

Guildford Borough Council

**Guildford Town and Approaches
Movement Study**

**Scenario Analysis and Appraisal of
Interventions Report**

Final Updated | March 2015

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 232012-00

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Appendix A

Appraisal of Interventions - 2050

Executive Summary

Arup was appointed by Guildford Borough Council (GBC) in July 2013 to undertake the **Guildford Town and Approaches Movement Study (GTAMS)**. The aim of the study was to develop a recommended long term movement strategy to 2050 for the town of Guildford. This will inform the development of a new Local Plan for the Borough for the period to 2031.

This report presents the findings of the third and fourth stages of the study, the **Scenario Analysis of Transport Futures Stage** and the **Appraisal of Interventions and Packages Stage**.

The study **vision** for sustainable mobility in Guildford in 2050 was used as the basis for the scenario analysis. Only interventions that aligned well with the vision were included within the GTAMS strategy.

The **inventory of interventions** was populated through review of the Invitation to Tender (ITT), key local documents, academic papers, and other regional, national and international sources. The interventions in the consolidated long list were scored against the main elements of the vision in order to produce a shortlist of interventions.

The approach to **scenario analysis** was to identify infrastructure interventions to be assessed individually, and to identify scenarios that comprise packages of interventions to be assessed together. The shortlist of interventions was reviewed, with each intervention allocated to one of the following scenarios:

- **Intermediate and Major Highway Infrastructure Interventions:** appraised individually to understand the impacts, for example: A3 bypass;
- **Sustainable Transport Interventions:** likely to increase the mode share of sustainable modes (walking, cycling, public transport), and conversely reduce the car mode share, for example: major public transport schemes; and
- **Other Interventions:** interventions that do not fall under the previous two categories and that cannot easily be represented in the SINTRAM strategic highway model, for example: rail improvements to regional locations.

The **appraisal process** was needed to assess which of the interventions or packages of interventions identified in the previous Scenario Analysis stage best support the vision for sustainable mobility in Guildford in 2050. It involves a mix of quantitative and qualitative assessment against the study metrics.

The metrics cover a range of criteria that contribute towards the different elements of the vision. The performance of each metric was assessed against the Business-As-Usual scenario to determine the general trend (positive or negative) and scale of impact. This assessment indicates which interventions perform better against the metrics and should therefore be taken forward into a preferred scenario. The main tool available to inform the quantitative assessment was Surrey County Council's SINTRAM strategic highway model. SINTRAM has been used on a number of studies to appraise interventions, packages of interventions, and alternative demand and mode shift scenarios in Guildford.

The qualitative assessment was undertaken using information already available for this study, such as previous studies and Guildford-specific data, combined

with the study team's professional experience and judgement from other similar projects.

The full appraisal results are included in Chapter 4 for 2031 (and Appendix A for 2050).

The **appraisal results** clearly show that all of the Sustainable Transport Intervention scenarios (including the Sustainable Movement Corridor, which was appraised individually) perform significantly better than either the Intermediate and Major Highway Infrastructure or the Other Interventions. The Other Interventions, which are largely rail interventions serving more regional travel needs, score well, and better than the Intermediate and Major Highway Infrastructure Interventions.

The deliverability results also demonstrate that the Sustainable Transport Interventions should be more acceptable and feasible to deliver than the Intermediate and Major Highway Infrastructure Interventions. They also present more opportunity for quick win schemes (i.e. schemes that can be delivered in the short term that contribute towards the overall strategy). Overall, this indicates that the Sustainable Transport Interventions packages would have higher benefits and are more deliverable than the Intermediate and Major Highway Infrastructure Interventions.

Considerations for the movement strategy are included in Chapter 7. The movement strategy delivers the vision for sustainable mobility in Guildford. As it supports a long term vision, the strategy needs to be flexible and adaptable to change. Therefore, it should not be a detailed plan, but rather a framework that provides direction for the development of the movement system in Guildford to 2050. As Guildford and the surrounding world change, the strategy elements will need to adapt, but the overall framework should remain constant.

The movement strategy comprises the preferred interventions from the appraisal process. These have been selected using a multi-criteria approach, focused on supporting the 2050 vision for sustainability mobility in Guildford. The appraisal has not focused purely on the economic case for each intervention, but on the wider benefits to the town's economy, the environment, the people in Guildford, and the town's role in the region.

To support the delivery of the vision for sustainable mobility in Guildford in 2050, the appraisal indicated that the best approach was to include a range of sustainable transport interventions in the following categories:

- **Public transport** - new system, expanded park-and-ride, enhanced bus services with priority, better integration;
- **Walking** - new and enhanced routes, development of a network, enhanced environment;
- **Cycling** - cycle superhighways with better facilities for cyclists in the town, including bike hire and sharing schemes;
- **Public realm improvements** - improved streetscape and wayfinding;
- **Demand management** - through car hire and sharing schemes, use of parking charges, encouragement of remote working, and a smarter choices programme to encourage use of more sustainable modes of travel; and

- **Regional links** - strengthening transport links to and from Guildford to other Surrey towns, to London, to Heathrow and Gatwick airports, and to other national and international connections.

The extent and location of these interventions in the town was considered further in the Strategy and Recommendations Stage. This sets out the movement strategy for Guildford, comprising the framework of key principles, the interventions needed to enable the vision, and the implementation programme for the strategy. It also presents indicative costs and benefits for interventions, as well as funding constraints and the potential scope of work for further development.

1 Introduction

1.1 Context

Arup was appointed by Guildford Borough Council (GBC) in July 2013 to undertake the Guildford Town and Approaches Movement Study (GTAMS).

The aim of the study was to develop a recommended long term movement strategy to 2050 for the town of Guildford. This will inform the development of a new Local Plan for the Borough for the period to 2031.

This report presents the findings of the third and fourth stages of the study, the Scenario Analysis of Transport Futures Stage and the Appraisal of Interventions and Packages Stage.

1.2 Scope of this Report

The report covers the following areas:

- Scenario analysis (Chapter 2);
- Appraisal process (Chapter 3);
- Appraisal of interventions (Chapter 4);
- Summary of appraisal (Chapter 5);
- Preferred interventions (Chapter 6);
- Considerations for the movement strategy (Chapter 7); and
- Next steps for the project (Chapter 8).

2 Scenario Analysis

This chapter describes the scenario analysis stage of the study.

2.1 Vision for Sustainable Mobility in Guildford in 2050

The headline vision for sustainable mobility in Guildford in 2050 was used as the basis for the scenario analysis and is presented below for reference.

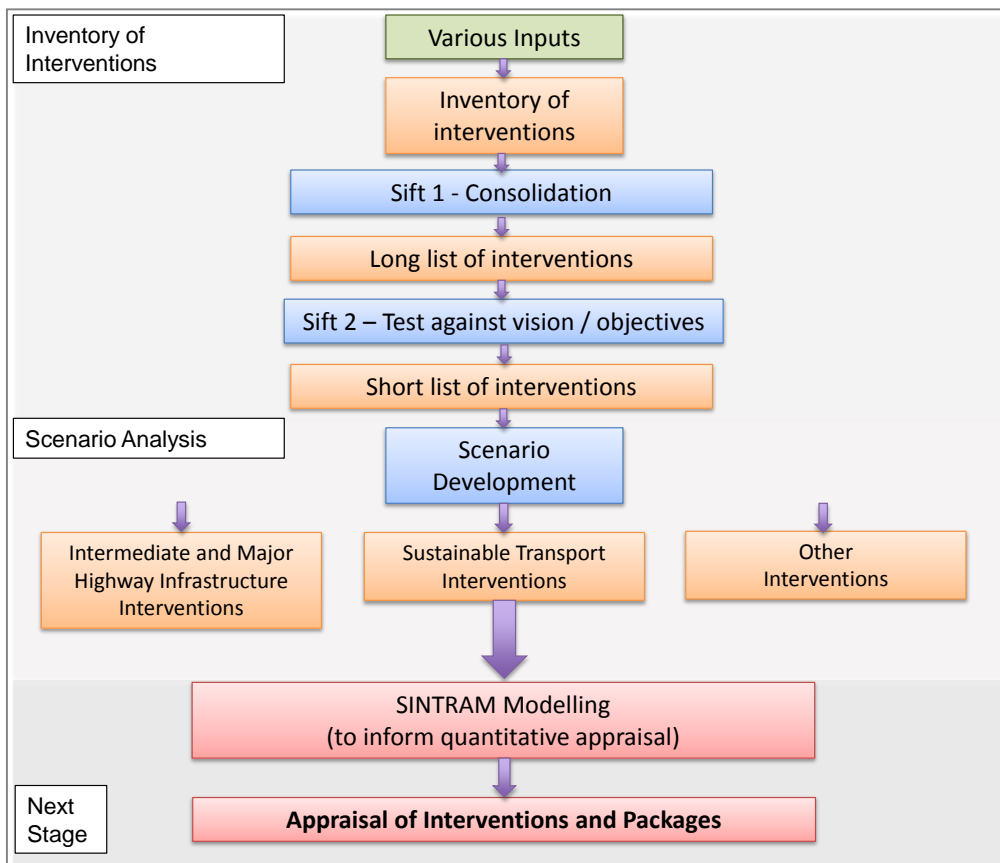
The transport system in 2050 will sustain Guildford as a centre of excellence with: an attractive and thriving town centre; an innovative world-class high-tech employment sector; a high-quality resilient environment; an engaged, healthy and prosperous community; and excellent connections, locally, regionally, and internationally via airports and high speed rail links.

2.2 Approach

Only interventions that align well with the vision and objectives are included within the GTAMS strategy.

Figure 1 summarises the approach that has been adopted for the scenario analysis stage, which includes the intervention long and short lists, and scenario analysis.

Figure 1: Scenario Analysis Approach



2.3 Inventory of Interventions

2.3.1 Long List of Interventions

The inventory of interventions was populated through review of the Invitation to Tender (ITT), key local documents, academic papers, and other regional, national and international sources.

The full list of sources consulted is provided in **Table 1** and the abbreviations are used for reference within the shortlist in Tables 3 and 4. Sources italicised were consulted but were not used as a basis for any interventions; as such, an abbreviation is not provided.

Table 1: Inventory of Interventions: Information Sources

| Source | Abbreviation |
|--|--------------|
| Local Sources on- Guildford and Surrey | |
| Invitation To Tender (GBC, June 2013) | ITT |
| Guildford Borough Local Plan (GBC, January 2003) | GBLP2003 |
| Draft Local Plan - Item 11 (1b) - Local Plan Strategy and Sites Issues and Options (GBC, October 2013) | DLP20131b |
| Guildford Strategic Parking Strategy – Stage 1: Parking Demand (SDG, August 2012) | GSPS1 |
| Guildford Strategic Parking Review – Stage 2 (SDG, November 2012) | GSPS2 |
| A3 Surrey Corridor Study: Strategic Report (Parsons Brinkerhoff and the Highways Agency, March 2009) | A3SCS |
| Guildford Borough Infrastructure Baseline (GBC, July 2013) | GBIB |
| Guildford Economic Strategy 2013-2031 (University of Surrey, July 2009) | GES |
| Rethinking Guildford's one-way gyratory system exhibition boards (draft, SCC, May 2013) | RGGS |
| Traffic, Pedestrians & Cycle movements in and around the Guildford Town Centre (Bibhas Neogi, December 2012) | BN |
| Guildford Bus Station Study Issues and Options Report (MVA, October 2011) | GBSS |
| Guildford Town Centre Strategic Development Study (Cushman & Wakefield, March 2010) | GTCSDS |
| Guildford Interim Town Centre Framework (GBC, September 2012) | GITCF |
| Avoid Future Gridlock: Suggestion by the Guildford Society Transport Group for measures to relieve some of Guildford's Transport problems (April 2013) | AFG |
| London and South East Route Utilisation Strategy (Network Rail, July 2011) | LSERUS |
| Emerging options and refinements to replacement Bus Station Designs (MVA, April 2012) | EORRBS |
| Surrey Transport Plan – Implementation and Finance module (SCC, April 2011) | SLTP3 |
| <i>Guildford Borough Preliminary Growth Scenarios Transport Assessment Report (SCC, August 2013)</i> | - |
| <i>Guildford Economic Development Study (GBC, 2009)</i> | - |
| <i>Guildford Town Centre TRANSYT Network (MVA, 2012)</i> | - |

| Source | Abbreviation |
|---|--------------|
| <i>Guildford Society's proposals for Guildford gyratory (Guildford Society, Feb 2013)</i> | - |
| <i>Guildford and Woking Integrated Transport Study: Summary (SCC, 2006)</i> | - |
| Academic and Research Papers | |
| Spatial Planning and the Demand for Travel (Hickman et al 2011) | SPDT |
| Digital-Age Transportation: The Future of Urban Mobility (Fishman, Deloitte) | DAT |
| Planning for Sustainable Travel: Summary (CfIT 2009) | PFST |
| Visioning and Backcasting for UK Transport Policy (VIBAT) (DfT 2006) | VBTP |
| Online TDM Encyclopaedia (VTPI 2013) | VTPI |

The Arup project team also added a number of interventions which were not covered in the sources consulted. In total, around 300 potential interventions were identified.

2.3.2 Consolidating the Long List

An internal consultant workshop was held to decide from the original intervention inventory which interventions would be carried through to the consolidated long list. This took the total number of potential interventions from over 300 to around 100.

This consolidation process removed interventions based on the following:

- If the intervention was duplicated by another intervention (e.g. ‘Changes to the existing A3 corridor through Guildford – widening’);
- If the intervention could be grouped with other comparable interventions (e.g. there were several interventions covering smartcards, contactless or integrated public transport ticketing, better value travel cards – all could be grouped into a single intervention at this stage, or there were various new park-and-ride facility proposals that can be grouped as one intervention);
- If the intervention was very localised and small scale for a long term strategy (e.g. new cycle parking facilities at a specified location);
- If the intervention was too general (e.g. travel information);
- If the intervention was completely out of the control of Guildford Borough Council or its partners (e.g. ecological tax reform);
- If the intervention could not be specified clearly as an intervention, but was rather a guiding principal or approach (e.g. contingency-based planning); or
- If the intervention was already a committed scheme or initiative.

All interventions are presented in the next section, either in the shortlisted or non-shortlisted tables.

2.3.3 Shortlisting of Interventions

The interventions in the consolidated long list were appraised against the main elements of the vision in order to produce a shortlist. This was achieved through

highlighting the foci of the vision, and establishing criteria that can be scored, as shown in **Table 2**.

Table 2: Shortlisting Approach

| Vision Statement Element | Focus | Criteria |
|--|--------------|---|
| An attractive and thriving town centre | Town Centre | Attractive Thriving |
| An innovative world-class high-tech employment sector | Employment | Innovative High-Tech |
| A high-quality resilient environment | Environment | High-Quality Resilient |
| An engaged, healthy and prosperous community | Community | Engaged Prosperous |
| Excellent connections, locally, regionally, and internationally via airports and high speed rail links | Connectivity | Locally-Connected Regionally-Connected |

Each intervention on the shortlist was assessed using a range between -3 to +3:

- -3: the intervention is expected to have a significantly negative impact for this criterion;
- 0: the intervention is expected to have a neutral impact for this criterion; and
- +3: the intervention is expected to have a significantly positive impact for this criterion.

Interventions scoring highly were included on the shortlist; in total, 36 interventions were shortlisted.

The initial intervention scoring exercise was done by two Arup project team members. These initial scores were then passed to the Project Manager to be reviewed and moderated, and following this stage of the process the consultant review group met together to finalise intervention scores for the purpose of shortlisting.

Because this was the first stage in reducing the number of interventions from the long list, the resource applied to this task was necessarily limited. The approach chosen was considered proportionate in order to identify which interventions to shortlist for more rigorous, appraisal-type testing.

Guildford Borough Council input and guidance was provided through the analysis process. Despite their lower scoring in the shortlisting process, the Council requested that several interventions be tested in the scenario analysis stage. The opportunity for the Council to request the inclusion of extra interventions for the more detailed scenario analysis stage also offered a ‘sense check’ on the shortlisting of interventions. These additional interventions are included in the shortlist alongside interventions shortlisted through the initial shortlisting process described above.

The interventions that the Council requested be tested in the scenario analysis stage were as follows:

- The closure of Walnut Tree Close to through traffic;
- Reinstatement of rail services along the corridor between Cranleigh and Guildford;
- Changes to the existing A3 corridor through Guildford – all junctions all movements;
- Widening the A3 to three lanes; and
- Workplace parking levy [in Guildford town centre].

The shortlisted and non-shortlisted interventions are presented in **Table 3** and **Table 4** respectively.

Table 3: Shortlisted Interventions

| Guildford Town and Approaches Movement Study | | | | | | | | | | | | | | Version: 1 | | |
|--|-----|-------------------------------------|--|--|--------|-------------|----------|------------|-----------|--------------|-----------|-----------|------------|-------------------|----------------------|-------|
| Shortlist of Interventions | | | | | | | | | | | | | | | | |
| 232012-00 | | | | | | | | | | | | | | | | |
| DRAFT 3 | | | | | | | | | | | | | | | | |
| Rank | Ref | Category | Intervention | Location | Source | TOWN CENTRE | | EMPLOYMENT | | ENVIRONMENT | | COMMUNITY | | CONNECTIVITY | | TOTAL |
| | | | | | | Attractive | Thriving | Innovative | High-Tech | High-Quality | Resilient | Engaged | Prosperous | Locally-Connected | Regionally-connected | |
| 1 | 73 | Public transport / integration | New segregated or mostly segregated PT option (BRT, guided busway or tram/light rail) | Guildford - Borough wide | ITT | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 3 | 2 | 24 |
| 2 | 76 | Public transport / integration | Integrated PT - coordinated timetabling of all PT across the region, and smartcard & integrated ticketing | Guildford - Borough wide | STF | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 22 |
| 3 | 99 | Walking | Creation of a well-signed comprehensive network of walking and cycling routes linking key trip attractors/generators such as employment areas, housing areas and education and leisure facilities | 14 specified routes across the town | GBIB | 2 | 2 | 1 | 0 | 3 | 3 | 3 | 2 | 3 | 0 | 19 |
| 4 | 58 | A3 | Tunnel carrying the A3 through the Guildford urban area: longer tunnel A31 to A320 | A3 in the Guildford urban area | ITT | 3 | 2 | 1 | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 18 |
| 5 | 61 | Cycling | Dedicated and continuous 'cycle superhighways' | All 'A' radial routes into town centre | ITT | 2 | 2 | 1 | 1 | 3 | 3 | 2 | 1 | 2 | 0 | 17 |
| 6 | 62 | Cycling | Extensive cycling infrastructure giving cyclists priority and road space: Dutch style cycling facilities across the town, and potentially the introduction of contraflow bike lanes | Guildford - Borough wide | ITT | 2 | 2 | 1 | 1 | 3 | 3 | 2 | 1 | 2 | 0 | 17 |
| 7 | 95 | Technological alternative to travel | Development of teleworking offices in local areas to reduce commute distance (alternative to working from home) | Guildford - Borough wide | Arup | 1 | 1 | 3 | 3 | 1 | 2 | 2 | 2 | 1 | 1 | 17 |
| 8 | 94 | Technological alternative to travel | Promotion of tele/home-working and flexible working hours through an information campaign to local businesses and council incentives for employers to acquire necessary equipment | Guildford - Borough wide | Arup | 1 | 1 | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 16 |
| 9 | 101 | Walking | New wider pedestrian bridge linking Walnut Tree Close to the Bedford Road surface car park site, creating better pedestrian linkages between station and town centre | Walnut Tree Close to Bedford Road car park site | GITCF | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | 16 |
| 10 | 109 | A3 | Tunnel carrying the A3 through the Guildford urban area: shorter tunnel A31 to A25 | A3 in the Guildford urban area | ITT | 3 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 15 |
| 11 | 82 | PT - Rail | Additional rail services on the North Downs Line (Reading - Gatwick) | North Downs railway line | ITT | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 15 |
| 12 | 84 | PT - Rail | New rail halt or station at Park Barn/Surrey Research Park | Park Barn/Surrey Research Park | ITT | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 1 | 15 |
| 13 | 56 | A3 | New Guildford bypass (north of Guildford) | Borough wide - outside Town Centre | ITT | 3 | 2 | 1 | 1 | 0 | 2 | 0 | 1 | 2 | 2 | 14 |
| 14 | 88 | PT - Rail | Improved rail access for Heathrow | Rail route to Heathrow | GES | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 0 | 3 | 14 |
| 15 | 100 | Walking | Improvements to pedestrian realm including replacing overbridges/subways with at-grade crossing facilities, improving other crossings/islands, widening pavements and shared surfaces | Guildford Town centre | Arup | 2 | 2 | 1 | 0 | 2 | 2 | 2 | 1 | 2 | 0 | 14 |
| 16 | 9 | Public realm | Streetscape design involving the removal or downgrading of traffic priority (including shared surfaces and traffic calming, including 20mph zones) - town centre | Guildford town centre | ITT | 3 | 2 | 0 | 0 | 3 | 1 | 1 | 1 | 2 | 0 | 13 |
| 17 | 11 | Public realm | Improving the quality of pedestrian wayfinding, and urban realm along key desire lines | Guildford - Borough wide | GSPS2 | 2 | 2 | 0 | 0 | 3 | 0 | 2 | 1 | 2 | 1 | 13 |
| 18 | 16 | Traffic Management / Highways | New link road, including a bridge over the River Wey and rail lines, from Woodbridge Road to the Guildford Park Road Car Park Access Road (off Guildford Park Road) and York Road to Millbrook tunnel, operating as an enlarged one-way system (Mr David Ogilvie proposal) | Guildford town centre | ITT | 3 | 2 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 13 |
| 19 | 36 | Low Carbon | Low emission vehicles, with recharging facilities and priority parking treatment | Guildford - Borough wide | ITT | 2 | 2 | 1 | 1 | 3 | 2 | 1 | 1 | 0 | 0 | 13 |
| 20 | 37 | Low Carbon | Introduction of low emission PT/council vehicle fleet | Guildford - Borough wide | STPSS | 2 | 2 | 1 | 1 | 3 | 2 | 1 | 1 | 0 | 0 | 13 |
| 21 | 46 | Parking | Park and stride strategy | Key car parks on approach to town centre | ITT | 3 | 2 | 0 | 0 | 2 | 1 | 1 | 1 | 2 | 1 | 13 |
| 22 | 71 | P&R | New park and ride facilities | Guildford borough | ITT | 2 | 2 | 1 | 0 | 2 | 2 | 1 | 0 | 2 | 1 | 13 |
| 23 | 79 | PT - Bus | Bus priority and corridor improvements: segregation, customer information systems and other stop improvements, signalling priority and bus gates) | Guildford - Borough wide | GBIB | 2 | 2 | 0 | 0 | 2 | 2 | 1 | 0 | 3 | 1 | 13 |
| 24 | 85 | PT - Rail | New rail halt or station at Merrow | Merrow | ITT | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 0 | 2 | 1 | 13 |
| 25 | 89 | PT - Rail | Increased capacity for services between Guildford and Waterloo (e.g. train lengthening, additional services, etc) | Train route to Waterloo | LSERUS | 1 | 0 | 1 | 0 | 2 | 2 | 2 | 1 | 1 | 3 | 13 |
| 26 | 10 | Public realm | Streetscape design involving the removal or downgrading of traffic priority (including shared surfaces and traffic calming) - borough wide excluding primary distributor roads | Guildford - Borough wide | ITT | 2 | 1 | 0 | 0 | 3 | 1 | 1 | 1 | 2 | 1 | 12 |
| 27 | 110 | Traffic Management / Highways | New link road following railway line on west side, and road bridge crossing the railway line to Walnut Tree Close from north of Guildford Park car park access road (Guildford Vision Group) | Guildford town centre | GVG | 3 | 2 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 12 |
| 28 | 29 | Gyratory | Pedestrianisation of Bridge Street, including wider gyratory changes, primarily including making the gyratory 2-way operation in other sections, with traffic control signals at junctions. | Gyratory/one-way system | RGGS | 3 | 1 | 0 | 0 | 2 | 2 | 0 | 1 | 2 | 1 | 12 |
| 29 | 32 | Travel demand management | Reduced car use through increased use of car clubs, car hire | Guildford - Borough wide | VBTP | 1 | 1 | 1 | 0 | 2 | 2 | 2 | 1 | 1 | 1 | 12 |
| 30 | 47 | Parking | Modifications to parking e.g. redistribution from long to short stay, premium on-street parking | Guildford town centre and other urban centres in the borough | GSPS2 | 2 | 2 | 1 | 0 | 2 | 1 | 2 | 1 | 1 | 0 | 12 |
| 31 | 64 | Cycling | Bike-sharing scheme / Cycle Hire | Guildford - Borough wide | DAT | 2 | 1 | 0 | 0 | 2 | 1 | 2 | 1 | 2 | 1 | 12 |
| 32 | 67 | Freight modes | Introduction of a freight consolidation centre for town centre deliveries combined with a restriction of (or cost for) HGVs entering town centre by time of day (potentially with exemption for electric vehicles/ cargo bikes) | Edge of Guildford town centre | VBTP | 2 | 2 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 12 |
| 33 | 72 | P&R | Expand existing park and ride facilities | Guildford borough | ITT | 2 | 1 | 1 | 0 | 2 | 2 | 1 | 0 | 2 | 1 | 12 |
| 34 | 74 | Public transport / integration | Demand responsive public transport - minibuses or similar | Guildford borough | ITT | 2 | 1 | 1 | 0 | 1 | 1 | 2 | 1 | 2 | 1 | 12 |
| 35 | 78 | Public transport / integration | Expand network of Shuttle Services - building on existing workplace shuttle services | Not location specific | VTPI | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 12 |
| 36 | 104 | Non-mode specific | Comprehensive smarter choice programme for whole town (based on the Sustainable Travel Towns Project) | Guildford town centre | ITT | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 1 | 0 | 0 | 12 |
| - | 86 | PT - Rail | Reinstatement of rail services along the corridor between Cranleigh and Guildford | Railway line between Cranleigh and Guildford | ITT | 1 | 1 | 0 | 0 | 2 | 2 | 1 | 0 | 2 | 1 | 10 |
| - | 108 | A3 | Widen A3 to three lanes | A3 in the Guildford urban area | HA | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 2 | 2 | 10 |
| - | 51 | A3 | Changes to the existing A3 corridor through Guildford - all junctions all movements | A3 corridor through Guildford | ITT | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 7 |
| - | 15 | Traffic Management / Highways | Closure of Walnut Tree Close to through traffic | Walnut Tree Close | ITT | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 5 |
| - | 45 | Parking | Workplace parking levy | Guildford town centre workplaces | ITT | 0 | 0 | 1 | 0 | 2 | 2 | -1 | -1 | 0 | 0 | 3 |

