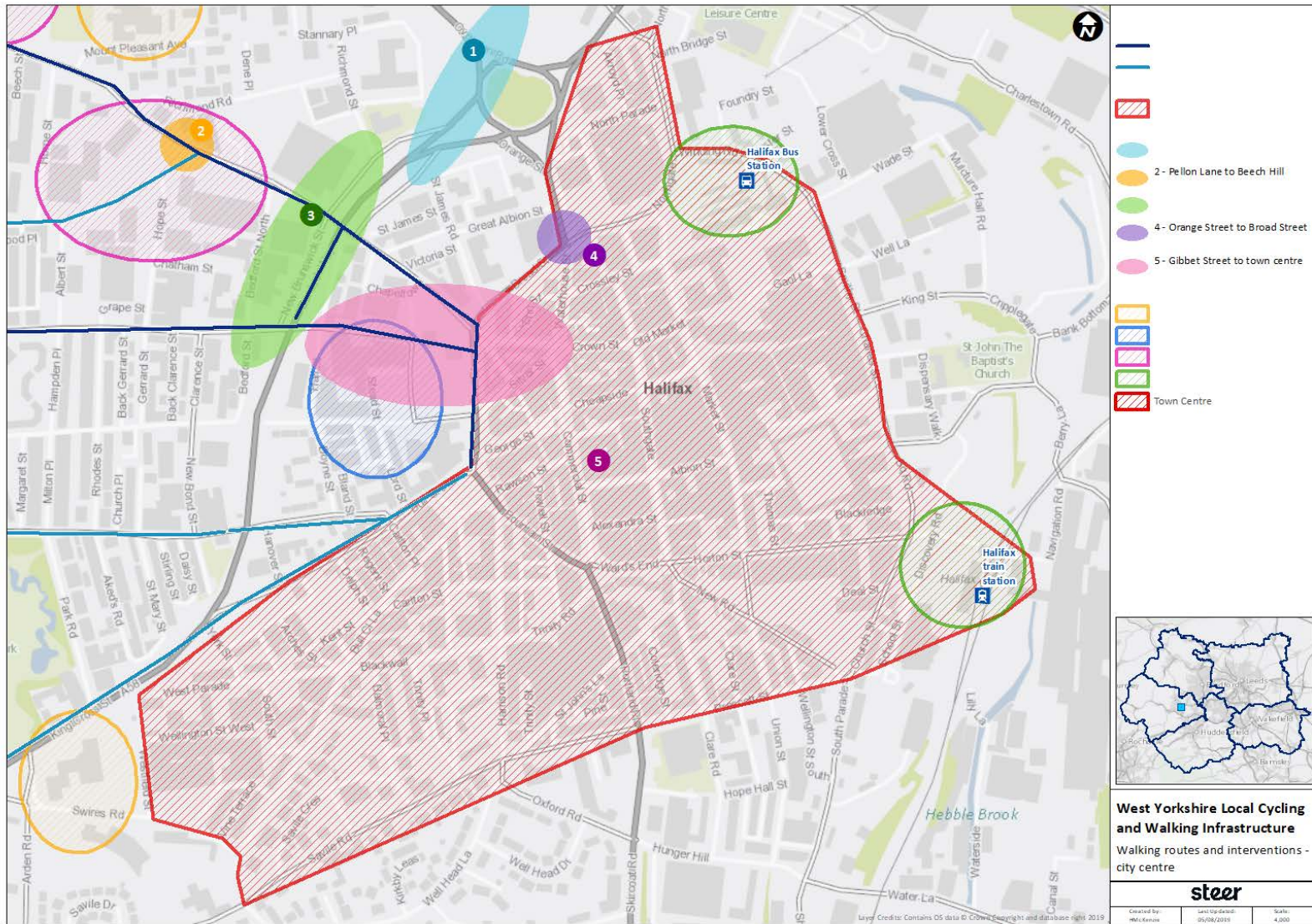


Table 2.3: Halifax proposed walking infrastructure improvements

| Intervention | Intervention scale | Intervention | Intervention type | Cost estimate | Timescale |
|--|--------------------|---|--|--|---|
| 1. Improve access from town centre to Dean Clough and Beech Hill areas | Location-specific | <ul style="list-style-type: none"> a. Pedestrian overbridge b. Surface level signalised crossing points c. Reduce foliage and repaint subways d. Open out subway entrances and exits e. Wayfinding and interpretation boards | <ul style="list-style-type: none"> a. Highway / footway b. Highway / footway c. Walking environment d. Walking environment e. Walking environment | <ul style="list-style-type: none"> a. £1m-£1.5m b. £50k-£62k each c. £5k-10k d. Subject to local study e. Subject to local study | <ul style="list-style-type: none"> Long Medium Short Short Medium |
| 2. Improve pedestrian access across Pellon Lane and connection to Beech Hill | Location-specific | <ul style="list-style-type: none"> a. Zebra crossing at Hanson Lane | <ul style="list-style-type: none"> a. Highway / footway | <ul style="list-style-type: none"> a. £20k-£33k | <ul style="list-style-type: none"> Medium |
| 3. Improve pedestrian access along Gibbet Street, Pellon Lane and along New Brunswick Street and Burdock Way to enhance connectivity around ring road and along key routes | Location-specific | <ul style="list-style-type: none"> a. Raised table crossing with markings at New Brunswick Street/Gibbet Street b. Build outs to reduce junction width at New Brunswick Street/Gibbet Street c. Signalised pedestrian crossings at Burdock Way/Pellon Lane on all arms d. Restrict access to vehicles from Richmond Street to New Brunswick Street e. Continuous footway across Richmond Street f. Modal filter cell for cycle access | <ul style="list-style-type: none"> a. Highway / footway b. Highway / footway c. Highway / footway d. Highway / footway e. Highway / footway f. Highway / footway | <ul style="list-style-type: none"> a. £14k b. Subject to local study c. £50k-£62k each d. Subject to local study e. £10k-£20k f. £150-350 each | <ul style="list-style-type: none"> Medium Medium Medium Short Medium Medium |
| 4. Adjust signal timings to improve accessibility at Broad Street / Orange Street intersection | Location-specific | <ul style="list-style-type: none"> a. Reduce pedestrian wait time and lengthen pedestrian green phase b. Introduce pedestrian all-green phase with diagonal crossing markings | <ul style="list-style-type: none"> a. Highway / footway b. Highway / footway | <ul style="list-style-type: none"> a. Subject to local study b. Subject to local study | <ul style="list-style-type: none"> Short Short |

