

East Reading Mass Rapid Transit Scheme

Environmental Statement

Volume 1 Main Report

Reading Borough Council



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	Name	Position	Signature	Date
Prepared by:	Caroline Dinnage Jenny Hughes	Graduate Environmental Planner Environmental Planner	CD JH	September 2018
Reviewed by:	Stefan Boss	Senior Associate	SB	October 2018
Approved by:	Sarah Matthews	Director	SM	October 2018
For and on behalf of Peter Brett Associates LLP				

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1 Introduction

1.1 Background

- 1.1.1 This Environmental Statement (ES) has been prepared by Peter Brett Associates LLP, now part of Stantec (PBA), in respect of a new planning application (referred to hereafter as the '2018 Planning Application' for a new mass rapid transit (MRT) scheme to the east of Reading, Berkshire (referred to as the 'Proposed Development')). The purpose of the East MRT scheme is to provide a fast track public transport, cycle and pedestrian route into the town centre. It is designed to improve accessibility and support continued sustainable growth in Reading and Wokingham Boroughs and the wider area.
- 1.1.2 A full planning application, with an ES, was submitted in 2017 for an earlier iteration of the MRT scheme. Reading Borough Council (RBC) was minded to grant the Proposed Development consent at the Planning Committee held on 30th May 2018, however, the application was refused by WBC in June 2018 on the grounds that the scheme would be '*harmful to the landscape character*'. A new full planning application is therefore being submitted that responds to the reasons for refusal and comments received from consultees.
- 1.1.3 This ES documents the Environmental Impact Assessment (EIA) of the East MRT scheme now proposed, in combination with the already permitted Thames Valley Park (TVP) Park & Ride Site (referred to as 'TVP P&R'). TVP P&R lies within Wokingham Borough Council's (WBC) administrative boundary and will provide 277 car parking spaces to the west of TVP Drive. The TVP P&R is discussed in further detail in [Section 3.5](#).
- 1.1.4 The Application Site boundary is shown in [Appendix A.1](#).
- 1.1.5 The Proposed Development straddles the two Local Planning Authority areas of RBC and WBC. The planning application will therefore be submitted to both RBC and WBC for determination.
- 1.1.6 The project is being promoted by RBC, working with WBC, and Thames Valley Berkshire Local Enterprise Partnership (TVB LEP). The applicant is RBC Highways Department, which is independent from the Highways Authority. The public-sector led project has been allocated funding by TVB LEP from the Local Growth Fund.

1.2 The Application Site

- 1.2.1 The Application Site is located to the south of the River Thames and to the north of the Great Western Main Line Railway that is raised on an embankment. The Application Site is characterised by a retail superstore to the west, the TVP P&R site to the east and the confluence of the River Thames and the River Kennet to the centre.
- 1.2.2 A more detailed description is provided in [Chapter 2](#).

1.3 The Proposed Development

- 1.3.1 The Proposed Development comprises the construction of a segregated fast track public transport, pedestrian and cycle route with associated junction improvements and landscaping. The purpose of the East MRT Scheme is to improve accessibility and support continued sustainable growth in Reading and Wokingham Boroughs and the wider area.

1.3.2 The description of the 2018 Planning Application is as follows:

“Construction of a segregated fast-track public transport, pedestrian and cycle bridge and viaduct, comprising concrete bridge structure supported by concrete columns, steel beams and reinforced soil embankment, together with new footway links and existing footway alterations, junction improvements and landscaping.”

1.3.3 The proposed scheme and the design evolution since the submission of the 2017 Planning Application is explained further in **Chapter 3**.

1.4 Planning Background

1.4.1 The planning background for the proposed scheme is summarised below:

- **2017 Planning Application including an ES (Refs:171108 and 172048):** this was submitted in July 2017 to RBC and WBC;
- **2018 (June) Amended Application and ES Addendum (Refs:171108 and 172048):** this was submitted in June 2018 in response to comments received from consultees. The scheme design was amended to address these responses and additional information was submitted. The planning application was refused; and
- **2018 Planning Application including an ES:** this planning application and ES has been prepared to assess the likely significant effects in relation to the amended scheme design.

1.4.2 At the RBC Planning Committee held on 30th May 2018, RBC was minded to grant planning permission to the proposed development.

1.4.3 WBC refused permission for the development at the Planning Committee on 25th June 2018 for the following reason:

‘The proposed MRT link, including bridge structure, due to its height and scale and its prominent and sensitive location, particularly its proximity to the River Thames and River Kennet, would be harmful to the landscape character of the area including its riparian appearance. This would be contrary to policies CP1, CP3 and CP11 of the Core Strategy’

1.4.4 A design review has been undertaken to consider how to blend the structure into the landscape/ backdrop of grass, shrubs, railway embankments, bridges, overhead electricity lines and electricity pylons, and riparian foreground.

1.5 Terms and Definitions

1.5.1 The following terms and definitions have been used within this ES:

- **The Application Site** - the area within the planning application boundary of the East Reading Mass Rapid Transit scheme;
- **The Proposed Development** – the current scheme for which full planning permission is sought;
- **The 2017 Proposed Development** - the development for which full planning permission was sought through the 2017 Planning Application;
- **The 2018 (June) Proposed Development** – the development for which full planning permission was sought through June 2018 Amended Application;

- **East Reading Mass Rapid Transit scheme** (abbrev. East MRT scheme) – the name of the development;
- **TVP P&R** – the boundary of the Thames Valley Park, Park and Ride Site; and
- **Combined site** - refers to the collective area of both the application site and the TVP P&R.
- **The 2017 Planning Application** (Refs: RBC 171108 and WBC 172048) - the full planning application submitted for the proposed East MRT Scheme, supported by the 2017 ES;
- **The 2018 (June) ES Addendum** (Refs: RBC 171108 and WBC 172048) - the ES Addendum submitted for the amended proposed East MRT scheme.
- **The 2018 Planning Application** - this full planning application submitted for the proposed East MRT Scheme for the Proposed Development, supported by the 2018 ES.

1.6 The Environmental Statement and other Documents

- 1.6.1 This ES presents the findings of an EIA undertaken in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended), referred to as the 'EIA Regulations'.
- 1.6.2 Running concurrently with the design process, the EIA has sought to identify the likely significant environmental effects and to identify appropriate design and construction measures and apply good practice both to mitigate any significant adverse environmental effects and to maximise the environmental opportunities which might arise as a consequence of the construction and operation of the Proposed Development. The EIA has also sought to determine the residual beneficial and adverse environmental effects remaining after mitigation has been incorporated.
- 1.6.3 The other principal documents submitted with this 2018 Planning Application, and which have been updated from the 2017 Planning Application, are:
- Planning Statement;
 - Design and Access Statement;
 - Consultation Statement;
 - Utilities Statement; and
 - Transport Statement.

1.7 Consultation

- 1.7.1 The Proposed Development is being progressed through an iterative process of design, assessment and review. Therefore, the Proposed Development incorporates measures to mitigate potential adverse environmental effects and to enhance environmental benefits, wherever possible through its design.

- 1.7.2 An EIA Scoping Report was prepared and submitted separately to both RBC and WBC on 29th August. The EIA Scoping Opinion was received on the 15th October.
- 1.7.3 Consultation with relevant statutory and non-statutory bodies has been undertaken for the 2018 Planning Application and has informed the iterative design through the EIA Scoping process and further direct consultation where required. **Appendix A.9** explains how each technical discipline has addressed the consultation responses received for the 2017 Planning Application, the 2018 ES Addendum, and the reasons for refusal.
- 1.7.4 A public consultation event was held on 12th September 2018 at the Wokingham Waterside Centre and sought views on examples to help further reduce the impact of the scheme on the riverside setting. The feedback received was used to inform the design of the Proposed Development. This is discussed further in **Section 5.6**.

1.8 Project Team

- 1.8.1 The Planning and ES work has been undertaken by the professional teams provided in **Table 1.1**.
- 1.8.2 In accordance with Regulation 18(5) of the EIA Regulations, a statement outlining the relevant expertise and qualifications of the competent experts appointed to prepare the ES is provided in **Appendix A.5**.

Table 1:1 Environmental Impact Assessment Team

Consultant	Technical Discipline
Peter Brett Associates LLP	Town and Country Planning
	EIA Co-ordination
	Socio-Economics
	Health
	Transport and Access
	Air Quality
	Hydrology and Flood Risk
	Noise and Vibration
	Landscape and Visual
	Lighting
	Biodiversity
Orion Heritage	Archaeology and Heritage
Treeworks	Arboriculture

1.9 Structure of the Environmental Statement

- 1.9.1 The ES comprises the following documents:
- **Volume 1** – Main report (this document);
 - **Volume 2** – Appendices; and

▪ **Non-Technical Summary.**

- 1.9.2 The Main Report (Volume 1) comprises the chapters shown in **Table 1.2**. The figures and appendices (Volume 2) relate to the same topics sequentially.

Table 1.2: Contents of the Environmental Statement

Chapter Nos.	Title of ES Chapter
1	Introduction
2	The Site and Surrounding Area
3	The Proposed Development
4	Construction and Site Management
5	Assessment Method
6	Planning Policy Context
7	Socio-Economics
8	Health
9	Transport and Access
10	Air Quality
11	Hydrology and Flood Risk
12	Ground Conditions
13	Landscape and Visual (including Lighting)
14	Biodiversity
15	Other Issues Considered
16	Impact Interactions and Summary
17	Schedule of Mitigation and Monitoring
	Glossary of Terms
	References
	Abbreviations

2 Application Site and Surrounding Area

2.1 Application Site Location

- 2.1.1 The linear Application Site is located to the south of the River Thames and to the north of the Great Western Main Line Railway that is raised on an embankment in the vicinity of the Application Site. The western end of the Application Site is located south of a retail superstore and its car park and the eastern end is immediately to the west of the Thames Valley Business Park. An indicative Application Site location plan is provided at **Figure 2.1** and the Application Site is located between the approximate Ordnance Survey (OS) National Grid References (NGR) of 472553(E) 173856(N) to the west and 473579(E) 173891(N) to the east.

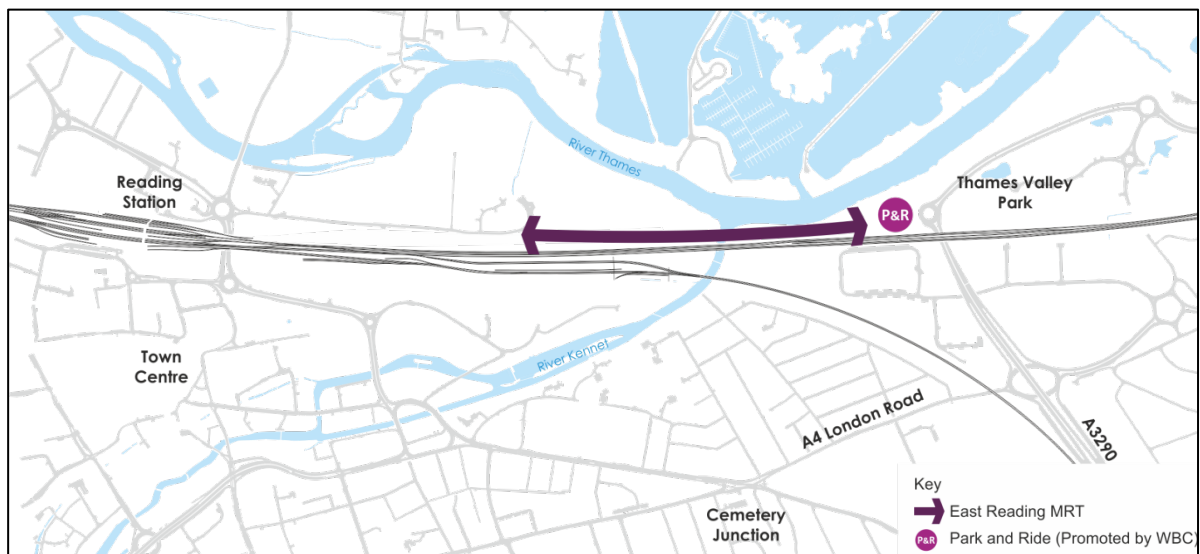


Figure 2.1: Site Location Plan (showing indicative route)

- 2.1.2 The Application Site straddles the administrative areas of RBC and WBC, the boundary of which is defined by the River Kennet. The Application Site Boundary is provided in **Appendix A.1**.

2.2 Site Description

- 2.2.1 As discussed in **Section 1.1**, the EIA includes an assessment of the East MRT scheme and the adjacent TVP P&R as part of the cumulative assessment. This section therefore includes a description of the Application Site, in addition to the TVP P&R.

East MRT

- 2.2.2 The western area of the Application Site (within Reading Borough) where the Proposed Development would connect with Napier Road is characterised by a retail superstore with associated fuel filling station and parking. Further west is residential tower blocks at Luscinia View.
- 2.2.3 The central area of the Application Site where the Proposed Development crosses the River Kennet is characterised by the confluence of the River Thames and the River Kennet. There is an existing railway bridge over the River Kennet and a footbridge allowing access over the River Kennet for the Thames Path National Trail. To the south of the railway, there is a gas storage facility.

- 2.2.4 The eastern area of the Application Site (within Wokingham Borough) where the Proposed Development would connect with the proposed TVP P&R to the west of Thames Valley Business Park would be on undeveloped flood plain adjacent to the River Thames. The Thames Valley Park Rowing Club and Wokingham Waterside Canoe & Kayak Centre are in close proximity to the north-east. There are also temporary moorings along the western bank of the River Thames. The Thames and Kennet Marina and Redgrave and Pinsent Rowing Lake are located approximately 100 m to the north on the opposite side of the River Thames. The Suttons Business Park is located beyond the Great Western main line railway to the south.
- 2.2.5 The Application Site within WBC is safeguarded land for strategic transport network including mass rapid transit along the A4/A329 corridors (in accordance with Wokingham Borough Council (2014) Development Plan – Adopted Managing Development Delivery Local Plan Policy CC08) and is therefore, for much of its the length, undeveloped and currently consists of grassland, scrub and trees. This safeguarding is consistent with the infrastructure corridor nature of the Application Site, including the railway, footway and overhead electricity lines. The Application Site is constrained by the River Thames to the north and the Great Western main line to the South, a Network Rail maintenance delivery unit to the west and Thames Valley Park to the east.
- 2.2.6 Policy CS21, together with Policies RC1 and RC3 of the Reading Central Area Action Plan and accompanying Figure 6.2, add that land needed for implementation of the East MRT scheme (identified as running east from Napier Road) will be safeguarded from other forms of development.

TVP P&R

- 2.2.7 The TVP P&R is located to the south of the River Thames and to the west of Thames Valley Business Park, adjacent to the north and east of the proposed East MRT scheme at its junction with the TVP roundabout. The TVP P&R site comprises a triangular plot of land of approximately 1.35 ha, also known as Broken Bow. The TVP P&R site boundary plan is provided in **Appendix A.2**.
- 2.2.8 Vegetation removal and ground clearance works have been undertaken on site for the TVP P&R site in accordance with the TVP P&R full planning permission (application ref: 161596). A Section 73 Application was submitted for the TVP P&R site on 7th September 2018 (see **Section 3.5.2**).

2.3 Environmental Setting

East MRT

- 2.3.1 The proposed route is located alongside the River Thames which flows west to east, north of the Application Site. The proposed route also passes over the River Kennet at its confluence with the River Thames at Kennetmouth. Both the rivers are sensitive controlled waters.
- 2.3.2 The Environment Agency (EA) 'Flood Map for Planning' shows that the western part of the proposed route lies within Flood Zone 2 'Medium Probability' (between 1 in 100 (1%) and 1 in 1000 (0.1%) annual probability of river flooding). The eastern part of the proposed route lies within Flood Zone 3 'High Probability' (greater than 1 in 100 (1%) annual probability river flooding).
- 2.3.3 The land to the west of the River Kennet is situated on an historical landfill that was used in the past for railway sidings. The land to the east of the River Kennet comprises undeveloped land with two historical gravel pits.
- 2.3.4 The closest designated heritage asset to the Application Site is the Grade II Listed Railway Bridge and attached Accommodation Bridge over the River Kennet. This lies immediately

beyond the southern perimeter of the Application Site. These were built by Isambard Kingdom Brunel as part of The Great Western Railway in the mid-19th century. The significance of the bridges lies in their architectural and historic interest. The setting of the bridges comprises woodland which runs along the River Kennet and screens long distant views into the Application Site.

- 2.3.5 The River Terrace Deposits and the White Chalk Subgroup geology at the Site are classified as Principal Aquifers. The Alluvium is classified as Secondary A Aquifer.
- 2.3.6 RBC has declared an Air Quality Management Area (AQMA) due to exceedances of the annual mean nitrogen dioxide objective. The AQMA comprises Reading city centre and extends out along the major arterial roads and part of the Application Site is located in one. However, the exceedance in this area is primarily as a result of the railway line emissions, electrification of the line is underway that should result in an improvement to local air quality.
- 2.3.7 The Thames Path National Trail and National Cycle Route 4 / Route 5 – Thames Valley pass through the Application Site alongside the River Thames.
- 2.3.8 Part of the Coal, Kennetmouth and Kings Meadow East Local Wildlife Site (LWS) is located within the Application Site, classed as 'open mosaic habitat on previously developed land'.
- 2.3.9 RBC are able, under the Town & Country Planning Act, to protect trees of amenity value by way of a Tree Preservation Order, commonly referred to as a "TPO". The RBC TPO directory identifies a woodland area within the site area which has been designated as a Woodland TPO, identified as W2 of *Tree Preservation Order: - Land North & East of Tesco site, Napier Road, Reading (August 2006)*. W2 is described on the TPO plan as comprising Norway maple, Silver birch, Sycamore and Western balsam poplar and covers a more or less triangular area bounded by the eastern end of the Tesco's car park to the west, woodland on the around the Thames Path, to the northeast, the Thames path adjacent to the River Kennet to the east and the northern edge of the railway embankment to the south.

3 The Proposed Development

3.1 Introduction

- 3.1.1 The purpose of the East MRT scheme is to improve access to and from Reading eastwards for buses, pedestrians and cyclists. This will help accommodate the forecasted increase in travel demand along the heavily congested A4 corridor, which provides access to existing residential employment and educational sites, as well as Reading town centre, Reading railway station and substantial planned development in Wokingham Borough and Reading town centre. An indicative area of works for the Proposed Development is included in **Appendix A.1**.
- 3.1.2 The scheme seeks to achieve the following key aims:
- Provide a sustainable alternative solution to accommodate future travel demand on the London Road corridor;
 - Increase capacity for movement of people thereby reducing journey times and forecast congestion, as well as improving reliability of journeys along the corridor;
 - Support economic development in Reading Town Centre, east Reading, Wokingham and within the Thames Valley;
 - Develop a high quality, sustainable system which provides a sustainable alternative to the private car;
 - Facilitate a future MRT network for Reading and the Thames Valley; and
 - Allow access for mobility impaired and pushchairs.
- 3.1.3 The design of the East MRT Scheme includes design options which respond to the comments from WBC at the Planning Committee for the 2017 Planning Application. Planters have been identified as the preferred option to green the structure. These options are discussed further in the consideration of alternatives section below (**Section 3.4**).

3.2 Description of the Proposed Development

- 3.2.1 The Proposed Development comprises the following:
- “Construction of a segregated fast-track public transport, pedestrian and cycle bridge and viaduct, comprising concrete bridge structure supported by concrete columns, steel beams and reinforced soil embankment, together with new footway links and existing footway alterations, junction improvements and landscaping”*
- 3.2.2 Plans illustrating the Proposed Development are included in **Appendix A.3** and listed below:
- Proposed Site Block Plan;
 - General Arrangement Plan;
 - Longitudinal Section and Typical Cross Section; and
 - Proposed Site Context including the TVP P&R.

Operation

- 3.2.3 The operation of the route will link the A3290 at Thames Valley Park, adjacent to the TVP P&R, to Napier Road, Reading town centre and the railway station. Once the proposed TVP P&R becomes operational, the Proposed Development will also facilitate travel directly to and from the TVP P&R facility itself.
- 3.2.4 It is proposed that buses will use the Proposed Development running at regular intervals throughout the day, with more frequent bus services running during the AM and PM peak periods. It is proposed that the existing fleet of buses, currently travelling to and from TVP via the A4, will instead use the Proposed Development.
- 3.2.5 The Proposed Development also provides the opportunity for the TVP P&R to operate at weekends and for extended hours during the week due to additional bus services serving the TVP P&R.
- 3.2.6 Cyclists and pedestrians will be able to use the Proposed Development at all times via the segregated cycleway and footway. The route will not be open to any other forms of traffic including taxis and motorcycles.

Bridge Design

- 3.2.7 The proposed bridge form comprises a single span of 59.5m along a gentle camber across the mouth of the River Kennet. The bridge will be aligned parallel to the adjacent listed bridge, at a slight angle across the mouth of the river.
- 3.2.8 The bridge comprises an in-situ concrete bridge deck with galvanised and painted steel parapet, and supported by weathering steel bridge girders. The eastern bridge pier comprises of a single column, with the western abutment comprising a concrete retaining wall faced with rock-filled gabion cages, supporting a soil embankment slope behind it.
- 3.2.9 The mid-span soffit level of the bridge will be 6.8m above Standard Head Water Level, matching that of the adjacent rail bridge, so as to minimise impacts on views and the setting of the listed bridge and support navigation.
- 3.2.10 The scheme rises approximately 5.6m at a steady 1:42 gradient from ground level in the east, adjacent to the proposed TVP P&R, to the new bridge across the River Kennet in the west. The 204m viaduct is raised up on concrete columns in order to accommodate flood flows beneath the structure and minimise flood impacts to the structure itself.
- 3.2.11 The viaduct comprises an in-situ concrete deck with galvanised and painted steel parapet, and supported by weathering steel girders. It stretches across 8 equal spans of 25.5m supported by concrete column piers with the eastern abutment comprising a concrete retaining wall.

Lighting

- 3.2.12 The design of the Proposed Development is supported by a lighting strategy to facilitate the safe and secure functioning of the scheme. The lighting strategy is based on secured by design principles focusing on crime reduction, promoting people's safety, and minimising the impact on the surrounding natural and built environment.
- 3.2.13 Lighting is proposed along the length of the Proposed Development to support operational requirements, with different types proposed dependant on the requirements of that area and the location of sensitive receptors.
- 3.2.14 Along the Proposed Development, 6m columns are proposed along the footway and cycleway, oriented towards the road junction to avoid light spillage. The footway and cycleway along the

bridge/viaduct will be lit by LED lighting on the top rail of the bridge parapet, at approximately 1.5 m in height, to reduce light intrusion. No lighting is proposed on the bus carriageway itself to minimise impacts on the surrounding area.

Landscaping

3.2.15 A landscape strategy for the Application Site has been developed in parallel with the design of the East MRT itself. Key features of the landscape strategy include:

- Retention of existing trees and vegetation where practicable, with additional planting of new native trees and shrubs to complement the retained trees;
- Selective management and re-planting of the woodland within the LWS to replace trees which require removal, increase diversity to the woodland, and provide additional screening of the East MRT embankment and route from locations within the LWS woodland and on the Thames Path adjacent to the LWS. This will include selective removal of existing shrubs and groundcover, e.g. removal of non-native species such as Buddleia and the invasive Virginia Creeper, to increase light levels and promote the growth of a more diverse ground flora;
- Retain and enhance / extend the existing area of Acid Grassland at the western end of the East MRT route, to provide biodiversity enhancement with scattered new tree planting to create a glade with dappled shade;
- Enhancements to the riparian corridor, for example removal of Himalayan Balsam and retention of Loddon Lily;
- Creation of tussocky grassland between the River Thames and the East MRT, and wildflower hydro-seeded grassland on the East MRT embankment; and
- Ivy planting to be installed in a planting trough at the northern edge of the elevated viaduct, and trained to grow downwards in order to green the structure.

Drainage

Eastern side (River Kennet Bridge and Viaduct)

3.2.16 Due to the need to keep the viaduct as slender as possible, a combined kerb drainage system is proposed. This will collect the surface water runoff to the low point (adjacent to the TVP P&R). This will then be picked up by a carrier drain, into an oil interceptor and then into a cellular storage attenuation system prior to discharging into the River Thames at the greenfield runoff rate of 5 litres per second (l/s). At times the outfall will be submerged so a non-return flap valve will be installed on the outfall. The attenuation will be sized such that it can continue to operate in times of flood.