Table 4: Non-Shortlisted Interventions

| Guildford Town and Approaches Movement Study Non-Shortlisted Interventions 232012-00 DRAFT 3 | | | | | | | Version: 2 | | | | | | | | | | |
|---|-----|------------------------------------|--|---|--------------|--|-------------|----------|------------|-----------|--------------|-----------|-----------|------------|-------------------|----------------------|-------|
| Rank | Ref | Category | Intervention | Location | Source | Reason for exclusion | TOWN CENTRE | | EMPLOYMENT | | ENVIRONMENT | | COMMUNITY | | CONNECTIVITY | | TOTAL |
| | | | | | | | Attractive | Thriving | Innovative | High-Tech | High-Quality | Resilient | Engaged | Prosperous | Locally-Connected | Regionally-connected | |
| 1 | 14 | Public realm | Linear park over A3 tunnel connecting Park Barn-University-Rail Station-River Wey-Town Centre | A3 corridor between Park Barn-University-Rail Station-River Wey-Town Centre | Arup | Relatively low impact - compared to similar interventions | 2 | 1 | 1 | 0 | 2 | 1 | 2 | 0 | 2 | 0 | 11 |
| 2 | 17 | Traffic Management / Highways | New link road, including a bridge over the River Wey and rail lines, from Walnut Tree Close to the Guildford Park Road Car Park Access Road, (Mr Bibhas Neogi proposal). | Guildford - Borough wide | ITT | Relatively low impact - compared to similar interventions | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 11 |
| 3 | 27 | Traffic Management / Highways | Introduction of a reduced speed - 20mph zone - in the town centre | Guildford town centre | AFG | Negative impacts | 3 | 2 | 1 | 0 | 2 | 1 | 1 | 0 | 1 | 0 | 11 |
| 4 | 33 | Travel demand management | Increased vehicle occupancy through increased use of car sharing | Guildford - Borough wide | VBTP | Negative impacts | 1 | 1 | 1 | 0 | 2 | 2 | 1 | 1 | 1 | 1 | 11 |
| 5 | 35 | Travel demand management | Incentives for commuting by sustainable modes: exclusive benefits for those who travel by PT or car share, payment of equivalent savings on car parking to staff who travel by alternative modes, interest-free loans for PT tickets, etc. | Guildford town centre | VTPI | Covered by another intervention | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 11 |
| 6 | 40 | Low Carbon | Low emission zone | Guildford town centre | VBTP | Relatively low impact - compared to similar interventions | 3 | 2 | 0 | 0 | 3 | 2 | 0 | 1 | 0 | 0 | 11 |
| 7 | 66 | Freight modes | Restriction of (or cost for) HGVs entering town centre by time of day (potentially with exemption for electric vehicles/ cargo bikes) | Guildford town centre | VBTP | Benefits likely to be lower than alternatives | 2 | 1 | 0 | 0 | 2 | 2 | 1 | 1 | 1 | 1 | 11 |
| 8 | 96 | Walking | Expansion of pedestrian priority in town centre | Guildford town centre | ITT | Relatively low impact - compared to similar interventions | 2 | 1 | 0 | 0 | 2 | 2 | 2 | 0 | 2 | 0 | 11 |
| 9 | 98 | Walking | Footway and pedestrian island improvements, shared surfaces, new bridge(s) over the River Wey | Guildford - Borough wide | GITCF | Covered by another intervention | 2 | 1 | 0 | 0 | 2 | 1 | 2 | 1 | 2 | 0 | 11 |
| 10 | 103 | Non-mode specific | Guildford/Borough or County specific multi-modal trip-planning app with real-time information | Borough or County level | DAT | Relatively low impact - compared to similar interventions | 1 | 1 | 1 | 0 | 1 | 2 | 2 | 1 | 1 | 1 | 11 |
| 11 | 105 | Non-mode specific | Station, school and workplace travel planning, retail and leisure visitor travel planning | Not location specific | STPSS + SPDT | Relatively low impact - compared to similar interventions | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 1 | 0 | 0 | 11 |
| 12 | 106 | Non-mode specific (mainly bike/PT) | Free guaranteed ride home programme for people who opt not to travel by single occupancy car | Guildford - Borough wide | VBTP | Relatively low impact - compared to similar interventions | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 11 |
| 13 | 19 | Traffic Management / Highways | Traffic demand management (optimisation of signals, UTM, SCOOT, driver information systems) | To be assessed - could cover Guildford town or entire Borough | ITT | Negative impacts | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 10 |
| 14 | 22 | Traffic Management / Highways | Reallocate road space on the main approaches into Guildford town centre | Main approaches and gyratory; bus lanes, cycle lanes, wider footways & crossings (remove subways) | DLP201 31b | Relatively low impact - compared to similar interventions | 2 | 0 | 0 | 0 | 2 | 1 | 1 | 1 | 3 | 0 | 10 |
| 15 | 68 | Freight modes | Development of rail freight facilities and loading capabilities for Guildford | Guildford town centre | VBTP | Relatively low impact - compared to similar interventions | 1 | 1 | 0 | 0 | 2 | 1 | 1 | 2 | 1 | 1 | 10 |
| 16 | 70 | Freight modes | Development of a delivery collection centre (lockers or similar) to reduce the need for deliveries | Guildford Borough and surrounding road network | STPSS | Relatively low impact - compared to similar interventions | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 10 |
| 17 | 97 | Walking | Cantilevered timber walkway attached to the piers on the Debenhams side of Millpool to connect Millbrook and Town Bridge and other riverside enhancements and access improvements | Millbrook/Town Bridge | GITCF | Too specific/localised | 2 | 1 | 0 | 0 | 2 | 1 | 1 | 1 | 2 | 0 | 10 |
| 18 | 86 | PT- Rail | Reinstatement of rail services along the corridor between Cranleigh and Guildford | Railway line between Cranleigh and Guildford | ITT | | 1 | 1 | 0 | 0 | 2 | 2 | 1 | 0 | 2 | 1 | 10 |
| 19 | 108 | A3 | Widen A3 to three lanes | A3 in the Guildford urban area | HA | | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 2 | 2 | 10 |
| 20 | 48 | Parking | Use of parking sensors and VMS signage to provide information about space availability | Car parks and associated signage | DAT | Relatively low impact - compared to similar interventions | 2 | 2 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 9 |
| 21 | 54 | A3 | Changes to the existing A3 corridor through Guildford - widening | A3 corridor through Guildford | ITT | Benefits likely to be lower than alternatives | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 2 | 1 | 9 |
| 22 | 55 | A3 | Changes to the existing A3 corridor through Guildford - widening to 3 lanes between A3/A31 Hogs Back and A322 Wooden Bridge Interchange | A3 corridor through Guildford | SLTP3 | Benefits likely to be lower than alternatives | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 2 | 1 | 9 |
| 23 | 75 | Public transport / integration | Soft measures to increase PT use: awareness and information campaigns, better passenger information systems, discounts and vouchers | Guildford - Borough wide | VBTP | Relatively low impact - compared to similar interventions | 1 | 1 | 0 | 0 | 1 | 1 | 2 | 1 | 1 | 1 | 9 |
| 24 | 77 | Public transport / integration | Priorities for PT - signalling, lanes, etc | Not location specific | VBTP | Too specific/localised | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 2 | 2 | 1 | 9 |
| 25 | 91 | Taxi | Taxi ranks - improve provision and access | [no source] | 0 | Relatively low impact - compared to similar interventions | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 9 |
| 26 | 107 | Non-mode specific | Promotion of local destinations and local activity patterns | Not location specific | VBTP | Relatively low impact - compared to similar interventions | 1 | 1 | 1 | 0 | 1 | 1 | 2 | 1 | 1 | 0 | 9 |
| 27 | 23 | Traffic Management / Highways | A320 Stoke Interchange: revised layout with Northbound off-slip, and southbound on-slip upgrades | A320 Stoke interchange | HA | Negative impacts | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 8 |
| 28 | 24 | Traffic Management / Highways | A320 Stoke Interchange: northbound off-slip, and southbound on-slip, upgrade connection with A25 | A320 Stoke interchange | HA | Covered by another intervention | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 8 |
| 29 | 34 | Travel demand management | HOV (High Occupant Vehicle) lanes - priority for HOVs in town centre and approaches | Guildford town centre | VTPI | Beyond the reasonable control/management of the Borough of Guildford | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| 30 | 50 | Parking | Shared Parking - Sharing parking facilities among multiple users. | Guildford town centre, potentially other trip attractors | VTPI | Relatively low impact - compared to similar interventions | 1 | 1 | 0 | 0 | 2 | 1 | 1 | 1 | 1 | 0 | 8 |
| 31 | 65 | Cycling | Grants for implementing cycling facilities at workplaces and requirements for provisions at new developments | Guildford - Borough wide | [no source] | Benefits likely to be lower than alternatives | 1 | 0 | 0 | 0 | 2 | 1 | 1 | 1 | 1 | 1 | 8 |
| 32 | 83 | PT - Rail | Shuttle rail services on North Downs Line between Shalford and Guildford | North Downs railway line, between Shalford and Guildford | ITT | Not recommended option in previous study | 1 | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 1 | 1 | 8 |
| 33 | 90 | Taxi | Minimum emissions standards for taxi licenses | Guildford - Borough wide | STPSS | Relatively low impact - compared to similar interventions | 1 | 1 | 1 | 1 | 2 | 1 | 0 | 0 | 1 | 0 | 8 |
| 34 | 13 | Public realm | Vehicle Use Restrictions - Limiting vehicle traffic in the town centre at particular times | Guildford town centre | VTPI | Relatively low impact - compared to similar interventions | 3 | 1 | 0 | 0 | 2 | 2 | -1 | 0 | 0 | 0 | 7 |
| 35 | 42 | Parking | Decrease (gradual reduction) in the provision of public off-street car parking in Guildford town centre | Guildford town centre | ITT | Negative impacts | 2 | 1 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 7 |
| 36 | 52 | A3 | Changes to the existing A3 corridor through Guildford - limited junctions | A3 corridor through Guildford | ITT | Relatively low impact - compared to similar interventions | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 7 |
| 37 | 53 | A3 | Changes to the existing A3 corridor through Guildford - proposed junction schemes | A3 corridor through Guildford | ITT | Benefits likely to be lower than alternatives | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 7 |
| 38 | 60 | A3 | A new two-way road alongside the east side of the A3 between the Dennis (A322) and the Cathedral roundabouts for local traffic | A3 in the Guildford urban area | AFG | Covered by another intervention | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 7 |
| 39 | 63 | Cycling | Soft cycling measures including cycle training and awareness and information campaigns | Guildford - Borough wide | STPSS | Benefits likely to be lower than alternatives | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 7 |
| 40 | 69 | Freight modes | Develop recommended freight routes in Guildford | Guildford Borough and surrounding road network | STPSS | Too specific/localised | 1 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 7 |
| 41 | 80 | PT - Bus | Relocated / new bus station with high quality facilities - Bedford Road car park or Farnham Road | Guildford town centre | GBIB | Relatively low impact - compared to similar interventions | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 7 |
| 42 | 81 | PT - Bus | Replace bus station with high quality on-street provision on Leapdale Road and North Street | Guildford town centre | GBIB | Relatively low impact - compared to similar interventions | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 7 |
| 43 | 51 | A3 | Changes to the existing A3 corridor through Guildford - all junctions all movements | A3 corridor through Guildford | ITT | | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 7 |
| 44 | 18 | Traffic Management / Highways | Clay Lane link road (between Clay Lane and the A320 south of Jacob's Well) | Clay lane | GBC website | Negative impacts | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 6 |
| 45 | 31 | Travel demand management | National road user charging - higher cost of driving, particularly in congested areas (eg town centre) | Guildford - Borough wide | VTPI | Relatively low impact - compared to similar interventions | 2 | 0 | 0 | 0 | 2 | 2 | -1 | -1 | 1 | 1 | 6 |
| 46 | 38 | Low Carbon | Use of technology to encourage fuel efficient driving | Guildford - Borough wide | STPSS | Relatively low impact - compared to similar interventions | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 6 |
| 47 | 39 | Low Carbon | Carbon based VED behavioural change marketing | Guildford - Borough wide | STPSS | Relatively low impact - compared to similar interventions | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 6 |
| 48 | 43 | Parking | Increase in the pricing of public off-street car parking in Guildford town centre | Guildford town centre | ITT | Covered by another intervention | 2 | 1 | 0 | 0 | 2 | 2 | 0 | -1 | 0 | 0 | 6 |
| 49 | 57 | A3 | New Guildford bypass (south of Guildford) | Borough wide - outside Town Centre | ITT | Covered by another intervention | 2 | 1 | 1 | 0 | -3 | 1 | 0 | 0 | 2 | 2 | 6 |
| 50 | 93 | PTWs | Powered Two Wheelers: schemes to encourage usage of PTWs (e.g. scooter hire/loans/Wheels to Work/etc) | Guildford - Borough wide | [no source] | Relatively low impact - compared to similar interventions | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 6 |
| 51 | 102 | Walking | Bridge Street shared between road users but with better provision for pedestrians | Gyratory/one-way system | RGGSS | Covered by another intervention | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 6 |
| 52 | 15 | Traffic Management / Highways | Closure of Walnut Tree Close to through traffic | Walnut Tree Close | ITT | Relatively low impact - compared to similar interventions | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 5 |

| Guildford Town and Approaches Movement Study | | | | | | | | | | | | | | | | | |
|---|-----|-------------------------------|--|--|--------------|---|-------------|----------|------------|-----------|--------------|-----------|-----------|------------|-------------------|----------------------|-------|
| Non-Shortlisted Interventions | | | | | | | | | | | | | | | | | |
| 232012-00 DRAFT 3 Version: 2 | | | | | | | | | | | | | | | | | |
| Rank | Ref | Category | Intervention | Location | Source | Reason for exclusion | TOWN CENTRE | | EMPLOYMENT | | ENVIRONMENT | | COMMUNITY | | CONNECTIVITY | | TOTAL |
| | | | | | | | Attractive | Thriving | Innovative | High-Tech | High-Quality | Resilient | Engaged | Prosperous | Locally-Connected | Regionally-connected | |
| 53 | 25 | Traffic Management / Highways | New link from the A281 near Cranleigh to the A3 at Milford, with parkway facility at Milford station | A281 in the Guildford urban area | AFG | Too specific/localised | 2 | 1 | 0 | 0 | -2 | 1 | 1 | 1 | 1 | 0 | 5 |
| 54 | 28 | Gyratory | Two-way traffic movements on the gyratory system | Gyratory/one-way system | RGGS | Negative impacts | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 5 |
| 55 | 30 | Travel demand management | Road user congestion charge in Guildford town centre | Guildford town centre | ITT | Covered by another intervention | 3 | 0 | 0 | 0 | 3 | 2 | -2 | 0 | 0 | -1 | 5 |
| 56 | 92 | PT - Air | Introduction of a heliport | Guildford - Borough wide | [no source] | Too specific/localised | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 5 |
| 57 | 12 | Public realm | Soft traffic calming measures such as a community speed watch programme | Guildford - Borough wide, particularly residential areas | STPSS | Covered by another intervention | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 4 |
| 58 | 20 | Traffic Management / Highways | Traffic management (eg gating of general traffic on radial routes) | Radial routes, other locations to be considered | ITT | Relatively low impact - compared to similar interventions | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 3 |
| 59 | 45 | Parking | Workplace parking levy | Guildford town centre workplaces | ITT | Negative impacts | 0 | 0 | 1 | 0 | 2 | 2 | -1 | -1 | 0 | 0 | 3 |
| 60 | 49 | Parking | Resident parking permit scheme | Residential areas | STPSS + SPDT | Relatively low impact - compared to similar interventions | 0 | 0 | 0 | 0 | 1 | 1 | -1 | 0 | 0 | 0 | 1 |
| 61 | 21 | Traffic Management / Highways | Major road capacity improvements in Guildford town centre and approaches | Main approaches and gyratory | GES | Relatively low impact - compared to similar interventions | -2 | 1 | 1 | 1 | -2 | -1 | 0 | 0 | 1 | 1 | 0 |
| 62 | 87 | PT - Rail | Station improvements at all borough stations | London Road station | GITCF | Relatively low impact - compared to similar interventions | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 63 | 26 | Traffic Management / Highways | A North-South relief road close to the town centre from Friary Bridge to Woodbridge Road (A25). | Guildford town centre | AFG | Too specific/localised | -1 | 0 | 0 | 0 | 0 | -1 | 0 | 0 | -1 | 1 | -2 |
| 64 | 41 | Parking | Increase in the provision of public off-street car parking in Guildford town centre | Guildford town centre | ITT | Relatively low impact - compared to similar interventions | 0 | 0 | 0 | 0 | -1 | -2 | 0 | 0 | 0 | 0 | -3 |
| 65 | 44 | Parking | Decrease in the pricing of public off-street car parking in Guildford town centre | Guildford town centre | ITT | Relatively low impact - compared to similar interventions | 0 | 0 | 0 | 0 | -1 | -2 | 0 | 0 | 0 | 0 | -3 |

Note: interventions highlighted in yellow are schemes selected for testing as part of the shortlist by Guildford Borough Council which did not achieve the minimum shortlisting score.

2.3.4 Types of Interventions Shortlisted

The following types of interventions performed well in the assessment, and are well represented on the shortlist:

- Interventions that support sustainable modes of transport (e.g. public transport, rail); and
- Walking, cycling and public realm interventions.

Highway schemes that focus on the A3 did not perform so well, but it was requested by Guildford Borough Council that these schemes were progressed for further assessment.

2.4 Scenario Development and Analysis

2.4.1 Approach

The shortlisted interventions covered a range of types, and included intermediate and major scale highway and rail schemes, softer measures and behavioural change initiatives. The study team developed an appraisal process to compare the performance of interventions and packages of interventions. The appraisal process reflected both the scale of potential interventions and the characteristics and limitations of the SINTRAM strategic highway model and the other approaches used to forecast metrics.

The approach to scenario development was to identify intermediate and major highway infrastructure interventions to be assessed individually, and then to identify packages comprising sustainable transport interventions – combined together – along with the best performing of the intermediate and major highway infrastructure interventions. The assessment process (the appraisal of interventions and packages against the study metrics) and the development of desirable transport futures scenarios is presented in chapters 3 to 6 of this report.

2.4.2 Scenario Development

The shortlist of interventions was reviewed, with each intervention allocated to one of the following scenarios:

- **Intermediate and Major Highway Infrastructure Interventions:** appraised individually to understand the impacts, for example:
 - A3: widening, tunnel, bypass;
 - Major packages of schemes (e.g. Guildford Vision Group's town centre proposal, which combines several highway infrastructure schemes); and
 - Town centre: gyratory changes, closure of Walnut Tree Close to through traffic;

These interventions could be individually represented in SINTRAM by making network changes within the model.

- **Sustainable Transport Interventions:** likely to increase the mode share of sustainable modes (walking, cycling, public transport), and conversely reduce the car mode share, for example:
 - Major public transport schemes (e.g. new segregated or mostly segregated public transport option (Bus Rapid Transit, guided busway or tram/light rail), new rail stations/services);
 - Public transport improvements (e.g. additional services);
 - Walking and cycling improvements (e.g. cycle superhighways); and
 - Localised speed reduction and road space reallocation.

Sustainable transport interventions were packaged together for testing in SINTRAM. This approach was used for two reasons. First, public transport, walking and cycling networks were not represented in the SINTRAM model, so instead mode shift was represented in the SINTRAM model by factoring the highway demand matrices to represent each of the high, medium and low scenarios for mode shift, together with changes to the road network within the model to reflect the introduction of these interventions. Second, individual sustainable transport interventions tend to be relatively small-scale and so may be best implemented as part of a package.

- **Other Interventions:** interventions that do not fall under the previous two categories and that cannot easily be represented in the SINTRAM model, for example:
 - Low emission vehicles;
 - Freight consolidation centre;
 - New park-and-ride sites; and
 - Rail improvements to regional locations.

As the Other Interventions include schemes that cannot easily be represented in the SINTRAM model, these are therefore not tested in SINTRAM but they are appraised.

We have also separately appraised a ‘sustainable movement corridor’. This is a priority pathway through the town for pedestrians, cyclists and public transport, which represents a combination drawn from three interventions: ‘creation of a well-signed comprehensive network of walking and cycling routes linking key trip attractors/generators’, ‘dedicated and continuous cycle superhighways’, and ‘new segregated or mostly segregated public transport option (Bus Rapid Transit, guided busway or tram/light rail)’.

2.4.3 Scenario Analysis

The scenario analysis involved a mix of quantitative and qualitative assessment against the study metrics.

The main tool available to inform the quantitative assessment was Surrey County Council’s SINTRAM strategic highway model. SINTRAM has been used on a number of studies to appraise interventions, packages of interventions, and alternative demand and mode shift scenarios in Guildford. The approach to using the model to inform the appraisal is described in the following section.

The qualitative assessment was undertaken using information already available for this study, such as previous studies and Guildford-specific data, combined with the study team's professional experience and judgement from other similar projects.

2.5 Modelling of Interventions and Packages

2.5.1 Modelling Approach

The modelling approach includes:

- Business-As-Usual scenarios for 2031 and 2050 produced as a reference case for comparison. These scenarios are described in section 5.3 of the Vision, Objectives, Baseline and Business-As-Usual Report (Arup, March 2015);
- Testing of Intermediate and Major Highway Infrastructure Interventions in 2031 and 2050; and
- Testing of Sustainable Transport Interventions at Low, Medium and High Mode Shift levels in 2031 and 2050.

The 2031 results are presented within the main body of this report, with the 2050 results presented in Appendix A. Details of the exact model tests specified are provided below.

2.5.2 Intermediate and Major Highway Infrastructure Interventions Tests

These tests included major projects related to the A3 trunk road and intermediate scale changes to the highway network in the town centre and traffic circulation on the network. These interventions could be individually represented in SINTRAM by making network changes within the model. The interventions tested are described in **Table 5**.

Table 5: Intermediate and Major Highway Infrastructure Interventions Tests

| Intermediate and Major Highway Infrastructure Intervention | Intervention name (as it appears in Section 4) | Description |
|--|--|---|
| Widen A3 to three lanes | A3 Widening | Widening the A3 to 3 lanes between A3/A31 Hogs Back and A320 Stoke Interchange. |
| New Guildford bypass (north of Guildford) | A3 Northern Bypass | Bypass to the north of Guildford that will divert through traffic so that it no longer passes through Guildford town (three lanes each direction) and a downgraded local distributor road on the existing A3 alignment as required to provide for more local movements. |
| Tunnel carrying the A3 through the Guildford urban area: longer tunnel A31 to A320 | A3 Tunnel (A31 to A320) | A bored tunnel between A31 and A320 junctions, with all movement junctions with the A31 and A320, and a downgraded local distributor road on the existing A3 alignment as required providing for more local movements. |
| Tunnel carrying the A3 through the Guildford urban area: shorter tunnel A31 to A25 | A3 Tunnel (A31 to A25) | A bored tunnel between A31 and A25 junctions, with all movement junctions with the A31 and A25 and a downgraded local distributor road on |

| Intermediate and Major Highway Infrastructure Intervention | Intervention name (as it appears in Section 4) | Description |
|---|---|--|
| | | the existing A3 alignment as required to provide for more local movements. |
| Changes to the existing A3 corridor through Guildford - all junctions all movements | A3 Corridor Junction Changes | Alter all the junctions of the A3 in the Guildford area so that all movements are possible, instead of the current restricted accesses. |
| New road bridge and tunnel proposal from David Ogilvie | Town centre road system redesign (David Ogilvie) | New link road, including a bridge over the River Wey and rail lines, from Guildford Park Road Car Park Access Road (off Guildford Park Road) to Woodbridge Road and York Road to Millbrook tunnel, operating as an enlarged one-way system. Junctions with these new roads are assumed to be signalised. |
| New link road and road bridge proposal from Guildford Vision Group | Town centre road system redesign (Guildford Vision Group) | New link road following railway line on west side from Farnham Road northwards, and a new bridge over the railway line from the north of the Guildford Park Car Park Access Road to Walnut Tree Close, and a new road link following the railway line to Woodbridge Road. |
| Pedestrianisation of Bridge Street | Pedestrianisation of Bridge Street | Pedestrianisation of Bridge Street, including wider gyratory changes, primarily including making the gyratory 2-way operation in other sections, with traffic control signals at junctions. |
| Closure of Walnut Tree Close to through traffic | Walnut Tree Close closure (to through traffic) | Close Walnut Tree Close to through traffic (except walking and cycling) so it is access only. |

2.5.3 Sustainable Transport Interventions Tests

Public transport, walking and cycling networks were not represented in the SINTRAM model, so instead mode shift was represented in the SINTRAM model by factoring the highway demand matrices to represent three scenarios developed and defined as Low Mode Shift, Medium Mode Shift and High Mode Shift, depending on:

- Level of infrastructure investment (low cost, medium cost, high cost); and
- The mode shift expected to sustainable modes (low shift, medium shift, high shift).

Benchmarking of other towns and cities in the UK and abroad has concluded the following:

- A car mode share of **30%** represents the lowest proportion currently obtained across Europe (examples: Copenhagen, Freiburg). A 30% mode share represents a High level mode shift for Guildford;

- A car mode share of **40%** is common across many Scandinavian and Dutch towns, and represents a Medium mode shift (examples: Amsterdam, Antwerp); and
- A car mode share of **50%** represents a lower level reduction, and is the suggested low level mode shift (examples: Bristol, Brussels).¹

A significant programme of interventions would be needed to achieve these levels of mode shift. The tests therefore represent the implementation of a package of interventions aimed at achieving a significant shift to more sustainable transport modes, with differing levels of investment for each test. These interventions are listed in **Table 6**.

Table 6: Sustainable Transport Interventions

| SUSTAINABLE TRANSPORT INTERVENTIONS | |
|--|--|
| Category | Intervention |
| Public realm | Streetscape design involving the removal or downgrading of traffic priority (including shared surfaces and traffic calming, including 20mph zones) in the town centre and across the borough, excluding primary distributor roads. |
| Public realm | Improving the quality of pedestrian wayfinding, and urban realm along key desire lines. |
| Public realm | Reduced car use through increased use of car clubs and car hire. |
| Parking | Park and stride strategy, where people are encouraged to park away from key destinations where parking demand is high (e.g. a town centre, a school) and park in areas of lower demand and walk the rest of the journey. |
| Parking | Modifications to parking e.g. redistribution from long to short stay, premium on-street parking. |
| Cycling | Dedicated and continuous ‘cycle superhighways’. |
| Cycling | Extensive cycling infrastructure giving cyclists priority and road space: Dutch style cycling facilities across the town, and potentially the introduction of contraflow bike lanes. |
| Cycling | Bike-sharing scheme / Cycle Hire. |
| Park and Ride | Expand existing park and ride facilities. |
| Public transport/integration | New segregated or mostly segregated public transport option (bus rapid transport, guided busway or tram/light rail). |
| Public transport/integration | Demand responsive public transport - minibuses or similar. |

¹ Mode share figures are for journeys to work in the peak periods. Source: EPOMM (European Platform on Mobility Management). 2013. TEMS - The EPOMM Modal Split Tool - City modal split database [online] available from: <http://www.epomm.eu/index.php?id=2591>. The benchmarking exercise employed journey to work data because this is the type of mode share information which is most readily available at an international level, enabling comparisons to be made between different cities. Further research on the transferability of this data to mode share in cities more generally came to the conclusion that using journey to work data was a robust approach, because the mode share for journey to work purposes is similar to that for other journey purposes (e.g. car mode share is 69% for journeys to work compared to 64% for all journeys in the UK National Travel Survey 2012). SINTRAM model runs are for the AM peak period so will broadly reflect journey to work trips.

| SUSTAINABLE TRANSPORT INTERVENTIONS | |
|--|--|
| Category | Intervention |
| Public transport/integration | Integrated public transport - coordinated timetabling of all public transport across the borough, and smartcard & integrated ticketing. |
| Public transport/integration | Expand network of Shuttle Services - building on existing workplace shuttle services. |
| Public transport - bus | Bus priority and corridor improvements: physical segregation on-street, signalling priority and bus gates, customer information systems and other stop improvements. |
| Technological alternative to travel | Promotion of tele-/home-working and flexible working hours through an information campaign to local businesses and council incentives for employers to acquire necessary equipment. |
| Technological alternative to travel | Development of teleworking offices in local areas to reduce commute distance (alternative to working from home). |
| Walking | Creation of a well-signed comprehensive network of walking and cycling routes linking key trip attractors/generators such as employment areas, housing areas and education and leisure facilities. |
| Walking | Improvements to pedestrian realm including replacing overbridges/subways with at-grade crossing facilities, improving other crossings/islands, widening pavements and shared surfaces. |
| Walking | New wider pedestrian bridge linking Walnut Tree Close to the Bedford Road surface car park site, creating better pedestrian linkages between station and town centre. |
| Non-mode specific | Comprehensive smarter choice programme for whole town (based on the Sustainable Travel Towns Project). |

The scenarios tested are described in **Table 7**, which shows the two main inputs for each model run: mode shift and accompanying interventions. The tests are cumulative, so the Medium test includes all the elements of the Low test, and the High test includes all elements of the Low and Medium tests.

Table 7: Packages of Sustainable Transport Interventions Tests

| Package of Sustainable Transport Interventions | Mode Shift | Accompanying Interventions |
|---|---|---|
| Low mode shift | 50% car mode share representing increased levels of walking, cycling and public transport use from relatively low levels of investment in these modes ² . This is based on interventions drawn from Table 6 . | Pedestrianisation of Bridge Street Closure of Walnut Tree Close to through traffic Streetscape design reducing traffic priority in the <i>town centre</i> and |

² Low levels of investment in these modes would likely equate to what has typically been spent on smarter choices measures around the UK, e.g. the Sustainable Travel Towns programme achieved a reduction in car driver trips of 9% and distance per resident of 5-7% through £10 million spending over 5 years in three towns (with a population of around 100,000-140,000 each) [Sloman et al (2010), The Effects of Smarter Choice Programmes in the Sustainable Travel Towns: Summary Report]. The 2011 Census mode split for journey to work trips as car or van driver for residents of Guildford borough was 62% and for residents of Guildford town was 54%; similar

| Package of Sustainable Transport Interventions | Mode Shift | Accompanying Interventions |
|--|---|--|
| | | improvements to pedestrian realm in the town centre |
| Medium mode shift | 40% car mode share representing increased levels of walking, cycling and public transport use from medium levels of investment in these modes. This is based on interventions drawn from Table 6 . | As Low + Streetscape design reducing traffic priority in the <i>urban area</i> |
| High mode shift | 30% car mode share representing increased levels of walking, cycling and public transport use from high levels of investment in these modes. This is based on interventions drawn from Table 6 . | As Medium |

Mode shift was represented in the SINTRAM model by factoring the highway demand matrices to represent each of the high, medium and low scenarios. The car trip rate factors applied to the highway demand matrices for each of these scenarios are shown in **Table 8**. LGV and HGV trips are assumed to represent essential trips, and were not adjusted.

Table 8: Trip rate factor by mode shift level

| Trip type | Low mode shift | Medium mode shift | High mode shift |
|---------------------|----------------|-------------------|-----------------|
| Intra Borough | 0.86 | 0.69 | 0.52 |
| External to Borough | 0.93 | 0.84 | 0.76 |
| Borough to External | 0.93 | 0.84 | 0.76 |

For each mode shift scenario, in addition to highway demand matrices being factored to represent mode shift, the road network within the model was also modified to reflect the introduction of the accompanying interventions, for example closing links to through traffic in the case of Bridge Street or Walnut Tree Close.

The impact of the accompanying interventions ‘Streetscape design reducing traffic priority in the town centre and improvements to pedestrian realm in the town centre’ was represented in the model by reducing the speed limit to 20mph for all roads within the town centre and removing a traffic lane along links with more than one lane in each direction (to represent the reallocation of roadspace).

‘Streetscape design reducing traffic priority in the urban area’ was represented in the model by reducing speed to 20mph on non-primary distributor roads within the Guildford urban area including the town centre.

It is important to understand that due to the modelling constraints discussed above, the sustainable transport interventions had to be tested with the different levels of mode shift as an input (i.e. the trip matrix was factored to reduce traffic levels to represent the relevant level of car mode share). This was different to

targeted investment in sustainable transport measures could therefore lead to this level of car mode share for residents of the town.

other tests where the trip matrix was fixed and the infrastructure changes are assessed as outputs from the model. An alternative way to consider this is that the sustainable transport tests were illustrating the potential outcome for Guildford if the relevant level of sustainable mode share could be achieved.

2.5.4 Modelling Process

The SCC Transport Studies team recommended using the SINTRAM model with a fixed demand matrix. This has the advantage of allowing the impacts of the proposed interventions to be isolated, without newly-generated demand masking any benefits, and the process of modelling the required scenarios is significantly quicker and less resource intensive. The disadvantage is that the results do not fully represent the likely situation in reality, where newly-generated traffic is likely to fill any spare road capacity made available during peak periods by improvement schemes. This can be overcome by explicit acknowledgement in the appraisal and strategy development that if spare road capacity (on high demand routes) is made available, it will fill up again during peak periods unless it is reallocated or demand is managed.

The coding of the tests varied depending on type of intervention, as summarised in **Table 9**.

Table 9: SINTRAM Model Coding

| Type of Test | Sub-category | Model Process |
|---|----------------------|---|
| Intermediate and Major Highway Infrastructure Interventions | Road network changes | Changes to link coding: <ul style="list-style-type: none"> links added or removed changes to speed limits changes to the number and direction of lanes |
| Sustainable Transport Interventions | Mode share changes | Changes to car trip rate factors in the origin-destination matrix as part of each scenario option test |
| | Road network changes | Changes to link coding: <ul style="list-style-type: none"> changes to the number and direction of lanes changes to speed limits |

The SINTRAM model outputs are used to inform the appraisal of the metrics, as shown in more detail in the next chapter.

2.6 Summary

This chapter described the process of developing transport futures scenarios for Guildford in 2050, comprising interventions and packages of interventions that were appraised against the study metrics. This process was used to inform the development of ‘desirable transport futures scenarios’, from which a preferred scenario was selected.

A shortlist of 36 transport interventions was produced from a long list of over 300 possible interventions. The shortlisting was undertaken against the main elements

of the vision, to ensure that all interventions are relevant and will meet the requirements of the vision.

The approach to scenario development was to review the shortlisted interventions and identify intermediate and major highway infrastructure interventions to be assessed individually, and then to identify packages comprising sustainable transport interventions – combined together – along with the best performing of the intermediate and major highway infrastructure interventions.

The next stage in the study was the Appraisal of Interventions and Packages Stage, which is reported in the following chapters.

3 Appraisal Process

3.1 Overview

The appraisal process assessed which of the interventions or packages of interventions identified in the previous Scenario Analysis stage best support the vision for sustainable mobility in Guildford in 2050. Interventions include Intermediate and Major Highway Infrastructure Interventions, Sustainable Transport Interventions, and the Other Interventions identified in the previous chapter.