| Intervention | Intervention scale | Intervention | Intervention type | Cost estimate | Timescale |
|--|--------------------|---|--|---|--|
| 5. Improve access and amenity at eastern end of Gibbet Street | Location-specific | <ul style="list-style-type: none"> a. Brighter LED lighting b. Sealed path to north of tower block connecting to new crossing point c. Wayfinding along length of Gibbet Street d. Local business engagement | <ul style="list-style-type: none"> a. Highway / footway b. Highway / footway c. Walking environment d. Complementary measure | <ul style="list-style-type: none"> a. £2.6k-3.2k per column b. £200 per metre c. Subject to local study d. Subject to local study | <ul style="list-style-type: none"> Medium Short Medium Short |
| 6. Improve perception of safety through brighter lighting | Area-wide | <ul style="list-style-type: none"> a. Install LED lighting across the core walking zone and surrounding area with supplementary task lighting where required | <ul style="list-style-type: none"> a. Highway / footway | <ul style="list-style-type: none"> a. £2.6k-3.2k per column | <ul style="list-style-type: none"> Medium |
| 7. Improve perception of safety and walkability through footway maintenance and repair | Area-wide | <ul style="list-style-type: none"> a. Audit all existing footway to identify areas requiring repair or maintenance and locations lacking level access b. Repairs to footway and crossing points c. Raised table crossings at side roads to replace dropped kerbs | <ul style="list-style-type: none"> a. Highway / footway b. Highway / footway c. Highway / footway | <ul style="list-style-type: none"> a. Subject to local study b. £200 per metre c. £14k per crossing | <ul style="list-style-type: none"> Short Medium Medium |
| 8. Enhance sense of community and reduce vehicle speeds through Park Ward | Area-wide | <ul style="list-style-type: none"> a. Gateway treatments at key access routes to Park Ward b. Modal filter treatment across Park Ward to restrict vehicle access, including pedestrianisation of lower portion of Hopwood Road | <ul style="list-style-type: none"> a. Walking environment b. Highway / footway | <ul style="list-style-type: none"> a. £7k-£8k b. Subject to local study | <ul style="list-style-type: none"> Short Long |

*The proposed interventions are intended to be used for prioritising schemes to take forward for delivery, with full design and costing to be done at a later stage. There is no national guidance on cost estimates for walking infrastructure. Indicative cost estimates were informed by Wiltshire Council Highways (2017) *Costs of highway works*, Glasgow Anderston 'Bridge to Nowhere' constructed in 2013 for intervention 1a and data from Borough of Poole Council (2019) for intervention 3e. All cost estimates subject to feasibility and design and may be higher or lower when taken forward for delivery. In some instances, cost efficiencies might be found by delivering schemes as part of a holistic area-based approach, rather than on a scheme-by-scheme basis.

Table 2.4: Core Design Outcomes for Walking

| Design | Description |
|-----------------------|---|
| Comfort | Footways level and in good condition, with no trip hazards. |
| | Footway widths generally in excess of 2m effective width |
| | Width on staggered crossings/pedestrian islands/refuges able to accommodate |
| | No instances of vehicles parking on footways. |
| Directness | Footways are provided to cater for pedestrian desire lines (e.g. adjacent to |
| | Crossings follow desire lines. |
| | Crossing of road easy, direct, and comfortable and without delay (< 5s |
| | Crossings are single phase pelican/puffin or zebra crossings. |
| | Diagonal crossing (pedestrian and all-green phase) available at intersections |
| | Green man time is of sufficient length to cross comfortably (presume 0.8m/s) |
| Coherence | Walking network developed to link key trip generators, public transport and |
| | Adequate dropped kerb and appropriate tactile paving provision. |
| | Comprehensive wayfinding with walking times installed throughout core |
| | Footway and crossing materials consistent throughout core walking zone and |
| Safety | Appropriate formal crossing points installed at all major road crossings |
| | Continuous network of footway available throughout core walking zone and |
| | Appropriate street lighting installed along all key routes |
| | Footway network maintained to avoid trip hazards |
| | Traffic calming measures in place in areas of higher pedestrian vulnerability |
| Attractiveness | Footway and street furniture maintained to a good standard (clean, safe and |
| | Regular litter and waste collection to ensure clean street |
| | Planting and greenery installed where possible, also to provide shade |

Source: adapted from Walking Route Audit tool (WRAT), developed by Local Transport Projects as part of the Welsh Active Travel Guidance.

Supporting analysis

3 Supporting analysis

Cycling network analysis

The LCWIP process and cycle network development good practice

- 3.1 LCWIP Technical Guidance sets out a recommended approach to developing a cycle network and the data and tools available to do so. Emphasis is placed on using evidence to plan a cycle network that connects places that people need to get to, whether for work, education, shopping or for other reasons.
- 3.2 As noted earlier, the key outputs for the LCWIP include a cycling network map and a programme of cycling infrastructure improvements
- 3.3 A review of good practice in cycling network planning, including the LCWIP Technical Guidance (DfT, 2017), London Cycling Design Standards (TfL, 2018) and Strategic Cycling Analysis (TfL, 2017) indicates that cycling networks should be planned to:
- Serve the highest number of current trips;
 - Enable the highest number of potentially cyclable trips; and
 - Connect the network to areas experiencing high growth.
- 3.4 For this reason, network development has focused on analysis existing cycling demand, potential cycling demand and growth areas. The methodology identified cycle network and prioritised infrastructure improvements for Brighouse are outlined below.

Methodology

- 3.5 The following seven steps were taken to develop the cycling network with each step described in further detail below:
1. Data analysis
 2. Stakeholder engagement
 3. Classifying desire lines
 4. Prioritising shortlisted desire lines
 5. Identifying a high priority route
 6. Selecting route alignment options
 7. Appraising route alignment options

Data analysis

To ensure an evidence-based approach, a wide range of data was gathered and is presented in a background report that forms part of phase 1 of this LCWIP. The data were analysed to understand existing and potential demand for cycling in Brighouse. Refer to Table 3.1 and Table 3.2 for a comprehensive list of data sources considered, the insights provided and how they were applied.

A separate background report is available containing the data and mapping used for the analysis. Analysis focused on four areas:

Local population

- 3.6 Understanding the characteristics and travel behaviours of the local population, as well as planned development. This information was used to gauge the propensity of people to cycle and the journeys that people are likely to make now and in the future.

Points of interest

- 3.7 Identifying key destinations that people need to get to – such as schools, hospitals, employment sites, leisure facilities and bus or train stations. When considering that journeys begin at home in residential areas, identifying key destinations and the likely routes between them provide the desire lines for local journeys. These destinations – or points of interest – were also clustered to indicate where they are located in high densities, which is likely to attract more journeys.

Existing cycle demand:

- 3.8 Understanding where people currently cycle, so that the network can be planned to serve the highest number of current trips by ensuring that these routes are safe and attractive to use. This can be understood by using the Propensity to Cycle Tool (PCT), which shows existing cycle journeys to work using 2011 Census data, as well as the Strava global heatmap, which shows where users of the Strava app currently cycle for all journey purposes. Though the Strava app does not provide a fully representative population sample (it is skewed towards the demographic that uses the app), the data still provides valuable insight, especially as it includes all trip purposes.

