

East Reading Mass Rapid Transit Scheme

Environmental Statement

Non-Technical Summary

On behalf of **Reading Borough Council Highways and Transport Department**



Reading
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Contents

1	Introduction	5
1.1	Introduction	5
1.2	Terms and Definitions	5
1.3	The EIA, ES and Other Documents	5
2	Site and Surrounding Area.....	7
2.1	Site Description	7
2.2	Environmental Setting	8
2.3	TVP P&R	8
3	The Proposed Development.....	10
3.1	Description of the Proposed Development.....	10
3.2	Construction Programme and Management	11
3.3	Consideration of Alternatives	12
4	Planning and Policy Context.....	14
5	Assessment of Effects.....	16
5.1	Introduction	16
5.2	Assessing Effects	16
5.3	Socio-Economic.....	17
5.4	Transport and Access	18
5.5	Air Quality	19
5.6	Hydrology and the Water Environment	20
5.7	Ground Conditions.....	21
5.8	Landscape and Visual including Lighting	22
5.9	Ecology	23
5.10	Archaeology and Heritage	24
5.11	Impact Interactions	25

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1 Introduction

1.1 Introduction

- 1.1.1 This document is the Non-Technical Summary (NTS) of an Environmental Statement (ES) prepared in respect of a planning application for a new mass rapid transit (MRT) scheme to the east of Reading, Berkshire (referred to as the 'proposed development'). The application is being promoted by Reading Borough Council (RBC) Highways and Transport Department as the local highways authority. The purpose of the East MRT scheme is to provide a high speed public transport, cycle and pedestrian route into the town centre.
- 1.1.2 This NTS summarises the Environmental Impact Assessment (EIA) of the East MRT scheme, 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.
- 1.1.3 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.
- 1.1.4 The proposed development comprises the construction of a segregated fast-track public transport route, pedestrian and cycle bridge over the River Kennet, with associated Public Right of Way (PRoW) links, junction improvements and landscaping. The purpose of the East MRT Scheme is to improve the attractiveness of travelling more sustainably, therefore reducing private car trips, easing forecast congestion and air quality along the existing highway network, particularly on the A4 corridor.
- 1.1.5 The project is being promoted by RBC, working with WBC, and Thames Valley Berkshire Local Enterprise Partnership (TVB LEP). The public-sector led project has been allocated funding by TVB LEP from the Local Growth Fund.

1.2 Terms and Definitions

- 1.2.1 For ease of reference the following terms have been used in this NTS:
- The application site: the area within the planning application boundary East Reading Mass Rapid Transit scheme;
 - The proposed development – the development for which full planning permission is sought;
 - 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.

1.3 The EIA, ES and Other Documents

- 1.3.1 This ES presents the findings of an Environmental Impact Assessment (EIA) undertaken in accordance with The Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (as amended 2015), referred to as the 'EIA Regulations'.
- 1.3.2 Running concurrently with the design process, the EIA has sought to identify any likely significant environmental effects. The EIA process then identifies appropriate design and construction measures and good practice both to mitigate any significant adverse

environmental effects and to maximise the environmental opportunities that might arise as a consequence of the construction and operation of the proposed development. The EIA has also sought to determine the residual significant beneficial and adverse environmental effects remaining after mitigation has been incorporated.

1.3.3 The ES comprises the following volumes:

- **Volume 1:** Main Report;
- **Volume 2:** Appendices; and
- **Non-Technical Summary** (this document).

1.3.4 The other principal documents to be submitted as part of the planning application are:

- Design and Access Statement;
- Planning Statement;
- Statement of Community Involvement (SC); and
- Design Code.

2 Site and Surrounding Area

2.1 Site Description

- 2.1.1 The proposed East MRT Scheme is located between Thames Valley Park and Napier Road, Reading, alongside the Great Western Main Line Railway and the River Thames which flows west to east. 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. The approximate size of the application site is 3.2 ha. **Figure 2.1** shows the site location.