Western side (adjacent to Tesco)

3.2.17 A channel system (Althon or similar) is proposed which will run both sides of the cambered carriageway as these systems incorporate attenuation. The surface water will then be picked up by a carrier drain to a point approximately adjacent to the realigned towpath, into an oil interceptor and then, due to level constraints, a pumping station will need to be installed which will pump the water to an outfall into the Thames, again at a controlled greenfield rate of 5l/s and with a non-return flap valve on the outfall.

3.2.18 Within the Application Site there are both overhead and underground electricity cables and underground high pressure and medium pressure gas mains. These will require localised

diversions to accommodate the proposed development. Further information is provided within the Utilities Statement submitted with the planning application.

Floodplain Capacity

- 3.2.19 In order to demonstrate no detrimental impact to fluvial (river) floodplain capacity it is proposed to incorporate a number of areas of localised ground lowering to 'compensate' for any losses in floodplain storage, up to the reference 1 in 100 annual probability plus allowance for climate change flood level, in accordance with local and national planning policy. These areas consist of:
- Lowering of an earth embankment to the immediate north-east of the Tesco store;
 - A cutting into the embankment at the eastern end of the East MRT (where the land rises out of the floodplain near the new P&R site); and
 - A shallow scrape (<250mm) immediately east of Kennetmouth.
- 3.2.20 These works support an overall improvement in floodplain storage capacity up to the reference flood level as a result.

3.3 Embedded Mitigation

- 3.3.1 In accordance with guidance from Institute of Environmental Management and Assessment (IEMA), assessments within each topic section have taken account of embedded mitigation which is inherent in the scheme design. The embedded mitigation which forms part of the Proposed Development and based on the plans within **Appendix A.3** includes:
- Implementation of a Construction Environmental Management Plan (CEMP). The CEMP will outline the arrangements and management practices to adopt in order to minimise the environmental effects of construction;
 - Incorporation of a number of sustainable drainage measures to minimise the risk of fluvial flooding, such as flood compensation measures, and flood storage areas in the form of an embankment of the west side of the River Kennet;
 - A selection of landscape enhancements to maintain/ improve the landscape including re-planting of woodland and tree plantings, creation of new grasslands, and the integration of a riparian habitat adjacent to the River Thames;
 - Retention of existing trees where practicable;
 - A sensitive lighting strategy to minimise night-time effects on the surrounding area including directional lighting columns to face away from the more sensitive ecological areas, low level parapet lighting and exclusion of lighting on the East MRT bus route aspect of the development;
 - Bridge design and height to coincide with the existing listed bridge adjacent to the site, to not disrupt the heritage and character of this local asset;
 - Incorporation of planters to green the viaduct to soften visual effects; and
 - Provision of sustainable transport modes, including bus services, footway and cycle ways to promote sustainable travel and reduce reliance on single occupancy car journeys.

3.4 Consideration of Alternatives

- 3.4.1 The EIA Regulations require an ES to include “a description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects”.
- 3.4.2 This legal requirement is expressed in very general and high-level terms, requiring only the inclusion of “reasonable” alternatives and an “indication” of “main” reasons. Although a full description of alternatives and a full assessment of their likely environmental effects are not required, sufficient detail should be provided to allow for a meaningful comparison between the alternatives and the Proposed Development.
- 3.4.3 It is a matter for the applicant to decide whether to consider alternatives and which alternatives it intends to consider. The EIA Regulations do not expressly require that an applicant considers alternatives, although it is widely encouraged at the policy level, both European and domestic, and is a feature of EIA.
- 3.4.4 The consideration of alternatives in this ES complies with that requirement and has regard to the guidance in the Planning Practice Guidance (PPG) on EIA. The PPG states “Where alternative approaches to development have been considered, the Environmental Statement should include an outline of the main alternatives studied and the main reasons for the choice made, taking account the environmental effects”.
- 3.4.5 Whilst environmental effects are relevant when choosing between alternatives, other factors are also relevant, these include: planning policy, viability, design quality, market requirements, site constraints and opportunities and environmental effects.
- 3.4.6 A two-stage options appraisal has been undertaken to compare and refine options which led to the identification of a preferred scheme. The options appraisal is included in **Appendix A.6**. The following provides an outline of the reasonable alternatives considered within this appraisal and any further alternatives considered in relation to the Proposed Development, and the main reasons for choosing the Proposed Development in preference to them including a comparison of environmental effects.

No Development

- 3.4.7 The following outcomes were identified within the options appraisal as a result of a ‘do nothing’ option:
- Increasing congestion and worsening transport conditions which will act as an inhibitor to growth, with private sector investment attracted to other areas with better accessibility;
 - Air Quality issues will be exacerbated without the mitigation afforded by the Proposed Development; and
 - The resident population of Reading and Wokingham will be disadvantaged by restricted accessibility to jobs services.
- 3.4.8 Based on the above, a ‘do nothing’ option no longer represents a reasonable alternative nor delivers the benefits of the Proposed Development.

Alternative Locations / Routes

- 3.4.9 A total of ten route options were initially considered within the options appraisal (**Appendix A.6**). Options 3 and 4 were found to result in the lowest impact on the environment compared

to other options, particularly in relation to ecology, flood risk, visual impact, landscape impact. These two options are outlined below:

- **Option 3** - this route option passes through the edge of the superstore car park, land owned by Tesco. The route bridges the River Kennet mouth and connects to the proposed TVP P&R; and
 - **Option 4** - this route option runs adjacent to the railway line on Network Rail land and through a small parcel of land owned by Tesco. The route bridges the River Kennet mouth and connects to the proposed TVP P&R.
- 3.4.10 Option 3 requires less third-party land than option 4, and was therefore considered more deliverable and potentially a lower cost.
- 3.4.11 A further two alternatives were considered for bus priority as follows:
- Bus priority Option 1 – Nearside bus lane on approach to Vastern Road Roundabout along with a fully segregated cycle route and landscape enhancements.
 - Bus priority Option 2 - Segregated MRT route between Napier Road and the A329(M) roundabout along with fully segregated cycle route and landscape enhancements. This option uses land owned by Tesco and Network Rail.
- 3.4.12 Bus Priority Option 2 was found to improve the journey times for bus services, other vehicles and cyclists (therefore supporting sustainable modes of travel and reducing air quality emissions), and improves the visual impacts and deliverability.
- 3.4.13 Option 3, combined with Bus Priority Option 2, was identified as the preferred option for the Proposed Development based on the options appraisal within **Appendix A.6**.

Design Evolution

- 3.4.14 The project team has considered a number of alternative designs to respond to the comments from WBC at the Planning Committee for the 2017 Planning Application. These alternatives are outlined below:
- **Planters at high level:** Planters beside the parapets containing ivy to spill over the deck of the viaduct. This would provide 'greening' of the structure.
 - **Gabion Cladding:** Additional gabion cladding with ivy across the lower areas of the structure. The type, shape, size, roughness and tone of stone could be carefully selected to help blend the structure into the lower-level surroundings;
 - **Coloured pigment and/or textured concrete:** Pigmented concrete would help to blend the structure with ground level colours. Texture on the surface of the concrete would potentially have a positive impact on very close views where this can be seen and/or surfaces in direct sunlight; and
 - **Additional Landscaping:** Further low-level planting and/or public art sculptures could be provided to enhance the landscape around the structure. There is limited opportunity for taller trees and substantial planting due to the easements required for the underground electricity cables.
- 3.4.15 Planters have been selected as the preferred option, as this would correspond with the proposed approach of a 'living green wall' at the TVP P&R development and would provide 'greening' of the upper level of the viaduct for local views from the Thames Path and river. Maintenance will be required, however automatic irrigation, a planting replacement

programme and CCTV could keep this to a minimum. Provided the planting is successfully established and maintained, this option would have the greatest effect on softening and greening the appearance of the viaduct.

Summary

- 3.4.16 The main alternatives considered for the Proposed Development have been in relation to the route of the East MRT and the design of the bridge in response to the landscape character of the surrounding area.
- 3.4.17 The Proposed Development is considered to best respond to the constraints of the Application Site and maximises benefits of the East MRT Scheme, such as supporting sustainable modes of travel and reducing air quality emissions.

3.5 Description of TVP P&R Development

- 3.5.1 The TVP P&R development was granted full planning permission (application ref: 161596) by WBC in November 2016 for:

“Development of a Park & Ride facility providing approximately 277 vehicular spaces, motorcycle parking and associated vehicular access and landscaping.”

- 3.5.2 The proposed site layout for the TVP P&R development is provided in **Appendix A.4**. It is understood that site clearance is complete.
- 3.5.3 A Section 73 Application (application ref: 182496) was subsequently submitted for the TVP P&R on the 7th September 2018 to vary aspects of the planning permission. This was approved at planning committee on 11th October. The application seeks to ‘alter ground levels/ retaining walls, and the layout and number of parking spaces, bus stop and bus turning area.’
- 3.5.4 Under the new EIA Regulations, it is necessary to consider the cumulative effects of approved schemes. Therefore, the assessment of effects from the combined development of both the East MRT scheme and the TVP P&R has been based on the Section 73 Application plans.
- 3.5.5 The proposed amended TVP P&R development incorporates the following:
- Vegetation and arboriculture clearance;
 - Provision of 260 car parking spaces, to include six disabled spaces;
 - Two bus stop bays on the north and south sides of the access road connecting to the roundabout;
 - Provision for motorcycle, and cycle parking;
 - Two bus shelters;
 - Incorporation of a living wall;
 - Access onto the roundabout that connects the A329(M), and Thames Valley Park Drive;
 - 2m wide maintenance strip along the site boundary.
 - Provision of a zebra crossing across the access road to link the proposed north and south bus stop bays; and

- Provision of a turning loop at the end of the access road to the west.
- 3.5.6 The TVP P&R development is proposed to be accessed via a new access road running west off the existing TVP roundabout junction, adjacent to the south of the TVP P&R parking area. The route of the East MRT scheme is proposed to connect with the permitted TVP P&R access road, running up to the TVP P&R roundabout junction.
- 3.5.7 The TVP P&R development and the proposed East MRT scheme are being progressed separately and have been designed to be capable of operating independently. However, it is anticipated that the proposed East MRT scheme and TVP P&R uses would complement each other once both developments become operational.

4 Construction and Site Management

4.1 Introduction

- 4.1.1 The construction stage of the Proposed Development will be carefully managed to limit the impact on the local area.
- 4.1.2 The key activities associated with the construction of the Proposed Development are:
- Removal or diversion of utilities;
 - Removal of vegetation on site where applicable;
 - Erection of site compounds (assumed to be on each side of the River Kennet), including temporary buildings;
 - Road construction;
 - Installation of bridge beams;
 - Construction of full height embankment;
 - Completion of bridge and viaduct structures;
 - Landscaping and drainage works; and
 - Highway works to connect the East MRT route into the wider network.
- 4.1.3 To accommodate the proposed 6.77m bridge height, the East MRT will be raised on either side of the bridge. A retaining wall will be used to the west of Tesco Car Park while imported fill material will be used to the east of the River Kennet.

4.2 Construction Works & Programme

- 4.2.1 It is anticipated that site clearance will commence in November 2019 and construction of the East MRT will commence in March 2020 (including enabling works and utility diversions), with completion expected in Spring 2023.

4.3 Construction Management

- 4.3.1 A CEMP will be prepared for the Proposed Development, and should be secured through a suitably worded planning conditions to manage the impacts of construction. The CEMP will identify a range of measures, in relation to aspects such as dust and air pollution, ground conditions, ecology, water resources, which will be utilised during the construction of the Proposed Development.
- 4.3.2 The format of the CEMP will need to be reviewed once the construction techniques and methodologies to be employed are confirmed. The CEMP will identify the responsibilities of all parties involved in the design, management and construction of the development. It is anticipated that matters to be addressed in a CEMP would include aspects set out in below,

as well as the construction mitigation and enhancement measures identified in each of the topic chapters of this ES. Measures include:

- **Health and Safety:** contractor's competence, risk method statements, contractor communication, welfare facilities, accident reporting, standards on personal protective equipment, display of safety notices etc.;
- **Contaminated land:** compliance with method statements for storage;
- **Noise and vibration:** selection of appropriate plant, site operation hours, monitoring, complaints procedure;
- **Dust and air:** prevention and mitigation measures, complaints procedure, wheel washing (if required);
- **Waste minimisation and management:** reduction, re-use, recovery, disposal (including Duty of Care), should include details of waste management and procurement policy;
- **Ecology:** timing of site clearance, tree protection (as necessary), new planting;
- **Water resources:** storage of materials, protocol for spillages and managing site drainage during construction, including from soil and silt run-off into nearby water courses;
- **Emergency planning & incident control:** incident recognition training, emergency planning, incident reporting and control;
- **Site logistics & operations:** safety and security; working hours; maintaining access, general site layout including compound location, construction traffic, access routes; and
- **Community liaison:** meetings and community contact, telephone helpline, designated point of contact.

4.4 Construction Traffic

- 4.4.1 Traffic will be generated during construction of the Proposed Development as a result of bringing plant and material to the Site and due to construction personnel accessing the Application Site.
- 4.4.2 An assessment of construction traffic and the resultant requirements for mitigation is provided in **Chapter 9** Transport and Access. Management of construction traffic, deliveries and personnel access will be managed through principles set out in the CEMP.

5 Assessment Method

5.1 Introduction

- 5.1.1 This chapter describes the process by which the EIA was carried out, and includes details of the relevant regulations, the EIA process, and general methodology for the assessment. Individual technical chapters include a description of topic specific assessment methodology.

5.2 EIA Regulations

- 5.2.1 The Town and County Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the EIA Regulations) implement Directive 2014/52/EU.
- 5.2.2 The EIA Regulations set out the procedures for undertaking an EIA and the information which is required in an Environmental Statement (ES) and such procedure has been followed in this assessment.

5.3 The EIA Process

- 5.3.1 In general terms, the main stages in the EIA are as follows:
- **Screening** – determining whether a proposed project falls within the remit of the EIA Regulations;
 - **Scoping** – determining the extent of issues to be considered in the assessment and reported in the ES;
 - **Establishing Baseline** – drawing together and reviewing existing available data and undertaking surveys to determine the baseline conditions;
 - **Assessment and Iteration** – assess likely significant effects of development, evaluate alternatives, provide feedback to design team on potential adverse impacts, modify development or impose parameters, incorporate mitigation, assess effects of mitigated development; and
 - **Preparation of the ES.**
- 5.3.2 It should also be noted that consultation with relevant stakeholders, as outlined below in **Section 5.5** and in **Appendix 9**, has been undertaken throughout the EIA process.

5.4 Screening

- 5.4.1 The Proposed Development is considered to constitute Schedule 2 (Section 10 Part (f) 'Construction of roads') development under the EIA Regulations as an Infrastructure Project for which the area of development exceeds 1 hectare and could result in significant environmental effects.
- 5.4.2 No formal screening exercise has been undertaken. The applicant has voluntarily undertaken an EIA of the Proposed Development, which has been documented in an ES, in compliance with the requirements of the EIA Regulations.

5.5 Scoping

- 5.5.1 The purpose of scoping is to identify the key policy, economic and social, and environmental issues relating to the proposed development early in the EIA process; it is also to ensure that those issues identified are subject to the appropriate level of assessment, thereby providing a focus for the EIA. Scoping gives relevant stakeholders an opportunity to express their views on the proposed development and to comment on the scope of the EIA.
- 5.5.2 The scoping process has been informed by the previous work and consultation with stakeholders. This includes the EIA Scoping Opinion provided by RBC on 25th November 2016, and the subsequent July 2017 ES and June 2018 ES Addendum. Following adoption of the Scoping Opinion (25th November 2016), there was further discussion with RBC to agree the approach to cumulative assessment with the TVP P&R and to agree the other approved developments to be considered in relation cumulative effects.
- 5.5.3 A Scoping Opinion Request for the Proposed Development was submitted to RBC and WBC on 29th August 2018. The request was supported by an EIA Scoping Report which set out the required information under the Section 15 (2) of the EIA Regulations. This included a description of the Application Site and the Proposed Development, the topics to be assessed as part of the EIA, the methodology for assessment and those topics to be scoped out of the EIA. A copy of the EIA Scoping Report is provided in **Appendix A.7**.
- 5.5.4 RBC and WBC provided an EIA Scoping Opinion on the 15th October 2018. A copy of the EIA Scoping Opinion is provided in **Appendix A.8**. A schedule of responses to the Scoping Opinion is provided in **Appendix A.9** to demonstrate where RBC, WBC and other statutory and non-statutory organisations comments have been considered within the ES.

5.6 Consultation

- 5.6.1 A comprehensive programme of consultations has been undertaken with statutory and non-statutory organisations as well as engagement with the local community. Such consultations have been undertaken to inform the emerging design and the EIA. **Appendix A.9** sets out the consultation undertaken by each EIA discipline and the response to any comments made. A Consultation Statement, which outlines the consultation process undertaken by the Applicant, has also been submitted as part of the planning application.
- 5.6.2 A public exhibition was held on the 12th September 2018 to allow individuals as well as community groups to provide representations on the planning application and sought views on the design options to help further reduce the impact of the scheme on the riverside setting. The feedback received was used to inform the design of the Proposed Development.
- 5.6.3 The EIA has been undertaken to fulfil the requirements of the consultees and the assistance of these consultees is gratefully acknowledged.
- 5.6.4 Consultation specific to each of the environmental topics covered in this ES is set out in the relevant ES chapters.

5.7 Approved Developments

- 5.7.1 The EIA Regulations require the assessment to consider the likely significant effects of the Proposed Development in the context of other developments, as well as the cumulative effects that may result from the Proposed Development and these other developments.
- 5.7.2 Approved developments are considered to be planning permissions that are partially built out and extant planning permissions. Planning applications that have been submitted but not yet

determined have also been considered where there is potential that the application may be granted planning permission before this application is determined.

- 5.7.3 A list of approved developments is included within **Appendix A.10**. As confirmed within the 2018 EIA Scoping Opinion, “RBC officers are not aware of significant developments since the previous Scoping Opinion was issued to advise of”. The approved developments identified have been considered as appropriate in the assessment of likely cumulative effects in the EIA. The assessment of likely significant cumulative effects with the Proposed Development is presented in the technical chapters of the ES (**Chapter 7 to 15**).
- 5.7.4 As agreed in the 2018 EIA Scoping Report (and subsequent EIA Scoping Opinion), the ES considers the likely significant cumulative effects of the East MRT with the TVP P&R development. This is provided in a section within each of the topic chapters in this ES. This has been undertaken on the basis of the assessment of the likely significant effects of the East MRT in isolation and the reports submitted with the TVP P&R application (Application ref: 161596 - as explained in **Section 3.5**).

5.8 Assessment Assumptions

- 5.8.1 The following assumptions have been used throughout the EIA (unless otherwise specified in each of the technical chapters) to ensure the EIA has undertaken an assessment of the likely significant effects of the Proposed Development and taken into account the full nature of the application:
- The Proposed Development will be constructed in accordance with the plans documented in **Chapter 3** and included in **Appendix A.3**;
 - The Proposed Development will be constructed in accordance with the indicative programme in **Chapter 4**;
 - The Proposed Development will be complete and operational by Spring 2023;
 - Baseline conditions are generally considered to be current conditions; likely changes to the current situation (the baseline evolution) have been considered in each of the topic chapters as appropriate;
 - The assessment of likely significant cumulative effects has assumed that the approved developments identified in **section 5.7** will be built out as set out in the documents supporting these applications; and
 - Suitable planning conditions will be imposed as identified in this ES to secure appropriate mitigation measures.
- 5.8.2 Further limitations in preparing this ES are noted in each of the topic chapters as appropriate.

5.9 Assessing Effects

Introduction

- 5.9.1 The EIA has assessed the likely significant effects of the Proposed Development against the appropriate future baseline i.e. the assessment takes the evolution of the baseline into account, which is described in each topic chapter.

Establishing Baseline Conditions

- 5.9.2 A range of site survey and data collection exercises have been used to identify environmental conditions at the Application Site and in the surrounding area. The surveys undertaken are reported in each of the topic chapters.

Assessing Construction Effects

- 5.9.3 The EIA has assessed the likely significant environmental effects that could occur during the construction phase for the Application Site. A principal contractor has not yet been appointed. It is not possible to be definitive about the construction works and therefore the assessment of likely significant environmental effects during the construction phase has been based on available information and reasoned judgements based on professional experience to enable the likely significant environmental effects to be identified.
- 5.9.4 Construction effects will be both temporary and intermittent, i.e. they will not occur at one place through the duration of the construction works. The potential duration and intermittency of effects is identified as appropriate in relevant topic chapters.

Assessing Operation Effects

East MRT

- 5.9.5 The EIA has focussed on assessing the likely significant environmental effects from the completed development to provide a robust assessment and one that is generally consistent between topics. This approach allows for the full environmental effects of the proposed Development have been considered.

Combined Development

- 5.9.6 In accordance with the EIA Scoping Opinion, the EIA considers the likely significant effects of East MRT and the TVP P&R. This has been undertaken on the basis of the assessment of likely significant effects of the East MRT in isolation and the reports submitted with the TVP P&R application.

5.10 Uncertainty

- 5.10.1 The prediction of future effects inevitably involves a degree of uncertainty. Where necessary, the environmental topic chapters describe the principal factors giving rise to uncertainty in the prediction of likely environmental effects and the degree of the uncertainty.
- 5.10.2 Uncertainty also applies to the success, or otherwise, of measures to mitigate adverse environmental effects. Where the success of mitigation is uncertain, the extent of the uncertainty has been identified in the ES.

5.11 Mitigation of Adverse Effects

5.11.1 The term 'mitigation' is used throughout the ES to describe measures of overcoming or reducing effects. The term has been used to describe the following types of measures:

- **Avoidance:** measures taken to avoid effects which could have adverse impacts e.g. locating the main development and its working areas and access routes away from high ecological value;
- **Reduction:** measures taken to reduce effects that could have adverse impacts, e.g. modifications or additions to the design of the Proposed Development, or changes in working practice;
- **Compensation:** in certain circumstances, it may not be possible to mitigate an impact, either through avoidance or reduction. In this situation, it may be possible to address the impact through compensation measures. In this assessment, the term compensation is used to describe measures to off-set losses caused as a result of the Proposed Development which cannot entirely be mitigated; and
- **Enhancement:** this describes measures that provide additional ecological benefit above and beyond those identified as mitigation and compensation.

5.11.2 The identification of mitigation measures to be implemented is an integral part of the design and related EIA process.

5.11.3 There is a distinction between mitigation that is incorporated or 'embedded' into the design of the Proposed Development (embedded mitigation) and mitigation that is subsequently identified in order to prevent, reduce or offset any remaining significant adverse effects.

5.11.4 Embedded mitigation evolves through the iterative design process and early consideration of the likely significant impacts is essential to incorporating suitable embedded mitigation measures. Design principles of the Proposed Development have been established and the ES has documented the embedded mitigation measures that have been employed within the design in response to the identification of potentially significant effects in **Section 3.3**. Additional mitigation measures are identified in each of the ES environmental topic chapters.

5.12 Residual Effects

5.12.1 Residual effects are the environmental effects that will remain after mitigation measures have been secured.

5.12.2 It is these residual effects which should be considered when assessing the likely significance of the effects of the Proposed Development, not the unmitigated effects. This is because the mitigation proposed within the East MRT Scheme will mean that the identified unmitigated effects will not occur in practice.

5.12.3 The significance of residual effects has been determined and is identified in the ES to provide an objective assessment of residual effects. This allows for comparison of effects between topics and also strengthens the assessment of the combined effects.

5.13 Significance Criteria

5.13.1 The two principal criteria for determining significance of an environmental effect are the magnitude of the impact and the sensitivity of the receptor, in addition the likelihood of the effect occurring is also considered as appropriate.

- 5.13.2 The approach to assessing and assigning significance to an environmental effect relies upon such factors as; consideration of the EIA Regulations, guidelines, standards or codes of practice, the advice and views of statutory consultees and other interested parties, and expert judgement.
- 5.13.3 The following questions are relevant in evaluating the significance of likely environmental effects:
- Is the effect direct, indirect or cumulative?
 - Does the effect occur over the short, medium or long term?
 - Is the effect permanent or temporary?
 - Is it positive, neutral or adverse effect?
 - Is the effect reversible or irreversible?
 - Does the effect increase or decrease with time?
 - Is the effect of local, regional, national or international importance?
 - Are health standards or environmental objectives threatened?
 - Are mitigating measures available and is it reasonable to require these?
- 5.13.4 Specific significance criteria have been prepared as appropriate for each specialist topic, based on the generic criteria (or the generic criteria referred to), for adverse and beneficial effects, set out in **Table 5.2**.

