The Leeds Railway Station (Southern Entrance) Order

Scheme Location and Design Rationale

Report 296480/RPT18

Revision B

May 2012

Metro

Network Rail

M Metrolink

Mott MacDonald
The Leeds Railway Station (Southern Entrance) Order

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Metro
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Issue and revision record

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<td>C</td>
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Executive Summary

Leeds City Station is one of Network Rail’s seventeen managed stations, serving the city centre of Leeds in West Yorkshire, with local, regional and inter-city rail services. At present, it is used by 85,000 passengers per day; including commuters, shoppers, business travellers, and leisure visitors. A single passenger access and egress point from the platforms serves both the main station entrance at New Station Street and the north concourse, which has entrances to Wellington Street and Princes Square. These three station entrances provide easy access to that part of the city centre which lies to the north of the railway viaduct. This structure bisects the city centre and impedes pedestrian flows to the south.

For a number of years Network Rail and Metro have been developing plans for a station southern entrance that would provide a new direct pedestrian link to redevelopment areas to the south, and relieve passenger congestion at the main station entrance. Various locations and concepts for the Leeds Station Southern Entrance (LSSE) have been explored and a preferred scheme has now been determined, funding has been secured and it is anticipated that LSSE will be open to passengers in 2014.

This document constitutes a consolidated options selection report which is intended to provide the evidence, rationale and context for how the preferred scheme location and design were reached. This is likely to be an important document that will set out the basis for the preferred scheme, demonstrating to potential external scrutiny that the most appropriate scheme was selected and developed as the basis of the Transport and Works Act Order (TWAO).

The scheme has been taken through Network Rail’s GRIP (Governance to Railway Investment Projects) process and has completed GRIP4 stage (single option development). A schematic flow chart summarising the key constraints, options and contemporaneous decision making at each GRIP stage is contained in Appendix B for reference.

GRIP1 Summary

Corus was commissioned by Network Rail to undertake a GRIP1 feasibility study which reported in September 2006. The study considered eight options at five different locations, namely:

- **River Aire (Granary Wharf area)**
  - Option 1 – Western river bank connecting to the Western Footbridge ~ **Progressed**
  - Option 2 – Western river bank connecting to Platform 16 ~ **Rejected**
  - Option 3 – Eastern river bank off Little Neville Street connecting to Platform 16 ~ **Rejected**

- **Sovereign Place (Sovereign Street)**
  - Option 4 – Connecting to Platform 16 ~ **Progressed**
  - Option 5 – Utilising existing station under-croft with stairs an lifts on Platform 8 ~ **Rejected**

- **Victoria Bridge (Granary Wharf area)**
  - Option 6 – An elevated walkway from the station Western Footbridge to Victoria Bridge ~ **Rejected**;

- **Dark Arches/ station under-croft (Granary Wharf area)**
  - Option 7 – Reopening former subways to Platforms 9, 11, 12, 13, and 15 ~ **Rejected**

- **Granary Wharf (Granary Wharf area)**
  - Option 8 – An extension to Platform 17 with access in the vicinity of Wharf Approach ~ **Rejected**

River Aire and Granary Wharf area location

Locating LSSE at the western end of the station would provide good access to key areas of passenger demand from Bridgewater Place, Granary Wharf and Holbeck Urban Village. In addition most train stopping points and platforms are located at the western end of the station and served by the Western Footbridge. An option directly connecting to the station Western Footbridge would be required to overcome...
safety and passenger capacity issues associated with connecting directly to platform 16, whilst maximising journey time benefits by providing direct access to most of the station platforms. However, in order to provide increased benefits for rail users east of the River Aire it was agreed that Option 1 would be modified at GRIP2 to provide direct access to both banks of the river. On this basis Option 1 appeared to offer significant journey time savings for the majority of potential users, and was progressed.

Utilising the abandoned station subway beneath platforms at the western end of the station was discounted as it would be relatively expensive, had very significant structural issues, construction would severely disrupt station operations and the proposed passenger access arrangements would create infrastructure and operational passenger flow conflicts.

**Sovereign Place**

Whilst modelling indicates strong rail user demand in the vicinity of Swinegate it is acknowledged that passengers from this area are unlikely to gain significant journey time benefits from LSSE being situated in Sovereign Place. This is because a shorter access route already exists to the majority of platforms within the station via the Swinegate railway bridge (over Swinegate) steps leading to New Station Street and the station main entrance (Swinegate Shortcut). Passenger demand from Granary Wharf may gain some journey time savings from using LSSE at Sovereign Place; however benefits would be reduced given the time delay in crossing over the busy Neville Street. Therefore many passengers from Granary Wharf, particularly those wishing to use the northern most platforms and western train stopping points, may continue to use the route to the main entrance via the Rotunda steps in preference to using a LSSE in Sovereign Place. These factors are likely to limit demand and the journey time savings possible from an LSSE location east of Neville Street. However, other factors such as the practicality of such a location, the cost of the works and the regeneration potential in the vicinity of Sovereign Street meant that this location could not be confidently ruled out at GRIP1.

Utilising Pitt Row as a subway concourse to lifts, stairs and escalators on Platform 8 was not considered practical due to the width of the platform and necessary works to bring Pitt Row into use for pedestrians.

For LSSE concepts at Sovereign Place it was apparent that an option connecting to the Eastern Footbridge or Barrow Way would have the advantage of avoiding safety and capacity issues on Platform 16 whilst providing more direct access to platforms. Therefore a development of Option 4 with an entrance in Sovereign Place connecting to a platform overbridge was pursued at GRIP2.

**GRIP2 Summary**

Corus was commissioned by Network Rail to undertake a GRIP2 feasibility study which reported in April 2007. The study was tasked with developing and appraising the following option variants:

- **Option 1 ~ River Aire**
  - **Option 1A** – This option could tie into both banks of the River Aire with a diagonal connection via escalators to the western bank of the River Aire at the ISIS Footbridge. It also ties into Western Footbridge inside the station ~ **Progressed**
  - **Option 1B** – This option provided direct access to the eastern bank of the River Aire through the Dark Arches and included a pedestrian walkway along the eastern bank of the River Aire to the ISIS Footbridge. It also ties into Western Footbridge inside the station ~ **Progressed**
  - **Option 1C** – This option ties into the Western Footbridge inside the station, and continues along an elevated walkway above Platform 17 providing access into the middle of the public space in Granary Wharf ~ **Rejected**
Option 4 ~ Sovereign Place

- **Option 4A** – This option provides an entrance in Sovereign Place which ties into the Barrow-Way crossing (either upgraded or reconstructed) with access provided onto all eastern platforms, requiring the Eastern Footbridge stairs to be reconfigured ~ **Rejected**
- **Option 4B** – This option provides an entrance in Sovereign Place which ties into the Barrow-Way crossing and also the Eastern Footbridge via a walkway above Sovereign Place, and a wide deck acting as a concourse area over Platforms 11, 12 and 14 ~ **Rejected**
- **Option 4C** – This option provides an entrance in Sovereign Place which ties into the Barrow-Way crossing, the Eastern Footbridge via a walkway above Sovereign Place and the Eastern Footbridge via an elevated walkway within the station footprint above Platform 16 ~ **Rejected**

River Aire Location

As noted at GRIP1 it is likely that the maximum aggregate journey time benefits would arise from an LSSE location to the west of Neville Street and connecting directly into the station Western Footbridge. Options to the west of the River Aire and particularly those towards Wharf Approach were considered too remote from the Sovereign Street area to offer benefits to those users; whilst any benefit to users in the vicinity of Neville Street may be marginal. Therefore it was concluded that the best LSSE location within the Granary Wharf area was immediately adjacent to or over the River Aire as this may provide at least some benefit for all areas south of the station. On this basis Options 1A and 1B were progressed to GRIP3 and Option 1C not pursued.

Sovereign Place Location

Whilst most existing rail user demand is from the east of Neville Street it was considered that a large proportion of this would continue to use the route via Swinegate to the main station entrance rather than LSSE in Sovereign Place. All of the Sovereign Place options considered required significant changes to the existing Barrow-Way, whilst Option 4B also necessitated rebuilding the Eastern Footbridge and Option 4C was dependent on the construction of an elevated walkway over Platform 16. These works would increase scheme costs and disrupt station operations to a greater or lesser degree. Therefore, an option to locate LSSE in the vicinity of Sovereign Place (east of Neville Street) was rejected on the basis of existing station access routes, likely passenger demand, the remoteness of the east end of the station from the majority of train stopping points, disruption during construction and value for money.

GRIP3 Summary

Corus was commissioned by Network Rail to undertake a GRIP3 feasibility study which reported in October 2007, and considered four options in the vicinity of the River Aire:

- **Option 1A (over the river)**
  - **Option 1Ai** – This option provided step free access from the western bank of the River Aire and to the eastern bank via Dark Neville Street. It also provided stepped access directly to the eastern bank of the river adjacent to the railway viaduct; and a link bridge connecting LSSE to the ISIS Footbridge landing at Waterman’s Place. Vertical access from the station Western Footbridge was via a single flight of escalators which were positioned diagonally relative to the railway viaduct ~ **Rejected**
  - **Option 1Aii** – This option provided step free access from the western bank of the River Aire and to the eastern bank via Dark Neville Street. It also provided stepped access directly to the eastern bank of the river adjacent to the railway viaduct. Proposals included a large deck area, almost spanning the whole of the River Aire between the railway viaduct and the ISIS Footbridge which would be
replaced by the deck structure. Access to the station Western Footbridge was provided via a double bank of escalators and a landing positioned diagonally relative to the railway viaduct ~ Rejected

- **Option 1Aiii** – This option provided step free access from the western bank of the River Aire and to the eastern bank via Dark Neville Street. It also provided stepped access directly to the eastern bank of the river adjacent to the railway viaduct; and a link bridge connecting LSSE to the ISIS Footbridge landing at Waterman’s Place. Access to the station Western Footbridge was provided via a double bank of escalators and a landing positioned parallel to the railway viaduct ~ Progressed

- **Option 1B (on the east bank of the river)**
  - **Option 1Bi** – This option is located off Little Neville Street between the railway viaduct and the ‘Blue Apartment’ Building with a high level walkway connecting to the station Western Footbridge. It provides step free access from the east bank of the River Aire, and incorporates a triple bank of escalators situated parallel to the railway viaduct. Step free access to the river’s western bank is provided via Dark Neville Street and stepped and step free access is via the ISIS Footbridge ~ Rejected

The extensive river deck associated with Option 1Aii is likely to be significantly expensive (not affordable) and would reduce the quality of the townscape within a Conservation Area; it was therefore not pursued.

Option 1Bi is situated within an extremely constrained site and there were doubts about how cost effectively it could be constructed. In addition the available pedestrian flow capacity within it was likely to be insufficient to accommodate any growth in passenger demand such as from Holbeck Urban Village. It was rejected as being unlikely to meet the scheme objectives and future requirements.

Any building or structures which are situated over the River Aire in proximity to the adjacent residential apartments will need to minimise visual intrusion. The principal way in which this can be achieved is by limiting how far the building and any structure at height extends away from the face of the railway viaduct. The escalator arrangement extending towards the ISIS Footbridge in Option 1Ai does not achieve this and was consequentially rejected. However the arrangement in Option 1Aiii with the escalators against the viaduct face and lengths split with an intermediate landing allows for a much more compact building. Therefore Option 1Aiii was progressed at it least impacted on third parties

**GRIP4 Summary**

Aecom was commissioned by Network Rail to undertake a GRIP4 feasibility study which reported in April 2009, and considered a single option comprising the following LSSE elements:

- A connection to an extended station Western Footbridge
- The building situated above the River Aire supported by an extension of the railway viaduct piers
- A lower level concourse extending back into the railway viaduct arches and connecting with a new footbridge over the river at Dark Neville Street
- Link bridges to either bank of the river

The GRIP4 scheme (Option 1Aiv) was developed in conjunction with major stakeholders and in particular Leeds City Council so that it minimised potential impacts on third parties whilst meeting the scheme objectives. A significant amount of environmental baseline data gathering was undertaken and consideration given to how this should shape the design, and in particular the incorporated mitigation.

The GRIP4 design has multiple access points to LSSE and access ramps in order to provide step free access from both banks of the river. The length of the access ramps was increased post GRIP3 in
response to the Environment Agency changing the flood risk level requirement to 1 in 200 years to align with the emerging Leeds Flood Alleviation Strategy.

Post GRIP4 Metro wished to ascertain whether the LSSE access arrangements could be rationalised in order to shorten the step free access routes and provide a more focused station entry point. SBS Architects were commissioned to undertake a review of the pedestrian access proposals in September 2011. Their review included an assessment of the GRIP4 preferred option, and considered potential variations of this baseline design.

SBS Options 1 and 2 were rejected on the basis that they did not add value to the scheme and some of the issues that they sought to address could be dealt with in other ways within the design. SBS Option 3 appeared to offer a rationalised access arrangement focused on a single point of entry (within Dark Neville Street) to LSSE. This potentially provided a more coherent solution that would strengthen the identity of LSSE by consolidating access arrangements. However it was acknowledged that SBS Option 3 did not provide an emergency evacuation route clear of the station under-croft. Concept proposals for SBS Option 3 were developed and a capital cost produced. This was put to the Project Board who considered that the additional £1.7 million (to be confirmed) was not affordable and consequently SBS Option 3 was rejected on that basis.

The GRIP4 design (Option 1Aiv) will form the basis of the Transport and Works Act Order application and is to be further developed at GRIP5.

**Recommendations**

The fundamental basis for the LSSE location and design will be scrutinised, possibly at Public Inquiry. It would be useful to further enhance the design rationale by undertaking the following steps:

- Provide scheme capital costs on a consistent basis for each option considered across all GRIP stages so that cost differences between options can be directly compared;
- Obtain full entry and exit data for the current ticket gate line in order to validate the demand forecasting assumptions;
- Calculate journey time savings to major trip attractors and aggregate journey time savings for each option at all GRIP stages;
- Greater consideration of cyclist access and facilities;
- Further consideration of the flood risk requirement in respect of the emerging changes to the Leeds Flood Alleviation Strategy.
1. Introduction

1.1 Project Background

Leeds City Station is one of Network Rail’s seventeen managed stations, serving the city centre of Leeds in West Yorkshire, UK with local, regional and inter-city rail services. At present, it is used by 85,000 passengers per day; including commuters, shoppers, business travellers, and leisure visitors. Access and egress for all passengers is usually via the main station entrance located on the north side of the station off New Station Street; an auxiliary entrance off platform 8 (also leading to New Station Street) is also opened during peak periods.

In recent years extensive redevelopment has taken place to the south of Leeds City Station and this has created demand for a new station entrance to more directly serve these areas, as existing routes from the station are somewhat convoluted. It is estimated (in the major scheme business case) that approximately 10% of current station users’ onward dispersal is to the south of the Leeds City Station railway viaduct. Demand is likely to rise in future years as further development is planned for areas south of the station, most particularly Holbeck Urban Village.

For a number of years Network Rail and Metro have been developing plans for a station southern entrance that would provide a new direct pedestrian link to redevelopment areas to the south, and relieve passenger congestion issues at the main station entrance. Various locations and concepts for Leeds Station Southern Entrance (LSSE) have been explored and the scheme has been taken through Network Rail’s GRIP options development process. A preferred scheme has now been determined, funding has been secured and it is anticipated that LSSE will be constructed during 2013 and open to passengers in 2014.

In order to progress the scheme, the promoters (Metro and Network Rail) require Works powers because it has the potential to affect the operation of railway infrastructure (at Leeds City Station). However, as it does not directly affect the operation of railway tracks an application to the Infrastructure Planning Commission is not considered appropriate. The promoters intend to apply to the Secretary of State for an Order under the Transport and Works Act 1992 that will authorise the construction and operation of LSSE. In addition concurrent applications will be made for various consents and a request for deemed planning consent.

Mott MacDonald has been appointed by the West Yorkshire Passenger Transport Executive (Metro) as the Planning and Environmental Technical Advisor to deliver a range of services relating to the delivery of a Transport and Works Act Order (TWAO) application for the LSSE scheme. This document presents the scheme options selection and design rationale, and may be used as supporting evidence as part of the TWAO application and subsequent public scrutiny.

1.2 Study Remit

This document constitutes a consolidated options selection report which is intended to provide the evidence, rationale and context for how the preferred scheme location and design were reached. This is likely to be an important document that will set out the basis for the preferred scheme, demonstrating to potential external scrutiny (including at any future hearing or Public Inquiry) that the most appropriate scheme was selected and developed as the basis of the TWAO application.
1.3 Report Structure

Pursuant to this introduction the report is structured in the following way:

Section 2 ~ Context and Constraints
This section provides an overview of the scheme milieu including physical constraints and the planning context. It sets out the scheme objectives at key stages of the development so that the options can be understood from a contemporaneous perspective. The scheme approvals chronology including levels of design review and approvals are also provided to add to the historical background context.

Section 3 ~ Appraisal Framework
The methodology used to assess the options at each GRIP is explained in the context of the New Approach to Transport Appraisal guidance. This covers the five themes of environment, safety, economy, accessibility and integration; and we have supplemented these with additional criteria where appropriate. The criteria have been used as the basis for the options assessment and the Appraisal Summary Tables.

Section 4 ~ GRIP1 Options Appraisal
This section examines each option considered at GRIP1. It includes an option specific description, key issues and a table of advantages and disadvantages. At the end of this section a summary of the key conclusions is provided together with an Assessment Summary Table of all options considered.

Section 5 ~ GRIP2 Options Appraisal
This section examines each option considered at GRIP2. It includes an option specific description, key issues and a table of advantages and disadvantages. At the end of this section a summary of the key conclusions is provided together with an Assessment Summary Table of all options considered.

Section 6 ~ GRIP3 Options Appraisal
This section examines each option considered at GRIP3. It includes an option specific description, key issues and a table of advantages and disadvantages. At the end of this section a summary of the key conclusions is provided together with an Assessment Summary Table of all options considered.

Section 7 ~ Post GRIP3 Scheme Influences
This section documents the further development of the Granary Wharf site including the ISIS Footbridge, Network Rail’s confirmation that LSSE would need to be largely structurally independent, and a change in design flood levels required by the Environment Agency.

Section 8 ~ GRIP4 Options Appraisal
This section examines each option considered at GRIP4. It includes an option specific description, key issues and a table of advantages and disadvantages. In addition a review of the GRIP4 access arrangements was undertaken by SBS Architects. At the end of this section a summary of the key conclusions is provided together with an Assessment Summary Table of all options considered.

Section 9 ~ Post GRIP4 Scheme issues
An overview of the funding and approvals basis of the scheme is set out in this section.

Section 10 ~ Options Review Workshop
An overview of a project options review workshop including objectives, the material presented and a summary of the discussions with key project team members from various GRIPs is outlined.

Salient points, conclusions and a summary table can be found in the Executive Summary at the start of this report.
2. Context and Constraints

2.1 Overview

This section describes the LSSE locale and pertinent influences that have shaped or had a direct impact on the scheme’s form and function. It should be noted that incorporated mitigation will have to be considered for potentially adverse impacts arising from the LSSE scheme; although there may be residual impacts which it is not practical to avoid. The impacts and mitigation for the preferred (to be promoted) scheme will be discussed in detail in the Environmental Statement; this will also refer to major scheme alternatives.

The proposed LSSE project is to be located in an urban area, with the surrounding land used mostly for residential apartments, businesses, offices and roads. LSSE needs to be located to the immediate south of Leeds City Station and form a connection to it. There are two broad locations for LSSE and these are:

- Granary Wharf area ~ west of Neville Street. It should be noted that an auxiliary site to support construction including the facility to load barges may be required and that this is likely to be on the Aire and Calder Navigation at Water Lane, off Meadow Lane.

- Sovereign Place/Pitt Row ~ East of Neville Street

A full description of site conditions for the preferred scheme is provided in the Environmental Statement.
2.2 Physical Infrastructure

A plan illustrating the key physical features is shown in Figure 2.1.

Figure 2.1: Key Infrastructure

Source: Mott MacDonald

2.2.1 Site Access

LSSE is primarily intended to serve pedestrians accessing the station from the southern areas of Leeds city centre. To meet this purpose, the entrance is located so as to provide connections to both the east and west of the River Aire and Neville Street. Figure 2.2 illustrates the main pedestrian desire lines south of Leeds City Station including:

- Routes to the Calls Commercial District to the east of Neville Street;
- Routes to the South of Leeds and further commercial areas along Neville Street;
- Routes via Granary Wharf area towards Holbeck; and
- Routes along the Canal towpath to the west of Leeds.
2.2.1.1 2006 Survey Pedestrian Results

As part of the development of the Outline Business Case in 2006, consultant Halcrow was commissioned to provide baseline data for the scheme development. The baseline information technical notes included a data collection note (ref: CTDAHC000/TN1), two notes summarising the pedestrian flows observed (ref: CTDAHC000/TN2) and an initial analysis of pedestrian flows (ref: CTDAHC000/TN3). Other technical notes included a ‘Walking Route Audit’, a summary of stakeholder consultation and forecasts of passenger growth based on Census data, records of station footfall, proposed development information and planning documents including the Local Transport Plan.

The pedestrian survey analysis identified the following key points:

- 56% of passengers have to use a footbridge to access their platforms (Platforms 9 to 17);
- Passenger demand by platform showed Platforms 11 to 12 and 16 were the busiest. The base Data Collection Technical Note observed that the highest platform demands occurred on Platforms 2, 8, 9, 11, 12, 15 and 16 which correlated well with 2006 historic train loading data from Metro;
- For pedestrian demand from the south of the station, the daily number of pedestrian movements was estimated at 10,000, equivalent to approximately 3.5million trips annually or 12.5% of movements at the station; and
The proportion of southbound trips via Neville Street was estimated to be higher in the AM peak hours at 15%, 12% in the Inter-Peak period and 11% in the PM peak period.

The data collection note provided a geographic breakdown for the trips to and from the station for a 1km catchment to the south of the station (based on the existing flows). The zoning was based on groupings of attractors and generators in the areas, with the note observing that for commuting passengers to the south of the station:

- The location with the highest attraction in the AM peak is the Central Riverside zone along Neville Street and Sovereign Street. Other significant areas include the Campfield and Eastern Gateway zones (Marshall’s Mill, City Walk and Victoria Place) (Figure 2.3);
- For the AM peak period, the two principal concentrations of demand for access to the station are from the Hilton Hotel and Blue Apartments Building and the Sweet Street Car Park, with smaller concentrations located at City Walk and other commercial office locations; and
- During the PM peak period the pedestrian demand to the station effectively represents the returning flows from the AM peak movements with some additional concentration in the Central Riverside zone.

The zonal attraction for trips from the station is shown in Figure 2.3 with Table 2.1 providing a brief summary of pedestrian demand/attraction by location and period.

Figure 2.3: Halcrow South Leeds Zone Plan: Trips Attracted from Leeds Station

Source: Halcrow, ‘Data Collection Results and Analysis (Tasks 4 and 5)’, Figure 11, CTDAHC000/TN1, July 2006
Table 2.1: Pedestrian Zonal Demand Distribution (Bandings) for South of Leeds Station (2006)

<table>
<thead>
<tr>
<th>Area</th>
<th>AM Demand (trips to the station)</th>
<th>AM Attraction (trips from the station)</th>
<th>PM Demand (trips to the station)</th>
<th>PM Attraction (trips from the station)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tower Works</td>
<td>No Demand</td>
<td>No Demand</td>
<td>No Demand</td>
<td>-</td>
</tr>
<tr>
<td>Temple Works</td>
<td>Low</td>
<td>Low</td>
<td>No Demand</td>
<td>-</td>
</tr>
<tr>
<td>Granary Wharf</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>Camp Field</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>Eastern Gateway</td>
<td>Low</td>
<td>Low</td>
<td>No Demand</td>
<td>-</td>
</tr>
<tr>
<td>Southern Gateway</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>Central Riverside</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>-</td>
</tr>
<tr>
<td>South Bank</td>
<td>No Demand</td>
<td>Low</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>Office and Retail Parks</td>
<td>No Demand</td>
<td>Low</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>Apex</td>
<td>No Demand</td>
<td>Low</td>
<td>Low</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Halcrow, ‘Data Collection Results and Analysis (Tasks 4 and 5)’, CTDAHC000/TN1, July 2006

*The Halcrow note specifies percentage ranges on the chart but does not provide details, these have been categorised above as No Demand, Low (<4%-8%), Medium (8% - 12%) and High (12% – 20%) in the absence of detailed results, with the predominate category being applied where demand was recorded. For the AM distribution of trip demand to the station the categories are amended to No Demand, Low (<8%-16%), Medium (16% - 24%) and High (24% – 40%).

It should be noted that these surveys were based on a sample pedestrian interview survey of 260 pedestrians at the rotunda staircase. Approximately 60%-70% of the pedestrians interviewed were passengers from Leeds City Station heading towards the south. Furthermore the resultant sample results (approximately 182 pedestrians) represent only approximately 14% of the 1,300 passenger trips observed in the peak hour and may therefore not be fully representative of the actual demand.

The results of the 2006 Halcrow survey should be treated with a degree of caution as significant development has subsequently taken place at Granary Wharf, Holbeck Urban Village and Bridgewater Place.

2.2.1.2 2012 Pedestrian and Passenger Demand Modelling

Further pedestrian modelling is currently being undertaken by consultant Hyder to provide a current estimate of passenger demand and pedestrian flows for LSSE. The revised 2031 Leeds Transport Model (LTM) has forecast a usage for LSSE of 22% in the AM peak, and 24% in the PM peak of the total passenger entries/exits from the station. This is a higher percentage than envisaged in previous modelling work and strengthens the case for LSSE.

The pedestrian model has provided an indication of the dispersal directions of the passengers, the results of which are summarised in Table 2.2. This shows that approximately two thirds of the passengers using LSSE will exit/enter from the east bank of the River Aire, with one approximately third using the west bank.
Table 2.2: LSSE Total Exit Entry Passenger Distribution (2029)

<table>
<thead>
<tr>
<th>Exit</th>
<th>AM Peak Hours</th>
<th>PM Peak Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSSE: East</td>
<td>66%</td>
<td>61%</td>
</tr>
<tr>
<td>LSSE: West</td>
<td>34%</td>
<td>39%</td>
</tr>
</tbody>
</table>

Source: Hyder 2012

Table 2.3 provides a summary of the peak hour demand for trips to/from the station and this is illustrated on Figures 2.5 to 2.8. The percentages presented on the plans (Figures 2.5 to 2.8) are the total rail user passenger demand for that zone; with the plans also showing the three existing entrances/access points, the access routes via the Rotunda steps and Swinegate, as well as proposed LSSE locations. Figure 2.4 shows the zoned overall demand for trips from the LTM to/from the station during the AM and PM peak hours.