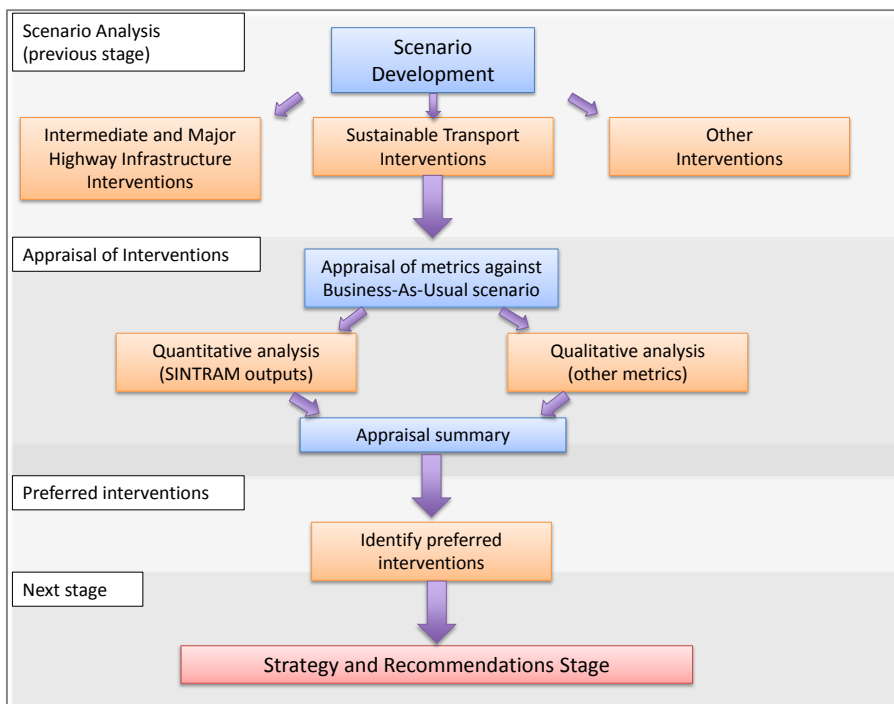
The appraisal was carried out using the metrics identified in the Vision, Objectives, Baseline and Business-As-Usual Report (Arup, March 2015). The metrics cover a range of criteria that contribute towards the different elements of the vision. The performance of each metric was assessed against the Business-As-Usual scenario to determine the general trend (positive or negative) and scale of impact. Some metrics were assessed quantitatively and some were assessed qualitatively. The appraisal indicates which interventions perform better against the range of metrics and should therefore be taken forward into a preferred scenario.

The appraisal process is summarised in **Figure 2**.

The identification of the preferred interventions fed directly into the next stage, the Strategy and Recommendations Stage, where the interventions in the preferred scenario were developed into the movement strategy for Guildford. This is discussed further in the ‘Considerations’ section at the end of this report.

A Strategic Environmental Assessment was undertaken in parallel to the appraisal process, and is reported separately, although outputs were considered in the appraisal – see section 4.5.

Figure 2: Appraisal Process



3.2 Interventions and Scenarios Appraised

The interventions and scenarios appraised are listed in **Table 10**. All 36 shortlisted interventions are included, either as part of a package of sustainable transport interventions or appraised individually. The sustainable movement corridor, which combines three shortlisted sustainable transport interventions, is also included.

Table 10: Interventions and scenarios appraised

| INTERMEDIATE AND MAJOR HIGHWAY INFRASTRUCTURE INTERVENTIONS | | |
|---|--|--|
| Intervention name (full) | Intervention name (short, as it appears in Section 4) | Description |
| Widen A3 to three lanes | A3 Widening | Widening the A3 to 3 lanes between A3/A31 Hogs Back and A320 Stoke Interchange. |
| New Guildford bypass (north of Guildford) | A3 Northern Bypass | Bypass to the north of Guildford that will divert through traffic so that it no longer passes through Guildford town (three lanes each direction) and a downgraded local distributor road on the existing A3 alignment as required to provide for more local movements. |
| Tunnel carrying the A3 through the Guildford urban area: longer tunnel A31 to A320 | A3 Tunnel (A31 to A320) | A bored tunnel between A31 and A320 junctions, with all movement junctions with the A31 and A320, and a downgraded local distributor road on the existing A3 alignment as required providing for more local movements. |
| Tunnel carrying the A3 through the Guildford urban area: shorter tunnel A31 to A25 | A3 Tunnel (A31 to A25) | A bored tunnel between A31 and A25 junctions, with all movement junctions with the A31 and A25, and a downgraded local distributor road on the existing A3 alignment as required to provide for more local movements. |
| Changes to the existing A3 corridor through Guildford - all junctions all movements | A3 Corridor Junction Changes | Alter all the junctions off the A3 in the Guildford area so that all movements are possible, instead of the current restricted accesses. |
| New road bridge and tunnel proposal from David Ogilvie | Town centre road system redesign (David Ogilvie) | New link road, including a bridge over the River Wey and rail lines, from Guildford Park Road Car Park Access Road (off Guildford Park Road) to Woodbridge Road and York Road to Millbrook tunnel, operating as an enlarged one-way system. Junctions with these new roads are assumed to be signalised. |
| New link road and road bridge proposal from Guildford Vision Group | Town centre road system redesign (Guildford Vision Group) | New link road following railway line on west side from Farnham Road northwards, and a new bridge over the railway line from the north of the Guildford Park Car Park Access Road to Walnut Tree Close, and a new road link following the railway line to Woodbridge Road. |
| Pedestrianisation of Bridge Street | Pedestrianisation of Bridge Street | Pedestrianisation of Bridge Street, including wider gyratory changes, primarily including making the gyratory 2-way operation in other sections, with traffic control signals at junctions. |
| Closure of Walnut Tree Close to through traffic | Walnut Tree Close closure (to through traffic) | Close Walnut Tree Close to through traffic (except walking and cycling) so it is access only. |

| PACKAGES OF SUSTAINABLE TRANSPORT INTERVENTIONS | | |
|--|---|---|
| Intervention name | Description | Accompanying Interventions |
| Low mode shift | 50% car mode share representing increased levels of walking, cycling and public transport use from low levels of investment in these modes. This is based on interventions drawn from Table 6 . | Pedestrianisation of Bridge Street Closure of Walnut Tree Close to through traffic Streetscape design reducing traffic priority in the <i>town centre</i> and improvements to pedestrian realm in the town centre |
| Medium mode shift | 40% car mode share representing increased levels of walking, cycling and public transport use from medium levels of investment in these modes. This is based on interventions drawn from Table 6 . | As Low + Streetscape design reducing traffic priority in the <i>urban area</i> |
| High mode shift | 30% car mode share representing increased levels of walking, cycling and public transport use from high levels of investment in these modes. This is based on interventions drawn from Table 6 . | As Medium |
| OTHER INTERVENTIONS | | |
| Intervention name (full) | Intervention name (short, as it appears in Section 4) | Description |
| Low emission vehicles, with recharging facilities and priority parking treatment | Low emission vehicles (including Council fleet) | Infrastructure to support use of electric vehicles across the borough. Network of charging points. Allocation of parking spaces at different trip attractors to electric or low emission vehicles. |
| Introduction of low emission public transport /council vehicle fleet | Low emission vehicles (including Council fleet) | GBC to set an example in leading the transition from high to low emission vehicles as its fleet is renewed. |
| Introduction of a freight consolidation centre for town | Freight Consolidation Centre | Restriction of (or cost for) HGVs entering town centre by time of day (potentially with exemption for electric vehicles/ cargo bikes). A system of monitoring to ensure compliance would have to be set up |

| OTHER INTERVENTIONS | | |
|---|--|---|
| Intervention name (full) | Intervention name (short, as it appears in Section 4) | Description |
| centre deliveries combined with a restriction of (or cost for) HGVs entering town centre by time of day (potentially with exemption for electric vehicles/ cargo bikes) | | (Automatic Number Plate Recognition or similar system). The introduction of a freight consolidation centre for town centre deliveries to reduce the number of delivery vehicles entering the town centre. |
| New park and ride facilities | New Park-and-Ride facilities | Four location options were put forward in the ITT: 1) to intercept A322/A323 traffic inbound to Guildford town centre (north west of Guildford town centre); 2) to intercept A320 traffic inbound to Guildford town centre (north of Guildford town centre); 3) to intercept A3 traffic from north as a replacement to existing Spectrum park and ride facility (north east of Guildford town centre); and 4) to intercept A281 traffic inbound to Guildford town centre (south of Guildford town centre). Introducing P&R at the four locations would give near-comprehensive P&R provision into Guildford (only the A31 route to Guildford from the west would not have a P&R option). |
| Additional rail services on the North Downs Line (Reading - Gatwick) | Additional rail services on North Downs line | Current services run about twice an hour in each direction, this intervention increases the service frequency. |
| New rail halt or station at Park Barn/Surrey Research Park | New station at Surrey Research Park | A new rail halt or station at Park Barn/Surrey Research Park. The North Downs railway line to Reading passes by alongside the Surrey Research Park and the Royal Surrey County Hospital currently. This intervention would provide an attractive rail travel option to this high employment area and encourage modal shift. |

| OTHER INTERVENTIONS | | |
|---|--|---|
| Intervention name (full) | Intervention name (short, as it appears in Section 4) | Description |
| New rail halt or station at Merrow | New station at Merrow | A new rail halt or station at Merrow. The New Guildford railway line to London passes by alongside Merrow currently. The halt/station would serve Merrow and Burpham as both are close to the railway line in this area. This intervention would provide an attractive rail travel option and encourage modal shift. |
| Reinstatement of rail services along the corridor between Cranleigh and Guildford | Reinstatement of Guildford to Cranleigh rail line | The route is currently protected from development because it is recognised as an important movement corridor. It is currently a recreational route for walkers, cyclists and horse riders. Reinstating rail services along this corridor would remove the current facility but replace it with a rail travel option from Cranleigh to Guildford (unless a green corridor could be provided alongside, providing a replacement facility for walkers, cyclists and horse riders). |
| Improved rail access for Heathrow | Improved southern rail access to Heathrow Airport | Current rail connections between Heathrow and Guildford involve two changes and the journey takes nearly 2 hours. This intervention assumes a southern rail link is built enabling direct rail services from Guildford to Heathrow, similar to the abandoned ‘Airtrack’ scheme. |
| Increased capacity for services between Guildford and Waterloo | Increased rail capacity to London Waterloo | Increased capacity for services between Guildford and Waterloo (e.g. train lengthening, additional services, etc.) on the Portsmouth Direct Line and/or the South West Main Line. |
| Sustainable movement corridor | Sustainable movement corridor | A priority pathway through the town for pedestrians, cyclists and public transport, which represents a combination drawn from three interventions: ‘creation of a well-signed comprehensive network of walking and cycling routes linking key trip attractors/generators...’ ‘dedicated and continuous ‘cycle superhighways’, and ‘new segregated or mostly segregated public transport option (Bus Rapid Transit, guided busway or tram/light rail)’. |

3.3 Metrics Assessment

The appraisal was carried out using the metrics identified in the Vision, Objectives, Baseline and Business-As-Usual Report (Arup, March 2015). Further details of metrics are given in that report. The metrics cover a range of criteria that contribute towards the different elements of the vision. The performance of each metric was assessed against the Business-As-Usual scenario to determine the general trend (positive or negative) and scale of impact. Some metrics were assessed quantitatively and some were assessed qualitatively.

The metrics are listed in **Table 11** showing how each metric was assessed. The metrics are grouped by their geographic coverage, either Borough or Town level.

Table 11: Summary of appraisal metrics

| Geographical coverage | Metric (full title) | Metric (shortened title) | SINTRAM model outputs, data and approach used for metric appraisal by category of intervention | |
|-----------------------|---|---|--|------------------------|
| | | | Intermediate and Major Highway Schemes Packages of Sustainable Transport Interventions | Other Interventions |
| Borough | Total vehicle distance within Guildford borough | Vehicle distance | SINTRAM model data | Professional judgement |
| | Sustainable mode share for Guildford borough residents' journey to work trips | Sustainable mode share | Professional judgement | Professional judgement |
| | Highway level of delay | Highway level of delay | SINTRAM model data | Professional judgement |
| | Air quality impact caused by transport in Guildford town | Air quality impact | SINTRAM model data | Professional judgement |
| | Noise impact resulting from traffic on major roads | Noise impact | SINTRAM model data | Professional judgement |
| | Brownfield and greenfield land use impact | Land use impact | Professional judgement | Professional judgement |
| | Number of accidents resulting in Killed or Seriously Injured (KSI) | Road accidents | SINTRAM model data | Professional judgement |
| Town | Guildford town centre accessibility by non-car modes | Accessibility by non-car modes (aggregated) | SINTRAM model data | Professional judgement |
| | Guildford Railway Station accessibility by non-car modes | | | Professional judgement |
| | Surrey Research Park accessibility by non-car modes | | | Professional judgement |

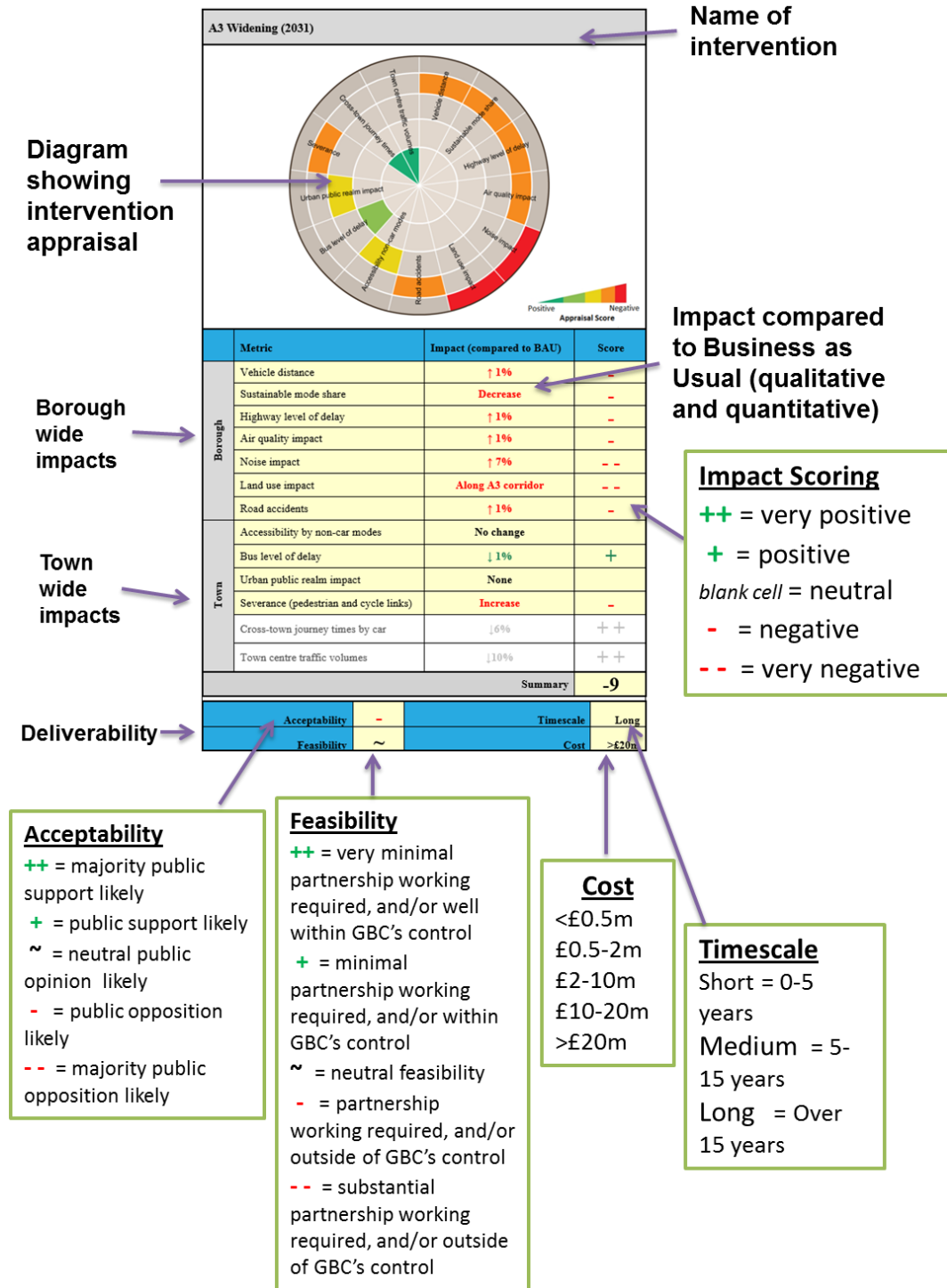
| Geographical coverage | Metric (full title) | Metric (shortened title) | SINTRAM model outputs, data and approach used for metric appraisal by category of intervention | |
|-----------------------|--|--|--|------------------------|
| | | | Intermediate and Major Highway Schemes Packages of Sustainable Transport Interventions | Other Interventions |
| | Slyfield Industrial Estate accessibility by non-car modes | | | Professional judgement |
| | Guildford Business Park accessibility by non-car modes | | | Professional judgement |
| | Bus level of delay | Bus level of delay | SINTRAM model data | Professional judgement |
| | Urban public realm impact | Urban public realm impact | Professional judgement | Professional judgement |
| | Number and amenity of pedestrian and cycle crossings of major transport barriers (e.g. A3, River Wey, Gyrotory, Railway lines) | Severance (pedestrian and cycle links) | Professional judgement | Professional judgement |
| | Cross-town journey times by car* | Cross-town journey times by car | SINTRAM model data | Professional judgement |
| | Town centre traffic volumes* | Town centre traffic volumes | SINTRAM model data | Professional judgement |

*Not a main metric but included for illustrative purposes at the request of GBC.

3.4 Appraisal Summary Table Template

An appraisal summary table was developed to show the results of the appraisal on one page for easy reference. This shows the quantitative and qualitative scores against the metrics. The appraisal summary table template format is explained in Figure 3.

Figure 3: Appraisal Summary Table Template



4 Appraisal of Interventions

4.1 Business-As-Usual

The 2031 Business-As-Usual (BAU) scenario is an estimate for how Guildford's transport system will perform in future without intervention (i.e. with only committed transport schemes as of the present day) and with traffic growth in the borough reflecting new developments in the borough which had been granted planning permission by April 2012 and background growth to 2031 in trips resulting from changes in demographic profile and car ownership, plus 'full development' to the forecast year of 2031 for the rest of the country.³ The BAU scenario reflects what might happen to Guildford's transport system by 2031 without any additional intervention.

Results for 2050 are provided in Appendix A for reference. The assumptions behind the BAU forecast are covered in more depth in the Vision, Objectives, Baseline and Business-As-Usual Report (Arup, March 2015), but it is worth emphasising the considerable uncertainty of using such a long timeframe, particularly for 2050.

However, the expected BAU scenario results show that without intervention the transport system in Guildford is expected to perform substantially worse against the metrics, indicating that it fails to support the vision for the town. The results of the BAU forecast are presented in **Table 12**. Metrics are assessed in comparison to 2009, the baseline year.

³ The GTAMS's 2031 BAU scenario is the 2031 Scenario 1 in the Preliminary Growth Scenarios Transport Assessment Report (Surrey County Council, August 2013). The use of this scenario was agreed with the study's Steering Group in October 2013. This is based on a forecast 2031 population of 146,544. The alternative of using another of the various scenarios which included potential future development sites was rejected, as, at that stage, GBC had not identified a proposed spatial development strategy to 2031. Also, given the number of potential interventions to be tested, it was not considered efficient to select more than one scenario as the 2031 BAU. A proposed spatial development strategy was identified in the Draft Guildford borough Local Plan: Strategy and Sites (GBC, July 2014). GBC proposes to test a number of shortlisted interventions with respect to the emerging spatial development strategy in due course.

Table 12: Metric Appraisal for 2031 Business-As-Usual

| | Metric | Impact (compared to 2009 Baseline) |
|----------------|--|------------------------------------|
| Borough | Vehicle distance | ↑ 12% |
| | Sustainable mode share | Slight increase |
| | Highway level of delay | ↑ 13% |
| | Air quality impact | ↑ 12% |
| | Noise impact | ↑ 8% |
| | Land use impact | No change |
| | Road accidents | ↑ 12% |
| Town | Accessibility by non-car modes | ↑ 2% |
| | Bus level of delay | ↑ 5% |
| | Urban public realm impact | No change |
| | Severance (pedestrian and cycle links) | No change |
| | Cross-town journey times by car | ↑ 4% |
| | Town centre traffic volumes | ↑ 7% |

The BAU scenarios show that doing nothing is not a desirable option; something must be done if Guildford’s transport system is to support the vision for sustainable mobility in Guildford in 2050.

4.2 Intermediate and Major Highway Infrastructure Interventions

The Intermediate and Major Highway Infrastructure Interventions scenarios represent what happens if there is significant investment in highway infrastructure as a strategy for Guildford's transport system. Schemes are focused around two of Guildford's road system assets which are currently considered to be key problem areas, the A3 strategic road and the town centre traffic system, which is currently focused around the gyratory. These interventions are appraised separately to assess the impact independent of any other changes to the system.

4.2.1 A3 Interventions

Four interventions for the A3 trunk road were appraised:

- **Widening** the A3 to three lanes in each direction through Guildford. (From the M25 Wisley interchange junction to the A320 Stoke Interchange within the Guildford urban area, the A3 is a dual carriageway with three lanes on each carriageway, but for the remaining stretch of some four kilometres through the urban area, between its junctions with the A320 and the A31 Hog's Back, the A3 is a lower standard, dual carriageway with two lanes on each carriageway);
- **Bypassing** Guildford so the A3 passes to the north of the urban area⁴;
- **Tunnelling** the A3 through the Guildford urban area to reduce impacts on the town; and
- **Junction changes** along the current A3 corridor alignment through the Guildford urban area, so all movements are possible at all junctions.

The second and third options utilise the existing A3 alignment as a local distributor road, allowing greater separation of local and through traffic. The results of the appraisal are presented below.

⁴ The bypass to the north of the town was selected as the preferred bypass option because there are major environmental constraints with a southern bypass, as it runs through a number of protected areas and through the North Downs. The northern route also has environmental constraints, but these are considered less difficult to overcome than the southern route.