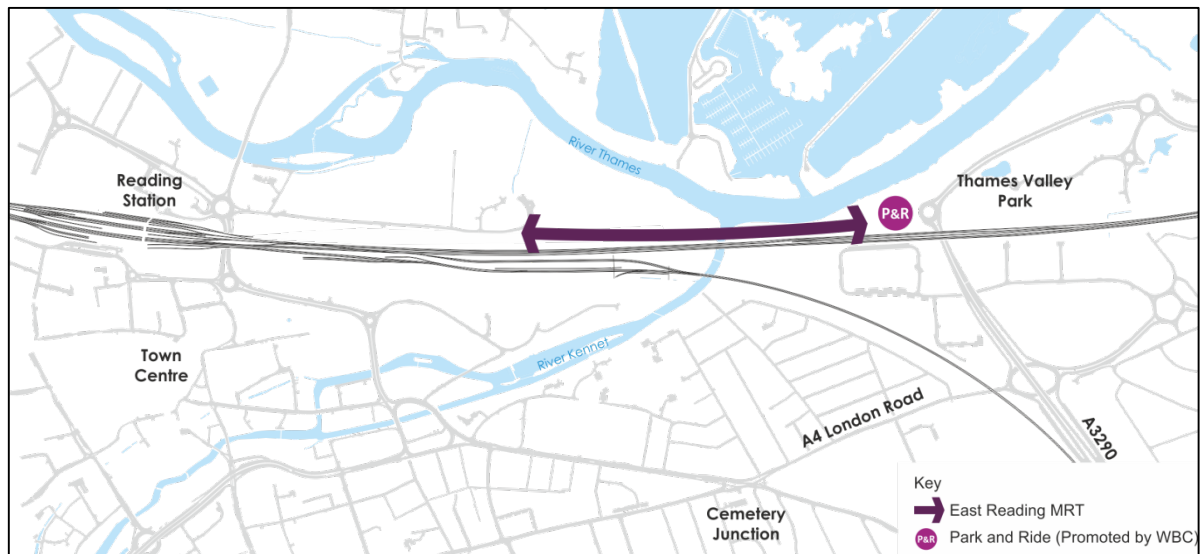


Figure 2.1 Site Location Plan

- 2.1.2 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.
- 2.1.3 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 listed railway bridge over the River Kennet and an attached listed footbridge allowing access over the River Kennet for the Thames Path National Trail.
- 2.1.4 The eastern area of the application site (within Wokingham Borough) is undeveloped flood plain adjacent to the River Thames. The Thames Valley Park Rowing Club and Wokingham Waterside Canoe and Kayak Centre are in close proximity to the north-east. There are also temporary moorings along the southern 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.

- 2.1.5 The application site is partially within safeguarded land for a 'cross town route' (in accordance with Wokingham Borough Council (2014) Development Plan – Adopted Managing Development Delivery Local Plan Policy CC08) and therefore for much of its the length the application site is undeveloped and consists of grassland, scrub and trees. This safeguarding is consistent with the infrastructure corridor nature of the site, including the railway, footpath and overhead electricity lines.

2.2 Environmental Setting

- 2.2.1 The land to the west of the River Kennet is situated on an historical landfill that was also used in the past for railway sidings. The land to the east of the River Kennet comprises undeveloped land. The land directly to the east of the River Kennet comprises amenity grassland and scrub with scattered trees, then continuing eastwards towards Thames Valley Park vegetation advances into denser woodland.
- 2.2.2 The Environment Agency (EA) 'Flood Map for Planning' shows that the western part of the proposed East MRT Scheme 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).
- 2.2.3 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 to the south of the application site. These were built as part of the Isambard Kingdom Brunel industrial engineering era for The Great Western Railway in the mid-19th century.
- 2.2.4 The River Terrace Deposits and the White Chalk Subgroup geology at the application site are classified as Principal Aquifers. The Alluvium is classified as Secondary A Aquifer.
- 2.2.5 RBC has declared an Air Quality Management Area (AQMA) due to exceedances of the annual mean nitrogen dioxide objective. The AQMA comprises Reading town centre and extends out along the major arterial roads and part of the application site is located within the AQMA. 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.
- 2.2.6 The Thames Path National Trail and National Cycle Route 4 / Route 5 – Thames Valley pass through the application site alongside the River Thames.
- 2.2.7 Part of the Coal, Kennet mouth and Kings Meadow East Local Wildlife Site (LWS) is located within the application site. The LWS is classed as 'open mosaic habitat on previously developed land'.

2.3 TVP P&R

- 2.3.1 The TVP P&R is located between the approximate OS NGR of 473339 (E), 173844 (N) in the west and 473574 (E), 173928 (N) in the east. It 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 site comprises a triangular plot of land of approximately 1.35 ha, also known as Broken Bow. The existing status of the site is undeveloped land, characterised by dense woodland and scrubland.

- 2.3.2 The TVP P&R development, at the P&R, was granted full planning permission (**application ref: 161596**) by WBC on 10/11/2016 for the:

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

- 2.3.3 The approved site layout for the development is provided in **Appendix 2 of the ES**, and incorporates the following:

- Vegetation and arboriculture clearance;
- Provision of 277 car parking spaces, to include 6 disabled spaces;
- A bus stop;
- Provision for motorcycle, and cycle parking;
- A bus shelter;
- Access onto the roundabout that connects the A329(M), and Thames Valley Park Drive; and
- 2m wide maintenance strip along the site boundary.

- 2.3.4 The TVP P&R site 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 P&R parking area. The route of the East MRT scheme is proposed to connect with the permitted P&R access road, running up to the TVP roundabout junction.

- 2.3.5 It is understood that detailed design work is currently being undertaken for the TVP P&R development, following the grant of full planning permission, and it is currently scheduled to commence construction in 2019.

- 2.3.6 The TVP P&R development and the 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.

3 The Proposed Development

3.1 Description of the Proposed Development

3.1.1 The development comprises the following:

“Construction of a segregated fast-track public transport, pedestrian and cycle bridge, comprising concrete bridge structure with a river span of 59.5m and a land span of 316m, supported by concrete columns and reinforced soil embankment, with associated footpath links, junction improvements and landscaping.”