Table 5.2: Generic Significance Criteria

	Level of Effect	Criteria
Significant	Substantial	These effects are assigned this level of significance as they represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites and features of national or regional importance. A change at a district scale site or feature may also enter this category.
	Major	These effects are likely to be important considerations at a local or district scale and may become key factors in the decision-making process.
	Moderate	These effects, while important at a local scale, are not anticipated to be key decision-making issues.
Not significant	Minor	These effects may be raised as local issues but are unlikely to be of importance in the decision-making process.
	Negligible or No Effect	Either no effect or an effect which is beneath the level of perception, within normal bounds of variation or within the margin of forecasting error. Such effects should not be considered by the decision-maker.

5.14 Cumulative Effects

- 5.14.1 **Section 5.7** and **Appendix A.10** identifies the approved developments that have been considered in the EIA with regards to likely significant cumulative effects. Each of the topic chapters of this ES includes a section documenting the assessment of the likely significant cumulative effects of the Proposed Development and these approved developments. This assessment is based on available information on the committed developments identified.

5.15 Impact Interactions

- 5.15.1 **Chapter 16** provides the assessment of combined effects, i.e. receptors being affected by more than one environmental effect and therefore potentially being subject to a more significant combined effect than the individual effects reported in each of the topic chapters.
- 5.15.2 The approach adopted for the assessment is in accordance with the methodology set out above, with further details provided in **Chapter 16**.
- 5.15.3 **Chapter 16**, therefore provides an overall summary of the effects of the Proposed Development during construction and operation.

5.16 Monitoring

- 5.16.1 The EIA Regulations introduce the requirement for the monitoring of significant residual adverse environmental effects and that a schedule of proposed monitoring should be set out in an ES.
- 5.16.2 Each chapter of the ES therefore identifies the proposed monitoring arrangements, which should be proportionate, for any residual significant adverse effects identified. A summary of mitigation and monitoring requirements identified in each topic chapter is provided in **Chapter 17**.

6 Planning Policy Context

6.1 Introduction

- 6.1.1 Section 70(2) of the Town and Country Planning Act 1990 and section 38(6) of the Planning and Compulsory Purchase Act 2004 are clear that decisions in regard of planning applications must be taken in accordance with the development plan unless there are material considerations that indicate otherwise. This therefore places the Development Plan at the heart of planning decision making and the government's National Planning Policy Framework (NPPF) reiterates the importance of having a plan led system and, where proposals accord with an up-to-date development plan, applications should be approved without delay.
- 6.1.2 Where the development plan is absent, silent or the relevant policies are out of date, paragraph 11 of the NPPF requires the application to be determined in accordance with the presumption in favour of sustainable development. This a theme running at the heart of planning.
- 6.1.3 Regarding the below-mentioned policy documents, the relevant parts of the documents are detailed in each of the topic chapter of the ES, along with other relevant legislation, policy and guidance documents.

6.2 NPPF 2018

- 6.2.1 The NPPF has three overarching objectives:

“a) an economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;

b) a social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and

c) an environmental objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.”

- 6.2.2 The new NPPF was published in July 2018, and largely retains the aims of the prior version in relation to sustainable transport.
- 6.2.3 As part of its social objective the NPPF sets out the need to promote healthy communities. In response to this paragraph 91 of the NPPF sets out that policies and decisions should promote easy pedestrian and cycle connections between neighbourhoods.
- 6.2.4 The NPPF sets out a priority in its 9th chapter to pursue and deliver sustainable transport. Paragraph 102 sets out that local planning authorities should promote walking, cycling and public transport. This follows the NPPF's environmental aim of reducing carbon emissions.

6.3 The Development Plan

Development Plan

- 6.3.1 The Site is predominantly located within the jurisdiction of RBC where the adopted development plan comprises:
- Core Strategy (adopted January 2008, altered January 2015);
 - Proposals Map (adopted October 2012);
 - Reading Central Area Action Plan (adopted January 2009); and
 - Sites and Detailed Policies Document (adopted October 2012, altered January 2015).
- 6.3.2 The Council is currently working on a new Local Plan which, when adopted, will replace the current adopted development plan. The plan will set out how Reading will develop up to 2036. The Local Plan was submitted for examination on 29th March 2018. The inquiry has now ended and publication of the Inspector's report is awaited.
- 6.3.3 The Site is also partially located within WBC where the adopted development plan comprises:
- Core Strategy (adopted January 2010); and
 - Managing Development Delivery (MDD) Local Plan (adopted February 2014).
- 6.3.4 WBC is also currently working on a new Local Plan, which will guide development in the Borough for the next 20 years. The Preferred Options Consultation took place this summer (2018). The detailed programme for the development of the new Local Plan will be set out in a new Local Development Scheme in the coming months. The emerging policy is still at the very early stages of preparation and therefore, in accordance with the NPPF, very little/no weight can be assigned to it

Supplementary Planning Guidance

- 6.3.5 RBC has adopted a number of additional supplementary planning documents to provide specific guidance to supplement the provisions of the adopted development plan. Additional planning guidance adopted by RBC and of relevance to the current development proposals is contained within the Infrastructure Delivery Plan (adopted July 2011) and the Local Transport Plan 3: Strategy 2011-2026 (adopted April 2011).
- 6.3.6 WBC has also adopted a number of additional supplementary planning documents to support the provisions of the development plan. Additional planning guidance adopted by WBC and of relevance to the current development proposals is contained within the Infrastructure Delivery Plan (June 2012, supporting the MDD Local Plan), Borough Design Guide SPD (adopted May 2012), Sustainable Design and Construction SPD (adopted May 2010), and Local Transport Plan 3: Strategy 2011-2026 (adopted 2011).

Key Planning Policies

Reading Borough Council

- 6.3.7 The principle of the proposed development within the jurisdiction of RBC has been established within adopted local planning policy. Policy CS20 of the Core Strategy requires development proposals to contribute appropriately to the provision of a balanced transport network as outlined in the Local Transport Plan, including the implementation of core transport infrastructure projects. The East MRT scheme is identified as a priority transport project in

Core Strategy Policy CS21 and the Local Transport Plan. Policy CS21, together with Policies RC1 and RC3 of the Reading Central Area Action Plan and accompanying **Figure 6.2**, add that land needed for implementation of the MRT scheme (identified as running east from Napier Road) will be safeguarded from other forms of development.

- 6.3.8 The Proposals Map identifies a number of designations for land in or adjacent to the Site, where local planning policy provides relevant detailed guidance. The development proposals and environmental assessment work have been undertaken having regard to the specific requirements of relevant planning policies outlined below.
- 6.3.9 Land between Napier Road and the River Kennet, including the Site (in part), is designated as an 'Area safeguarded for Crossrail extension'. Paragraph 15.3.6 of the Sites and Detailed Policies Document notes that the Council will consult with Crossrail Limited on planning applications within this designated land. Land between Napier Road and the River Kennet includes a designated Green Link, where Policy DM17 of the Sites and Detailed Policies Document requires development to maximise enhancement opportunities and incorporate landscaping features.
- 6.3.10 Land between the River Thames/Kennet and Tesco, within (in part) and to the north of the Site, is identified as a Major Landscape Feature and an area of public open space, where Policies CS37 of the Core Strategy, SA17 of the Sites and Detailed Policies Document and RC14d of the Reading Central Area Action Plan are relevant. Policies CS37 and SA14 seek to preserve the character and appearance of the Major Landscape Feature, whilst Policy RC14 requires development to protect and make a positive contribution towards the quality of areas of public open space. This area of land also includes a designated Cycle Route, where Policy SA14 of the Sites and Detailed Policies Document seeks to ensure that development does not detrimentally affect the identified route but provides improvements where possible.
- 6.3.11 Land adjacent to the railway line, within (in part) and to the south of the Site, is identified as an Area of Archaeological Potential. Core Strategy Policy CS33 states that areas of historic importance will be protected and where appropriate enhanced.
- 6.3.12 A number of additional planning policies contained within the development plan provide further detailed guidance which will be taken into account in the preparation of the current development proposals. In particular, the development proposals will seek to adhere to the provisions of: Core Strategy Policies CS1 (Sustainable Construction and Design), CS3 (Social Inclusion and Diversity), CS7 (Design and the Public Realm), CS8 (Waterspaces), CS28 (Loss of Open Space), CS34 (Pollution and Water Resources), CS35 (Flooding), CS36 (Biodiversity and Geology); and Sites and Detailed Policies Document Policies SA16 (Public And Strategic Open Space), DM1 (Adaptation To Climate Change), DM4 (Safeguarding Amenity), DM12 (Access, Traffic And Highway-Related Matters), DM16 (Provision Of Open Space), and DM19 (Air Quality).
- 6.3.13 In relation to emerging policies, limited weight can be afforded to them due to the fact that they have not been subject to examination by an Inspector, and then formally consulted with the public and other third parties. Whilst this is the case, some emerging policy is relevant. In particular, planning policy TR2: Major Transport Projects, seeks to allocate land within the plan for the development of the East MRT. This is shown under designation TR2a on the emerging Proposals Map.
- 6.3.14 The policy further allocates land for the following related projects, Green Park Station and Interchange (TR2b), Reading West Station (TR2c), Cow Lane Bridges (TR2d) and National Cycle Network Phases 1 and 2 (TR2e).

Wokingham Planning Policy

- 6.3.15 The principle of the proposed development within the jurisdiction of WBC is addressed within local planning policy and supporting documentation. Key policies include the following:

- **Policy CP1- Sustainable Development** – key requirements include that development proposals should ‘maintain or enhance the high quality of the environment’, ‘provide attractive, functional, accessible, safe, secure and adaptable schemes’, and ‘demonstrate how they support opportunities for reducing the need to travel, particularly by private car’;
 - **Policy CP3 – General Principles for Development** – highlights key characteristics required for proposals, including requirements for appropriate ‘*scale of activity, mass, layout, built form, height, materials and character to the area together with a high quality of design*’, and proposals should ‘*contribute towards the provision of an appropriate sustainable network of community facilities*’, and ‘*have no detrimental impact upon important ecological, heritage, landscape (including river valleys) or geological features or water courses*’; and
 - **Policy CP6 – Managing Travel Demand** – Planning permission will be granted for schemes that: ‘provide sustainable forms of transport to allow choice; are located where there are or will be at the time of development choices in the mode of transport available and which minimise the distance people need to travel; improve the existing infrastructure network, including road, rail and public transport, enhance facilities for pedestrians and cyclists, including provision for those with reduced mobility, and other users; provide appropriate vehicular parking, having regard to car ownership; mitigate any adverse effects upon the local and strategic transport network that arise from the development proposed; enhance road safety; and do not cause highway problems or lead to traffic related environmental problems.
 - **Policy CP11 - Proposals outside Development Limits** – proposals outside of development limits will not normally be permitted except where ‘*it does not lead to excessive encroachment or expansion of development away from the original buildings*’. Other key policies include Policy CP6 of the Core Strategy, which supports schemes that provide for sustainable forms of transport, and Policy CP10 of the Core Strategy. In addition, Policy CC08 and **Appendix 3** of the MDD Local Plan, safeguard areas identified for improvements to the strategic transport network including mass rapid transit along the A4/A329 corridors, improvements to public transport services and improvements to footway and cycle networks.
- 6.3.16 **Appendix 3** of the MDD Local Plan refers to strategic transport projects indicated on **Figure 24** of the Local Transport Plan, which includes a proposed highway scheme connecting west into Reading Borough from Thames Valley Park and the proposed Park & Ride facility.
- 6.3.17 The Proposals Map identifies a number of designations for land in or adjacent to the Site, where local planning policy provides relevant detailed guidance. The development proposals and environmental assessment work will be undertaken having regard to the specific requirements of relevant planning policies outlined below.
- 6.3.18 Land adjacent to the west of the roundabout at Thames Valley Park, including the Site (in part), is located within a ‘Major Development Location’, where development proposals are acceptable in principle in accordance with Core Strategy Policy CP9. Policy CP9 requires that proposals outside of defined Development Limits (including part of the Site) contribute to enterprise and promote recreation, whilst not leading to excessive encroachment.
- 6.3.19 Land adjacent to the west of the roundabout at Thames Valley Park is also allocated for development under Policies SAL07 and SAL09 of the MDD Local Plan for either 2,700sqm commercial floorspace or a Park & Ride facility and associated development. A planning application has been permitted for a Park & Ride facility in this location.
- 6.3.20 Thames Valley Park and Sutton’s Industrial Estate, located to the east and south of the Site, are identified as Core Employment Areas within the Borough, where development for business, industry or warehousing is acceptable in accordance with Policy CP15 of the Core Strategy.

- 6.3.21 A number of additional planning policies contained within the development plan provide further detailed guidance which will be considered in the current development proposals. In particular, the development proposals will seek to adhere to the provisions of: Core Strategy Policies CP3 (General Principles for Development), CP7 (Biodiversity), and MDD Local Plan Policies CC03 (Green Infrastructure, Trees and Landscaping), CC04 (Sustainable Design and Construction), CC06 (Noise), CC09 (Development and Flood Risk), CC10 (Sustainable Drainage), TB21 (Landscape Character) and TB23 (Biodiversity and Development).
- 6.3.22 Considering the early stage of the emerging Local Plan, little/no weight can be given to it, and it is therefore not set out in further detail here.

6.4 Summary

- 6.4.1 The development proposals are being delivered to accord with the following key planning policies:
- RBC Core Strategy (adopted 2008 and updated 2015) Policy CS21;
 - RBC Central Area Action Plan (2009) Policy RC1 & RC3;
 - WBC Core Strategy (2010) Policy CC10; and
 - WBC Managing Development Delivery Local Plan (2014) Policy CC08.
- 6.4.2 The Proposed Development is on land within WBC that is safeguarded for the strategic transport network including mass rapid transit along the A4/A329 corridors (Appendix 3 of the MDD Local Plan). Policy CS21, together with Policies RC1 and RC3 of the Reading Central Area Action Plan and accompanying Figure 6.2, add that land 'within RBC' needed for implementation of the MRT scheme (identified as running east from Napier Road) will be safeguarded from other forms of development.

7 Socio-Economics

7.1 Introduction

7.1.1 This chapter has been prepared by PBA to assess the socio-economic impact of the East MRT. This chapter provides:

- A review of relevant socio-economic policy and strategy documents;
- The baseline socio-economic context;
- An assessment of gross employment generated in construction and operational phases;
- An assessment of net employment and Gross Value Added (GVA)¹ impacts once operational; and
- The cumulative impacts when considered alongside committed developments.

7.1.2 In accordance with Regulation 18(5) of the Regulations 2017, a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this ES is provided in **Appendix A.5**.

7.2 Policy Context

7.2.1 Relevant planning policies for the Proposed Development are summarised in **Chapter 6**.

7.2.2 Planning, housing and economic development policies relating specifically to socio-economics are provided in **Appendix B.1: Policy** and are summarised below.

National Policy

7.2.3 A review of policy and strategy documents identified an emphasis on sustainable travel policies and objectives set out in national policy. The NPPF advocates managing patterns of growth and exploiting any opportunities to make a location more sustainable (for example by improving the scope for access on foot, by cycling or by public transport) (para 102).

Local Policy

Thames Valley Berkshire Local Enterprise Partnership (TVBLEP)

7.2.4 Thames Valley Berkshire Local Enterprise Partnership is a business-led, multi-sector partnership mandated by government to lead activities that drive economic growth. The Partnership works to secure UK and European public funds to deliver a wide range of initiatives in the Thames Valley Berkshire sub-region. The sub-region stretches from Hungerford in the west to Slough in the east and incorporates Reading and Wokingham which are of relevance to this socio-economic assessment.

7.2.5 The sub-region's growth strategy is premised on connectivity, given the area's links to London and polycentric economic geography. Key priority areas within the Strategic Economic Plan (TVB Strategic Enterprise Partnership, 2015) are identified as the delivery of housing, enhanced urban connectivity, and improving the STEM skills base and targeting business support. It recognises the importance of the area's international connectivity (particularly given the areas proximity to London) and commits to continuous investment particularly through

¹ Gross Value Added (GVA) is a measure of the value of goods and services produced in an area

Local Growth Funding and implementation of the SEP. In particular, the plan aims to address constraints on strategic growth including near capacity on road and rail networks.

- 7.2.6 More generally, the TVB Growth Deal (2014) aims to enhance urban connectivity to address strategic infrastructure priorities. This is crucial to achieving new housing delivery (particularly in Wokingham) and improving journey times across the LEP area.

Wokingham Borough Council

- 7.2.7 WBC's Core Strategy (adopted January 2010) sets out key policies with respect to sustainable development. Among environmental improvements, this includes demonstrating a support for reducing travel need, and providing functional, attractive, accessible, safe and accessible schemes. Development control policy CP9 notes that the scale and location of development proposals need to reflect existing levels of facilities and services at a location, in addition to accessibility. In addition, policy CP10 sets out improvements to the Strategic Transport Network, which similarly identifies the need for improved accessibility in public transport through the East MRT projects.

Reading Borough Council

- 7.2.8 RBC's Core Strategy (amended 2015) and Reading's Central Area Action Plan (2009) supports economic development as complementary to existing public transport services. Policy CS10 notes the importance of supporting major office developments along key transport corridors. Policy CS13 similarly notes that employment development should provide mitigation measures in line with impacts on housing, labour, skills and the transport network, recognising potential pressures on a 'tight' labour market. Development control policies CS25-CS27 advocate the development of centres.
- 7.2.9 Reading's submitted draft Local Plan (2018) identifies the East MRT as necessary infrastructure to provide alternative's to car use, encourage sustainable transport, reduce congestion and improve accessibility and air quality. The East MRT and other accessibility improvements are consistent with town centre improvement.

7.3 Consultation

- 7.3.1 A Scoping Report was submitted to RBC and WBC in August 2018, which included an outline of the proposed scope and methodology for the socio-economic assessment. The Scoping Opinion is included in **Appendix A.8**.

7.4 Methodology

Study Area

- 7.4.1 The spatial scope of the socio-economic assessment reflects the geography of potential impacts of the Proposed Development. The economic impacts are measured on a 60-minute drive time catchment reflecting typical travel to work patterns. The 60-minute drive time study area is shown in the map provided in **Appendix B.2: Study Area**. The Baseline Profile in **Appendix B.3** also provides information on RBC and WBC labour market areas.

Baseline Data Collection

- 7.4.2 Data and information from national and local databases has been reviewed. Key data sources include:
- Experian 2018 (based on Census 2011 data);
 - NOMIS 2017;

- Office of National Statistics data;
- East Reading Mass Rapid Transit Business Case (2017); and
- PBA Demand Model Outputs 2021 and 2031 (2017).

Assessment

7.4.3 The main stages of the approach employed are as follows:

- **Review Available Data/Information:** Data and information from the sources set out in **Section 7.4.2** has been reviewed.
- **Baseline Conditions:** The study area's current and socio-economic position has been described using standard indicators:
 - Economic: the area has been described using a combination of publicly available National Statistics and indicators including Experian 2018, Census 2011 and NOMIS 2017;
 - Social: the area's demographic structure has been examined within the 60-minute study area; and
 - Policy Context: planning, economic development and other relevant policy have been reviewed to identify related economic, social and regeneration objectives that the proposed development may affect (whether contributing to their realisation or otherwise).
- **Baseline Evolution:** The baseline evolution has been informed by planned future growth and expected delivery of new infrastructure to accommodate increased demand within the Study Area.
- **Assessment of Effects:** An assessment of likely significant effects on the local and national economy during construction and operation has been undertaken. This assessment has been based on standard methods as set out in best practice documents including the HM Treasury *Green Book Economic Appraisal Guidance* (2018), HCA *Additionality Guide* (2014) and HCA *Calculating Cost Per Job – Best Practice Note* (2015). The assessment covers:
 - Direct economic impacts: jobs and GVA that are wholly or largely related to the proposed development;
 - Indirect economic impacts (beneficial and negative): jobs and GVA generated in the study area in the chain of suppliers of goods and services to the direct activities;
 - Induced economic impacts: jobs and GVA created by direct and indirect employees' spending in the study area or in the wider economy; and
 - Wider economic and social effects (beneficial and negative): employment and income generated in the economy.

7.4.4 As noted above, best practice principles² have been applied to assess the employment impact of the proposed development. An economic impact model, consistent with appraisal guidance, has been used to measure net additional employment and GVA.³ Appropriate

²https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/220541/green_book_complete.pdf

³ The economic impact model allows the guidance to be applied to the quantitative elements of the employment impact assessment

economic appraisal guidance⁴ and professional judgement based on economic impact assessment elsewhere has been used to estimate values for:

- **Deadweight** - what would happen in the absence of the proposed development;
- **Leakage** - the proportion of employment opportunities accessed by people living outside the study area;
- **Displacement** – the proportion of proposed development benefit accounted for by a reduction in benefit elsewhere;
- **Substitution** - when a firm substitutes one activity for another to take advantage of public sector assistances; and
- **Multipliers** – to estimate further economic activity associated with additional income and supplier purchases.

Mitigation and Enhancement Measures

- 7.4.5 Mitigation and enhancement measures have been identified where appropriate to address potentially significant effects and enhance potential beneficial effects.

Residual Effects

- 7.4.6 Likely significant residual effects (i.e. effects following any proposed mitigation) on the local and wider socio-economic context have been identified.

Significance of Effects

- 7.4.7 The significance of residual effects has been determined using professional judgement and the Significance Criteria in **Chapter 5, Table 5.1**.

Cumulative Effects

- 7.4.8 An assessment of likely cumulative effects is provided. This takes into account the major local committed developments identified in **Appendix A.10**. Cumulative impacts have been assessed for the East MRT and the East MRT combined with the TVP P&R.

Limitations

- 7.4.9 The baseline data and information collated is based on the most up-to-date information publicly available from third parties.

Baseline Conditions

The Site

- 7.4.10 The East MRT is proposed to link the A329 at Thames Valley Park, from the proposed new Park & Ride facility, to Napier Road, Reading town centre, and the railway station. The route will pass through both RBC and WBC administrative areas. Further information regarding the site can be found in **Chapter 2**.

⁴ HM Treasury Green Book Economic Appraisal Guidance (see Reference section).

The Surrounding Area

- 7.4.11 Reading, Wokingham and the 60-minute drive time study area are characterised by higher than average population growth projections. Each area has a rapidly increasing working age population which is contrary to the national trend.
- 7.4.12 Economic activity is high in the 60-minute drive time area and within Reading and Wokingham. The population is highly qualified, with about half of the population employed in highly skilled jobs. The area's share of professional, scientific and technical activities is particularly high compared to wider region and national averages. Across the council areas, the greatest growth to 2035 is expected in finance and insurance, professional services, utilities, accommodation and food services, and recreation.
- 7.4.13 Reading, Wokingham and the study area⁵ is defined by a mobile but relatively contained workforce. A significant number of people that work in Reading or Wokingham travel east-west to places of work. Travel patterns are similar around the application site, with the majority of local employees travelling from within Reading and from Wokingham. As detailed in **Appendix B Table B.3-9**, it is clear that a significant proportion of the workforce in Reading travel from Wokingham and vice versa to a more limited extent.
- 7.4.14 **Appendix B.3: Baseline Profile** provides a description of the socio-economic conditions within the local area (Reading and Wokingham Borough Council local authority areas) and the socio-economic study area (60-minute drive time from the centre of the proposed development).
- 7.4.15 The aspects considered include: population and demographic change; travel to work patterns; unemployment rates, education and skills; projected employment change to 2025 and 2035 and Gross Value Added (GVA) by industry.
- 7.4.16 The East MRT Full Business Case (September 2017) states that *"the A4 corridor in East Reading linking the town centre and the A3290 is suffering from significant levels of congestion, particularly in the peak periods. This congestion is forecast to increase with the projected level of growth in Reading and Wokingham Borough."*⁶
- 7.4.17 The scale of impact that can be directly linked to the project has been calculated using the future housing and employment growth set out in the Full Business Case and the increase in new East MRT users which is used as a proxy for realised capacity. **Table 7.1** summarises that 15,000 jobs and 14,700 homes are planned in the area from existing commitments under construction and local plan allocations. This scale of development is threatened by the lack of road network capacity.