Figure 4: Appraisal Summary Table – A3 Widening

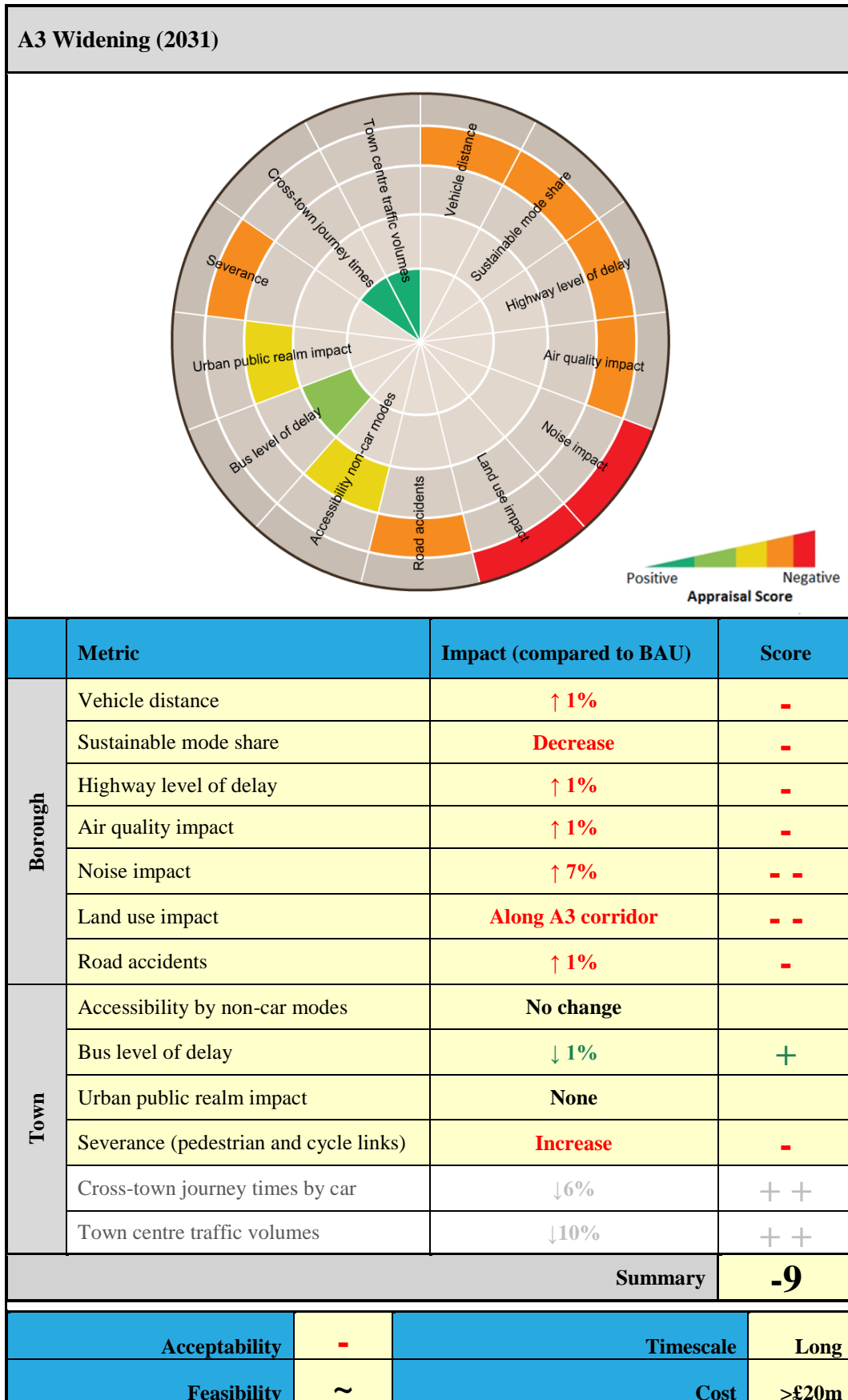


Figure 5: Appraisal Summary Table – A3 Northern Bypass

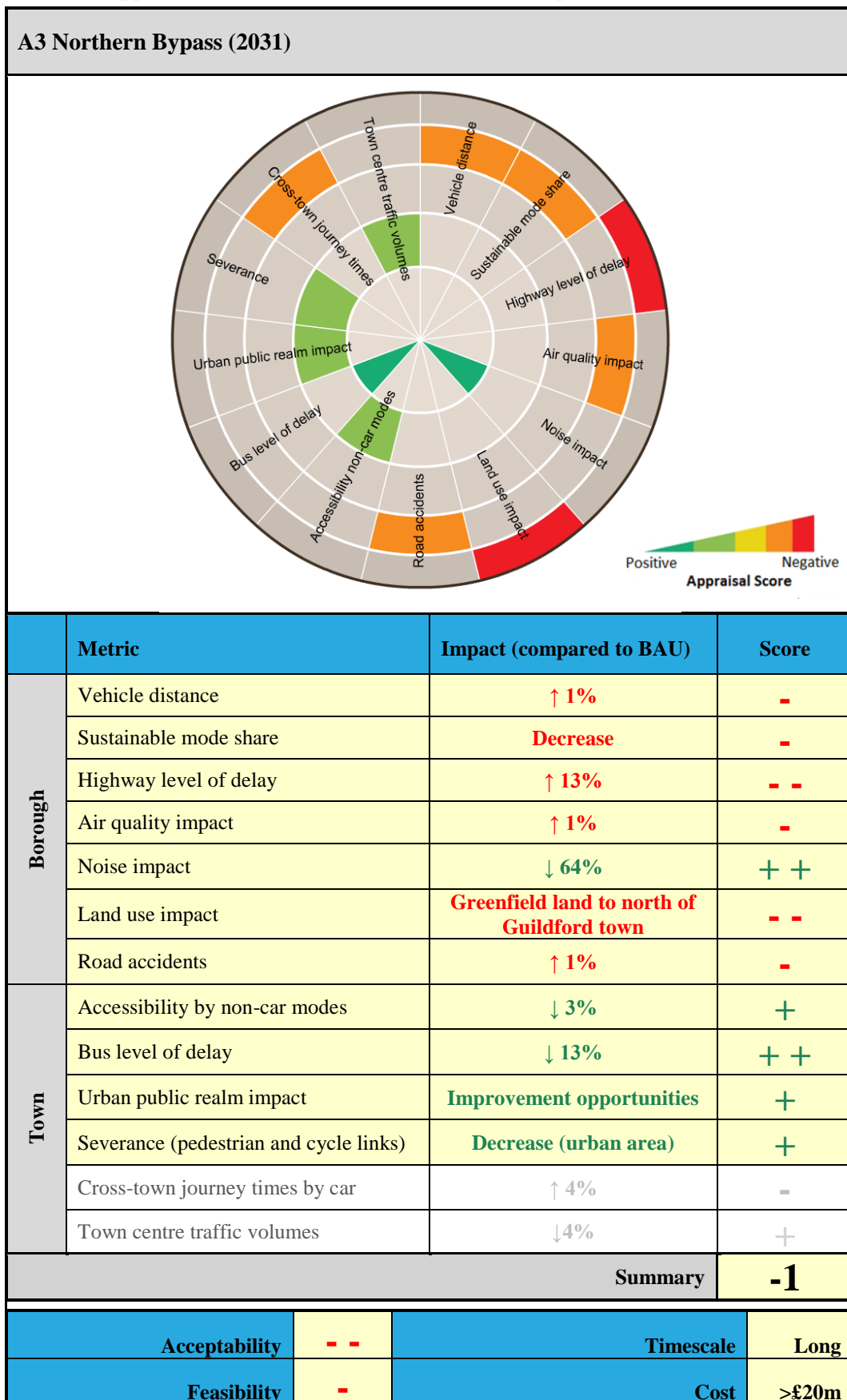
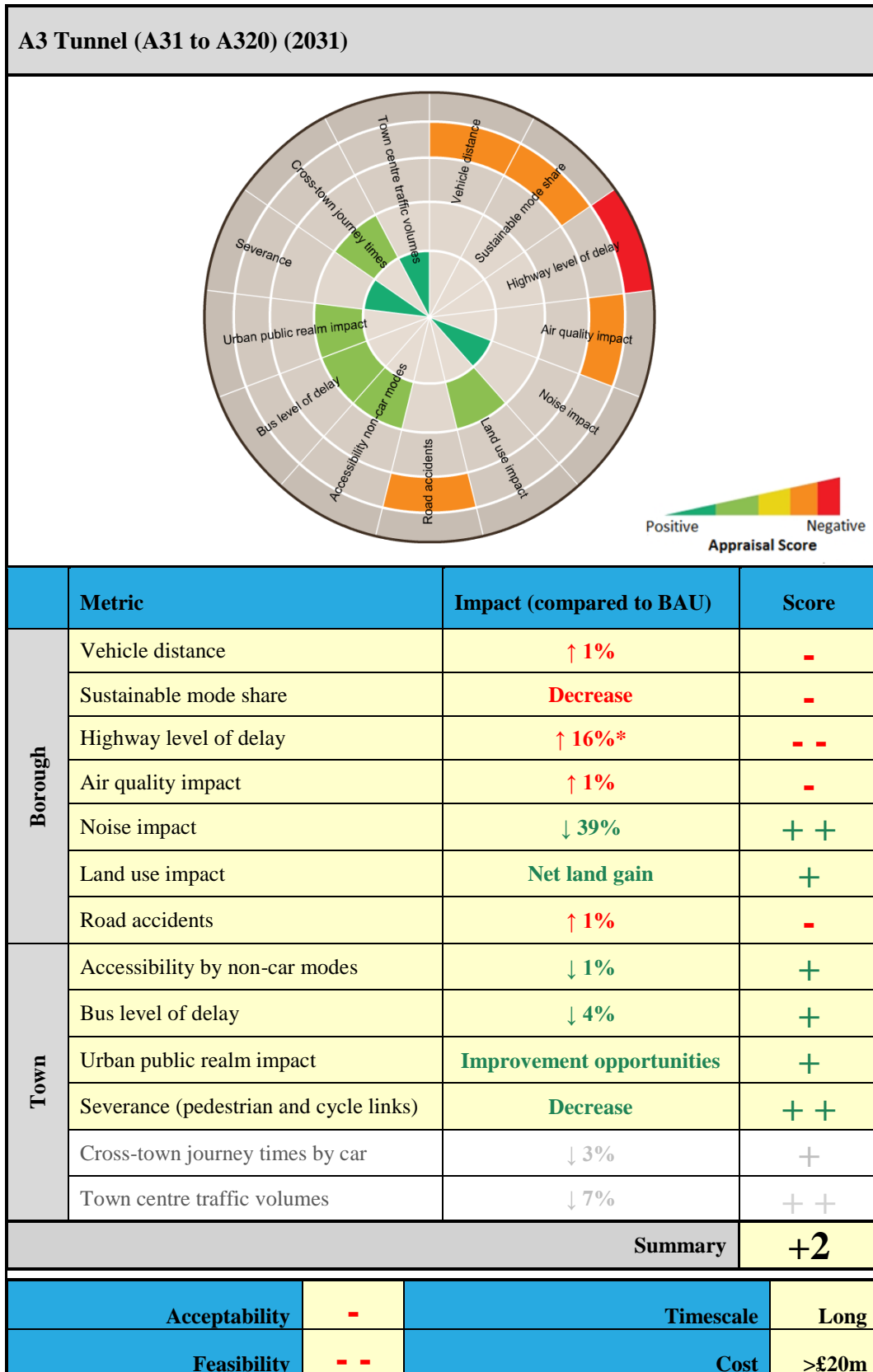
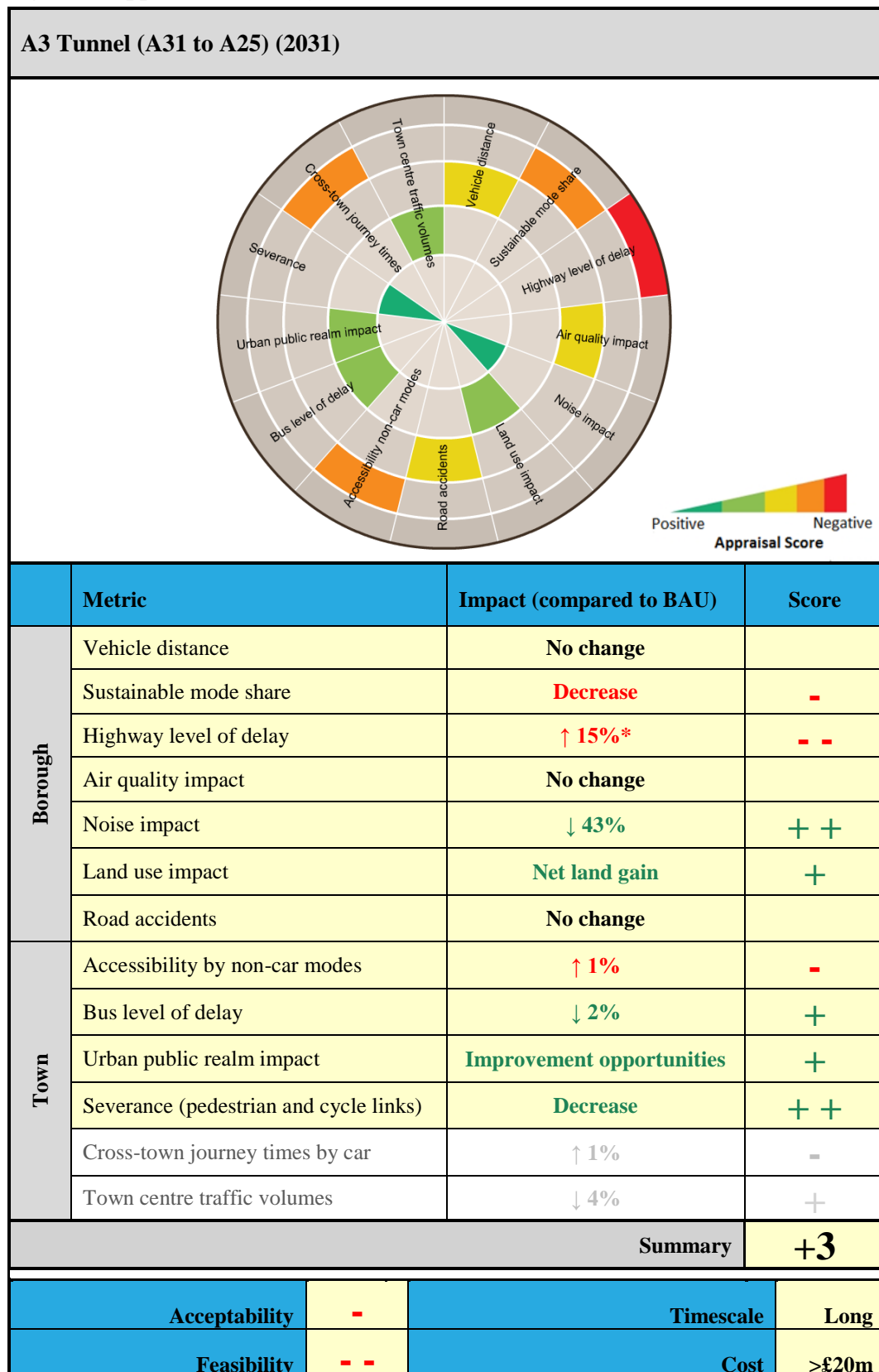


Figure 6: Appraisal Summary Table – A3 Tunnel (A31 to A320)



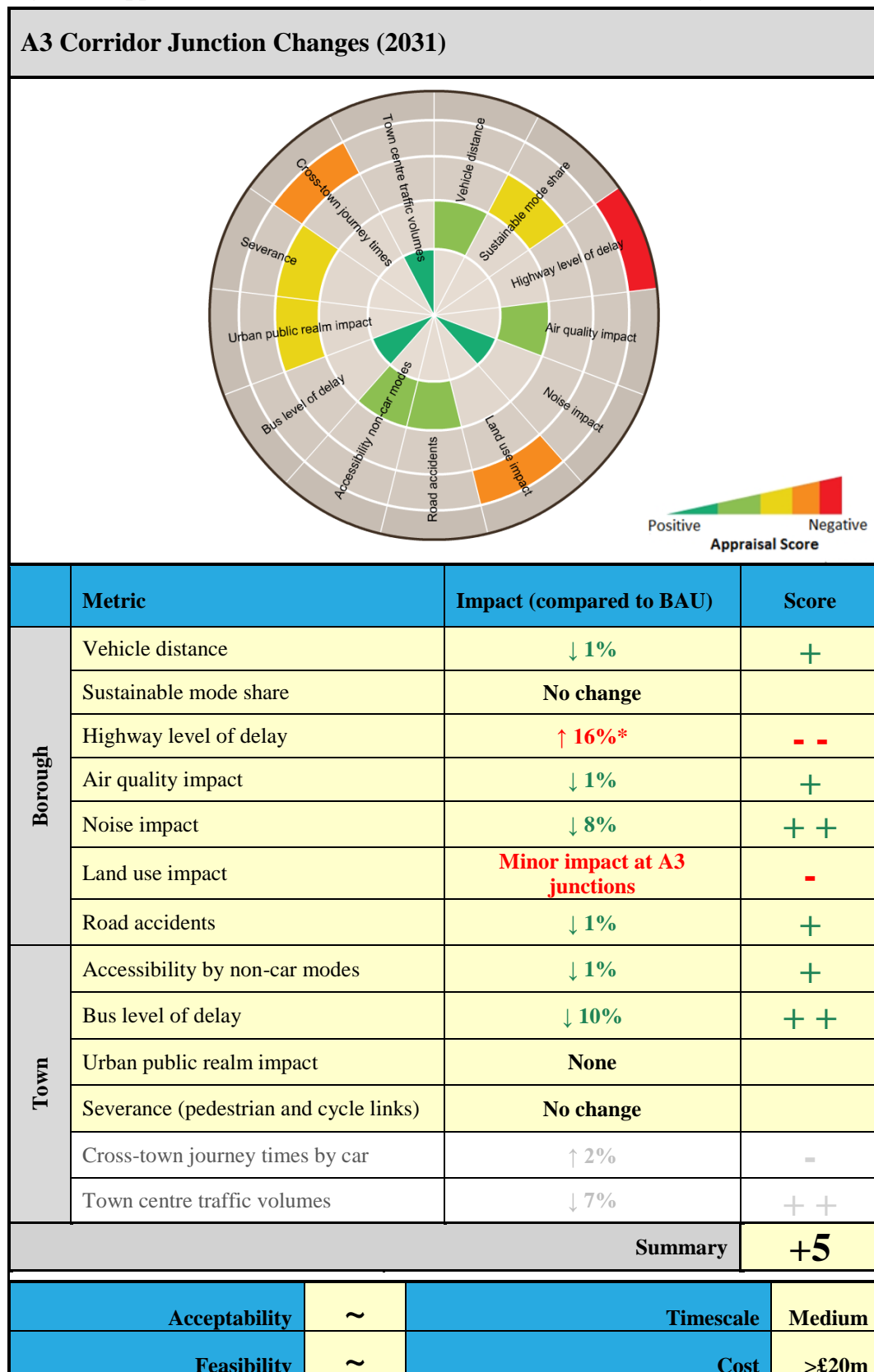
* Highway level of delay for the road network increases significantly due to significant delay increases at key junctions onto the A3, and delay at new junctions to access the A3 not experienced in the Business-As-Usual scenario.

Figure 7: Appraisal Summary Table – A3 Tunnel (A31 to A25)



* Highway level of delay for the road network increases significantly due to significant delay increases at key junctions onto the A3, and delay at new junctions to access the A3 not experienced in the Business-As-Usual scenario.

Figure 8: Appraisal Summary Table – A3 Corridor Junction Changes



* Highway level of delay for the road network increases significantly due to significant delay increases at key junctions onto the A3, and delay at new junctions to access the A3 not experienced in the Business-As-Usual scenario.

4.2.2 Town Centre Schemes

Four interventions for the town centre were appraised:

- **Redesigning the town centre road system** which includes building a new tunnel from York Road to Millbrook, and a new bridge over the railway to the north of the station, effectively creating a one way outer ring road system – as proposed by David Ogilvie⁵;
- **Redesigning the town centre road system** which includes building a new road following the railway line on the west side from Farnham Road northwards, and a new bridge over the railway line from the north of the Guildford Park car park access road to Walnut Tree Close, and a new road link following the railway line to Woodbridge Road – as proposed by Guildford Vision Group (GVG);
- **Closing Walnut Tree Close to through traffic**, so it is access only; and
- **Pedestrianising Bridge Street** and converting the rest of the gyratory to two way operation.

The first two schemes create quite significant changes to the road network over an important part of the town centre. The second and third schemes are much more localised but still occur in strategically important places.

⁵ David Ogilvie is a stakeholder in Guildford who has proposed this scheme for the town centre. The scheme was listed in the ITT by Guildford Borough Council.

Figure 9: Appraisal Summary Table – Town centre road system redesign (David Ogilvie)

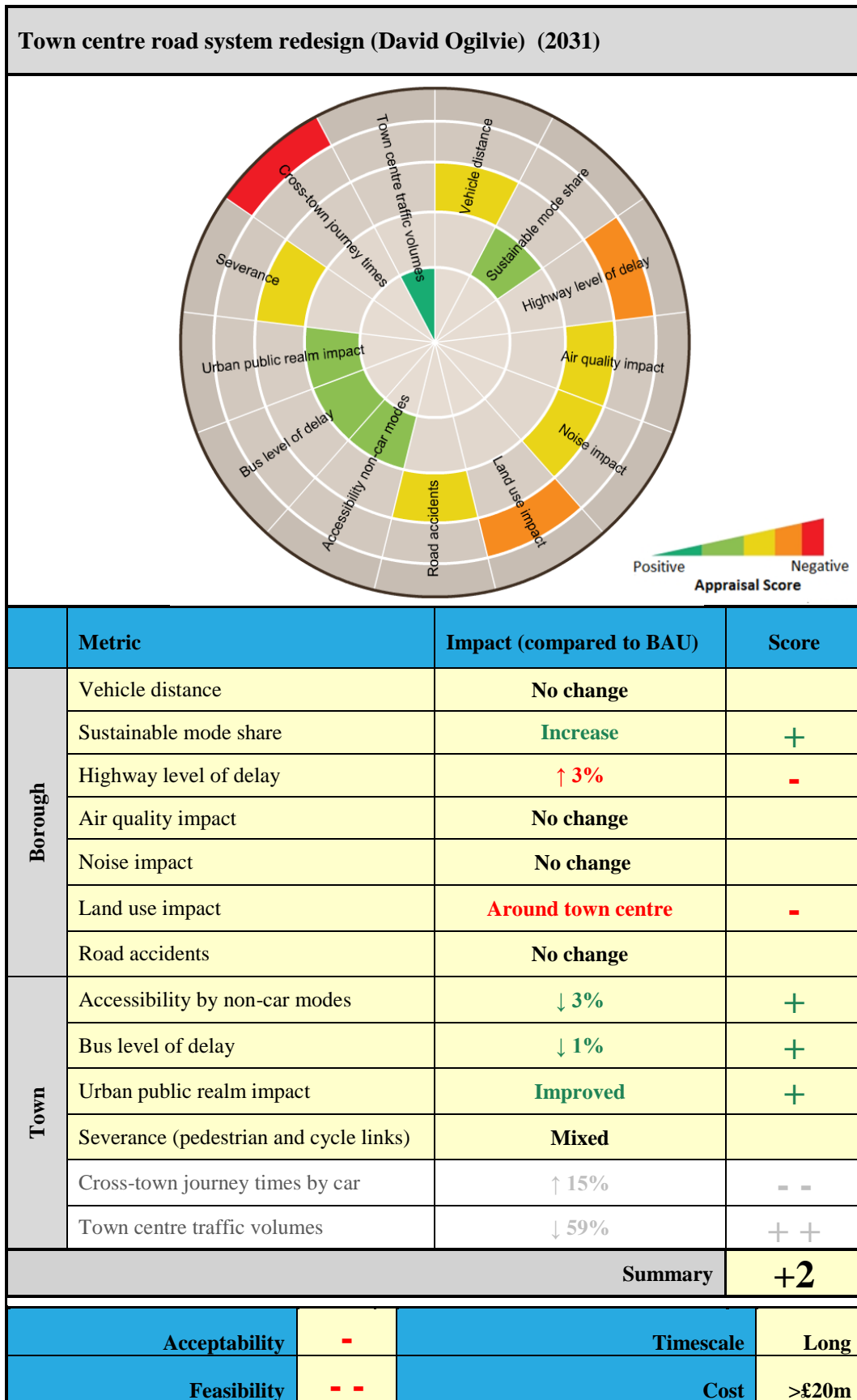


Figure 10: Appraisal Summary Table – Town centre road system redesign (Guildford Vision Group)

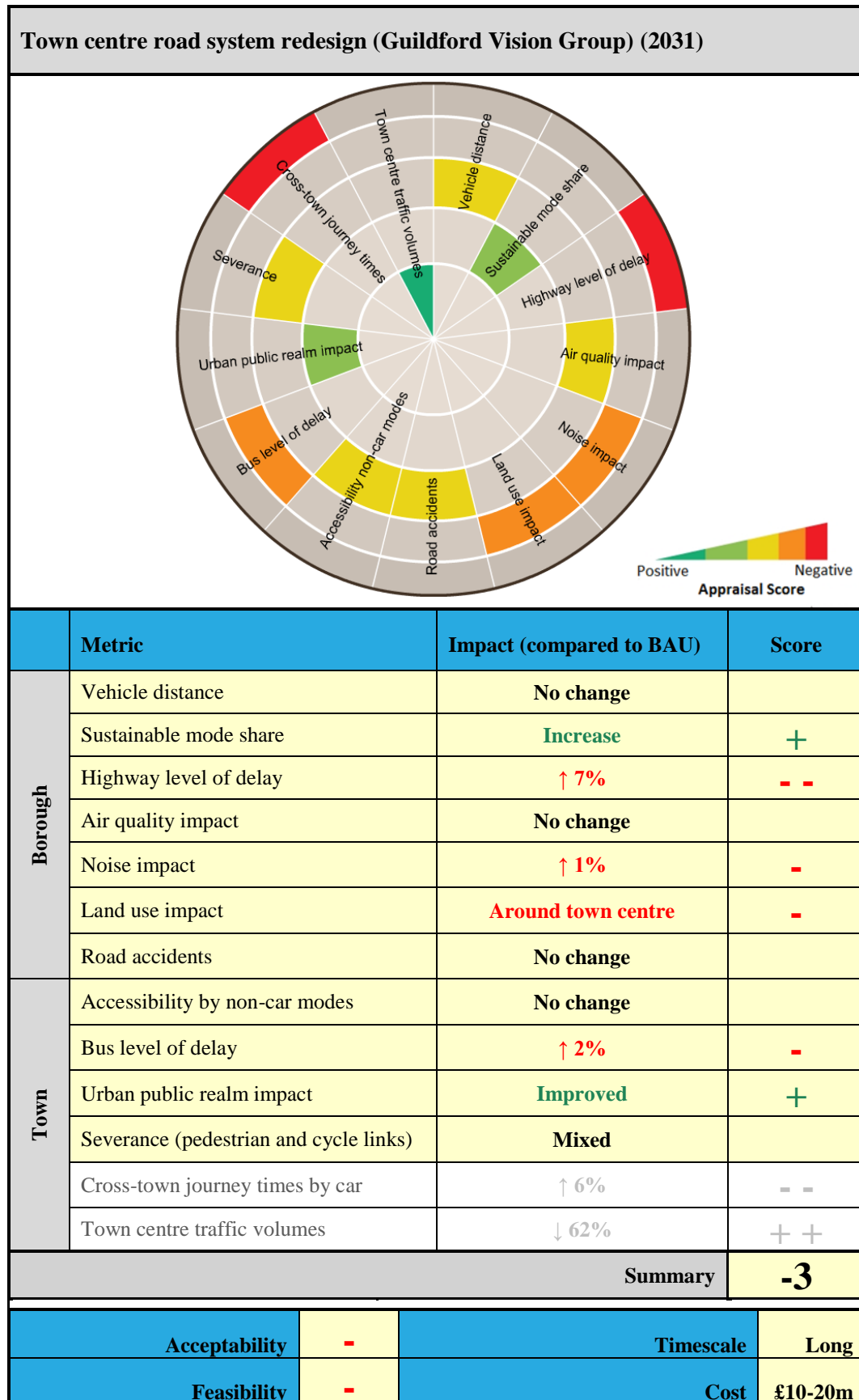


Figure 11: Appraisal Summary Table – Pedestrianisation of Bridge Street

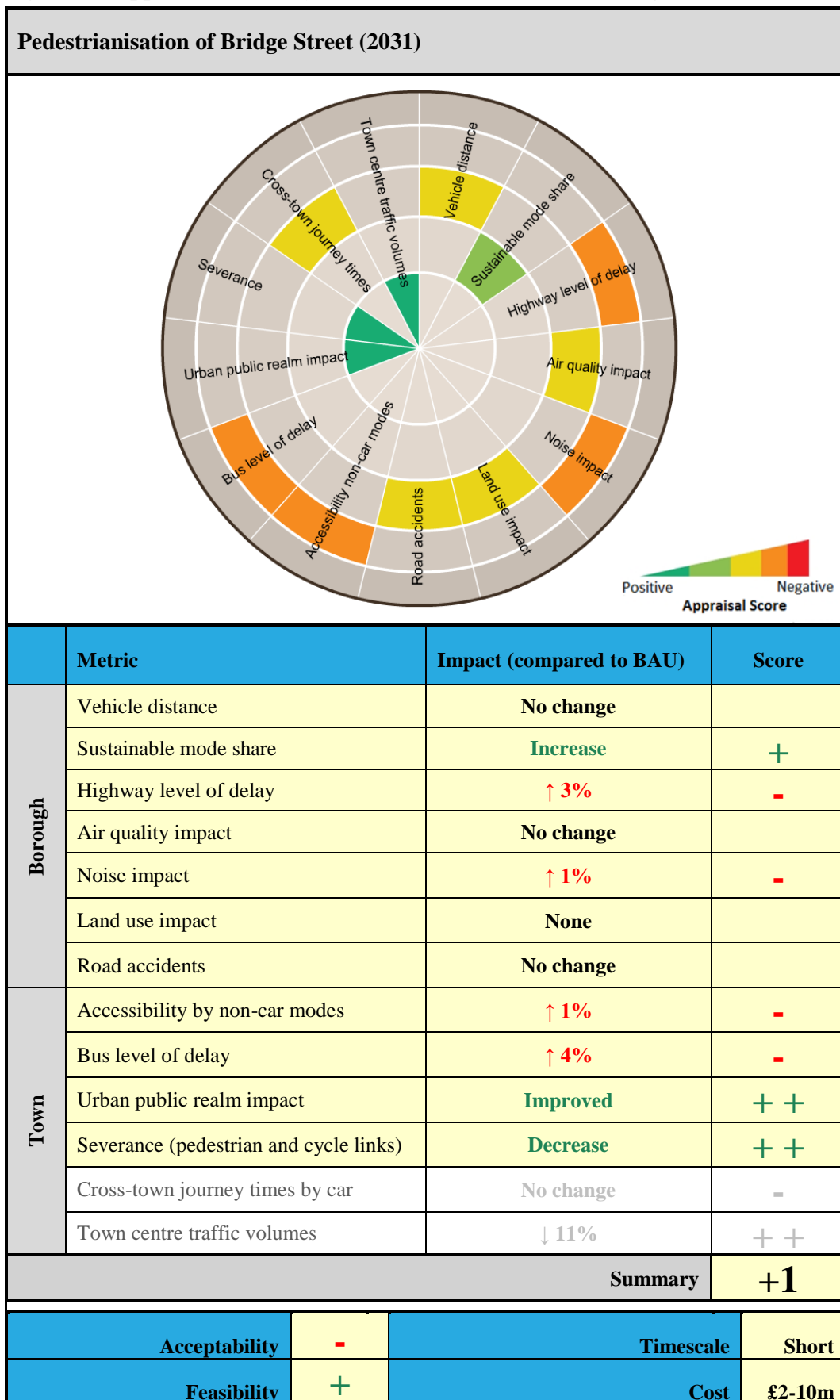
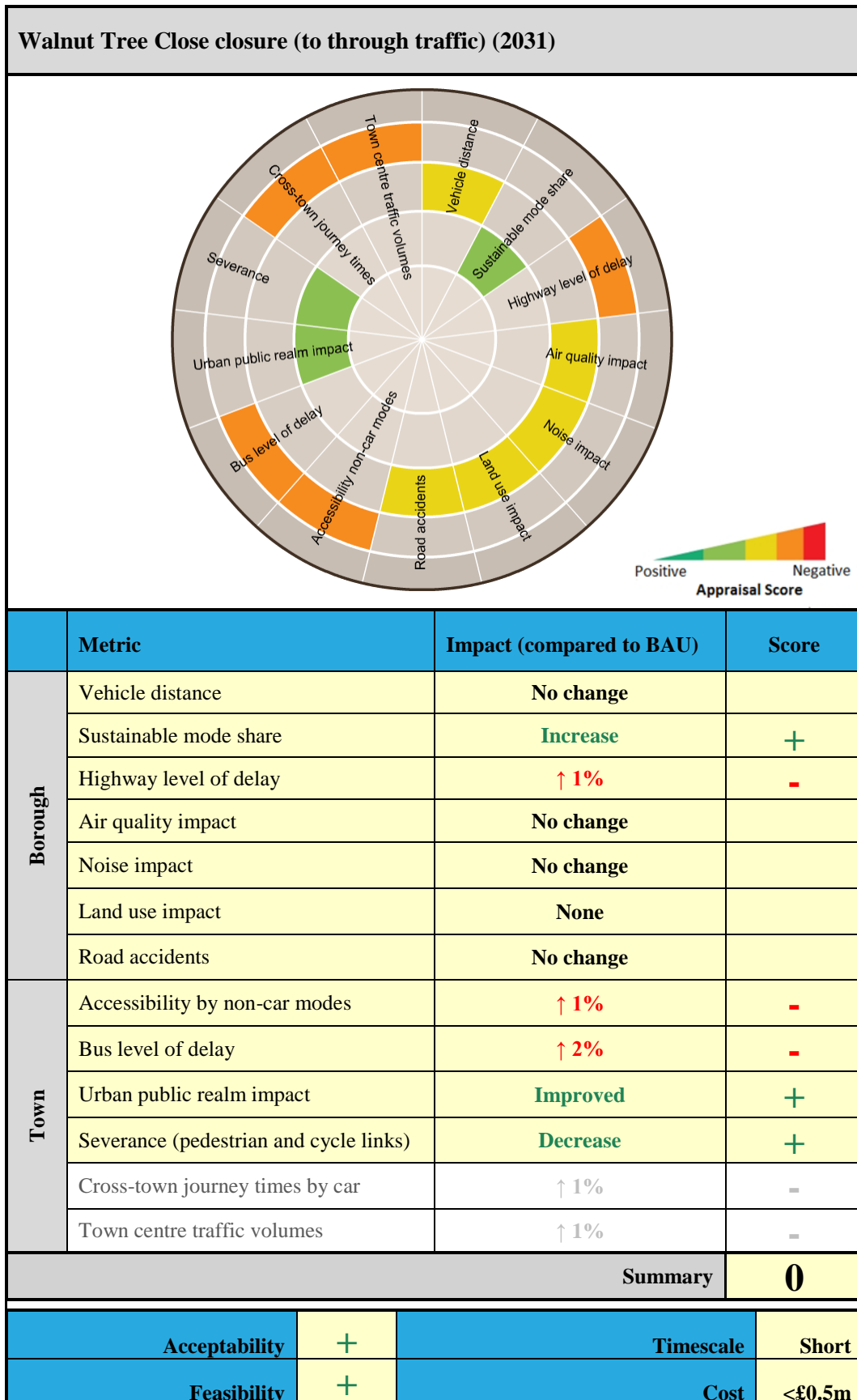


Figure 12: Appraisal Summary Table – Walnut Tree Close closure (to through traffic)



4.2.3 Summary of Intermediate and Major Infrastructure Interventions Appraisal

The appraisal against the study metrics indicates the following:

Borough-Wide

- All of the major A3 interventions other than the A3 tunnel (A31 to A25) and A3 corridor junction changes are expected to increase vehicle distance (by 1%) and decrease sustainable mode share in the Borough. The town centre interventions have no impact on vehicle distance across the Borough, and they all potentially increase sustainable mode share as they particularly improve town centre conditions for walking and cycling.
- Air quality is forecast to be worse under all A3 interventions (again excluding the A3 tunnel (A31 to A25) option and A3 corridor junction changes). Noise is worse for A3 widening, but improved with the A3 tunnels, northern bypass and corridor junction changes, although the northern bypass potentially creates new noise impact areas along its route to the north of the town. The town centre interventions have no impact on air quality overall; their impact on noise is either neutral or causes an increase in noise impacts of 1%.
- The A3 widening and A3 northern bypass interventions have significant land take issues, as they require either existing developed land (for widening) or greenfield land (for the bypass). The two town centre road system redesign interventions have an impact on land, in particular the Ogilvie scheme which requires land for tunnel portals in the town centre.
- Road accidents are forecast to increase under all of the A3 interventions which increase vehicle traffic (all but the A3 tunnel (A31 to A25) and A3 corridor junction change options). None of the town centre interventions have an impact on road accidents.

Town-Wide

- Accessibility by non-car modes and public transport delays in the town are expected to improve under the A3 northern bypass, A3 tunnel (A31 to A320) and A3 corridor junction change interventions, with the A3 northern bypass showing a 13% decrease in delay to buses. Of the town centre interventions, the Ogilvie town centre road system redesign scheme slightly improves these indicators (by 1-3%) whilst the GVG town centre road system redesign scheme has a neutral or slightly negative impact (2%).
- Of the A3 interventions, the northern bypass and tunnels offer potential urban public realm improvement opportunities. All of the town centre interventions offer urban public realm improvement opportunities, as they remove traffic from a number of streets.
- Whilst the A3 northern bypass and tunnel interventions would reduce severance in the town, the A3 widening increases severance by creating a wider A3 corridor in the town. Whilst severance in the town centre is potentially improved by the road system redesign interventions, it is also potentially impacted by increased traffic around the periphery of the town centre, hence the 'mixed' score in the appraisal.

Deliverability

- The A3 interventions are long term (>15 years), high cost (>£20m) schemes (with the exception of the changes to junctions in the Guildford urban area which could be delivered more quickly). Many of the larger schemes would actually cost in excess of £100m, such as the A3 northern bypass or the A3 tunnels and such schemes have potential acceptability issues (i.e. the schemes are likely to encounter significant public opposition). Of the town centre interventions, the road system redesign schemes are long term and high cost, but the Walnut Tree Close and Bridge Street schemes are both short term (<5 years) and lower cost (<£0.5m and £2-10m respectively) options.

Overall

- In the appraisal against the study metrics, the best performing major infrastructure intervention on the A3 is the A3 corridor junction changes, followed by the A3 tunnel (A31 to A25). The best performing intermediate infrastructure intervention in the town centre is the pedestrianisation of Bridge Street.⁶ Of these interventions, the Bridge Street scheme demonstrates potentially higher benefits for a relatively short term, lower cost scheme. Either of the two A3 tunnel options are long term, high cost interventions, with potential acceptability issues.