3.1.2 The new route is approximately 0.9 km in length, running from the Tesco Superstore/ Napier Road junction in the west to the Thames Valley Park Drive roundabout in the east. A new priority junction will be created at the existing Tesco Superstore/ Napier Road junction, as well as an additional link to the existing two arm roundabout at the Thames Valley Park Drive / A3290 junction.

3.1.3 The development comprises a dedicated bus lane and separate segregated footway and cycleway for pedestrians and cyclists, including a new bridge across the River Kennet.

3.1.4 The segregated footway and cycleway will each run along the entirety of the route, with the footway being 2m wide and the cycleway being 3m wide. The MRT bus lane will be 6.5m wide at the western section of the route, allowing for a two-way bus only corridor. As the route approaches the bridge over the River Kennet, the bus route narrows to a 3.5m wide one-way road which is signal controlled at both sides of the bridge. To the east of the River Kennet bridge, the bus route widens again to a two-way 6.5m wide carriageway up to the roundabout.

3.1.5 The route will be graded up to the height of the river crossing over the Kennet which is approximately 6.77m in height (from normal water level). A slender bridge design and colour palette is proposed to respect the context of the adjacent listed bridges.

3.1.6 A landscape strategy for the application site has been developed in parallel with the design of the East MRT Scheme 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 MRT embankment and route from locations within the LWS woodland and on the tow-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 riverside corridor, for example removal of Himalayan Balsam, retention of Lodden Lily and the installation of riparian habitat rafts alongside selected areas of engineered banks (east of the River Kennet mouth);
- Creation of grassland between the River Thames and the MRT, and wildflower grassland on the MRT embankment;

- Provision of 'green panels' (for example, living willow panels or panels with climbers), set at an angle to the direction of the tow-path / PRow / Thames Path to filter people's views of the MRT and provide additional 'greening' of the space; and
 - Creation of reclaimed boat planters, providing raised beds for urban community food growing;
- 3.1.7 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 MRT (where the land rises out of the floodplain near the new P&R site); and
 - a shallow scrape of and (<250mm) immediately east of Kennetmouth.
- 3.1.8 These works support an overall improvement in floodplain storage capacity up to the reference flood level as a result.

3.2 Construction Programme and Management

- 3.2.1 This section provides information on the construction of the proposed development.
- 3.2.2 The key activities associated with the construction of the East MRT Scheme 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;
 - Commencing 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 MRT route into the wider network; and
 - To accommodate the proposed 6.77m bridge height (from normal water level) the 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.
- 3.2.3 It is anticipated that construction of MRT will commence in July 2019 (although seasonal site clearance may need to be done earlier in 2019) with completion expected in Spring 2022. Given the length of the MRT the development is likely to be implemented in phases and therefore construction is unlikely to be undertaken at any one location through the construction period.
- 3.2.4 A Construction Environmental Management Plan (CEMP) will be prepared for the site and identify a range of measures in relation to aspects such as dust, air pollutions, ground conditions, ecology and water resources which will be utilised during the construction of the proposed development.

3.2.5 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.

3.3 Consideration of Alternatives

3.3.1 The EIA Regulations require an ES to include an outline of the main alternatives studied by the applicant, indicating the main reasons for the choice made, taking into account the environmental effects. This legal requirement is expressed in very general and high-level terms, requiring only the inclusion of an outline of main alternatives and an indication of main reasons. It is a matter for the applicant to decide which alternatives it intends to consider.

3.3.2 For the East MRT Scheme there was an evaluation of options for a Segregated or Non-Segregated Scheme within a two stage Options Appraisal Report (OAR), which was prepared to inform the bid to secure funding from the Thames Valley Berkshire Local Enterprise Partnership (TVB LEP). The report presented the results of a study of route options that led to the identification of a preferred scheme.

3.3.3 The main selection criteria which the applicant used when choosing between the alternatives include: planning policy, viability, design quality, site constraints and opportunities and environmental effects. The alternative considered were (of which 1-4 provided the same connection, but using a different alignments):

- **Option 1** – Segregated MRT route between Napier Road and the A329(M) roundabout;
- **Option 2** - Segregated MRT route between Napier Road and the A329(M) roundabout;
- **Option 3** - Segregated MRT route between Napier Road and the A329(M) roundabout;
- **Option 4** - Segregated MRT route between Napier Road and the A329(M) roundabout;
- **Option 5** – A tidal flow scheme on the A4 London Road;

- **Option 6** - Segregated MRT route between Napier Road and the A329(M) roundabout;
- **Option 7** – Park and Ferry. A new ferry route to be created between Reading Station, and the proposed TVP Park & Ride;
- **Option 8** – Park and Rail;
- **Option 9** – Segregated MRT route between Sutton Park Avenue and Alexander Turner Close, across the River Kennet and beneath the Reading to Waterloo railway line; and
- **Option 10** - A tidal flow bus lane scheme on the A4 London Road.

3.3.1 The development options were compared with a 'do nothing' option where the following outcomes were identified:

- Ever increasing congestion and worsening transport conditions 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 intervention; and
- The resident population will be disadvantaged by restricted accessibility to jobs services.