Potential cycle demand

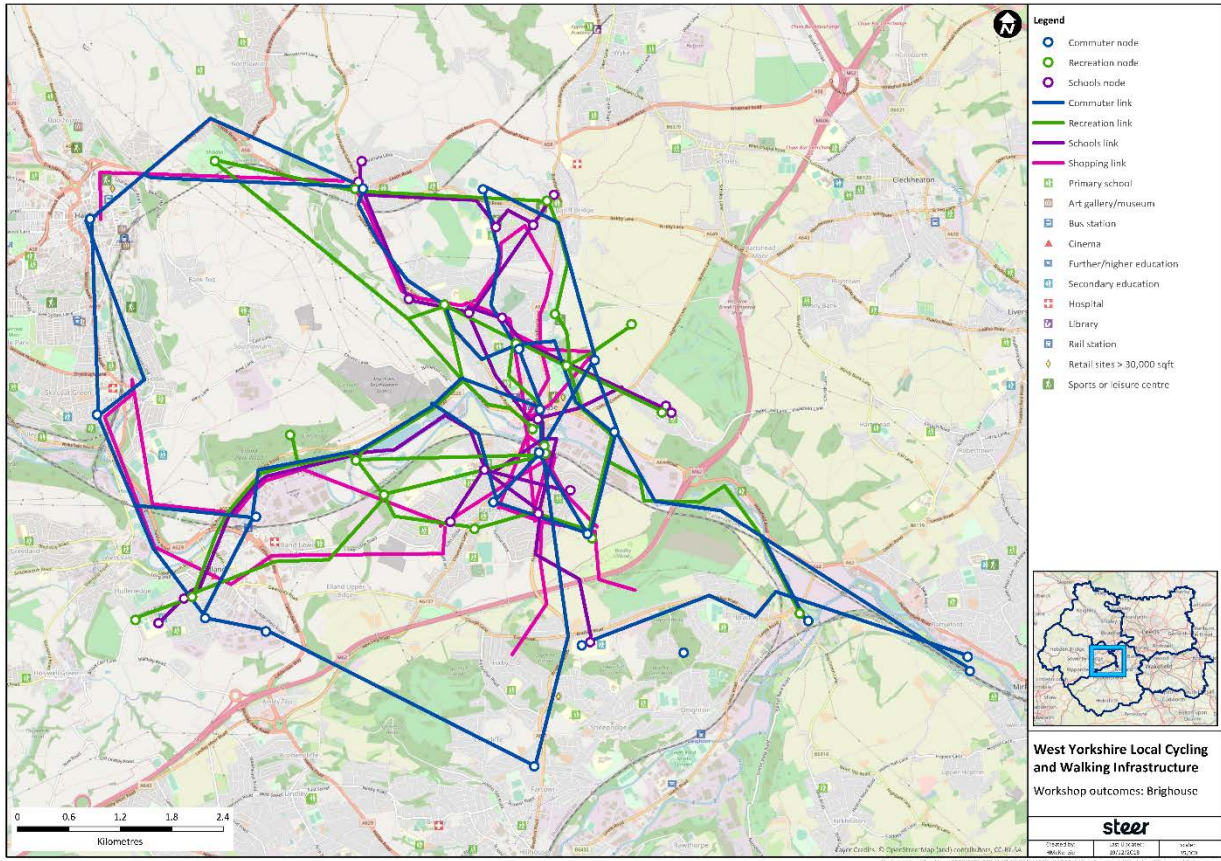
- 3.9 Understanding where there is the highest potential to switch trips made by other modes – especially by private car, so that infrastructure investment can be targeted to locations that will reduce car use and enable the highest number of cycle trips. The PCT 'Go Dutch' modelling data can be used to show where people would be likely cycle if a safe and attractive cycling environment was provided, based on reasonable cycle trip distances and hilliness. This is especially useful for identifying the highest potential cycling desire lines and route alignment options, though this is also based on commuting trips only.
- 3.10 Steer's Cycling Potential Index can also show where people are more likely to cycle based on social demographics, which is important to understand so that investment is made in places where people that do not currently cycle are most likely to take up cycling as a result. These factors have also been cross-referenced with Calderdale Council's planned future cycle network to take in to account local knowledge of where future potential is situated

Stakeholder engagement

- 3.11 In November 2018, Steer held a workshop with local stakeholders in Halifax. In November 2018, local stakeholders took part in a hands-on, interactive workshop to give local knowledge and expertise to shape the future cycle network in Brighouse. Dutch consultancy Mobycon facilitated the workshop, bringing insights from their experience of cycle network planning in the Netherlands.

3.12 In the first part of the exercise, the Mobycon team worked with workshop participants to identify key origins and destinations for local trips to help identify important cycling desire lines. The results of this exercise are shown in Figure 3.1.

Figure 3.1: Brighouse cycle network workshop outputs – unprioritised desire lines



3.13 The second part of the exercise looked in more detail at the area of focus to identify the most desirable corridors and routes in this area.

3.14 The results provide a visual clue to the importance of specific streets and other traffic-free routes for cycling, which has implications for the type of facility (infrastructure) that's required there.

3.15 Taking into account origins and destinations identified by local stakeholders, and the desire lines between them, Mobycon analysed the results and identified:

- A north-south desire line, notably from Bailiff Bridge and Hipperholme in the north to Brighouse town centre and south towards Rastrick / Woodhouse;
- An east-west desire line along the River Calder between Elland, Brighouse and Bradley; and
- An extension of the east-west desire line from Elland to Halifax

3.16 The results of the stakeholder engagement were fed in to the subsequent classification and prioritisation of desire lines, to be considered against other data sources.

Table 3.1: Population and points of interest data analysed in developing the cycle network in Brighouse

| Theme | Source | Insight | LCWIP application |
|---------------------------|-----------------------------|--|--|
| Local population | Population density | Identifying trip origins and areas most needing to be served by the network | Provided confidence in identified desire lines and informed alignment optioneering |
| | Employment density | Identifying trip origins and areas most needing to be served by the network | Provided confidence in identified desire lines and informed alignment optioneering |
| | Car ownership | Potential for switchable trips by location | Non-insightful – high car ownership across whole area |
| | Journeys to work under 5km | Identifying proportion of journeys within reasonable cycling distance, by area | Supports rationale to link to Brighouse station, as in most Brighouse >50% journeys to work are over 5km |
| | Growth areas | Identifying areas that need to be served by the network in future | Informed shortlisting and prioritisation of desire lines |
| Points of interest | GIS-identified destinations | Identifying key destinations | Informed plotting / selection of OD mapping |
| | GIS clustering | Identifying key clusters of destinations | Informed plotting / selection of OD mapping |
| | POI density | Identifying POI densities to be served by network | Provided confidence in identified desire lines |

Table 3.2: Cycle demand data and stakeholder engagement inputs used – as detailed in the Background Report

| Theme | Source | Insight | LCWIP application |
|------------------------|---------------------------------|--|---|
| Existing cycle demand | PCT 2011 Census (LSOA) | Identifying existing cycling demand for journeys to work | Used to identify and quantify desire lines for existing cycling |
| Existing cycle demand | Strava | Identifying existing demand for a wider range of trips | Used to identify existing demand for cycling and highlight gaps in Census data |
| | Existing cycling infrastructure | Identifying existing network to build on | Identified that River Calder route is only existing infrastructure to connect to |
| Potential cycle demand | PCT Go Dutch (LSOA) | Identifying potential cycling demand for journeys to work | Used to identify and quantify desire lines and alignment options for potential demand |
| | CyIPT | Checking for recommended infrastructure improvements and sourcing traffic count data | Used to cross-reference LTN 2/08 guidance on required cycle provision – by traffic volume and speed |
| | Local planned cycle network | Identifying planned network | Identified River Calder existing route and potential for garden suburb link and south east River Calder extension |
| | Cycling Potential Index | Hex mapping to show demographic propensity to cycle | Used to sense-check and inform desire line identification and prioritisation |
| Stakeholder engagement | Workshop nodes | Identifying key POIs for employment, leisure, education and utility | Added to base maps, along with GIS-identified destinations |
| | Workshop desire lines | Joining nodes to identify desire lines | Provided confidence in identified desire lines and suggests future route extensions |
| | Mobycon interpretation | Expert input for desire lines, based on interpretation of stakeholder-identified nodes | Provided confidence in identified desire lines and offered alternative interpretation |