4.3 Sustainable Transport Interventions

The Sustainable Transport Interventions represent what happens if a strategy of investing in sustainable movement in Guildford is developed. The scenarios are defined to show what would happen under different levels of investment in sustainable transport modes and related infrastructure. Interventions in these scenarios include improved public transport services and improvements to the pedestrian realm in the town centre. The interventions are focused in Guildford town, and particularly in and around the town centre. These interventions are appraised as packages to assess the combined effect of a number of relatively small schemes.

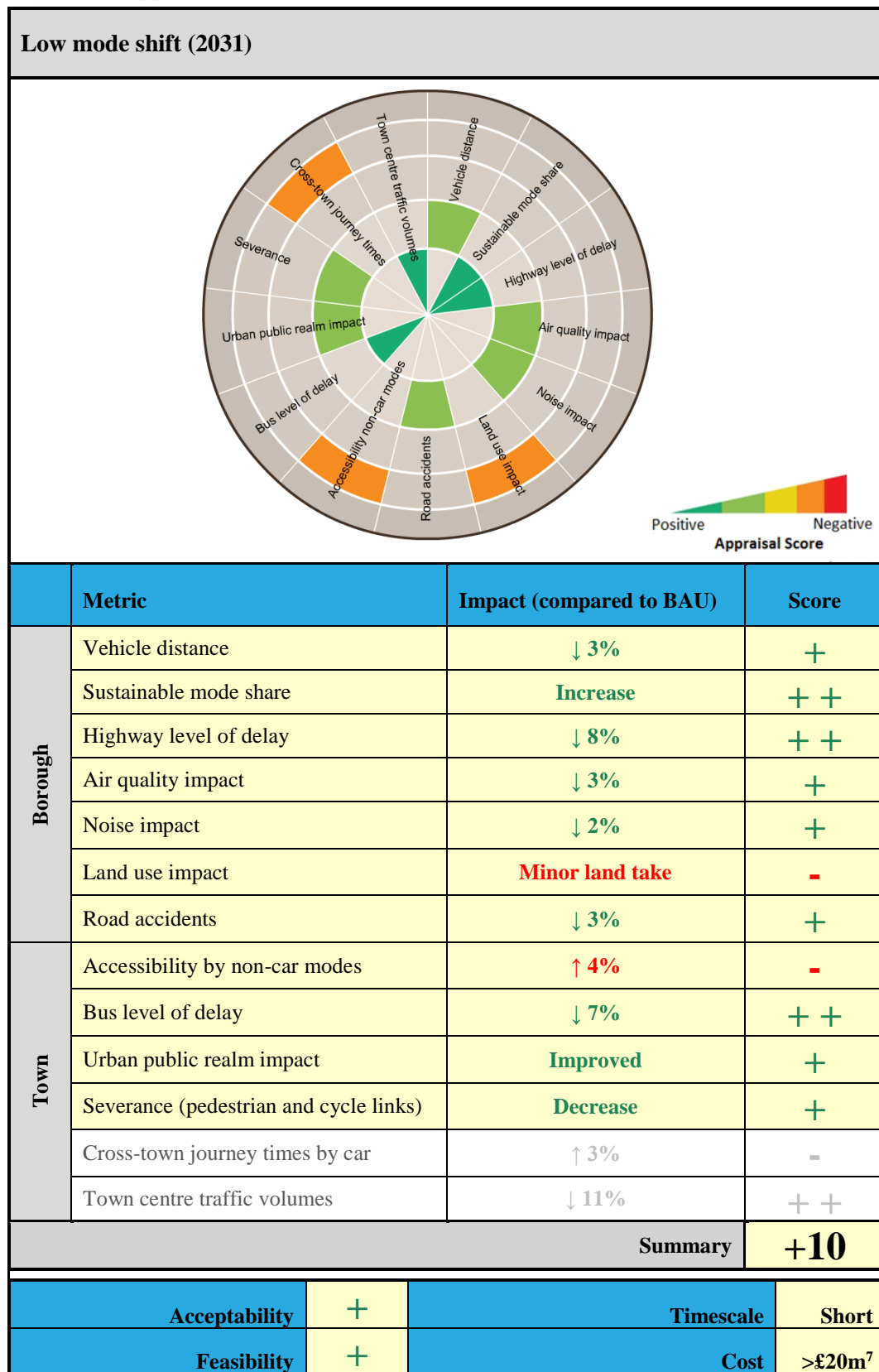
The scenarios are considered at three levels, low, medium and high mode shift. The overall approach to developing these scenarios was to add interventions as the level of investment increases. The scenarios are cumulative, so the low investment interventions are included in the medium and high scenarios, and medium investment interventions are included in the high scenario.

To reflect the different interventions included for each scenario, the shift to more sustainable transport modes is adjusted for each scenario. Mode shift levels are determined based on levels found in comparable urban areas which have chosen to invest in sustainable modes.

The results of the appraisal are presented below.

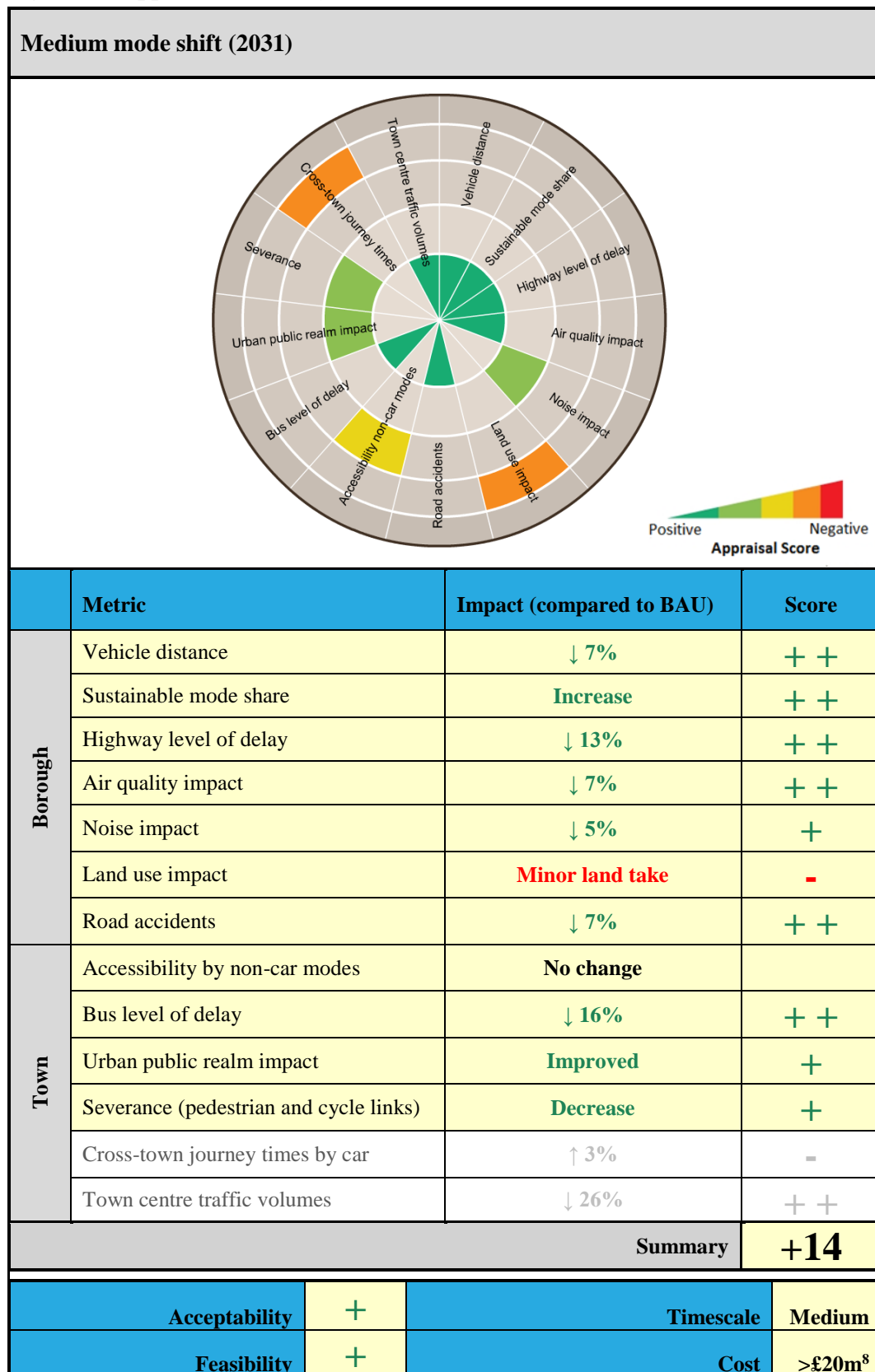
⁶ It should be noted that this scheme has been tested by Surrey County Council at a more detailed level. The conclusion was that when considered in traditional transport economic terms this would not offer good value for money. The more positive results from the GTAMS appraisal reflects the inclusion of a wider range of criteria beyond just transport economic indicators.

Figure 13: Appraisal Summary Table – Low mode shift



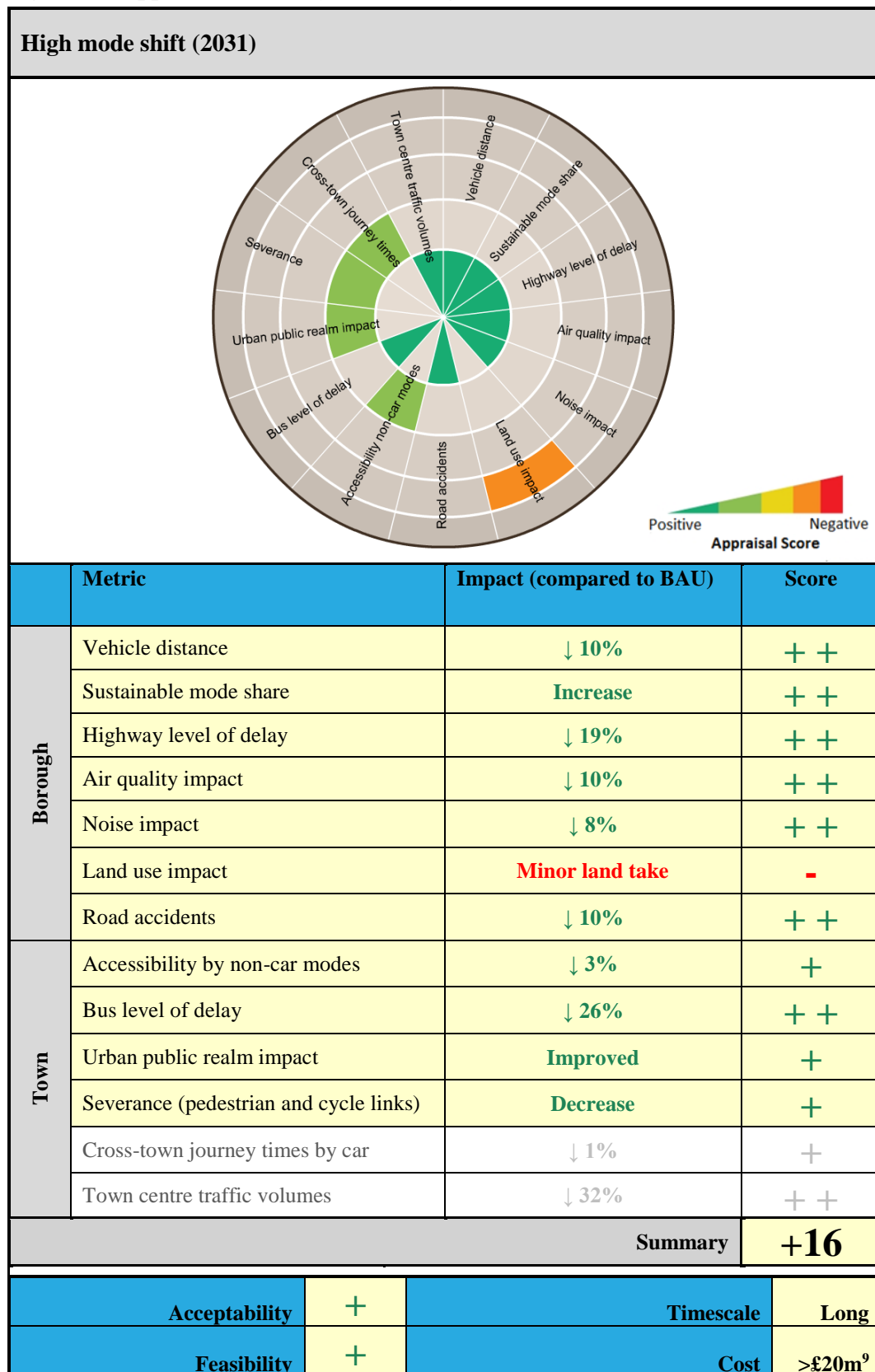
⁷ Cost includes capital costs of pedestrianising Bridge Street and closing Walnut Tree Close to through traffic, as well as on-going costs for sustainable transport improvements.

Figure 14: Appraisal Summary Table – Medium mode shift



⁸ Cost includes capital costs of pedestrianising Bridge Street and closing Walnut Tree Close to through traffic, as well as on-going costs for sustainable transport improvements.

Figure 15: Appraisal Summary Table – High mode shift



⁹ Cost includes capital costs of pedestrianizing Bridge Street and closing Walnut Tree Close to through traffic, as well as on-going costs for sustainable transport improvements.

4.3.1 Summary of Sustainable Transport Interventions Appraisal

The appraisal against the study metrics indicates the following:

Borough-Wide

- All of the sustainable transport interventions are expected to decrease vehicle distance (by 3%, 7% and 10% for low, medium and high mode shift scenarios respectively). By definition they all increase sustainable mode share in the Borough. Highway level of delay is forecast to reduce by 8%, 13% and 19% for the low, medium and high mode share scenarios respectively.
- The forecast reduction in vehicle traffic has positive impacts on the environmental indicators, with air quality impacts forecast to improve by 3%, 7% and 10% respectively and noise impacts improving by 2%, 5% and 8% respectively.
- None of the three scenarios require significant land take.
- Road accidents are forecast to decrease in each of the scenarios (as they reduce vehicle traffic) by 3%, 7% and 10% respectively.

Town-Wide

- Accessibility by non-car modes is 4% worse under the low mode shift scenario, remains unchanged in the medium mode shift scenario and improves under the high mode shift scenario (by 3%). Public transport delays reduce under all scenarios, by 7%, 15% and 25% respectively.
- All scenarios offer potential urban public realm improvement opportunities, as pedestrian environments are improved to encourage more sustainable movement around the town.
- All of the scenarios reduce severance in the town by increasing connectivity across existing barriers (e.g. roads, rail and river).

Deliverability

- Over the 36 year period to 2050 all three scenarios would be expected to cost >£20m (representing a combination of capital and revenue spending). There would be different levels of investment increasing from the Low scenario to the High scenario, but within these scenarios many individual interventions would be low cost (<0.5m) and could be delivered in the short term (within 5 years). The sustainable transport interventions should all be generally acceptable to the public, but there will always be some opposition, for example to the reallocation of roadspace for sustainable transport modes.

Overall

- In the appraisal against the study metrics, the best performing sustainable transport intervention is the high mode shift scenario. This is logical as it represents a higher level of investment and the higher mode shift to sustainable transport.

4.4 Appraisal of Other Interventions

The Other Interventions category includes those interventions that do not fall into either the Intermediate and Major Highway Infrastructure or Sustainable Transport categories. It includes technology interventions (e.g. electric cars), and regional schemes such as improved rail links to London and Heathrow Airport.

These interventions cannot be represented in the SINTRAM model so the appraisal is purely qualitative. Impacts are estimated assuming interventions would generally serve the purpose intended.

The results of the appraisal are presented below and are for 2031 and 2050.

The appraisal results for the sustainable movement corridor are also presented below.

Figure 16: Appraisal Summary Table – Low emission vehicles (including Council fleet)

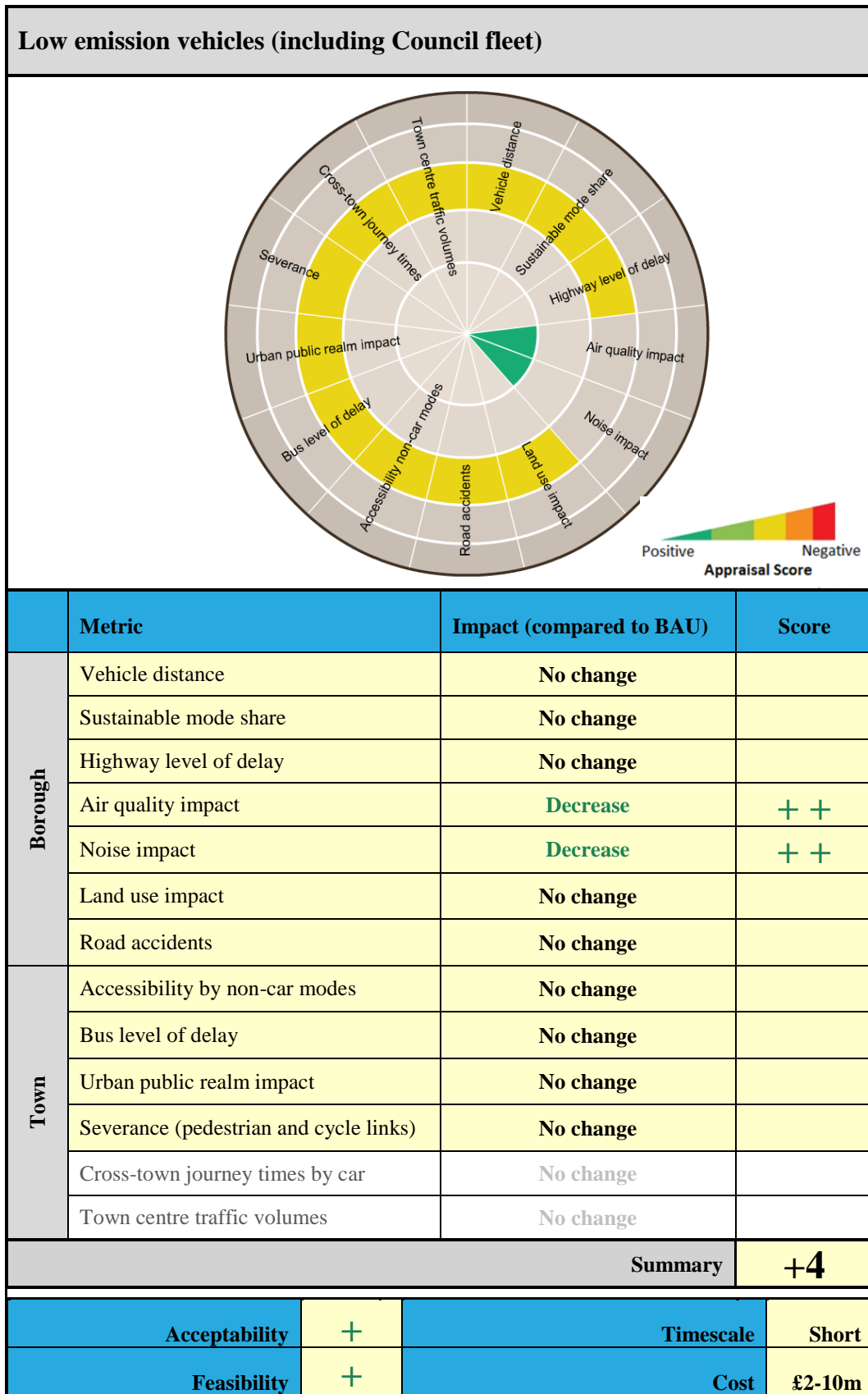


Figure 17: Appraisal Summary Table – Freight Consolidation Centre

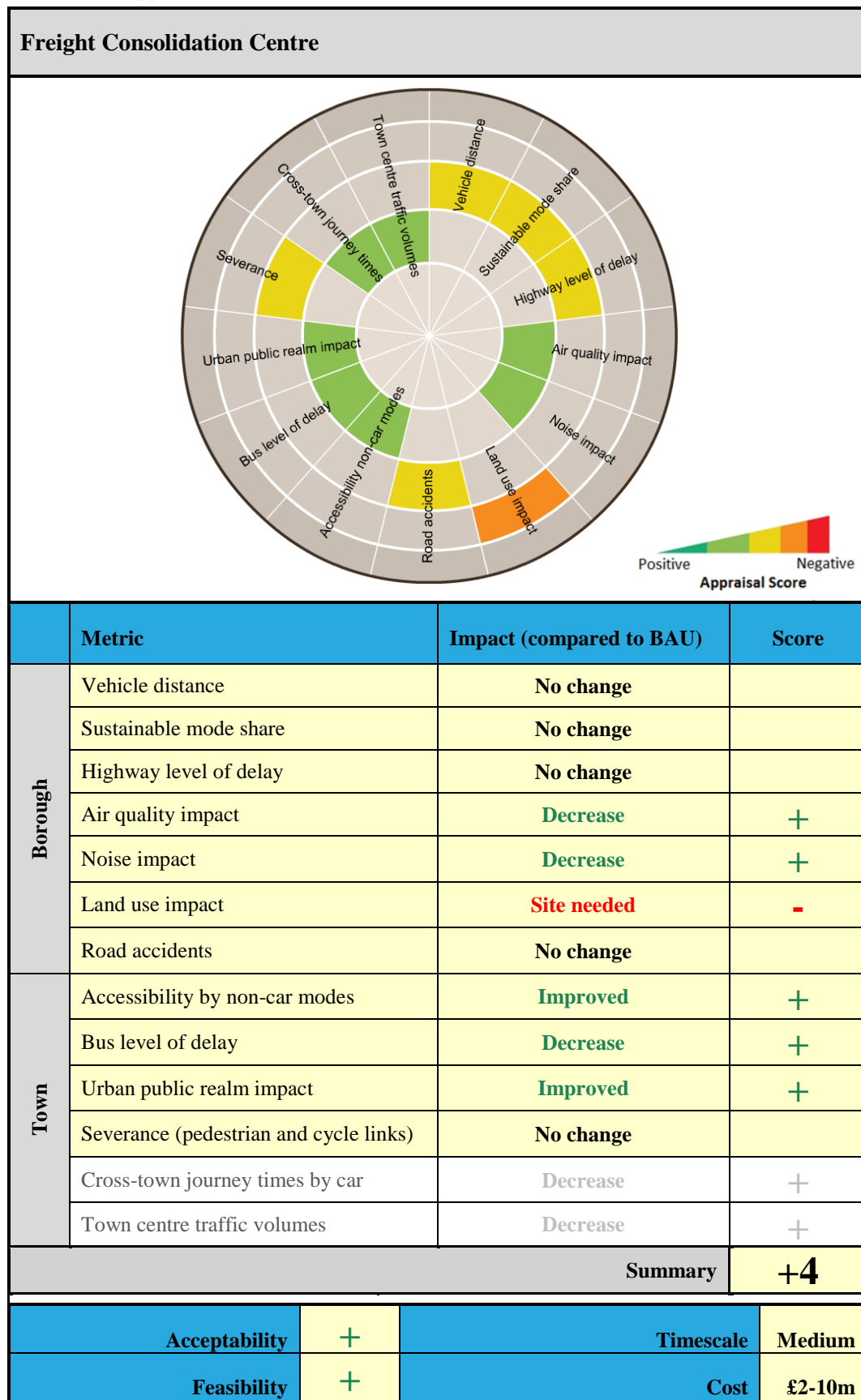


Figure 18: Appraisal Summary Table – New Park-and-Ride facilities

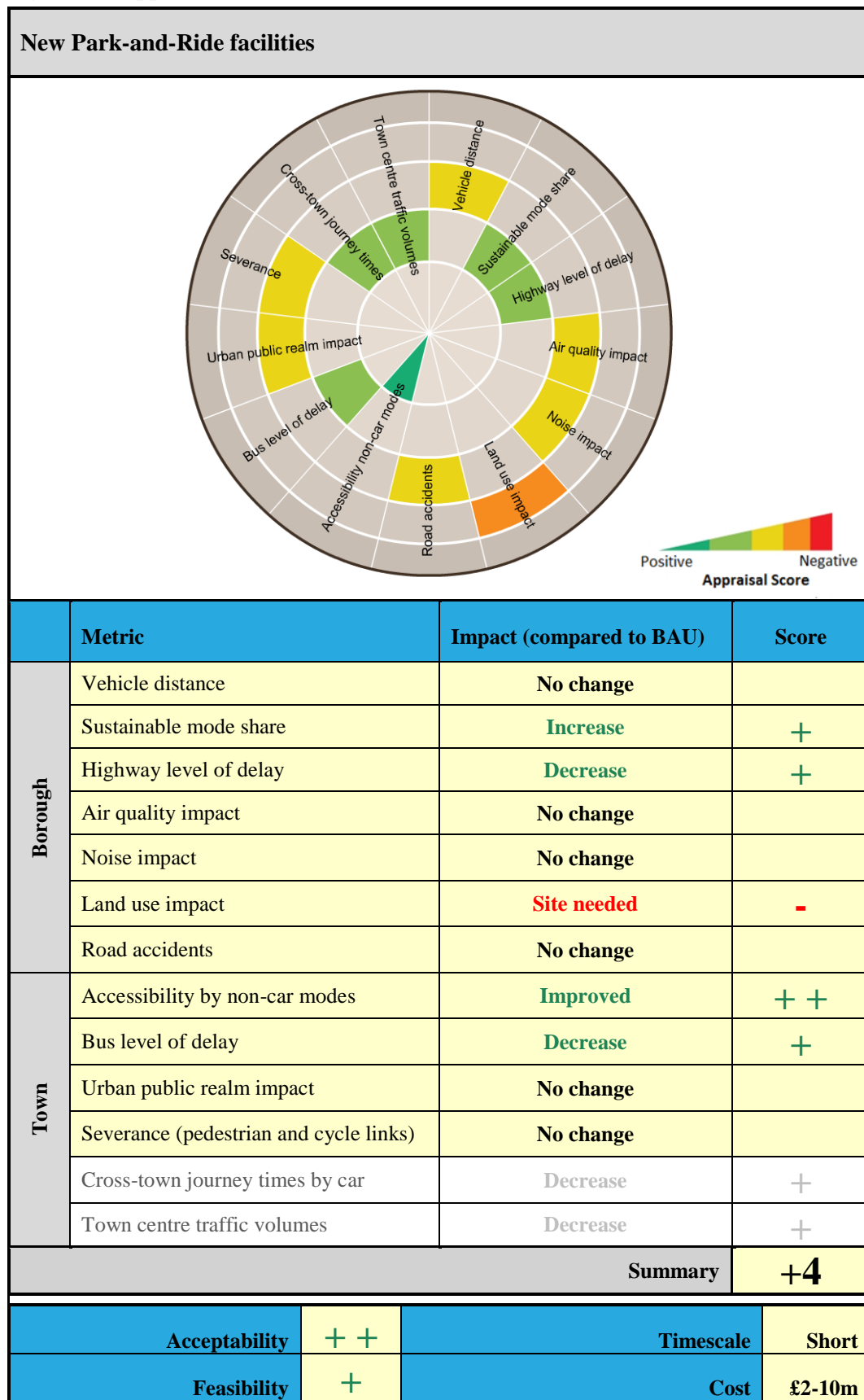


Figure 19: Appraisal Summary Table – Additional rail services on North Downs line

