Western Gateway

Feasibility Study for a Rail Freight Terminal Site at Avonmouth

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EXECUTIVE SUMMARY

This feasibility study, commissioned by Western Gateway and undertaken by Polaris Consultancy Group, has assessed the potential for developing a Rail Freight Terminal (RFT) at Avonmouth. The study has considered market demand, technical and environmental feasibility, stakeholder views, financial and economic viability and alignment with regional and national freight policies. The conclusions demonstrate that Avonmouth is well positioned to host a terminal of strategic significance. The success of such a scheme will depend on carefully navigating operational constraints, aligning with stakeholder priorities and securing both public and private investment.

Stakeholder Engagement

Stakeholders - including Network Rail, SUEZ, Bristol Port, WECA, and major Freight Operating Companies (FOC) - expressed support for an RFT at Avonmouth, recognising its potential to drive decarbonisation, improve connectivity and strengthen the logistics cluster. Concerns were raised about the balance with passenger rail services, local traffic impacts and commercial viability of a standalone terminal. Businesses in the logistics sector remain focused on cost and operational efficiency, rather than decarbonisation, though this is expected to change over time.

Alternative Sites Assessment

Eight potential sites within Avonmouth and Portbury were assessed during this commission. Site A, adjacent to the SUEZ Severnside Energy Recovery Centre, emerged as the preferred option due to its proximity to the distribution centre cluster, existing rail access and available space. Challenges include complex rail access requiring train reversals and uncertainties around land ownership. Dockside sites within Avonmouth Port (Sites D, E, F) also present viable alternatives but depend heavily on the port's strategic intentions, including the CO_2 capture and shipping hub ($7CO_2$) project.

Selected Site Assessment

Site A can physically accommodate a terminal handling up to six intermodal services per day, with trains of up to 600m length. Road access is strong, particularly with the new M49 junction, although rail access is operationally complex, requiring two reversals via St Andrew's Road and Severn Beach. While this is workable, it adds costs and time. Environmental risks, including flood management and ecological sensitivities, are manageable within existing mitigation frameworks.

Demand and Market Analysis

The demand assessment shows strong potential for both maritime and domestic intermodal traffic. Avonmouth's position within a dense logistics cluster and its growing warehousing footprint (1.5m square metres, with major operators such as Amazon, Tesco, Lidl and Panattoni) creates a significant customer base. The opening of East West Rail in 2025 will transform connectivity, enabling competitive services to the East Midlands' "Golden Triangle" of logistics. Stakeholders indicated interest in services, but certainty of base traffic flows is critical.

Operational and Technical Feasibility

A schematic design confirms operational feasibility, with layouts that balance rail efficiency, container storage and HGV flows. Technical feasibility is underpinned by Network Rail confirmation that the route is cleared to W12 loading gauge, removing a major historic constraint. Capacity analysis shows that with timetable adjustments, up to 12 intermodal trains per day could be accommodated alongside passenger services.

Environment and Planning Feasibility

The Avonmouth/Severnside area is environmentally sensitive, with proximity to the Severn Estuary SPA, SAC and Ramsar sites, as well as historic drainage rhines. Precedents (e.g., flood defence schemes and SUEZ development) show that mitigation is possible and initial assessment suggests effectives mitigations can be applied to a RFT. A detailed planning application is required, but no national infrastructure designation applies.

Financial and Economic Appraisal

Standalone intermodal terminals rarely achieve profitability without integration into wider logistics developments. Nevertheless, Avonmouth's scale and location offer strong prospects if a FOC or major operator takes a long-term view. Capital costs remain significant but lower than for comparable greenfield sites, due to existing connections. Economic appraisal shows wider benefits in congestion relief, carbon reduction, road safety and regional competitiveness.

Risk Assessment

Key risks include; uncertain land availability, operational inefficiencies from train reversals, competition for paths with passenger services and stakeholder misalignment. These risks are significant but manageable with proactive mitigation.

Overall Conclusions and Recommendations

The study confirms that Avonmouth has both the demand base and strategic position to support a RFT. Site A is the preferred option, though port-based alternatives must be kept under consideration. Technical feasibility is confirmed, environmental risks are manageable and economic benefits are compelling. Successful delivery depends on securing private sector commitment, aligning stakeholder interests and resolving operational complexities.