3.3.2 The resultant preferred option was Option 3 (combined with Bus Priority Option 2) on the basis of its quantitative and qualitative scores on strategic, economic, managerial, financial and commercial aspects. This is now identified as the proposed development for the East MRT Scheme.

4 Planning and Policy Context

- 4.1.1 The National Planning Policy Framework (NPPF) sets out the Government’s planning policies for England and outlines how these are expected to be applied to both plan-making and decision-making.
- 4.1.2 Paragraph 17 of the NPPF sets out 12 core planning principles which should underpin both plan-making and decision-taking. Most notably and of relevance to the current proposals, planning should:
- “Proactively drive and support sustainable economic development to deliver the homes, business and industrial units, infrastructure and thriving local places that the country needs;”
 - “Promote mixed use developments, and encourage multiple benefits from the use of land in urban and rural areas, recognising that some open land can perform many functions (such as for wildlife, recreation, flood risk mitigation, carbon storage, or food production);” and
 - “Actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable.”
- 4.1.3 Of further relevance, Paragraph 29 of the NPPF states that the transport system should be balanced in favour of sustainable transport modes, in order to give people a choice about how they travel. Paragraph 30 provides additional encouragement for solutions which support reductions in greenhouse gas emissions and reduce congestion.
- 4.1.4 The application site must also be considered in a Local Policy context. The East MRT Scheme 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).
- 4.1.5 The Council is currently working on a new Local Plan, which when adopted will replace the current adopted Core Strategy and guide how Reading will develop up to 2036. The Council undertook consultation on Issues and Options between January and March 2016, and a subsequent draft Local Plan consultation between May and June 2017. Adoption is anticipated in 2019.
- 4.1.6 The East MRT Scheme is identified as a priority transport project in Core Strategy Policy CS21 and the Local Transport Plan by RBC, where implementation will be prioritised. Policy CS21, together with Policies RC1 and RC3 of the Reading Central Area Action Plan, adds together the land needed for implementation of the East MRT Scheme (identified as running east from Napier Road) which will thus be safeguarded from other forms of development.
- 4.1.7 The application 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).
- 4.1.8 WBC is also currently preparing a new Local Plan which will guide development in the borough for the next 20 years. WBC undertook Issues and Options consultation in August 2016 and anticipate adoption of the updated Local Plan in 2019.

5 Assessment of Effects

5.1 Introduction

5.1.1 This chapter summarises the findings of the EIA.

5.1.2 In general terms the main stages in the EIA are as follows:

- Screening – determining the need for EIA;
- Scoping – identifying significant issues, determining the scope of the EIA;
- Data review – drawing together and review available data;
- Baseline surveys – undertaking baseline surveys and monitoring;
- Assessment and iteration – assessing likely significant effects of development, evaluate alternatives, provide feedback to design team on potential adverse impacts, modify development or impose parameters, incorporate mitigation (including monitoring and long-term management), assess effects of mitigated development; and
- Preparation of the ES.

5.1.3 The scope of the EIA was agreed with RBC and WBC through an EIA Scoping Opinion, based on an EIA Scoping Report prepared by Peter Brett Associates LLP. As a result, the following provides a summary in response to the Scoping Opinion of each of the likely significant environmental effects of the proposed development. Effects have been considered during the construction and operation of the proposed development, as well as considering effects in combination with the approved TVP P&R scheme.

5.1.4 A full account of the methodology is provided in **Appendix 5-1 of the ES**.

5.2 Assessing Effects

5.2.1 A range of site surveys and data collection exercises have been used to identify environmental conditions at the site.

5.2.2 The EIA has assessed the likely significant environmental effects that could occur during the construction phase. Given that a principal contractor has not yet been appointed it is not possible to be definitive about the construction works and therefore the assessment has been based on available information and reasoned judgements to enable the likely significant environmental effects to be identified. In judging the significance of construction effects, it has been assumed that the construction mitigation measures identified and the proposed CEMP are fully implemented (as it is expected would be required by a suitable planning condition).

5.2.3 To provide a robust assessment and one that is generally consistent between topic chapters, the EIA has focused on assessing the likely significant environmental effects of the completed development to identify the operational effects of the proposed development.

5.2.4 Specific significance criteria have been prepared for each specialist topic, based on the generic criteria, for adverse and beneficial effects, set out in **Table 5.1**.

Table 5:1 Generic Significance Criteria

	Significance Level	Criteria
Significant	Severe	Only adverse 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 but, if adverse, are potential concerns to the project and may become key factors in the decision-making process.
	Moderate	These effects, if adverse, while important at a local scale, are not likely to be key decision-making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource.
Not significant	Minor	These effects may be raised as local issues but are unlikely to be of importance in the decision-making process. Nevertheless, they are of relevance in enhancing the subsequent design of the project and consideration of mitigation or compensation measures.
	Negligible	Either no effect or 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.

5.3 Socio-Economic

- 5.3.1 The socio-economic effects associated with the construction and operation phases of the proposed development have been assessed.
- 5.3.2 The East MRT and the TVP P&R is consistent with local and sub regional strategy, policy and economic objectives. It will enable high value employment opportunities and new housing that is required for a study area characterised by above average population growth and high levels of economic activity, skills and qualifications
- 5.3.3 The baseline data, that sets the context for the assessment, indicates that 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. Travel patterns are similar around the application site, with the majority of local employees travelling from within Reading and from Wokingham.