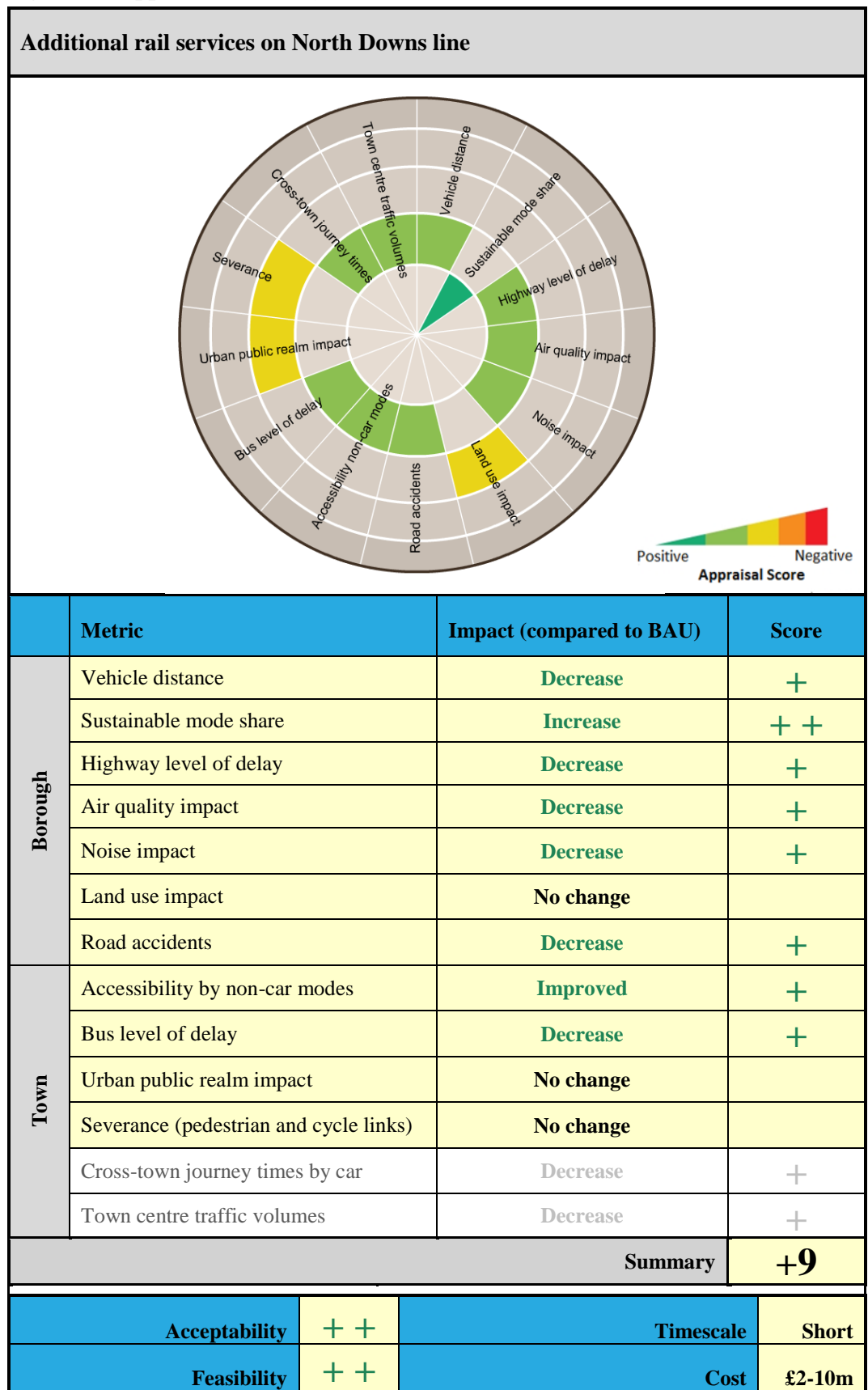


Figure 20: Appraisal Summary Table – New station at Surrey Research Park

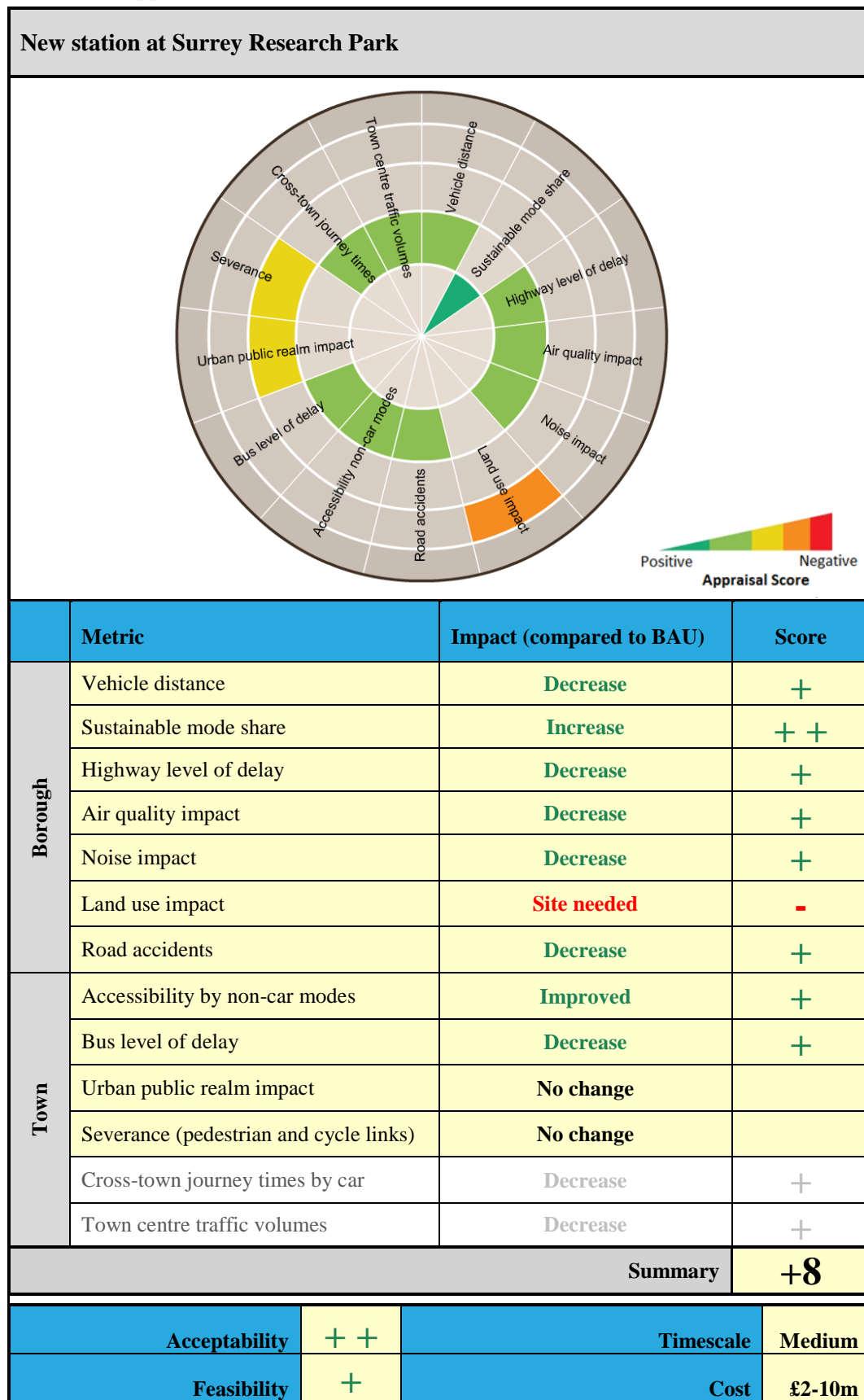


Figure 21: Appraisal Summary Table – New station at Merrow

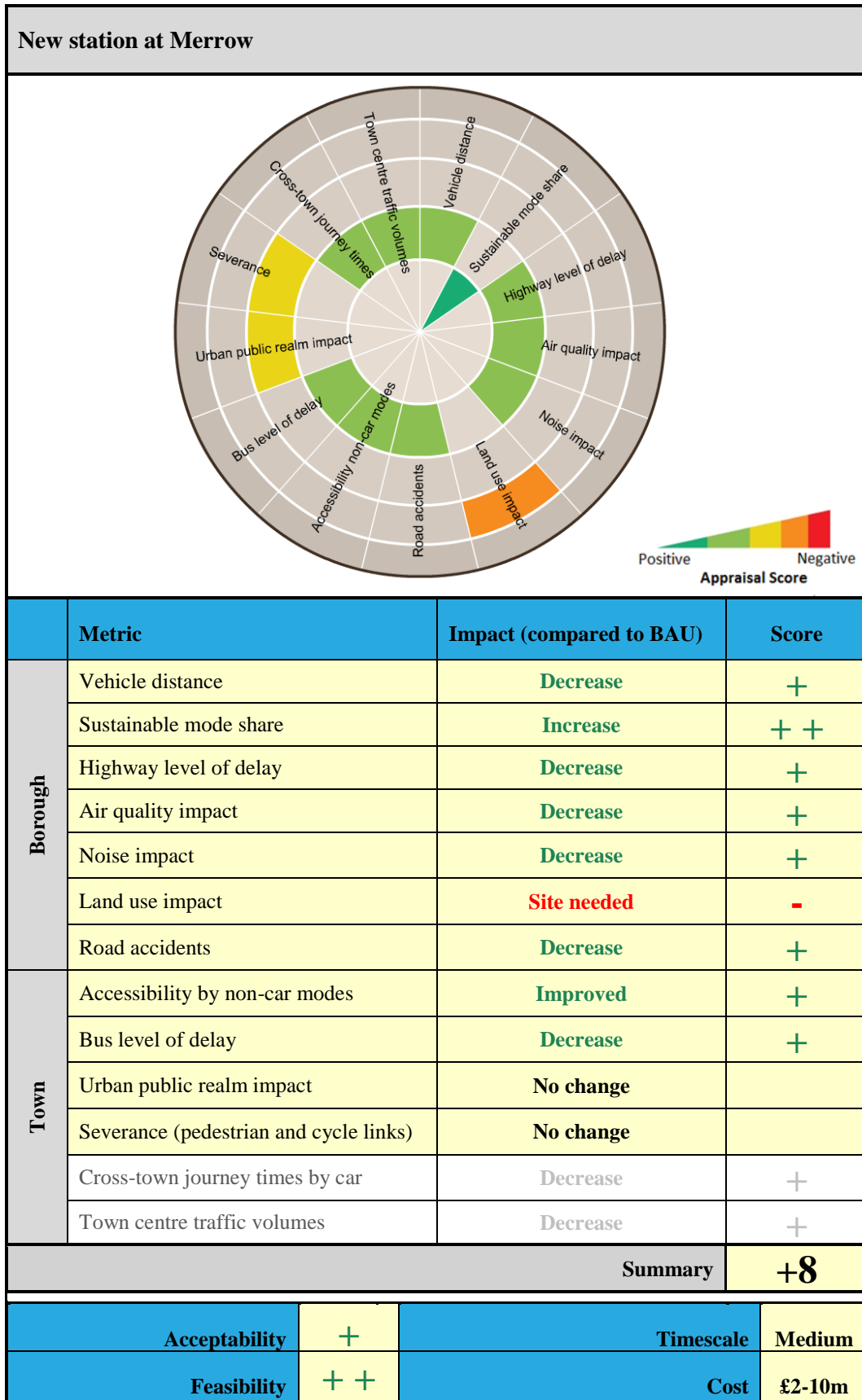


Figure 22: Appraisal Summary Table – Reinstatement of Guildford to Cranleigh rail line

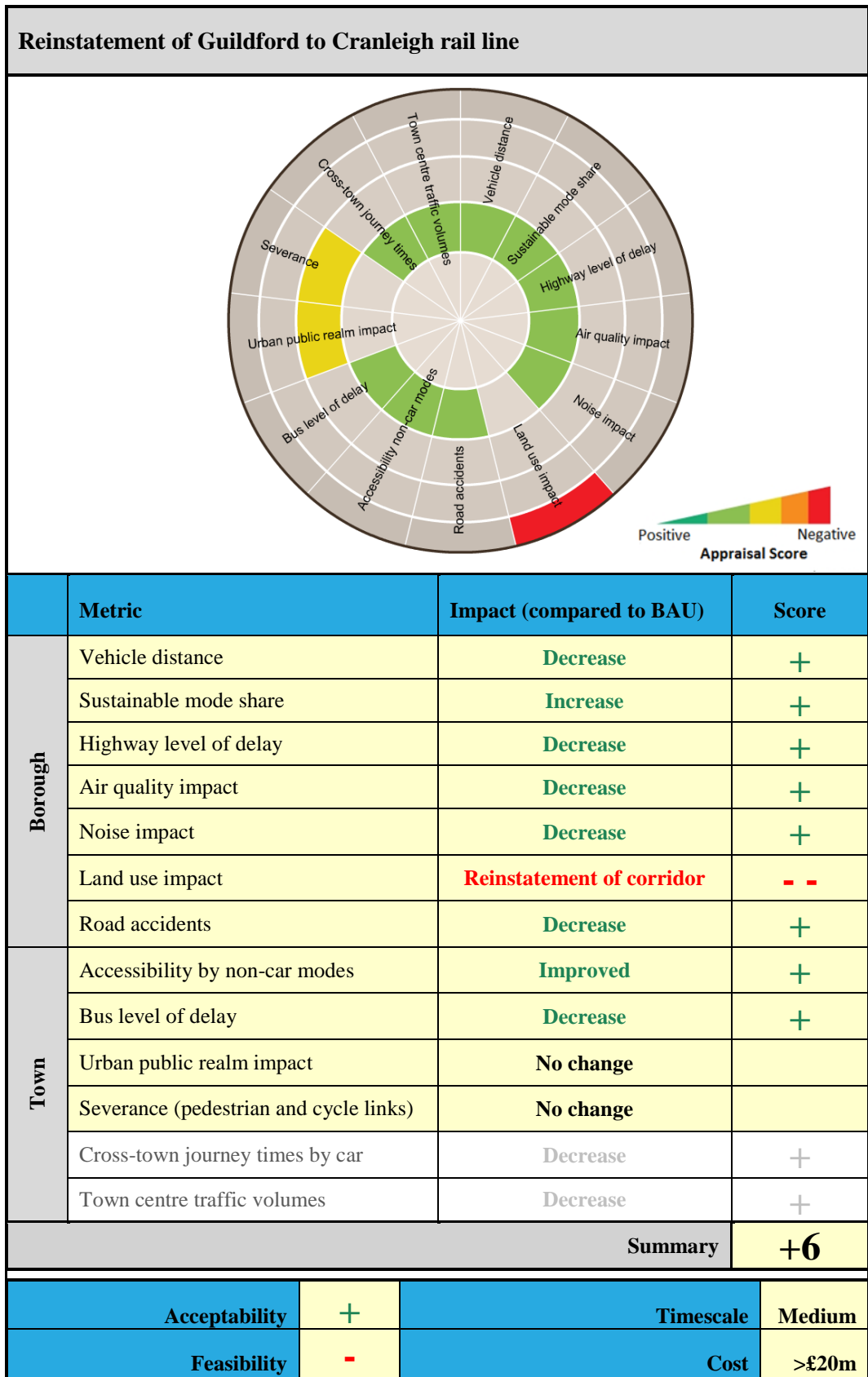


Figure 23: Appraisal Summary Table – Improved southern rail access to Heathrow Airport

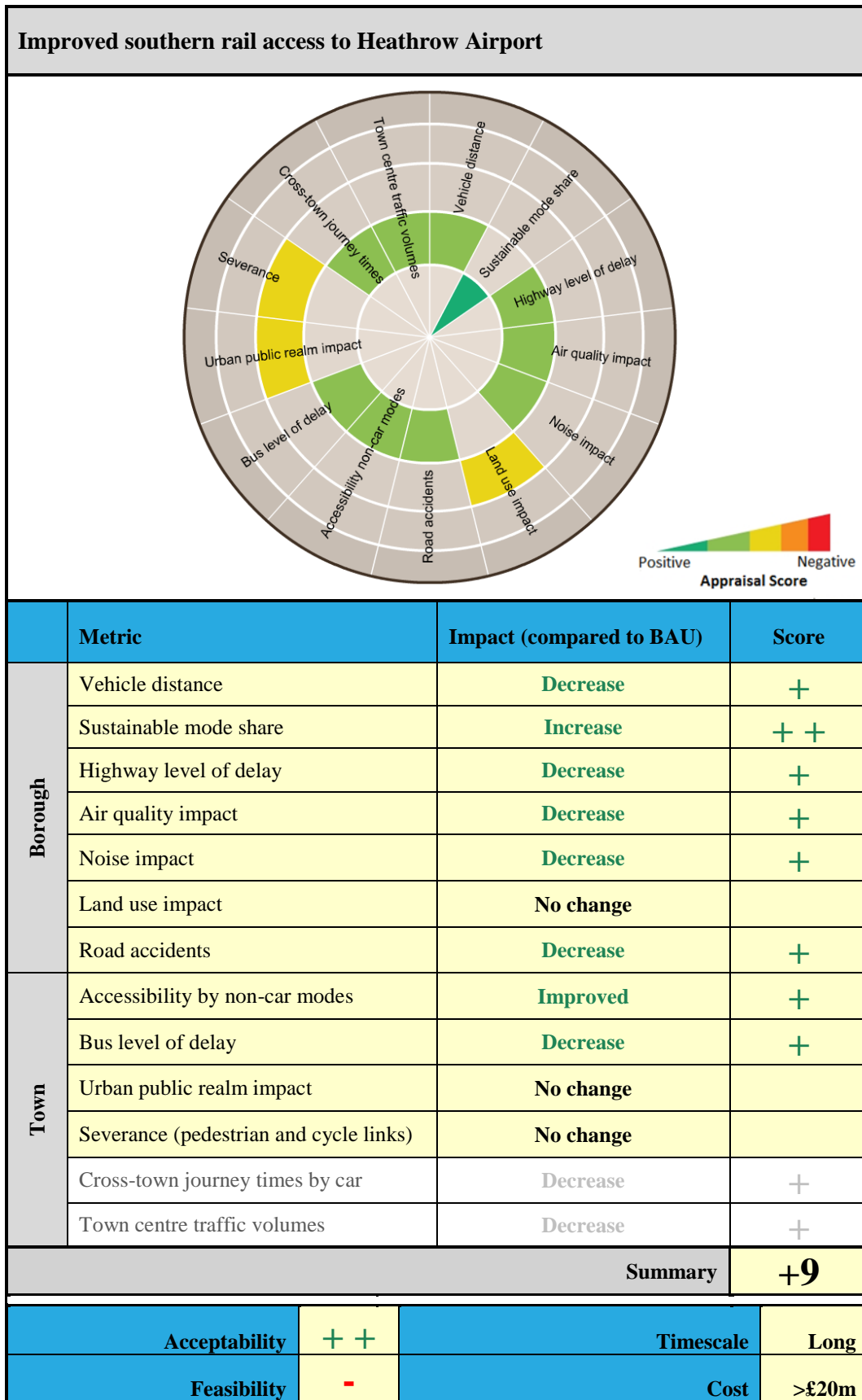


Figure 24: Appraisal Summary Table – Increased rail capacity to London Waterloo

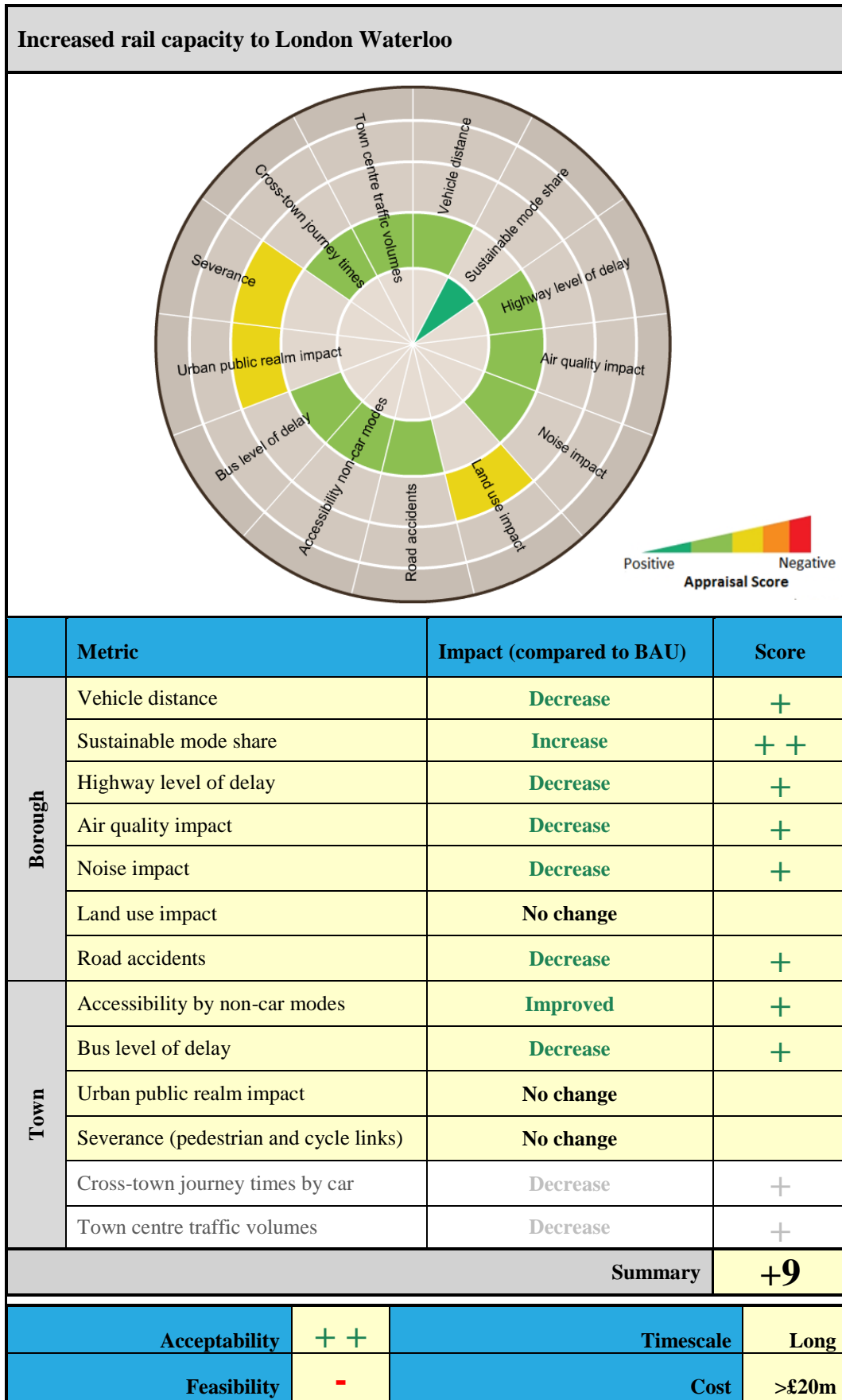
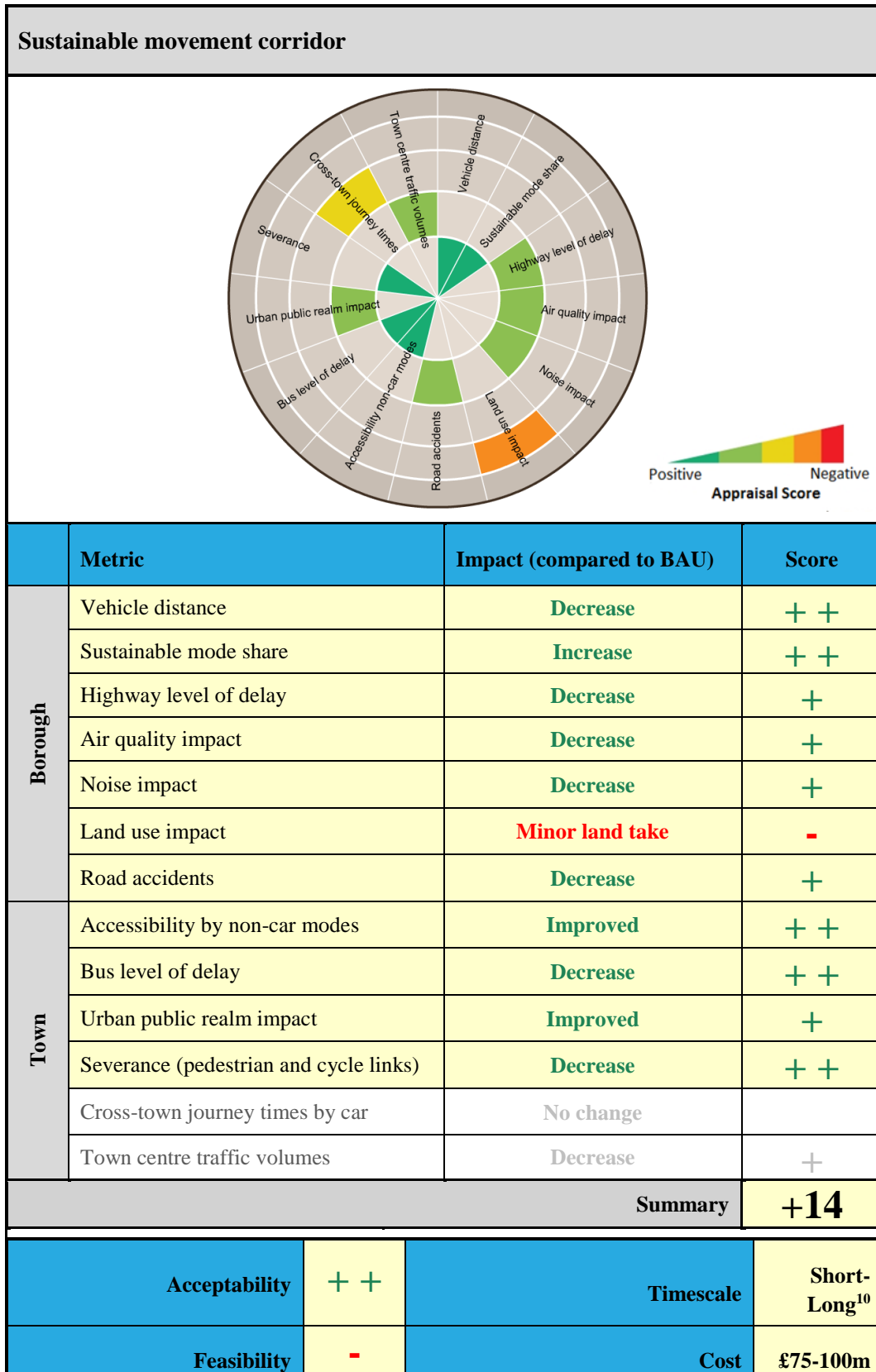


Figure 25: Appraisal Summary Table – Sustainable movement corridor



¹⁰ Can be phased by route section.

4.4.1 Summary of Other Interventions Appraisal

The appraisal against the study metrics indicates the following:

Borough-Wide

- Apart from the low emission vehicles, freight consolidation centre and the new park-and-ride facilities interventions, all of the Other Interventions are expected to decrease both vehicle distance and highway level of delay. All of the rail interventions are expected to increase sustainable mode share.
- Where reductions in vehicle traffic are expected there would also be positive impacts on the environmental indicators, with air quality and noise impacts both expected to improve. These reductions have not been quantified and are likely to be slight except in the case of the sustainable movement corridor which would be expected to have a greater mode shift impact.
- Land take is impacted by those interventions needing land for their operations, for example the freight consolidation centre, the new or expanded park-and-ride sites, and the new rail stations. Minor land take would be required to deliver the sustainable movement corridor. Other interventions have no land take impacts (or land take impacts would be outside Guildford borough, for example in the case of rail capacity increases to London on the South West Main Line).
- Road accidents are expected to decrease under all of the interventions where they reduce vehicle traffic.

Town-Wide

- Accessibility by non-car modes improve and public transport delays reduce under all interventions except for the low emission vehicles intervention, which is not expected to change traffic volumes.
- The freight consolidation centre is expected to improve the urban public realm, as it provides opportunities with the removal of goods vehicles from the town centre. The sustainable movement corridor would be expected to improve urban public realm by creating a new attractive movement corridor through Guildford and increasing the amount of space being used by modes which have a less intrusive impact on the local environment.
- None of the interventions are expected to have any significant impact on severance in the town except for the sustainable movement corridor, which is expected to have a significant positive impact in reducing severance.

Deliverability

- The scenarios range from short term (<5 years) for low emission vehicles, new park-and-ride facilities and additional rail services on the North Downs Line, to long term (>15 years) for some of the larger rail schemes. Most of the interventions are deliverable, although the reinstatement of the Guildford-Cranleigh rail link and the southern rail access to Heathrow are more challenging due to the requirements for construction of new rail lines. The sustainable movement corridor could be delivered in phases with initial phases delivered in the short term and the full movement corridor delivered in the medium to long term.

Overall

- In the appraisal against the study metrics, all of the interventions score well, especially the sustainable movement corridor. This is to be expected in this qualitative assessment as the schemes meet a number of the study criteria. The low emission vehicles intervention scores against fewer metrics than other interventions, largely because it only meets specific criteria for air quality and noise, but does not have wider benefits that other interventions exhibit.

4.5 Issues affecting Ecology and Biodiversity

A review of publicly-available data indicates the following ecological and biodiversity issues for the interventions under appraisal:

- The A3 widening scheme would be likely to result in habitat loss along the length of the route, and replacement planting would be required. This would also be the case for the A3 tunnel portal areas.
- The A3 bypass would pass through the Thames Basin Special Protection Area (SPA) and Whitmoor Common. Whitmoor Common, encompassing both Whitmoor and Rickford Commons, has been designated as a Site of Special Scientific Interest (SSSI) and is also a declared Local Nature Reserve (LNR). The A3 bypass would therefore result in habitat loss in addition to increased levels of disturbance to the protected species that reside within the SPA, SSSI and LNR. This intervention would therefore require a full assessment under the Conservation of Habitats and Species Regulations 2010, and is unlikely to be permitted unless there are no suitable alternatives and it can be proven that the bypass is of overriding public interest.
- Town centre interventions have less significant impacts as they only impact on existing built up areas, although it is noted that any new river crossings should be designed to avoid impacts.

A Habitats Regulations Screening Assessment has been undertaken which looks at the potential impacts on European protected sites (e.g. Thames Basin SPA) in more detail and is reported separately.

5 Summary of Appraisal

The summary scores for all the interventions and packages of interventions appraised in this report are shown in **Table 13**. The scores are calculated according to how many ‘pluses’ or ‘minuses’ the intervention receives in the appraisal. For example, ‘++’ gives a score of 2 and ‘--’ gives a score of -2. The scores are then summed to give an overall score. The deliverability score is calculated by adding together the acceptability and feasibility scores from the appraisal results for each intervention.

The appraisal summary and deliverability scores are only intended to provide an indication of the relative benefits that each intervention or package of intervention delivers. The scores should not be used as absolute values for any other purposes.

The interventions considered to have performed best in the appraisal are highlighted in yellow in the table and are those recommended for inclusion in the preferred scenario.

Table 13: Summary of Appraisal Scores

| Scenarios | Interventions | Appraisal Summary Score | Deliverability Score | Cost | Timescale |
|--|--|-------------------------|----------------------|---------|-----------|
| INTERMEDIATE AND MAJOR INFRASTRUCTURE INTERVENTIONS | | | | | |
| A3 | A3 Widening | -9 | -1 | >£20m | Long |
| | A3 Northern Bypass | -1 | -3 | >£20m | Long |
| | A3 Tunnel (A31 to A320) | +2 | -3 | >£20m | Long |
| | A3 Tunnel (A31 to A25) | +3 | -3 | >£20m | Long |
| | A3 Corridor Junction Changes | +5 | 0 | >£20m | Medium |
| Town Centre | Town centre road system redesign (Ogilvie) | +2 | -3 | >£20m | Long |
| | Town centre road system redesign (GVG) | -3 | -2 | £10-20m | Long |
| | Pedestrianisation of Bridge Street | +1 | 0 | £2-10m | Short |
| | Walnut Tree Close closure (to through traffic) | 0 | +2 | <£0.5m | Short |

| Scenarios | Interventions | Appraisal Summary Score | Deliverability Score | Cost | Timescale |
|--|---|-------------------------|----------------------|----------|------------|
| SUSTAINABLE TRANSPORT INTERVENTIONS | | | | | |
| Low Mode Shift | Low mode shift interventions package | +10 | +2 | >£20m | Short |
| Medium Mode Shift | Medium mode shift interventions package | +14 | +2 | >£20m | Medium |
| High Mode Shift | High mode shift interventions package | +16 | +2 | >£20m | Long |
| OTHER INTERVENTIONS | | | | | |
| | Low emission vehicles | +4 | +2 | £2-10m | Short |
| | Freight consolidation centre for town centre deliveries | +4 | +2 | £2-10m | Medium |
| | New park and ride facilities | +4 | +3 | £2-10m | Short |
| | Additional rail services on the North Downs Line (Reading - Gatwick) | +9 | +4 | £2-10m | Short |
| | New rail station at Park Barn/Surrey Research Park | +8 | +3 | £2-10m | Medium |
| | New rail station at Merrow | +8 | +3 | £2-10m | Medium |
| | Reinstatement of rail services along Cranleigh-Guildford corridor | +6 | 0 | >£20m | Medium |
| | Improved rail access for Heathrow | +9 | +1 | >£20m | Long |
| | Increased capacity for services between Guildford and London Waterloo | +9 | +1 | >£20m | Long |
| | Sustainable movement corridor | +14 | +1 | £75-100m | Short-Long |

The results clearly show that all of the Sustainable Transport Intervention scenarios and the sustainable movement corridor perform significantly better than either the Intermediate and Major Highway Infrastructure or the Other Interventions. The Other Interventions score well, and better than the Intermediate and Major Highway Infrastructure Interventions.

The deliverability results also demonstrate that the Sustainable Transport Interventions and the sustainable movement corridor should be more acceptable and feasible to deliver than the Intermediate and Major Highway Infrastructure Interventions. The Sustainable Transport Interventions also have more opportunity for quick win schemes (i.e. schemes that can be delivered in the short term that contribute towards the overall strategy). Overall, this indicates that the Sustainable Transport Interventions packages and the sustainable movement corridor would have higher benefits and are more deliverable than the Intermediate and Major Highway Infrastructure Interventions.