Table 2.3: Passenger Zonal Demand Distribution for 2031 (see Figures 2.5 to 2.8)

<table>
<thead>
<tr>
<th>Area</th>
<th>AM Demand (to the station)</th>
<th>AM Attraction (from the station)</th>
<th>PM Demand (to the station)</th>
<th>PM Attraction (from the station)</th>
</tr>
</thead>
<tbody>
<tr>
<td>West of Neville Street*</td>
<td>4%†</td>
<td>4%†</td>
<td>5%†</td>
<td>14%†</td>
</tr>
<tr>
<td>East of Neville Street*</td>
<td>4%†</td>
<td>6%†</td>
<td>6%†</td>
<td>6%†</td>
</tr>
<tr>
<td>South of Neville Street*</td>
<td>10%</td>
<td>5%</td>
<td>6%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Source: Hyder 2012

* West of Neville Street (zones 124, 125 and 131) covering Granary Wharf and Holbeck Urban Village; East of Neville Street (zones 125 and 136) covering Sovereign Place and sites between Neville Street and Swinegate; South of Neville Street (zones 134, 135 and 148) covering areas south of Water Lane and Great Wilson Street; and † zone 125 spans Neville Street and is not apportioned.

The analysis of these results in Table 2.3 suggests that the demand for to the station is evenly distributed to the east and west of Neville Street, except in the PM peak hour where there is a higher demand for access to the western bank (Granary Wharf (5%) and Holbeck (9%)). Similarly the distribution south of Water Lane / Great Wilson Street in the periods is relatively even except for a high percentage of trip generated from City Walk (including Lateral).
The demand forecasts suggest that there are areas of high rail user demand to the south of the railway station and east of Neville Street; in particular Sovereign Place and Swinegate. Although these locations may utilise LSSE it is likely that many of these passengers would continue to use the existing Swinegate Shortcut (providing access to New Station Street from Swinegate) with LSSE likely to provide greater additional benefits for users from the south and west.
Figure 2.5: Hyder Passenger Demand Modelling 2031 AM Peak Hour - Origins

Source: Hyder 2012 data, Mott MacDonald plan

Figure 2.6: Hyder Passenger Demand Modelling; 2031 AM Peak Hour - Destinations

Source: Hyder 2012 data, Mott MacDonald plan
Figure 2.7: Hyder Passenger Demand Modelling: 2031 PM Peak Hour - Origins

Source: Hyder 2012 data, Mott MacDonald plan

Figure 2.8: Hyder Passenger Demand Modelling: 2031 PM Peak Hour - Destinations

Source: Hyder 2012 data, Mott MacDonald plan
2.2.1.3 Leeds City Station

Leeds City Station is located to the immediate south-west of Leeds city centre, off City Square. A single passenger access and egress (on the north side of the station) from the platforms serves the main station entrance at New Station Street and the north concourse which has entrances to Aire Street and Princes Square. This single point of entry/exit from the platform area (to the three northern exits) is controlled by ticket barriers and is an area of passenger congestion and delay during peak periods. In order to help relieve this congestion, passenger egress is allowed during peak periods via a gate leading from Platform 8 to New Station Street.

A vehicular passenger drop of and pick up area is provided at Princes Square; however this often results in server traffic congestion on local streets despite being marshalled by station staff.

Passengers wishing to access or egress the station from the south of the railway must traverse a convoluted and indirect route via the main entrance (New Station Street), the ‘Rotunda’ steps to Bishopgate Street, and through the Neville Street underpass or a route alongside the railway viaduct to Swinegate.

2.2.1.4 Granary Wharf area

The principal highway access to the Granary Wharf site is via Neville Street (loop traffic) and Water Lane. A private road (Dark Neville Street) runs beneath the station structure and over the River Aire. It is primarily used for accessing car parking spaces within the station under-croft and for access to Little Neville Street.

In addition to highway, further pedestrian routes exist across the Leeds and Liverpool Canal and through the Granary Wharf development including a footbridge (Figure 2.9) over the River Aire. Pedestrians make use of Dark Neville Street to walk between Granary Wharf and Neville Street (and often to the station).

Figure 2.9: ISIS Footbridge

Source: Mott MacDonald
2.2.1.5 Dark Neville Street

An extensive brick arched under-croft exists beneath Leeds City Station and this is predominantly used for car parking with a few retail units located within the structure fronting onto Neville Street and Granary Wharf. The principal route of access through the under-croft is via Dark Neville Street which is a single carriageway private (Network Rail) road which is aligned east-west and situated on the southern side of the station. It runs from Neville Street through the under-croft, where an access point is provided to Little Neville Street, the road then crosses the River Aire to Granary Wharf where there are two access points to the south, the most westerly of which provides a route to Wharf Approach and the wider highway network. The Dark Neville Street Bridge has a weight limit of 3 tonnes although it is currently closed to all vehicular traffic. There do not appear to be traffic restrictions enforced along Dark Neville Street between Neville Street and Little Neville Street. Consequently, it is used as a route for vehicles to and from Little Neville Street as it would be difficult to turn around vehicles within the Little Neville Street carriageway.

Figure 2.10: Dark Neville Street (showing bridge)

<table>
<thead>
<tr>
<th>Route</th>
<th>Vehicles</th>
<th>Cars (%)</th>
<th>Taxis (%)</th>
<th>LGV (%)</th>
<th>HGV (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dark Neville Street – Little Neville Street</td>
<td>261 (50%)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Little Neville Street – Dark Neville Street</td>
<td>263 (50%)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>524 (100%)</td>
<td>423 (81%)</td>
<td>11 (2%)</td>
<td>74 (14%)</td>
<td>16 (3%)</td>
</tr>
</tbody>
</table>

Source: Leeds City Council, Mott MacDonald

Table 2.4: Dark Neville Street Vehicle Survey Results

Source: Metro 2011
The Leeds Railway Station (Southern Entrance) Order
Scheme Location and Design Rationale

Table 2.5: Activities Summaries

<table>
<thead>
<tr>
<th>Activities</th>
<th>Vehicles</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver Through</td>
<td>145</td>
<td>29%</td>
</tr>
<tr>
<td>Parking (Dark Neville Street)</td>
<td>295</td>
<td>60%</td>
</tr>
<tr>
<td>Deliver / Loading</td>
<td>55</td>
<td>11%</td>
</tr>
</tbody>
</table>

Source: Metro 2011

Table 2.4 and Table 2.5 provide summaries of the traffic surveys undertaken by Metro in December 2011 on Little Neville Street and Dark Neville Street. From these results it can be seen that the two way flows are approximately equally, with 81% of the vehicles surveyed being cars, with a limited number of taxis and goods vehicles using the two streets. The predominant activity observed in the two streets is the access for cars to the Dark Neville Street car parking, at 60% with 11% of activities being servicing and access activities, and 29% of through trips between the two junctions with Dark Neville Street.

2.2.2 Waterways

The River Aire is designated as a Main River (meaning that the Environment Agency (EA) have direct powers to act) and it runs through the city centre of Leeds, flowing from the northwest to southeast. It flows beneath Leeds City Station, through an engineered channel within the under-croft structure, known locally as the Dark Arches. Approximately 100 metres downstream of the Dark Arches, the River Aire joins with the Leeds and Liverpool Canal to become the Aire and Calder Navigation at a canal lock, and just east of this, the Millshaw Beck tributary enters the River Aire. Approximately 600 metres down stream of Leeds City Station, the Aire and Calder Navigation flows past the possible ancillary construction site (at Water lane/ Meadow Lane) whose primary purpose would be loading and unloading barges with materials to support LSSE construction. Further downstream (east of Leeds), the River Aire converges with the River Calder, west of Castleford and then with the River Ouse, west of Goole, before discharging to the North Sea at the mouth of the Humber.

2.2.3 Flood Risk

The primary source of flood risk to, and resulting from the proposed scheme, is considered to be fluvial flooding from the River Aire. Consideration has been given throughout the scheme development to the requirements and recommendations of the Leeds Strategic Flood Risk Assessment (SFRA), Planning Policy Statement 25: Development and Flood Risk (PPS25), LCC and the Environment Agency (EA). The EA flood map and the Leeds SFRA flood map (Figure 2.11) indicates that the Granary Wharf area is at risk of fluvial flooding from the River Aire.

The flood risk design level was initially set at 1% AEP (1 in 100 year) plus 20% for climate change following consultation with the EA; and this was the assumption from GRIP1 to 3. However, at GRIP4 the EA increased the flood risk level requirement to 1 in 200 years to align with the emerging Leeds Flood Alleviation Strategy. This has significant implications for options in the vicinity of the River Aire requiring additional, stairs, ramps and lifts to provide step free access and sufficient clearance over the river channel.

We understand that the Leeds Flood Alleviation Strategy as proposed at GRIP4 was not successful in obtaining funding and that a revised scheme is being developed with Leeds City Council. This is likely to have a 1 in 75 year flood risk design level through Leeds City Centre, requiring lower (compared to the previous scheme) flood defence walls and innovative features such as movable weirs to allow the passage of greater volumes of water. However, this scheme is a concept stage and no design requirements will be
confirmed for some time. Consequently, it is our understanding that the EA flood risk requirement for the LSSE scheme remains unchanged at the 1 in 200 year level.

Figure 2.11: Flood Risk Areas

Source: Leeds City Council, Mott MacDonald
2.2.4 Sub station

A YEDL substation is located in one of the Dark Arches to the rear of Waterman’s Place and adjacent to the River Aire; it was relocated to this position as part of the ISIS development in 2009. A search of Statutory Undertakers’ equipment has highlighted that the substation connects to underground high voltage cables and a large number of these are located to its immediate south, serving the ISIS development. Relocation of the sub station and diversion of the high voltage cables may be significantly expensive in the context of this scheme. If the sub station is to remain, suitable access will need to be retained for maintenance and replacement of equipment. The substation is shown in Figure 2.12 below.

Figure 2.12: Granary Wharf Sub-Station

Source: Mott MacDonald
2.3 Planning Context

A plan illustrating the key planning features is shown in Figure 2.13.

Figure 2.13: Key Planning Features: Conservation Areas

Source: Leeds City Council, Mott MacDonald

2.3.1 Site Historic Environment

The Sovereign Place/ Pitt Row location is not with a Conservation Area and is unlikely to affect the setting of listed buildings. However, at that location cognisance will need to be taken of potential visual impacts on the Victorian brick arch railway viaduct and the townscape character of the area.

The Granary Wharf area location is within a Conservation Area and the following heritage assets were identified as being potentially visually impacted during the construction or operation phase:

- River lock and retaining walls to the River Aire, Grade II* Listed Building;
- Granary Wharf area, Grade II* Listed Building;
- Victoria Bridge, Grade II Listed building; and
- Dark Arches over the River Aire, locally designated heritage asset.

It is likely that a site at Water Lane would be required to support construction in proximity to the River Aire through the delivery and storage of materials, loading and unloading of barges, and requisite site welfare.
facilities. This ancillary site would be of temporary nature and it lies partly within the Leeds City Centre Conservation Area. As Figure 2.14 shows, the site contains an arch remnant of a former warehouse and it is likely that this will need to be demolished to facilitate site activities, requiring Conservation Area consent.

Figure 2.14: Warehouse Arch at Water Lane (in Conservation Area)

Source: Leeds City Council, Mott MacDonald

2.3.2 Developments

At the inception of the LSSE scheme in 2006, there were a number of major developments to the south of Leeds City Station, located mostly to the southwest in Granary Wharf, Holbeck Urban Village to the southwest and Criterion Place on Sovereign Street to the southeast. One of the key drivers of this scheme was to improve accessibility to these major development areas. For reference, the developments planned during the life of this project are listed below with a brief description of each.
Southwest

- Tower Works – Commercial Office and Leisure ~ projected completion winter 2012, however owing to market conditions construction of this development has not begun.


- The Mint – Commercial Office Space and Leisure Opportunities ~ completed


- Round Foundry - Commercial Office Space and Leisure Opportunities ~ completed
Granary Wharf - Residential and Leisure Development. Comprises Mint Hotel, Watermans Place Apartments, Candle House Apartments and Blue Apartments Building ~ completed.
- Blue Apartments Building is a 16 storey high residential block with ground floor retail use that has recently been fitted out as a golf shop and virtual driving range. The Blue Apartments Building were granted planning permission and subsequently constructed a deck spanning out over the River Aire circa post GRIP3 and this would be in conflict with a possible LSSE associated walkway along the east bank of the river.
- Waterman’s Place is a 15 storey primarily residential block situated on the west bank of the River Aire.

- Temple Works – Arts and Cultural Opportunities ~ project ongoing.

- Bridgewater Place – large 33 storey office block complex ~ completed 2006.
South East

- Criterion Place – This development came about from an architectural competition held by Leeds City Council in 2004, which the ‘Kissing towers” scheme by Ian Simpson Architects won, consisting of apartments, and a hotel. Unfortunately, in July 2008 it was announced that this scheme was cancelled owing to the downturn in the market conditions. More recently another party has expressed interest in the site and is in discussions with Leeds City Council.

![Criterion Place (Looking towards Neville Street)](source: Mott MacDonald)

### 2.3.3 Ecology

There are no statutory designated sites, such as Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Interest, National Nature Reserves and Local Natural Reserves within a 2km radius surrounding the site. In relation to non-statutory local sites, three Local Wildlife Sites (LWSs) were recorded within the 2km search radius, as follows:

- Leeds and Liverpool Canal Site of Ecological and Geological Importance, located where the canal joins the River Aire, approximately 100m downstream from the LSSE area;
- Aireside Embankment Leeds Nature Area located west of the train station on southern bank of the River Aire to the north of the LSSE area; and
- St Matthew’s Local Nature Area, approximately 1.75 km east of the LSSE site in Holbeck.

Detailed consideration of ecological baseline conditions has been largely confined to the later stage of design development (i.e. GRIP4), and therefore the Granary Wharf area west of Neville Street. However, a site walkover (no surveys or specific data gathering) was undertaken of the Sovereign Place locale and this indicates that there are unlikely to be ecological issues of significance as this area is predominantly hard stranding for car parking. The options to the east of Neville Street are located in a heavily built up area distant from the River Aire. Therefore, the following sections refer to the Granary Wharf area west of Neville Street only.

2.3.3.1 Habitats

Scheme location options west of Neville Street are situated over or near to the River Aire. The west bank of the river was a surface car park at GRIP1 and was subsequently developed creating a highly built-up environment with very little natural vegetation present.

The habitats in the vicinity of the location options (Granary Wharf area) generally consist of hardstanding, with stone and metal piled river banks, with no submerged, with marginal or emergent vegetation for options near or over the River Aire. There is potential for these areas to support protected species, including use of the river, isolated occasional strips of ruderal vegetation areas and structures for commuting, foraging, shelter, roosting and breeding sites for birds or bats.

These habitats may support commuting otters and foraging bats; although no evidence of bat roosts in the vicinity of the LSSE options has been found. The River Aire offers connectivity to more optimal habitats upstream and downstream of the LSSE site, and is an example of a UKBAP Priority habitat (rivers and streams), but the section of river within 500m of the site is of little value in itself. These potential habitats are therefore considered to be of less than local importance for nature conservation.

2.3.3.2 Surveys

As part of the GRIP4 design development and assessment processes, ecology surveys have been undertaken in October 2009, with further surveys undertaken in 2011, including:
- Extended Phase 1 habitat survey;
- Bat habitat assessment;
- Breeding birds habitat assessment;
- An otter survey; and
- Inspection of bridge structures, activity and static recording surveys for signs of bats.

2.3.3.3 Protected Species

The protected species surveys undertaken at and subsequent to GRIP4 indicate:
- Bats: There is only low to moderate potential for roosting bats at the GRIP4 LSSE site. In both the GRIP4 and subsequent bat surveys, no sign of roosting activity was found during daytime inspections with limited foraging taking place after dusk to the south of the viaduct (common pipistrelle, *Pipistrellus pipistrellus*) near Dark Neville Street.
- **Breeding Birds**: The habitat assessments indicated very limited nesting opportunities within the LSSE GRIP4 footprint or within the zone of influence of works for birds.

- **Otters**: Although evidence from 2008 Environment Agency surveys indicated otter activity north and south of the station, the 2009 surveys noted that the section of the River Aire in the vicinity of LSSE offers no resting sites for otters, with no evidence of otter holts or other signs of otters in this area. The initial findings of the 2011 otter surveys suggest otters travel through the proposed LSSE area between more optimal habits elsewhere on the River Aire.

An artificial otter holt was installed as part of the ISIS redevelopment of the Granary Wharf site, and it is located on the western river bank immediately south of the ISIS Footbridge and adjacent to the Watermans’ Place building as shown in Figure 2.16 below.

Figure 2.16: Artificial Otter Holt - River Aire Western Bank (Adjacent to Waterman Place)

![Approximate location of artificial Otter Holt](source: Mott MacDonald)

### 2.3.3.4 Scheme Location Options Impacts

Reviews and assessments of the GRIP4 design suggests that the scheme could have effects on species that use bridges and rivers as habitat, namely breeding birds, bats and otters. Bats and otters are known to use the River Aire and breeding birds including kingfisher have been anecdotally recorded.

The expected impacts of works for the options at the different GRIP design stages may include:

- Noise and vibration due to construction works on bridge structures, construction traffic and site staff movements, causing disturbance to any nesting birds and foraging bats;
- Dust deposition on any vegetation leading to loss of food sources and of nesting habitats;
- Temporary land take;
- Temporary drainage; and
Specific impacts of works involving the western and eastern banks of the River Aire and working over the river on ecological receptors are likely to include:

- Minor vegetation removal and subsequent habitat loss for birds and bats as part of the site clearance prior to commencement of works (limited to vegetation growing out of walls);
- Accidental pollution of running water which could affect otters using the River Aire at the construction site and at the proposed loading/unloading area at Water Lane.

During the operational phase of the scheme, the impacts affecting specific ecological receptors are likely to include:

- Increased human activity and lighting and associated disturbance;
- Increased human activity and lighting and associated disturbance around the Dark Arches where bats forage, and where breeding birds and otters may be present; and
- Permanent modification of riverine habitats.

### 2.4 Promoters’ Objectives

Over the life of this project, the scheme’s objectives have evolved most notably at the end of the GRIP4 when the Major Scheme Business Case was prepared and funding sought from the Department for Transport. The scheme objectives at various stages are listed below.

#### 2.4.1 General Design Requirements at GRIP1 (Circa September 2006)

The following scheme objectives were derived as the basis for initial concept for LSSE:

- The entrance should provide a safe secure passage for pedestrians and should not compromise the overall security of Leeds City station.
- It should offer sufficient space to enable the installation of the infrastructure required, such as, ticket barriers, staircase landing, lift, etc.
- It should also offer sufficient space for the free flow of pedestrians. The pedestrian volume that would use this entrance is projected to be 12,000 people per day.
- The entrance should be fully compliant to provide disabled access in accordance with the Disability Discrimination Act 1995, the SRA Code of Practice and BS 8300:2001.
- The entrance should be well lit so as to prevent vandalism and encourage more people to use it.
- The projected usage of the southern entrance requires the provision of 10 ticket barriers.
- Automated ticket machines should be provided to complement a staff manned ticket office. This would ease the flow of pedestrians through the entrance and would also enable it to be operated unmanned when required.

#### 2.4.2 Promoter’s Project Objectives at GRIP4 (April 2009)

The following scheme objectives were derived as the basis for the single option (preferred) preliminary design at GRIP4. They are a refinement of the earlier GRIP options and respond to the emerging scheme concept and stakeholder liaison:

- To minimise pedestrian journey times accessing Leeds Station to/from the south;
- To develop a new southern entrance to Leeds station in line with the Railway Standards;
- To meet existing and future passenger flow requirements to the south of Leeds Station;
- To develop a DDA compliant entrance;
- To provide gating / security arrangement to the new entrance;
2.4.3 Promoter's Project Objectives Post GRIP4 (November 2009)

The following scheme objectives were derived as part of the major scheme business case application for funding. They are the current scheme objectives.

- To improve access to Leeds by sustainable means;
- Maximise growth of the Leeds economy by enhancing its competitive position and facilitating future employment and population growth;
- Support and facilitate the sustainable growth of Leeds, in particular to the South, recognising the importance of its city centre to the future economy of the Leeds City Region;
- To minimise journey times accessing Leeds Station to/from the south;
- To meet existing and future passenger flow requirements to the south of Leeds Station; and
- To ensure the current passenger flows within the station are maintained or improved.

2.5 Scheme Approvals Chronology

The LSSE scheme came about as a result of pedestrian flow studies (undertaken in 2006 on behalf of Network Rail) which identified that the area south of Leeds City Station was a key pedestrian trip generator. The analysis also forecast that passenger demand to the south of the station would increase as a result of developments such as Holbeck Urban Village. Following this Network Rail initiated the LSSE scheme and the GRIP (Governance to Railway Investment Projects) process to investigate the location, form and function of a new southern entrance to Leeds City Station. The chronology of major studies and approvals is set out below:

- GRIP1 (Output definition) undertaken by Corus and concluded in September 2006;
- GRIP2 (Pre-feasibility) Undertaken by Corus and concluded in April 2007;
- GRIP3 (Option selection) Undertaken by Corus and concluded in October 2007;
- GRIP4 (Single option development) Undertaken by AECOM and Bauman Lyons Architects Ltd and concluded in April 2009;
- LSSE major scheme business case (based on the GRIP4 scheme) was promoted by Metro and submitted to the DfT in November 2009;
- Programme Entry Approval (funding) granted by DfT for the GRIP4 scheme in March 10;
- Planning permission granted by Leeds City Council for the GRIP4 scheme in May 2010;
- Revised LSSE application for funding to DfT (as part of the Comprehensive Spending Review) in Summer 2010 and funding approval granted in December 2010.

Metro and Network Rail have supplied Mott MacDonald with various reports, drawings and documents (produced by other parties) in connection with the above GRIPs and applications for funding approval. A list of key documents has been included in Appendix A.
3. Appraisal Framework

3.1 Categories and Scoring Assessment

To demonstrate that all options, throughout the GRIPs have been considered objectively, they have been appraised in accordance with the Department for Transport’s Transport Analysis Guidance (TAG) using the New Approach to Transport Appraisal (NATA) methodology. The guidance provides a framework for assessing schemes against the Government’s objectives for transport namely:

- Environment;
- Safety;
- Economy;
- Accessibility; and
- Integration.

The above objectives (assessment criteria) have been included in an Appraisal Summary Table (AST) which allows all options to be compared against each other on a consistent basis. In addition to the Government’s Transport Objectives we have added Deliverability, Acceptability and fit with the Promoter’s Objectives.

The ASTs for GRIP1 and GRIP2 were high level and only considered objectives based on the information available at the time of these studies. They were completed to a level of detail commensurate with the concept nature of the options development. However at GRIP3 more detailed investigations had taken place and therefore the options were scored against the main categories and associated sub categories as a result of more information available at the time. All categories in the AST are described below with an explanation of how the options were assessed. An example of the AST including the categories used is shown below in Table 3.1.

The options at all GRIPs are presented later in this Chapter which includes a description of the option, a schematic, key considerations and a table of their associated advantages and disadvantages. At the end of each GRIP, an AST for that GRIP is provided and this indicates whether an option was promoted or rejected.

Table 3.1: Example AST

<table>
<thead>
<tr>
<th>Accessibility</th>
<th>Safety</th>
<th>Economy</th>
<th>Environment</th>
<th>Integration</th>
<th>Acceptability</th>
<th>Deliverability</th>
<th>Promoters Objectives</th>
<th>Promoted / Rejected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source: Mott MacDonald</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All options have been appraised against the above categories, and if sufficient information was available, they were also scored against the sub-categories using the following matrix.
The Leeds Railway Station (Southern Entrance) Order  
Scheme Location and Design Rationale

Scoring matrix

| Adverse | Slight Adverse | Neutral | Slight Benefit | Benefit |

It should be noted that the scoring matrix is a comparative scale used to differentiate options and does not necessarily imply detrimental impacts.

3.2 Accessibility

This NATA objective is to improve access to facilities for those without private transport and to reduce severance. Improving access to the LSSE has been considered by means of a high level and subjective review of points of access including the following:

- Pedestrian and cycle links to the station entrance;
- Non discriminatory access including Disability Discrimination Act compliance;
- Meeting existing and future passenger flow requirements;
- Minimises pedestrian journey times to/from the south of the city; and
- Maximise patronage based on available pedestrian model outputs and catchment areas.

Severance is considered to be the degree to which transport interventions increase separation between communities or more locally. It is both a physical and visual/perceived separation and may be considered under the following headings:

- Pedestrians can readily access the entrance without having to overcome barriers; and
- Does not create visual barriers to adjacent receptors.

3.3 Safety

This NATA objective is to reduce the loss of life, injuries and damage resulting from collisions and associated crime. It is also concerned with personal security through both design and the location of facilities. The measures for this objective are:

- To reduce accidents – ensure that pedestrians are not exposed to conflicts or potential hazards; and
- To improve security – this can be assessed through consideration of location facilities and passive surveillance.

3.4 Economy

This NATA objective is to support sustainable economic activity and delivery of value for money, namely:

- The scheme costs produced should be treated with a degree of caution and used only to compare options within a particular GRIP. They should not be assumed to be a total capital or outturn cost of the works for the following reasons:
  - Different parties have produced capital costs at GRIPs 2, 3 and 4 and the costs between GRIPs should not be compared as we are not certain that they were produced on a like for like basis, and they have different base years;
  - Full cost build ups have not been available to Mott MacDonald and we are therefore uncertain as to whether all of the works, design costs, and preliminaries are included.
- Additional details from Steer Davie Gleave (SDG) produced at GRIP3 have been incorporated into the AST, including details of journey times and the Benefit Cost Ratio (BCR)
- Disruption to the operation of the train station during construction or as a permanent feature;
- Improve reliability (ease congestion);
- Improve economic efficiency for business and commuter users; and
- Provide beneficial wider economic impacts.

### 3.5 Environment

This NATA objective is to protect and enhance the built and natural environment. It includes direct and indirect impacts from the station entrance and while some can be quantified, others are more difficult to define. At the early stages of the options development it was not possible to assess certain measures; however all of the environment objectives are listed below for reference:

- **To reduce noise**: A qualitative view can be provided at this stage; a quantitative view will be provided;
- **To protect and enhance the townscape**: A high level qualitative assessment can be taken at this stage on issues such as urban character, quality of areas, tree planting, green space, public open space and recreational amenity. A formal Landscape and Visual Impact Assessment will be considered in the Environmental Statement for the preferred option only;
- **To protect and enhance the landscape**: Due to the urban nature of the scheme, landscape has been scoped of this option appraisal and the appraisal will focus on townscape only. This approach is consistent with the scope of the EIA.
- **To protect heritage of historic resources**: A high level qualitative assessment can be taken at this stage;
- **To support biodiversity**: A high level qualitative assessment can be taken at this stage;
- **To protect the water environment**: A high level qualitative assessment can be taken at this stage;
- **To encourage physical fitness**: In terms of physical fitness it is assumed that all options would "score" the same since the objective of the scheme is to promote walking/cycling and has therefore been scoped out of this appraisal;
- **To improve journey ambience**: A qualitative assessment may be made at this stage on issues such as visual continuity and entrance identity.
- **To improve air quality and to reduce greenhouse gases**: Local air quality and greenhouse gases objectives have been scoped out of this option appraisal as the scheme is for a pedestrian entrance and therefore the effect on local traffic is anticipated to be minimal and not relevant when comparing options. Air quality and greenhouse gases during construction and operation will also be considered for the preferred option in the EIA, however there are not anticipated to be any significant effects.