Future Growth – Planned Projects

Table 7.1: Planned Projects

Jobs/ Home	Location
15,000 jobs	Thames Valley Park and IQ Winnersh
5,300 homes	Kenavon Drive, Station Hill, Chatham Place and Royal Mail sites
9,400 homes	Wokingham

Source: East MRT Full Business Case (Page 8)

⁵ 60 minute drive time

⁶ MRT East Full Business Case (2017), Page 1

Uplift in patronage as a result of the East MRT

- 7.4.18 A Demand Model prepared by PBA as part of the Demand Modelling undertaken to support the Business Case for East MRT provides an indication of the level of capacity that will be released by the East MRT. The Full Business Case also assumes delivery of the TVP P&R within their modelling. **Table 7.2** shows **513** additional new users per day (above current usage) are predicted to use the East MRT during 2021, 379 (74%) of which are directly related to the use of the bus service and 134 (26%) are related to the TVP P&R as part of the Business Case. These figures have been calculated from trip data set out at p.26-29 of PBA's Demand Modelling Report. These tables are enclosed at **Appendix B.7**.

Table 7.2: Uplift in patronage as a result of the East MRT

Demand Model Outputs	2021	2031
Bus	379	417
TVP P&R	134	299
Combined	513	716

Source: PBA Demand Model Outputs (p26-29); PBA Transport Team

Capacity Released

- 7.4.19 The information above relating to the capacity constraints, planned developments and capacity released by the East MRT has been used to estimate the number of jobs and homes that can be considered to be enabled by the additional network capacity. The East MRT will provide enough network capacity to accommodate a further 3.5%-4.8% new jobs and between 3.6%-4.8% new homes around the A4 London Road corridor, as identified in the East MRT Full Business Case (2017).⁷

Table 7.3: Capacity Released by East MRT

	Jobs (15,000)		Homes (14,700)	
Demand Model Outputs ⁸	2021	2031	2021	2031
Bus	2.5%	2.8%	2.6%	2.8%
TVP P&R	1.0%	2.0%	1.0%	2.0%
Combined	3.5%	4.8%	3.6%	4.8%

Source: PBA Demand Model Report

- 7.4.20 The information in **Table 7.3** is a conservative estimate based on available information and a "pessimistic" service frequency of every 15 minutes⁹. A more frequent service could potentially open up substantially more capacity than tested in the Demand Model for the Business Case as more passengers could be transported. In the future, East MRT could be connected to further P&Rs in the area. Crossrail is also likely to result in additional journeys to Reading railway station. East MRT can therefore be viewed as a key component in delivering greater urban connectivity and accessibility¹⁰.

⁷ 15,000 jobs and 14,700 homes (Table 7.1)

⁸ Patronage uplift stated in Table 7.2 as a percentage of the the number jobs/homes eg. 379 is 2.5% of 15,000.

⁹ PBA Demand Modelling Report (2017) p.26

¹⁰ PBA report: *East Reading MRT Full Business Case* p.16

- 7.4.21 This data has been used in the economic impact model to show the net additional impact that can be directly linked to the East MRT and the East MRT and the TVP P&R (please see **Appendix B4: Additionality Data & Assumption**).

Baseline Evolution

- 7.4.22 Housing growth is planned in both Reading and Wokingham Boroughs. Reading's emerging New Local Plan, in **Section 3.2** identifies a housing requirement of 15,134 new homes up to 2036 (equating to 658 homes per year), with 7,700 new dwellings (51% of the housing need) directed to the city centre and 1,000 new dwellings (6%) directed to the east of the city. Wokingham's adopted core strategy identifies a requirement of 13,230 new homes by 2026.
- 7.4.23 Also, PBA's *East Reading Mass Rapid Transit – Phases 1 & 2 Business Case* (2017) report identifies that 5,300 homes are planned for the region at Kenavon Drive, Station Hill, the Former Cooper BMW site and the Royal Mail site, together with 9,400 new homes in Wokingham and the west side of Bracknell.
- 7.4.24 This suggests that without the East MRT intervention going ahead, there would be growth in the population that would inevitably result in increased congestion on the local highways network.
- 7.4.25 However, both the adopted Wokingham Core Strategy (Policy CP10, p.51) and the emerging Reading New Local Plan (Policy TR2 p.88) identify mass rapid transport schemes for delivery during their plan periods. In addition, mass rapid transport schemes are detailed as one of several proposed measures to alleviate congestion of the area's highways network in RBC's *New Local Transport Plan and Borough-wide Car Parking & Air Quality Strategy* report presented to RBC's Policy committee in July 2018.
- 7.4.26 This suggests that road congestion is regarded as a key issue in the area and the delivery of transport interventions are a priority of both local authorities.

7.5 East MRT Site

Embedded Mitigation

- 7.5.1 There are no embedded mitigation measures relating to the socio-economic impacts of the Proposed Development.

Assessment of Likely Effects

- 7.5.2 The section estimates the potential economic, social and housing related impacts that are likely to result from the East MRT's construction and operational phases.

Construction: Employment & GVA

Gross Impact

- 7.5.3 Construction impacts have been estimated for the construction of the East MRT and the net additional impact on housing through released capacity.
- 7.5.4 A standard method has been used to estimate the number of direct construction jobs supported by the construction phase. Estimated construction costs are £24 million for the East MRT¹¹ and approximately £2.1 billion for the 14,700 new homes.

¹¹ PBA report: *East Reading MRT Full Business Case*

- 7.5.5 According to the Office of National Statistics (ONS) construction expenditure of £204,706¹² supports one construction worker for a one-year period (i.e. the output per head in the construction sector). On this basis, East MRT construction phase would create 117 person years of construction employment while the new homes would create 10,259 person years of construction employment.¹³

Net Additional Impact ¹⁴

- 7.5.6 Only a proportion of this impact and associated benefit is directly attributable to the East MRT and not all of it will occur in the study area.¹⁵ A bespoke Economic Impact Model consistent with best practice guidance¹⁶ has been built to measure the net additional impact in the study area (i.e. factoring in deadweight, leakage, displacement and multipliers).
- 7.5.7 The Economic Impact Model applies the Additionality Data and Assumptions in **Appendix B4 Table B-4-1** to the scale of planned development. **Table 7.4** below shows the gross and net additional impacts of the East MRT.

Table 7.4: Gross Impact of Planned Projects and Net Additional Impact of East MRT

Demand Model Outputs	Estimated Construction Cost (£m)	Gross		Net Additional Impact in 60-minute study area	
		Person years	GVA (£m)	Person years	GVA (£m)
East MRT	£24	117	£12.8	78	£5.6
Housing	£2.1billion	10,294	£1.7billion	6,794	£490
Total				6,872	£495.6

Source: PBA

- 7.5.8 The East MRT is likely to support an estimated:
- **78 net additional temporary construction local jobs** in the study area during the construction of the East MRT; and
 - **6,794 net additional temporary construction local jobs** in the study area from the scale of planned housing that can be directly linked to the capacity released through road network improvements.
- 7.5.9 Gross Value Added (GVA) is a measure of the value of goods and services produced in an area. GVA per head in the construction industry in South East England is £72,128 compared to £70,618 nationally.¹⁷ Applying the South East England GVA it is estimated the proposed development will therefore have the following net additional GVA impact:
- **£5.6 million net additional GVA** relating to the East MRT; and
 - **490 million net additional GVA** related to the housing element.

¹² ONS Turnover by Industry and Region (data as at March 2017)

¹³ £24m/ 204,706 = 117

¹⁴ i.e. factoring in deadweight, leakage, displacement and multiplier effects

¹⁵ This is because workers may live and spend wages outside the area. Activity at the proposed development may also reduce activity elsewhere in the economy

¹⁶ HCA *Additionality Guide* (2014), HM Treasury *The Green Book* (2018),

¹⁷ PBA working using ONS 2017 GVA per sector and number of FTEs

- 7.5.10 Construction impacts are considered to be of local level scale which are classified as **minor beneficial effects** according to the Significance Criteria in **Table 5.1**.

Operation: Employment & GVA Impacts

- 7.5.11 Some 15,000 jobs are planned in the East of Reading over the next 15 years. The PBA Demand Model Assessment shows the East MRT will provide between 3.5% - 4.8% capacity (**Table 7.3**). This information has been used to inform the Operational Additionality assumptions in **Appendix B4 Table B-4-2**. General non-sector specific employment multipliers and average GVA per head values have been used.
- 7.5.12 The East MRT will support an estimated:
- Approximately **243 net additional operational local jobs** in the study area that can be directly linked to the capacity released through road network improvement;
 - **£17.5 million net additional GVA** impact on the local economy;¹⁸ and
 - **7 training and apprenticeship places.**¹⁹

- 7.5.13 Operational impacts are considered to be of local level scale which are classified as **minor beneficial effects** according to the Significance Criteria in **Table 5.1**.

Further Mitigation and Enhancement

Mitigation

- 7.5.14 The construction and operational impacts are considered to be beneficial and do not require further mitigation measures.

Enhancement

- 7.5.15 The scale of beneficial construction effects that could be secured locally could be enhanced by maximising the value of supply chain contracts that could be delivered locally. This could be achieved through 'meet the contractor days' or business engagement with Thames Valley Berkshire Local Enterprise Partnership, the Reading and Wokingham Chamber of Commerce, or other relevant organisations.
- 7.5.16 The construction programme also offers employment opportunities for participants of construction related apprenticeship programmes such as the Thames Valley Construction Training Association.
- 7.5.17 The local impact could be maximised through liaison with local career, employability and recruitment services to help maximise the number of jobs that are taken up by local residents. This would help lower the area's unemployment rate and improve productivity and competitiveness.

¹⁸ 341 x £72,128 (Average GVA per worker in Study Area)

¹⁹ Apprenticeship Statistics: <http://dera.ioe.ac.uk/22847/1/SN06113.pdf>

7.6 Combined Site (East MRT and TVP P&R)

Potential Effects

- 7.6.1 Potential employment and GVA effects have been calculated for the combined project using the same methodology for the East MRT. The differentiating factors are the consideration of the extra capacity released from the combined project and the higher construction costs.
- 7.6.2 **Table 7.5** shows the East MRT and TVP P&R scheme are estimated to cost a combined £27.6 million.²⁰ This scale of construction activity will provide **89 net additional temporary construction jobs** and provide **£6.4 million net additional GVA**. This is 14% higher than the East MRT without the TVP P&R.
- 7.6.3 The East MRT and the TVP P&R, combined, will release enough highways network capacity to accommodate planned housing growth that will directly provide **6,794 additional temporary construction jobs** and **£490 million additional GVA**.
- 7.6.4 Table 7.5: Gross Impact of Planned Projects and Net Additional Impact of East MRT and Thames Valley Park & Ride

Demand Model Outputs	Estimated Construction Cost (£m)	Gross		Net Additional Impact in 60-minute study area	
		Person years	GVA (£m)	Person years	GVA (£m)
East MRT and TVP P&R	£27.6	134	£15.6	89	6.4
Housing	£2.1billion	10,294	£1.7billion	6,794	£490
Total				6,883	£496.4

Source: PBA

Operation: Employment & GVA Impacts

- 7.6.5 The East MRT and TVP P&R will support an estimated:
- Approximately **341 operational local jobs** in the study area that can be directly linked to the capacity released through road network improvement;
 - £24.6 million additional GVA** impact on the local economy;²¹ and
 - 11 training and apprenticeship places**.²²
- 7.6.6 Operation impacts are considered to be of local level scale and are therefore classified as **minor beneficial effects** according to the Significance Criteria in Table 5.1. The employment effects are 40% higher than the East MRT in isolation.

Further Mitigation and Enhancement

Mitigation

- 7.6.7 The construction and operational impacts are considered to be beneficial and do not require further mitigation measures.

²⁰ £24million + £3.6million = £27.6million

²¹ 380 x £77,031 (Average GVA per worker in Study Area)

²² Apprenticeship Statistics: <http://dera.ioe.ac.uk/22847/1/SN06113.pdf>

7.6.8 Enhancement effects are comparable to those described for the East MRT (please see [paragraph 7.12.14](#)).

7.6.9 The results above are based on the East MRT and TVP P&R directly releasing capacity that can support a number of new jobs and homes. Based on the findings of the Full Business Case the project will have a greater effect on employment and housing development (please see Section 4.6 of the Full Business Case). **Appendix B.5** provides the results of a sensitivity analysis that assesses greater levels of impact that can be directly related to the East MRT.

7.7.1 The residual effects have been assessed based on the information provided in the Baseline Conditions section and the assessment of Potential Effects section. The assessment relies on professional judgement based on the Significance Criteria outlined in **Table 5.1** along with consideration of the study area's labour market and scale of effect.

7.7.2 The construction phase will provide minor beneficial employment effects for the East MRT and the combined scheme. Beneficial effects related to construction apprenticeships and training schemes are considered to be negligible. The operational phase will also provide minor beneficial employment effects.

7.7.3 **Table 7.6** provides a summary of residual effects along with explanatory comments.

Table 7.6: Summary of Residual Effects (East MRT and East MRT and TVP P&R)

	Quantum of Impact	Description of Impact	Residual Significance Level	Comments
Construction Phase				
Construction Jobs	Creation of jobs during construction phase: • East MRT: 78 net additional temporary construction jobs • East MRT and TVP P&R 89 net additional temporary construction jobs.	The South East of England has construction workforce containment level of around 55%. It is likely the majority of construction jobs will be taken up by residents with a 60-minute drive time and that most of the positive economic benefit will be secured within this area.	Minor beneficial effect Minor beneficial effect	Beneficial effects could be maximised through enhanced engagement with local construction firms and other supply chain companies.
Training and apprenticeships	The development will support approximately:	Potential for onsite training in construction	Negligible beneficial effect	Apprentices in South of England remain below their 2011/12 level

	Quantum of Impact	Description of Impact	Residual Significance Level	Comments
	Between 7-11 construction related apprenticeship placements.	Potential development of local skills which in turn will benefit the local economy.		
Operational Phase				
Operational jobs	Enabling of jobs during operational phase: East MRT 243 net additional local jobs. East MRT and TVP P&R 341 net additional local jobs	The Project's development would present an opportunity for local residents with appropriate skills and experience that currently work outside the local area, and can be linked to the capacity released through road network improvement, rather than the operation of the scheme. The new jobs would provide employment opportunities for graduates of related training courses and would enable the reskilling of some of the currently available workforce.	Minor beneficial effect Minor beneficial effect	Beneficial effects could be maximised through local career, employability and recruitment services.

7.8 Monitoring

- 7.8.1 On the basis that the construction and operational phases do not result in adverse residual effects, there is no requirement for monitoring with respect to socio-economic impacts.

7.9 Cumulative Effects

- 7.9.1 **Appendix B6: Cumulative Assessment** provides a schedule of projects that have been considered for the cumulative assessment. **Tables B.6-1 to Table B.6-5** in **Appendix B6** demonstrate there is sufficient construction labour in the study area to build the East MRT along with the cumulative projects along with the East MRT and TVP P&R without creating any minor labour market distortions (i.e. the total requirement does not exceed 15% of the workforce for any category).
- 7.9.2 **Table 7.7** below provides the headline findings that summarise the cumulative assessment. A total of 1,807 temporary construction jobs would be required to build nearby projects, or approximately 1,900 including the East MRT and the TVP P&R. This accounts for less than 1% of the available construction workforce. The cumulative projects could therefore be built using labour from the study area without creating any minor labour market distortions.

Table 7.7: Required Employment and Absorption Capacity within Labour Market Area.

Employment & Absorption	Value (£ or %)
Total Investment (excluding. East MRT, TVP P&R)	£256m

Employment & Absorption	Value (£ or %)
Construction Requirement: <u>Cumulative Projects only</u>	
Total employment	1,807
% of construction workforce (in study area)	0.7%
Construction Requirement: Cumulative Projects & East MRT & Planned Housing	
Total required workforce including East MRT	1807+construction employment (8,601)
% of construction workforce (in study area)	3.4%
Construction Requirement: Cumulative Projects & East MRT & TVP P&R & Planned Housing	
Total required workforce including East MRT, TVP P&R	1,807 +combined construction employment (8,690)
% of construction workforce (in study area)	3.5%
Notes: - Person years of construction labour prepared using a consistent method as the main assessment - Construction costs estimates have been prepared using Building Cost Information Service data (Jan 2018) - Workforce percentages are derived using workforce profile information in Appendix 7F Table 7F2.	

7.9.3 The Absorption Capacity analysis assumes a worst-case scenario (i.e. all cumulative projects and planned housing growth will be constructed at the same time as the East MRT and TVP P&R). In practice this is unlikely to occur for a number of reasons, as discussed in **Appendix B.6.**

7.9.4 Based on this assessment, there will be no adverse cumulative impacts on the wider labour market area, as the total projects are anticipated to constitute below 15% of total construction labour in the study area. Combined, the cumulative projects will provide a beneficial stimulus to the study area's economy through the provision of construction related training and employment opportunities and supply chain linkages.

7.10 Summary

7.10.1 The East MRT will enable employment opportunities and new housing, which is required for a study area characterised by above average population growth, and high levels of economic activity, skills and qualifications.

7.10.2 This chapter has examined the socio-economic conditions of the area, which suggests a relatively highly skilled and qualified working populations. Reading's Core Strategy describes the borough as a 'tight' labour market, with high levels of travel between the adjacent administrative areas of Reading and Wokingham.

7.10.3 The assessment incorporates the findings of the East MRT Full Business case which states that the A4 and the A329 is close to capacity, and there is concern given the amount of growth planned for in the area. The assessment also includes the results of the Demand Modelling

supporting the Business Case to provide an indication of the scale of network capacity that could be released.

- 7.10.4 The economic impact assessment is consistent with best practice guidance.²³ The East MRT, in isolation and when combined with the TVP P&R, will deliver minor beneficial employment effects through the construction and operation phases.
- 7.10.5 The cumulative effects of the scheme have also been considered. The analysis demonstrates sufficient construction labour in the study area to build the East MRT and TVP P&R, along with the cumulative projects, without creating any minor labour market distortions.
- 7.10.6 The cumulative impact assessment shows that when the East MRT and TVP P&R when combined with nearby construction projects would not account for more than 4% of the study area's construction workforce. This requirement is well below the level that could create minor labour market distortions.

²³ HM Treasury Green Book Guidance – Appraisal and Evaluation in Central Government

8 Health

8.1 Introduction

- 8.1.1 This chapter has been prepared by PBA and documents the assessment of the likely significant effects of the East MRT scheme with respect to health and wellbeing).
- 8.1.2 This chapter outlines the existing health characteristics of the site and surrounding communities and assesses the likely effects of the Proposed Development on the population in the study area during construction and operation. Embedded mitigation and further mitigation measures are taken into account in the assessment of likely significant effects.
- 8.1.1 The previous EIA and ES Addendum for the 2017 Proposed Development and 2018 (June) Proposed Development were completed under the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (as amended 2015), which did not include the need for specific assessment of the health impacts. However, the 2017 ES did include consideration of health effects as part of specific technical assessments, including those on air quality and transport.
- 8.1.2 This ES has been undertaken in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, as amended in 2018. In accordance with Regulation 18(5) of the Regulations 2017, a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this ES is provided in **Appendix A.5**.

8.2 Policy Context

- 8.2.1 This section presents a review of the health priorities for East MRT as set out in published policy and strategies at local and national levels. It also outlines guidance and checklists used to inform and undertake the HIA.

National Policy and Guidance

National Planning Policy Framework (2018)

- 8.2.2 The revised NPPF acknowledges the importance of considering health impacts during the planning process and covers many issues that are directly related to the determinants of health.
- 8.2.3 The NPPF identifies the three mutually dependent roles that the planning system needs to consider to deliver the “*presumption in favour of sustainable development*”. *The role of particular relevance to health is the ‘social role’. Paragraph 7 of the NPPF states the planning system should support “strong, vibrant and healthy communities... by creating a high quality built environment, with accessible local services that reflect the community’s needs and support its health, social and cultural well-being.”*
- 8.2.4 The NPPF also acknowledges that planning policies and decisions should aim to achieve healthy, inclusive and safe places which:
- “a) promote social interaction, including opportunities for meetings between people who might not otherwise come into contact with each other – for example through mixed-use developments, strong neighbourhood centres, street layouts that allow for easy pedestrian and cycle connections within and between neighbourhoods, and active street frontages;*
- b) are safe and accessible, so that crime and disorder, and the fear of crime, do not undermine the quality of life or community cohesion – for example through the use of clear*

and legible pedestrian routes, and high quality public space, which encourage the active and continual use of public areas; and

c) enable and support healthy lifestyles, especially where this would address identified local health and well-being needs – for example through the provision of safe and accessible green infrastructure, sports facilities, local shops, access to healthier food, allotments and layouts that encourage walking and cycling.” (Paragraph 91).

Planning Policy Guidance (2014)

8.2.5 The Planning Practice Guidance (PPG) includes guidance on the importance of addressing health and wellbeing through planning.

8.2.6 The PPG (para. 002 Reference ID: 53-002-20140306) identifies a range of issues that should be considered through the decision-making process in relation to health and wellbeing, including:

“Development proposals can support strong, vibrant and healthy communities and help create healthy living environments which should, where possible, include making physical activity easy to do and create places and spaces to meet to support community engagement and social capital;

The healthcare infrastructure implications of any relevant proposed local development have been considered;

Opportunities for healthy lifestyles have been considered (e.g. planning for an environment that supports people of all ages in making healthy choices, helps to promote active travel and physical activity, and promotes access to healthier food, high quality open spaces, green infrastructure and opportunities for play, sport and recreation);

Potential pollution and other environmental hazards, which might lead to an adverse impact on human health, are accounted for in the consideration of new development proposals; and

Access to the whole community by all sections of the community, whether able-bodied or disabled, has been promoted.”

8.2.7 It is understood that, the PPG will, where necessary, be updated in due course to reflect changes to the NPPF (2018).

Local Policy

8.2.8 RBC and WBC planning policies are set out in a series of adopted and emerging documents. This section outlines the relevant policies in relation to the Proposed Development.

Reading Borough Council

Adopted Core Strategy

8.2.9 The Core Strategy was adopted by RBC with alteration in January 2015 and sets out the overall planning strategy and important principles for development in the borough up to the year 2023. The strategy sets out a number of themes such as *making the borough better* through improving health and care.

The Sites and Detailed Policies Document

8.2.10 The Sites and Detailed Policies Document was adopted by RBC with alterations in January 2015 and provides detailed planning policies as well as identifying the specific development sites and designations necessary to deliver the Core Strategy. The key policies relating to health are:

- **DM10: Private and Communal Outdoor Space** aims to ensure that households have access to an appropriate level of open space to ensure a healthy lifestyle and high quality of life.
- **DM19: Air Quality** states that development should have regard to the need to improve air quality and reduce the effects of poor air quality. Clean air is essential for our health, quality of life, and the environment.

Emerging Local Plan

- 8.2.11 RBC has submitted the Submission Draft Reading Local Plan for examination by the Planning Inspectorate and is expected to be adopted in the beginning of 2019. The new Local Plan will set out how development in Reading will be planned for up until 2036.
- 8.2.12 Key policies outlined in the draft Local Plan (2018) in relation to health for new developments include:
- **CC6: Accessibility and the Intensity of Development** states that the scale and density of development will be related to its level of accessibility by walking, cycling, and public transport. Development accessible by these methods can help work towards important public health goals, such as increased physical activity.
 - **CC7: Design and Public Realm** explains that all development must be of a high quality. An attractive built environment can encourage walking, cycling, and other healthy behaviours.
 - **EN15: Air Quality** ensures that development should have regard to the need to improve air quality and reduce the effects of poor air quality. Air pollution can have a serious effect on human health.

Wokingham Borough Council

Adopted Core Strategy

- 8.2.13 The Core Strategy was adopted by WBC in January 2010 and explains where development will go within the borough to 2026. The key policies relating to health are:
- **CP2: Inclusive Communities** explains that new development contributes to the provision of sustainable and inclusive communities, especially through addressing the requirements of an ageing population, particularly in terms of housing, health, and wellbeing.
 - **CP3: General Principles for Development** advises what planning permissions should be granted and aids the delivery of green infrastructure that can contribute towards the delivery of healthy communities.