Strategic Principles

- **Act decisively** to capture first-mover advantage in linking the South West with the Golden Triangle and major ports.
- **Adopt a phased approach**, scaling investment in line with confirmed demand.
- **Align strategically** with national freight and decarbonisation policies to strengthen funding bids.
- **Maintain optionality** by developing both Site A and one dockside alternative to the final business case stage.
- **Embed resilience**, through proactive risk management, diversified funding and sustained stakeholder collaboration.

To move into the next phase and ensure successful delivery, action is needed in the following areas:

- Secure landowner consent
- Address key operational questions
- Develop the project business case
- Agree the delivery model
- Agree a planning strategy
- Agree a scheme design
- Continue to engage stakeholders

Conclusion

The Avonmouth RFT represents a pivotal opportunity to decarbonise freight, strengthen supply chains and unlock regional economic growth. This study demonstrates that the case is compelling, provided that strategic risks are managed and stakeholder alignment is secured. The recommended next steps set out a clear path to progress the scheme from feasibility to delivery, ensuring Western Gateway continues on its low-carbon logistics journey.

GLOSSARY AND TECHNICAL TERMS

Abbreviation	Definition
ASA	Alternative Sites Assessment
ASEA	Avonmouth Severnside Enterprise Area
BCR	Benefit-Cost Ratio
CEMP	Construction Environmental Management Plan
CO_2	Carbon Dioxide (used in context of Carbon Capture Project)
COMAH	Control of Major Accident Hazards
CTMP	Construction Traffic Management Plan
DC	Distribution Centre
DfT	Department for Transport
DIRFT	Daventry International Rail Freight Terminal
EIA	Environmental Impact Assessment
FOC	Freight Operating Company
GBFM	Great Britain Freight Model
HGV	Heavy Goods Vehicle
LGP	Local Growth Plan
LPA	Local Planning Authority
NDP	Neighbourhood Development Plan
NNNPS	National Networks National Policy Statement
NPPF	National Planning Policy Framework
ORR	Office of Rail and Road
PACE	Project Acceleration in a Controlled Environment
PEIA	Preliminary Environmental Impact Assessment
PIR	Project Inception Report
RDC	Regional Distribution Centre
RFT / RFI	Rail Freight Terminal / Interchange
ROG	Rail Officers Group
SAC	Special Area of Conservation
SNCI	Site of Nature Conservation Interest
SOG	Senior Officers Group
SPA	Special Protection Area
SRFI	Strategic Rail Freight Interchange
SSSI	Site of Special Scientific Interest
STB	Sub-national Transport Body
SWMP	Site Waste Management Plan
TOG	Technical Officers Group
VfM	Value for Money

Table 1 Glossary

Term	Definition
Alternative Sites Assessment	A structured process used to compare potential locations for a facility (such as rail terminals) against agreed criteria like access, cost, and environmental impact.
Avonmouth Severnside Enterprise Area	A designated development zone in the Avonmouth/Severnside area aimed at encouraging industrial, logistics, and energy-related investment.
Benefit–Cost Ratio	A measure used in economic appraisal that compares the value of expected benefits from a project against its costs.
Carbon Capture Project	An initiative to capture carbon dioxide (CO_2) emissions from industrial activities, transport them, and store them permanently underground or reuse them in industrial processes.
Construction Environmental Management Plan	A document prepared before major construction works begin, setting out how environmental impacts (noise, dust, waste, ecology, etc.) will be minimised.
Construction Traffic Management Plan	A plan to manage and control the movement of construction vehicles during a project to reduce congestion, safety risks, and disruption.
Distribution Centre	A large warehouse facility used for storing, sorting, and distributing goods to retailers, businesses, or consumers.
Environmental Impact Assessment	A formal process for assessing the likely environmental consequences of a major project before it goes ahead.
Freight Operating Company	A rail company licensed to run freight trains on the national network.
Great Britain Freight Model	A forecasting tool used by government and industry to predict future demand and flows for rail freight across the UK.
GBR Transition Team	The GBR Transition Team (GBRTT), also referred to as the Shadow Great British Railways (SGBR), was a collaborative group formed to prepare for the formal establishment of Great British Railways (GBR)—a new publicly owned body that will oversee both rail infrastructure and passenger services across England, Scotland, and Wales.
Heavy Goods Vehicle	Large road vehicles, typically lorries or trucks over 3.5 tonnes, used to transport freight.
Intermodal Freight / Terminal	Freight transport using more than one mode (rail, road, sea) in standardised containers that can be transferred easily between trains, trucks, and ships.
Loading Gauge	The maximum physical height and width of trains (and their loads) that can safely pass through tunnels, bridges, and tracks on a route.
Local Growth Plan	A strategy prepared by local authorities or partnerships to promote economic development, housing, and infrastructure in a defined area.
Local Planning Authority	The local council body responsible for making decisions on planning applications and enforcing planning law.
Neighbourhood Development Plan	A community-led planning document that sets out policies for the use and development of land within a neighbourhood area.
National Networks National Policy Statement	A UK government statement setting out policy for nationally significant road and rail infrastructure projects.
National Planning Policy Framework	The overarching planning policy document for England, guiding development and land use decisions.