It is assumed that for all options considered in this appraisal, best practice methods and appropriate mitigation will be applied.

In terms of the environment, the comparison of options has focussed on the option versus a baseline "Do Nothing" option, however reference to comparisons between options has also been considered where appropriate.

In terms of the environment, the comparison of options has focussed on qualitative information and professional judgement rather than quantitative information.

### 3.6 Integration

This NATA objective is to ensure that the scheme takes cognisance of the government’s integrated transport policy, more specifically:

- Transport interchange – improving modal interchange at Leeds City Station; and
Land use policy – any designs should be appropriate for future local, regional and national land use policies i.e. how well would the proposed entrance serve the surrounding land uses.

3.7 Other Criteria

In addition to the Government’s core objectives for transport appraisal above, the guidance for the appraisal process also recommends the consideration of supporting analyses for practicality (deliverability), public acceptability and scheme objectives.

3.7.1 Deliverability

This supporting appraisal area considers the procurement, monitoring and delivery issues for the scheme, generally covering project governance and risk considerations; ensuring that the scheme takes cognisance of how it will be implemented and delivered, specifically:

- Disruption during construction;
- Consents required;
- Risks associated with obtaining approvals & powers to deliver the scheme;
- Programme risks and how they will be managed; and
- Scheme outturn cost risks and their management.

3.7.2 Acceptability

The acceptability of the scheme to the public, stakeholders and politically requires careful consideration and management. In addition to engagement with key stakeholders and consultation with the general public, the appraisal should also consider the degree of strategic and local government support for the scheme. It is likely to include high level consideration of:

- Alignment of the scheme objectives and outcomes against the policy context, the national, regional and local area objectives and aspirations (strategic fit);
- Testing of acceptability of the solution through consultation with stakeholders and the public;
- Impacts on third parties (such as property acquisition); and
- Disruption during construction and likely mitigation measures;

3.7.3 Promoters Objectives

The ASTs also consider how the options at each GRIP meet the Promoters Objectives relevant at that specific GRIP of the scheme development. The Promoter Objectives are outlined in Section 2.4, relate to the initial GRIP1 design requirements (Network Rail) and the GRIP4 and post-GRIP4 objectives (Network Rail & Metro). These generally include:

- A safe and secure passenger environment;
- Fully compliant with disabled passenger access requirements;
- Minimisation of passenger journey times from south Leeds; and
- Meeting current and future passenger flows in the station
4. GRIP1 Options Appraisal

This section describes, appraises and provides commentary on the scheme options considered at GRIP1. A schematic flow chart summarising the options and contemporaneous decision making is contained in Appendix B.

4.1 Options Overview

The options rejected or progressed from GRIP1 and key associated issues are shown on the schematic flow chart contained in Appendix B.

Corus was commissioned by Network Rail to undertake a GRIP1 feasibility study which was reported in September 2006. The study considered eight options at five different locations, namely:

- **River Aire (Granary Wharf area)**
  - Option 1 – Western bank of the River Aire connecting to the Western Footbridge;
  - Option 2 – Western bank of the River Aire connecting to Platform 16;
  - Option 3 – Eastern bank of the River Aire on Little Neville Street, connecting to Platform 16;

- **Sovereign Place (Sovereign Street)**
  - Option 4 – connecting to Platform 16;
  - Option 5 – New pedestrian concourse utilising existing station under-croft, and punching up through onto Platform 8;

- **Victoria Bridge (Granary Wharf area)**
  - Option 6 – An elevated walkway which ties into the Western Footbridge in the station and Victoria Bridge at the Junction of Neville Street with Water Lane;

- **Dark Arches/ station under-croft (Granary Wharf area)**
  - Option 7 – Reopening of former subways providing access to Platforms 9, 11, 12, 13, and 15; and

- **Granary Wharf (Granary Wharf area)**
  - Option 8 – An extension to Platform 17, with access just off Granary Wharf area.
4.2 Option Commentary

4.2.1 Option 1 - River Aire Western Footbridge

This option would widen the existing station Western Footbridge (over platforms 15 and 16), construct a cantilevered high level footway above the River Aire and lifts, stairs and escalators on the west bank of the river to provide a pedestrian link to the Granary Wharf area. The design utilises the existing viaduct piers in the riverbed to support the entrance structure along with new foundations on the west bank of the river.

Figure 1: GRIP1 – Option 1 (Extract from Drawing B30384-001)

Source: GRIP1 Report (Corus, September 2006)

Key Considerations
- This option directly serves a significant proportion of the pedestrian demand from Bridgewater Place, Granary Wharf and the Holbeck Urban Village area; therefore it should provide greatly reduced passenger walking times to and from the station. It also serves areas east of Neville Street via the ISIS Footbridge, and Little Neville Street although journey time savings may be marginal from this location.
- Post GRIP1 issues to note:
  - Network Rail has advised (at GRIP3) that the station support structure is unlikely to be able to accommodate additional loading and therefore LSSE should be largely structurally independent. This would preclude this option although the constraint was not known at the time.
The area for lifts, stairs and escalators on the west bank of the river is no longer available as it has been redeveloped (post GRIP1) to accommodate Waterman’s Place. This would preclude this option although the constraint was not known at the time.

Table 4.1: GRIP1 – Option 1 Review

<table>
<thead>
<tr>
<th>Category</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian Provision</td>
<td>Direct pedestrian access from the west bank of the River Aire and Granary Wharf.</td>
<td>Indirect pedestrian access to the east bank of the River Aire via Dark Neville Street and the ISIS Footbridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indirect pedestrian access to the Sovereign Street area (east of Neville)</td>
</tr>
<tr>
<td>Step Free Access</td>
<td>Step free access provided from the West Bank of the River Aire</td>
<td>Step free access to the east bank of the River Aire is via Dark Neville Street. Routes across the ISIS Footbridge also provide step free access (this was not confirmed by developers at the time).</td>
</tr>
<tr>
<td>Access / Egress</td>
<td>Direct access on to the station western footbridge providing direct access to most station platforms</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td></td>
<td>Structural loading issues on station under-croft to be investigated</td>
</tr>
<tr>
<td>Architectural</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Environmental</td>
<td></td>
<td>Interface with flood risk levels on western river bank to be investigated</td>
</tr>
<tr>
<td>Operational</td>
<td>Significant journey time savings from Bridgewater Place, Granary Wharf and Holbeck Urban Village</td>
<td>Only marginal journey time savings from east of Neville Street compared to a route via the Rotunda Steps or Swinegate</td>
</tr>
<tr>
<td>Construction</td>
<td>Opportunity to minimise construction in the river through re-use of existing piers to provide support for cantilevered structure</td>
<td>Works over the river</td>
</tr>
<tr>
<td>Urban Design &amp; Regeneration</td>
<td>Opportunity to create a prominent landmark structure</td>
<td></td>
</tr>
<tr>
<td>Third Party Impacts</td>
<td></td>
<td>Would require consultation with developers on western river bank of the river to avoid design conflicts</td>
</tr>
<tr>
<td>Traffic and Servicing</td>
<td>Does not appear to conflict with vehicular access routes</td>
<td>Would require consultation and agreement with the Environment Agency regarding the concourse extension over the River Aire Access control measures would be required at Granary Wharf to help prevent vehicular drop off resulting in congestion and impact some third party businesses</td>
</tr>
<tr>
<td>Comparative Capital Costs</td>
<td></td>
<td>Not assessed</td>
</tr>
</tbody>
</table>
4.2.2 Option 2 – River Aire Platforms 16/17

This option provides the same point of access into the Granary Wharf area as Option 1, but ties in to the station at platform level (Platform 16) rather than the Western Footbridge level. The level differences would be overcome by means of lifts, stairs and escalators located on the western river bank. The expanded concourse near Platform 16 and 17 would accommodate the new entrance and this would require the extension of Platform 17 westwards to maintain current operational length. The design utilises the existing viaduct piers in the riverbed to support the entrance structure along with new foundations on the west bank of the river.

Figure 4.2: GRIP1 – Option 2 (Extract from Drawing B30384-002)

Key Considerations

- This option directly serves a significant proportion of the pedestrian demand from Bridgewater Place, Granary Wharf and the Holbeck Urban Village area; therefore it should provide greatly reduced passenger walking times to and from the station. It also serves areas east of Neville Street via the ISIS Footbridge, and Little Neville Street although journey time savings may be marginal from this location.

- This option ties into Platform 16 and 17 and locally widens the platform concourse. However, given the stair and lift arrangement from Platform 16 to the Western Footbridge, this may still result in passenger congestion and safety issues at platform level. Passenger conflicts may result from crowding at the bottom of the escalator and stairs (which can be the case today) being exacerbated by additional flows from the Western Footbridge (to get to LSSE) and other flows from Platforms 16 and 17 towards LSSE.
Pedestrian flow modelling would be required to confirm whether the layout offered satisfactory levels of capacity and safety.

- Post GRIP1 issues to note:
  - Network Rail has advised (at GRIP3) that the station support structure is unlikely to be able to accommodate additional loading and therefore LSSE should be largely structurally independent. This would preclude this option although the constraint was not known at the time.
  - The area for lifts, stairs and escalators on the west bank of the river is no longer available as it has been redeveloped (post GRIP1) to accommodate Waterman’s Place. This would preclude this option although the constraint was not known at the time.

<table>
<thead>
<tr>
<th>Category</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian Provision</td>
<td>Direct pedestrian access from the west bank of the River Aire and Granary Wharf.</td>
<td>Indirect pedestrian access to the east bank of the River Aire via Dark Neville Street and ISIS Footbridge. Indirect pedestrian access to the Sovereign Street area (east of Neville)</td>
</tr>
<tr>
<td>Step Free Access</td>
<td>Step free access provided from the West Bank of the River Aire</td>
<td>Step free access to the east bank of the River Aire is via Dark Neville Street. Routes across the ISIS Footbridge also provide step free access (this was not confirmed by developers at the time).</td>
</tr>
<tr>
<td>Access / Egress</td>
<td>Indirect access to the station western footbridge and all station platforms</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td></td>
<td>Structural loading issues on station under-croft to be investigated</td>
</tr>
<tr>
<td>Architectural</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Environmental</td>
<td></td>
<td>Interface with flood risk levels on western river bank to be investigated</td>
</tr>
<tr>
<td>Operational</td>
<td>Moderate (reduced due to likely passenger conflicts on platform 16 and 17) journey time savings from Bridgewater Place, Granary Wharf and Holbeck Urban Village</td>
<td>Only marginal journey time savings from east of Neville Street compared to a route via the Rotunda Steps Platform 17 needs to be extended to maintain its operational length Potential passenger crowding and safety issues at the interface between LSSE and Platform 16/17. This may delay passengers at certain times, reducing journey time benefits</td>
</tr>
<tr>
<td>Construction</td>
<td>Opportunity to minimise construction in the river through re-use of existing piers to provide support for cantilevered structure</td>
<td>Works over the river</td>
</tr>
<tr>
<td>Urban Design &amp; Regeneration</td>
<td></td>
<td>Reduced height (compared to Option 1) would result in a lower profile &amp; less prominent structure</td>
</tr>
<tr>
<td>Third Party Impact</td>
<td></td>
<td>Requires consultation with developers on eastern river bank of the river to avoid design conflicts</td>
</tr>
<tr>
<td>Traffic and Servicing</td>
<td>Does not appear to conflict with vehicular access routes</td>
<td>Would require consultation and agreement with the Environment Agency regarding the concourse extension over the River Aire Access control measures would be required at Granary Wharf to help prevent vehicular drop off resulting in congestion &amp; third party impacts.</td>
</tr>
<tr>
<td>Comparative Capital Costs</td>
<td></td>
<td>Not assessed</td>
</tr>
</tbody>
</table>
4.2.3 **Option 3 – River Aire near Little Neville Street**

This option provides a pedestrian link from the Western Footbridge of the station to Little Neville Street, located to the rear of the ‘Blue Apartment’ Building and Hilton Hotel. Access would be provided by staircase/escalator and lift, and a ticket office facility could be provided within the arches at ground level.

**Key Considerations**

- This option directly serves significant pedestrian demand from Bridgewater Place, Granary Wharf and the Holbeck Urban Village area. Therefore it would provide greatly reduced passenger walking times for most passengers to and from the station. However, the facility only indirectly serves the minority of pedestrian demand to the east of Neville Street. These users would experience only marginal journey time savings and they may wish to use the alternative route via the Rotunda steps or Swinegate in certain circumstances.

- This location would affect the servicing and access arrangements to the ‘Blue Apartment’ Building and the Hilton Hotel and would require consultation and agreement of any alternate provision.

- The out of the way location which would not be visible from the surrounding areas and therefore does not provide an opportunity for a prominent structure; potentially reducing its usage and value. Furthermore, the secluded location would provide only relatively poor passive surveillance and this may discourage some users.

---

Source: GRIP1 Report (Corus, September 2006)
The restricted building footprint, particularly the width would impose passenger capacity constraints

Post GRIP1 issues to note:
- Network Rail has advised (at GRIP3) that the station support structure is unlikely to be able to accommodate additional loading and therefore LSSE should be largely structurally independent. This would preclude this option although the constraint was not known at the time.

Table 4.3: GRIP1 – Option 3 Review

<table>
<thead>
<tr>
<th>Category</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian Provision</td>
<td>Direct pedestrian access from east bank of the River Aire</td>
<td>Indirect pedestrian access to the west bank of the River Aire via Dark Neville Street or the ISIS Footbridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indirect pedestrian access to the Sovereign Street area (east of Neville Street)</td>
</tr>
<tr>
<td>Step Free Access</td>
<td>Step free access provided from the east bank of the River Aire</td>
<td>Step free access to the west bank of the River Aire is via Dark Neville Street. Routes across the ISIS Footbridge also provide step free access (this was not confirmed by developers at the time).</td>
</tr>
<tr>
<td>Access / Egress</td>
<td>Direct access on to the station Western Footbridge providing direct access to most platforms</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td></td>
<td>Structural loading issues on the station under-croft to be investigated</td>
</tr>
<tr>
<td>Architectural</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Environmental</td>
<td></td>
<td>Interface with flood risk levels on eastern river bank to be investigated</td>
</tr>
<tr>
<td>Operational</td>
<td>Significant journey time savings from Bridgewater Place, Granary Wharf and the Holbeck Urban Village area; although for the latter two these are not maximised as the facility does not directly serve the western bank of the river</td>
<td>Only moderate to marginal journey time savings from the east of Neville Street compared with a route via the Rotunda steps or Swinegate. The secluded nature of the site may give rise to passive security issues, and potential users being less aware of routes to LSSE</td>
</tr>
<tr>
<td>Construction</td>
<td>Minimises works over the river</td>
<td>Extremely constrained site; construction would be very difficult (or perhaps not feasible) if a tower crane could not be located within or adjacent to the LSSE building. This would need to be confirmed in consultation with a crane provider and may require 3D modelling to prove its feasibility.</td>
</tr>
<tr>
<td>Urban Design &amp; Regeneration</td>
<td>Provides the opportunity to create a high quality pedestrian space with retail opportunities</td>
<td>The building would not be prominent and does not provide an opportunity for a landmark structure</td>
</tr>
<tr>
<td>Third Party Impact</td>
<td></td>
<td>This option would affect the servicing and access arrangements to the ‘Blue Apartment’ Building and the Hilton Hotel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New entrance in close proximity to Blue Apartments Building potentially requiring mitigation for maintenance requirements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Would require consultation and agreement with the EA for flood levels and works over the river</td>
</tr>
<tr>
<td>Traffic and Servicing</td>
<td></td>
<td>May require street closure at the railway viaduct Provision of a turning head (if required) on Little Neville Street may be problematic</td>
</tr>
<tr>
<td>Comparative Capital Costs</td>
<td></td>
<td>Not assessed</td>
</tr>
</tbody>
</table>
4.2.4 **Option 4 – Sovereign Street**

This option provides direct access to Platform 16 from Sovereign Place and would be attached to the south face of the railway viaduct. A variant included the provision of a tower staircase with the option of an integral lift with the viaduct arches used to provide space for access points and ticket sales and barrier locations.

Figure 4.4: GRIP1 – Option 4 (Extract from Drawing B30384-004)

Source: GRIP1 Report (Corus, September 2006)

**Key Considerations**

- This option directly serves the minority of the pedestrian demand east of Neville Street and Bridgewater Place. It would provide significantly reduced passenger walking times for many passengers to and from the station. However, the facility only indirectly serves a key area of pedestrian demand which it is understood would come from Granary Wharf and Holbeck Urban Village.

- There are likely to be only marginal journey time savings for users from Granary Wharf area, and given likely delays crossing the busy Neville Street, some users may choose to route via the Rotunda Steps rather than LSSE. Provision of a signal controlled pedestrian crossing with extensive on demand priority and green man time would disrupt the loop traffic flows on Neville Street and reduce highway capacity.
The restricted building footprint, particularly the width would impose passenger capacity constraints. This may result in safety issues at escalator landings and pedestrian flow modelling would be required to confirm its capacity and acceptability.

This option ties into Platform 16; however, given the stair and lift arrangement and width of Platform 16 at this location, this may result in passenger congestion and safety issues at platform level. Passenger conflicts would be a consequence of crowding at the bottom of the stairs being exacerbated by additional flows from the Eastern Footbridge (to get to LSSE) and other flows from Platforms 16 towards LSSE. Pedestrian flow modelling would be required to confirm whether the layout offered satisfactory levels of capacity and safety. However, it appears possible to modify this option to connect at a higher level to the Eastern Footbridge or modified Barrow Way – see GRIP2 Option 4A.

The enclosed location would not be generally visible from the surrounding areas and therefore does not provide an opportunity for a prominent structure; although there is some opportunity for large signage on the Neville Street elevation of the building.

The majority of train stopping points and platforms are at the western end of the station. Therefore an LSSE location at the east end of the station would not provide as direct a route to and from trains, nor the journey time savings which would accrue for a location west of Neville Street.
<table>
<thead>
<tr>
<th>Category</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian Provision</td>
<td>Direct pedestrian access to the Sovereign Street area (east of Neville Street)</td>
<td>Indirect pedestrian access from Granary Wharf area including a requirement to cross Neville Street which is a busy and important highway carrying the Leeds inner loop traffic.</td>
</tr>
<tr>
<td>Step Free Access</td>
<td>Step free access provided from all key areas</td>
<td>Step free access from the west bank of the River Aire is via Dark Neville Street. Routes across the ISIS Footbridge also provide step free access (this was not confirmed by developers at the time).</td>
</tr>
<tr>
<td>Access / Egress</td>
<td>Indirect access to the station eastern footbridge and all station platforms</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Architectural</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Environmental</td>
<td>Does not require works in proximity to the River Aire or within a Conservation Area</td>
<td></td>
</tr>
<tr>
<td>Operational</td>
<td>Significant journey time savings from the east side of Neville Street and likely to be marginal from Bridgewater Place.</td>
<td>Only marginal journey time savings for a significant proportion of users which are from Granary Wharf area, compared with a route via the Rotunda steps. The majority of train stopping points and platforms are at the west end of the station so less well served by LSSE in this location. The relatively secluded nature of the site may give rise to passive security issues.</td>
</tr>
<tr>
<td>Construction</td>
<td>Does not require works over a river</td>
<td>There are a number of railway Location Cases at the east end of the station and these may need to be relocated which may disruption operations at the station.</td>
</tr>
<tr>
<td>Urban Design &amp; Regeneration</td>
<td>Provides the opportunity to create a high quality pedestrian space with retail opportunities. Integrates well with proposed Sovereign Street development proposals and may serve as a catalyst for this</td>
<td>The building would not be prominent and does not provide an opportunity for a landmark structure</td>
</tr>
<tr>
<td>Third Party Impact</td>
<td></td>
<td>Potential loss of retail units within the arches and loss of part of the development site.</td>
</tr>
<tr>
<td>Traffic and Servicing</td>
<td>Does not appear to be in conflict with servicing arrangements for businesses</td>
<td></td>
</tr>
<tr>
<td>Comparative Capital Costs</td>
<td></td>
<td>Not assessed</td>
</tr>
</tbody>
</table>
4.2.5 Option 5 – Subway/Under-croft at Platform 8

This option would provide a link from Sovereign Place, to beneath the station structure (currently used as an underground car park) where lifts and escalators would be provided up through the under-croft structure and onto Platform 8. This would involve the creation of a concourse within the station under-croft along the alignment of Pitt Row to connect the entrance building with the access to Platform 8.

Figure 4.5: GRIP1 – Option 5 (Extract from Drawing B30384-005)

Key Considerations

- This option directly serves the pedestrian demand east of Neville Street and Bridgewater Place. It would provide significantly reduced passenger walking times for some passengers to and from the station. However, the facility only indirectly serves a significant proportion of pedestrian demand which it is understood would come from Granary Wharf and Holbeck Urban Village.

- There are likely to be only marginal journey time savings for users from Granary Wharf area, and given likely delays crossing the busy Neville Street, some users may choose to route via the Rotunda Steps rather than LSSE. Provision of a signal controlled pedestrian crossing with extensive on demand priority and green man time would disrupt the loop traffic flows on Neville Street and reduce highway capacity.

- This option would access directly onto Platform 8; however, given the requisite new stair and lift arrangement and width of Platform 8, this is likely to result in passenger congestion and safety issues at platform level. Passenger conflicts would be a consequence of crowding around the top of the
escalators and stairs, on what is one of the busiest platforms in the station. Pedestrian flow modelling would be required to confirm whether the layout offered satisfactory levels of capacity and safety.

- The out of the way location which would not be generally visible from the surrounding areas and therefore does not provide an opportunity for a prominent structure. Furthermore users who are not familiar with LSSE are less likely to be aware of its location and benefits, thereby reducing its value.

- The secluded environs of the new entrance on Sovereign Place would provide poor passive surveillance and this may raise security issues and discourage potential users, especially at night.

- The majority of train stopping points and platforms are at the western end of the station. Therefore an LSSE location at the east end of the station would not provide as direct a route to and from trains, nor the journey time savings which would accrue for a location west of Neville Street.

- The parking provision within the under-croft would be reduced or removed and the new pedestrian link concourse is likely to cause severance of areas of parking requiring alternative vehicular accesses to be provided.

- An investigation would be needed to ascertain what works would be required to create a pedestrian concourse within the under-croft including issues such as: surfacing, lighting, signage, interface with vehicles and control measures such as blocking off side passages.
Table 4.5: GRIP1 – Option 5 Review

<table>
<thead>
<tr>
<th>Category</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian Provision</td>
<td>Direct pedestrian access to the Sovereign Street area (east of Neville Street)</td>
<td>Indirect pedestrian access from Granary Wharf area including a requirement to cross Neville Street which is a busy and important highway carrying the Leeds inner loop traffic.</td>
</tr>
<tr>
<td>Step Free Access</td>
<td>Step free access provided from all key areas</td>
<td>Requires new lift structures to provide step free access</td>
</tr>
<tr>
<td>Access / Egress</td>
<td>Indirect access to the station eastern footbridge and all station platforms</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Architectural</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Environmental</td>
<td>Relatively poor pedestrian environment within the under-croft structure. There may be issues with car fumes and human health requiring additional ventilation</td>
<td></td>
</tr>
<tr>
<td>Operational</td>
<td>Significant journey time savings from the east side of Neville Street and Bridgewater Place.</td>
<td>Only marginal journey time savings for many users which are from Granary Wharf area, compared with a route via the Rotunda steps. The majority of train stopping points and platforms are at the west end of the station so less well served by LSSE in this location. The secluded nature of the site may give rise to passive security issues; this includes the safety of station staff operating the ticket barrier in a remote location.</td>
</tr>
<tr>
<td>Construction</td>
<td>Does not require works over a river</td>
<td></td>
</tr>
<tr>
<td>Urban Design &amp; Regeneration</td>
<td>Good integration with Sovereign Street business locations</td>
<td>Unlikely to be able to provide a prominent or landmark structure</td>
</tr>
<tr>
<td>Third Party Impact</td>
<td>Potential closure and relocation of retail premises on Sovereign Place, requiring consultation with Spacia and businesses.</td>
<td>Loss of car park spaces</td>
</tr>
<tr>
<td>Traffic and Servicing</td>
<td>Does not appear to be in conflict with servicing arrangements for businesses</td>
<td></td>
</tr>
<tr>
<td>Comparative Capital Cost</td>
<td>Not assessed</td>
<td></td>
</tr>
</tbody>
</table>
4.2.6  Option 6 – Victoria Bridge Elevated Walkway

This option would involve the construction of a new elevated steel (or composite) footbridge extending from the existing station Western Footbridge over and along the River Aire to the road junction of Neville Street with Water Lane, at Victoria Bridge. The elevated walkway above the River Aire and Navigation is likely to be supported by inclined steel piers at intervals from either river bank.

Figure 4.6: GRIP1 – Option 6 (Extract from Drawing B30384-006)

Source: GRIP1 Report (Corus, September 2006)

Key Considerations

- If the elevated walkway is to land in the vicinity of Victoria Bridge (as shown on the plans) it would directly serve Bridgewater Place but would not directly serve Sovereign Place or Granary Wharf areas. Therefore journey time savings are not likely to be great and pedestrians from certain areas south of the station may prefer to use the existing route via the Rotunda steps or Swinegate to access the station.
- It is unclear how the level difference between the station Western Footbridge and Victoria Bridge would be overcome whilst providing a Disability Discrimination Act compliant route.
- It is unclear from the GRIP1 material whether the elevated walkway was intended to be covered or at least provide wind deflectors. If this is not the case it is likely to result in an exposed walking environment especially at height (adjacent to the station) and towards Water Lane where high winds have frequently been a safety issue. If the elevated walkway has side wind protection this would add to structural requirements and may result in greater visual impact.
- The proposals are within the Granary Wharf area Conservation Area and the proposed works would create a significant visual impact, including past residential buildings. It would also adversely affect the
setting of various listed buildings and may required physical work to the listed canal walls. This would increase the approvals and therefore scheme delivery risk.