Classifying and prioritising cycling desire lines in Brighouse

- 3.17 LCWIP guidance states that desire lines should be identified and then classified.
- 3.18 All desire lines – identified through analysis of existing cycle demand, potential cycle demand and the stakeholder workshop – were mapped alongside the growth areas and classified (see Figure 3.2).
- 3.19 Considering the relatively small size of Brighouse, desire lines were simply classified as shortlisted (for further analysis and consideration) or longlisted (not for further analysis and consideration at this stage).

Classifying desire lines

- 3.20 Desire lines were classified in consideration of:
- **Trip distance** – journeys beyond 5km and longer journeys to Halifax were longlisted, as they are less cyclable in terms of distance and hilliness
 - **Existing and potential demand** – desire lines with the highest existing and potential demand were shortlisted.
 - **Links to growth areas** – desire lines that connect to, or would serve journeys from growth areas were prioritised
 - **Network density** – a 400m mesh density (distance between routes in a cycle network) is recommended and therefore routes should not be too close together or far apart
 - **Contribution to a coherent network** – where possible, routes should connect to one another and serve key movements. North-south and east-west routes are often the foundation of a coherent network and joining up routes across a town centre to form longer routes can benefit the network

Prioritising shortlisted desire lines

- 3.21 To inform future investment and network development decisions, the shortlisted desire lines were assessed against available evidence and placed in priority order as shown in Table 3.3.
- 3.22 The desire lines were prioritised in consideration of:
- **Existing cycle demand** – evidence and scale of existing demand from the PCT and Strava;
 - **Potential cycle demand** – evidence and scale of potential demand from the PCT and Cycling Potential Index;
 - **Workshop output** – identification of desire line by local stakeholders and/or prioritised cycle movement by Mobycon; and
 - **Links to growth areas** – whether a direct link to a growth area, or serving a growth area by being situated on a future desire line or within 400m of a growth area.

Figure 3.2: Brighouse cycling desire line map, including short and longlisted desire lines

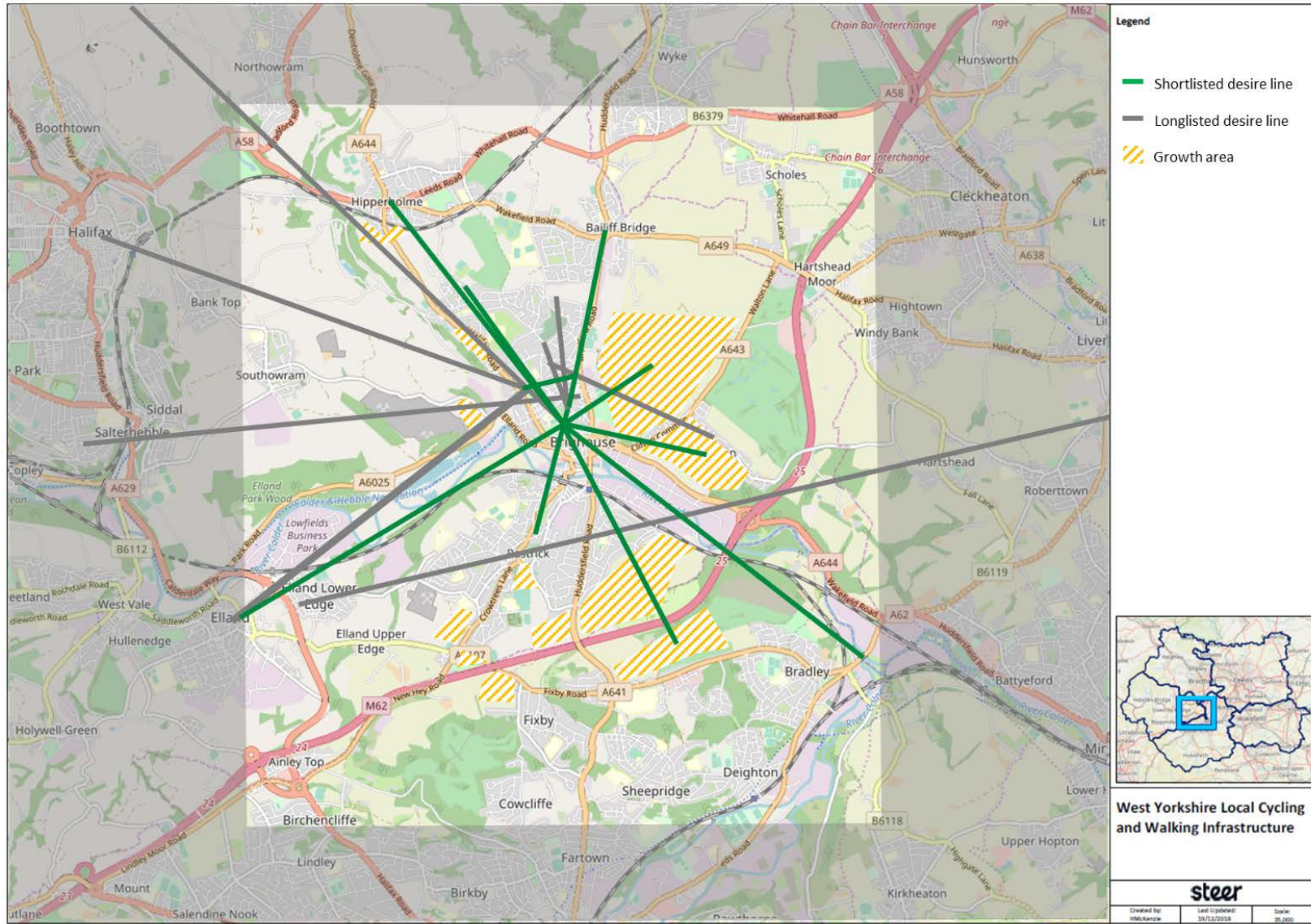


Table 3.3: Shortlisted desire lines in Brighouse in order of priority to increase cycling (based on available data)