Office of Rail and Road	The independent regulator for railways and highways in the UK, overseeing safety, performance, and charges.
PACE	It is a project delivery framework introduced in 2020 to replace the older GRIP (Governance for Railway Investment Projects) process. PACE was developed as part of Project SPEED (Swift, Pragmatic and Efficient Enhancement Delivery), a joint initiative between Network Rail and the Department for Transport, aimed at delivering infrastructure projects faster, more flexibly, and at lower cost.
Preliminary Environmental Impact Assessment	An initial assessment of potential environmental effects to identify whether a full Environmental Impact Assessment is needed.
Project Inception Report	The first formal project report, setting out objectives, scope, methods, and initial findings.
Rail Freight Interchange / Terminal	A logistics facility where goods are transferred between trains and lorries, often including container handling equipment and warehousing.
Rail Officers Group / Senior Officers Group / Technical Officers Group	Forums where officers from local authorities and partner organisations coordinate planning, technical, and strategic issues.
Regional Distribution Centre	A large warehouse that serves a region by receiving goods in bulk from manufacturers or ports and redistributing them to local outlets.
Site of Nature Conservation Interest	Areas designated locally for their wildlife or ecological value, often forming part of wider environmental protection.
Special Area of Conservation / Special Protection Area / Site of Special Scientific Interest	Formal environmental designations that protect habitats, species, and landscapes of national or international importance.
Strategic Rail Freight Interchange	Large integrated developments combining major warehouses with rail freight terminals, designed to move significant volumes of goods by rail.
Sub-national Transport Body	A statutory partnership of local authorities and transport organisations covering a region, responsible for developing transport strategy.
Site Waste Management Plan	A document that sets out how waste from a construction project will be reduced, reused, recycled, or disposed of.
Value for Money	An economic assessment that considers whether a project's benefits justify its costs and whether it represents an efficient use of resources.

Table 2 Technical Terms

1 INTRODUCTION AND STRUCTURE OF THE REPORT

A Rail Freight Terminal (RFT) in Avonmouth represents a pivotal opportunity to support low-carbon logistics, unlock strategic development land and strengthen the areas position as a national freight and distribution hub.

Through the reduction of road-based freight, the terminal aims to ease traffic congestion, improve air quality and release capacity on surrounding routes. These improvements pave the way for housing and employment growth, making the interchange both a catalyst for economic development and a model of integrated infrastructure planning.

This report looks at the feasibility of developing such a scheme, presenting an early case for the scheme, reviewing location options and assessing the operational and financial models needed to support its development.

The outcome of this work will inform strategic decision-making and support the development of business cases, funding application(s) and engagement with key stakeholders.

The report is structured in a way that addresses the key requirements of the feasibility study specification.

The report begins by setting the context for the proposed development, establishing its strategic relevance and alignment with regional priorities. It then outlines the methodology adopted for the study, followed by an overview of stakeholder engagement activities that informed key decisions. An assessment of alternative sites is presented, leading to the rationale for the selected location.

The report continues with a demand and market analysis to demonstrate commercial viability and explores various operational and design options tailored to the scheme's objectives. A technical feasibility assessment evaluates infrastructural, logistical and engineering requirements, while environmental and planning feasibility is considered in relation to policy compliance and sustainability targets. The financial and economic appraisal quantifies anticipated investment outcomes and community benefits. Finally, the report addresses project risks and concludes with clear recommendations to guide next steps and decision-making.