- Due to the nature of the structure (i.e. an elevated steel walkway) the option was considered cost prohibitive;

Table 4.6: GRIP1 – Option 6 Review

<table>
<thead>
<tr>
<th>Category</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian Provision</td>
<td>Direct pedestrian access to Bridgewater Place</td>
<td>Indirect pedestrian access from Granary Wharf area and Sovereign Street including a requirement to cross Neville Street for the latter</td>
</tr>
<tr>
<td>Step Free Access</td>
<td>Step free access provided to indirect routes serving all key areas</td>
<td></td>
</tr>
<tr>
<td>Access / Egress</td>
<td>Access to the station Western Footbridge and all station platforms</td>
<td>Extensive support structures would be required on either side of the river and Navigation with unknown structural implications for river and canal walls</td>
</tr>
<tr>
<td>Engineering</td>
<td>None</td>
<td>Extensive support structures would be required on either side of the river and Navigation with unknown structural implications for river and canal walls</td>
</tr>
<tr>
<td>Architectural</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Environmental</td>
<td>Relatively poor pedestrian environment on the elevated walkway.</td>
<td>Relatively poor pedestrian environment on the elevated walkway. There may be ecological impacts on either river bank. Extensive visual intrusion within a Conservation Area resulting in a reduction in townscape value</td>
</tr>
<tr>
<td>Operational</td>
<td>Significant journey time savings from Bridgewater Place.</td>
<td>Only marginal journey time savings for the majority of users which are from the Granary Wharf and Sovereign Street areas compared with a route via the Rotunda steps or Swinegate. The secluded nature of the site may give rise to passive security issues; this includes the safety of station staff operating the ticket barrier in a remote location.</td>
</tr>
<tr>
<td>Construction</td>
<td>Extensive works over the river</td>
<td></td>
</tr>
<tr>
<td>Urban Design &amp; Regeneration</td>
<td>Large visual intrusion. Unlikely to support new development and regeneration</td>
<td></td>
</tr>
<tr>
<td>Third Party Impact</td>
<td>Visual intrusion to residential properties</td>
<td></td>
</tr>
<tr>
<td>Traffic and Servicing</td>
<td>Does not appear to be in conflict with servicing arrangements for businesses</td>
<td>The potential impact on traffic along the navigation would need to be investigated</td>
</tr>
<tr>
<td>Comparative Capital Costs</td>
<td>Not assessed</td>
<td></td>
</tr>
</tbody>
</table>
4.2.7  **Option 7 – Former Subway to Platforms 9, 11, 12, 13 and 15**

This option would reopen the former station subway at the western end of the station which was stopped up during the station redevelopment (Leeds First) completed in 2002. This option would provide direct access from Dark Neville Street via former subways and would involve re-establishing the former staircase entrances onto Platforms 9, 11, 12, 13 and 15.

**Figure 4.7: GRIP1 – Option 7 (Extract from Drawing B30384-007 – revised version)**

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**Key Considerations**

- This option directly serves the significant pedestrian demand from Bridgewater Place, Granary Wharf and Holbeck Urban Village. Therefore it would provide greatly reduced passenger walking times for most passengers to and from the station. However, the facility only indirectly serves pedestrian demand to the east of Neville Street. These users would experience only marginal journey time savings and they may wish to use the alternative route via the Rotunda steps or Swinegate in certain circumstances.

- Anecdotal evidence suggests that these subways were closed off due to unsociable and criminal activity taking place within them, and therefore measures would have to be put in place to prevent a reoccurrence of this type of activity. Furthermore, due to the enclosed nature of the subways, the option would not benefit from significant passive surveillance, particularly at night.
The subway would need to be extended from its current terminus at Platform 15 to Platform 16; the structural implications and feasibility of this would need to be investigated. It is likely that the works would result in significant disruption to train services during construction.

The previous staff access between Dark Neville Street and the station subway would not be adequate for passenger flows. Therefore a new access structure containing lifts, stairs and escalators would need to be constructed to provide a step free access route. This likely to require far-reaching works to maintain the structural integrity of the under-croft and the extent of these works are not known.

Conflicts between the subway stairs (as they come onto the platforms) and the stairs and escalators installed as part of the Leeds First project would need to be reviewed, as would extending the lift shafts to serve the subway level. It is unlikely that sufficient step free capacity could be provided (lifts and escalators) to the subway level without conflicting with the current stairs and escalators. Platform widths past the new stairs and escalators to the subway level are likely to be comprised and this may affect safety.

Works to install access to the subway level are likely to be expensive; and highly disruptive to passengers and the operation of the station.

Table 4.7: GRIP1 – Option 7 Review

<table>
<thead>
<tr>
<th>Category</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian Provision</td>
<td>Direct pedestrian access to both banks of the River Aire (via the Dark Neville Street Footbridge) and Granary Wharf.</td>
<td>Indirect pedestrian access to the Sovereign Street area (east of Neville)</td>
</tr>
<tr>
<td>Step Free Access</td>
<td>Step free access provided to all areas</td>
<td>Requires new lift structures to provide step free access</td>
</tr>
<tr>
<td>Access / Egress</td>
<td>Direct access to the station subway and most platforms</td>
<td>Possible extension of the subway to Platform 16 Structural implications of creating a large access box in the station under-croft should be investigated</td>
</tr>
<tr>
<td>Engineering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Architectural</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Environmental</td>
<td>Minimal impacts and visual intrusion</td>
<td></td>
</tr>
<tr>
<td>Operational</td>
<td>Significant journey time savings from Bridgewater Place, Granary Wharf and Holbeck Urban Village</td>
<td>Only marginal journey time savings from east of Neville Street compared to a route via the Rotunda Steps or Swinegate</td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td>Potential passenger crowding and safety issues at the interface between LSSE (subway access) and platform level. This may delay passengers at certain times, reducing journey time benefits</td>
</tr>
<tr>
<td>Urban Design &amp; Regeneration</td>
<td>No visual intrusion</td>
<td>No opportunity of an iconic landmark structure</td>
</tr>
<tr>
<td>Third Party Impact</td>
<td>Few permanent third party impacts</td>
<td>Loss of parking spaces within the under-croft</td>
</tr>
<tr>
<td>Traffic and Servicing</td>
<td>No effect on existing uses</td>
<td></td>
</tr>
<tr>
<td>Comparative Capital Costs</td>
<td></td>
<td>Not assessed</td>
</tr>
</tbody>
</table>
4.2.8 Option 8 – Granary Wharf area to Platform 17

This option proposed a large new station entrance near the Wharf Approach canal bridge. This would house lifts, stairs and escalators providing access at station level to a proposed walkway on the viaduct structure connecting to the end of Platform 17.

Figure 4.8: GRIP1 – Option 8 (Reconstructed image)

Key Considerations

- This option directly serves significant pedestrian demand from Granary Wharf and Holbeck Urban Village; therefore it should provide reduced passenger walking times to and from the station. However, given the distance from Neville Street it is unlikely to provide journey time benefits for the Bridgewater Place and Sovereign Street area and it is envisaged that these users would continue to use the route via the Rotunda steps and Swinegate.
- This option ties into the station Platform 17 which narrows locally past the escalators and lifts to the Western Footbridge. It is likely that this narrowing may present safety issues as a result of passenger congestion arising from significant pedestrian flows to and from LSSE. Pedestrian flow modelling would be required to confirm whether the layout offered satisfactory levels of capacity and safety.

REJECTED
The route for certain users from in the vicinity of the River Aire and Bridgewater Place is somewhat convoluted and journey time savings for some may be marginal. It is unlikely that journey time savings would be possible for users from east of Neville Street.

This option appears to block the two vehicular entrance/ exits to the station under-croft car parking in the vicinity of Wharf Approach. It may be that access was intended to be provided beneath part of the LSSE building. Loss of vehicular access to the under-croft car parking would be a significant third party impact and reduce revenue to Network Rail.

Table 4.8: GRIP1 – Option 8 Review

<table>
<thead>
<tr>
<th>Category</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian Provision</td>
<td>Direct pedestrian access from Granary Wharf.</td>
<td>Indirect pedestrian access to the east bank of the River Aire via Dark Neville Street and ISIS Footbridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indirect pedestrian access to the Sovereign Street area (east of Neville)</td>
</tr>
<tr>
<td>Step Free Access</td>
<td>Potential provision of lifts to provide step free access</td>
<td></td>
</tr>
<tr>
<td>Access / Egress</td>
<td>Indirect access to station Western Footbridge via platform 17</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>Relatively straight forward</td>
<td></td>
</tr>
<tr>
<td>Architectural</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Environmental</td>
<td>No works over the River Aire.</td>
<td>Relatively few impacts</td>
</tr>
<tr>
<td>Operational</td>
<td>Significant journey time savings from Granary Wharf and Holbeck Urban Village</td>
<td>There are unlikely to be any journey time savings from the east of Neville Street when compared to a route via the Rotunda Steps or Swinegate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Entrance location is beyond the extreme western end of station and introduces a long pedestrian route to access Platform 17 or the Western Footbridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Potential passenger crowding and safety issues at on Platform 17. This may delay passengers at certain times, reducing journey time benefits</td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td>Affects the emergency evacuation route access during construction and operation</td>
</tr>
<tr>
<td>Urban Design &amp; Regeneration</td>
<td>Opportunity to create a landmark structure</td>
<td></td>
</tr>
<tr>
<td>Third Party Impact</td>
<td></td>
<td>Potential loss of access for lessees of railway arches and loss of revenue for Network Rail</td>
</tr>
<tr>
<td>Traffic and Servicing</td>
<td>Vehicular access route from Wharf Approach to Granary Wharf unaffected</td>
<td></td>
</tr>
<tr>
<td>Comparative Capital Costs</td>
<td></td>
<td>Not assessed</td>
</tr>
</tbody>
</table>
4.3 GRIP1 Options Summary

At GRIP1, eight options were considered at five different locations, with a ninth hybrid option discussed at the GRIP1 workshop. The locations investigated included the vicinity of the River Aire, Sovereign Place, Victoria Bridge, the Dark Arches and Granary Wharf. From this study Option 1 with elements of Option 3 was progressed as a hybrid solution to GRIP stage 2. Option 4 was also taken forward to GRIP2 resulting in two locations (River Aire and Sovereign Place) to be investigated in greater detail.

The Appraisal Summary Table (shown on the next page) confirmed that:
- Options 1 and 4 should progress to the next GRIP;
- Option 1 had no categories scores of ‘Slight Adverse’ or ‘Adverse’ impacts;
- Option 4 had two category scores of ‘Slight Adverse’ both relating to the potential impact on existing retail units. The single ‘Adverse’ impact related to pedestrians crossing Neville Street which could be considered at the next GRIP; and
- The other options were not progressed as they failed to safely accommodate pedestrian flows, step free access or due to the impacts on third parties.

River Aire and Granary Wharf area location

The initial user demand modelling indicated that a large number of passenger trips would be from the western side of Neville Street and that consequently locating LSSE at Granary Wharf was likely to provide the optimum journey time benefits. In addition most train stopping points and platforms are located at the western end of the station. An option directly connecting to the station Western Footbridge would be required to overcome safety and passenger capacity issues (on the platforms) whilst maximising journey time benefits by providing direct access to most of the station platforms. On this basis Option 1 appeared to offer the most appropriate benefits. However, in order to provide benefits for users east of Neville Street the preferred option was modified so that access was provided directly to both banks of the River Aire. Therefore, a hybrid option (9) was suggested as the basis for an optimal solution at Granary Wharf area and this was developed at GRIP2.

Sovereign Street

Whilst demand modelling indicated that there was likely to be more benefit in locating LSSE at Granary Wharf area, other factors such as the practically of such a location, the cost of the works and the regeneration potential at Sovereign Street meant that this location could not be confidently ruled out at GRIP1. At Sovereign Street/ Sovereign Place it was apparent that an option connecting to the Eastern Footbridge or Barrow Way had the advantage of avoiding safety and capacity issues on Platform 16 whilst providing better access to the platforms. Therefore a development of Option 4 with an entrance in Sovereign Place connecting to a platform overbridge was pursued at GRIP2. Utilising Pitt Row as a subway concourse to lifts, stairs and escalators on Platform 8 was not considered practical due to the width of the platform and necessary works to bring Pitt Row into use for pedestrians.

Subway

Utilising the abandoned station subway beneath platforms at the western end of the station was discounted as it would be relatively expensive, had very significant structural issues, construction would severely disrupt station operations and the proposed passenger access arrangements would create infrastructure and operational passenger flow conflicts.
### The Leeds Railway Station (Southern Entrance) Order

**Scheme Location and Design Rationale**

<table>
<thead>
<tr>
<th>Category</th>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
<th>Option 4</th>
<th>Option 5</th>
<th>Option 6</th>
<th>Option 7</th>
<th>Option 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility</td>
<td>Provides pedestrian access to the south of Leeds Train Station. Provides direct access to Western Footbridge and therefore serves all Platforms. Does not provide direct access to both banks (East only).</td>
<td>Provides pedestrian access to the south of Leeds Train Station. Does not directly serve all station platforms, and does not provide direct access to both banks (West only).</td>
<td>Provides pedestrian access to the south of Leeds Train Station, and improves congestion relief to all platforms.</td>
<td>Provides pedestrian access to the south of Leeds Train Station, but does not provide direct access to all platforms. Provides pedestrian access to the south of Leeds Train Station, but does not provide direct access to all platforms.</td>
<td>Provides pedestrian access to the south of Leeds Train Station, but does not provide direct access to all platforms. Provides pedestrian access to the south of Leeds Train Station, but does not provide direct access to all platforms.</td>
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<td>Provides pedestrian access to the south of Leeds Train Station, but does not provide direct access to all platforms. Provides pedestrian access to the south of Leeds Train Station, but does not provide direct access to all platforms.</td>
<td>Provides pedestrian access to the south of Leeds Train Station, but does not provide direct access to all platforms. Provides pedestrian access to the south of Leeds Train Station, but does not provide direct access to all platforms.</td>
</tr>
<tr>
<td>Safety</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Does not directly serve new development / regeneration</td>
<td>Does not directly serve new development / regeneration</td>
</tr>
<tr>
<td>Environment</td>
<td>Structure is likely to be higher than Option 2, however with appropriate design mitigation, this option could have beneficial impact on the surrounding areas and could contribute to pedestrian accessibility.</td>
<td>Structure is likely to be higher than Option 2, however with appropriate design mitigation, this option could have beneficial impact on the surrounding areas and could contribute to pedestrian accessibility.</td>
<td>Structure is likely to be higher than Option 2, however with appropriate design mitigation, this option could have beneficial impact on the surrounding areas and could contribute to pedestrian accessibility.</td>
<td>Structure is likely to be higher than Option 2, however with appropriate design mitigation, this option could have beneficial impact on the surrounding areas and could contribute to pedestrian accessibility.</td>
<td>Structure is likely to be higher than Option 2, however with appropriate design mitigation, this option could have beneficial impact on the surrounding areas and could contribute to pedestrian accessibility.</td>
<td>Structure is likely to be higher than Option 2, however with appropriate design mitigation, this option could have beneficial impact on the surrounding areas and could contribute to pedestrian accessibility.</td>
<td>Structure is likely to be higher than Option 2, however with appropriate design mitigation, this option could have beneficial impact on the surrounding areas and could contribute to pedestrian accessibility.</td>
<td>Structure is likely to be higher than Option 2, however with appropriate design mitigation, this option could have beneficial impact on the surrounding areas and could contribute to pedestrian accessibility.</td>
</tr>
<tr>
<td>Integration</td>
<td>Consultation with ISIS development required</td>
<td>Consultation with ISIS development required</td>
<td>Consultation with ISIS development required</td>
<td>Consultation with ISIS development required</td>
<td>Consultation with ISIS development required</td>
<td>Consultation with ISIS development required</td>
<td>Consultation with ISIS development required</td>
<td>Consultation with ISIS development required</td>
</tr>
<tr>
<td>Acceptability</td>
<td>Does not directly serve new development / regeneration</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
</tr>
<tr>
<td>Deliverability</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
</tr>
<tr>
<td>Delivered to construction</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
<td>Provides good links to the bus stops on Neville Street</td>
</tr>
<tr>
<td>Promoters/Rejected</td>
<td>Safety accommodates pedestrian flows and improves the operational capacity of the station</td>
<td>Safety accommodates pedestrian flows and improves the operational capacity of the station</td>
<td>Safety accommodates pedestrian flows and improves the operational capacity of the station</td>
<td>Safety accommodates pedestrian flows and improves the operational capacity of the station</td>
<td>Safety accommodates pedestrian flows and improves the operational capacity of the station</td>
<td>Safety accommodates pedestrian flows and improves the operational capacity of the station</td>
<td>Safety accommodates pedestrian flows and improves the operational capacity of the station</td>
<td>Safety accommodates pedestrian flows and improves the operational capacity of the station</td>
</tr>
<tr>
<td>Promoted/Rejected</td>
<td>Safety accommodates pedestrian flows and improves the operational capacity of the station</td>
<td>Safety accommodates pedestrian flows and improves the operational capacity of the station</td>
<td>Safety accommodates pedestrian flows and improves the operational capacity of the station</td>
<td>Safety accommodates pedestrian flows and improves the operational capacity of the station</td>
<td>Safety accommodates pedestrian flows and improves the operational capacity of the station</td>
<td>Safety accommodates pedestrian flows and improves the operational capacity of the station</td>
<td>Safety accommodates pedestrian flows and improves the operational capacity of the station</td>
<td>Safety accommodates pedestrian flows and improves the operational capacity of the station</td>
</tr>
</tbody>
</table>

**Key**

- **Advise**
- **Slight Advise**
- **Neutral**
- **Slight Benefit**
- **Benefit**
5. GRIP2 ~ Options Appraisal

5.1 Options Overview

The options rejected or progressed from GRIP1 and key associated issues are shown on the schematic flow chart contained in Appendix B.

Corus was commissioned by Network Rail to undertake a GRIP2 feasibility study which was reported in April 2007. The study was tasked with developing and appraising the following option variants:

- **Option 1 ~ River Aire**
  - **Option 1A** – This option could tie into both banks of the River Aire with a diagonal connection via escalators to the western bank of the River Aire at the ISIS Footbridge. It also ties into Western Footbridge inside the station;
  - **Option 1B** – This option provided direct access to the eastern bank of the River Aire through the Dark Arches and included a pedestrian walkway along the eastern bank of the River Aire to the ISIS Footbridge. It also ties into Western Footbridge inside the station;
  - **Option 1C** – This option ties into the Western Footbridge inside the station, and continues along an elevated walkway above Platform 17 providing access into the middle of the public space in Granary Wharf;

- **Option 4 ~ Sovereign Place**
  - **Option 4A** – This option provides an entrance in Sovereign Place which ties into the Barrow-Way crossing (either upgraded or renewed) with access provided onto all eastern platforms, with the stairs reconfigured on a reconstructed Eastern Footbridge;
  - **Option 4B** – This option provides an entrance in Sovereign Place which ties into the Barrow-Way crossing and also the Eastern Footbridge via a walkway above Sovereign Place and a wide deck acting as a concourse area over Platforms 11, 12 and 14; and
  - **Option 4C** – This option provides an entrance in Sovereign Place which ties into the Barrow-Way crossing, the Eastern Footbridge via a walkway above Sovereign Place and the Eastern Footbridge via an elevated walkway within the station footprint above Platform 16.
5.2 Options Commentary

5.2.1 Option 1A River Aire Both Banks

This option would widen the existing station Western Footbridge (over platforms 15 and 16) and project it over the River Aire to form an upper concourse. Lifts, stairs and escalators would connect the upper concourse to a lower concourse deck situated over and spanning the River Aire at approximately river bank level. The lower concourse deck would be supported by extending the existing viaduct piers and creating abutments on either bank of the river. It appears that the lower level concourse would take the form of a triangular deck which would provide multiple access points to either bank of the river including the western side of the ISIS Footbridge.

This is a hybrid option which takes the GRIP1 Option 1 concept and moves the stairs, lifts and escalators over the river, and adopts the Option 3 functionality of connecting to the east bank of the river (as well as the west bank) to avoid severance issues. The river level concourse deck is a new feature not apparent in any of the GRIP1 options although its extent in this option is unclear from the material made available to Mott MacDonald.

Figure 5.1: GRIP2 – Option 1A – Schematic from GRIP2 report

Source: GRIP2 Report (Corus, April 2007)

Key Considerations

- This option directly serves significant pedestrian demand which is understood to be in the vicinity of Bridgewater Place, Granary Wharf and Holbeck Urban Village; therefore it should provide significantly reduced passenger walking times to and from the station. It also serves areas east of Neville Street for which journey time savings may be moderate to marginal from this location.

- The area of land between the railway viaduct and the ‘Blue Apartment’ Building would require urban realm improvements to enhance the public environment and encourage users

- Maintenance access to the escalators would be difficult over the river and this may impose an additional long term liability

296480/BNI/EST/RPT18/ C May 2012
http://pims01/pims/lisapi.dll/Open/1500339349
Figure 5.2: GRIP2 – Option 1A – Visualisation from GRIP2 Report

Source: GRIP2 Report (Corus, April 2007)
## GRIP2 – Option 1A Review

<table>
<thead>
<tr>
<th>Category</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian Provision</td>
<td>Direct pedestrian access from both banks of the River Aire serving the main area of demand</td>
<td>Indirect access from east of Neville Street</td>
</tr>
<tr>
<td>Step Free Access</td>
<td>Step free access to both banks of the River Aire</td>
<td></td>
</tr>
<tr>
<td>Access / Egress</td>
<td>Direct access to the station Western Footbridge providing direct access to most station platforms</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>Largely structurally independent from the station</td>
<td></td>
</tr>
<tr>
<td>Architectural</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Environmental</td>
<td>A prominent location and dramatic structure</td>
<td>The river level deck may not give sufficient clearance should the emerging Leeds Flood Alleviation Strategy increase the design flood levels in this area</td>
</tr>
<tr>
<td>Operational</td>
<td>Significant journey time savings from Bridgewater Place, Granary Wharf and Holbeck Urban Village</td>
<td>Only moderate to marginal journey time savings from areas east of Neville Street compared with a route via the Rotunda steps or Swinegate Long term maintenance liability for structures over the river</td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td>Construction over the river</td>
</tr>
<tr>
<td>Urban Design &amp; Regeneration</td>
<td>Provides a new public space connecting both sides of the river</td>
<td>Extent of visual intrusion should be investigated in particular that resulting from the extent of the escalators The structure is in 3 main parts and appears disjointed; a single building may provide more of a coherent identity</td>
</tr>
<tr>
<td>Third Party Impact</td>
<td></td>
<td>Would require consultation with the Environment Agency with the concourse extension over the River Aire Potential impacts and mitigation required for the Blue Apartments Building developments, particularly the proposed walkway along the eastern riverbank and tie into the ISIS Footbridge</td>
</tr>
<tr>
<td>Traffic and Servicing</td>
<td>Does not appear to conflict with vehicular access routes</td>
<td></td>
</tr>
<tr>
<td>Comparative Capital Costs</td>
<td></td>
<td>£6.997m</td>
</tr>
</tbody>
</table>
5.2.2 Option 1B River Aire East Bank Blue Apartments

This option would widen the existing station Western Footbridge (over platforms 15 and 16) and project a high level walk over the River Aire. An access tower would be provided on the east bank of the river situated between the Blue Apartments Building and railway viaduct; this would contain lifts, stairs and escalators.

Figure 5.3: GRIP2 – Option 1B – Schematic from GRIP2 report

Key Considerations

- This option directly serves significant pedestrian demand which is understood to be in the vicinity of Bridgewater Place, Granary Wharf and Holbeck Urban Village; therefore it should provide significantly reduced passenger walking times to and from the station. It also serves areas east of Neville Street for which journey time savings may be moderate to marginal from this location.
- The constrained nature of the site between two other structures would make this difficult to construct, particularly if it is not feasible to locate a tower crane in Little Neville Street.
- Initial pedestrian modelling indicated that congestion was likely to occur at the escalator landings (shown in red in figure 5.3) and that this would limit passenger capacity, particularly as there would be insufficient space to install more escalators. In addition the pedestrian crowding at escalator landings may lead to safety concerns requiring the numbers of passengers permitted to enter LSSE to be
controlled within certain limits. It was suggested at the time that this option was unlikely to have sufficient passenger capacity to meet future passenger growth projections.

- It was acknowledged at the time that this option did not provide the capacity or functionality of Option 1A, but it was considered to be a low cost alternative and therefore was progressed on these grounds.

Table 5.1: GRIP2 – Option 1B Review

<table>
<thead>
<tr>
<th>Category</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian Provision</td>
<td>Direct pedestrian access from the east bank of the River Aire</td>
<td>Indirect pedestrian access to the west bank of the River Aire via Dark Neville Street or the ISIS Footbridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indirect pedestrian access to the Sovereign Street area (east of Neville Street)</td>
</tr>
<tr>
<td>Step Free Access</td>
<td>Step free access provided from the east bank of the River Aire</td>
<td>Step free access to the west bank of the River Aire is via Dark Neville Street. Routes across the ISIS Footbridge also provide step free access (this was not confirmed by developers at the time).</td>
</tr>
<tr>
<td>Access / Egress</td>
<td>Direct access on to the station Western Footbridge providing direct access to most platforms</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>Structurally independent from the station</td>
<td></td>
</tr>
<tr>
<td>Architectural</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Environmental</td>
<td>Minimised footprint over the River Aire</td>
<td>Interface with flood risk levels on eastern river bank to be investigated</td>
</tr>
<tr>
<td>Operational</td>
<td>Significant journey time savings from Bridgewater Place, Granary Wharf and Holbeck Urban Village; although savings from the latter two are not maximised as the facility does not directly serve the western bank of the river</td>
<td>Only moderate to marginal journey time savings from the east of Neville Street compared with a route via the Rotunda steps or Swinegate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The secluded nature of the site may give rise to passive security issues, and potential users being less aware of routes to LSSE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Potential passenger crowding and safety issues at escalator landings. This may delay passengers at certain times, reducing journey time benefits</td>
</tr>
<tr>
<td>Construction</td>
<td>Reduced construction requirements over the River Aire</td>
<td>Extremely constrained site; construction would be very difficult (or perhaps not feasible) if a tower crane could not be located within or adjacent to the LSSE building. This would need to be confirmed in consultation with a crane provider and may require 3D modelling to prove its feasibility.</td>
</tr>
<tr>
<td>Urban Design &amp; Regeneration</td>
<td>Provides the opportunity to create a high quality pedestrian space with retail opportunities</td>
<td>The building would not be prominent and does not provide an opportunity for a landmark structure</td>
</tr>
<tr>
<td>Third Party Impact</td>
<td></td>
<td>New entrance in close proximity to Blue Apartments Building potentially requiring mitigation for maintenance requirements</td>
</tr>
<tr>
<td>Traffic and Servicing</td>
<td></td>
<td>This option would affect the servicing and access arrangements to the ‘Blue Apartment’ Building and the Hilton Hotel</td>
</tr>
<tr>
<td>Comparative Capital Costs</td>
<td></td>
<td>£5.712m</td>
</tr>
</tbody>
</table>
5.2.3 Option 1C River Aire Granary Wharf Public Square

As with Options 1A and 1B, this option provides a direct connection into the station Western Footbridge, but continues above Platform 17 on an elevated walkway which then drops down into the public space in Granary Wharf via stairs, escalators and lifts.