Adopted Managing Development Delivery Local Plan

- 8.2.14 The Managing Development Delivery Local Plan was adopted by WBC in February 2014 and adds extra detail to the policies within the Core Strategy. The key policy relating to health is:
- **Policy CC03: Green Infrastructure, Trees and Landscaping** relates to the promoting new and protecting existing green infrastructure, which can provide health benefits by enabling access to opportunities for recreation.

Other National Guidance, Requirements and Checklists

- 8.2.15 There are a number of published guidance documents and checklists that address health in planning. The Healthy Urban Development Unit (HUDU) checklist referred to below has been

used as the basis of this assessment, more detail on this and the other sources of information is included in **Table 8.1** and **Appendix C.1**.

Healthy Urban Planning Checklist (3rd Edition) (Health Urban Development Unit (2017))

8.2.16 The checklist aims to promote healthy urban planning by ensuring that the health and wellbeing implications of local plans and major planning applications are consistently taken into account. Although it was created for London it has many principles that are applicable to any development. The checklist is divided into four themes:

- Obesity and diseases related to physical inactivity and poor diet;
- Excess winter deaths;
- Air and noise pollution; and
- Road safety.

The Marmot Review (2010)

8.2.17 Fair Society, Healthy Lives: A Strategic Review of Health Inequalities in England Post-2010 was published on 11 February 2010 (The Marmot Review)²⁴. reported on a substantial body of evidence on the influence the built environment has on the determinants of health. According to the Commission on the Social Determinants of Health, “*Where people live affects their health and chances of leading flourishing lives. Communities and neighbourhoods that ensure access to basic goods, that are socially cohesive, that are designed to promote good physical and psychological wellbeing and that are protective of the natural environment are essential*”.

8.3 Consultation

8.3.1 The EIA Scoping Report was submitted to RBC and WBC in August 2018 and included a section on the baseline and approach to the assessment of health effects. The Scoping Opinion is appended to this ES. included in **Appendix A.8**.

8.4 Methodology

Study Area

8.4.1 The geographical scope of this assessment is determined by receptor groups which are likely to be significantly affected by the Proposed Development. The scope of the HIA is therefore in part dependent upon the study areas identified by other disciplines (such as air quality and transport) and the receptor groups within these study areas whose health may be adversely or beneficially affected or by the Proposed Development (see **section 8.5** for more detail).

Baseline Data Collection

8.4.2 To understand the specific local health characteristics of the communities in close proximity to the Application Site baseline data has been collected for the two boroughs, and also the Wards in which the site falls or is adjacent to, to enable more localised understanding of the baseline. These are ‘Abbey’, and ‘Park’ Ward in RBC, and ‘Bulmershe and Whitegates’ Ward in WBC. The Wards around the site are shown in **Appendix C.1**.

8.4.3 Wards to the north of the scheme are not considered as these populations are separated from the Site by the physical barrier of the River Thames. Consideration is also given to the health

character of the wider population of Reading and Wokingham boroughs that may also be affected by the Proposed Development.

- 8.4.4 These four wards and the two boroughs form the main area for the baseline data collection, however the assessment also draws upon baseline information presented in other Chapters in this ES (which are referenced where relevant throughout this chapter) and as such other geographies have been used where appropriate.
- 8.4.5 The following sources of information have been used to develop the baseline conditions:
- Reading Borough Council, Joint Strategic Needs Assessment (<http://www.reading.gov.uk/jsna> accessed 15 September 2018);
 - Wokingham Borough Council, Joint Strategic Needs Assessment (<http://jsna.wokingham.gov.uk/> accessed 15 September 2018);
 - Wokingham Borough Health & Wellbeing Strategy Action Plan 2017-2020
 - Public Health England, *Health Profiles* (2018);
 - Public Health England, *Local Health Information* (2016); and
 - Creating the Right Environments for Health: The Annual Report from the Director of Public Health (2018) for Wokingham and Reading.
- 8.4.6 The sources outlined above are those which were primarily used to inform the baseline conditions of the assessment. The assessment also draws upon baseline information presented in other Chapters in this ES (which are referenced where relevant throughout this chapter) and the Transport Assessment (PBA, 2018).
- 8.4.7 The baseline health characteristics and how the baseline may evolve in the future has also been identified. The evolution of the baseline is relevant to understand the likely health characteristics of specific receptor groups at the time significant effects may occur.

Sensitive Receptors

- 8.4.8 The following groups have been identified as sensitive receptors to human health and are considered in the remainder of this chapter:
- Existing users of the Thames Path, who are likely to be drawn from wards immediately surrounding the Site (primarily those within the wards of Abbey, Bulmershe and Whitegates and Park wards);
 - Future users of the Proposed Development, including walkers, cyclists, and those using the scheme;
 - Construction workers during the construction of the Proposed Development;
 - Existing residents of the local and wider area, this will draw on the identification of receptors in other technical assessments in the ES; and
 - Specific vulnerable groups who may be inequitably affected by health impacts.
- 8.4.9 Furthermore, some groups are more vulnerable to health impacts from the Proposed Development and therefore disproportionately experience the effects of development. In addition to addressing the overall effects on health and wellbeing of the sensitive receptors noted above, the assessment will also identify the impacts on specific vulnerable groups that could occupy the Proposed Development.

8.4.10 The vulnerable groups used in this assessment have been determined from the baseline conditions of the study area. The vulnerable groups considered include:

- Children (aged 0-16);
- Elderly (aged 65 and over);
- Low income groups;
- People without access to a car; and
- People with pre-existing health conditions include people with disabilities.

8.4.11 There may be other vulnerable groups over the lifetime of the Proposed Development. However, these are the groups that are most likely to characterise the Proposed Development, especially during the early years of use.

Assessment Method

8.4.12 The approach to the assessment will involve a desk-top investigation of health impacts.

8.4.13 The established definition of health from the World Health Organisation (WHO) is “*health is a state of complete physical, social and mental wellbeing and not simply the absence of disease or infirmity*”. This assessment uses the WHO definition of health, recognising that although illness and disease (mortality and morbidity) are useful ways of understanding and measuring health, they need to be fitted within a broader understanding of health and wellbeing to be properly useful.

8.4.14 The definition of health reflects the understanding that an individual's inherited traits interact with lifestyle, community, environmental, social, and economic factors as well as a much wider range of issues to determine their health outcomes, as shown in **Figure 8.1**.

8.4.15 Many of these ‘determinants’ can be influenced by the quality of people's environments. Therefore, in planning for the Proposed Development it is understood that health is not only about avoiding environmental impacts and contributing to the factors that improve wellbeing, it also includes access to jobs, access to green infrastructure and more physical activity.

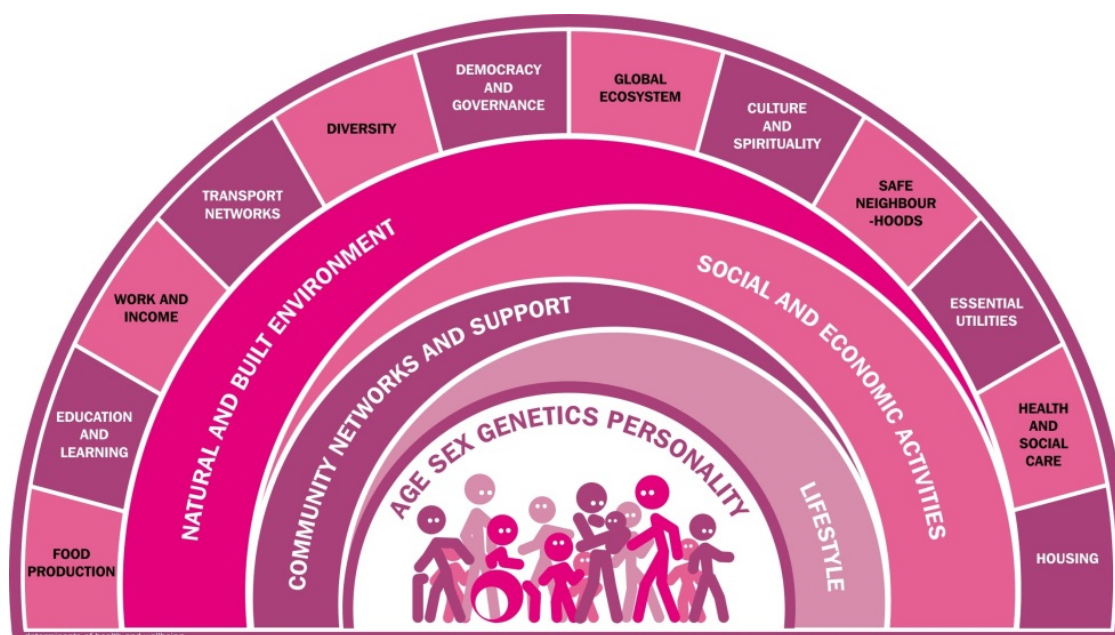


Figure 8.1: The Determinants of Health and Wellbeing (Peter Brett Associates, adopted from Dahlgren and Whitehead, 1991)

- 8.4.16 The assessment will be undertaken against determinants of health that relate to the planning issues. The determinants considered are presented within the structure from the HUDU checklist and are based on national and local policy and guidance strategies.
- 8.4.17 **Table 8.1** indicates the determinants of health and wellbeing that will be considered in this assessment and the associated pathways to specific health outcomes based upon themes in the HUDU planning checklist. By assessing the Proposed Development against these themes, it will be possible to identify adverse or beneficial effects of the scheme on the health and wellbeing of the sensitive receptors, provide a basis for setting actions for further mitigation and enhancement and assessing significance.
- 8.4.18 The assessment will draw on various technical assessments included within the ES, including; air quality, noise, ground conditions, hydrology, flood risk and drainage, transport, and socio-economics which have all considered potential risks to human health and wellbeing. As such, the assessment undertaken is largely qualitative, except where data is readily available to enable quantification or where quantification of health and wellbeing impacts is undertaken in other assessments (e.g. other technical studies in this ES).

Table 8.1: Determinants of health considered in this assessment

Health Determinants		Pathways to Health Outcomes (and stage at which impact is assessed)
Theme	Planning Issue	
Active Travel	Promoting Walking and Cycling	Levels of walking and cycling can affect physical activity, which in turn can affect mental and physical health outcomes including prevalence of cardiovascular disease and obesity. The Proposed Development has the potential to effect existing walking and cycling routes during construction and also includes the creation of a new improved direct walking and cycling route, complementing those that already exist. Relevant to Construction and Operation

Health Determinants		Pathways to Health Outcomes (and stage at which impact is assessed)
Theme	Planning Issue	
	Safety	Transport accidents and safety have direct links to health and injury and low income groups are inequitably effected by injury from road accidents. The Proposed Development has the potential to affect the volume of traffic on the wider network and create a car free route for cyclists and pedestrians and therefore transport accidents will be considered. Relevant to Construction and Operation
	Connectivity	Connectivity can affect the ability of people to access services and social networks and can encourage walking and cycling – with associated mental health and physical health outcomes. The Proposed Development has potential effects on the connectivity of local residents to their place of employment, residency and surrounding facilities. Relevant to Operation
	Minimising Car Use	Links with health will be considered with respect to walking and cycling (above) and air quality (below). Therefore, this topic is not specifically included in the assessment tables.
Healthy Environment	Air Quality	Poor air quality is linked to a range of health conditions including chronic lung disease (chronic bronchitis or emphysema), heart conditions and asthma levels among children, as well implications for mental health, primarily dementia. The Proposed Development has the potential to affect air quality through construction activities and the potential to reduce the rate of growth of car use. Relevant to Construction and Operation
	Contaminated Land	Contamination of land poses direct health risks due to toxicity from inhalation and ingestion of pollutants. The Proposed Development has the potential to disturb existing contamination, increase the deposition of metals to soil and contaminate water resources, parts of the Application Site are identified as having potential sources of contamination. Relevant to Construction and Operation
	Open Space/ Biodiversity/ Play Space	Access to open/green space and nature can lead to more physical activity and reduce levels of heart disease, strokes and other ill-health problems that are associated with both sedentary and stressful lifestyles. The Proposed Development is in an area of existing open space and has the potential to have an impact on this, including the visual effects of the Proposed Development having an impact on the character. Relevant to Construction and Operation

Health Determinants		Pathways to Health Outcomes (and stage at which impact is assessed)
Theme	Planning Issue	
	Flood Risk	Flood risk may be exacerbated by climate change, which at its extreme poses direct risks to health through drowning and spread of waterborne diseases. There are also links to effects on mental health through damage or loss transport infrastructure. Flood risk on the Proposed Development will be considered. Relevant to Construction and Operation
Vibrant Neighbourhoods	Access to Social Infrastructure	Social capital is associated with better levels of health, better educational attainment, better chances of employment and lower crime rates. The Proposed Development has the potential to involve the local community to maintain social cohesion. Relevant to Operation
	Local Employment and Healthy Workplaces	Access to employment can have an effect on both physical and mental health through enhanced social integration, self-esteem, physical activity, and income. The Proposed Development has the potential to affect access to existing jobs, as well as having a potential effect on the economy. Relevant to Construction and Operation

- 8.4.19 The likely significant effects for each health determinant are considered for both construction and operational phases, where appropriate as noted in the table above, and presented within an impact table. Furthermore, the assessment takes embedded mitigation into account.
- 8.4.20 Both potential cumulative and in-combination health impacts of this development and other planned development have also been considered and are drawn upon from the other ES Chapters.

Assessment of Significance

- 8.4.21 The IEMA '*Health in Environmental Impact Assessment – A Primer for a Proportionate Approach*' notes the complexities to defining significance for population and human health. There is therefore an absence of specific significance criteria or a defined threshold for determining significance for population and health in UK EIA practice.
- 8.4.22 The overarching methodology for assigning significance to effects in the ES is described in **Chapter 5** of the ES. The approach to assessing and assigning significance to an environmental effect relies upon factors such as legislative requirements, guidelines, standards and codes of practice, consideration of the EIA Regulations 2017 (as amended), and judgement.
- 8.4.23 Given the multitude of factors (determinants) that contribute to an individual's health outcomes, it is difficult to draw a quantified conclusion regarding the contribution of a particular development to an increase or decrease in the number of additional cases of a particular physical or mental health outcome. A significant effect is reported where, based on professional judgement, the Proposed Development is likely to contribute to a material change in health outcomes associated with the health issue being assessed and, in determining this, the following questions have been considered, which are in line with those described in **Chapter 5** of the ES.

- Have significant effects been identified in the ES which are linked to human health (i.e. are environmental or health standards threatened)?
- Are vulnerable groups affected?
- Is the effect reversible or irreversible?
- Does the effect occur over the short (less than one year), medium (one to five years) or long (over five years) term?
- Is the effect permanent or temporary?
- Does it increase or decrease with time?
- Is the effect at an individual or population level? and
- Are mitigating measures available and is it reasonable to require these?

8.4.24 Effects that are described as 'minor' or 'negligible' are determined to be 'Not Significant' and effects that are described as 'moderate', 'major' or 'substantial' are determined to be 'Significant'. This is set out in **Chapter 5** of the ES in **Table 5.2**.

Limitations

8.4.25 There are inherent uncertainties in the assessment of health and wellbeing impacts. As illustrated in **Figure 8.1**, there are many determinants that can have an impact on an individual's health. It is possible for the Proposed Development to create conditions that could lead to greater health and wellbeing, but it may be that there are other factors that cannot be managed by the Proposed Development. These factors include:

- Performance of the wider economy;
- Existing health of the new population;
- Embedded habits;
- Price of fresh food;
- The effectiveness of local healthcare;
- Local public health strategies and initiatives;
- National Government Policy; and
- Genetic factors.

8.4.26 The above factors have the potential to have a greater impact on the health and wellbeing of communities than the characteristics of the Proposed Development covered in this assessment.

8.4.27 Lastly, some of the health characteristics of the study area that has formed the baseline of the study have been based on census data. There can be a number of issues when using census data which may not provide a true representation of the study area, including; Ward boundary changes and census data only detailing the health characteristics of the study area at a single temporal point.

8.5 Baseline Conditions

The Surrounding Area

General Characteristics

- 8.5.1 According to the Local Authority Public Health Profile 2018 (Public Health England (PHE)) the health of people in Reading is varied compared with the England average. About 16% (5,100) of children live in low income families. Life expectancy for both men and women is similar to the England average. However, there is local inequity in Reading and more deprived areas are characterised by worse health outcomes.
- 8.5.2 Reading has a high rate of premature deaths and deaths from heart attacks, strokes, and cancer. This is having a more significant impact in more deprived areas. A significant proportion of the population have a disability with 17% of residents reporting their activities were limited by a disability (Reading JSNA, Common Causes of Death and Disability). The Reading JSNA identifies key health and wellbeing needs for the area, these include:
- *“Life expectancy for men is poor, with significantly worse early death rates from cardiovascular disease, and a 10.2 year difference in life expectancy between our least and most deprived wards;*
 - *We have high levels of preventable premature mortality and low uptake of screening programmes in key areas e.g. breast and bowel screening;*
 - *We have a largely young population (25% of the population are under 20) and we see a significant impact of mental illness on our children’s health;*
 - *Rates of obesity double during primary school, and significant numbers of children have tooth decay; and*
 - *We have higher than expected numbers of young people not in education employment or training.”*
- 8.5.3 Abbey and Park wards, as shown in **Appendix C.2**, contain areas of high deprivation, with Abbey Ward identified as the fifth most deprived Ward out of 16 wards in the borough. Abbey Ward also performs significantly worse than for England on several health indicators, as shown in the PHE Local Health Profile 2016. Indicators that are significantly worse for both wards include the proportion of older people in deprivation, obese children in year 6, emergency hospital admissions for stroke, death from all causes at all ages, deaths from circulatory disease (aged under 75). Abbey Ward also has significantly worse life expectancy at birth for males.
- 8.5.4 The Local Authority Public Health Profile 2018 for Wokingham identifies that the health of people in Wokingham is generally better than the England average. Wokingham is one of the 20% least deprived districts/unitary authorities in England, however about 6% (1,800) of children live in low income families. Life expectancy for both men and women is higher than the England average. However, there are pockets of deprivation within the borough, and as shown in **Appendix 8.1**, part of Bulmershe and Whitegates Ward, within which the eastern end of the Site falls, are identified as slightly more deprived than others within Wokingham (Indices of Deprivation 2015). However, overall the Ward has health characteristics that are similar to England averages (PHE, Local Health Profile 2016).
- 8.5.5 Wokingham is generally performing well in terms of life expectancy, childhood obesity, deprivation, and other health indicators, in comparison to the England average (Berkshire West Healthy Weight Strategy, 2018-2020). Most Wokingham residents feel they are not limited at all in performing their day to day activities. Life satisfaction and subsequent

indicators are comparable to figures seen in the whole of England (Wokingham JSNA, [General Health and Wellbeing](#)).

- 8.5.6 Happiness scores in Reading, like Wokingham, were comparable with the figures for England, whereas the numbers of people who “felt anxious yesterday” was significantly better than the England average. Life expectancy is lower in Reading than the national and regional averages. of adults classed as inactive is also lower than the national average (Reading JSNA, Physical Activity).

Population

- 8.5.7 Reading has a similar population distribution to England, although there is a lower proportion of people aged 65 or more (approx. 12.1% compared to 17.9% (PHE, Reading Profile). However, in the local area Abbey Ward there is an even greater difference, with only 6% aged 65 or over. The Ward is characterised by a very high proportion of people of a working age (25-64 year) at 67.3% compared to the England average of 52.0%. However, despite this larger proportion of people of a working age there are also more who are childless as the proportion of those under 16 years is 3% less than the England average (ONS 2016, as reported the Local Health Profiles Abbey Ward, PHE, 2016). Park Ward is characterised by a high proportion of people aged 16-24 years (20.1% compared to 11.3% for England), which is likely to be as a result of its proximity to Reading University. As with Abbey Ward there is a lower proportion of people aged 65 or over (8.3%) (Local Health Profiles Abbey and Park Wards, PHE, 2016).
- 8.5.8 By comparison both Wokingham borough and the Bulmershe and Whitegates Ward have a population distribution very similar to the England average. Although the proportion of people 65 or older is higher in the Ward at 20.2% compared to 17.9% for England (and 17.3% for the borough) (Local Health Profiles Abbey and Park Wards, PHE, 2016).

Active Travel

- 8.5.9 The Thames Path National Trail (‘Thames Path’ – otherwise known as the towpath) and National Cycle Route 4 and 5 (Thames Valley) pass through the Site, with the National Cycle Route turning south along the River Kennet at the site. The shared cycle and footpath at the Site is unlit and narrow in places, meaning cyclists must slow down to accommodate pedestrians.
- 8.5.10 The path crosses the River Kennet via a stepped pedestrian footbridge known as the Horseshoe Bridge. Cyclists currently have to dismount to cross the bridge, pushing cycles up a narrow ramp that runs alongside the steps. The surfacing of these routes is also deteriorating, and there is little natural surveillance which reduces safety. The indirect slower route, along the river, is therefore more suited to leisure cycling.
- 8.5.11 Road traffic congestion in Reading is high and is identified to be one of the most congested areas outside of London. The congestion is limiting economic growth in the area. The A4 London Road is the main strategic route for vehicles travelling to and from Reading Town Centre to the east and links to M4 junction 10. The A4/A329 Cemetery Junction is an area that experience particularly high congestion levels, particularly during peak travel times. The A4 London Road also does not make good provision for walkers and cyclists. More detail on the transport baseline can be found in [Chapter 9](#) of this ES.
- 8.5.12 Construction on the TVP P&R to the east of the Application Site is underway and site clearance is now complete.
- 8.5.13 Road safety is a priority for WBC in the JSNA. Over the previous ten years, road casualties have been reduced by 63% (11 in 2005 and 3 in 2014). However, with more housing development being planned and increasing car use (Transport: Car miles travelled, accidents and bus use (Public transport), 2016), there will be increased road safety risks due to increased numbers of people travelling.

- 8.5.14 In the JSNA there is an aim to continue reducing casualties as well as road collisions and improve road safety awareness. This will be done through promoting safer road use, providing skills and training, designing and maintaining safer roads, provide safer crossing facilities, influencing drivers, reducing vehicle speeds, and providing for vulnerable road users (Wokingham JSNA, Road Safety). WBC's Road Safety Plan describes the steps being taken by WBC to improve road safety and demonstrates how successful the borough has been in bettering the Government Road Safety Targets and details the current casualty statistics. It also provides details of interventions and activities available to assist Wokingham Borough Council in its aim to have an improving road safety record.
- 8.5.15 A high proportion of working age people in Reading walk or cycle to work, however, travelling by car is still the most popular form of commuting. Walking is the dominant method for travelling to the centre of Reading. There is also a cycle strategy in place in Reading. Road safety figures such as rates of road accidents are similar or better than average (Reading JSNA, Transport).

Obesity and Physical Activity

- 8.5.16 There are a number of local initiatives relating to healthy eating and introductory exercise is offered in Wokingham borough. The borough's adult population is statistically more active than the England average.
- 8.5.17 Information in the Director of Public Health for Berkshire (2018) *Creating the Right Environments for Health: The Annual Report from the Director of Public Health* shows that in Reading, data shows 66% of people are meeting the physical activity guidelines set out by the Chief Medical Officer, yet 19.2% of adults complete less than 30 minutes exercise per week. Just over half (53.6%) of adults have 30-minutes exercise at least 5 times per week. 71% of 15 year olds are sedentary for over seven hours per day on average.
- 8.5.18 Over half of Reading's adults are overweight or obese (55.3%), and this starts in childhood – 32.9% of Year 6 children are overweight or obese.
- 8.5.19 The Director of Public Health report (2018) for Wokingham, shows 67.6% of adults (18-65) report meeting the physical activity guidelines set out by the Chief Medical Officer, yet 21.1% of adults complete less than 30 minutes exercise per week. Less than half (46.5%) of adults do any walking at least 5 times per week. 62.9% of 15 year olds are sedentary for over seven hours per day on average. Over half of Wokingham's adults are overweight or obese (53%), and this starts in childhood – 26.6% of Year 6 children are overweight or obese

Healthy Environment

- 8.5.20 As reported in the Transport Assessment (PBA, 2018), to understand the number of pedestrian movements within the area and use of the space, a pedestrian survey was undertaken along Thames Path between the Waterside Centre and the Horseshoe Bridge. The survey found that the towpath was well used on the weekdays and weekends. Use continues throughout the day, but is limited during the night.
- 8.5.21 In addition, to understand the use of the open space, a survey was carried out of the open space between the Horseshoe Bridge and Dreadnought building. The results of the survey showed extremely limited use of the space, with the exception of people passing through on the towpath. The only users identified were two people sitting on the ground at the edge of the towpath using mobile phones. By comparison during similar sunny periods the meadows further west and east opposite Tesco and Thames Valley Park Drive were both well used during the surveys periods.
- 8.5.22 Medium and high voltage powerlines and pylons that cross the Application Site are due to be replaced and re-routed underground. However, this is not part of the Proposed Development and is an SSE project to replace infrastructure that has reached the end of its useful life.