East MRT Scheme

- 5.3.4 The East MRT Scheme is likely to support an estimated:
- 56 net additional temporary construction local jobs in the study area during the construction of the East MRT;
 - 135 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;
 - 221 net additional operational local jobs in the study area that can be directly linked to the capacity released through road network improvement;
 - £17.1 million net additional GVA impact on the local economy¹; and

- 7 training and apprenticeship places².

East MRT Scheme and TVP P&R

- 5.3.5 Combined the East MRT Scheme and the TVP P&R will release enough network capacity to accommodate housing growth that will directly provide 231 net additional temporary construction jobs and £19.3million net additional boost to the local economy. This is 72% higher than the East MRT without the TVP P&R.
- 5.3.6 The East MRT and TVP P&R will support an estimated:
- 380 net additional operational local jobs in the study area that can be directly linked to the capacity released through road network improvement;
 - £29.3 million net additional GVA impact on the local economy; and
 - 11 training and apprenticeship places.
- 5.3.7 Construction impacts are considered to be of local level scale with the employment effects being 72% higher than the East MRT in isolation.

5.4 Transport and Access

- 5.4.1 The effect of the East MRT Scheme has been assessed based on The Guidelines for the Environmental Assessment of Road Traffic published by The Institute of Environmental Assessment in 1993.

East MRT Scheme

- 5.4.2 During the construction phase the East MRT Scheme has no significant effects in relation to severance, pedestrian and cyclist delay and amenity, fear and intimidation and accidents and road safety.
- 5.4.3 The East MRT Scheme has a major beneficial effect on public transport delay, as it provides significant journey time savings. The East MRT Scheme provides an alternative route from the A3290 London Road Roundabout to Reading Railway Station.
- 5.4.4 The East MRT Scheme will have a major beneficial on severance, as a result of reducing traffic flows on London Road and Kings Road which have residential and commercial frontage. Buses will be routed via the East MRT Scheme Route which is located at high level between the River Thames and a railway line, which is a mainly undeveloped area, therefore resulting in a negligible effect on severance in this location.
- 5.4.5 The effect of the East MRT Scheme on pedestrian and cyclist delay and amenity due to the provision of new pedestrian and cycle routes which will reduce cyclist and pedestrian delay.
- 5.4.6 The East MRT Scheme provides a major benefit to fear and intimidation, as buses using London Road and Kings Road are rerouted along the East MRT Scheme. The East MRT

² Apprenticeship Statistics: <http://dera.ioe.ac.uk/22847/1/SN06113.pdf>

Scheme includes cycle and pedestrian routes, therefore offers a route which is separate to traffic.

East MRT Scheme and TVP P&R

- 5.4.7 The transport effects of the combined development as summarised above for the East MRT development.

5.5 Air Quality

- 5.5.1 The air quality effects associated with the construction and operation phases of the proposed development have been assessed.
- 5.5.2 Information on existing air quality has been obtained by collating the results of monitoring carried out by the RBC. Background concentrations for the site have been defined using the national pollution maps, published by Defra, adjusted using local background monitoring data.
- 5.5.3 The application site is generally located away from sensitive residential receptors, except for Kings Reach Meadows Association.

East MRT Scheme

- 5.5.4 The main air pollutants of concern related to construction are dust and fine particulate matter (PM₁₀), and for road traffic they are nitrogen dioxide (NO₂) and fine particulate matter (PM₁₀ and PM_{2.5}).
- 5.5.5 The construction works have the potential to create dust. Construction phase effects are judged to be negligible when appropriate mitigation measures are applied through a CEMP.
- 5.5.6 The operational effects of the proposed development are judged to be not significant. This judgement is made in accordance with the methodology, in particular that the proposed development does not give rise to any exceedances of the air quality strategy objectives and a conservative assessment has been carried out. No additional traffic mitigation measures are therefore required.

East MRT Scheme and TVP P&R

- 5.5.7 Significant construction effects are unlikely to occur as each development is anticipated to employ similar dust mitigation techniques such that the individual construction phase effect should be not significant, alone or in combination. Construction phase effects are judged to be negligible when appropriate mitigation measures are applied through a CEMP.
- 5.5.8 The predicted NO₂, PM₁₀ and PM_{2.5} concentrations in 2021 without and with the proposed development in place are below the relevant objectives at all existing receptor locations. The effects of the combined development are not significant.

5.6 Hydrology and the Water Environment

- 5.6.1 The potential effects on the water environment have been assessed for both the construction and operation phases of the development.
- 5.6.2 The Environmental 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). The TVP P&R lies wholly within Flood Zone 1 'Low Probability'.
- 5.6.3 The site encompasses three Water Framework Directive (WFD) designated water bodies: the Kennet and Holy Brook, Thames (Wallingford to Caversham), and Thames (Reading to Cookham). All water bodies lie within the South Chilterns operational catchment. A comprehensive WFD Compliance Statement has been compiled to accompany the planning application.