It seeks to avoid the potential safety and capacity issues of tying into Platform 17 by connecting LSSE with the station Western Footbridge via an elevated walkway above the platform. In order to maximise journey time benefits for users from Granary Wharf and the east side of the River Aire, the entrance has been moved east from Wharf Approach (GRIP1 Option 8) to between Waterman’s Place and the Mint Hotel.

Figure 5.4: GRIP2 – Option 1C – Schematics from GRIP2 report

Source: GRIP2 Report (Corus, April 2007)
Key Considerations

- This option directly serves significant pedestrian demand which is understood to be in the vicinity of the Bridgewater Place, Granary Wharf and Holbeck Urban Village; therefore it should provide significantly reduced passenger walking times to and from the station. However, given the distance from Neville Street, only marginal journey time benefits for the Sovereign Street area are envisaged, and some users may continue to use the route via the Rotunda steps or Swinegate.

- This option ties into the station Western Footbridge and consideration would need to be given to how this is supported off the existing structure and platform. It should however avoid the safety and capacity issues arising with connecting into the end of Platform 17 as per GRIP1 Option 8.

- The location of LSSE would directly affect a number of retail units who occupy the arches and make use of the viaduct frontage.

<table>
<thead>
<tr>
<th>Table 5.2: GRIP2 – Option 1C Review</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category</strong></td>
</tr>
<tr>
<td>Pedestrian Provision</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Step Free Access</td>
</tr>
<tr>
<td>Access / Egress</td>
</tr>
<tr>
<td>Engineering</td>
</tr>
<tr>
<td>Architectural</td>
</tr>
<tr>
<td>Environmental</td>
</tr>
<tr>
<td>Operational</td>
</tr>
<tr>
<td>Construction</td>
</tr>
<tr>
<td>Urban Design &amp; Regeneration</td>
</tr>
<tr>
<td>Third Party Impact</td>
</tr>
<tr>
<td>Traffic and Servicing</td>
</tr>
<tr>
<td>Comparative Capital Cost</td>
</tr>
</tbody>
</table>
5.2.4 **Option 4A Sovereign Street Eastern Barrow-Way**

Option 4A is located at Sovereign Place (east of Neville Street) and would provide step free access via provision of lifts, stairs and escalators connecting into the station at the existing Barrow-Way crossing level. The Barrow-Way crossing is an overbridge running perpendicular to and above platforms at the east end of the station and is for goods transfer and staff use. It would need to be refurbished to provide a public access route requiring new staircases to connect the barrow crossing to the platforms below (including Platforms 7 to 16). New staircases were proposed to exit the barrow crossing on the west side requiring the existing East Footbridge staircases (which descend to the east) to be removed to make room. The existing goods lifts to each platform would be refurbished for use by the public.

![Figure 5.5: GRIP2 – Option 4A – Schematic from GRIP2 report](source: GRIP2 Report (Corus, April 2007))

**Key Considerations**

- This option directly serves the pedestrian demand east of Neville Street and Bridgewater Place. It would provide significantly reduced passenger walking times for some passengers to and from the station. However, the facility only indirectly serves a significant proportion of pedestrian demand which it is understood would come from the Granary Wharf and Holbeck Urban Village area.
- There are likely to be only marginal journey time savings for users from the Granary Wharf and Holbeck Urban Village areas, and given likely delays crossing the busy Neville Street some users may choose to route via the Rotunda Steps rather than LSSE. Provision of signal controlled pedestrian crossing
facilities with extensive on demand priority and green man time would disrupt the loop traffic flows on Neville Street and reduce highway capacity.

- Both the Barrow-Way crossing and Eastern Footbridge within the train station are not DDA compliant and therefore would require significant upgrading or removal and replacement;
- The form of structure of the Barrow-Way would need to be investigated to ascertain whether it is suitable to allow stairs to connect with it.
- The out of the way location which would not be generally visible from the surrounding areas and therefore does not provide an opportunity for a prominent structure.
- The majority of train stopping points and platforms are at the western end of the station. Therefore an LSSE location at the east end would not provide as direct a route to and from trains, nor the journey time savings which would accrue for a location west of Neville Street.
<table>
<thead>
<tr>
<th>Category</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian Provision</td>
<td>Direct pedestrian access to the Sovereign Street area (east of Neville Street)</td>
<td>Indirect pedestrian access from the Granary Wharf area including a requirement to cross Neville Street which is a busy and important highway carrying the Leeds inner loop traffic.</td>
</tr>
<tr>
<td>Step Free Access</td>
<td>Step free access provided from all key areas</td>
<td>Entrance location at extreme eastern end of station does not provide improved access for southwest Leeds</td>
</tr>
<tr>
<td>Access / Egress</td>
<td>Direct access to the station Barrow-Way which provides access to all platforms at the east end of the station</td>
<td>High level connection into existing Barrow Crossing, which would require substantial refurbishment and upgrading Bridge beams would need to be modified to provide access to stairs.</td>
</tr>
<tr>
<td>Engineering</td>
<td>Step free access provided from all key areas</td>
<td>Entrance location at extreme eastern end of station does not provide improved access for southwest Leeds</td>
</tr>
<tr>
<td>Architectural</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Environmental</td>
<td>Does not require works in proximity to the River Aire or within a Conservation Area</td>
<td></td>
</tr>
<tr>
<td>Operational</td>
<td>Significant journey time savings from the east side of Neville Street and marginal from Bridgewater Place. Pedestrians delivered to the less congested east end of the station</td>
<td>Only marginal journey time savings for the majority of users which are from the Bridgewater Place, Granary Wharf and Holbeck Urban Village area, compared with a route via the Rotunda steps The majority of train stopping points and platforms are at the west end of the station so less well served by LSSE in this location The secluded nature of the site may give rise to passive security issues.</td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td>Disruption to station operations during construction to modify the Barrow-Way and reconfigure access to the platforms at the east end of the station. This will require possessions of platforms and railway tracks</td>
</tr>
<tr>
<td>Urban Design &amp; Regeneration</td>
<td>Provides the opportunity to create a high quality pedestrian space with retail opportunities. Integrates well with proposed Sovereign Street development proposals and may serve as a catalyst for this</td>
<td>The building would not be prominent and does not provide an opportunity for a landmark structure</td>
</tr>
<tr>
<td>Third Party Impact</td>
<td></td>
<td>Potential loss of retail units within the arches and loss of part of the development site.</td>
</tr>
<tr>
<td>Traffic and Servicing</td>
<td>Does not appear to be in conflict with servicing arrangements for businesses</td>
<td></td>
</tr>
<tr>
<td>Comparative Capital Costs</td>
<td></td>
<td>£5.504m</td>
</tr>
</tbody>
</table>

Table 5.3: GRIP2 – Option 4A Review
5.2.5 Option 4B Sovereign Street Eastern Barrow-Way and Eastern Footbridge

Option 4B was a development of Option 4A and located at Sovereign Place (east of Neville Street) with step free access via provision of lifts, stairs and escalators connecting into the station at the existing Barrow-Way crossing and Eastern Footbridge level.

It differs from Option 4A in that the Barrow-Way would not be accessed via new stairs to the platforms but by a large concourse deck above the platforms (and railway tracks) which connects to the Eastern Footbridge. Therefore access to LSSE would be via the eastern Footbridge stairs or the Barrow-Way lifts from each platform. The existing Barrow-Way crossing would need to be refurbished to provide a public access route across the tracks at the eastern end of the station.

Figure 5.6: GRIP2 – Option 4B – Schematic from GRIP2 report

Source: GRIP2 Report (Corus, April 2007)

Key Considerations

- This option directly serves the pedestrian demand east of Neville Street and Bridgewater Place. It would provide significantly reduced passenger walking times for some passengers to and from the station. However, the facility only indirectly serves the majority of pedestrian demand which it is understood would come from the Bridgewater Place, Granary Wharf area and Holbeck Urban Village area.

- There are likely to be only marginal journey time savings for users from the Granary Wharf area, and given likely delays crossing the busy Neville Street some users may choose to route via the Rotunda Steps rather than LSSE. Provision of a signal controlled pedestrian crossing with extensive on demand...
priority and green man time would disrupt the loop traffic flows on Neville Street and reduce highway capacity.

- Both the Barrow-Way crossing and Eastern Footbridge within the train station are not DDA compliant and therefore would require significant upgrading or more likely reconstruction;

- The form of structure of the Barrow-Way would need to be investigated to ascertain whether it is suitable to allow the elevated concourse deck to connect with it. Given the additional loading it is likely that the Barrow-Way would need to be significantly strengthened or rebuilt. This may not be acceptable given the associated disruption to station operations.

- The form of structure of the Eastern Footbridge would need to be investigated to ascertain whether it is suitable to allow the elevated concourse deck to connect with it. Given that the form of structure is unsuitable and the additional loading, it is likely that the Eastern Footbridge would need to be significantly rebuilt.

- The out of the way location which would not be generally visible from the surrounding areas and therefore does not provide an opportunity for a prominent structure.

- The majority of train stopping points and platforms are at the western end of the station. Therefore an LSSE location at the east end would not provide as direct a route to and from trains, nor the journey time savings which would accrue for a location west of Neville Street and this is where the majority of the demand is from.

- The relatively large costs associated with this option may mean that it is not affordable.

Figure 5.7: GRIP2 – Option 4B – Visualisation from GRIP2 Report

Source: GRIP2 Report (Corus, April 2007)
### Table 5.4: GRIP2 – Option 4B Review

<table>
<thead>
<tr>
<th>Category</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian Provision</td>
<td>Direct pedestrian access to the Sovereign Street area (east of Neville Street)</td>
<td>Indirect pedestrian access from the Granary Wharf area including a requirement to cross Neville Street which is a busy and important highway carrying the Leeds inner loop traffic.</td>
</tr>
<tr>
<td>Step Free Access</td>
<td>Step free access provided from all key areas</td>
<td></td>
</tr>
<tr>
<td>Access / Egress</td>
<td>Direct access to the station Barrow-Way and Eastern Footbridge which provides access to all platforms at the east end of the station</td>
<td>Entrance location at extreme eastern end of station does not provide improved access for southwest Leeds</td>
</tr>
<tr>
<td>Engineering</td>
<td>High level connection into existing Barrow Crossing, which would require substantial refurbishment and upgrading</td>
<td>Barrow-Way is likely to require significant strengthening work or reconstruction. The Eastern Footbridge is likely to require reconstruction.</td>
</tr>
<tr>
<td>Architectural</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Environmental</td>
<td>Does not require works in proximity to the River Aire or within a Conservation Area</td>
<td></td>
</tr>
<tr>
<td>Operational</td>
<td>Significant journey time savings from the east side of Neville Street and marginal from Bridgewater Place. Increased concourse area and space for facilities which may help to relieve any platform congestion issues in this area.</td>
<td>Only marginal journey time savings for the majority of users which are from the Granary Wharf and Holbeck Urban Village area, compared with a route via the Rotunda steps. The majority of train stopping points and platforms are at the west end of the station so less well served by LSSE in this location. The secluded nature of the site may give rise to passive security issues.</td>
</tr>
<tr>
<td>Construction</td>
<td>Significant disruption to station operations to modify the Barrow-Way, reconstruct the Eastern Footbridge and construct the elevated concourse deck. This will require possessions of platforms and railway tracks</td>
<td></td>
</tr>
<tr>
<td>Urban Design &amp; Regeneration</td>
<td>Provides the opportunity to create a high quality pedestrian space with retail opportunities. Integrates well with proposed Sovereign Street development proposals and may serve as a catalyst for this</td>
<td>The building would not be prominent and does not provide an opportunity for a landmark structure</td>
</tr>
<tr>
<td>Third Party Impact</td>
<td></td>
<td>Potential loss of retail units within the arches and loss of part of the development site.</td>
</tr>
<tr>
<td>Traffic and Servicing</td>
<td>Does not appear to be in conflict with servicing arrangements for businesses</td>
<td></td>
</tr>
<tr>
<td>Comparative Capital Costs</td>
<td></td>
<td>£12.459m</td>
</tr>
</tbody>
</table>
5.2.6 Option 4C Sovereign Street Elevated Concourse

Option 4C proposed a new entrance at Sovereign Place (similar to Options 4A and 4B) with lifts, stairs and escalators providing access to a new elevated walkway (above Platform 16) connecting the Eastern and Western Footbridges and the Barrow-Way crossing.

Figure 5.8: GRIP2 – Option 4C – Schematic from GRIP2 report

Key Considerations

- This option directly serves the pedestrian demand east of Neville Street and Bridgewater Place. It would provide significantly reduced passenger walking times for some passengers to and from the station. However, the facility only indirectly serves a significant proportion of pedestrian demand which it is understood would come from the Granary Wharf area and Holbeck Urban Village.
- There are likely to be only marginal journey time savings for users from the Granary Wharf area, and given likely delays crossing the busy Neville Street some users may choose to route via the Rotunda Steps rather than LSSE. Provision of a signal controlled pedestrian crossing with extensive on demand priority and green man time would disrupt the loop traffic flows on Neville Street and reduce highway capacity.
- Both the Barrow-Way crossing and Eastern Footbridge within the train station are not DDA compliant and therefore would require significant upgrading or reconstruction;
The Leeds Railway Station (Southern Entrance) Order
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- The out of the way location which would not be generally visible from the surrounding areas and therefore does not provide an opportunity for a prominent structure.

- The majority of train stopping points and platforms are at the western end of the station. Therefore an LSSE location at the east end would not provide as direct a route to and from trains, nor the journey time savings which would accrue for a location west of Neville Street and this is where the majority of the demand is from.

- The elevated walkway between the Eastern and Western Footbridges would need to be of sufficient width to accommodate expected passenger flows and it is assumed to be at least 5 metres wide. The support arrangement for the walkway may impede passenger flows on Platform 16 if standard support columns are used. However a cantilever arrangement should be utilised to avoid this, the structural integrity of the station viaduct and requisite strengthening works should be investigated.
### Table 5.4: GRIP2 – Option 4C Review

<table>
<thead>
<tr>
<th>Category</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian Provision</td>
<td>Direct pedestrian access to the Sovereign Street area (east of Neville Street)</td>
<td>Indirect pedestrian access from the Granary Wharf area including a requirement to cross Neville Street which is a busy and important highway carrying the Leeds inner loop traffic.</td>
</tr>
<tr>
<td>Step Free Access</td>
<td>Step free access provided from all key areas albeit via a convoluted route</td>
<td></td>
</tr>
<tr>
<td>Access / Egress</td>
<td>Direct access to the station Barrow-Way and Eastern Footbridge which provides access to all platforms at the east end of the station. Although there is direct access to the Western Footbridge with is a somewhat convoluted route to access the platforms</td>
<td>Entrance location at extreme eastern end of station does not provide improved access for southwest Leeds</td>
</tr>
<tr>
<td>Engineering</td>
<td>High level connection into existing Barrow Crossing, which would require substantial refurbishment and upgrading Structural support for the elevated walkway above platform 16</td>
<td></td>
</tr>
<tr>
<td>Architectural</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Environmental</td>
<td>Does not require works in proximity to the River Aire or within a Conservation Area</td>
<td>Only marginal journey time savings from the Granary Wharf and Holbeck Urban Village areas, compared with a route via the Rotunda steps. The majority of train stopping points and platforms are at the west end of the station so less well served by LSSE in this location. The secluded nature of the site may give rise to passive security issues.</td>
</tr>
<tr>
<td>Operational</td>
<td>Significant journey time savings from the east side of Neville Street and marginal from Bridgewater Place.</td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>Disruption to station operations to modify the Barrow-Way and construct the Platform 16 elevated walkway. This will require possessions of platforms and railway tracks</td>
<td></td>
</tr>
<tr>
<td>Urban Design &amp; Regeneration</td>
<td>Provides the opportunity to create a high quality pedestrian space with retail opportunities. Integrates well with proposed Sovereign Street development proposals and may serve as a catalyst for this</td>
<td>The building would not be prominent and does not provide an opportunity for a landmark structure</td>
</tr>
<tr>
<td>Third Party Impact</td>
<td>Potential loss of retail units within the arches and loss of part of the development site.</td>
<td></td>
</tr>
<tr>
<td>Traffic and Servicing</td>
<td>Does not appear to be in conflict with servicing arrangements for businesses</td>
<td></td>
</tr>
<tr>
<td>Comparative Capital Costs</td>
<td></td>
<td>£6.146m</td>
</tr>
</tbody>
</table>
5.3 GRIP2 Options Summary

At GRIP2, six options (1A, 1B, 1C, 4A, 4B and 4C) were considered and these comprised three variants of Option 1 locating LSSE in the vicinity of the River Aire; and three variants of Option 4 in Sovereign Place. To overcome the significant safety issue of inadequate platform widths on Platform 16 as noted at GRIP1, Option 4 variants were amended to tie into various combinations of either and/or the Barrow-Way Crossing, the Eastern Footbridge and the Western Footbridge.

The Appraisal Summary Table (shown on the next page) confirmed that:

- Options 1A and 1B should progress to the next GRIP;
- Option 1A had a single ‘Slight Adverse’ score relating to potential impacts on third party developments with the mitigation to be identified in the following GRIP;
- Option 1B had similar issues with impacts on third parties, but was also located in a confined area which would constrain the construction site and works; and
- The other Options 1C, 4A, 4B, and 4C, did not provide the desired journey time savings (‘Adverse’ scores) and also had ‘Slight Adverse’ and ‘Adverse’ scores relating to their deliverability, safety (construction and operation) and environmental considerations.

River Aire Location

The initial user modelling indicated that strong passenger demand would be from the western side of Neville Street and that consequently locating LSSE at the Granary Wharf area was likely to provide the optimum journey time benefits. In addition most train stopping points and platforms are located at the western end of the station.

Options to the west of the River Aire and particularly those towards Wharf Approach were considered too remote from the Sovereign Street area to offer benefits to those users; whilst any benefit to users from the vicinity of Neville Street may be marginal. Therefore it was concluded that the best location within the Granary Wharf area was immediately adjacent to or over the River Aire as this may provide at least some benefit for all areas south of the station. On this basis Options 1A and 1B were progressed to GRIP3 and Option 1C not pursued.

Sovereign Street Location

Whilst demand modelling indicated that there was likely to be more benefit in locating LSSE within the Granary Wharf area, significant benefits associated with the Sovereign Street area could be found to offset this. All of the options considered required significant changes to the existing Barrow-Way whilst Option 4B also necessitated rebuilding the Eastern Footbridge and Option 4C was dependent on the construction of an elevated walkway over Platform 16. All of these works would increase scheme costs and disrupt station operations to a greater or lesser degree. Therefore, an option to locate LSSE in the vicinity of Sovereign Street was rejected on the basis of passenger demand, remoteness of the east end of the station, disruption during construction and that they were unlikely to offer value for money.
<table>
<thead>
<tr>
<th>Category</th>
<th>Sub Category</th>
<th>Option 1A</th>
<th>Option 1B</th>
<th>Option 1C</th>
<th>Option 4A</th>
<th>Option 4B</th>
<th>Option 4C</th>
</tr>
</thead>
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<tr>
<td>Accessibility</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td>Pedestrian Trips (peak hour demand)</td>
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<td>1598 (Both banks)</td>
<td>1627 (East bank)</td>
<td>1608 (West Bank)</td>
<td>1465</td>
<td></td>
<td></td>
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<td>Safety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No pedestrian/vehicle conflicts</td>
<td>Good/poor surveillance</td>
<td>No pedestrian/vehicle conflicts</td>
<td>Benefits from minimal surveillance but not as good as Option 1A</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Economy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good journey time savings</td>
<td>Insecure footpath passing existing retail units or passing potential opportunities</td>
<td>Good journey time savings</td>
<td>Insecure footpath passing existing retail units or passing potential opportunities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparative Capital Cost</td>
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<td>£6,997,000</td>
<td>£5,712,000</td>
<td>£6,493,000</td>
<td>£5,504,000</td>
<td>£12,459,000</td>
<td>£15,146,000</td>
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<td>Environment</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likely to require considerable construction work over the River Aire, resulting in lower risk to the water environment, however it is assumed that this risk will be managed with appropriate mitigation and construction best practice.</td>
<td>Good/poor surveillance</td>
<td>Likely to require considerable construction work over the River Aire, resulting in lower risk to the water environment, however it is assumed that this risk will be managed with appropriate mitigation and construction best practice.</td>
<td></td>
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<tr>
<td>Integration</td>
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</tr>
<tr>
<td>Serves all developments situated in the Holbeck Urban Village located to the south/southwest of the train station.</td>
<td>Serves all developments located in the south/southwest of the train station.</td>
<td>Serves all developments situated in the Holbeck Urban Village located to the south/southwest of the train station.</td>
<td>Serves all developments located in the south/southwest of the train station.</td>
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<td>Acceptability</td>
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<td></td>
</tr>
<tr>
<td>This option impacts upon the ISIS Blue building developments, however it is considered that this could be mitigated through consultation with the developers.</td>
<td>This option impacts upon the ISIS Blue building developments, however it is considered that this could be mitigated through consultation with the developers.</td>
<td>This option impacts upon the ISIS Blue building developments, however it is considered that this could be mitigated through consultation with the developers.</td>
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<tr>
<td>Rejected</td>
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</tr>
<tr>
<td>Key</td>
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<tr>
<td>Slight Adverse</td>
<td></td>
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<tr>
<td>Neutral</td>
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<tr>
<td>Slight Benefit</td>
<td></td>
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</tr>
<tr>
<td>Benefit</td>
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</tr>
</tbody>
</table>
6. GRIP3 ~ Options Appraisal

6.1 Options Overview

The options rejected or progressed from GRIP2 and key associated issues are shown on the schematic flow chart contained in Appendix B.

Corus was commissioned by Network Rail to undertake a GRIP3 feasibility study which was reported in October 2007, and considered four options in the vicinity of the River Aire. Three options were variants of Option 1A from GRIP2, and a fourth option was developed from Option 1B. Variants of Option 1B were unlikely to be feasible given the confined nature of the site.

The options at GRIP3 are as follows:-

- **Option 1A (over the river)**
  - **Option 1Ai** – This option provided step free access from the western bank of the River Aire, and to the eastern bank via Dark Neville Street. It also provided stepped access directly to the eastern bank of the river adjacent to the railway viaduct; and a link bridge connecting LSSE to the ISIS Footbridge at Waterman’s Place. Vertical access from the station Western Footbridge was via a single flight of escalators (in both directions) which were positioned diagonally relative to the railway viaduct;
  - **Option 1Aii** – This option provided step free access from the western bank of the River Aire, and to the eastern bank via Dark Neville Street. It also provided stepped access directly to the eastern bank of the river adjacent to the railway viaduct. Proposals included a large deck area, almost spanning the whole of the River Aire (except an area adjacent to Watermans Place) between the railway viaduct and the ISIS Bridge which would be replaced by the deck structure. Access to the station Western Footbridge was provided via a double bank of escalators on the river deck and a landing positioned diagonally relative to the railway viaduct; and
  - **Option 1Aiii** – This option provided step free access from the western bank of the River Aire, and to the eastern bank via Dark Neville Street. It also provided stepped access directly to the eastern bank of the river adjacent to the railway viaduct; and a link bridge connecting LSSE to the ISIS Footbridge at Waterman’s Place. Access to the station Western Footbridge was provided via a double bank of escalators on the river deck and a landing positioned parallel to the railway viaduct.

- **Option 1B (on the east bank of the river)**
  - **Option 1Bi** – This option is located on Little Neville Street between the railway viaduct and the ‘Blue Apartment’ Building with a high level walkway connecting to the station Western Footbridge. It provides step free access from the east bank of the River Aire, and incorporates a triple bank of escalators that are situated parallel to the railway viaduct. Step free access to the river’s western bank is provided via Dark Neville Street and via the ISIS Footbridge.
6.2 Options Commentary

6.2.1 Option 1Ai River Aire Diagonal Escalators

This option is a development of GRIP2 Option 1A and proposes the creation of a triangular deck over the River Aire supporting escalators lifts and a staircase connecting to the station Western Footbridge. The deck over the River Aire provided two connections to the west bank and a secondary connection to the east bank between the viaduct and the Blue Apartments Building. For this option, the ticket office and automatic ticket gates would be located at Western Footbridge level, with the possibility of a small retail unit located at the river deck level.

Figure 6.1: GRIP3 – Option 1Ai

Source: GRIP3 Report (Corus, October 2007)

Key Considerations

- This option directly serves the significant pedestrian demand which is understood to be in the vicinity of the Bridgewater Place, Granary Wharf and Holbeck Urban Village area; therefore it should provide greatly reduced passenger walking times to and from the station. It also serves areas east of Neville Street for which journey time savings may be moderate to marginal from this location.
- The area of land between the railway viaduct and the ‘Blue Apartment’ Building would require urban realm improvements to enhance the public environment and encourage users.
- In order to provide a step free route an access ramp is provided from west bank of the River Aire and this would conflict with the frontage of numerous retail units in the Dark Arches;
- Post GRIP3 comment:
  - Once the ISIS Footbridge was built, it was realised that its construction prevented a tie-in with LSSE and therefore the escalators might have to double back on themselves.