| Desire line | | Existing demand | | | Potential (H: High, M: Med, L: Low) | | | Demographics | | Growth area | Workshop priority | Rationale |
|-------------|--------------------------------------|----------------------|-----------------------|--------|-------------------------------------|-----------------------|-----|--------------------|--------------------|-------------|-------------------|---|
| | | PCT (OD desire line) | PCT (on route sample) | Strava | PCT (no of cyclists) | PCT (on route sample) | CPI | Population density | Employment density | | | |
| 1 | Bailiff Bridge to Brighouse | 3 | 38 | H | 27 | 711 | M/H | M/H | M/H | Yes | Yes | Highest existing and potential demand route. Has the potential to support both the residential areas to the west of the A641 and new housing to the east (Brighouse Garden Suburb) |
| 2 | Rastrick to Brighouse | N/A | 21 | H | 16 | 375 | M/H | M | M/H | Yes | | High existing demand likely to be catering for longer distance trips from the south west but also trips to schools. Second highest potential demand. |
| 3 | Hove Edge to Brighouse | 1 | 34 | H | 12 | 283 | M | M | M/L | Yes | Yes | High potential in its own right and an enabler to longer distance trips to Hipperholme and Halifax. Links various schools – including Brighouse High School – to the town centre |
| 4 | Hove Edge to Hipperholme | N/A | 34 | H | 7 | 269 | H | M | M/H | Yes | Yes | A short extension from Hove Edge to Hipperholme, with some existing demand from Hipperholme and longer trips from Halifax. High CPI and links to strong cluster |
| 5 | A644 to A641 orbital link | 1 | 20 | M | 14 | 205 | M | M/H | M/H | | | A short orbital link with high potential demand. Would provide a useful link between routes 1 and 3, which would benefit the network |
| 6 | Clifton to Brighouse | 3 | 24 | H | 10 | 144 | M/H | M/L | M | Yes | | High existing demand and good potential demand. Links to education and recreational nodes. Would provide a key link to new residential development and employment - forthcoming plans and data to be factored in to future prioritisation. |
| 7 | Woodhouse to Brighouse | 1 | 23 | H | 7 | 360 | M | M/L | L | | Yes | Some existing demand, mostly catering for longer distance trips from the south. Medium potential demand. Will provide a key link to new residential development Forthcoming plans and data to be factored in to future prioritisation. |
| 8 | Elland to Brighouse via River Calder | 3 | 28 | H | 2 | 206 | M/H | L | M/L | | Yes | Primarily a leisure route along the river with limited potential as a high frequency route, but already part of network, high existing demand and local support |
| 9 | Brighouse to Brighouse Garden Suburb | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Yes | | Will provide a key link to new residential development - a new garden suburb to the north east of Brighouse town centre. A significant development |

| | | | | | | | | | | | | |
|-----|----------------------|-----|-----|-----|-----|-----|---|---|-----|--|-----|---|
| | | | | | | | | | | | | site for Brighouse - forthcoming plans and data to be factored in to future prioritisation. |
| 10. | Brighouse to Bradley | N/A | N/A | M/L | N/A | 139 | M | L | M/L | | Yes | Primarily a leisure route along the river and part of the planned cycle network. Limited potential as a high frequency route but identified as a priority as part of wider connectivity to neighbouring settlements in Kirklees. A business case to secure funding to develop and deliver this scheme is currently under development. |

Identifying a priority route

3.23 One priority route was identified for Brighouse, formed by joining desire line 1 – Bailiff Bridge to Brighouse and 2 – Rastrick to Brighouse. This was informed by the prioritisation of shortlisted desire lines and consideration of desire line convergence, where two or more run closely in parallel and may cater for greater cycling demand together as a result. Calderdale Council’s aspirations were also factored in to decision, notably the desire to future-proof connections to future growth areas and to improve cycling links across the river and to Brighouse station. The priority route chosen is:

- Bailiff Bridge to Rastrick via Brighouse

3.24 The desire lines selected had overlapping high existing and potential cycle demand and were identified as key desire lines in the stakeholder workshop.

3.25 In developing a coherent network, there is also an opportunity to join these desire lines together through Brighouse town centre to form a longer north-south route, which would be the spine of the cycle network. As a full route, this would form Bailiff Bridge to Rastrick via Brighouse. The route would connect numerous schools, jobs, amenities and should include a short spur to Brighouse train station.

3.26 Progressing this route would draw attention to significant severance in Brighouse town centre, which consists of high traffic volumes, little cycling infrastructure provision and multi-lane junctions which may be perceived as dangerous by less confident cyclists. Addressing severance in the town centre will be fundamental to creating a coherent and permeable cycle network in Brighouse.

3.27 The route alignment options are shown in Figure 3.4. This map also shows a planned off-road future route that would follow a disused rail line to the east of Bradford Road, which would complement this route and provide an additional link to the garden suburb.

3.28 Route alignment appraisal is shown in Figure 3.5. Please note that the planned route along the old railway line has not been subject to detailed feasibility work at the time of publication. However, this route has been specifically acknowledged in Policy IM3 (‘Safeguarding Transport Investment [...] Safeguarding Disused Railway Lines’) and the Policies Map of the publication draft Calderdale Local Plan which should offer some form of protection for a future route.

Selecting route alignment options

3.29 To identify alignment options and to assist in appraisal, the route was split in to three sections: Bailiff Bridge to Brighouse, Brighouse town centre and Rastrick to Brighouse. For this route, alignment Option 1 provides the most direct alignment, which normally utilises primary transport corridors and requires a higher level of intervention. Option 2 provides a less direct route – or route sections – that normally also makes use of secondary transport corridors, back streets, green spaces and waterways.

3.30 The two alignment options were then appraised to inform decision makers as to which might be taken forward for delivery in the future. In some cases, route sections may be interchangeable – such as each option north or south of Brighouse centre – which means that there is some flexibility.

Appraising route alignment options

- 3.31 To appraise the alignment options, the principles of the Department for Transport's Route Selection Tool were applied to compare each option. This was done using the key indicators from the tool across the three main route sections. The key indicators, measurements, sources of data and LCWIP application are outlined in Table 3.4 below.

Table 3.4: Route appraisal inputs and application

| Key indicator | Measurement | Source | LCWIP application |
|----------------------------|---|-----------------------------------|--|
| Directness | Comparison between alignment lengths | GIS/online mapping | Measure alignments – the shortest is the most direct |
| Gradient | Profile of gradient | Online cycle route planning tools | Note overall change in gradient and hilliness – the lowest incline and steepness is generally more cyclable |
| Connectivity per km | Number of adjoining side roads | GIS/online mapping | Count side roads and note their quantity per km – a higher number is a general indication of higher connectivity |
| Critical junctions | Number across the route (including: potential conflict with heavy / fast traffic, pinch points at junctions, congested conditions reducing visibility, roundabouts without cycle provision) | GIS/online mapping | Count all junctions that meet the critical junction criteria – a lower number means that the existing route is generally safer to cycle, whereas a higher number indicates that more difficult junctions need to be addressed to improve safety, which will impact on feasibility and cost |