East MRT Scheme

- 5.6.4 Potential effects during the construction phase were identified included:
- Development works, including earthworks operations, have the potential to impact upon the surface water drainage regime;
 - Compaction of the ground caused and an increase in the extent of impermeable surfaces has the potential to impact upon the surface water drainage regime and increase surface water run-off from the site;
 - Construction activities also have the potential to give rise to the contamination of surface water and groundwater;
 - Potential for an increase in silt and mobilised soil matter to enter the River Kennet and River Thames water courses which could potentially impact the WFD designations; and
 - Construction works have the potential to affect flood storage and flood flows/flood routing processes.
- 5.6.5 Suitable mitigation has been identified to be incorporated into the CEMP to minimise the residual effects of construction to a level that they are not significant.
- 5.6.6 Potential effects during the operation phase were identified included:
- An increase in the impermeable area within the application site, thereby increasing surface water run-off rates to the rivers. This has the potential to increase flood risk to existing development/infrastructure/third party assets/land downstream of the proposed development; and
 - Potential for the contamination of surface water entering the rivers.
- 5.6.7 The WFD Compliance Assessment (**Appendix 10.2 of the ES**) has comprehensively detailed the potential effects on the WFD water bodies in the vicinity of the MRT. Mitigation has been identified to demonstrate that the effects of the proposed development are not significant. Mitigation includes:
- Ground lowering to provide compensatory floodplain storage, construction of the east section as a viaduct over a floodable area, incorporation of flood culverts under the MRT embankment west of Kennetmouth (to maintain flow routes into flood storage areas) and setting of bridge soffit levels above reference flood levels and navigation requirements;

- Provision of a surface water management strategy to control surface water flows for up to and including the 100-year design standard (including an allowance for the predicted impacts of climate change) such that flood risk downstream is not adversely affected; and
- Surface water management infrastructure designed in accordance with CIRIA C753 'The SuDS Manual' and guidance set out by the Lead Local Flood Authority such that the surface water run-off regime replicates that existing prior to development.

East MRT Scheme and TVP P&R

- 5.6.8 As the TVP P&R is in an area at 'Low' probability of river flooding, the potential effects and receptors are the same as the East MRT Scheme, i.e. 'Not Significant'.

5.7 Ground Conditions

- 5.7.1 An assessment of the ground conditions has been undertaken to identify the likely significant effects of the proposed development on human and non-human receptors in relation to ground contamination on site during redevelopment and operation. The receptors considered in the assessment are those receptors identified in statutory guidance.
- 5.7.2 The study area for ground conditions comprises of the land within the combined site plus the land immediate (adjoining) land for identification of specific current and historic land uses.

East MRT Scheme

- 5.7.3 A ground investigation be undertaken prior to development to determine the nature of the ground conditions review the risk assessments, and to enable any remediation or specific mitigation measures in respect of land contamination to be agreed with the regulatory authority and implemented.
- 5.7.4 A CEMP will be prepared, secured by a suitably worded planning condition, for the proposed development and this will include specific measures as appropriate, for the protection of controlled waters during construction and will therefore provide adequate control for any effects that arise during construction.
- 5.7.5 To reduce the potential risk of ingestion and uptake of contaminants by future site users, a layer of clean soil cover will be provided in areas of soft landscaping, if contamination is identified. The depth and form of soil cover required will be agreed with RBC and will depend on the concentrations of the potential contaminants.
- 5.7.6 The identified potential construction phase effects included risks to human health (on site), human health (neighbouring the site), groundwater shallow aquifer, ground water deep aquifer, surface waters, property (buildings), property (animal / crop) and ecology. The assessed risks, prior to mitigation, from impacts ranged between minor adverse to negligible.
- 5.7.7 The identified potential operation phase effects included risks to human health (on site), human health (neighbouring the site), groundwater shall aquifer, ground water deep aquifer, surface waters, property (buildings), property (animal / crop) and ecology. The assessed risks, prior to mitigation, from impacts were negligible.
- 5.7.8 It is concluded that the potential effects associated with ground contamination do not pose an unacceptable constraint to the proposed development.

East MRT Scheme and TVP P&R

- 5.7.9 There are no additional potential effects identified for the combined site scenario across the construction or operation phase.

5.8 Landscape and Visual including Lighting

- 5.8.1 The potential effects on the landscape and visual (LVIA) including lighting, have been assessed for both the construction and operation phases of the development. Viewpoints were selected, to assess local, medium and long distance views of the site from public rights of way, long distance footpaths, roads and the edges of residential areas.
- 5.8.2 A lighting survey was also undertaken to establish the existing lighting conditions of the site.
- 5.8.3 Currently, the combined site forms open land that is undeveloped and includes a section which crosses the River Kennet at its confluence with the River Thames. A section of The Thames Path National Trail runs through the site.