6 Preferred Interventions

The preferred scenario should comprise those interventions that score well against the study metrics in the appraisal presented above. These are listed in **Table 14**.

Table 14: Preferred Interventions

| INTERMEDIATE AND MAJOR HIGHWAY INFRASTRUCTURE INTERVENTIONS | |
|---|--|
| Category | Intervention |
| Gyratory | Pedestrianisation of Bridge Street |
| Traffic management/Highways | Walnut Tree Close closure (to through traffic) |
| SUSTAINABLE TRANSPORT INTERVENTIONS | |
| High mode shift interventions package including the following interventions: | |
| Category | Intervention |
| Public realm | Streetscape design involving the removal or downgrading of traffic priority (including shared surfaces and traffic calming, including 20mph zones) in the town centre and across the borough, excluding primary distributor roads. |
| Public realm | Improving the quality of pedestrian wayfinding, and urban realm along key desire lines. |
| Public realm | Reduced car use through increased use of car clubs, car hire. |
| Parking | Park and stride strategy. |
| Parking | Modifications to parking e.g. redistribution from long to short stay, premium on-street parking. |
| Cycling | Dedicated and continuous ‘cycle superhighways’.* |
| Cycling | Extensive cycling infrastructure giving cyclists priority and road space: Dutch style cycling facilities across the town, and potentially the introduction of contraflow bike lanes. |
| Cycling | Bike-sharing scheme / Cycle Hire. |
| Park and Ride | Expand existing park and ride facilities. |
| Public transport/integration | New segregated or mostly segregated PT option (e.g. BRT, or guided busway).* |
| Public transport/integration | Demand responsive public transport - minibuses or similar. |
| Public transport/integration | Integrated public transport - coordinated timetabling of all public transport across the region, and smartcard & integrated ticketing. |
| Public transport/integration | Expand network of Shuttle Services - building on existing workplace shuttle services. |
| Public transport - bus | Bus priority and corridor improvements: segregation, customer information systems and other stop improvements, signalling priority and bus gates). |

| | |
|-------------------------------------|---|
| Technological alternative to travel | Promotion of tele-/home-working and flexible working hours through an information campaign to local businesses and council incentives for employers to acquire necessary equipment. |
| Technological alternative to travel | Development of teleworking offices in local areas to reduce commute distance (alternative to working from home). |
| Walking | Creation of a well-signed comprehensive network of walking and cycling routes linking key trip attractors/generators such as employment areas, housing areas and education and leisure facilities.* |
| Walking | Improvements to pedestrian realm including replacing overbridges/subways with at-grade crossing facilities, improving other crossings/islands, widening pavements and shared surfaces. |
| Walking | New wider pedestrian bridge linking Walnut Tree Close to the Bedford Road surface car park site, creating better pedestrian linkages between station and town centre. |
| Non-mode specific | Comprehensive smarter choice programme for whole town (based on the Sustainable Travel Towns Project). |
| OTHER INTERVENTIONS | |
| Category | Intervention |
| Park and Ride | New park and ride facilities |
| Public Transport - Rail | Additional rail services on the North Downs Line (Reading - Gatwick) |
| Public Transport - Rail | New rail halt or station at Park Barn/Surrey Research Park |
| Public Transport - Rail | New rail halt or station at Merrow |
| Public Transport - Rail | Improved rail access for Heathrow |
| Public Transport - Rail | Increased capacity for services between Guildford and Waterloo |
| Public transport - Bus | Sustainable movement corridor |

*To be combined as the sustainable movement corridor.

The preferred interventions are those that provide a balanced approach to movement and comprise a mix of walking, cycling, public transport (bus, rail and integration), park-and-ride, public realm, parking, and technological alternatives.

7 Considerations for the Movement Strategy

7.1 An Adaptable and Flexible Framework

The movement strategy delivers the vision for sustainable mobility in Guildford. As it supports a long term vision, the strategy needs to be flexible and adaptable to change. Therefore, it should not be a detailed plan, but rather a framework that provides direction for the development of the movement system in Guildford to 2050. As Guildford and the surrounding world change, the strategy elements will need to adapt, but the overall framework should remain constant.

The movement strategy comprises the preferred interventions from the appraisal process. These have been selected using a multi-criteria approach, focused on supporting the 2050 vision for sustainable mobility in Guildford. The appraisal has not focused purely on the economic case for each intervention, but on the wider benefits to the town's economy, the environment, the people in Guildford, and the town's role in the region.

From the appraisal in this report, it is clear that interventions focused on a range of sustainable modes of transport, including the sustainable movement corridor, perform much better in terms of the study metrics than individual intermediate and major highway schemes. This is due to the positive impacts of a mode shift away from car use on the majority of metrics, including economic metrics such as delay and environmental metrics such as noise and air quality.

The sustainable transport interventions provide a choice of travel mode and a more efficient means of transport that reduce overall levels of road traffic and congestion. These interventions are also generally less contentious and more deliverable than the major road schemes tested.

The interventions aimed at tackling congestion by providing additional road capacity do not perform well, so even with additional capacity on the road network vehicle distance and junction delay tend to increase¹¹. For example, a bypass or tunnel on the A3 is a major project that will take many years to develop and deliver, and is likely to attract significant public opposition. These interventions will also cost hundreds of millions of pounds.

By contrast, improvements to public transport services between an area of Guildford and the town centre are potentially deliverable within a year, are likely to attract significant public support, and at much lower cost.

The sustainable transport interventions are flexible and can generally be delivered in stages and adapted to meet the changing spatial needs of the town (e.g. to link to new business areas). By contrast, a major road scheme generally needs to be delivered in one phase.

They also have wider benefits, for example they offer opportunities for improved public realm, increased vitality in the town, and active and healthy travel.

¹¹ Note that this is with a fixed trip matrix. If a variable demand modelling approach was used then it is expected that the scenarios with additional road capacity would generate additional trips as well.

To support the delivery of the vision for sustainable mobility in Guildford in 2050, the appraisal indicated that the best approach was to include a range of sustainable transport interventions in the following categories:

- **Public transport** – sustainable movement corridor, expanded park-and-ride, enhanced bus services with priority, better integration;
- **Walking** - new and enhanced routes (including along a sustainable movement corridor), development of a network, enhanced environment;
- **Cycling** - cycle superhighways with better facilities for cyclists in the town, including bike hire, sharing schemes and a route for cycling along a sustainable movement corridor;
- **Public realm improvements** - improved streetscape and wayfinding;
- **Demand management** - through car hire and sharing schemes, use of parking charges, encouragement of remote working, and a smarter choices programme to encourage use of more sustainable modes of travel; and
- **Regional links** - strengthening transport links to and from Guildford to other Surrey towns, to London, to Heathrow and Gatwick airports, and to other national and international connections.

The extent and location of these interventions in the town is considered further in the Strategy Report, the culmination of the Strategy and Recommendations Stage.

A movement strategy which facilitates the use of a range of sustainable transport measures will provide choice and balance for movement in Guildford in future. It will enable the town to be resilient against challenges posed by relying on any single mode (e.g. traffic congestion), as people will have choices about how they can travel, and it will support sustainable development around the town as the population and the economy grows. It also enables the movement system to develop in modest, achievable, deliverable steps within a consistently-applied framework. These relatively modest interventions can accrue and be adapted as required to deliver a successful Guildford in 2050.

7.2 Implementation Programme

There are a number of key issues which need to be considered for the implementation of the movement strategy:

- Lead time required to implement each intervention or package of interventions to meet the vision for 2050 – to ensure schemes can be delivered to the required level by the required time;
- Interdependencies between interventions – to identify schemes requiring other schemes to be completed before they can be delivered;
- Cost of delivery and funding availability for each intervention or package of interventions and the profile of all costs – to ensure that costs are spread as much as possible and they are only implemented when relevant funding becomes available;
- Identification of quick wins – so that stakeholders can see outcomes of the strategy immediately in Guildford; and

- Identification of longer term schemes to be developed with partners and stakeholders – where work may start immediately but schemes may not be implemented for a number of years (e.g. rail improvement schemes).

The implementation programme was developed in more detail with the strategy in the next stage of work, the Strategy and Recommendations Stage.

8 Next Steps

The next stage in the study was the Strategy and Recommendations Stage. This involved the development of the movement strategy for Guildford, comprising the key strategy principles, the interventions needed to enable the vision, and the implementation programme for the strategy. It presents indicative costs and benefits for interventions, as well as funding constraints and the potential scope of work for further development. It also brings together the appraisal results with the Habitats Regulations Assessment and Equality Impact Assessment. It is reported in the Guildford Town and Approaches Movement Study: Strategy Report (Arup, March 2015).

Appendix A

Appraisal of Interventions - 2050

A1 Business-As-Usual

This Appendix provides the Business-As-Usual (BAU) forecast and the results of the appraisal of interventions for 2050.

Table A1: Metric Appraisal for 2050 Business-As-Usual

| | Metric | Impact (compared to 2009 Baseline) |
|---------|--|------------------------------------|
| Borough | Vehicle distance | ↑ 60% |
| | Sustainable mode share | Slight increase |
| | Highway level of delay | ↑ 267% |
| | Air quality impact | ↑ 60% |
| | Noise impact | ↑ 40% |
| | Land use impact | No change |
| | Road accidents | ↑ 60% |
| Town | Accessibility by non-car modes | ↑ 18% |
| | Bus level of delay | ↑ 54% |
| | Urban public realm impact | No change |
| | Severance (pedestrian and cycle links) | No change |
| | Cross-town journey times by car | ↑ 25% |
| | Town centre traffic volumes | ↑ 46% |

The highway level of delay metric is particularly high for 2050 compared to the 2009 Baseline (+267%, compared to 13% for 2031). This is because some model zones have very high growth rates from 2009 to 2031 (usually where they started from a low base). These growth rates were then applied from 2031 to 2050 resulting in significant growth in those particular zones. Traffic modelling is complex and nonlinear, depending on the interactions of a large number of vehicles, and hence sometimes these effects occur. This was identified during the study and hence the interventions were tested against both 2031 and 2050 scenarios to ensure they were robust.

A2 Intermediate and Major Highway Infrastructure Interventions

A2.1 A3 Interventions

The results of the appraisal are presented below.

Figure A1: Appraisal Summary Table – A3 Widening

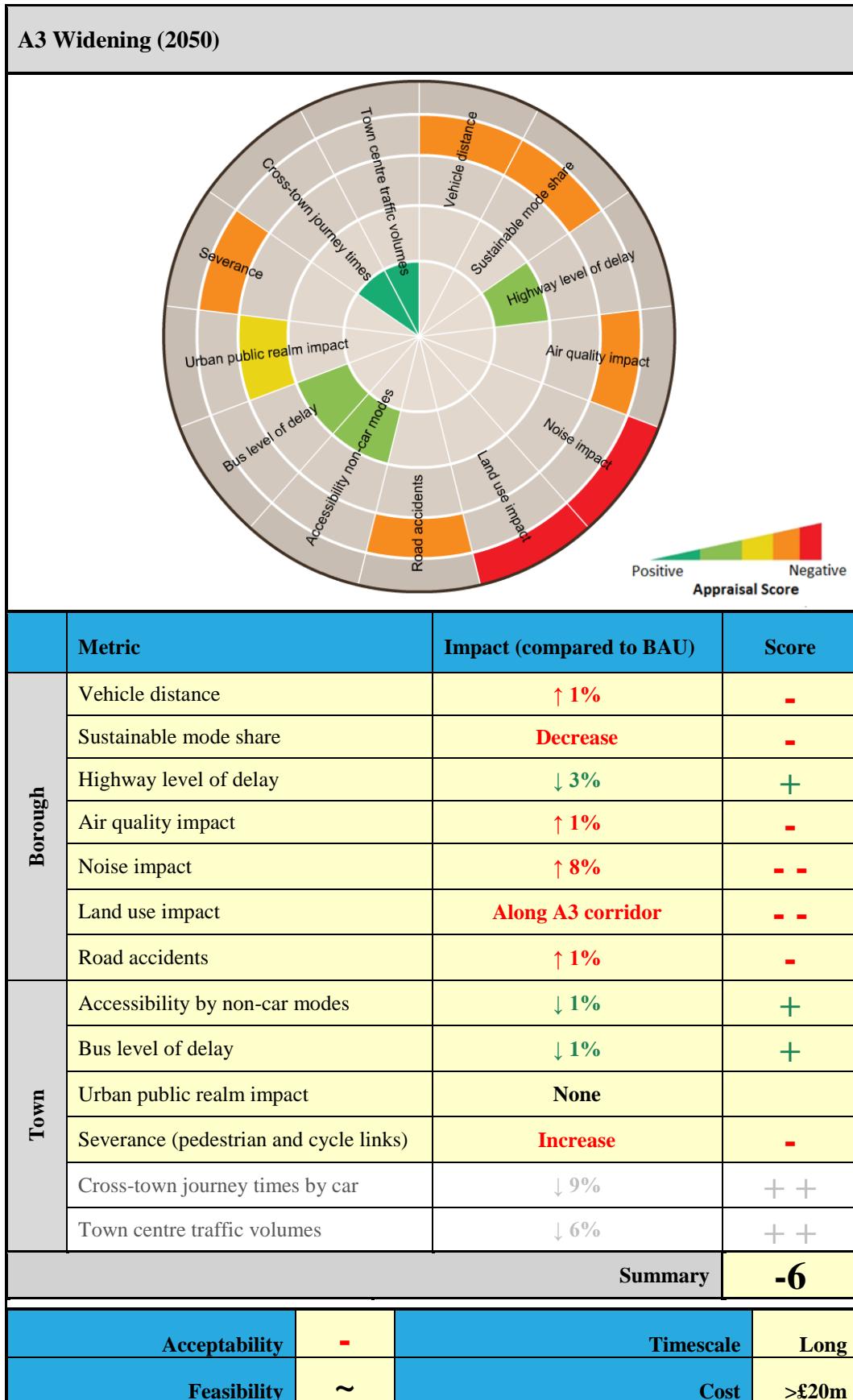


Figure A2: Appraisal Summary Table – A3 Northern Bypass

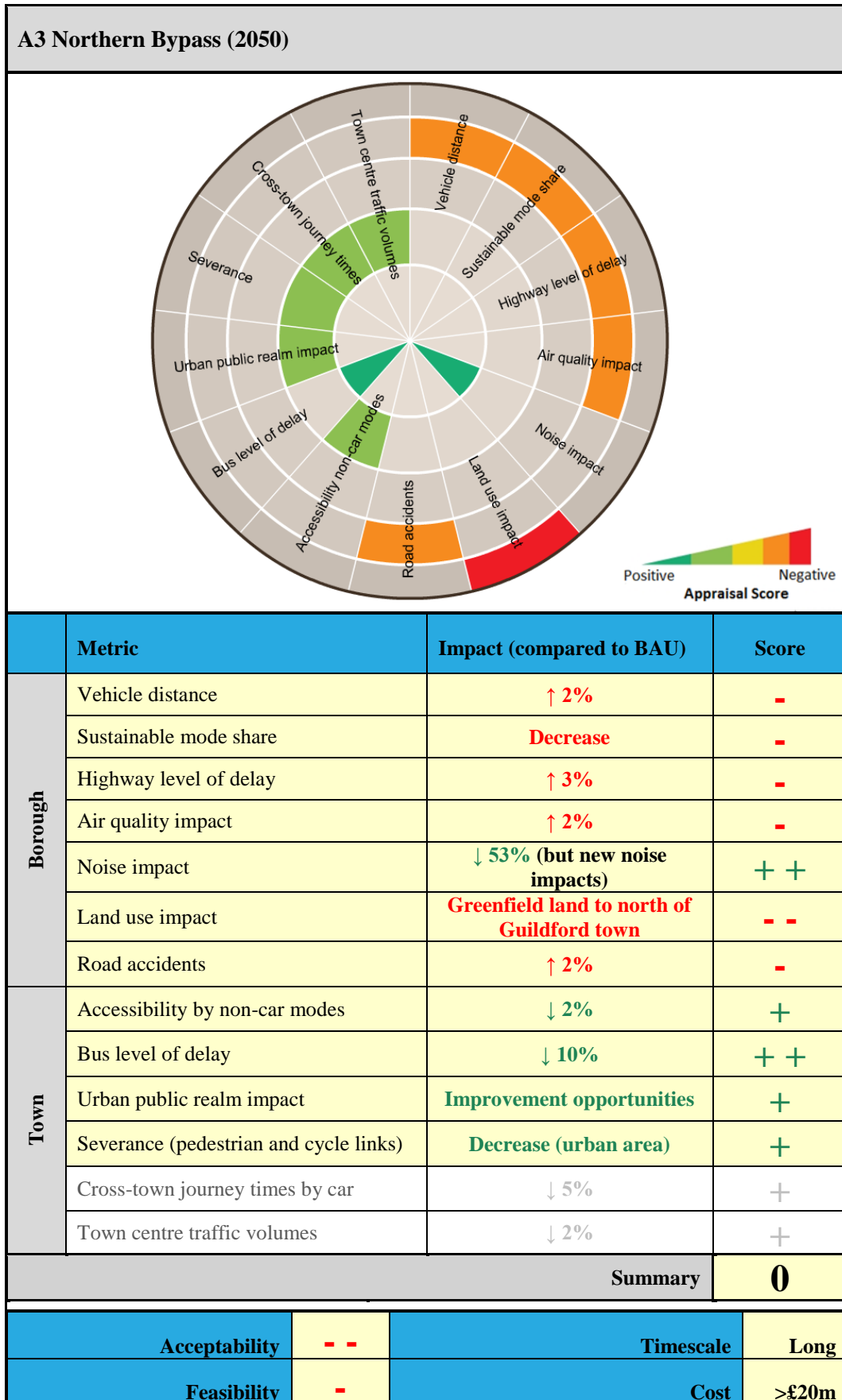


Figure A3: Appraisal Summary Table – A3 Tunnel (A31 to A320)

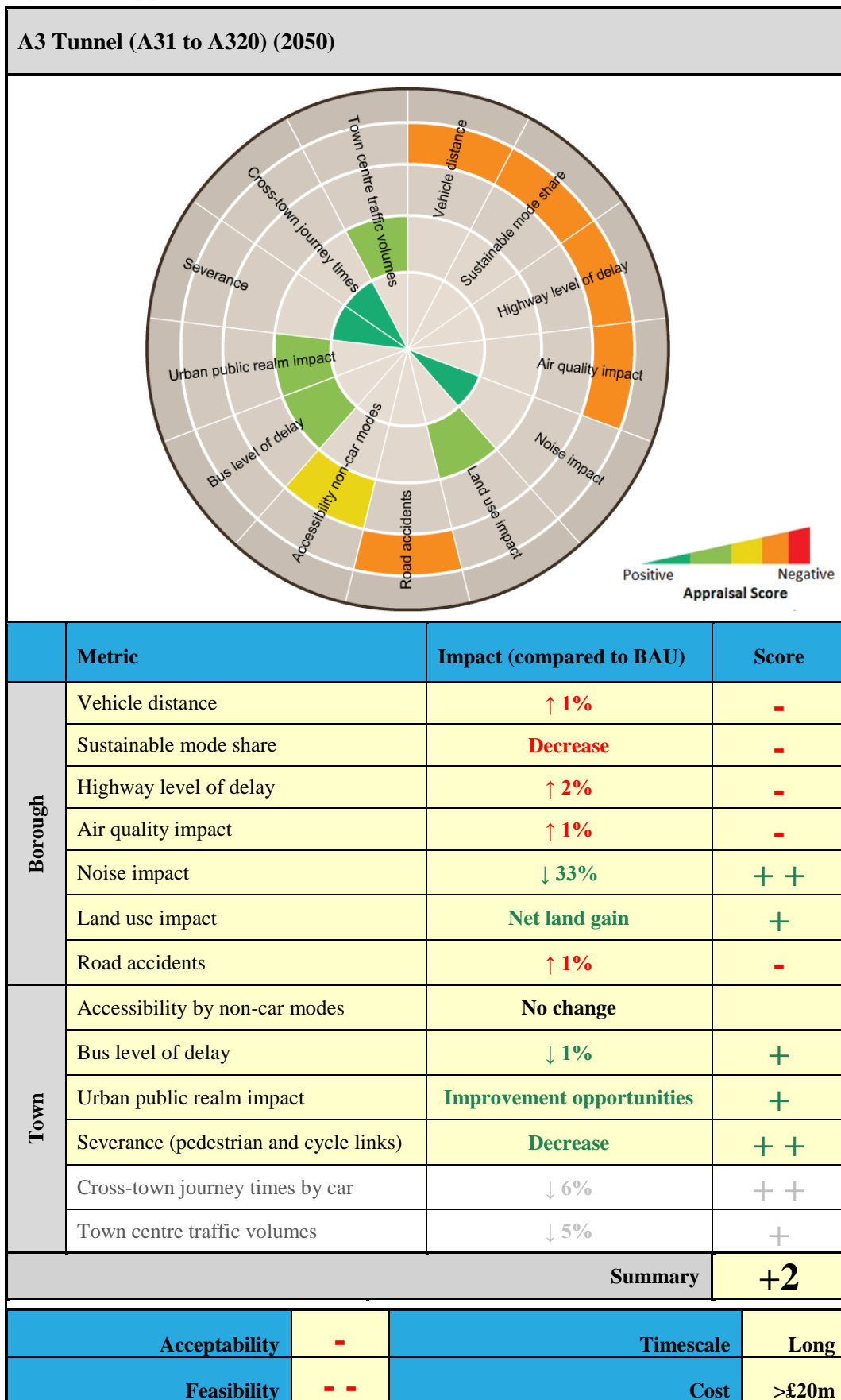


Figure A4: Appraisal Summary Table – A3 Tunnel (A31 to A25)

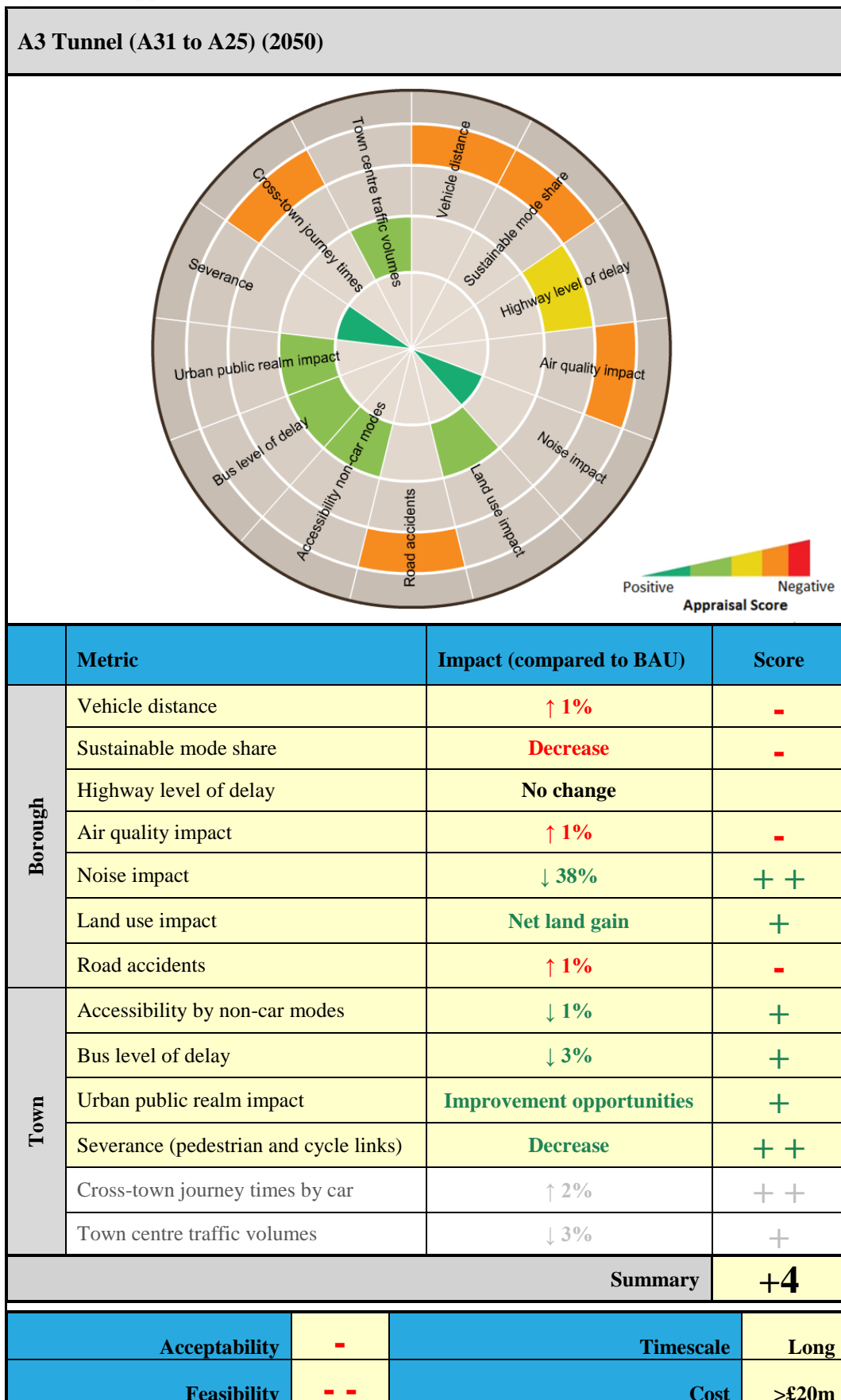
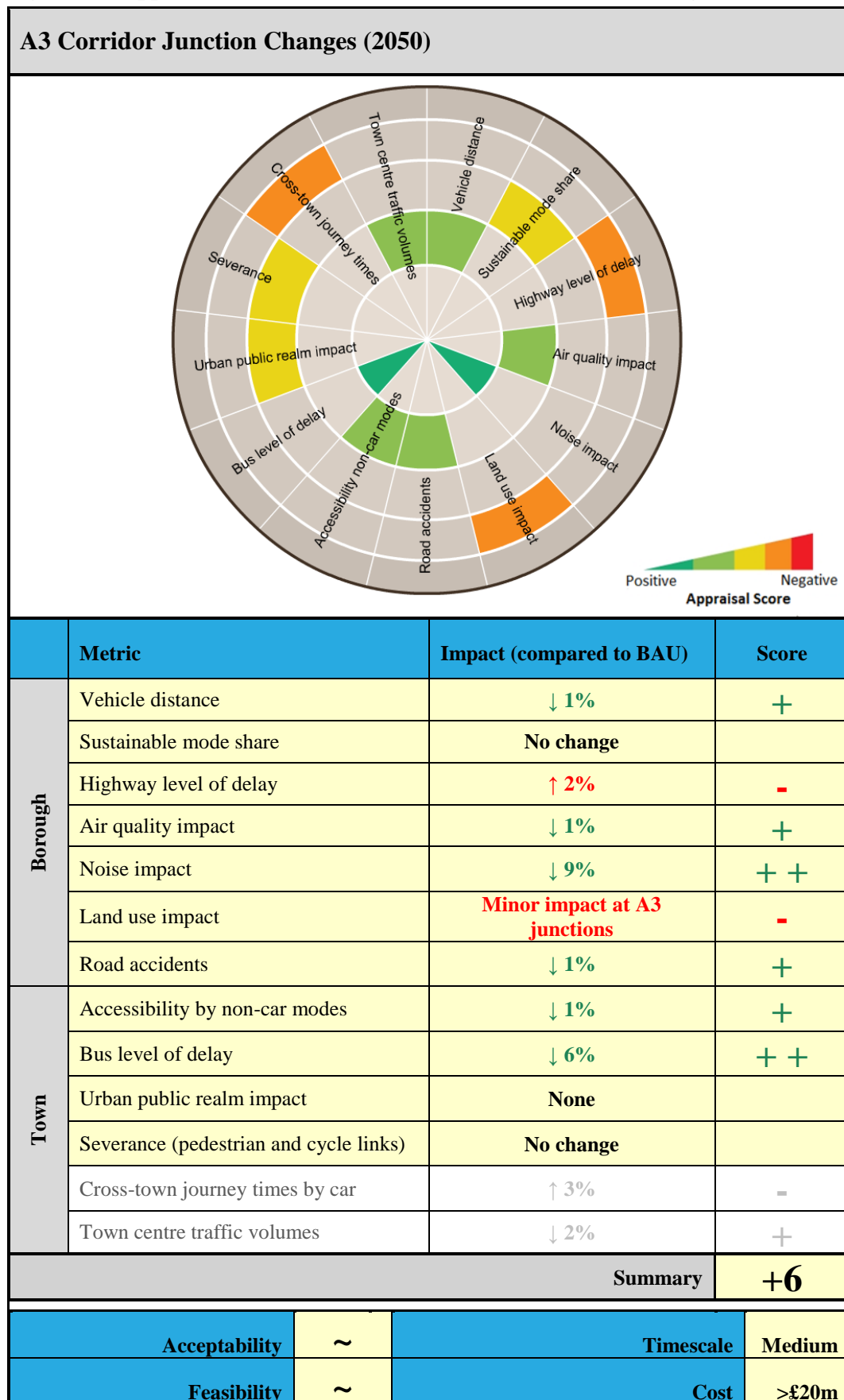


Figure A5: Appraisal Summary Table – A3 Corridor Junction Changes



A2.2 Town Centre Schemes

The results of the appraisal are presented below.