Figure 3.4: Priority cycle route: Bailiff Bridge to Rastrick via Brighouse

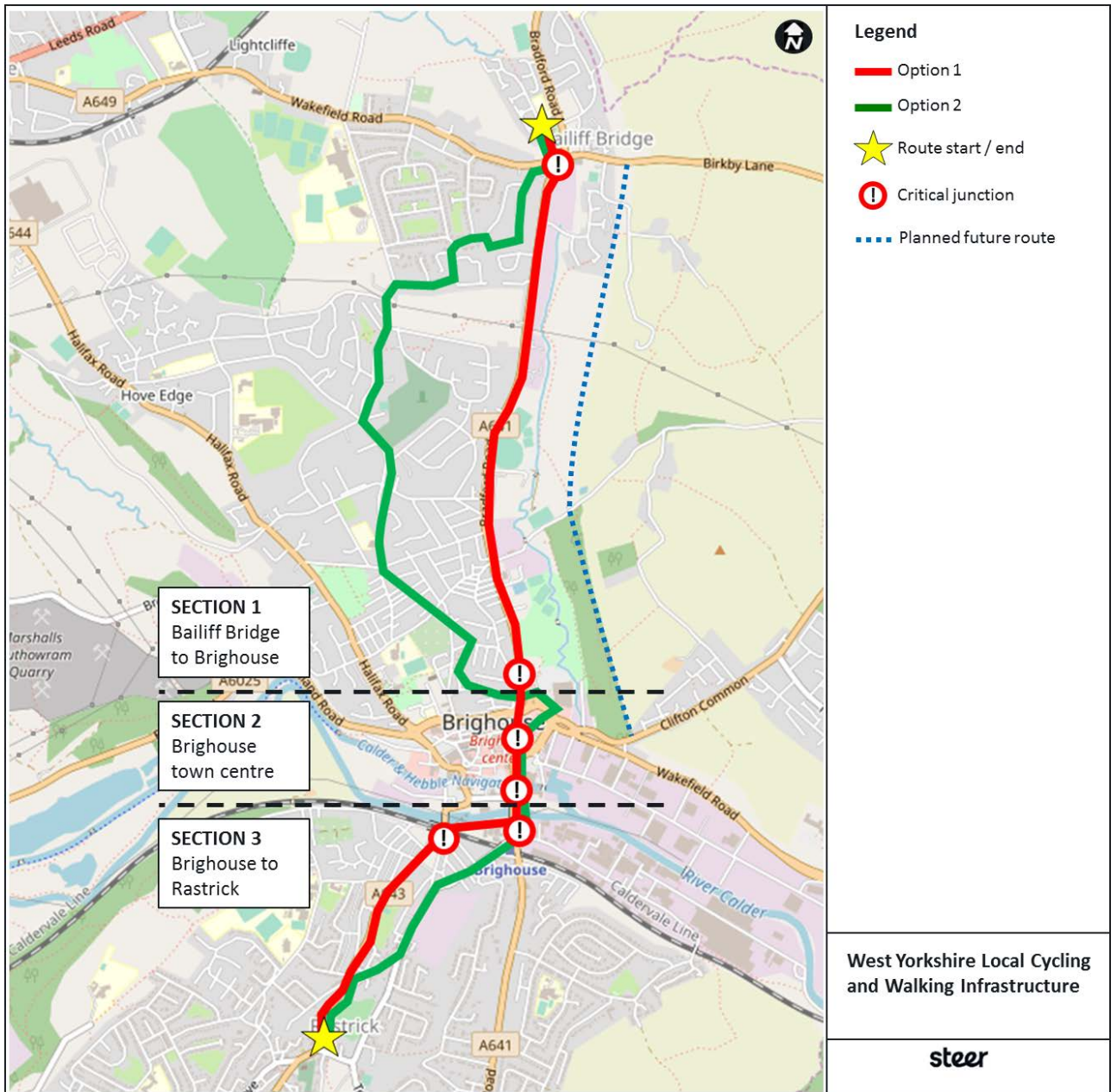










Figure 3.5: Priority cycle route alignment appraisal

| FULL ROUTE | Length (km) | Gradient | Connections per km | Critical junctions |
|-----------------|-------------|---|--------------------|--------------------|
| Option 1 | 4.2 | † 50 m · ‡ 29 m  | 14.8 | 4 |
| Option 2 | 5.0 | † 84 m · ‡ 63 m  | 16.8 | 3 |
| SECTION 1 | Length (km) | Gradient | Connections per km | Critical junctions |
| Option 1 | 2.33 | † 0 m · ‡ 25 m  | 15.0 | 2 |
| Option 2 | 3.20 | † 34 m · ‡ 59 m  | 15.9 | 0 |
| SECTION 2 | Length (km) | Gradient | Connections per km | Critical junctions |
| Option 1 | 0.51 | † 3 m · ‡ 4 m  | 19.6 | 2 |
| Option 2 | 0.51 | † 3 m · ‡ 4 m  | 19.6 | 2 |
| SECTION 3 | Length (km) | Gradient | Connections per km | Critical junctions |
| Option 1 | 1.36 | † 47 m · ‡ 0 m  | 12.5 | 0 |
| Option 2 | 1.25 | † 47 m · ‡ 0 m  | 18.4 | 1 |

Walking network analysis

The LCWIP process and walking network development good practice

- 3.32 LCWIP Technical Guidance sets out a recommended approach to developing a future walking network and identifying infrastructure improvements. It stresses that in many cases comprehensive walking networks already exist, but that people may be deterred from walking routes due to severance issues, such as the need to cross roads or because facilities are poorly designed or maintained.
- 3.33 The main focus of the LCWIP is to improve, and in some cases extend, the existing walking network to encourage more people to take short trips on foot.
- 3.34 The key outputs of the LCWIP process for walking are:
- A walking network map, showing preferred routes and zones for further development
 - A programme of walking infrastructure improvements required to achieve suitable standards

Methodology

- 3.35 Overall, the steps taken to develop the walking network were:
1. Data analysis
 2. Stakeholder engagement
 3. Identifying key walking routes
 4. Auditing key walking routes and identifying barriers

Data analysis

- 3.36 To ensure an evidence-based approach, a wide range of data were analysed to determine the key routes and zones for improvements to enable more walking trips as outlined in Table 3.5. Analysis focused on three areas:

Local population

- 3.37 Understanding the characteristics and travel behaviours of the local population, as well as planned development. This information was used to gauge the walking journeys that people are likely to make now and in the future.

Points of interest

- 3.38 Identifying key destinations that people need to get to – such as schools, hospitals, employment sites, leisure facilities and bus or train stations. When considering that journeys begin at home in residential areas, the likely walking routes between origins and destinations can be identified. They provide the desire lines for local journeys. These destinations – or points of interest – were also clustered to indicate where they are located in high densities, which is likely to attract more journeys.

Existing walking demand

- 3.39 Understanding where people currently walk, so that the network can be planned to improve conditions for those that already walk, while making it more attractive to encourage more walking trips. This can be understood by using 2011 Census data, which indicates walking trips to work.

Stakeholder engagement

- 3.40 A stakeholder street audit was carried out by Living Streets – the UK charity for everyday walking – on behalf of Steer. This also provided an opportunity for stakeholder input, which supported the process of developing key walking routes and recommendations for improvements.
- 3.41 The street audits are a roving consultation exercise, gathering feedback on the local walking environment while walking with local stakeholders. This allowed participants to comment on and capture their live experience of walking the route. A follow-up workshop captured the most salient points and allowed participants to comment on wider issues that might otherwise have been missed. Comments from participants were used to capture the main barriers to walking and to translate observations into recommendations for infrastructure improvements to enhance the walkability of the area as described later in this section.
- 3.42 The audit took place in December, with attendees including representatives from Calderdale Council, WYCA, Halifax Opportunities Trust, Active Calderdale and local government in Park Ward. The area of focus and route was agreed between all parties prior to the audit and designed to make the most efficient use of stakeholder time by incorporating the key routes and crossing points into Halifax Town Centre from Park Ward, while allowing enough opportunity for meaningful discussion. This means that other routes in the Core Walking Zone and areas of interest within the 2km catchment were not assessed as part of this work. Further assessment would be needed to cover other areas.