REJECTED
Table 6.1: GRIP3 – Option 1Ai Review

<table>
<thead>
<tr>
<th>Category</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian Provision</td>
<td>Direct pedestrian access from the both banks of the River Aire serving the main area of demand</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ramped access from Granary Wharf (west bank) and graded access from the ISIS Footbridge, with Steps and lifts accessible from the eastern bank of the River Aire</td>
<td></td>
</tr>
<tr>
<td>Step Free Access</td>
<td>Step free access provided directly to the western river bank. Step free access to the eastern river bank is provided via Dark Neville Street</td>
<td>The bottom end of escalators lands adjacent to ISIS Footbridge, possibly requiring revisions to their proposals to ensure adequate interface between the two schemes</td>
</tr>
<tr>
<td>Access / Egress</td>
<td>Direct access to the station Western Footbridge providing direct access to most station platforms</td>
<td>A single escalator in each direction with no return landings would help maximise capacity</td>
</tr>
<tr>
<td></td>
<td>A single escalator in each direction with no return landings would help maximise capacity</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>Largely structurally independent from the station</td>
<td>Interfaces with ISIS Footbridge and Waterman’s Place regarding a tie-in with the footbridge</td>
</tr>
<tr>
<td>Architectural</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Environmental</td>
<td>Excellent visibility of this design from Victoria Bridge and Water Lane to the south makes this the most prominent location of any option. Significant opportunities to create a landmark structure</td>
<td>Works within the river may adversely impact on otters and fish; although this has not been confirmed at this stage</td>
</tr>
<tr>
<td>Operation</td>
<td>Significant journey time savings from the Bridgewater Place, Granary Wharf and Holbeck Urban Village area</td>
<td>Only moderate to marginal journey time savings from areas east of Neville Street compared with a route via the Rotunda steps or Swinegate</td>
</tr>
<tr>
<td></td>
<td>Relatively simple dual escalator arrangement leaves free space for potential retrospective addition of extra ‘tidal’ escalator to be switched to peak flows – additional capacity</td>
<td>Long term maintenance liability for structures over the river</td>
</tr>
<tr>
<td>Construction</td>
<td>Construction over the river</td>
<td></td>
</tr>
<tr>
<td>Urban Design &amp; Regeneration</td>
<td>Provides a new public space connecting both sides of the river</td>
<td>The extent of the building and requirement for the ISIS Footbridge link should be reviewed to minimise visual impacts.</td>
</tr>
<tr>
<td>Third Party Impacts</td>
<td>Upper end of escalators (connecting to extension of western over-bridge) is close to existing Blue Apartments Building (would require louvre screening to allay privacy concerns)</td>
<td>The access ramp on the western river bank adjacent to the railway viaduct would conflict with access and frontage to a number of retail units</td>
</tr>
<tr>
<td>Traffic and Servicing</td>
<td>Does appear to directly conflict with vehicular access routes</td>
<td></td>
</tr>
<tr>
<td>Comparative Capital Costs</td>
<td></td>
<td>£12.801m</td>
</tr>
</tbody>
</table>
6.2.2 Option 1Aii River Aire Full Deck with Double Escalator Bank

This option encompasses the creation of a full deck over the River Aire from the viaduct wall to the line of the existing ISIS Footbridge. The deck would support a double bank of escalators (four in total), lifts and stairs. It would also form a new public space, with wide connections to both banks of the River Aire. The ticket office and automatic ticket gates would be located at either the station Western Footbridge or River Aire deck levels; with the possibility of a small retail unit being located on the river deck.

This option provided step free access from the western bank of the River Aire, and to the eastern bank via Dark Neville Street. It also provided stepped access directly to the eastern bank of the river adjacent to the railway viaduct.

Key Considerations

- This option directly serves the significant pedestrian demand which is understood to be in the vicinity of Granary Wharf area; therefore it should provide greatly reduced passenger walking times to and from the station. It also serves areas east of Neville Street for which journey time savings may be moderate to marginal from this location.
- The area of land between the railway viaduct and the ‘Blue Apartment’ Building would require urban realm improvements to enhance the public environment and encourage users.
- In order to provide a step free route an access ramp is provided from west bank of the River Aire and this would conflict with the frontage of numerous retail units in the Dark Arches;
The Environment Agency are likely to oppose this scheme since the deck effectively culverts a water course and this would contravene their current policy stance. The effects on upstream flooding would need to be modelled and any necessary mitigation works considered so that flood risk did not increase as a result of the works.

The riverside apartments (Waterman’s Place and ‘Blue Apartment’ Building) would suffer significant adverse visual impacts if the river was replaced with a concrete deck structure in front of their buildings. In addition there may be a reduction in the quality of the townscape in what is a Conservation Area.

The extensive river deck and likely support arrangements beneath and on either river bank make this option relatively expensive and less likely to be affordable.
<table>
<thead>
<tr>
<th>Category</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
</table>
| Pedestrian Provision  | Direct pedestrian access from the both banks of the River Aire  
                      | Ramped access from Granary Wharf (west bank) and graded access from the ISIS Footbridge, with Steps and lifts accessible from the eastern bank of the River Aire                                                       |                                                                                                                                                                                                            |
| Step Free Access      | Potential to provide step free access from both banks of the River Aire via escalators and lifts                                                                                                               |                                                                                                                                                                                                            |
| Access / Egress       | Clear logical route for passengers with a compact building  
                      | Direct access to the station Western Footbridge and most station platforms                                                                                                                                  | Extensive support structure required beneath the river deck with associated impacts on the river bank walls                                                                                                 |
| Engineering           | Largely structurally independent from the station                                                                                                                                                          | Works within the river may adversely impact on otters and fish; although this has not been confirmed at this stage. It is particularly significant with this option due to the amount of the river covered by the deck. Note that an opening has been provided adjacent to Waterman’s Place and we assume this is for otters. |
| Architectural         | Not assessed                                                                                                                                                                                               | Not assessed                                                                                                                                                                                                |
| Environmental         | Excellent visibility of this design from Victoria Bridge and Water Lane to the south makes this the most prominent location of any option. Significant opportunities to create a landmark structure  
                      | In section there is the potential for an interesting and extensive new public space on the river deck.                                                                                                          |                                                                                                                                                                                                            |
| Operational           | Significant journey time savings from the Bridgewater Place, Granary Wharf and Holbeck Urban Village areas  
                      | Flexibility is available in this option with respect to the position of the ticket office & barrier line (at upper or lower level)                                                                         | Only moderate to marginal journey time savings from areas east of Neville Street compared with a route via the Rotunda steps  
                      | Potentially greater maintenance issues than Option 1Ai due to size of deck over the river & constraints on east and west banks of the River Aire |
| Construction          |                                                                                                                                                                                                            | Potentially greater construction costs and complexity due to size of deck and constraints on east and west banks of the River Aire                                                                               |
| Urban Design &        | Wide open space at river level is major benefit; it enables the scheme to promote the creation of a new ‘public square’ (note also the potential for commercial opportunities at this level)  
                      | Opportunity to enhance area between the railway viaduct and ‘Blue Apartments’ building                                                                                                                                                                    |
| Regeneration          |                                                                                                                                                                                                            |                                                                                                                                                                                                            |
| Third Party Impacts   | The access ramp on the western river bank adjacent to the railway viaduct would conflict with access and frontage to a number of retail units  
                      | Large deck approach would require extensive interfaces with both adjoining developments (Blue Apartment and Waterman’s Place) including removal of the cantilever deck from the Golf bar  
                      | Likely that the EA would oppose this scheme as the design effectively culverts the River Aire at this location and conflicts with flood risk requirements.                                                                                                                                 |
| Traffic and Servicing | Does appear to directly conflict with vehicular access routes                                                                                                                                              |                                                                                                                                                                                                            |
| Capital Costs         | £17.375m                                                                                                                                                    |                                                                                                                                                                                                            |
6.2.3 Option 1Aiii River Aire Double Bank of Escalators Parallel to Railway Viaduct

This option is a development of GRIP2 Option 1A and it proposes the creation of a small triangular deck over the River Aire with footbridge connections to either bank; with the deck supporting a double bank of escalators (four in total), lifts and stairs. The footbridges provide connections to both banks of the River Aire, with the combination of the connections able to be varied from the arrangement shown. The ticket office and automatic ticket gates could be located at either Western Footbridge or river deck levels.

Figure 6.3: GRIP3 – Option 1Aiii

Source: GRIP3 Report (Corus, October 2007)

Key Considerations

- This option directly serves the significant pedestrian demand which is understood to be in the vicinity of the Bridgewater Place, Granary Wharf and Holbeck Urban Village area; therefore it should provide significantly reduced passenger walking times to and from the station. It also serves areas east of Neville Street for which journey time savings may be moderate to marginal from this location.
- The area of land between the railway viaduct and the ‘Blue Apartment’ Building would require urban realm improvements to enhance the public environment and encourage users
- In order to provide a step free route an access ramp is provided from west bank of the River Aire and this would conflict with the frontage of numerous retail units in the Dark Arches;
- Post GRIP3 comment:
  - This option reduced the impact on the buildings that flank the proposed entrance by siting the structure at and perpendicular to the railway viaduct. Options 1Ai and 1Aii both have greater visual intrusion of the adjacent developments because of overlooking issues into apartments. This option...
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reduces this impact on adjacent developments as the structure is perpendicular to the railway viaduct.

- Once the ISIS Footbridge was built, it was realised that its construction prevented a tie-in with LSSE and therefore the escalators might have to double back on themselves.

- During consultation with Leeds City Council, the issue of maximising natural light entering Dark Neville Street emerged, combined with maintaining access to the railway viaduct for inspections and maintenance.
# Table 6.3: GRIP3 – Option 1Aiii Review

<table>
<thead>
<tr>
<th>Category</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
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</table>
| Pedestrian Provision      | Direct pedestrian access from both banks of the River Aire serving the main area of demand  
Ramped access from Granary Wharf (west bank) and graded access from the ISIS Footbridge, with Steps and lifts accessible from the eastern bank of the River Aire |                                                                                                                                               |
| Step Free Access          | Step free access provided directly to the western river bank. Step free access to the eastern river bank is provided via Dark Neville Street |                                                                                                                                               |
| Access / Egress          | Direct access to the station Western Footbridge providing direct access to most station platforms | The bottom end of escalators lands adjacent to ISIS Footbridge, possibly requiring revisions to their proposals to ensure adequate interface between the two schemes |
| Engineering              | Largely structurally independent from the station                          | Interfaces with ISIS Footbridge and Waterman’s’ Place regarding a tie-in with the footbridge                                                |
| Architectural            | Not assessed                                                                | Not assessed                                                                                                                                 |
| Environmental            | Excellent visibility of this design from Victoria Bridge and Water Lane to the south makes this the most prominent location of any option. Significant opportunities to create a landmark structure | Works within the river may adversely impact on otters and fish; although this has not been confirmed at this stage |
| Operational              | Significant journey time savings from the Bridgewater Place, Granary Wharf and Holbeck Urban Village area  
Flexibility is available with this option with respect to the location of a ticket office and barrier line (at upper or lower level) | Only moderate to marginal journey time savings from areas east of Neville Street compared with a route via the Rotunda steps  
Long term maintenance liability for structures over the river |
| Construction             |                                                                 | Construction over the river  
Proximity of new structure to viaduct could be difficult in terms of buildability; may require proposal to be shifted slightly to south |
| Urban Design & Regeneration | Provides a new public space connecting both sides of the river               | The extent of the building and requirement for the ISIS Footbridge link should be reviewed to minimise visual impacts. |
| Third Party Impact       | Pulling the escalators tight against the viaduct reduces the scale of the proposed structure from either side of the river (and hence impact on the adjacent buildings) | Back of lift/stair core (connecting to extension of western over-bridge) is close to existing Blue Apartments Building  
Mid-landing and upper level of escalators is close to residential apartments, possibly requiring louvre screening to allay privacy concerns  
The access ramp on the western river bank adjacent to the railway viaduct would conflict with access and frontage to a number of retail units |
| Traffic and Servicing    | Does appear to directly conflict with vehicular access routes               |                                                                                                                                               |
| Capital costs            | £11.956m                                                                   |                                                                                                                                               |
6.2.4 **Option 1Bi River Aire East Bank Blue Apartments**

Option 1Bi connects the station Western Footbridge to the east bank of the River Aire and aims to minimise construction over the river with the principal structure located between the Blue Apartments Building and the railway viaduct. The entrance would include a triple bank of escalators (six in total), lifts and stairs. This option gives excellent connections to the eastern bank of the River Aire at Little Neville Street; however, there is no direct connection to the western bank except by the ISIS Footbridge or Dark Neville Street. The ticket office and automatic ticket gates would be located at the station Western Footbridge level in this option, given the limited space available at ground level.

Figure 6.4: GRIP3 – Option 1Bi

**Key Considerations**

- This option directly serves the majority of the pedestrian demand which is understood to be in the vicinity of Bridgewater Place, Granary Wharf and Holbeck Urban Village area; therefore it should provide significantly reduced passenger walking times to and from the station. It also serves areas east of Neville Street for which journey time savings may be moderate to marginal from this location.
- The constrained nature of the site between two other structures would make this difficult to construct, particularly if it is not feasible to locate a tower crane in Little Neville Street.
- This is a confined site and flexibility within the design is limited. The configuration of the escalators are such that they their feasibility would need to be confirmed with more detailed work;
- Pedestrian modelling indicated that congestion may occur at the escalator landings and this could raise safety issues. It also indicated that the pedestrian design capacity was reached early in the design life leaving little capacity for passenger growth
- Secluded site location which would not be visible from the surrounding areas and furthermore the location does not benefit from good passive surveillance.

REJECTED
Table 6.4: GRIP3 – Option 1Bi Review

<table>
<thead>
<tr>
<th>Category</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian Provision</td>
<td>Direct pedestrian access from the east bank of the River Aire</td>
<td>Indirect pedestrian access to the west bank of the River Aire via Dark Neville Street or the ISIS Footbridge Indirect pedestrian access to the Sovereign Street area (east of Neville Street)</td>
</tr>
<tr>
<td>Step free Access</td>
<td>Step free access provided from the east bank of the River Aire</td>
<td>Step free access to the west bank of the River Aire is via Dark Neville Street. Routes across the ISIS Footbridge also provide step free access (this was not confirmed by developers at the time).</td>
</tr>
<tr>
<td>Access / Egress</td>
<td>Direct access on to the station Western Footbridge providing direct access to most platforms</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>Largely structurally independent from the station</td>
<td></td>
</tr>
<tr>
<td>Architectural</td>
<td>Not Assessed</td>
<td>Not Assessed</td>
</tr>
<tr>
<td>Environmental</td>
<td>Minimised footprint over the River Aire</td>
<td>Interface with flood risk levels on eastern river bank to be investigated Structure hidden from view by surrounding buildings so no potential for a landmark building</td>
</tr>
<tr>
<td>Operational</td>
<td>Significant journey time savings from Bridgewater Place, Granary Wharf and Holbeck Urban Village area; although these are not maximised as the facility does not directly serve the western bank of the river</td>
<td>Only moderate to marginal journey time savings from the east of Neville Street compared with a route via the Rotunda steps or Swinegate The secluded nature of the site may give rise to passive security issues, and potential users being less aware of routes to LSSE Potential passenger crowding and safety issues at escalator landings. This may delay passengers at certain times, reducing journey time benefits Capacity limitations may be reached shortly after opening and there is little potential for capacity enhancements</td>
</tr>
<tr>
<td>Construction</td>
<td>Reduced construction requirements over the River Aire</td>
<td>Extremely constrained site; construction would be very difficult (or perhaps not feasible) if a tower crane could not be located within or adjacent to the LSSE building. This would need to be confirmed in consultation with a crane provider and may require 3D modelling to prove its feasibility.</td>
</tr>
<tr>
<td>Urban Design &amp; Regeneration</td>
<td>Provides the opportunity to create a high quality pedestrian space with retail opportunities</td>
<td>The building would not be prominent and does not provide an opportunity for a landmark structure</td>
</tr>
<tr>
<td>Third Party Impacts</td>
<td></td>
<td>New entrance in close proximity to Blue Apartments Building potentially requiring mitigation for maintenance requirements</td>
</tr>
<tr>
<td>Traffic and Servicing</td>
<td></td>
<td>This option would affect the servicing and access arrangements to the ‘Blue Apartment’ Building and the Hilton Hotel</td>
</tr>
<tr>
<td>Capital Costs</td>
<td></td>
<td>£9.45m</td>
</tr>
</tbody>
</table>
6.3 GRIP3 Options Summary

A number of external influences took place after GRIP3 and during the single option development at GRIP4 which significantly changed the form of the entrance. The main influences were consultations with key Stakeholders such Leeds City Council, the Environment Agency, Train Operating Companies and interface with adjacent developers.

The Appraisal Summary Table (shown on the next page) confirmed that:

- Option 1Aiii was the preferred option;
- Option 1Aiii achieved the improved accessibility, journey times, allowed for future flexibility and satisfied the Promoter objectives;
- Options 1Ai and 1Aii were rejected due to the impacts on residential properties alongside the River Aire and their cost; and
- Option 1Bi was rejected due to residual security and safety issues, Constructability and the relatively limited passenger capacity available.

River Aire Location

The extensive river deck associated with Option 1Aii is likely to be relatively expensive and reduce the quality of the townscape within a Conservation Area; it was therefore not pursued.

Option 1Bi is situated within an extremely constrained site and there were doubts about how cost effectively it could be constructed. In addition the available pedestrian flow capacity within it was likely to be insufficient to accommodate any growth in passenger demand such as from Holbeck Urban Village. It was rejected as being unlikely to meet the scheme objectives and future requirements.

Any building or structures which are situated over the River Aire in proximity to the adjacent residential apartments will need to minimise visual intrusion. The principal way in which this can be achieved is by limiting how far the building and any structure at height extends away from the face of the railway viaduct. The escalator arrangement extending towards the ISIS Footbridge in Option 1Ai does not achieve this and was consequentially rejected. However the arrangement in Option 1Aiii with the escalators against the viaduct face and lengths split with an intermediate landing allows for a much more compact building and structures. Therefore Option 1Aiii was progressed at it least impacted on third parties.
<table>
<thead>
<tr>
<th>Category</th>
<th>Sub Category</th>
<th>Option 1A</th>
<th>Option 1Ai</th>
<th>Option 1Aii</th>
<th>Option 1Aiii</th>
<th>Option 1Bi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Pedestrian Links</td>
<td>Improves accessibility to the station</td>
<td>Creates wide open space with unrestricted routes, improving accessibility to the station</td>
<td>Improves accessibility to the station</td>
<td>Improves accessibility to the station</td>
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<tr>
<td>Pedestrian Trips</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Key Location Served</td>
<td>Generates greater pedestrian demand than Option 1B</td>
<td>Passengers from the MSBC Appraisal comparison dated 20/03/08: 1.51 million</td>
<td>Holbeck Urban Village and Granary Wharf not served directly</td>
<td>Holbeck Urban Village and Granary Wharf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discriminatory</td>
<td>Provides step free access from the west bank of the River Aire and the ISIS Footbridge</td>
<td>Provides good links to potential development site on Sovereign Street</td>
<td>Negligibly greater interaction than Option 1A variants from the east</td>
<td>Negligibly greater interaction than Option 1A variants from the east</td>
<td></td>
<td></td>
</tr>
<tr>
<td>User Perception</td>
<td>Highly visible from the surrounding area with high pedestrian activity, which is overlaid by a number of developments</td>
<td>Serves the wider area from the south of the station</td>
<td>Negligible effect on sensitive noise receptors</td>
<td>Negligible effect on sensitive noise receptors</td>
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<tr>
<td>Safety</td>
<td></td>
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<tr>
<td>Highway Interaction</td>
<td>Minimal interaction between pedestrians and vehicles, which is further mitigated by low vehicle speeds and low number of vehicles travelling on Dark Neville Street</td>
<td>Journey time saving marginally more than the Option 1A variants from the west</td>
<td>Provides good links to potential development site on Sovereign Street</td>
<td>Provides good links to potential development site on Sovereign Street</td>
<td></td>
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</tr>
<tr>
<td>Potential to enhance regeneration</td>
<td>Pedestrians travel through Granary Wharf area which may encourage wider development or greater use of Dark Arches</td>
<td>Journeymen time saving: 1.1 minutes</td>
<td>Journeymen time saving: 1.6 minutes</td>
<td>Journeymen time saving: 1.6 minutes</td>
<td></td>
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<tr>
<td>Journey Time</td>
<td></td>
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<tr>
<td>Journey time saving</td>
<td>£12,801,000</td>
<td>£18,995,000</td>
<td>£11,956,000</td>
<td>£9,450,000</td>
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<tr>
<td>Comparative Capital Cost</td>
<td></td>
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<tr>
<td>Biodiversity</td>
<td>Considerable impact on the western bank during construction and operation which is in close proximity to a known artificial otter holt</td>
<td>Considerable impact on the western bank during construction and operation which is in close proximity to a known artificial otter holt</td>
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<td>Considerable impact on the western bank during construction and operation which is in close proximity to a known artificial otter holt</td>
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<tr>
<td>Environment</td>
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<tr>
<td>Noise</td>
<td>Construction works required in close proximity to sensitive receptors on the west bank. Once the entrance is operational, the noise from station users is likely to be concentrated on the west bank of the River Aire.</td>
<td>Considerable construction works required resulting in greater effect on sensitive noise receptors.</td>
<td>Once operational, this option would create a public realm space which is likely to increase noise to the nearby residential receptors.</td>
<td>Construction works required in close proximity to sensitive receptors on the west bank, however once operational, the noise from station users will be further away from the sensitive receptors.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Townscape</td>
<td>With appropriate design mitigation, this option could have a beneficial impact on the surrounding townscape.</td>
<td>With appropriate design mitigation, this option could have a beneficial impact on the surrounding townscape.</td>
<td>With appropriate design mitigation, this option could have a beneficial impact on the surrounding townscape.</td>
<td>With appropriate design mitigation, this option could have a beneficial impact on the surrounding townscape.</td>
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</tr>
<tr>
<td>Biodiversity</td>
<td>Considerable impact on the western bank during construction and operation which is in close proximity to a known artificial otter holt</td>
<td>Considerable impact on the western bank during construction and operation which is in close proximity to a known artificial otter holt</td>
<td>Considerable impact on the western bank during construction and operation which is in close proximity to a known artificial otter holt</td>
<td>Considerable impact on the western bank during construction and operation which is in close proximity to a known artificial otter holt</td>
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</tr>
<tr>
<td>Heritage of historical resources</td>
<td>Structure located with the Canal Wharf Conservation Area, however with appropriate design mitigation, this option could have a beneficial impact on the Conservation Area.</td>
<td>Structure located with the Canal Wharf Conservation Area, however with appropriate design mitigation, this option could have a beneficial impact on the Conservation Area.</td>
<td>Structure located with the Canal Wharf Conservation Area, however with appropriate design mitigation, this option could have a beneficial impact on the Conservation Area.</td>
<td>Structure located with the Canal Wharf Conservation Area, however with appropriate design mitigation, this option could have a beneficial impact on the Conservation Area.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Environment</td>
<td>Considerable construction works required over the River Aire.</td>
<td>Considerable construction works required over the River Aire.</td>
<td>Considerable construction works required over the River Aire.</td>
<td>Considerable construction works required over the River Aire.</td>
<td></td>
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</tr>
<tr>
<td>Journey Ambience</td>
<td>Compared to the existing baseline, in terms of journey ambience, this option could be perceived to be an attractive, open and less crowded space to use resulting in reduced traveller stress compared to Option 1B</td>
<td>Compared to the existing baseline, in terms of journey ambience, this option could be perceived to be an attractive, open and less crowded space to use resulting in reduced traveller stress compared to Option 1B</td>
<td>Compared to the existing baseline, in terms of journey ambience, this option could be perceived to be an attractive, open and less crowded space to use resulting in reduced traveller stress compared to Option 1B</td>
<td>Compared to the existing baseline, in terms of journey ambience, this option could be perceived to be an attractive, open and less crowded space to use resulting in reduced traveller stress compared to Option 1B</td>
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<tr>
<td>Integration</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Improve Modal Interchange</td>
<td>It is considered that all options will encourage modal change because they make the station more accessible. Furthermore these options improve links to the bus stops on Neville Street</td>
<td>It is considered that all options will encourage modal change because they make the station more accessible. Furthermore these options improve links to the bus stops on Neville Street</td>
<td>It is considered that all options will encourage modal change because they make the station more accessible. Furthermore these options improve links to the bus stops on Neville Street</td>
<td>It is considered that all options will encourage modal change because they make the station more accessible. Furthermore these options improve links to the bus stops on Neville Street</td>
<td></td>
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</tr>
<tr>
<td>Wider Government Policy</td>
<td>It is considered that all scheme options will meet the wider Government policy objectives.</td>
<td>It is considered that all scheme options will meet the wider Government policy objectives.</td>
<td>It is considered that all scheme options will meet the wider Government policy objectives.</td>
<td>It is considered that all scheme options will meet the wider Government policy objectives.</td>
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<td></td>
</tr>
<tr>
<td>Fit With Land Use Policy</td>
<td>It is considered that all scheme options will fit with and complement local land use policies.</td>
<td>It is considered that all scheme options will fit with and complement local land use policies.</td>
<td>It is considered that all scheme options will fit with and complement local land use policies.</td>
<td>It is considered that all scheme options will fit with and complement local land use policies.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexibility for Future Upgrades</td>
<td>It is considered that a benefit of the Option 1A variants is the flexibility in the design</td>
<td>The site is confined and there is little opportunity to improve the design or add on future upgrades.</td>
<td>The site is confined and there is little opportunity to improve the design or add on future upgrades.</td>
<td>The site is confined and there is little opportunity to improve the design or add on future upgrades.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promoters’ Objectives</td>
<td>The promoters’ objectives of providing a safe and secure passenger environment; a design which is fully compliant with disabled passenger access requirements; minimisation of passenger journey times</td>
<td>Discriminatory to mobility impaired pedestrians because it does not provide access to both banks of the river</td>
<td>Discriminatory to mobility impaired pedestrians because it does not provide access to both banks of the river</td>
<td>Discriminatory to mobility impaired pedestrians because it does not provide access to both banks of the river</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promoted/Rejected</td>
<td>REJECTED</td>
<td>REJECTED</td>
<td>PROMOTED</td>
<td>PROMOTED</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7. Post GRIP3 Scheme Influences

During the hiatus between the GRIP3 and GRIP4 studies a number of external factors which were outside of the control of the Design Team shaped the form the LSSE design, The influential factors along with their approximate timing are described in this section.

7.1 Structural Loads on the Viaduct

Following a structural investigation by Network Rail it was established that the railway viaduct and existing station have limited additional load bearing capacity, therefore the new LSSE structure must be substantially supported by other means, and ideally be structurally independent.

7.2 Flood Risk Level

The flood risk design level was initially agreed with the EA to be 1% AEP (1 in 100 year) plus 20% for climate change and this was the case for GRIPs 1 to 3. However in response to the emerging Leeds Flood Alleviation Strategy, in January 2009, the EA increased the flood risk level requirement to 1 in 200 years. This has significant implications for options in the vicinity of the River Aire with all proposed works over the river channel to be raised significantly above the river bank level; and the resultant level difference with ground level overcome with ramps, lifts and stairs.

In order to minimise the height and extent of ramps and stairs, the LSSE river deck became a composite concrete/steel type construction, to reduce the LSSE deck depth.

7.3 ISIS Footbridge over the River Aire

Representatives of the Granary Wharf development were consulted during the various GRIP studies to help achieve compatibility with the LSSE scheme. However, the schemes followed different timescales, and the ISIS Footbridge (constructed circa 2009) would be difficult to integrate with certain LSSE options which initially sought to form a connection with it. Furthermore, provision of step free access to both river banks via the new ISIS Footbridge was not confirmed during the initial discussions although it was understood to be part of the proposals. The final scheme as implemented does provide step free access to both banks, albeit the eastern bank has a combination of steps and an indirect ramp return down to footway level on Little Neville Street.