Figure A6: Appraisal Summary Table – Town centre road system redesign (David Ogilvie)

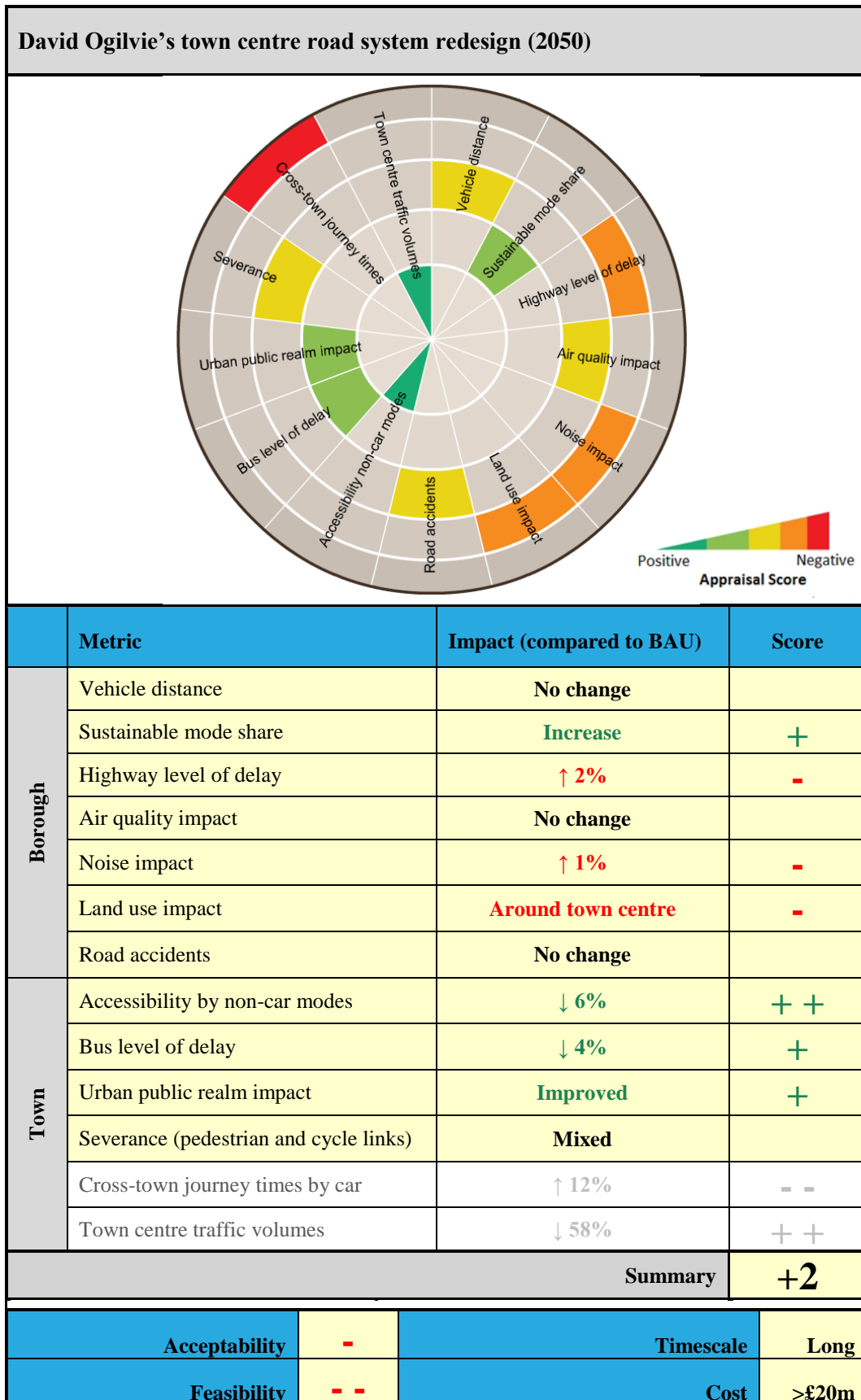


Figure A7: Appraisal Summary Table – Town centre road system redesign (Guildford Vision Group)

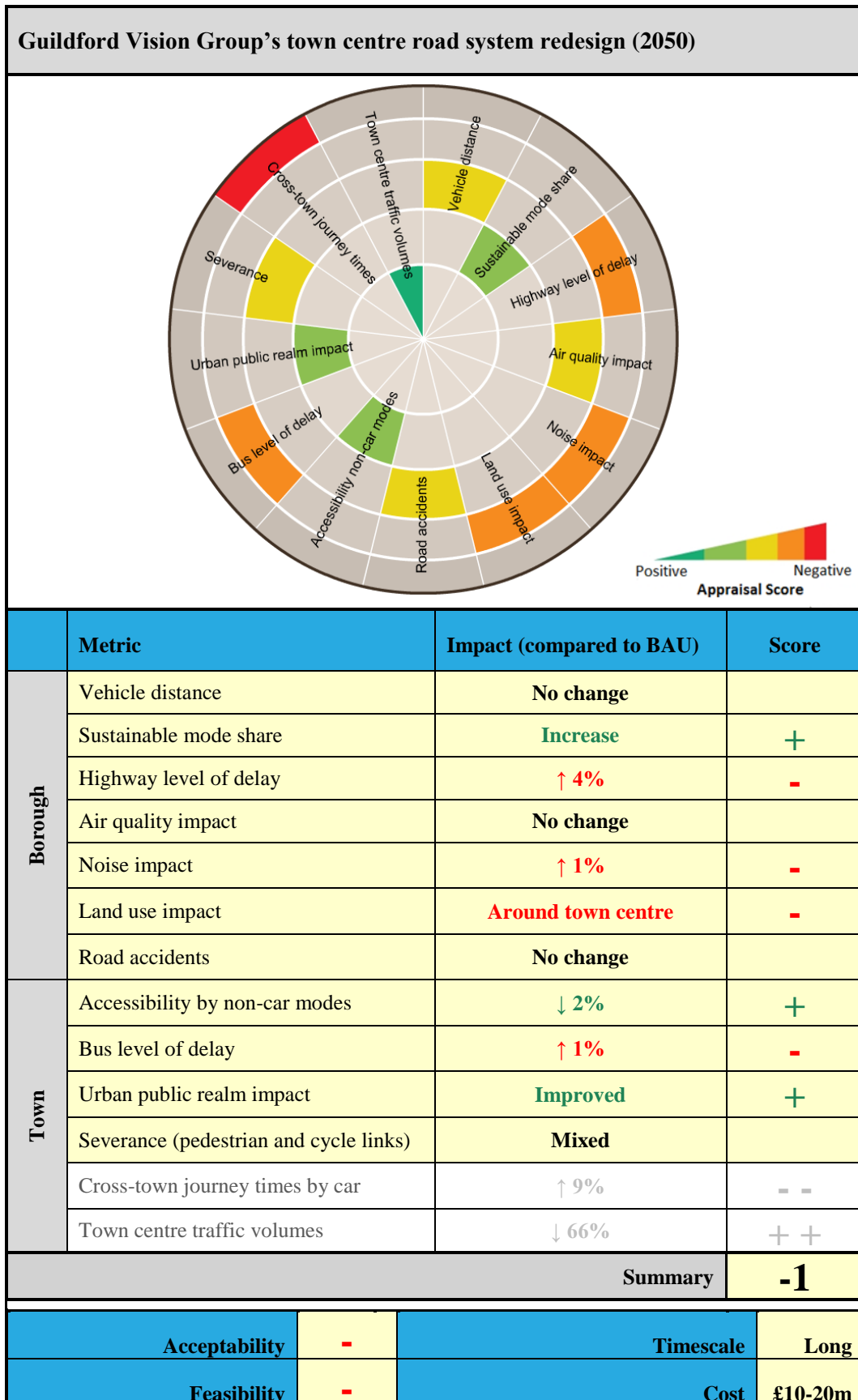


Figure A8: Appraisal Summary Table – Pedestrianisation of Bridge Street

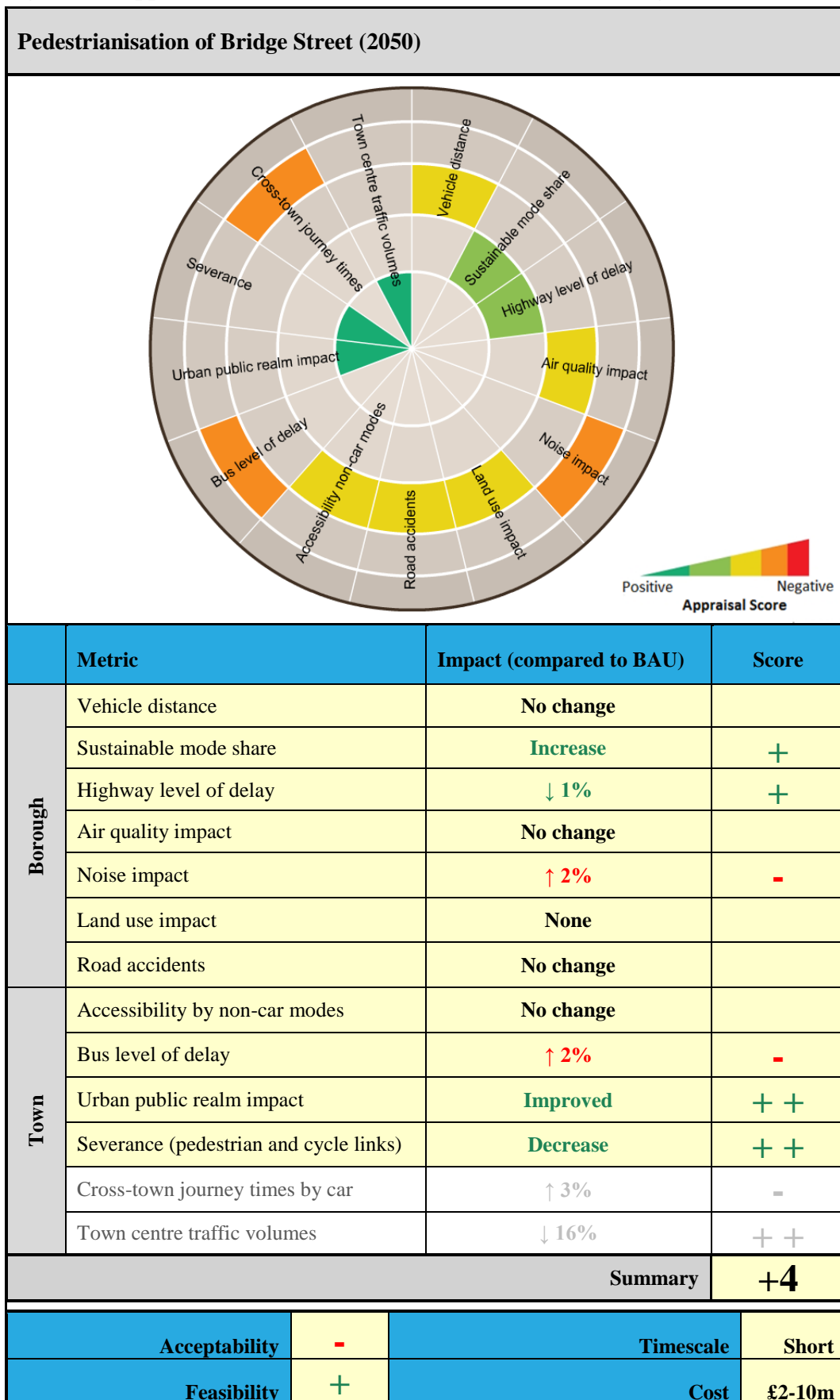
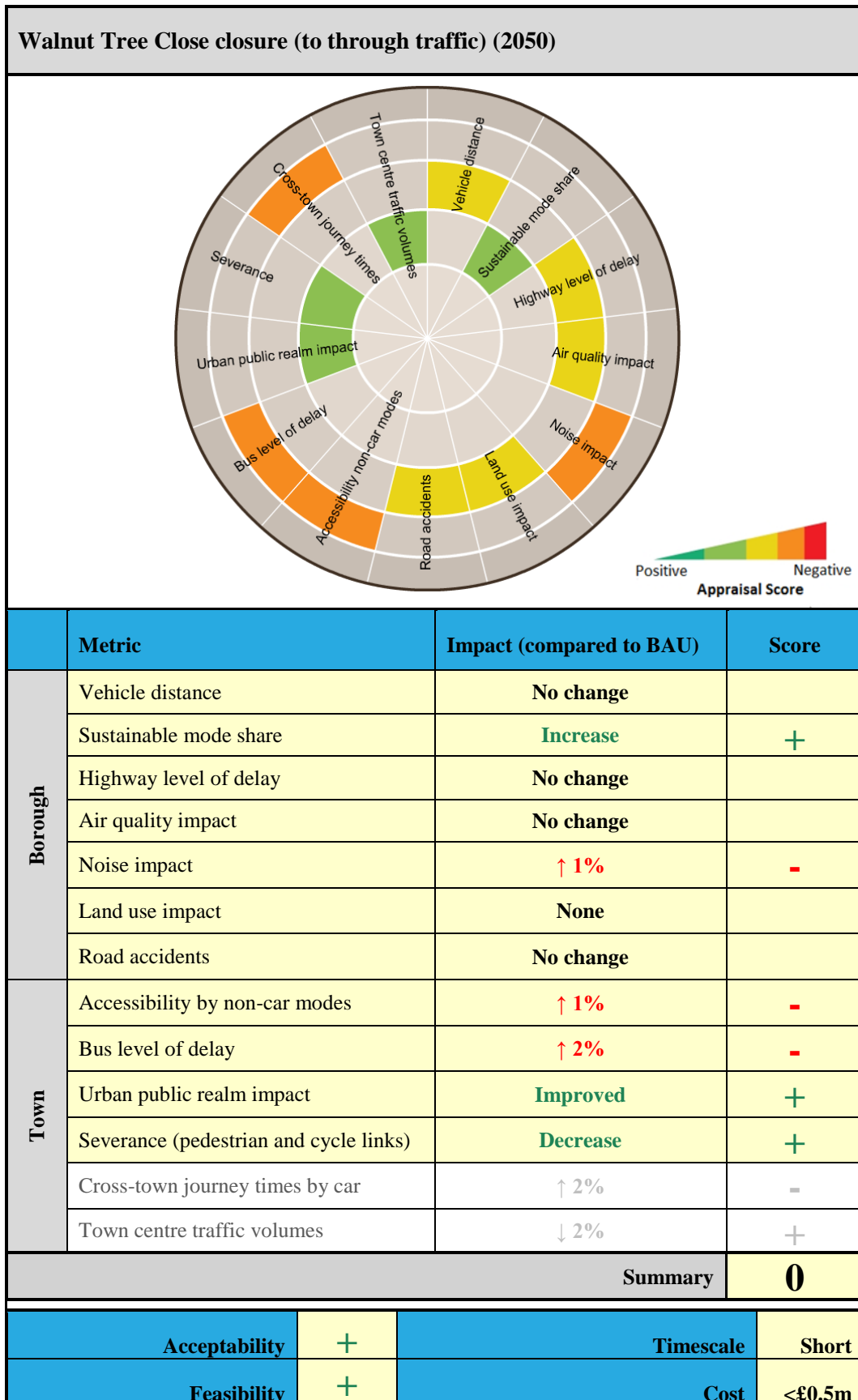


Figure A9: Appraisal Summary Table – Walnut Tree Close closure (to through traffic)



A2.3 Summary of Intermediate and Major Infrastructure Interventions Appraisal - 2050

The appraisal against the study metrics indicates the following:

Borough-Wide

- All of the major A3 interventions (with the exception of the A3 corridor junction changes) are expected to increase vehicle distance (by 1-2%) and decrease sustainable mode share in the Borough. The town centre interventions have no impact on vehicle distance across the Borough, and they all potentially increase sustainable mode share as they particularly improve town centre conditions for walking and cycling.
- Air quality is forecast to be worse under all A3 interventions (again excluding the corridor junction changes, which reduce distance, and therefore improve air quality, by 1%). Noise is worse for A3 widening, but improved with the A3 tunnel, bypass and junction changes, although the bypass potentially creates new noise impact areas along its route to the north of the town. The town centre interventions have no impact on air quality overall but increase noise impacts (by 1-2%).
- The A3 widening and A3 bypass interventions have significant land take issues, as they require either existing developed land (for widening) or greenfield land (for the bypass). The two town centre road system redesign interventions have an impact on land; in particular the Ogilvie scheme requires land for tunnel portals in the town centre.
- Road accidents are forecast to increase under all of the A3 interventions (excluding the junction changes which reduce rather than increase vehicle traffic). None of the town centre interventions have an impact on road accidents.

Town-Wide

- Accessibility by non-car modes and public transport delays in the town are expected to improve most under the bypass intervention, with a 10% decrease in delay to buses. Of the town centre interventions, the Ogilvie scheme improves these indicators most, with a 6% improvement under the Ogilvie scheme in accessibility by non-car modes.
- Of the A3 interventions, the bypass and tunnel offer potential urban public realm improvement opportunities. All of the town centre interventions offer urban public realm improvement opportunities, as they remove traffic from one or more streets.
- Whilst the A3 bypass and tunnel interventions would reduce severance in the town, the widening increases severance by creating a wider A3 corridor in the town. Whilst severance in the town centre is potentially improved by the road system redesign interventions, it is also potentially impacted by increased traffic around the periphery of the town centre, hence the 'mixed' score in the appraisal.

Deliverability

- All of the A3 interventions are long term (>15 years), high cost (>£20m) schemes (excluding the corridor junction changes which could potentially be

delivered in the medium rather than the long term). Many of the larger schemes would actually cost in excess of £100m, such as the bypass or the tunnel and such schemes have potential acceptability issues (i.e. the schemes are likely to encounter significant public opposition). Of the town centre interventions, the road system redesign schemes are long term and high cost, but the Walnut Tree Close and Bridge Street schemes are both short term (<5 years) and lower cost (<£0.5m and £2-10m respectively) options.

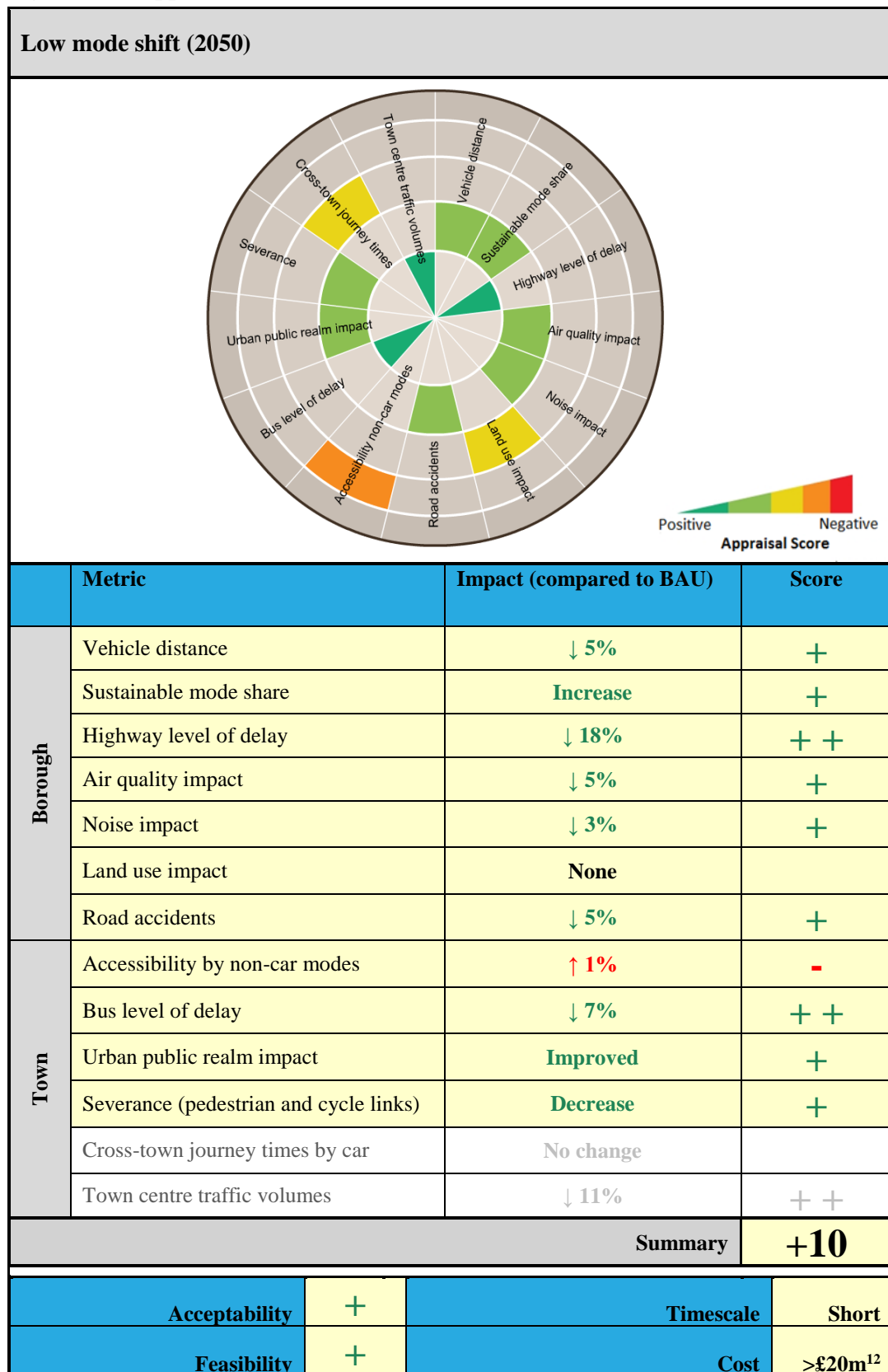
Overall

- In the appraisal against the study metrics, the best performing major infrastructure intervention on the A3 is the changes to the junctions in the Guildford urban area, followed by the shorter tunnel. The best performing intermediate infrastructure intervention in the town centre is the pedestrianisation of Bridge Street. Of these two interventions, the Bridge Street scheme demonstrates potentially higher benefits for a relatively short term, lower cost scheme. Either of the two A3 tunnel options are long term, high cost interventions, with potential acceptability issues.

A3 Sustainable Transport Interventions

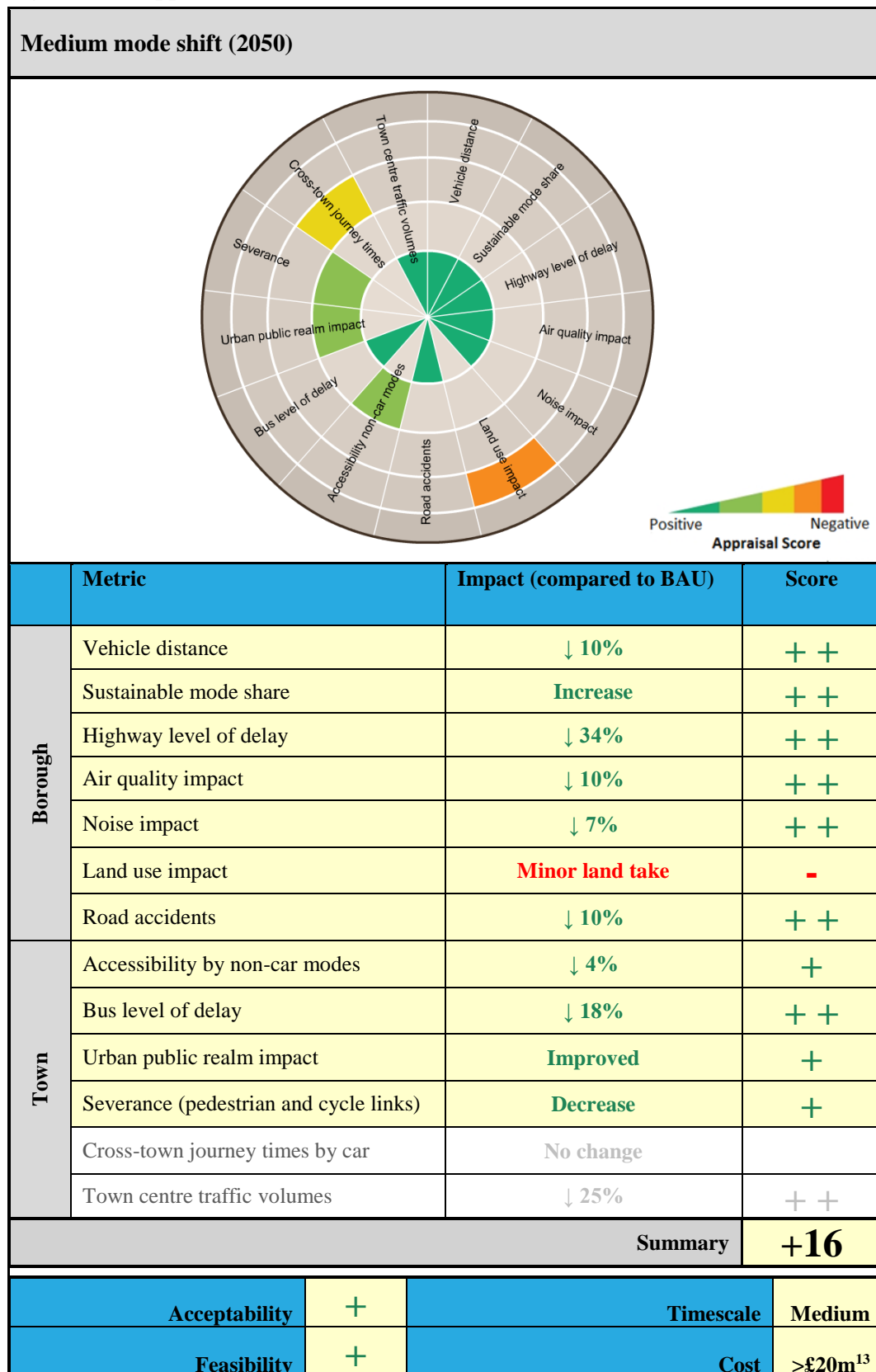
The results of the appraisal are presented below.

Figure A10: Appraisal Summary Table – Low mode shift



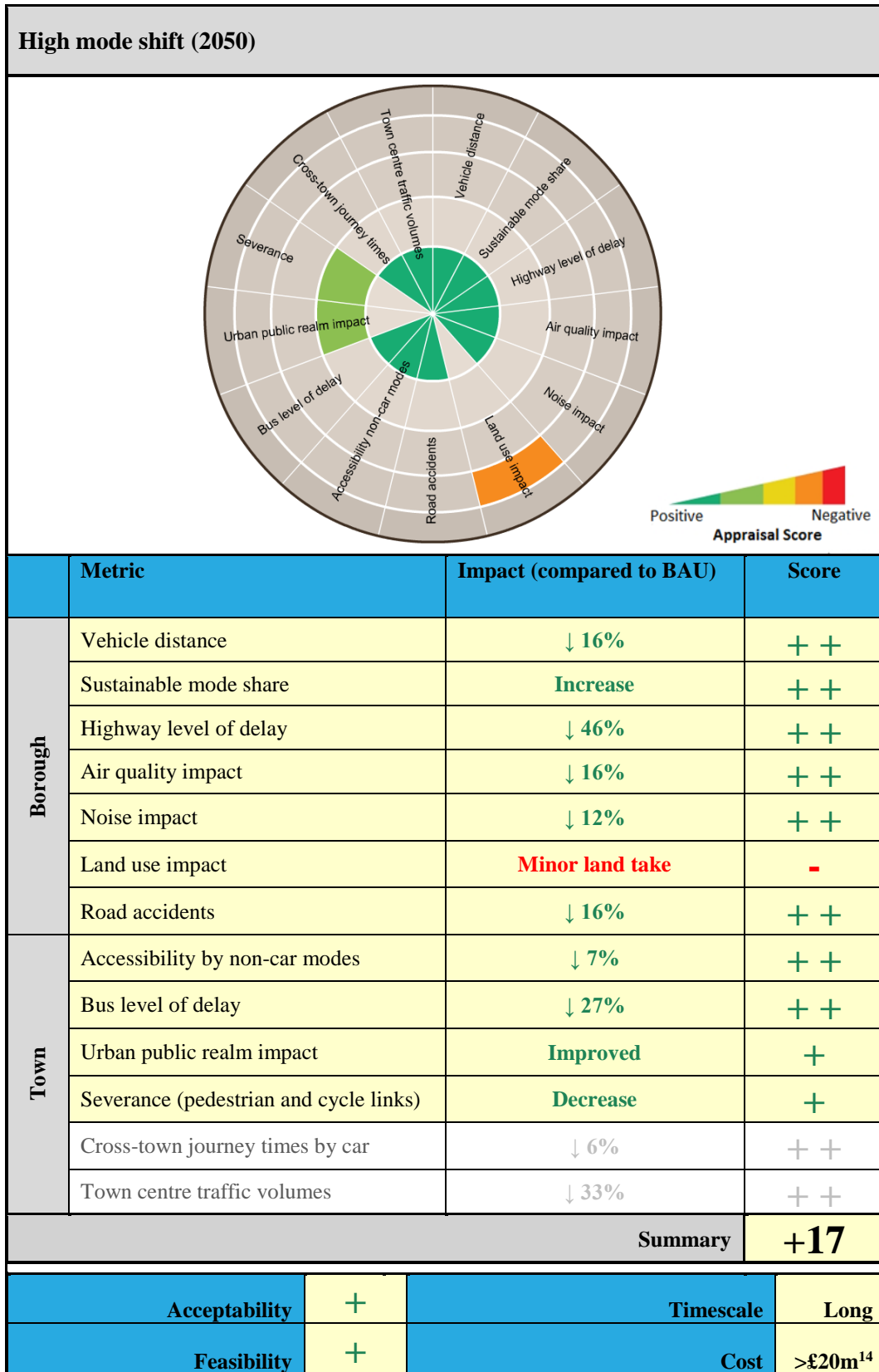
¹² Cost includes capital costs of pedestrianising Bridge Street and closing Walnut Tree Close to through traffic, as well as on-going costs for sustainable transport improvements.

Figure A11: Appraisal Summary Table – Medium mode shift



¹³ Cost includes capital costs of pedestrianizing Bridge Street and closing Walnut Tree Close to through traffic, as well as on-going costs for sustainable transport improvements.

Figure A12: Appraisal Summary Table – High mode shift



¹⁴ Cost includes capital costs of pedestrianizing Bridge Street and closing Walnut Tree Close to through traffic, as well as on-going costs for sustainable transport improvements.

A3.1 Summary of Sustainable Transport Interventions Appraisal

The appraisal against the study metrics indicates the following:

Borough-Wide

- All of the sustainable transport interventions are expected to decrease vehicle distance (by 5%, 10% and 16% for low, medium and high mode shift scenarios respectively). By definition they all increase sustainable mode share in the Borough. Highway level of delay is forecast to reduce by 18%, 34% and 46% for the three scenarios.
- The forecast reduction in vehicle traffic has positive impacts on the environmental indicators, with air quality impacts forecast to improve by 5%, 10% and 16% respectively and noise impacts improving by 3%, 7% and 12% respectively.
- None of the three scenarios require significant land take.
- Road accidents are forecast to decrease under all of the scenarios (as they reduce vehicle traffic) by 5%, 10% and 16% respectively.

Town-Wide

- Accessibility by non-car modes increases negatively (by 1%) in the low mode shift scenario, but improves under the medium and high mode shift scenarios (by 4% and 7% respectively). Public transport delays reduce under every scenario by 7%, 18% and 27% respectively.
- All scenarios offer potential urban public realm improvement opportunities, as pedestrian environments are improved to encourage more sustainable movement around the town.
- All of the scenarios reduce severance in the town by increasing connectivity across existing barriers (e.g. roads, rail and river).

Deliverability

- Over the 36 year period to 2050 all three scenarios would be expected to cost >£20m (representing a combination of capital and revenue spending). Within these scenarios many individual interventions would be low cost (<0.5m) and could be delivered in the short term (within 5 years). The sustainable transport interventions should all be generally acceptable to the public, but there will always be some opposition, for example to the reallocation of roadspace for sustainable transport modes.

Overall

- In the appraisal against the study metrics, the best performing sustainable transport intervention is the high scenario. This is logical as it represents a higher level of investment and the higher mode shift to sustainable transport.

A4 Appraisal of Other Interventions

Because the appraisal of other interventions is purely qualitative (due to not being able to represent these interventions in the SINTRAM model), results for 2050 are identical to results for 2031, and so are not repeated here.