Table 3.5: Data analysed in developing the walking network in Halifax

| Theme | Source | Insight | LCWIP application |
|--------------------------------|-------------------------------|--|---|
| Local population | Population density | Identifying trip origins and areas most needing to be served by the network | Provided confidence in identified routes |
| | Employment density | Identifying trip origins and areas most needing to be served by the network | Provided confidence in identified routes |
| | Car ownership | Potential for switchable trips by location | Non-insightful – high car ownership across whole area |
| | Journeys to work | Identifying proportion of journeys within reasonable walking distance, by area | Provided confidence in identified routes and potential to switch trips to walking |
| | Growth areas | Identifying areas that need to be served by the network in future | Informed identification of barriers and programme of improvements needed |
| Points of interest | GIS-identified destinations | Identifying key destinations | Informed plotting / selection of OD mapping |
| | GIS clustering | Identifying key clusters and density of destinations | Informed plotting / selection of OD mapping |
| Existing walking demand | 2011 Census | Identifying existing walking demand for journeys to work | Used to identify and quantify desire lines for existing walking trips to work, notably to the core walking zone |
| Stakeholder engagement | Key routes | Local knowledge of key routes for walking | Incorporated in to network planning |
| | Barriers | Local knowledge of barriers to walking | Incorporated in to network planning and programme of improvements |
| | Points of interest | Local knowledge of key destinations in and around the core walking zone | Incorporated in to network planning and programme of improvements |
| | Living Streets interpretation | Expert development of key routes and programme of improvements | Provided confidence and input in to network planning and programme of improvements |

Developing the walking network in Halifax

Identifying key walking routes

- 3.43 Halifax town centre forms the Core Walking Zone for this initial LCWIP phase. The focus is on key walking routes into Halifax town centre from Park Ward to the west, seeking to overcome severance by the A58. As per the LCWIP Technical Guidance, all routes within the western area of focus were considered within 2km of the core walking zone (Halifax town centre).
- 3.44 There are a number of radial routes between Park Ward and Halifax town centre, which form the key links between this densely populated area and the core walking zone. In particular, Pellon Lane and Gibbet Street were highlighted by stakeholders as the primary routes into Halifax. Other secondary radial routes were identified and added to the walking network plan.
- 3.45 Two orbital routes also emerged as important for the walking network: New Brunswick Street and Cow Green. New Brunswick Street provides a link between Pellon Lane and Gibbet Street, and Cow Green needs to be crossed to enter the town centre by all radial routes.
- 3.46 The walking routes were classified as follows:

| Walking route | Route type | Street |
|---------------------------------|------------|----------------------|
| Primary walking routes | Radial | Pellon Lane |
| | | Gibbet Street |
| | Orbital | New Brunswick Street |
| | | Cow Green |
| Secondary walking routes | Radial | Hopwood Lane |
| | | Lister Lane |
| | | King Cross Street |

Auditing key walking routes and identifying barriers

- 3.47 The key walking routes were first audited as part of the stakeholder route audit and workshop activity with additional auditing undertaken by Living Streets Technical Advisor. Local stakeholders and representatives from Steer, Living Streets, WYCA and Calderdale Council worked together to assess and agree the primary and secondary routes for Park Ward. The group also provided qualitative assessments of the current conditions for walking on each route, the barriers inhibiting more walking trips being made and suggestions for improvements.
- 3.48 When auditing walking routes, stakeholders were asked to consider attractiveness, comfort, directness, safety and coherence. By noting the nature of any instances where the routes or particular locations along routes did not perform well against these factors, we were able to establish the following main types of barrier:
1. High traffic volumes
 2. High traffic speeds, especially around corners
 3. Poor pavement conditions and maintenance
 4. Pavement obstructions
 5. Poor or no formal crossing provision

6. Long wait times for crossing
7. Personal safety concerns, including poor lighting and visibility
8. An unattractive walking environment

3.49 On assessment of the identified barriers, the following key intervention sites were prioritised as follows:

1. Access to Dean Clough
2. Pellon Lane to Beech Hill connectivity
3. Ring Road permeability (Pellon Lane, Gibbet Street and New Brunswick Street)
4. Orange Street to Broad Street connectivity
5. Gibbet Street to town centre connectivity

The key walking routes and intervention sites are shown in Figure 3.6.

Programme of improvements for walking

3.50 Eight different interventions have been suggested to improve conditions for walking across Park Ward. For each intervention, recommended infrastructure has been outlined, as well as indicative costs and timescales for delivery.

3.51 Table 3.6 comprises a programme of infrastructure improvements for walking in Park Ward in order to achieve suitable standards to encourage more walking trips in Halifax.