Flood risk

- 8.5.23 As set out in **Chapter 11** of this ES the EA 'Flood Map for Planning' shows that the western part of the proposed route lies within Flood Zone 2 'Medium Probability' (between 1 in 100 (1%) and 1 in 1000 (0.1%) annual probability of river flooding). The eastern part of the proposed route lies within Flood Zone 3 'High Probability' (greater than 1 in 100 (1%) annual probability river flooding).
- 8.5.24 A detailed hydraulic model has been used to provide greater detail to these maps, which has identified significant flood potential at Kings Meadow to the west. During flood events flood water would spill onto Napier Road and back up into the lower lying land further east. At Kennetmouth the 1 in 100 annual probability flood level indicates significant flooding. For the 1 in 1000 (0.1% flood event) there is a risk across much of the Application Site with flooding extending across the majority of the Tesco Extra store and surrounding car park.
- 8.5.25 The proposed TVP P&R lies wholly within Flood Zone 1 'Low Probability'.

Land Contamination

- 8.5.26 There is a risk of contamination at the Application Site as previously the western end was raised with materials from unidentified sources and is defined by the Environment Agency as a historical landfill. The Application Site was also used as railway land with fuel tanks located on the Site. The eastern part of the Application Site comprises principally undeveloped land with the exception of two historical gravel pits.
- 8.5.27 A ground investigation was carried out in the western part of the site in 2016 and 2017. As set out in the Land Chapter of the ES (**Chapter 12**) measured concentrations of potential contaminants are, in general, mean the Application Site is suitable for the proposed use. Also, in general, the measured concentrations are below those that would indicate that there is the potential for groundwater impacts on UK drinking water quality standards, where any assessment requirement would be triggered.

Air Quality

- 8.5.28 RBC has investigated air quality within the borough as part of its responsibilities under the Local Air Quality Management Areas (LQMA) regime. An Air Quality Management Area (AQMA) has been declared due to exceedances of the annual mean NO₂ objectives. The AQMA comprises Reading town centre and extends out along major roads including the A33 and A327. The west part of the site lies partially within the AQMA.
- 8.5.29 People with respiratory or pulmonary conditions are more vulnerable to the risks associated with bad air quality (Reading JSNA, Air Quality). An estimated 5.7% of deaths in Reading are attributed to poor air quality (Reading JSNA, Transport). The air has a fine particulate concentration of 8 µg/m³, which is lower than the national average (RBC, Creating the Right Environments for Health). In Wokingham, the fine particulate concentration is also lower than the national average, at 7.9 µg/m³.

Noise

- 8.5.30 A noise survey of the Application Site and surroundings has identified that the vast majority of adjoining land uses are industrial which would not be considered noise sensitive. The only potential noise sensitive receptors are residential dwellings located on the west of the Site along Luscinia View off Napier Road. A desktop assessment was undertaken to determine the potential increase in noise levels here as a result of the operation of the development. This found a very limited increase in noise from the existing ambient of noise level of 1 decibel only, this is a negligible increase and therefore the noise effect of the Proposed Development is not considered further in this assessment.

Vibrant Neighbourhood

- 8.5.31 This section draws on the socio-economic chapter of the ES 2018 of the Proposed Development (**Chapter 7**). Reading, Wokingham and the surrounding area (within a 60-minute drive from the Application Site) have a higher than national average projected population growth. There is a rapidly increasing working age population.
- 8.5.32 The population is highly qualified, with about half of the population employed in highly skilled jobs. Across the council areas, greatest growth to 2035 is expected in finance and insurance, professional services, utilities, accommodation and food services and recreation.
- 8.5.33 Reading, Wokingham and the study area is defined by a mobile but relatively contained workforce. A significant number of people that work in Reading or Wokingham travel east-west to places of work, with more people travelling from Wokingham to Reading than the other way.

Baseline Evolution

- 8.5.34 There are aspirations through Local Plans and strategies to deliver improvements in the health of the local population in Reading and Wokingham. In the Wokingham Health and Wellbeing Board Action Plan 2017-2020, the aims are to:
- Increase the proportion of the adult population achieving the Chief Medical Officer's (CMO) physical activity guide levels and reduce the number of those who are deemed inactive in the priority areas; and
 - Increase the proportion of the adult population achieving the advised CMOs physical activity guide levels from 66% to 68% in the next 2 years particularly those who live in the HWB prioritised areas.
- 8.5.35 The Reading Health and Wellbeing Strategy 2017-2020 contains two priorities, two of which are relevant to the Proposed Development. These are:
- Supporting people to make healthy lifestyle choices (improving dental care, reducing obesity, increasing physical activity, reducing smoking). The associated actions include *"Promote walking and cycling both for leisure and active travel"*;
 - Reducing loneliness and social isolation. The associated actions include to: *"Improve the quality of people's community connections as well as the wider services which help these relationships to flourish such as access to transport and digital inclusion"*.
- 8.5.36 There is also a projected rapid increase in local working age population in Reading and Wokingham and the wider 60-minute travel time from the Application Site. Also, the Business Case for the East MRT identifies that there will be increasing travel demand as a result of the 15,000 jobs and 6,000 homes planned for the area (see **Chapter 7** of this ES).

Creating the Right Environments for Health: The Annual Report from the Director of Public Health (2018) for Reading and Wokingham

- 8.5.37 The reports prepared for Reading by the Director of Public Health for Reading make a number of recommendations for improving public health in the two areas, with particular emphasis on increasing physical activity and access to greenspace.
- 1. Continue to encourage community initiatives that make the most of natural space available, with the aim of improving mental health, increasing physical activity and strengthening communities.
 - 2. Existing green space should be improved and any new developments should include high quality green spaces. The use of professional design and arrangements to ensure

the ongoing management of natural environments should be considered if spaces are to be sustainable.

- 3. Opportunities to increase active transport should be considered when designing new green spaces and in the improvement of existing space.
- 4. Planning guidance for new developments should specifically consider the use of green and blue space to improve the health and wellbeing of residents and others using the space.
- 5. Local Authorities and their public health teams should foster new relationships with organisations aiming to improve the natural environment and its use

8.6 East MRT Site

Embedded Mitigation

Construction

8.6.1 The principal mitigation measure necessary during construction to mitigate potential adverse effects from construction is the preparation and implementation measures within a CEMP, which will be secured through a planning condition. Details of proposed mitigation measures for air quality, transport and traffic, and land contamination are set out in relevant Chapters of this ES and include:

- Management of construction traffic, construction worker trip and deliveries through the CEMP, which will include measures to reduce effects on local roads, and in particular pedestrian and cyclist safety, minimising closure, disruption and diversion of the Thames Path for all users and safety of construction workers on site (see [Chapter 9](#));
- Lighting management during construction;
- Air quality management measures as recommended in the IAQM guidance and a Dust Management Plan in accordance with the risk level identified on site (see [Chapter 10](#));
- Measures to manage risks of contamination on site works including making the site secure to prevent children and adults accessing the site and coming into contact with potential contaminants. In addition, work should not commence on site until further site investigation is completed and suitable remediation or other mitigation is agreed with the local authority and undertaken as necessary (see [Chapter 12](#)).

Operation

- 8.6.2 The purpose of the project is to improve connectivity between Reading town centre and east Reading, specifically between Napier Road to the west and the A3290 roundabout with Thames Valley Park Drive to the east.
- 8.6.3 The Proposed Development includes a new dedicated segregated cyclepath and footpath along the entire length. This has been designed to be accessible by all. The route is also direct, providing the shortest route for these users between its start and end points.
- 8.6.4 The route protects the existing Thames Path recreational route, allowing this to be retained for leisure users who may wish to travel at a slower pace.
- 8.6.5 The design of the development has taken into consideration the setting and responded with a design that seeks to reduce visual effects on the surrounding amenity areas. It will include the use of planters and landscape enhancements to soften the visual effect of Proposed Development. Furthermore, the iteration of the route through the design process has sought

to protect existing trees wherever possible. The width of the route has been designed to narrow in the location where it is in closest proximity to the River Thames to help reduce the impact on the open space character in this location.

- 8.6.6 There are further elements of embedded mitigation as part of the Proposed Development, particularly in relation to specific technical issues such as flood risk. These are covered in greater detail in **Tables 8.3 to 8.8**.

Assessment of Likely Effects

- 8.6.7 This section sets out the predicted impacts and subsequent effects arising from the construction and operation of the Proposed Development on human health. The assessment considers the embedded mitigation measures (see section above), which are incorporated into the Proposed Development.
- 8.6.8 The health outcomes associated with each health determinant are summarised in **Table 8.1**.

Construction Effects

- 8.6.9 **Tables 8.3-8.5** summarise the assessment of likely significant effects to human health and wellbeing from the construction of the Proposed Development. Only those determinants relevant to construction are assessed for construction stage effects.

Table 8.3 The assessment of effects on the active travel health determinant from the construction of the Proposed Development

Health Determinant	Likely Significant Effects and Embedded Mitigation	Receptor Group and Vulnerable Group	Effect prior to further mitigation
Promoting walking and cycling	During the construction phase of the Proposed Development there may be adverse effects on the existing walking and cycling route along the Thames Path National Trail ('Thames Path') and National Cycle Route 4 and 5 (Thames Valley), as a result of construction activity, with excavations resulting in the phased closure and diversion of sections of these routes for periods of time. This may have an effect on the attractiveness of the route for existing users and local residents and during construction may discourage their use, reducing walking and cycling connectivity in the area.	<i>Receptor Groups:</i> - Existing users - Existing residents <i>Vulnerable Groups:</i> - Those without access to a car - Income deprived	Minor Adverse - temporary
Safety	Based on the findings outlined in the Transport ES Chapter (Chapter 9), it is anticipated that the site is assessed as generating a maximum of 60 two-way construction HGV movements per day (8 trips per operational hour) construction vehicles movements per day, plus an additional 38 vehicle trips for construction workers arriving before 08:00 and leaving after 18:00. This is peak traffic movements rather than a typical level of traffic, particularly regarding deliveries. On a typical day, the total construction traffic generated is assessed as 20-25 vehicle trips of the employees, before and after peak hours (before 08:00 and after 18:00 subject to the time of year); and 5-10 two-way HGV movements per day This is likely to cause a temporary increase of traffic on the surrounding road network which is not assessed as likely to have an adverse effect on pedestrian delay and amenity (see Chapter 9).	<i>Receptor Groups:</i> - Existing users - Existing residents - Site Workers <i>Vulnerable Groups:</i> - The elderly; - Children (aged 0-16) - Those without access to a car	Negligible

Table 8.4 The assessment of effects on the healthy environment determinant from the construction of the Proposed Development

Health Determinant	Likely Significant Effects and Embedded Mitigation	Receptor Group and Vulnerable Group	Effect prior to further mitigation
Air Quality	The main potential effects during construction are dust deposition and elevated PM₁₀. The following activities have the potential to cause emissions of dust: - Site preparation; - Demolition of existing buildings on site; - Earthworks;	<i>Receptor Groups:</i> - Existing residents offsite; - Site workers.	Not significant

	- Materials handling; - Construction and fabrication of units; and - Disposal of waste materials off-site. Typically, the main cause of unmitigated dust generation on construction sites is from demolition and vehicles using unpaved haul roads and off-site from the suspension of dust from mud deposited on local roads by construction traffic. Exposure to dust deposition and elevated PM₁₀ from construction can cause a risk to human health over a long period of time. Dust-related illnesses include; asthma and Chronic Obstructive Pulmonary Disease (COPD), without additional mitigation as set out in section 8.8 and in the Air Quality ES Chapter (Chapter 10). The assessment of air quality impacts in Chapter 10 of this ES does not identify any likely effects of construction traffic on air quality. This is because the increase in movements is likely to be negligible.	<i>Vulnerable Groups:</i> - The elderly; - Children (aged 0-16); - Those with pre-existing health conditions, particularly those with respiratory conditions	
Open space/ public realm	Construction activities on the Application Site will have an effect on the character of the area for existing users, which may have an impact on the attractiveness of recreation and active travel. These effects will be temporary, lasting throughout the majority of the construction phase of development. Specific views that are assessed as likely to be affected are set out in Chapter 13 of this ES within the landscape and visual assessment.	<i>Receptor Groups:</i> - Existing residents; - Existing users. <i>Vulnerable Groups:</i> - The elderly; - Children (aged 0-16) - Those without access to a car	Minor adverse - temporary
Land Contamination	During construction, there is potential for construction workers to come into contact with existing contaminated soil and water, particularly around areas of fuel storage and/or vehicle maintenance, via ingestion, inhalation, and dermal absorption pathways. This has potential direct biomedical health effects. If children gain access to the construction site they may be at particular risk. The CEMP would set out necessary measures to secure the site.	<i>Sensitive Receptors:</i> - Construction workers - Existing site users <i>Vulnerable Groups:</i> - Children (aged 0-16)	Negligible

	The assessment of ground conditions in this ES (see Chapter 12) identifies that prior to mitigation there is a minor adverse risk to human health (not significant) at the Application Site.		
Flood	An FRA has been prepared for the Proposed Development and Chapter 11 of this ES assesses flood risk and hydrology. The assessment indicates that surface water runoff during construction may increase the risk of flooding and there could a risk to surface water quality from construction activities. These risks will be mitigated through a CEMP.	<i>Sensitive Receptors:</i> - Construction workers <i>Vulnerable groups:</i> - None identified (lack of nearby residential receptors)	Not significant

Table 8.5 The assessment of effects on the vibrant neighbourhoods determinant from the construction of the Proposed Development

Health Determinant	Likely Significant Effects and Embedded mitigation	Receptor Group and Vulnerable Group	Effect prior to further mitigation
Local Employment	Construction of the Proposed Development is assessed to have a positive impact on local jobs and the economy. This includes an additional 78 net additional temporary construction local jobs in a 60-minute drive time of the Application Site. There may also be further benefits as the scheme releases capacity in the existing road network helping further housing growth. More detail on the assessment is shown in Chapter 7 of this ES covering socio-economic effects. The Proposed Development would also help support the local economy, which would have a further beneficial effect on local jobs in the drive time area.	<i>Sensitive Receptors:</i> - Construction workers - Existing residents <i>Vulnerable groups:</i> - Low income groups	Minor beneficial

Operational Effects

8.6.10 **Tables 8.6-8.8** summarise the assessment of human health effects arising from the Proposed Development during operation.

Table 8.6 The assessment of effects on the active travel health determinant from the operation of the Proposed Development

Health Determinant	Likely Significant Effects and Embedded mitigation	Receptor Group and Vulnerable Group	Significance
Promoting Walking and Cycling	The design of Proposed Development makes specific provision for cyclists and pedestrians. The East MRT route includes a 2.5 to 3m wide two-way cycle lane for much of its length, and a segregated 1.2 to 2 m pedestrian route. These routes are designed to provide a wide, lit, relatively flat and direct route into the Reading town centre from the east. The route is also wide enough to allow users of mobility bikes, wheelchairs and pushchairs along its entire length. In some locations the pedestrian and cycle route narrow, including where the route is closest to the river, in order to protect amenity. However, over the River Kennet the width has been maintained and instead the bus route narrows to a single carriageway. It is assessed that the Proposed Development will increase cycle trips by 114 a day compared to a 'no development' scenario, as reported in the East MRT Transport Statement (PBA< 2018). The East MRT route also protects the existing pedestrian and cycle routes of the Thames Path and National Cycle Routes meaning that people can choose to continue to use this less direct leisure route where cyclists and pedestrians are not segregated, or the more direct East MRT route that can support faster commuter cycling. The new River Kennet bridge will be wide and step free to allow access for pushchairs and wheelchairs. The design will support recreational routes. In addition, off site, the Proposed Development is anticipated to reduce the number of buses on Kings Road and London Road that will in turn help increase the attractiveness of these route to pedestrians.	<i>Sensitive Receptors:</i> - Existing residents offsite - Future visitors - Existing users <i>Vulnerable groups:</i> - People with pre-existing health conditions – including those with disabilities - People without access to a car	Moderate beneficial
Safety	The East MRT route has been designed for safe cycling and walking. As set out above in 'Promoting Walking and Cycling' the route has been designed to allow space for a segregated two-way cycle lane and pedestrian route. This reduces the safety risk from conflicting uses, as on the existing Thames Path. The East MRT	<i>Sensitive Receptors:</i> - Existing residents offsite - Future users	Moderate beneficial

	route has been designed to be safe through the use of lighting, encouraging high usage and therefore more natural surveillance and surveillance from passing buses. The smooth surfacing of the route will also make it safer for cyclists and pedestrians. The Proposed Development could have benefits for users of the Thames Path and National Cycle route at the Site, as it is designed to reduce congestion and potential conflict between cyclists and pedestrians. Particularly by providing a new higher speed cycle connection (2-way) connecting Reading town centre to the east. In addition, users of the Thames Path and National Cycle Route can safely cross under the East MRT route with no conflict risk. In addition, off-site there should be benefits in terms of reduced severance, according to the Transport Chapter of the ES (Chapter 9) that should help improve attractiveness of walking. There will be a reduction in the number of vehicles on the road in two locations - at London Road east of Cemetery Junction and at Kings Road adjacent to Reading College. In addition, off site, the Proposed Development is likely to reduce the number of buses on Kings Road and London Road (as shown in the transport model see Chapter 9). These are roads with a high number of pedestrians, and rerouted buses along the East MRT Scheme will be via lower sensitivity roads. This is likely to mean there is less fear and intimidation associated with these other routes with potential safety benefits.	- Existing users <i>Vulnerable groups:</i> - Children (aged 0-16) - Elderly (aged 65 and over) - Low income groups - People without access to a car	
Connectivity	The location and design of development directly contributes to a beneficial effect in relation to increased connectivity. The Proposed Development provides reduced public transport journey times and improves connectivity between Reading town centre and the east of Reading. Journey times for existing bus users currently travelling along London Road would be reduced by up to 13 minutes at peak times, as set out in Chapter 9 of this ES. The Proposed Development is expected to result in faster, more reliable public transport services with significantly increased levels of capacity (East MRT Transport Statement, PBA 2018). Through a mix of rerouted existing buses and new bus services. The Proposed Development is likely to result in an increase in bus use as a result of improved routes and capacity, which has positive benefits for connectivity.	<i>Sensitive Receptors:</i> - Existing residents offsite - Future visitors - Existing users <i>Vulnerable groups:</i> - Children (aged 0-16) - Elderly (aged 65 and over) - People without access to a car	Major beneficial

	The design also provides a new direct pedestrian and cycle route from Wokingham and East Reading into the town centre. The route is designed to avoid reducing connectivity of the existing Thames Path and National Cycle Route, which passes under the new route.		
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Table 8.7 The assessment of effects on the healthy environment determinant from the operation of the Proposed Development

Health Determinant	Likely Significant Effects and Embedded mitigation	Receptor Group and Vulnerable Group	Effect prior to further mitigation
Air Quality	The air quality assessment of the Proposed Development is included in Chapter 10 of this ES. The assessment models the likely change in concentrations of nitrogen dioxide (NO ₂) and particulate matter (PM ₁₀ and PM _{2.5}) in air on nearby residential receptors to the Application Site, as a result of changes in traffic caused by the Proposed Development. As set out in Chapter 10 of the ES, the assessment does not identify any likely significant beneficial or adverse effects related to human health as a result of changes in air quality when considered against UK and European air quality values.	<i>Sensitive Receptors:</i> - Existing residents offsite <i>Vulnerable groups:</i> - Children (aged 0-16) - Elderly (aged 65 and over)	Not significant
Contaminated Land	Once the Proposed Development is constructed there will be little opportunity for people to come in to contact with any potentially contaminated land as the route will be covered in hardstanding. There is a low risk from contaminated land in areas of landscaping and open space as more people may access the Application Site. More detail of the assessment is included in Chapter 12 of this ES.	<i>Sensitive Receptors:</i> - Future users <i>Vulnerable groups:</i> - Children (aged 0-16) - Elderly (aged 65 and over)	Minor adverse
Open Space/ Biodiversity/ Play Space / Public Realm	The Proposed Development passes through areas that are currently open space, such as to the east of the River Kennet and through the informal footpaths of the LWS. The Thames Path and National Cycle Routes also pass through the Application Site and the new East MRT scheme will be visible to those using the Thames Path and National Cycle Path. It will also introduce a new element of built infrastructure in this location, which may be particularly visible due its height. Therefore, there is the potential for the Proposed Development to have an effect on the quality of open space and the public realm by introducing a new built form into this location. However, the choice of location of the Proposed Development means that there is already a level of visual enclosure that limits the visibility of the Proposed	<i>Sensitive Receptors:</i> - Existing and future users <i>Vulnerable groups:</i> - Children (aged 0-16) - Elderly (aged 65 and over)	Minor adverse and minor beneficial

	Development to the immediate local area. This is provided by the raised railway embankment to the south and mature trees to the northern side of the River Thames. Visual assessment of the site identifies visibility of the route to the surrounding areas is limited to local views. There is embedded mitigation as part of the design that will help to reduce the effects on the existing open space as well as bring improvements to the Public Realm. This is to help protect the character of the area as a river corridor through an urban area. Embedded mitigation is covered in greater detail in the Design and Access Statement and Chapters 13 (LVIA) and 14 (ecology) of this ES. The scheme routing has been designed to reduce the landscape impact from the outset including the following measures (see Chapter 13 for more detail): ▪ Retention of existing trees and vegetation where practicable; ▪ Re-routing of services and utilities to the south of the proposed MRT, to enable replacement tree planting to take place to the north of the MRT; ▪ Height of the proposed bridge element to correspond to that of the listed railway and accommodation bridge ▪ Low-level parapet lighting; ▪ Planting of new native trees and shrubs suitable for the river corridor; ▪ Selective management and re-planting of the woodland within the LWS to replace trees which require removal; ▪ One-column viaduct design and viaduct narrowed by 1m to the east of the River Kennet, with narrowed foundations; ▪ Ivy planting to be installed in a planting trough at the northern edge of the elevated viaduct. There are also further enhancements proposed to improve the Public Realm and encourage more people to use the space for outdoor recreation. This includes improvement to the existing open space and interface of the site with the River Thames and measures to reduce crime and anti-social behaviour – including through the use of area under the viaduct as a marshy wet habitat, benefiting ecology while reducing the attractiveness of this being a place for people to use, including boat users. New planting to soften the foreground with the structure rising above intended to make a positive visual statement.		
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Flood Risk	Due to the characteristics of the area there are potential effects from flooding on the operation of the route, and, unmitigated, this could also have safety implications. However, the design of the Proposed Development incorporates mitigation to reduce risks associated with flooding. This includes: ▪ a 204 m viaduct section over the floodable area east of the River Kennet in order to accommodate flood flows beneath the structure and minimise flood impacts to the structure itself ▪ installing the new bridge at a height to allow for increased flooding, even taking into account climate change; ▪ surface water management strategy and attenuation features; and ▪ incorporation of pollution control measures in the drainage design. Therefore, as set out in the ES Chapter 11 and the Flood Risk Assessment (PBA, 2018) there are no assessed adverse effects on human health off-site as a result of the Proposed Development. In addition, the Proposed Development is designed minimise the 'floodable footprint' to make it less susceptible to its continued use during flood events.	<i>Sensitive Receptors:</i> ▪ Future users ▪ Existing residents <i>Vulnerable groups:</i> ▪ The elderly ▪ Children (0-16) ▪ People without access to a car	Negligible
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Table 8.8 The assessment of effects on the vibrant neighbourhoods determinant from the operation of the Proposed Development

Health Determinant	Likely Significant Effects and Embedded mitigation	Receptor Group and Vulnerable Group	Effect prior to further mitigation
Access to Social Infrastructure	The Proposed Development will enhance accessibility of the boroughs of Reading and Wokingham and the wider area to the town centre, including to strategic transport networks such as the Reading Railway Station. It will help to deliver wider social and economic benefits, including by improving the connectivity between employment areas, community and leisure facilities of Reading town centre and east Reading for cyclists and pedestrians, and also reducing bus journey times. The Proposed Development itself also provide a new element of social infrastructure with new proposed seating in the open space, relocation and repair of the existing mosaic and provision of story/sign boards. In addition, the Proposed Development protects the existing Thames Path recreation route.	<i>Sensitive Receptors:</i> ▪ Existing residents offsite ▪ Future visitors ▪ Existing users: <i>Vulnerable groups:</i> ▪ Children (aged 0-16) ▪ Elderly (aged 65 and over) ▪ Low income groups ▪ People without access to a car	Minor beneficial

Local Employment	The Socio-economic assessment of the Proposed Development in Chapter 7 of this ES identifies the importance of the East MRT scheme in supporting anticipated job and housing growth in RBC and WBC areas. It is estimated that the East MRT scheme can support 243 net additional local jobs through increased capacity, £17.5 million net additional Gross Value Added (GVA) in the local economy and 7 training and apprenticeship places.	<i>Sensitive Receptors:</i> - Existing residents offsite <i>Vulnerable groups:</i> - Children (aged 0-16) - Low income groups	Minor beneficial
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Further Mitigation and Enhancement

Construction

- 8.6.11 As set out above the implementation of the mitigation measures within a CEMP is embedded mitigation for the majority of construction stage potential effects.
- 8.6.12 In addition, comments in **Chapter 7** of the ES identifies measures to deliver socio-economic enhancements through the use of the local supply contracts, apprenticeship programmes, and liaison with local career, employability and recruitment services to help maximise local employment. Helping lower local unemployment rate and local deprivation.