East MRT Scheme

- 5.8.4 During construction, temporary adverse and direct effects of a major level of significance upon the local landscape character of the Application Site, land use and public rights of way/cycle routes were identified. Temporary, adverse and direct effects of a moderate level of significance were assessed for: the landscape of the site itself; landform and watercourses; vegetation and tree cover. Temporary, direct and adverse effects were assessed for the district landscape and townscape character areas and open space, which were of a minor or negligible level of significance and are therefore not significant.
- 5.8.5 The visual effects of the proposed development were identified to be limited by the location of the application and shielding as a result of vegetation and topography. As a result, visual effects during construction are limited to the application site and its immediate surroundings. A temporary adverse effect of severe-major significance is noted on views from the section of the Thames Path within the site, with other visual effects being noted to be of lower significance.
- 5.8.6 Effects of lighting during construction should be minimal, as there will be limited night time working outside of agreed standard working hours. Careful landscape design has been integrated into the design of the proposed development. This includes the retention of existing trees and vegetation where practicable, sensitive height of the proposed bridge, new tree planting, retention of an area of acid grassland and improvements to habitats along the River Thames
- 5.8.7 On completion, landscape effects that are direct, adverse and long term were assessed as being of a moderate level of significance upon the landscape of the site itself, local landscape character, land use, and vegetation and tree cover. These occur as a result of a partial change to the land use of the site and consequential changes to local landscape character, and the loss of trees to facilitate the MRT. Long term, adverse landscape effects upon district landscape and townscape character areas, open space, landform and watercourses were identified as either minor or negligible levels of significance. No change is assessed for the public rights of way / cycle routes, because on completion of the development, the Thames Path National Trail is reopened and remains on its original route.

- 5.8.8 As during construction, the visual effects during operations are limited to the application site and its immediate surroundings. A temporary adverse effect of severe-major significance is noted on views from the section of the Thames Path within the site, with other visual effects being noted to be of lower significance.
- 5.8.9 The primary effect of lighting once the site is operational is from the Tesco/ Napier Road junction. Light intrusion may occur into the residential properties at Luscinia View, although this can be limited by using front and back shields on the luminaires. Column mounted LED lighting will be provided along the length of the scheme. Benefits of using this as opposed to traditional high pressure sodium bulbs is that it is directional, reduces obtrusive light and uses less energy. Minimal light intrusion is anticipated across the site and surrounding areas due to this directional lighting.

East MRT Scheme and TVP P&R

- 5.8.10 Potential landscape and visual effects during the construction of the East MRT Scheme and TVP P&R S are the same as those set out for the East MRT Scheme for construction with the exception of:
- The effect on landscape character area on the Thames River Valley with Open Water, which is assessed as a long term adverse effect of a minor level of significance during construction;
 - The impact on the local landscape character which is addressed as an adverse effect of a moderate level of significance during construction; and
 - The impact on vegetation and tree cover is assessed to be neutral of a negligible significance during construction and therefore, not significant.
- 5.8.11 Potential landscape and visual effects during operation of the East MRT Scheme and TVP P&R are the same as those set out for the East MRT Scheme for operation with the additional visual effects of:
- The Thames Path National Trail, north of Dreadnought Building (eastwards), with the visual effect during the operational phase assessed as being temporary, adverse and of a moderate level of significance;
 - The Thames Path National Trail (westwards), operational impact is assessed as being temporary, adverse and of a moderate level of significance; and
 - The Roundabout on A3290 (looking west) has an operational visual effect assessed as being temporary, adverse and of a moderate level of significance.
- 5.8.12 The lighting effects during operation are expected to be similar to that explained for the East MRT Scheme above, but with the addition of the TVP P&R lighting. Since the TVP P&R lighting is only going to be lit during operational hours (07:00-19:00), lighting effects will be minimal and mainly experienced during winter months when daylight hours are shorter.

5.9 Ecology

- 5.9.1 There are a number of designated areas of nature conservation importance within the wider area, including The Coal, Kennetmouth and Kings Meadow East Local Wildlife Site (LWS) and Henley Road Gravel Pits LWS.

- 5.9.2 The habitats within the combined site are generally of low intrinsic ecological value; with broadleaved semi-natural woodland, running water and marginal vegetation (namely associated with the on-site LWS and adjacent water courses) the only habitat types of importance in the local context or greater. With the exception of slow worm and grass snake populations, and roosting, foraging and commuting bats; protected or otherwise notable species recorded within and adjacent to the application site and with the TVP P&R site are not considered to be of importance within the 'local context or.