The GRIP3 layout proposed to have a link tying into the ISIS Footbridge where it landed on the west bank of the River Aire. However, the support constructed for the ISIS Footbridge comprises a tall, deep weathering steel ‘goalpost’ arrangement which rendered the GRIP3 link bridge impossible to construct. This led to the LSSE design changing to turn back on itself and direct passengers back into the Dark Arches utilising the existing footbridge on Dark Neville Street.
7.4 Consultation with the SFO

During consultation with the station facility operator (SFO) it was ascertained that they had safety concerns for their staff who it was anticipated would operate the ticket barriers especially during unsociable hours. They did not want staff to be in a remote and secluded environment (the river deck level) away from the main station activity. As a consequence, the ticket barriers were moved from deck level up to the concourse level on the Western Footbridge.

7.5 Local Businesses

The option to include a walkway along the east bank of the River Aire, parallel to the ‘Blue Apartment’ Building which provided access to the ISIS Footbridge (east bank) was compromised when Planning Permission was granted for a deck out over the River Aire. The deck can be seen in Figure 7.2.
The ramp proposed at GRIP3 for Option 1Aiii and provided on the west bank of the River Aire extending towards the public space in Granary Wharf was acknowledged as blocking access to retail units with the Dark Arches as seen in Figure 7.3 below and therefore the ramps were routed through the Dark Arches to maintain access to these retail units.

Figure 7.3: Retail Units in Granary Wharf

Source: Mott MacDonald
7.6 **GRIP4 Design Tender**

During the GRIP 4 tender process, tenderers were informed of the changes in circumstances and constraints post GRIP3 and took these into account. These changes included the developments since the completion of the GRIP 3 work and the concern that the lower end of the escalators and the stairs were very close to neighbouring buildings. As part of their submission Aecom proposed an alternative design which re-orientated the escalators at right angles to the viaduct; this produced a more compact overall design. The initial illustrations of this proposal included in the tender documentation showed the entrance contained within a ‘box’ shaped building.
8. GRIP4 ~ Options Appraisal

8.1 Options Overview

The options rejected and the single option progressed from GRIP3, along with associated key issues are shown on the schematic flow chart contained in Appendix B.

Aecom was commissioned by Network Rail to undertake a GRIP4 feasibility study which was reported in April 2009, and considered a single option comprising the following elements:

- A connection to an extended station Western Footbridge
- The LSSE building situated above the River Aire supported by an extension of the railway viaduct piers
- A lower level concourse extending back into the railway viaduct arches and connecting with a new footbridge over the river at Dark Neville Street
- Link bridges to either bank of the river

In addition, further stakeholder consultation took place which introduced additional requirements, these were:

- Northern Rail stated their preference for the ticket office and barriers to be located at footbridge level to provide better integration with the rest of the station.

  The connection with the western footbridge was widened over and above that provided by the GRIP 3 work. To achieve this, the connection with the western footbridge was widened over and above that provided by the GRIP 3 work.

- At a meeting with the Environment Agency, new design flood levels over the River Aire arising from new proposals for a flood alleviation scheme through Leeds. These levels were over 1m higher than had been advised at the GRIP 3 stage.

  The impact of was minimised by utilising a thinner deck construction to maintain the GRIP3 upper deck level. However, the revised design flood level required the lengthening of the ramps between the entrance deck and the adjacent river banks to accommodate the level change. This necessary as the underside of the deck could not be lowered over the river due to the flooding design constraints, also meaning that the ramps descent could begin over the river.

8.2 Planning Process Influences

The preferred solution at the start of GRIP4 was discussed extensively with Leeds City Council (LCC) in their role as Local Planning Authority. This was to help align the scheme with the views of LCC and their requirements in advance of submitting a planning application to them.

The following key design principles were discussed and developed by the LSSE team in conjunction with LCC; and these were reflected in the scheme Planning, Design and Access Statement. Therefore these issues were an integral part of the GRIP4 design development.
Proximity of Neighbouring Developments

The ‘Blue Apartment’ Building Apartments and Waterman Place Apartments were built in close proximity to the banks of the River Aire and to the Railway Viaduct which restricts opportunities for siting the building to avoid overshadowing and overlooking, as well as the available area on the banks for structural support. The Aecom development note (Appendix D) also notes that one of the two eastern lifts was moved to the western side of the building leading to the ‘stepped arch’ profile which was maintained through planning approval.

Structural Loads on the Railway Viaduct and Existing Station

Investigations of the railway viaduct has discovered that it has limited additional load bearing capacity so the new structure must be substantially supported by other means (i.e. structurally independent).

Figure 8.1: Extension of Existing Railway Viaduct Piers

Extension of the two railway viaduct brick piers to span the deck between resolves the structural issue and minimises the impact of the support piers in the river flow. Hydraulic analysis has indicated that no increase to river levels would occur as a result of extending piers. There is insufficient space available on the river banks to provide any substantial structural support (i.e. constructing in the river is the only solution).

Figure 8.2: Maximising Visual Impact from the South Whilst Minimising the Blockage View to the Railway Viaduct

By siting the structure perpendicular to the railway viaduct and in line with the two central piers the obscuration of the railway viaduct is minimised and the amount of natural light able to get through to Dark Neville Street is maximised.

Figure 8.3: Minimise Impact on Adjacent Buildings

The form of the canopy (curved) minimises the size of the enclosure in order to reduce overshadowing and proximity to the neighbouring buildings to a minimum and was also considered to be more sympathetic to the existing station roof.

Figure 8.4: Proximity on Adjacent Buildings
Additionally, siting the building perpendicular to the railway viaduct reduces its proximity to the flanking buildings.

Figure 8.5: Link to Dark Neville Street

An important link is the key pedestrian route across on Dark Neville Street for which there are current proposals for future improvements. A direct link to Little Neville Street was not possible without forming a large d over the River Aire.

Figure 8.6: Adjoining and Respecting the Existing Form of the Station and Viaduct

The design of the structure picks up and continues the rhythm of the existing station roof by joining into the end bay of the barrelled north light roof, at the same time bringing this section forward in line with the rest of the existing west elevation from its current set back position. The form of the new canopy will effectively mitre in to that of the existing station roof.

The eaves line of the canopy roof is simply continued, dropping over the side of the viaduct and sweeping into the form of the flanking bridges at ground level. This naturally sets the new canopy slightly away from the viaduct revealing a glazed section between new and old.

Figure 8.7: Material Choice

Gold coloured copper/aluminium shingles reflect light, require minimal maintenance, and are striking in form. The colour of the shingles fits well within an eclectic palette of neighbouring materials. In colour it is similar in appearance to the yellow/beige cladding tiles of Blue apartment encouraging a visual association between the two. As a metallic material it is very similar to the feature balconies of the ISIS development. The quickened natural ageing process of the material associates with the age and rugged appearance of the viaduct whilst the shingles themselves are similar in scale to the brickwork of the viaduct and other surrounding cladding materials.

Source: Leeds Station South Entrance Planning, Design & Access Statement

The GRIP4 report was completed in April 2010 and took cognisance of the discussions with LCC outlined above. In October 2009, a Planning Application for the LSSE project was submitted to LCC and planning permission granted in May 2010.
8.3 Options Commentary

8.3.1 River Aire Diagonal Escalators (1Aiv)

The proposed GRIP4 scheme for LSSE is a development of Option 1Aiii from GRIP3. It comprises a new structure over the River Aire with decks and bridge connections to the east and west banks of the River Aire and a connection into Dark Neville Street. The structure supports lifts, escalators and stairs to provide a connection into the existing station Western Footbridge providing direct access to all platforms. The station Western Footbridge would be extended and widened to the south and west over platforms 15, 16 and 17, connecting to the new entrance at the footbridge level.

Figure 8.8: GRIP4 – Selected Option

Source: GRIP4 Report (Faber Maunsell, April 2009)

Key Considerations

- This option directly serves the significant pedestrian demand which is understood to be in the vicinity of the Bridgewater Place, Granary Wharf and Holbeck Urban Village area; therefore it should provide greatly reduced passenger walking times to and from the station. It also serves areas east of Neville Street for which journey time savings may be moderate to marginal from this location.
- The area of land between the railway viaduct and the ‘Blue Apartment’ Building would require urban realm improvements to enhance the public environment and encourage users.
- The stairs to ramp arrangement within the Dark Arches (Dark Neville Street) restricts the manoeuvrability of certain delivery vehicles which undertake a three-point turn to exit via Granary Wharf area; this should be resolved at GRIP5.
- Lengthy pedestrian access ramps are required (due to the design flood risk level over the river channel) to provide a DDA compliant route to and from LSSE. A ramp from the end of the eastern link bridge would block the Little Neville Street access to the Dark Arches. A ramp from the end of
the western link bridge would also block access to the Dark Arches as well as conflicting with the access and frontage of retail units. Therefore, the access ramps have been located within the Dark Arches and are connected to LSSE via a concourse deck extending back to Dark Neville Street.

- The stepped link bridges on the outside of the railway viaduct serve two purposes, namely:
  - The link bridges provide an emergency access route outside of the Dark Arches and this is useful for when an incident (such as a fire or terrorist incident) creates a hazard within the undercroft; therefore passengers can evacuate via a route clear of this
  - The links provide direct stepped access to the entrance which enhance the journey time saving for most users.

### Key Design Changes from GRIP3

- **Extension of viaduct piers**: minimises the impact of structure supports on the river flow;
- **Structure perpendicular to viaduct**: enables re-siting of structure away from apartments reducing the proximity to the neighbouring apartments; also leaves three arches fully open and maximises the natural light entering Dark Neville Street;
- **Change to a curved canopy**: minimises the size of the building enclosure, reducing overshadowing and proximity to the neighbouring apartments;
- **Escalator arrangements**: in previous stages the escalators descended in a single stage, the two ‘stage’ arrangement with escalators descending into the viaduct arch reduces the volume of the building outside the viaduct and the impact on the neighbouring apartments;
- **Links to Dark Neville Street**: Retains the key pedestrian links to and along Dark Neville Street; and
- **Cladding materials changes**: copper/aluminium shingles reflect light, further reducing the impacts of the new structure, with the materials complementing those used in the immediate developments and the railway viaduct.
### Table 8.1: GRIP4 – Option Review

<table>
<thead>
<tr>
<th>Category</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian Provision</td>
<td>Direct pedestrian access from the both banks of the River Aire serving the main area of demand</td>
<td></td>
</tr>
<tr>
<td>Step Free Access</td>
<td>Ramped access from both banks of the river via Dark Neville Street.</td>
<td></td>
</tr>
<tr>
<td>Access / Egress</td>
<td>Direct access to the station Western Footbridge providing direct access to most station platforms</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>Largely structurally independent from the station</td>
<td></td>
</tr>
<tr>
<td>Architectural</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Environmental</td>
<td>Design modifications from GRIP3 stage have improved the entry of natural light to the Dark Arches and reduced the shadow casting impact on the riverside apartments</td>
<td>Some residual restriction of views of the viaduct and reduced natural light entering the Dark Arches Works over the river may create slight adverse effects on ecology. This is to be reviewed in detail and incorporated mitigation defined</td>
</tr>
<tr>
<td>Operational</td>
<td>Significant journey time savings from the Bridgewater Place, Granary Wharf, Holbeck Urban Village area</td>
<td>Only moderate to marginal journey time savings from areas east of Neville Street compared with a route via the Rotunda steps or Swinegate</td>
</tr>
<tr>
<td>Construction</td>
<td>Construction over the river</td>
<td>Extremely constrained site; construction would be very difficult and complex if a tower crane could not be located within or adjacent to the LSSE building. This would need to be confirmed in consultation with a crane provider and may require 3D modelling to prove its feasibility. Alternative construction methodology appear feasible but would add to cost and programme</td>
</tr>
<tr>
<td>Urban Design &amp; Regeneration</td>
<td>Opportunity to enhance area between the railway viaduct and the ‘Blue Apartments’ building. Potential for small retail unit under escalator at street level LSSE presents a single coherent building which acts as a landmark structure.</td>
<td></td>
</tr>
<tr>
<td>Third Party Impact</td>
<td>Rotation of the structure from earlier GRIPs, changes in the building position and shape and reductions in the building volume have reduced the visual intrusion and impact on the riverside apartments</td>
<td></td>
</tr>
<tr>
<td>Traffic and Servicing</td>
<td>Does appear to directly conflict with vehicular access routes</td>
<td></td>
</tr>
<tr>
<td>Comparative Capital costs</td>
<td></td>
<td>£14.132m</td>
</tr>
</tbody>
</table>
8.3.2  SBS Architects Access Review

The GRIP4 design (Option 1Aiv) has multiple access points to LSSE and lengthy access ramps in order to provide step free access from both banks of the river. Metro wished to ascertain whether the LSSE access arrangements could be rationalised in order to shorten the step free access routes and provide a more focused station entry point. SBS Architects were commissioned to undertake a review of the pedestrian access proposals in September 2011 in advance of the next design phase (GRIP5). Their review included an assessment of the GRIP4 preferred option, and considered potential variations of this base design.

8.3.2.1 Existing Scheme (GRIP4)

Figure 8.9: Existing Scheme

SBS Architects Comments on GRIP4 Design

- The step and ramp landing are combined which is not recommended within the code of practice;
- Pedestrian flows are hindered by escalator positions at deck level;
- The run-off at the escalator landings is too short and needs to be 6m; and
- The steps linking into the ramp (referenced as ‘C’ above in Figure 8.9) at the western end of the Dark Neville Street prevent service vehicles undertaking a 3-point turn to exit Dark Neville Street.

Please note that Metro did not accept all of these comments and further work such as pedestrian flow modelling was subsequently commissioned to make sure the GRIP4 design was in accordance with standards and robust.
8.3.2.2 SBS Alternative Option 1

Figure 8.10: Design Review Option 1

**SBS Architects Comments on Alternative**

- Does not provide step free access from the west bank of the River Aire.

This option was not recommended by SBS Architects to Metro.
8.3.2.3 SBS Alternative Option 2

Figure 8.11: Design Review Option 2


SBS Architects Comments on Alternative

- This option improved the pedestrian flow;
- Only step free access provided from the west bank;
- Access to the existing sub station in the Dark Arches is not maintained;
- This option would not meet the EA’s flood risk requirements with regard to the ramped access to the concourse deck; and
- The run-off at the escalator landings is too short and needs to be 6m.

This option was not recommended by SBS Architects to Metro.
8.3.2.4 SBS Alternative Option 3

Figure 8.12: Design Review Option 3

SBS Architects Comments on Alternative

- Pedestrian flow requirements met;
- The run-off at the escalator landings is too short and needs to be 6m;
- The option reduces the benefit cost ratio of scheme due to increased journey times for able bodied pedestrians;
- Creates additional Network Rail liability over Dark Neville Street Bridge; and
- No vehicle access along Dark Neville Street.

This option was recommended by SBS Architects to Metro.
8.4 Options Summary

The GRIP4 option was developed in conjunction with major stakeholders and in particular Leeds City Council so that it minimised potential impacts on third parties whilst meeting the scheme objectives. A significant amount of environmental baseline data gathering was undertaken and consideration given to how this should shape the design, and in particular the incorporated mitigation.

The GRIP4 design (Option 1Aiv) has multiple access points to LSSE and lengthy access ramps in order to provide step free access from both banks of the river. SBS Architects were commissioned to undertake a review of the pedestrian access proposals and this identified potential variations on the GRIP4 design which included:

- Alternate arrangements of step free access routes;
- Modification to the walkway wings adjacent to the viaduct; and
- Alternate detailed layout changes to address their comments on the design.

Several meetings were held between the promoters and SBS Architects to discuss their alternative access proposals. SBS Options 1 and 2 were rejected on the basis that they did not add value to the scheme and some of the issues they sought to address could be dealt with in other ways within the GRIP4 design. SBS Option 3 appeared to offer a rationalised access arrangement focused on a single point of entry (within Dark Neville Street) to LSSE. This potentially provided a more coherent solution that would strengthen (over GRIP4 proposals) the identity of LSSE by consolidating access arrangements. However it was acknowledged that SBS Option 3 did not provide an emergency evacuation route clear of the station underground.

Concept proposals for SBS Option 3 were developed and a capital cost produced on a like for like basis with the GRIP4 scheme. This was put to the Metro Project Board who considered that the additional £1.7 million (to be confirmed) was not affordable and consequently SBS Option 3 was rejected on that basis.

The GRIP4 design (Option 1Aiv) will form the basis of the Transport and Works Act Order application and be further developed at GRIP5.
9. Post GRIP4 Scheme Issues

9.1 Major Scheme Business Case

The Major Scheme Business Case for LSSE was submitted in December 2009 with an estimated benefit to cost ratio of 5.1:1 and scheme outturn cost of £15.2 million, of which 90% of funding was sought from the Department for Transport (DfT). Programme Entry Approval was granted for the scheme on 23rd March 2010 with an approved DfT funding contribution of £13.7 million.

9.2 Best and Final Funding Bid

As part of government’s Comprehensive Spending Review (announced in June 2010) the scheme’s Programme Entry Status was suspended. The promoters (Metro) were asked to review the scheme’s benefits and the contribution from central government as part of a Best and Final Offer submission to DfT.

The revised cost estimate at re-submission in January 2011 was £16.282 million, an increase as a result of inflation, updated Quantified Risk Assessment, additional work required for the Business Case and to meet the requirements of a changing approvals process. However, value management exercises identified a series of costs saving measures, risk and procurement changes which reduced the outturn scheme cost to £14.4 million. The Best and Final Funding bid sought £12.4 million from DfT, with the remaining £2 million being provided by Metro and Leeds City Council. No significant changes to the scope of the scheme were proposed as part of the re-submission.

Programme Entry approval was (re) awarded in February 2011, subject to the application for statutory powers and a cap on DfT funding of £12.4 million.

9.3 Transport and Works Act Order

In October 2009, a planning application for the LSSE project was submitted to Leeds City Council (LCC) and permission was granted in May 2010. However in addition to planning permission, the scheme requires Works powers and given the programme delay, renewal of planning consent before implementation.

In June 2011, the Department for Transport (“DfT”) confirmed that in order to authorise the construction and maintenance of the scheme, an application could be submitted for an order under the Transport and Works Act 1992 (“the 1992 Act”). Accordingly, an application has been prepared to be submitted to the Secretary of State for an order under sections 1 and 3 of the 1992 Act.

An order is required under sections 1 and 3 of the 1992 Act to authorise:-

a) the construction and maintenance of a new station entrance at Leeds Railway Station;

b) the carrying out of works in the Aire and Calder Navigation adjacent to the southern boundary of Leeds Railway Station and associated with a) above;

c) the carrying out of other works and the exercise of powers required in connection with or ancillary to the matters set out in items a) and b) above; and

d) the acquisition of land and rights over land required in connection with items a), b) and c) above.

The application is being promoted jointly by Metro and Network Rail Infrastructure Limited. In addition, a request for a direction as to deemed planning permission will also be submitted to the Secretary of State under section 90(2A) of the Town and Country Planning Act 1990. An application for conservation area consent is also being submitted in respect of works proposed to be undertaken at Water Lane, Leeds as part of the overall scheme. It is intended that an application for an order will be submitted to the Secretary of State in Spring 2012.
10. Options Review Workshop

10.1 Overview
A workshop was organised to gather project stakeholders and design team members who were involved in the scheme during the previous design stages up to the current GRIP4 and Planning Permission stage. The workshop drew together the previous design material for the scheme in a common comparable format to facilitate discussion of the issues at the previous design stages; and to agree scoring of the New Approach to Transport Appraisal (NATA) style Appraisal Summary Tables (AST) to provide a common basis for comparison against the Government and Promoter objectives.

The discussions between the attendees at the workshop (in Table 10.1) clarified the options selection process and issues which arose during the life of the project. This helped to form a narrative of the scheme development and optioneering process. The options review workshop took place on 9th December 2011 at the Mott MacDonald's Leeds office at Brewery Wharf.

Table 10.1: Workshop Attendees

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Name</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joanne Blignaut</td>
<td>Metro</td>
<td>Sue Cooke</td>
<td>Network Rail</td>
</tr>
<tr>
<td>Ben Whitaker</td>
<td>Metro</td>
<td>Tony Rivero</td>
<td>Network Rail</td>
</tr>
<tr>
<td>Tom Gifford</td>
<td>Metro</td>
<td>Steve Warbis</td>
<td>Network Rail</td>
</tr>
<tr>
<td>Caroline Young</td>
<td>Metro</td>
<td>Guy Smith</td>
<td>Bauman Lyons</td>
</tr>
<tr>
<td>Kate Morris</td>
<td>AECOM</td>
<td>Matt Murphy</td>
<td>Bauman Lyons</td>
</tr>
<tr>
<td>Chris Lewis</td>
<td>AECOM</td>
<td>Jason Smith</td>
<td>Mott MacDonald</td>
</tr>
<tr>
<td>Andrew Farnworth</td>
<td>Network Rail</td>
<td>Daniel Weir</td>
<td>Mott MacDonald</td>
</tr>
<tr>
<td>Debra Armistead</td>
<td>Network Rail</td>
<td>Andrew Norman</td>
<td>Mott MacDonald</td>
</tr>
<tr>
<td>Rob Clarke</td>
<td>Network Rail</td>
<td>John Kennedy</td>
<td>Mott MacDonald</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

10.2 Workshop Objectives
The principal workshop objective was to confirm and record the scheme development rationale from the initial concept at GRIP1 to the current GRIP4 design stage.

The workshop would also consolidate the project experience and evidence from the teams in order to provide a coherent narrative of how the preferred scheme design was developed. The confirmation of the basis of the evidence, contextual constraints, changing circumstances and decisions at each design stage and drawing these together into a coherent narrative will help to provide a compelling and robust case for the design development should the scheme be tested at Public Inquiry.

10.3 Minutes of the Workshop
Please refer to Appendix C for a copy of the minutes from the workshop; these provide a record of the discussions at the workshop.
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## Appendix A. References

Table A.1: Documents Provided to Mott MacDonald

<table>
<thead>
<tr>
<th>Document Name</th>
<th>Reference</th>
<th>Prepared by</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRIP1 Feasibility Study – Leeds City Station Southern Entrance</td>
<td>B30356</td>
<td>Corus</td>
<td>September 2006</td>
</tr>
<tr>
<td>GRIP2 Study (Pre-feasibility) – Leeds Station South Entrance</td>
<td>B40021</td>
<td>Corus</td>
<td>April 2007</td>
</tr>
<tr>
<td>GRIP3 Option Selection – Leeds Station South Entrance</td>
<td>B40021 Revision B</td>
<td>Corus</td>
<td>October 2007</td>
</tr>
<tr>
<td>Appraisal Summary – Leeds Southern Entrance</td>
<td></td>
<td>Steer Davies Gleave</td>
<td>March 2008</td>
</tr>
<tr>
<td>(summary document outlining GRIP3 options BCRs, walk times and growth statistics)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost Analysis – QCRA Report (held 21/05/2008)</td>
<td>102506 Version 1</td>
<td>Network Rail</td>
<td>June 2008</td>
</tr>
<tr>
<td>GRIP4 Report – Leeds Station Southern Entrance</td>
<td>60092600/1002</td>
<td>AECOM</td>
<td>April 2009</td>
</tr>
<tr>
<td>Leeds Station South Entrance – Report for Value Engineering Workshop</td>
<td></td>
<td>Turner and Townsend</td>
<td>March 2009</td>
</tr>
<tr>
<td>Leeds Station Southern Entrance – Transport Statement</td>
<td></td>
<td>AECOM</td>
<td>September 2009</td>
</tr>
<tr>
<td>Leeds Station Southern Entrance- Major Scheme Business Case</td>
<td></td>
<td>Steer Davies Gleave</td>
<td>November 2009</td>
</tr>
<tr>
<td>Leeds Station Southern Entrance – Step Free Access Design Review (Stage 1 and 2)</td>
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<td>SBS Architects</td>
<td>September 2011</td>
</tr>
<tr>
<td>Leeds Station Southern Entrance – Existing and Proposed Option Review Summary</td>
<td></td>
<td>SBS Architects</td>
<td>September 2011</td>
</tr>
</tbody>
</table>

Source: Metro WYPTE and Network Rail
Appendix B. Option Development Flowchart
Appendix C. Scheme Location and Design Rationale Workshop Minutes
1.0 Introduction - Jason Smith

The objectives of the workshop were outlined at the start of the session; with the principle aim to develop the narrative of how the current scheme design was developed in order to provide a compelling and robust case should the scheme be tested at Public Inquiry.

The previous reports had been reviewed to generate the current narrative. However, the case could be strengthened by drawing upon the prior knowledge of the project from those attending the workshop and to further develop the narrative.

This would also serve as a review and verification of the option decision making at each GRIP stage to be contemporaneous although subsequent changes in circumstances can be noted for information.

The advantages/disadvantages listed below are either additional items raised during the workshop or a further explanation to those presented with more reasoning/rationale to clarify reasoning etc.

2.0 Option Development Overview - Daniel Weir

2.1 GRIP 1 Stage

Overarching Comments

- River Aire footbridge: It was confirmed that there was a footbridge (on a different alignment) near the current ISIS bridge location before the GRIP1 stage which was replaced by the ISIS bridge.
<table>
<thead>
<tr>
<th>Item</th>
<th>Text</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Leeds Station Gating:</strong> Leeds station was ‘open’ (with no tickets barriers, but with staffed booths) at the early GRIP stages with consideration of gating included at GRIP4 – RC. [installed late 2008 – JK post meeting addendum]</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Pedestrian Flow Study:</strong> RC stated that scheme came about from pedestrian flow studies which indicated congestion would develop in the station; giving rise to a need, to provide another entrance. The entrance should cater for approximately 10% of the existing passenger flows, maintaining capacity over time and to provide an additional DDA compliant entrance. These would be the main ‘drivers’ at the inception of the scheme.</td>
<td></td>
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<tr>
<td></td>
<td><strong>Catalyst for LSSE:</strong> the original catalyst for the scheme was confirmed as the aspiration to accommodate future growth and tie-in to the development areas to the south of the station</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Metro were initially a consultee rather than a funder but became more involved at the GRIP3 stage – BW / TG.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o At GRIP1 Network Rail were not aware of the details of the Granary Wharf developments.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Overarching ‘Disadvantage’ at GRIP1:</strong> SW noted that at the GRIP1 stage there was uncertainty about the nature and detail of the Canal Wharf developments and how these would pan out was an underlying concern. Also there was uncertainty of how or if agreement could be reached with developers or whether constraints may be imposed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>It was indicated that during the early stages there was an assumption that as the Canal Wharf proposals developed, communication with developers would attempt to tie-in with the proposals, however this did not come to fruition – RC.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Overarching Disadvantages:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Potential impacts on neighbours adjacent to the River Aire, i.e. overlooking buildings and impacts on access and servicing arrangements.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o For all early GRIP stages – risks associated with trying to pursue uncertain options, e.g. reliance on third party developments or permissions needs to be noted – SW.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o All options that provide access from the east bank of the River Aire would require development of ‘urban realm’ / public spaces to overcome the existing poor environment between the Blue Building, the railway viaduct and Little Neville Street. There are also negative impacts on commercial uses with some options (exits, servicing, useful occupation of spaces).</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Construction Complexity:</strong> It was agreed that construction complexity is not a ‘show stopper’ reason for an option to be rejected. Whilst some options are more complex than others to construct, it is considered that all options are relatively complicated and therefore construction complexity should not form part of the options judgement.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Journey Time Savings:</strong> At GRIP1, journey time savings were not the key driver; this came later and became more relevant at the MSBC stage.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Maintaining Visibility of Viaduct:</strong> Through consultation with Leeds City Council’s Planning Officers, maintaining the visibility of the viaduct arches (as much as possible) arose during the Planning Permission Application process.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Platform Congestion:</strong> Platform 16 experiences congestion at peak periods near the escalators, stairs, and lift. There are also capacity constraints on the route to/from Platform 16 and Platform 17.</td>
<td></td>
</tr>
</tbody>
</table>
Any option should not worsen the existing situation in terms of congestion and pedestrian distribution.