Operation

- 8.6.13 Further mitigation measures to reduce the adverse effects identified and deliver further enhancements during operation of the Proposed Development are as follows:

Active Travel

- Use of signage to promote walking and cycling routes, including signage to key destinations and routes.

Healthy Environment

- Detail of the mitigation measures necessary are set out in **Chapter 12** of this ES. To include a layer of clean soil cover in areas of soft landscaping, if contamination is identified, this would be agreed with RBC/WBC following further investigations.
- Full flood mitigation measures are set out in the ES **Chapter 11** and the Flood Risk Assessment (PBA, 2018).
- In order to help mitigate potential effects on the character of the Application Site, visual effect and ecology a combined Landscape and Ecology Maintenance and Management Plan (LEMMP) will be secured by planning condition (see **Chapter 13**).

Residual Effects

- 8.6.14 The residual effects are the effects likely to occur following implementation of the embedded and further mitigation measures as described above. The only likely significant effects identified relate to the Active Travel determinants, and for these the likely implications for health outcomes are identified.

Construction

Active Travel

- 8.6.15 Impacts on 'promoting walking and cycling' are identified as minor negative. No significant issues are identified in relation to 'safety'.
- 8.6.16 Overall, with appropriate mitigation in place, the residual effect of construction is assessed as not significant.

Healthy Environment

- 8.6.17 Following the adoption of a CEMP and best practice guidance, as set out in relevant Chapters of this ES there are no significant residual effects identified in relation to a healthy environment, covering 'air quality', 'land contamination', 'flooding'. Effects on open space and the public realm are likely to be minor adverse during construction and are therefore not significant.

Vibrant Neighbourhoods

- 8.6.18 The construction phase of the development is assessed as creating a net of up to 78 temporary construction jobs during the construction period. New jobs created would have a temporary benefit for people within a 60-minute travel time from the site related to mental and physical wellbeing associated with being in employment, with potential for minor beneficial effects for low income groups, which are not significant.

Operation

Active Travel

- 8.6.19 The purpose of the Proposed Development is to improve non-car accessibility to Reading town centre from the east, with benefits for walkers, cyclists and bus users. A major beneficial impact is identified in relation to 'promoting walking and cycling' and 'safety' and a major beneficial impact for 'connectivity'. This has the potential to achieve a range of positive health outcomes in relation to increased levels of physical activity. These include reductions in cardiovascular disease, type 2 diabetes, mental wellbeing as well as a reduction in obesity levels. The Proposed Development would also improve connectivity and peoples' ability to access jobs in Reading town centre, and to the open space to the east of the Application Site.
- 8.6.20 Sensitive receptors that would experience the identified beneficial effects include existing residents offsite, and existing and future users of the site. Vulnerable groups that may be particularly affected include children, low income groups and people without access to a car and those with existing health conditions (including disabilities), particularly in relation to road safety, access to services and improved walking and cycling routes.

Healthy Environment

- 8.6.21 For the majority of determinants, no significant effects are identified in relation to air quality, contaminated land and flooding.
- 8.6.22 In relation to access to open space and the public realm there are inevitable changes in the character of the area, through the introduction of new built development into this riverside location, with minor adverse effects. The scheme does include elements that may help increase the attractiveness to some users, including new lighting, landscape planting, benches and signboards, with minor beneficial effects. Overall, the effect would not be significant.

Vibrant Neighbourhoods

- 8.6.23 By improving capacity in the transport network, the Proposed Development will support economic growth of Reading and access to employment for local people. The East MRT scheme reduces bus and cycle commuting travel times, which will have particularly benefits for those without access to a car including lower income groups. These residual effects are minor beneficial effects, which are not significant.
- 8.6.24 The Proposed Development will help improve access to Reading town centre and provide better access to open space with residual minor beneficial effects, which are not significant.

8.7 Combined Site (East MRT and TVP P&R)

Assessment of Likely Effects

- 8.7.1 This section considers the effects of the East MRT scheme combined with the TVP P&R. The intention here is to consider where there will be new or different effects as a result of the combined site, beyond those already identified in the **section 8.6** and specifically **Tables 8.3 to 8.8**.

Construction

- 8.7.2 The construction period of the two schemes may coincide, although vegetation clearance and ground preparation has already been undertaken for the TVP P&R scheme. Potential cumulative construction effects could occur with nearby development sites should construction occur at the same time.
- 8.7.3 Significant combined effects are unlikely to occur as each development will be covered by a CEMP that will ensure suitable mitigation measures are employed during construction. This will include a plan to manage construction traffic, and dust mitigation techniques, as required by national and local planning policy.

Active Travel

- 8.7.4 *Promoting walking and cycling:* The construction of the TVP P&R does not directly affect the National Cycle Routes or Thames Path or any other walking and cycling route so will have no additional effect to those already identified for East MRT scheme.
- 8.7.5 *Safety:* The combined effect of construction at both sites is likely to result in an increase in construction vehicles, including HGVs, from that identified for the East MRT alone. However, this increase is not anticipated to have a significant effect.

Healthy Environment

- 8.7.6 As set out above a CEMP is required for both Proposed Developments that will mitigate impacts on the air quality, noise, flooding (although the TVP P&R site is outside the functional floodplain) and ground contamination on both sites. Therefore, significant combined effects are not likely and remain negligible. There are also likely to be no additional combined effects of the two schemes on the public realm and open space. However, the TVP P&R is seeking a change to the existing planning permission that will further reduce tree loss on the site and help to protect the character of the area, with some potential reduction in effects on the landscape character of the area.

Vibrant Neighbourhoods

- 8.7.7 Construction on the combined sites would see an increase in the net temporary construction jobs. However, the combined effect is not significant and remains as minor beneficial.
- 8.7.8 The TVP P&R revised scheme includes protection of the existing caravan site with benefits for users of the site. However, the impacts on social infrastructure is not significant.

Operational

Active Travel

- 8.7.9 *Promoting walking and cycling:* The TVP P&R will have dedicated cycle parking and therefore can support mixed travel mode trips, with people having the ability to cycle to the P&R prior to getting a bus. This will have additional benefits in relation to promoting walking and cycling.
- 8.7.10 *Safety:* As with the East MRT scheme the combined scheme would help to support non-car access to Reading town centre. However, no additional effects are identified of the combined scheme in comparison to East MRT alone.
- 8.7.11 *Connectivity:* The TVP P&R scheme would provide additional parking for a new bus west into central Reading. This would help improve the connectivity of east and west Reading and into Wokingham. Furthermore, the provision of disabled spaces in the P&R allows people with mobility impairment to use the bus to access central Reading. This is a negligible increase in the assessed effect for East MRT.

Healthy Environment

- 8.7.12 *Air quality:* As reported in **Chapter 10** of this ES the combined schemes do result in some additional air quality effects as a result of an increase in trips. However, at all locations these remain with the UK and European air quality limit values and effects are negligible.
- 8.7.13 *Contaminated land:* No additional combined effects have been identified.
- 8.7.14 *Open space and public realm:* The TVP P&R will result in the removal of an additional area of trees and scrubland, although this area contains no formal footpaths. The TVP P&R backs onto the Wokingham Waterside Centre and Thames Valley Park Rowing club, which are in an area of open space on the river edge. The TVP P&R will not affect this open space, or the operation of the clubs, with a landscape buffer maintained between these and the proposed car park. Therefore, no additional effects are identified beyond those for the East MRT scheme.
- 8.7.15 *Flooding:* The combined schemes increase the extent of impermeable ground on each site. Both sites will have a drainage strategy in place to manage surface water run-off (and pollution risk) and therefore the effect of the combined sites remains as assessed and are assessed as negligible.

Vibrant Neighbourhoods

- 8.7.16 *Local employment:* The combined effect of the two sites would result in an increase in jobs in the study area, with new jobs created and opportunities for local residents with appropriate skills. However, the effect remains as minor beneficial and therefore not significant.
- 8.7.17 *Access to Social Infrastructure:* The provision of new car and cycle parking at this location, combined with the new bus route would have beneficial effect on access to social infrastructure for existing and future residents. However, the effect remains as minor beneficial and therefore not significant.

Further Mitigation and Enhancement

- 8.7.18 No further mitigation and enhancement is proposed beyond that set out the Proposed Development.

Residual Effects

- 8.7.19 No changes in the assessed residual effects have been identified for the East MRT scheme in **section 8.6**. The residual effects are summarised in **Table 8.9** below.

8.8 Monitoring

- 8.8.1 On the basis that the construction and operational phases do not result in adverse residual effects, there is no requirement for monitoring with respect to health impacts.
- 8.8.2 Monitoring measures are identified for landscape and visual impact (**Chapter 13**) to include footpath diversions during construction and in the event of flood events (**Chapter 11**).

8.9 Cumulative Effects

- 8.9.1 This section considers the cumulative effects of the Proposed Development with other committed developments in the surrounding area (**Appendix A.10**).
- 8.9.2 The committed developments to be considered for cumulative effects as part of this ES are a mix of development types including office conversions, other buildings of non-residential use (Class B1-8) including studios and apartments, and other residential units (C3). As well as

new residential development, totalling over 1,800 new homes, plus a number of student accommodation developments.

Construction

- 8.9.3 Potential cumulative construction effects could occur with nearby development sites should construction occur at the same time.
- 8.9.4 Significant cumulative effects are unlikely to occur as each development is anticipated to employ appropriate mitigation measures. For example, this will include a CEMP and dust mitigation techniques, as required by national and local planning policy, such that the construction phase effects would not be not significant, when considered individually or in combination.
- 8.9.5 **Chapter 7** of this ES sets out the likely effects on the construction labour force and identifies that, in combination, all projects will have a beneficial effect and will be a stimulus to the local economy through the provision of construction related training and employment. This would have a beneficial effect on health and wellbeing related to being in employment, however, the effect would be not significant.

Operation

- 8.9.6 The future year traffic data used in the assessments of transport and air quality effects includes committed development in the area (see **Chapter 9** for more detailed information), therefore effects assessed related to these issues in **section 8.6** and **8.7**)
- 8.9.7 *Active Travel:* The Proposed Development has the potential to encourage more active travel for future residents or employees of committed developments in the local area. This will support a greater level of physical activity and therefore has beneficial effects, although these are classified as not significant.
- 8.9.8 *Healthy Environment:* All of the Proposed Developments would need to be constructed in accordance with National and Local policy relating to a healthy environment, with suitable conditions attached to any planning permission. On this basis it is considered that the cumulative effect of the Proposed Development and committed development schemes are not likely to give rise to any likely significant cumulative effects on air quality, flooding or land contamination.
- 8.9.9 Due to the location of the committed developments no significant cumulative effects are identified in relation to open space and the public realm.
- 8.9.10 *Vibrant Neighbourhoods:* The committed developments will also help support the local economy of Reading and Wokingham, through the direct and indirect provision of new jobs and Gross Value Added. The Proposed Development will help support this growth by increasing local transport capacity. Overall, no significant likely effects are identified.

8.10 Summary

- 8.10.1 An assessment of the likely significant effects of the Proposed Development East MRT scheme with respect to health and wellbeing has been undertaken by PBA.
- 8.10.2 This assessment outlines the existing health characteristics of the site and surrounding communities and assesses the likely effects in the study area during construction and operation. The assessment takes into account embedded mitigation and further mitigation measures in the assessment of likely significant effects. The assessment is based around the health determinants that relate to proposed development including 'active travel', a 'healthy environment' and 'vibrant neighbourhoods'. A summary is included in **Table 8.9**.

Baseline

- 8.10.3 Both Reading and Wokingham boroughs are characterised by inequities in life expectancy, heart attacks, strokes and cancer between more and less deprived areas, with deprived areas having worse health outcomes. The areas around the route of the Proposed Development are some of the more deprived areas of the boroughs.
- 8.10.4 The River Thames towpath is within the Application Site and will remain unchanged by the Proposed Development. This route is part of the National Cycle Network and is currently used by walkers and cyclists. Cyclists and walkers share the space, making it more suited for slow leisure cycling.
- 8.10.5 It is identified that a high proportion of people of working age walk or cycle to work, with walking being the dominant method for travel to the town centre.
- 8.10.6 The Site has been assessed to be in an area of flood risk and historical contamination. An Air Quality Management Area covers the town centre and out along major roads including the A33 and A327.
- 8.10.7 As obesity levels are rising for children and adults in Reading and Wokingham and many people are not meeting recommended physical activity levels local health bodies have identified priorities for health and wellbeing in the two areas that relate to increasing physical activity for residents, in particular improve the opportunities for people to make healthy lifestyle choices, including access to green spaces and increased walking and cycling.

Construction Effects

- 8.10.8 The assessment identifies that there is the potential for effects to be experienced on health and wellbeing during the construction phase for construction workers, existing residents and users of the Application Site. However, mitigation, including through the implementation of a CEMP, means that no there are no significant residual adverse effect identified against any of the health determinants.

Operation Effects

- 8.10.9 The assessment identifies that there is the potential for effects to be experienced on health and wellbeing during the operational phase for existing residents, existing and future users of the Application Site. Embedded mitigation as part of the East MRT scheme includes a segregated, well-lit, step-free, and direct cycleway, footpath and bus route to provide an improved link between Reading town centre to the east has the potential to have beneficial effects. As result there are likely to be major beneficial effects related to 'active travel', with potential benefits for health from increased physical activity including reductions in cardiovascular disease, type 2 diabetes, mental wellbeing as well as a reduction in obesity levels.
- 8.10.10 As a result of embedded mitigation as part of the Proposed Development, no significant effects are identified in relation to 'vibrant neighbourhoods' or 'healthy environment'.
- 8.10.11 No change in the assessed effects are identified when considering the combined effect of the East MRT scheme and the Thames Valley Park, Park & Ride scheme.

Table 8.8 Summary of effects

Health determinant	Effect	Embedded Mitigation	Significance of Effect	Further Mitigation (if required)	Residual Significance of Effect
Construction					
Active Travel					
Promoting walking and cycling	Reduced attractiveness of existing footpaths and cycleways to users	Implementation of a CEMP and strategy to reduce closure and diversion of the existing Thames Path and National Cycle Routes and other footpaths	Minor Adverse - temporary	None identified	Minor Adverse - temporary
Safety	Construction traffic on local roads with potential safety and amenity effects.	Implementation of a construction traffic management plan within a CEMP	Negligible	None identified	Negligible
Healthy Environment					
Air quality	Dust emissions and construction traffic	None	Not significant	None identified	Not significant
Open space/public realm	Construction activities changing the character and attractiveness of the site and open space.	Implementation of CEMP that includes measures to reduce impact on recreational routes.	Minor adverse -temporary	None identified	Minor adverse - temporary
Land contamination	Potential exposure to contaminants during construction	Implementation of pollution control measures in a CEMP.	Minor adverse – temporary	Additional ground investigation and remediation or mitigation put in place prior to development commencing.	Minor adverse – temporary
Flood	Surface water runoff during construction on off-site resident and construction workers	Implementation of control measures to manage surface water runoff during construction.	Not significant	None identified	Not significant

Health determinant	Effect	Embedded Mitigation	Significance of Effect	Further Mitigation (if required)	Residual Significance of Effect
Vibrant Neighbourhoods					
Local employment	Additional construction jobs created	None	Minor beneficial – none	Maximising local supply contracts, apprenticeship programmes and liaison with local recruitment services.	Minor beneficial
Operation					
Active Travel					
Promoting Walking and Cycling	Improvements to the cycling and walking infrastructure	The design of development incorporates a segregated walking and cycling route.	Moderate beneficial	Use of signage	Moderate beneficial
Safety	Improved safety for existing users and future uses of walking and cycling routes	Development will provide a relatively level, well surfaced, lit and segregated route for cyclists and walkers, including natural surveillance.	Moderate beneficial	None identified	Moderate beneficial
Connectivity	Improved connectivity for future uses of the scheme.	The purpose of the scheme is to provide improved public transport, walking and cycling connectivity of Reading town centre to the east.	Major beneficial	None identified	Major beneficial
Healthy Environment					
Air quality	Air quality remains within UK and European limit values for human health	The development helps accommodate increase in travel demand through non-car trips.	Negligible	None identified	Not significant
Contaminated land	Low risk to human health from potential contamination in soils in landscaped areas.	None identified	Negligible	Further site investigation to identify areas that may need clean soil capping.	Negligible

Health determinant	Effect	Embedded Mitigation	Significance of Effect	Further Mitigation (if required)	Residual Significance of Effect
Open space / public realm	Changes to the character of the site from new built infrastructure.	Improvements to the character of the site through high quality design, landscaping and lighting	Minor beneficial and adverse	Use of story boards, benches, involvement of community groups and relation of the mosaic	Minor beneficial and adverse
Flood risk	Impact on flood on and off-site.	Drainage design to manage surface water flows and pollution control.	Negligible	Detailed design of surface water drainage strategy, as set out in the Chapter 11 of this ES and the FRA (PBA, 2018)	Negligible
Vibrant Neighbourhoods					
Access to social infrastructure	Improved access to social and community facilities	The Proposed Development links Reading town centre to the east, and improves non-car access to the station.	Minor beneficial	Sign boards, benches and involvement with local schools/community groups in their design	Minor beneficial
Local employment	Support for the local economy and jobs	The Proposed Development is designed to aid economic growth in the area by adding additional transport capacity.	Minor beneficial	None identified	Minor beneficial

9 Transport and Access

9.1 Introduction

- 9.1.1 This chapter has been prepared by PBA to document the likely significant effects of the proposed East MRT Scheme in terms of traffic and transport.
- 9.1.2 A Transport Statement (TS) has been prepared for the planning application for the proposed East MRT Scheme, and is included in **Appendix D.1**. The TS informed the preparation of this chapter. The reader is referred to the TS where further information is required.
- 9.1.3 This chapter includes a review of the current transport conditions within the study area. It outlines the mitigation measures that have already been incorporated into the proposals, or will be implemented in the future, and then the significance of the residual effects of the East MRT Scheme have been assessed.
- 9.1.4 In accordance with Regulation 18(5) of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, as amended, a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this Environmental Statement (ES) is provided in **Appendix A.5**.

9.2 Policy Context

NPPF 2018

- 9.2.1 The National Planning Policy Framework states that: “planning policies should:
- a. support an appropriate mix of uses across an area, and within larger scale sites, to minimise the number and length of journeys needed for employment, shopping, leisure, education and other activities;*
 - b. be prepared with the active involvement of local highways authorities, other transport infrastructure providers and operators and neighbouring councils, so that strategies and investments for supporting sustainable transport and development patterns are aligned;*
 - c. identify and protect, where there is robust evidence, sites and routes which could be critical in developing infrastructure to widen transport choice and realise opportunities for large scale development;*
 - d. provide for high quality walking and cycling networks and supporting facilities such as cycle parking (drawing on Local Cycling and Walking Infrastructure Plans);*
 - e. provide for any large scale transport facilities that need to be located in the area, and the infrastructure and wider development required to support their operation, expansion and contribution to the wider economy. In doing so they should take into account whether such development is likely to be a nationally significant infrastructure project and any relevant national policy statements; and*
 - f. recognise the importance of maintaining a national network of general aviation airfields, and their need to adapt and change over time – taking into account their economic value in serving business, leisure, training and emergency service needs, and the Government’s General Aviation Strategy”*
- 9.2.2 The East MRT scheme has been identified by both Reading Borough Council (RBC) and Wokingham Borough Council (WBC) highway authorities, alongside transport operators such

as: Reading Buses, Stewarts Travel and Rail Air to support the delivery of sustainable economic growth and housing for both boroughs and beyond in Bracknell Forest.

- 9.2.3 Land has been safeguarded in both boroughs for the scheme to be delivered, and included specifically within WBC's Proposals Map and referenced in their Managing Development Delivery.
- 9.2.4 The scheme delivers significant upgrades to the walking and cycling networks between Reading and Wokingham boroughs.
- 9.2.5 The scheme is a fundamental element of the wider sustainable transport strategy for Reading and the Thames Valley, enabling the future provision of a dedicated public transport corridor between Reading – Wokingham – Bracknell and in north Reading linked to the proposed Third Thames crossing.
- 9.2.6 The East MRT scheme will improve accessibility to the strategic rail and highway networks, allowing residents from existing and planned development living to the east of Reading to reach the rail services and Reading town centre, or visitors arriving from the motorway to use the P&R at TVP or Winnersh into Reading town centre.
- 9.2.7 The scheme therefore strongly accords with the NPPF.

Thames Valley Berkshire LEP Strategic Priorities

- 9.2.8 The LEP seek to *"ensure we have transport infrastructure for the 21st century"*
- 9.2.9 One of LEP's objectives is *"to secure investment for Thames Valley Berkshire Strategic infrastructure from public or private sources that will cause barriers to growth in the four areas"*:
- Housing and Regeneration
 - Transport
 - Telecommunications
 - Utilities
- 9.2.10 The delivery of the East MRT Scheme will help to achieve these aspirations and objectives.

Thames Valley Berkshire LEP Strategic Economic Plan and Implementation Plan

- 9.2.11 The East Reading Mass Rapid Transit (MRT) has been identified for support from LGF from 2016/17 onwards. The scheme has been identified to respond to business concerns with regard to accessibility and journey time and reliability. It will improve access to Reading town centre and major employment sites, from the east and complement the Park and Ride facilities at Winnersh Triangle and Thames Valley Park. It will enable the delivery of south eastern section between Reading, Wokingham and Bracknell.

Reading Borough Council Core Strategy (2015)

- 9.2.12 The adopted RBC Core Strategy identifies four distinct, but well-connected areas that present themselves as sustainable locations for future development. Quality bus corridors / MRT is identified as one of the eight core infrastructure projects.
- 9.2.13 Policy CS21 'Major Transport Projects' states:

“As a regional transport hub, priority will be given to the implementation of the priority transport projects identified in the Local Transport Plan, particularly the upgrading of Reading Station Interchange, Park and Ride Sites, Mass Rapid Transit, road improvements, Quality Bus Routes and associated transport improvements. Land needed for the implementation of priority transport projects will be safeguarded from development, to enable their future provision.”

Reading Borough Council Local Transport Plan (2011)

- 9.2.14 RBC's Local Transport Plan (2011 – 2026) provides the following detail with regards to their Transport Vision for Connecting Reading:

“Transport in Reading will better connect people to the places that they want to go: easily, swiftly, safely, sustainably and in comfort. We will meet the challenges of a dynamic, low-carbon future to promote prosperity for Reading. Whichever way you choose to travel, by foot or bicycle, motorcycle, bus, rail, car or boat whether to work or education, to leisure or the services you need, our transport system will help you get there.”

- 9.2.15 The LTP provides a number of Area Action Plans (AAP's) for the different areas across the borough, with each of these supporting the implementation of MRT through 'Opportunities for Addressing Challenges'.