East MRT Scheme

- 5.9.3 The construction phase of the proposed East MRT Scheme will result in permanent reduction in the overall size of the on-site portion of The Coal, Kennetmouth and Kings Meadow East LWS; as such resulting in a permanent adverse effect on this ecological feature. Given that the majority of key features associated with the LWS are located outside the proposed East MRT Scheme boundary however, and will remain unaffected by the works, this is not anticipated to be significant beyond the Local context.
- 5.9.4 In spite of a Reptile Mitigation Strategy being implemented during the construction phase of works, given an absence of specific mitigation associated with construction phase habitat loss and temporary albeit phased severance of north – south connectivity, there remains a residual adverse effect on populations of grass snake and slow worm utilising the East MRT Scheme for the duration of the construction period. This is potentially significant within the local context.
- 5.9.5 Once operational, there will be a permanent improvement in the quality of habitat present within The Coal, Kennetmouth and Kings Meadow East LWS, resulting in a permanent beneficial effect on this important ecological feature. Given that there will be an overall reduction in size of The Coal, Kennetmouth and Kings Meadow East LWS associated with the construction phase of the proposed East MRT Scheme however, (see above) this is not anticipated to be significant beyond the local context.
- 5.9.6 The proposed East MRT Scheme will include a variety of habitat suitable for use by foraging and commuting bats. Once new growth has become established, there will be improvements in quality and diversity of habitat and retention in overall habitat connectivity, in spite of the construction phase losses. As such, no significant effects on the foraging and commuting bats are anticipated as a result of habitat changes once the scheme is operational.
- 5.9.7 Subject to the implementation of habitat interventions, reptile tunnels and guide walls across the entire East MRT Scheme and the wider The Coal, Kennetmouth and Kings Meadow East LWS, as appropriate, and once new growth has become established, no significant effects on the reptile population associated with the East MRT Scheme, is anticipated to arise upon operation.

East MRT Scheme and TVP P&R

- 5.9.8 As a result of the mitigation measures incorporated into the TVP P&P scheme, the likely significant effects of the combined development as per the East MRT scheme.

5.10 Archaeology and Heritage

East MRT Scheme

- 5.10.1 The likely significant effects on the historic environment by the East MRT Scheme and East MRT and TVP P&R have been assessed.
- 5.10.2 The historic environment includes a wide range of features resulting from human intervention in the landscape, varying in scope from buried archaeological remains to late 20th century industrial and military structures.
- 5.10.3 The desk based assessment found that no designated heritage assets are present within the application with one exception, a grade II listed Railway Bridge and attached Accommodation Bridge over the River Kennet which lies immediately to the south of the southern boundary. Another railway bridge (not designated) is situated approximately 75m to the south, which dates to the later Victorian period, and with which the bridge has a contextual relationship. Through sensitive design the effect of the proposed development on the listed bridge is considered to minor adverse and therefore not significant.
- 5.10.4 The extent and character of the non-designated buried archaeological heritage assets within the application site has been identified, as well as their significance. This includes evidence of a potential Prehistoric artefacts of low sensitivity, and potential remnants of Saxon remains of low to medium sensitivity. With the implementation of an appropriate mitigation strategy the residual effects of the proposed East MRT development to these assets would in no instance be more than negligible to minor adverse, and no significant effects would result from the proposed East MRT development.

East MRT Scheme and TVP P&R

- 5.10.5 The effect of the Combined Site, with the permitted TVP P&R development was also considered, and with archaeological mitigation the Combined Site would not result in a higher significance of effect than the proposed East MRT development.

5.11 Impact Interactions

- 5.11.1 The direct and indirect effects of the proposed development have been summarised above. Environmental effects have been assessed relative to the topic under consideration. This approach can lead to the interaction of effects being reported in separate sections but the collective effect on the same environmental resource(s) not being considered.
- 5.11.2 This section therefore summarises the potential for impact interactions also therefore provides a summary of the likely significant environmental effects identified throughout the ES.

Construction Effects

- 5.11.3 Sensitive design and sound environmental management during the construction works means that the majority of the residual effects of the construction of East MRT Scheme will not be significant.
- 5.11.4 The local community will experience negligible to major-severe adverse effect on local views. It should be recognised however that the design of the development and provision of landscaping has minimised the extent to which views of the development will be significantly affected. Local people will also experience a minor beneficial effect as a result of job opportunities and resultant economic benefits during the construction works. As a result of careful construction management there are unlikely to be any significant impact interactions on the local community.

- 5.11.5 With regards to environmental receptors, there will be a negligible to major adverse effect on local landscape, although as noted with regards to views the design of the development has minimised the extent of landscape effects. There will also be a minor beneficial effect on surface water quality as a result of the management of potential contamination during construction and a minor adverse effects on The Coal, Kennetmouth & Kings Meadow East LWS, bats and reptiles.

Operation Effects

- 5.11.6 The East MRT Scheme is designed to improve accessibility in east Reading and provide a faster, safer and more reliable connection for users of public transport, as well as pedestrians and cyclists. It will therefore provide major beneficial effects on bus users, severance and pedestrian and cyclist delay and amenity, plus minor beneficial effects in relation to fear and intimidation and accidents and road safety. The local community will also experience negligible to major-severe adverse effect on local views and a minor beneficial through support to local jobs.
- 5.11.7 Given that the visual effects of the East MRT Scheme have been localised by sensitive design and landscaping, while the beneficial effects on accessibility will affect a much wider area of East Reading, the East MRT Scheme is considered to have a moderate beneficial effect on local people.
- 5.11.8 With regards to environmental receptors, there will be a negligible to moderate adverse effect on the local landscape the extent of which has been minimised through the design process. There will be minor beneficial effects on surface water and groundwater quality, and on the ecological value of the Coal, Kennetmouth & Kings Meadow East LWS. There will also be a minor adverse effect on listed Railway Bridge.

East MRT Scheme and TVP P&R

- 5.11.9 There are no further significant impact interactions from East MRT Scheme and TVP P&R in addition to those noted above for the East MRT Scheme in isolation.