- **Crossing Neville Street**: Crossing Neville was considered a safety issue particularly in the west to east direction since pedestrians are channelled towards Sovereign Place across Neville Street (a busy 3 lane carriageway). Whereas, in the east to west movement pedestrians are channelled along Sovereign Street and cross at the signal controlled junction of Neville Street with Little Neville Street (albeit with no formal crossing facilities).

  **Context:**
  - At GRIP1 (i.e. 2006) it was pre-recession and that multiple developments including the Sweet Street area were proposed providing large pedestrian generators/attractors to the southwest.
  - Whereas Criterion Place development (speculated at the time) was only the main pedestrian generator/attractor to the south east.
  - With Swingate Shortcut (located to the east) would continue serve the east and southeast of Leeds, the balance of flows would be greater from the southwest, generating in the order of 7% of pedestrian demand and the southeast generating 3%.

**Option 1**

In addition to the existing advantages and disadvantages drawn out from the documentary evidence, the following items were also raised:

- **Option 1**: Post GRIP1 clarification determined that the design would not be able use the existing viaduct piers; due to the turning movements that would be imposed on the viaduct façade.
- Developer uncertainty as outlined for GRIP1 (the exact details of the ISIS Development were unknown at that stage).

**Option 2**

- **Advantages**: This option ties directly into Platform 16/17 rather than the Western Footbridge and therefore the structure adjacent to the railway viaduct would be smaller and not extend out as far as the other options (hence less intrusion).
- **Disadvantages:**
  - “Does not directly serve all Platforms” – i.e. a convoluted route
  - Platform 16 and 17 cannot safely accommodate demand from the new entrance in addition to the existing flows due to narrow platform widths and congestion around the stairs, escalator and lifts.

**Option 3**

- **Disadvantages:**
  - Vertical Movement: The stair provision for this option did not work very well in terms of efficient movement of pedestrians and would only work with the inclusion of Lifts and escalators.
  - Connection with Platform 16 occurs at a congested point where the existing
Record of meeting/discussion
Continuation sheet

Project No. 296480

Date of Meeting Friday 9th December 2011

<table>
<thead>
<tr>
<th>Item</th>
<th>Text</th>
<th>Action</th>
</tr>
</thead>
</table>

stairs and escalators land and will create conflicting pedestrian movements.

- Significant adverse impacts on neighbours, i.e. access, servicing and operation with further impacts including visual intrusion on the Blue Apartments.
- Constrains the potential retail usage of Dark Neville Street.
- The inclusion of staff and passenger amenities (staff welfare, ticketing and supervision) were considered at ground level for this option, however the accommodation was constrained by the space available – SW.

Option 4

- **Option design clarifications / issues:**
  - There are a number of Location Cases (LOCs) at the eastern end of the station which would need to be relocated with this option – CL / RC.
  - Additional variants / considerations included options to extend the structure to the east – RC.
  - The viaduct arches at this location did have active tenants / businesses at this time and would have been impacted by this option – AF / RC.
  - The eastern footbridge is not compliant for step-free (DDA) access without improvement works to provide lifts – KM / RC.
  - There are safety issues relating to platform width near the stairs as discussed in previous options, however this option ties in towards the eastern end of the platform 16 which is designated for Transpennine services (also platform 15) – GS. Potentially two services can arrive at once on this platform which may lead to congestion.

- **Advantages:**
  - It was considered that there is more ‘room’ at this end of the station, with potential to develop the station further and tie-in with LCC’s aspirations for the area to the south east of the station.

- **Disadvantages:**
  - The entrance does not ideally meet with the land use policy in that the entrance doesn’t directly serve Granary Wharf and Holbeck Urban Village areas. Additionally the entrance would be remote from the stations’ facilities and amenities - SW.
  - Journey time saving from western side of Neville Street would be reduced because pedestrians would have to access the entrance via Dark Neville Street or Little Neville Street, cross Neville Street and then walk to their desired platform via a convoluted route within the station because there is no direct access to each platform. Therefore pedestrians from the southwest may continue to use the existing access, depending on which platform that they use.
  - Accessibility for mobility impaired pedestrians on Platform 16 would be convoluted because lifts are only provided at the western end of the platform – SW.
  - “Pedestrians from Holbeck Urban Village and Granary Wharf required to cross busy 3 lane carriageway” – DW.

- **Option Variants:** It was acknowledged that this option would not work on safety grounds due to platform widths. However, a variant of this was carried forward using workable features which connected at footbridge level.
<table>
<thead>
<tr>
<th>Item</th>
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<tbody>
<tr>
<td><strong>Option 5</strong></td>
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<tr>
<td><strong>Option design clarifications:</strong></td>
<td></td>
<td></td>
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<tr>
<td>o The option makes use of an existing route in the station undercroft and punches a hole through on Platform 8 – TG / TR.</td>
<td></td>
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<tr>
<td><strong>Advantages:</strong></td>
<td>no additional risks for pedestrians, except those crossing Little Neville Street – GS.</td>
<td></td>
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<tr>
<td><strong>Disadvantages:</strong></td>
<td></td>
<td></td>
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<tr>
<td>o Location remote from Holbeck Urban Village [south western developments / areas] and other station facilities/welfare – SW.</td>
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<tr>
<td>o Most pedestrian flows were thought to be from the western side of the station – JAS. [In the workshop figures of approximately 10% of the total station demand were quoted with approximately a 70/30 split, 7% from the west and 3% from the east.)]</td>
<td></td>
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<tr>
<td>o Concern over available space on Platform 8 at this location and potential disturbance to train services – TG [particularly national services – JK addendum].</td>
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<tr>
<td><strong>Option 6</strong></td>
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<tr>
<td><strong>Option comments:</strong></td>
<td></td>
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<tr>
<td>o The option was ambitious (TR) and showed that the options considered were cast wide (SW) potentially helping show thoroughness of considerations.</td>
<td></td>
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<tr>
<td><strong>Disadvantages:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Affects Canal Wharf conservation area.</td>
<td></td>
<td></td>
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<tr>
<td>o No lifts were included in this option.</td>
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<tr>
<td><strong>Option 7</strong></td>
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</tr>
<tr>
<td><strong>Option design clarifications:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>o The option used former subways – TR.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Some of the former subways currently provide emergency access but some have been permanently closed up – RC.</td>
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<tr>
<td>o Station redevelopment (Leeds First) led to subway access points to platform level being blocked.</td>
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<td></td>
</tr>
<tr>
<td><strong>Advantages:</strong></td>
<td>Reuses existing infrastructure.</td>
<td></td>
</tr>
<tr>
<td><strong>Disadvantages:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Lifts could not be provided and therefore this option would be discriminatory towards mobility impaired pedestrians – CY / RC.</td>
<td></td>
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<tr>
<td>o The former subways were considered as a hostile and antisocial environment and closed on these grounds – TG / CY.</td>
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<td></td>
</tr>
<tr>
<td>o Does not directly connect with all platforms – particularly Platforms 16/17 – CL. Also at Platform 2 – BW / RC.</td>
<td></td>
<td></td>
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<tr>
<td>o This option would conflict with aspirations to extend/convert Platforms 10/11–</td>
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</table>
Option 8

- **Option design clarifications:**
  - This option was not in the original workshop material but was developed as a sketch at the workshop – SW.

- **Disadvantages:** additional issues raised:
  - Conflict with Platforms 16 / 17 pedestrian flow and platform capacity issues – RC.
  - Option would conflict with emergency exit at western end of viaduct / Platform 17 during construction.
  - Journey times savings lost by the convoluted route and its location at Canal Wharf (mostly affecting south eastern Leeds) – RC.

Option 9

- **Option design clarifications:**
  - Option 9 was develop at the GRIP1 workshop. All the options at the workshop (Option 1 – 8) all had issues to resolve (‘creaky’) with no clear front-runners arising – CL / SW.

  - Option 9 asked the question “if the river wasn’t there, where would the best location be?” – ‘at the end of the western footbridge’. This would be the preferred place and was taken forward as an option to the next GRIP stage – CL / SW.

  - Effectively Option 9 is a variant on Option 1 and Option 3

  - The option satisfies all the scheme objectives CL/ SW.

  - The concept was to build on both banks and then span across to the entrance and to the ISIS footbridge, with no construction in the river.

2.2 GRIP 2 Stage

**Overarching Comments**

[Advantages / Disadvantages at GRIP2: in many cases the comments on option variants 1A, 1B, 1C, 4A, 4B and 4C may apply to some or all three variants of the two main concepts but only listed against the option where they were raised in the workshop]

- **Sovereign Street:** It is hard to quantify the impacts when considering the issue of developments on Sovereign Street at the time because of the uncertainty whether developments when implemented.

- **Dark Neville Street:** This also applies to the developments on Dark Neville Street and the south west, are implemented.

- **Neville Street:** People’s route choice would be affected by the recent footway and aesthetical improvements on Neville Street under the station [late 2009 – JK post workshop addendum] but these route choice considerations would not have be known at the time of GRIP2 – DW.
Options connecting to Sovereign Place: All options would require some urban design to provide a suitable pedestrian route to the entrance to tie-in with the proposed developments.

Maintenance of Viaduct: Through consultation with Stakeholders, the issue of maintaining access to the railway viaduct to undertake inspections/maintenance etc.

Option 1A

- Disadvantages:
  - Structural type for ISIS bridge not known at this stage – RC.

Option 1B

- Option design clarifications:
  - It was identified that this option had pedestrian conflict issues on the escalator landings relating to the space, however the structure could be extended eastwards to provide space – SW.
  - It was acknowledged at the GRIP2 stage that with further work, the option could work with amendments (see comment above). – TG.
  - This option was progressed on the basis of if “all else fails” then this could be delivered as a low cost option albeit with some disadvantages and compromises on the scheme objectives – SW.

- Disadvantages:
  - The design version considered did not provide 6.0m at landings – RC. Affecting pedestrian flows and circulations with saturation likely to be reached earlier within its design life than other options (thus not meeting the project objectives).
  - As with GRIP1, Option 3, the station is ‘hidden’ and cannot be seen from the surrounding area – BW.
  - Likely to require rental / purchase of land from Blue Apartments to provide ticket office. The land required is currently used as a car park – CL.
  - Not structurally independent, cantilevered from the railway viaduct and places loads on existing footbridge which is not ideal and requires further investigation – RC.
  - Potentially too narrow to accommodate escalators – potential to resolve at later design stages? – TG or shouldn’t have been progressed? – AF.

Option 1C

- Disadvantages:
  - Required integration with ISIS developments at Granary / Canal Wharves – SW
  - Note earlier comments regarding emergency access route via Platform 17 / western end of viaduct to canal level.
  - [Requires the removal of existing canopy over Platform 17].

Option 4A

- Option design clarifications:
This option would require a substantial upgrade to the Barrow-Way because it is not wide enough, and to make it DDA compliant – BW / RC.
- The Eastern Footbridge is not DDA compliant because it does not have lifts.
- This option requires urban design improvements at Sovereign Place to upgrade pedestrian routes towards Pit Row (TG) and tie-in with developments on Sovereign Street (RC).
- It was noted that the Barrow-Way would deposit passengers in the open air. [This is not substantially correct as the Barrow-Way is located outside the station train ‘shed’ but the platform areas at this location are covered by the platform canopies. Hence the passengers would not be deposited in the open air, but would be deposited in a marginally more exposed area outside the train ‘shed’ – JK].
- This option would require the existing Eastern Footbridge to be removed and replaced with a new bridge, because the construction type would not permit punching through the footway walls to add stairs – CL.
- Option 4 variants would require urban realm improvements to the entrance at Sovereign Place with enhanced pedestrian links to Sovereign Street. This would require consultation with developers and Leeds City Council.

**Disadvantages:**
- Widening of the Barrow-Way may have some construction issues – RC.
- Pedestrians from the east may use the Swinegate shortcut in preference dependant on their platform destination.
- Not an ideal structure to provide access for mobility impaired pedestrians – TG.
- It is considered that if the Barrow Way was upgraded it could accommodate both servicing and new entrance pedestrian flows – MM / SW.
- Pedestrian capacity of platforms was not checked for this option at this GRIP stage, but would need to be clarified at a later stage – SW.
- Option does not provide as many station amenities or serve the Holbeck Urban Village developments.
- Pedestrians would be directed to a “remote” area of station at the eastern end where there are limited amenities and facilities – SW.
- New bridge likely to be required for Eastern Footbridge because it is not DDA compliant in the absence of the lifts, unlikely to allow the option to ‘punch through’ the footbridge side walls because of its construction (half through bridge) – CL.
- Consultation with adjacent developments and LCC regarding links and urban realm improvements.

**Option 4B**

**Option design clarifications:**
- Option assumed some permanent solution regarding peak period egress onto New Station Road – TR.
- Option 4 variants (A and C) provide fewer amenities, facilities than this option (C). The £12.5m price at this location provides potential space for new amenities and could help develop the eastern end of the station (RC).
- The connection to the eastern footbridge reduces the impacts on retail units (in Sovereign Place) by pushing the vertical components westwards and permitting single escalators to footbridge level – CL / SW [Options 4A and 4C require loss
of retail units in Sovereign Place].

- Required consultation with developers and with Leeds City Council on the existing car park.

**Advantages:**

- Widening of the Barrow-Way may have some construction issues – RC.
- The connection to the Eastern Footbridge reduces the impacts on retail units in Sovereign Place – CL / SW.

**Disadvantages:**

- Relies on potential future developments (to the southeast) for patronage – TG. [with hindsight these developments have not come to fruition yet whilst many developments to the southwest have.]
- Existing steps are non-compliant (RC) and the option assumes replacement of the footbridge (CL).
- Required consultation with developers, in particular with Leeds City Council on the existing car park.
- Does not achieve journey time savings for passengers for South Western Leeds because pedestrians from this location would have to double back on themselves (depending on which platform they were going to) but this distance could equal the distance travelled when using the existing train access.

**Option 4C**

**Option design clarifications:**

- The option assumes that the escalators / stairs at the western end of Platform 16 would be relocated – CL / RC.
- Option 4 variants would require urban realm improvements to the entrance at Sovereign Place with enhanced pedestrian links to Sovereign Street. This would require consultation with developers and Leeds City Council.

**Advantages:**

- Ties into Western and Eastern Footbridges – TG [Albeit the tie-in to the western footbridge is via a convoluted route].
- Avoids some of circulation issues on Platform 8 compared to other options – CL / SW.
- Although this option provides a longer route using the existing compliant western footbridge to provide access for mobility impaired pedestrians (with associated cost implications) other options do not – RC.
- Is affordable – RC.

**Disadvantages:**

- Complexity of working over a live railway and potential service impacts during reconstruction of the Eastern Footbridge and Barrow Way, and the construction of an elevated walkway above Platform 16 – CL.
- Does not achieve journey time savings for passengers for south western Leeds because pedestrians from this location would have to double back on themselves (depending on which platform they were going to) but this distance could equal the distance travelled when using the existing station access.
### 2.3 GRIP 3 Stage

#### Overarching Comments

- **Offers established at GRIP3**: When the designs went out to tender alternative options were received including sketched options with rotation of escalators into the arches with Option 1Aiii plus elements of others carried forward – RC / DA / AF / GS.

- **GRIP Stages**: GRIP3 included elements of options assessment with the successful elements of the different options carried forward to the GRIP4 design where possible.
  
  - Construction over the river is complex but meets all scheme objectives and taken forward to GRIP4 with modifications to design to resolve residual issues GS.

- **Evacuation Plan**: The evacuation plan for the station excludes LSSE as it is assumed LSSE is closed at night. This means that there is greater clarity in an emergency situation in only having one evacuation plan (day & night) and not complicating evacuation by having different plans incorporating LSSE (day time) and not (night time).

- **Changing Circumstances**:
  
  - In this stage: Option 1Aiii has the smallest footprint, 'mass' and intrusion, with a compact deck but also has landings on both sides of the river. Option 1Aiii is the parent of the GRIP4 option but was later modifies to incorporate the rotated escalator and core elements, further reducing the impacts on neighbouring developments.

- **Mechanical Platform Lifts**: At GRIP4 Network Rail made a preference not to provide mechanical platform lifts knows for maintenance and safety reasons, these would be removed from the design post-GRIP3 and replaced with ramps - RC.

- **Otters**: At GRIP3 otters were thought to travel along the canal and routes around the River Aire.

#### Option 1Ai

**Option design clarifications**:

- This shows the original three-wing arrangement (access to east and west banks at the River Aire adjacent to the Railway Viaduct and the ISIS footbridge), the precursor to the two-wing arrangement – TG.

- At this stage the ISIS bridge design and alignment were unclear. It was assumed that it would be DDA compliant with ramps. However, when it was constructed there was no ramped access provided on the eastern bank of the River Aire, only stepped access.— SC / RC.

- It was thought there would be sufficient space to land the third wing next to the ISIS footbridge; however this later fell foul of the changes in flooding level requirements – CL.
### Advantages:
- Three access points, serving both sides of the river – TG.
- Meets design criteria, [i.e. the Project Objectives] – RC.
- Offers more opportunities to Option 1Aii, such as an otter route – SW.

### Disadvantages:
- Impact on third parties – looks out on both Blue Apartments and Waterman Place developments – SW. Also western ramps block access to back of retail units.

### Option 1Aii

#### Disadvantages:
- Greater impact on navigation rights.
- Environment Agency unlikely to approve because the option effectively culverts a watercourse;
- Likely to have adverse impacts on Granary Wharf Conservation Area;
- Significantly affects Riverside apartments;
- Visual blockage of viaduct structure (in terms of views from the south and maintenance) and reduction in natural light to Dark Neville Street, (another residual issue sorted at GRIP4) – GS.

### Option 1Aiii

#### Option design clarifications:
- Effectively the GRIP2 Option 1B at the GRIP4 location, but aiming to minimise proximity to Blue Apartments and Waterman Place with the barriers being moved upstairs at GRIP4 – CY.
- Residual issues dealt with between GRIP3 and GRIP4 included:
  - Pedestrian flow issues at escalator landings.
  - Blocking of access to the viaduct for maintenance (Network Rail) and visually from the south (Leeds City Council Planning department) – CL.
- This option was carried forward with modifications to GRIP4.

#### Advantages: additional issues raised:
- Differentiate from other options by noting “it is less intrusive” than Option 1Aii and not as close to apartments – CL.
- More compact against viaduct as with Option 1Ai the diagonal link is optional – SW.
- Any other variations of this arrangement have issues with lift and escalator pits below the flood levels and have greater obstructions below the deck – CL. These may not have been ‘clear’ issues at the time due to changes and uncertainty, but with current situation, it is now known – CY.

### Option 1B

#### Advantages:
- Provides good pedestrian circulation at entrance
### Disadvantages:
- The cantilever structure would not be feasible given later investigations – RC.
- There is an issue with the access to Dark Neville Street and maintenance access to the viaduct.

#### 2.4 GRIP 4 Stage

**Overarching Comments**

- **Option design clarifications:**
  - Further post GRIP3 assessments were carried out to resolve residual design issues at GRIP3.
  - The winged ramps were provided to serve as an emergency access – CW.
  - Footfalls for the station from Holbeck Urban Village and Granary Wharf area are a justification for having access from both sides of the river – SC.

- **Design changes:** changes introduced post GRIP3 were to address residual issues with the preferred design and to meet Leeds City Council Planning requirements, including:
  - Reduction in building volume
  - Lighting/daylight and shadow modelling
  - Accessibility
  - The driver for the structure changes were not to develop an ‘iconic’ structure.
  - Interim sketches are available and would be provided – SC / GS.
  - Landing point on ISIS footbridge larger than originally indicated on initial plans leading to dropping of third optional access – CL.
  - Maintaining Visibility of Viaduct: thought to be an additional constraint developing from correspondence with Leeds City Council during application for planning permission and included in Tender documentation – GS / SC.
  - Improving the light entering Dark Neville Street to try to maintain natural lighting levels.
  - Leeds City Council had some input to the access arrangements – minutes of meeting can be provided – SC.

- **Issue of comparability of costs:** between 2006-2010 costs and current option costs [inflation / constraints etc.] raised as a potential exercise to help explain why costs at high level design stage may be lower than the current option – AF. Not the same level of detailed considerations at different GRIP stages – TG.

- **Advantages:**
  - Structurally independent of railway viaduct and footbridge therefore no reliance on other structures – RC.

#### 2.5 Step Free Access Options Testing (SBS Architects)

**Remit for Study**

- As the project was remobilised and the design being carried forward, there was a desire to improve the certainty about ‘why’ the GRIP4 option was the correct design to
Item | Text | Action
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progress. |  |  
- SBS Architects were commissioned by METRO to look at Step Free Access options using the GRIP4 design as a starting point, effectively acting as a validation exercise to provide further confidence that the design could stand up to challenge at Public Inquiry. Their findings were considered at the workshop, where it was agreed to review the pros and cons of the options investigated in relation to the delivery of this scheme.

3.0 Summary – Andrew Norman

In summary of the workshop, the headline comments were:

- A number of options at GRIP1 were affected by capacity issues on Platform 16 namely:-
  - Limited capacity and some congestion particularly at the escalators, lifts and stairs at the western end of platform 16 during peak periods.
  - Similar issues are also present at the eastern end due to effective platform widths.
  - New connections to the station at Platform 16 / 17 level do not provide the pedestrian flow improvements or journey time savings required.
- Issues remain with pedestrians crossing Neville Street in a west to east movement at Sovereign Place.
- The previous studies documentation and correspondence would help document the process which led to the current design.
- Consideration of a costing exercise, whether detailed or gross to provide comparable costs
- GRIP1 Option 9 was developed at the GRIP1 workshop and developed further at GRIP2 as a combination of Options 1 and 3.
- Clarification that the changes from rectangular structure to current form was as a result of refinements to address impact of structure on neighbours and improve conditions on Dark Neville Street.
- Clarification of the issues at the extreme ends of the station, particularly with regards to Sovereign Place and Canal Wharf, together with remoteness within the station itself.
- Clarification that the changes in flood design levels came in at the GRIP4 stage. These were also varied by the EA’s proposed flood alleviation scheme and a change in guidance.
- Clarification that further design constraints arose during the discussions and application preparation for Planning Permission.
- At the end of the GRIP3 development stage, a hybrid option was developed from Option 3Aiii which incorporated the workable elements of the GRIP3 design options and refinements to address residual design issues, resulting in the GRIP4 design.
Appendix D. AECOM GRIP4 Development Log
The following note sets an overview of how the design proposals for a new Southern Entrance to Leeds Station developed from the end of GRIP Stage 3 to the end of GRIP Stage 4.

**End of GRIP 3 to GRIP 4 Contract Award**

**Final GRIP 3 Option**
The final GRIP 3 option comprised a set of escalators parallel to the railway viaduct leading down from the existing western footbridge down to a deck over the River Aire, with associated lifts and stairs. The ticket office and ticket barriers were located at the lower level. This option provided direct connection with both sides of the River Aire, with the main routes being via a direct connection with the proposed Isis footbridge just to the south of the proposed entrance and via a walkway on the eastern bank of the river, in front of the Blue Apartments building.

**Developments after Completion of GRIP 3**
A number of developments occurred after completion of the GRIP 3 work. These included the installation of the Isis footbridge to the south of the proposed entrance and the application for a decked area on the eastern river bank, serving the Golf Cafe which was about to open on the ground floor of the Blue Apartment building. The form of construction chosen for the Isis bridge and the presence of the decked area on the eastern river bank had the effect of rendering the connection routes proposed by the GRIP 3 work unfeasible to construct.

**GRIP 4 Tender**
During the GRIP 4 tender process, AECOM took into account the developments since the completion of the GRIP 3 work and the concern that the ends of the escalators and the stairs were very close to the adjacent buildings and proposed an alternative design. The alternative design re-orientated the escalators to a position at right angles to the viaduct, which produced a more compact overall design. Initial illustrations of this proposal showed the entrance contained within a ‘box’ shaped building.

**GRIP 4 Development**

**Initial Review**
Following contract award, AECOM undertook a full review of all developments to the south of the station since the completion of the GRIP 3 work. The impact of these developments was evaluated and the layout of the proposed entrance was revised, adopting the alternative layout proposed by AECOM during the tender process.

**Initial Input from Stakeholders**
Initial meetings with stakeholders were held at the start of the GRIP 4 process. During the general stakeholder meeting, Northern Rail stated their preference to have the ticket office and ticket barriers at the western footbridge level, in order to provide better integration with the rest of the station. To achieve this, the connection with the western footbridge was widened over and above that provided by the GRIP 3 work.
At a meeting with the Environment Agency, the design flood levels over the River Aire were discussed. Due to the new proposals for a flood alleviation scheme through Leeds, these levels were now over 1m higher than had been advised during the GRIP 3 work. The impact of this was minimised by designing a thinner deck construction to maintain the upper deck level as per the GRIP 3 work, but the revised design flood level meant that the ramps required to accommodate the level difference between the entrance deck and the adjacent river banks had to be lengthened. This was due to the fact that the underside of the deck could not be lowered over the river and therefore the ramps could not start until the deck had reached the river bank.

General Design Development
The initial building shape proposed at the start of the GRIP 4 process had taken the form of a simple box-like structure. As the design was progressed, it was considered that there were a number of reasons to change this shape, these are outlined below;

- It was known that the area around the proposed entrance was valued by the planners in terms of aesthetics and therefore a more aesthetically appealing design would aid the progress through planning approval.
- Due to the proximity of the adjacent buildings, a curved roof design would allow more light into the adjacent apartments.
- A curved design would minimise the visual impact of the building, thus minimising the impact on the adjacent residents.
- A curved roof is sympathetic to the curved nature of the existing station roof.

Planning Process
During meetings with the planners, the issue of the proximity of the building to the Blue Apartments was raised. They were concerned that the building may still be too close and requested that the design be amended to move it further away from the Blue Apartment building.
To achieve this one of the two lifts on the eastern side of the proposed entrance building was moved to the western side to allow a section of this side of the building to be moved away from the Blue Apartments building. This resulted in the ‘stepped’ arch profile which progressed successfully through planning approval.