The opportunities for the Eastern AAP include:

- *“To continue to work with Wokingham Borough Council, South Oxfordshire District Council, Oxfordshire County Council and Bracknell Forest District Council to find cross-boundary solutions to transport challenges.*
- *To work with Wokingham Borough Council to progress the implementation of a long-term Park and Ride strategy, considering alternative sites to Loddon Bridge, including the possible use of Broken Brow at the northern end of the A3290.*
- *To carry out targeted neighbourhood or area studies, working with Wokingham Borough Council to build on previous work to deliver multi-targeted benefits, including the improvement of public transport journey times and reliability and the management of development pressures. One focus would be on strategic radial routes into Reading and the potential provision of a mass rapid transit supporting a park and ride strategy.*
- *To work with the private sector and Wokingham Borough Council to innovate and secure delivery of integrated transport choices associated with new development proposed within Wokingham Borough.*
- *To work with Wokingham Borough Council to deliver an East Reading Transport Link and associated Park & Ride facilities.”*

- 9.2.16 The LTP notes that: *“An MRT system must be designed to meet a set of standards above and beyond a quality local bus. The long-term vision incorporates a network that expands the public transport offer rather than replacing existing networks, and it will be branded as such. The MRT network extends beyond Reading to offer public transport and interchange options to the wider travel to work area. The Park and Ride objectives and policies support the MRT and interchange options, aiming to reduce private transport mileage and improve journey times and air quality on some of Reading's busiest roads.”*

Wokingham Borough Council Core Strategy (2010)

- 9.2.17 High Quality express bus services or MRT along the A4 and A329 corridors are identified as an integral part of WBC's Core Strategy. Policy CP10 of the Core Strategy, together with

Policy CC08 and Appendix 3 of the MDD Local Plan, safeguard areas identified for improvements to the strategic transport network including MRT along the A4/A329 corridors, improvements to public transport services and improvements to footway and cycle networks.

- 9.2.18 The East MRT Scheme will help assist the planning obligations related to South Wokingham (2500 homes) and North Wokingham (1500 homes):

- *“Improvements to the quality and frequency of public transport services along any part of the network” ...; and*
- *“High quality express bus services or mass rapid transit along A329 corridor”.*

Wokingham Local Transport Plan (2011)

- 9.2.19 Policy PT8 Park & Ride states that: *“the council will promote the use of Park & Ride services and will support the future introduction of new sites in the borough where feasible.*

Over the life of this plan and the development of the adopted core strategy we will work with Reading Borough council and Bracknell Forest Councils to deliver and retain Park & Ride at the following locations:

- *Near to Coppid Beach roundabout on the A329 in Wokingham*
- *Park and Ride in the vicinity of the M4 junction 11 (MereOak)*
- *Relocation or retention of the Park & Ride at Winnersh*
- *Park & Ride located in Thames Valley Park to complement the high quality express bus services or mass rapid transit along the A4 or A329 corridors into central Reading.”*

- 9.2.20 This confirms WBC’s aspirations to connect to a MRT system along the A4 or A329.

- 9.2.21 Policy SP1: Support for Major Infrastructure sets out that *“the Council will actively support development of suitable major transport projects that are necessary to support the future growth and success of the Borough. Major Strategic Public Transport, Walking and Cycling Infrastructure includes:*

- *“High quality express bus services or mass rapid transit along the A4 and A329 corridors*
- *High quality express bus services or mass rapid transit between Reading and Woodley town centres*
- *High quality express bus services between Green Park and Twyford stations via the Park & Rides in the vicinity of M4, J11 and Loddon Bridge and Winnersh Triangle Railway Station*
- *Measures to improve accessibility by non-car transport modes along routes to the stations at Green Park and Winnersh Triangle”*

Wokingham Borough Managing Development Delivery (MDD) Local Plan (2014).

- 9.2.22 Appendix 3 of the MDD Local Plan refers to strategic transport projects indicated on Figure 24 of the Local Transport Plan, which includes a proposed highway scheme connecting west into Reading Borough from Thames Valley Park and the proposed TVP P&R facility. Supporting text to Policy SAL09 of the MDD Local Plan (Paragraphs 4.68-4.69) requires development

proposals to have regard to the 'Cross Town Link' proposals from Thames Valley Park being pursued by RBC.

Consultation

- 9.2.23 PBA has consulted with RBC and WBC in their capacity as the local highway authorities. Details including the assessment area, model scenarios, scheme widths and scheme operation in terms of bus movements have been discussed and agreed.
- 9.2.24 A Scoping Report was submitted to RBC and WBC in August 2018, which included an outline of the proposed scope and methodology for the transport assessment. The Scoping Opinion is included in **Appendix A.8**.
- 9.2.25 This chapter has been prepared in accordance with the Scoping Report and the Scoping Opinion received (see **Chapter 5** for more details).

9.3 Methodology

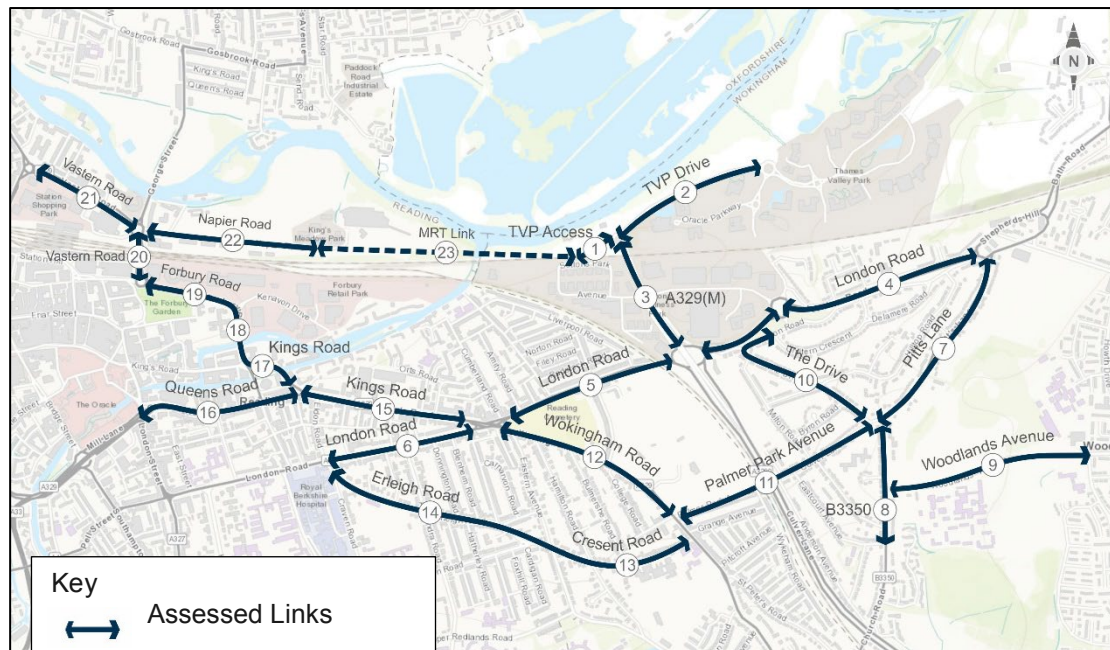
Study Area

- 9.3.1 The assessment area includes transport links on the approaches to the proposed East MRT Scheme and alternative routes between the A3290 and Inner Distributor Road at Napier Road/Kings Meadow Road.
- 9.3.2 The assessment area comprises the links listed in **Table 9-1**, and is shown in **Figure 9-1**.

Table 9.1: Assessment Area Links and Junctions

Link	Link Name
L1	Site Access
L2	Thames Valley Park Drive
L3	A3290 between Site Access and A4
L4	A4 London Road South of Shepherds Hill
L5	A4 London Road east of Cemetery Junction
L6	A4 London Road west of Cemetery Junction
L7	Pitts Lane
L8	Church Road
L9	Woodlands Avenue
L10	Whitegates Lane
L11	Palmer Park Avenue
L12	Wokingham Road adjacent to Palmer Park
L13	Crescent Road
L14	Erleigh Road
L15	A329 Kings Road adjacent to Reading College
L16	A329 Queens Road
L17	A329 Kings Road adjacent to Gas Works Road
L18	A329 Forbury Road between Kings Road and Kenavon Drive
L19	A329 Forbury Road between Kenavon Drive and Vastern Road
L20	Vastern Road Rail Bridge
L21	Vastern Road
L22	Napier Road
L23	New East MRT Scheme Route

Figure 9.1: Assessment Area



Baseline Data Collection

Reading Borough Council Traffic Data

- 9.3.3 Automatic Traffic Count (ATC) data is available online which is provided at a number of sites across Reading by RBC. Data is available from 2014 up to present day and includes information on the quantity, the classes and the speed of vehicles. Data from 2017 has been used for 3 ATC's on London Road east of Cemetery Junction, Kings Road and Wokingham Road to determine Heavy Goods Vehicles (HGV) percentages and traffic flow profiles.

Thames Valley Park and Ride (TVP P&R) Transport Assessment

- 9.3.4 The TVP P&R has a separate Transport Assessment (TA) which provides information on traffic flows. The data relating to the traffic flows at the junction between the A3290 and London Road was taken from the TA.

SATURN Model

- 9.3.5 The SATURN model uses data from the Reading road network model to model the effect of a number of schemes. The SATURN Model is based on the 2021 future baseline with allowances for the committed developments, which are expected to be complete by 2021.
- 9.3.6 With the 2021 future baseline the SATURN Model simulates the effect of the East MRT Scheme, the TVP P&R, and both the TVP P&R and East MRT Scheme in the network.

Assessment

Scenarios

- 9.3.7 It is expected that the committed TVP P&R will be delivered in advance of the East MRT Scheme, but there is the potential that these are not delivered in this sequence therefore this Environmental Statement assesses the effect of the East MRT Scheme with and without the TVP P&R and in combination will the TVP P&R.

9.3.8 It is worth noting that vegetation and ground clearance works have been undertaken for TVP P&R (as discussed in Section 2.2.)

9.3.9 **Table 9.2** summarises the scenarios assessed in this report.

Table 9.2: The Baseline and Proposed Scheme for each scenario

Reference	Baseline	Proposed Scheme
Scenario 1	2021 Future Baseline (No TVP P&R but with committed development)	2021 Future Baseline with East MRT (No TVP P&R)
Scenario 2	2021 Future Baseline (No TVP P&R but with committed development)	2021 Future Baseline with East MRT and TVP P&R
Scenario 3	2021 Future Baseline (With TVP P&R and with committed development)	2021 Future Baseline with East MRT and TVP P&R

Approach

9.3.10 The effects of the TVP P&R have been abstracted from the TVP P&R TA. The effects of the East MRT Scheme and any combined effects have been informed by the SATURN modelling explained in the TS supporting this planning application.

9.3.11 To convert the peak hour flows to 24 hour flows, an automatic traffic counter profile for that link or similar link has been applied based on the location and size of road as well as the direction of the traffic.

9.3.12 Links which experienced an increase or reduction in vehicle flow of greater than 10% are investigated in further detail in this assessment.

9.3.13 Across all links the AM and PM peak hour flows have been calculated in addition to the Annual Average Weekday Traffic (AAWT) to further analyse the impacts on the local traffic network.

Assessment Criteria

9.3.14 The potential effects of the East MRT Scheme assessed in this chapter are as per the effects set out in The Guidelines for the Environmental Assessment of Road Traffic published by The Institute of Environmental Assessment in 1993 (now the Institute of Environmental Management and Assessment) (IEMA Guidelines). Definitions of each of the potential effects identified are set out below along with explanatory text relating to assessment criteria. It is on this basis that the assessment in this chapter has been undertaken.

9.3.15 **Driver Delay** - delay to drivers generally occurs at junctions where opposing vehicle manoeuvres are undertaken with vehicles having to give or receive priority depending upon the type of junction arrangement. The IEMA guidance states that computer modelling programmes can be used to assess the changes in driver delay on the network as a result of the Proposed Development. The IEMA guidelines do not state specific thresholds to calculate the magnitude of the effect, however, it does advise that delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system.

9.3.16 **Table 9.3** below shows the magnitude-scale applied to the category 'driver delay' for the purpose of this assessment.

Table 9.3: Driver Delay - Scale of Magnitude

Magnitude	Description
Large	Average vehicle delay changes of more than 1 minute as a result of the proposed development during the peak hour periods
Medium	Average vehicle delay changes are between 30 and 60 seconds as a result of the proposed development during the peak hour periods
Small	Average vehicle delay changes are between 20 and 30 seconds as a result of the proposed development during the peak hour periods
Negligible	Average vehicle delay changes are less than 20 seconds as a result of the proposed development during the peak hour periods

9.3.17 **Public Transport Delay** –is the delay caused to busses and public transport vehicles as a result of the proposed development. This is different to driver delay as public transport operate along designated routes, such as MRT routes, separate to general vehicles. Additionally, public transport vehicles often have a defined route which cannot be altered to avoid heavy traffic.

9.3.18 **Severance** - is the perceived division that can occur within a community when it becomes severed by a major traffic artery. This may result from the difficulty in crossing a heavily trafficked road or a physical barrier. Severance is difficult to measure and by its subjective nature is likely to vary between different groups within a single community. In addition to the volume, composition and speed of traffic, severance is also likely to be influenced by the geometric characteristics of a road, the demand for movement across a road and the variety of land uses and extent of community located on either side of a road. All these factors are considered when determining the likely severance effect.

9.3.19 The main indicators for the assessment of separation have been formulated from studies of changes in traffic flow on observed links and are discussed in the IEMA guidelines. It must be recognised that these are guidelines only, and are highly dependent on existing ambient traffic levels. They are in no way definitive measures of separation. Indicators for this assessment are presented in **Table 9.4** below.

Table 9.4: Severance - Scale of Magnitude

Magnitude	Description
Large	Links subject to a 60+% traffic flow increase per day
Medium	Links subject to a 40% - 60% traffic flow increase per day
Small	Links subject to a 30% - 40% traffic flow increase per day
Negligible	Links with daily traffic flow increases below 30%

9.3.20 **Pedestrian Delay and Amenity** - pedestrian delay and amenity for a particular walking journey are related to traffic flows through the impact of changes in vehicular demand on the ability of pedestrians to cross individual routes. This will therefore affect an individual's desire to make a particular walking journey. Changes in the volume, speed or composition of traffic

are most likely to affect pedestrian delay, with the level of severity dependent on the general level of pedestrian activity and the physical condition of crossing points.

- 9.3.21 The determination of what constitutes a material impact on pedestrian delay and amenity is generally left to the judgement of the assessor and knowledge of local factors and conditions. However, the IEMA guidelines suggest that pedestrian delay, the time a pedestrian has to wait before crossing a road, at an individual link should not exceed 40 seconds where no crossing facilities are available. It further advises that the lower threshold equates to a two-way flow of approximately 1,400 vehicles per hour.
- 9.3.22 Pedestrian amenity can be materially affected where traffic flow is halved or doubled. It can also be improved by the provision of new dedicated facilities or segregated routes.
- 9.3.23 **Table 9.5** shows the magnitude-scale applied to the category 'pedestrian delay and pedestrian amenity' for the purpose of this assessment.

Table 9.5: Pedestrian Delay - Scale of Magnitude

Magnitude	Description
Large	Change in traffic flow of >50%
Medium	Change in traffic flow of 40%-50%
Small	Change in traffic flow of 30%-40%
Negligible	Change in traffic flow of <30% or Traffic flow less than 800 vehicles per hour*

*Note: This threshold is based upon the Manual for Streets (2007) threshold of 10,000 vehicles per day for traffic flow and road safety for streets with direct frontage access. Peak hour flow is estimated at approximately 8.5% of daily flow (850 vehicles), although this has been reduced to 8% (800 vehicles) in order to provide a robust assessment threshold.

- 9.3.24 **Fear and Intimidation** - is broadly defined as the relative pleasantness of a journey. It is affected by traffic flow, traffic composition and pavement width / separation from traffic. It encompasses the overall relationship between pedestrians and traffic, including fear and intimidation which is the most emotive and difficult effect to quantify and assess. There are no commonly agreed thresholds for quantifying the significance of changes in pedestrian amenity, although the IEMA guidelines suggest a useful study which could be referenced when considering any effect. These thresholds are replicated in **Table 9.6**.

Table 9.6: Fear and Intimidation – Threshold Guidelines

Degree of Hazard	Average traffic flows over 18hr day (vehicles/hour)	Total 18hr HGV flow	Average vehicle speed over 18hr day (mph)
Extreme	1,800	>3,000	>20
Moderate	1,200-1,800	2,000 – 3,000	15 – 20
Slight	600 – 1,200	1,200 – 2,000	10-15

9.3.25 Notwithstanding the thresholds set out above, the guidance suggests that they should be approached with a certain level of caution as the individual factors could be weighted by local circumstances to decide on the overall value of intimidation. For example, a road may show higher speeds but lower flows making crossing easier. A road could alternatively have high flows but be congested and have constant traffic, therefore reducing total fear of passing vehicles but increasing crossing difficulties.

9.3.26 **Table 8.7** shows the magnitude-scale applied to the category ‘fear and intimidation’ for the purpose of this assessment.

Table 8.7: Fear and Intimidation – Scale of Magnitude

Magnitude	Description
Large	Change in average traffic flow over 18 hours of >1500 vehicles/hr; An average 18 hour HGV flow of >2500; or Change in average speed over 18 hours of >17 mph
Medium	Change in average traffic flow over 18 hours of 1200-1500 vehicles/hr; An average 18 hour HGV flow of 2000-2500; or Change in average speed over 18 hours of 15-17 mph
Small	Change in average traffic flow over 18 hours of 600-1200 vehicles/hr; An average 18 hour HGV flow of 1000-2000; or Change in average speed over 18 hours of 10-15 mph
Negligible	Change in average traffic flow over 18 hours of <600 vehicles/hr; An average 18 hour HGV flow of <1000; Change in average speed over 18 hours of <10 mph

9.3.27 **Accidents and Safety** - the IEMA guidance states that overall changes in vehicle kilometres as a result of the proposed development may be used to assess the magnitude of impact on accidents and safety. However, the guidance does not prescribe specific criteria to be applied to the changes in vehicle kilometres to identify impact magnitude. This would be dependent on local circumstances such as traffic speed, flow and composition as well as vehicle conflict and pedestrian activity. The IEMA guidelines state that it is this combination that enables a professional judgement to be made regarding the significance of the effect.

9.3.28 **Dust and Dirt** - the impact of dust and dirt on the highway has been assessed in relation to the nature of development and in particular during the construction stage. This has been considered in **Chapter 10** (Air Quality).

- 9.3.29 **Hazardous Loads** - the impact of hazardous loads on the highway has not been assessed, as the development is not expected to generate any hazardous loads in either the construction or operational stage.
- 9.3.30 The significance of the effects of the Proposed Development on these topics has been determined by the magnitude of the effect, the sensitivity of the receptor and whether the impact is temporary or permanent.
- 9.3.31 Further to the level of significance, environmental effects will also be determined by whether effects are temporary or permanent, and whether they are beneficial or adverse.

Significance Criteria

- 9.3.32 The two principal criteria for determining the significance of an environmental effect are the sensitivity of the receptor (see **Table 9.10**) and magnitude of effect (see **Table 9.3** to **Table 9.5**, as well as **Table 9.7**). However not all assessments are based on this approach and therefore professional judgement is also a key factor in determining the significance of effects.
- 9.3.33 **Table 9.8** shows the significance matrix used to determine the significance of environmental transport effects.

Table 9.8: Transport and Access – Significance Criteria

	Sensitivity of Receptor			
Magnitude of Effect	High	Medium	Low	Negligible
Large	Severe	Major	Moderate	Minor / Not significant*
Medium	Major	Moderate	Minor	Not Significant
Small	Moderate	Minor	Not Significant	Not Significant
Negligible	Minor / Not Significant*	Not Significant	Not Significant	Not Significant

*Note: The choice between 'Minor' and 'Not significant' will depend on the specifics of the impact and will be down to professional judgement and reasoning.

- 9.3.34 Further to the level of significance, environmental effects will also be determined by whether effects are temporary or permanent, and whether they are beneficial or adverse.
- 9.3.35 A description of criteria for each level of significance (severe, major, moderate, minor and not significant) can be found in **Chapter 5**.
- 9.3.36 The IEMA guidelines provide general rules that can be used as a screening process to establish the extent of the assessment. The rules are as follows:
- 'Rule 1 - Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and
 - Rule 2 - Include any other specifically sensitive areas where traffic flows have increased by 10% or more'.
- 9.3.37 Categories of receptor sensitivity have been defined based on the principles set out in the IEMA guidelines, although in detail, each receptor assessed will have a different sensitivity to

each specific impact. **Table 9.10** sets out how the sensitivity or value of each receptor has been determined.

Table 9.10: Sensitivity / Value of Receptors

Sensitivity / value of a receptor	Examples
High	Schools, colleges and other educational institutions; retirement/care homes for the elderly or infirm; roads used by pedestrians with no footways; high pedestrian activity; accident black spots.
Medium	Hospitals, surgeries and clinics; parks and recreation areas; shopping areas; roads used by pedestrians with narrow footways.
Low	Open space; tourist/visitor attractions; historical buildings; churches

9.4 Baseline Conditions

Walking

9.4.1 There are currently four main pedestrian route (PR) options for pedestrians travelling from the A4 London Road east of the A3290 roundabout to Reading town centre and station. These are:

- PR1) Via London Road and Kings Road;
- PR2) Via the River Kennet towpath;
- PR3) Via the River Thames and Napier Road towpaths; and
- PR4) Via the River Thames and Kennet towpaths and Napier Road.

9.4.2 The routes are illustrated in **Figure 9.2, 9.3, 9.4** and **9.5**.

Figure 9.2: Pedestrian Route 1 – Via London Road and Kings Road



Pedestrian Route 1 (PR1)

- 9.4.3 PR1 is approximately 1.75 miles in length and the whole route is lit, and is along footways or through pedestrianised zones. The first section of Route 1 is along the A4 London Road and Kings Road, which are both heavily trafficked main roads with footways and signalised crossings. The Kings Road crosses the Reading Inner Distribution Road (IDR) at a signalised junction with pedestrian crossing facilities. Kings Road then alters in character from a busy main road to a much lower trafficked town centre route. Kings Road ends at the pedestrianised section of Broad Street in the town centre. The route continues along Broad Street and Queen Victoria Street, both of which are pedestrianised, and onto Station Road, a low trafficked street that is primarily a bus route with wide footways either side, to Reading Station.

--- Route on footway
 Route on pedestrianised area
 — Route on off carriageway shared foot/cycleway
 Heavy traffic

Sources: Esri, HERE DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

9.4.4 PR2 is approximately 1.85 miles in length and the whole route is lit, and along footways or through pedestrian zones. The first section of the route is along the A4 London Road for approximately 150m, the route then continues along Liverpool Road before reaching the River Kennet towpath. Liverpool Road is a quiet, traffic calmed residential street in a 20mph speed limit zone and the River Kennet towpath is a shared foot/cycle way. The route reaches the town centre at Duke Street, a low trafficked street that is primarily a bus route, which leads to the pedestrianised area of Broad Street. The route then continues along PR1 to Reading Station.

Legend:

- Route on footway
- Route through Tesco
- Route on off carriageway
- shared foot/cycleway
- Signalised crossing
- Stepped Bridge
- Route unlit
- Route can flood

Sources: Esri, HERE DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

9.4.5 PR3 is approximately 1.85 miles in length, the whole route is along footways but part of the route, along the Thames towpath, is unlit and at risk of flooding. The first section of the route is along a shared foot/cycleway alongside the A3290 for approximately 500m. This section of the A3290 provides access to the Waterside Centre and TVP and accommodates relatively high peak hour traffic flows due to people arriving and leaving the business park. The route then crosses the road via a signalised pedestrian crossing and onto the River Thames towpath. The Thames towpath is a shared foot/cycleway; however, it is unlit and narrow in places with the width ranging between approximately 1.5 to 3.0m. The route crosses the River Kennet at its confluence with the River Thames via a stepped (with small cycle ramp alongside) pedestrian footbridge known as the Horseshoe Bridge, see **Figure 9.6**. The route continues along the towpath up to a Tesco Superstore. Here the route travels around the superstore and onto Napier Road. Napier Road is a 30mph, relatively low trafficked route with a footway. Napier Road meets the IDR at Reading Bridge Roundabout; a signalised pedestrian crossing facility is available which crosses the IDR to the Reading Station car park and through to the northern station entrance.