Figure 3.6: Halifax key walking routes and intervention sites

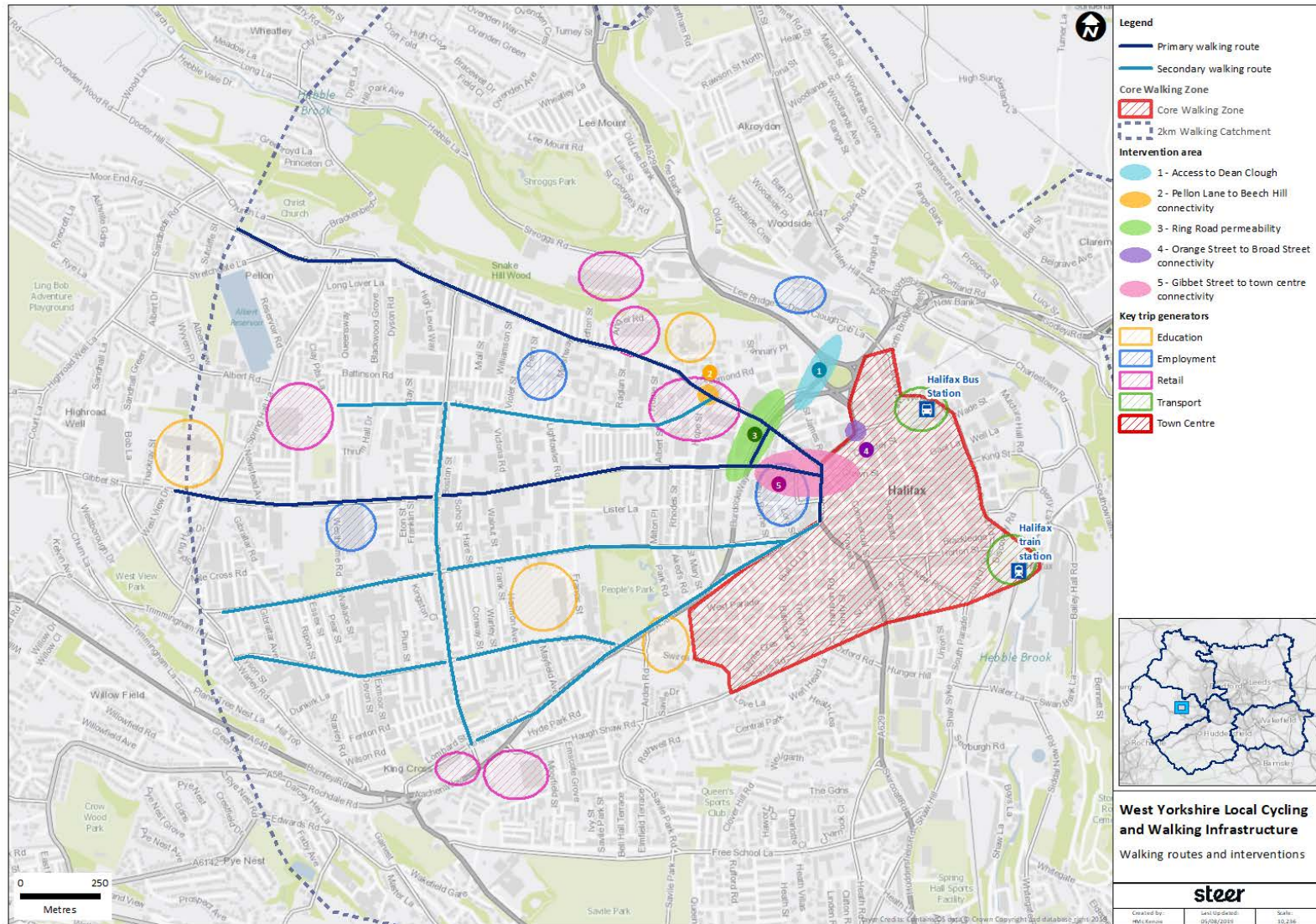


Table 3.6: Summary of walking interventions with indicative costs and timescales

| Intervention | Intervention scale | Intervention | Intervention type | Cost estimate | Timescale |
|--|--------------------|---|--|--|---|
| 1. Improve access from town centre to Dean Clough and Beech Hill areas | Location-specific | <ul style="list-style-type: none"> a. Pedestrian overbridge b. Surface level signalised crossing points c. Reduce foliage and repaint subways d. Open out subway entrances and exits e. Wayfinding and interpretation boards | <ul style="list-style-type: none"> a. Highway / footway b. Highway / footway c. Walking environment d. Walking environment e. Walking environment | <ul style="list-style-type: none"> a. £1m-£1.5m b. £50k-£62k each c. £5k-10k d. Subject to local study e. Subject to local study | <ul style="list-style-type: none"> Long Medium Short Short Medium |
| 2. Improve pedestrian access across Pellon Lane and connection to Beech Hill | Location-specific | <ul style="list-style-type: none"> a. Zebra crossing at Hanson Lane | <ul style="list-style-type: none"> a. Highway / footway | <ul style="list-style-type: none"> a. £20k-£33k | <ul style="list-style-type: none"> Medium |
| 3. Improve pedestrian access along Gibbet Street, Pellon Lane and along New Brunswick Street and Burdock Way to enhance connectivity around ring road and along key routes | Location-specific | <ul style="list-style-type: none"> a. Raised table crossing with markings at New Brunswick Street/Gibbet Street b. Build outs to reduce junction width at New Brunswick Street/Gibbet Street c. Signalised pedestrian crossings at Burdock Way/Pellon Lane on all arms d. Restrict access to vehicles from Richmond Street to New Brunswick Street e. Continuous footway across Richmond Street f. Modal filter cell for cycle access | <ul style="list-style-type: none"> a. Highway / footway b. Highway / footway c. Highway / footway d. Highway / footway e. Highway / footway f. Highway / footway | <ul style="list-style-type: none"> a. £14k b. Subject to local study c. £50k-£62k each d. Subject to local study e. £10k-£20k f. £150-350 each | <ul style="list-style-type: none"> Medium Medium Medium Short Medium Medium |
| 4. Adjust signal timings to improve accessibility at Broad Street / Orange Street intersection | Location-specific | <ul style="list-style-type: none"> a. Reduce pedestrian wait time and lengthen pedestrian green phase b. Introduce pedestrian all-green phase with diagonal crossing markings | <ul style="list-style-type: none"> a. Highway / footway b. Highway / footway | <ul style="list-style-type: none"> a. Subject to local study b. Subject to local study | <ul style="list-style-type: none"> Short Short |

| Intervention | Intervention scale | Intervention | Intervention type | Cost estimate | Timescale |
|--|--------------------|---|--|---|--|
| 5. Improve access and amenity at eastern end of Gibbet Street | Location-specific | <ul style="list-style-type: none"> a. Brighter LED lighting b. Sealed path to north of tower block connecting to new crossing point c. Wayfinding along length of Gibbet Street d. Local business engagement | <ul style="list-style-type: none"> a. Highway / footway b. Highway / footway c. Walking environment d. Complementary measure | <ul style="list-style-type: none"> a. £2.6k-3.2k per column a. £200 per metre b. Subject to local study c. Subject to local study | <ul style="list-style-type: none"> Medium Short Medium Short |
| 6. Improve perception of safety through brighter lighting | Area-wide | <ul style="list-style-type: none"> a. Install LED lighting across the core walking zone and surrounding area with supplementary task lighting where required | <ul style="list-style-type: none"> a. Highway / footway | <ul style="list-style-type: none"> a. £2.6k-3.2k per column | <ul style="list-style-type: none"> Medium |
| 7. Improve perception of safety and walkability through footway maintenance and repair | Area-wide | <ul style="list-style-type: none"> a. Audit all existing footway to identify areas requiring repair or maintenance and locations lacking level access b. Repairs to footway and crossing points c. Raised table crossings at side roads to replace dropped kerbs | <ul style="list-style-type: none"> a. Highway / footway b. Highway / footway c. Highway / footway | <ul style="list-style-type: none"> a. Subject to local study b. £200 per metre c. £14k per crossing | <ul style="list-style-type: none"> Short Medium Medium |
| 8. Enhance sense of community and reduce vehicle speeds through Park Ward | Area-wide | <ul style="list-style-type: none"> a. Gateway treatments at key access routes to Park Ward b. Modal filter treatment across Park Ward to restrict vehicle access, including pedestrianisation of lower portion of Hopwood Road | <ul style="list-style-type: none"> a. Walking environment b. Highway / footway | <ul style="list-style-type: none"> a. £7k-£8k b. Subject to local study | <ul style="list-style-type: none"> Short Long |

*The proposed interventions are intended to be used for prioritising schemes to take forward for delivery, with full design and costing to be done at a later stage. There is no national guidance on cost estimates for walking infrastructure. Indicative cost estimates were informed by Wiltshire Council Highways (2017) *Costs of highway works*, Glasgow Anderston 'Bridge to Nowhere' constructed in 2013 for intervention 1a and data from Borough of Poole Council (2019) for intervention 3e. All cost estimates subject to feasibility and design and may be higher or lower when taken forward for delivery. In some instances, cost efficiencies might be found by delivering schemes as part of a holistic area-based approach, rather than on a scheme-by-scheme basis.

Control Information

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