1.1 ACKNOWLEDGEMENTS

We would like to express our gratitude to all those who contributed to the development of this feasibility study. In particular, thanks go to the stakeholders and organisations who provided valuable insights, data and feedback throughout the process. These include Network Rail, SUEZ, Bristol Port, the West of England Combined Authority, South Gloucestershire Council, SevernNet, Maritime Transport, Freightliner and others listed in Chapter 4. Their collaboration and expertise have been instrumental in shaping the direction and outcomes of this study and we are grateful for their continued support.

2 CONTEXT

The Feasibility Study covers:

- *The feasibility of a rail freight terminal at Avonmouth*
- *The best location for such a terminal*
- *The basic design and layout of a terminal*
- *Costs and revenue streams for terminal operation*
- *Next steps and requirements for taking forward a terminal opportunity*

2.1 FREIGHT IN WESTERN GATEWAY

Working together with Peninsula Transport and the West of England Combined Authority, the Western Gateway Sub National Transport Body (STB) has developed a good understanding of the logistics sector across the West of England and has agreed a comprehensive strategy to improve freight efficiency and reduce impacts, set out in the South West Freight Strategy which is now in its 3rd year of delivery.

At the same time, Avonmouth has emerged as the dominant logistics hub for the region, including an estimated 1.5 million square metres of logistics "sheds", thriving ports at Avonmouth and Portbury and excellent transport links by road, rail and air. ("Sheds" are buildings used for logistics. They can also be called warehouses, distribution centres, or logistics hubs. The trend is for larger sheds – and those over 10,000 square metres are referred to in the logistics and property industry as "big sheds".)

The big sheds at Avonmouth are important generators of freight movements, acting as key hubs in national and international supply chains for companies such as Amazon, Tesco, Lidl, Royal Mail and Next. A key role for many of the logistics buildings is to act as a regional hub, receiving goods from ports or national hubs and then distributing those goods throughout the South West.

Proposals for further growth are in various stages of development, highlighting that the area is poised to strengthen its role as a dynamic regional hub. Recently, developer Panattoni has grown warehouse space in the area by over a 100,000 square metres, including the UK's largest ever speculatively built warehouse.

These developments mean that there should be an opportunity for rail freight, supporting the delivery of aspirations in the Freight Strategy, meeting the needs of the logistics sector, as well as contributing to delivering carbon reduction targets through mode shift.

In addition, establishing a South West freight link via Avonmouth would unlock vital connectivity between strategically significant freight hubs—including other major UK ports, the Golden Triangle logistics cluster and key distribution corridors nationwide. This enhanced integration would strengthen supply chains, support economic growth and improve access to national and international markets.

2.2 THE ROLE OF RAIL FREIGHT

Rail freight has long played a role in the development of industry around Avonmouth and for the Bristol Port. This has included a range of bulk freight terminals and various rail terminals such as rail

connected warehouses aimed at consumer goods. Avonmouth continues to play a role in bulk freight movement, notably for imported and sea dredged aggregates, as well as bringing waste from London into the Suez site.

Recent growth of rail freight nationally and planned future growth focus on two groups of traffic: building materials (where Avonmouth already plays an important role) and the movement of a wide range of goods in containers – the intermodal market.

Intermodal container movements are divided into two groups: maritime – to and from ports and domestic – between inland terminals. Growth in this sector is largely driven by the increase in the number of rail-connected warehouses or warehouses near to rail terminals. Rail can compete strongly for movement between warehouses near to railheads. Some companies, notably Tesco, have built their supply chains around the ability to use rail between rail connected warehouses. For example, the Tesco hub at DIRFT, near Rugby, has recently doubled its daily service to Wentloog, near Cardiff, to two trains per day.

Developing a rail terminal at Avonmouth would lead to some key benefits, including reduced road traffic on the strategic road network, reduced carbon emissions and improved air quality. It also supports road safety goals, aligning with National Highways' 'Road to Zero Harm', South Gloucestershire's Vision Zero for no avoidable road deaths by 2036, and Bristol's 10-Year Road Safety Plan. It would also serve to improve the competitive position for business in the immediate area. While the main focus of such a terminal would be to link ports, or logistics hubs in the Midlands and beyond, to Avonmouth, there may also be potential to use Avonmouth as a hub for consolidated rail freight services further southwest.

2.3 Rail Freight Challenges

Given Avonmouth's prime location as a logistics hub with a history of rail freight use, why hasn't a successful intermodal terminal been developed in the area already? There are three main reasons, which are explored in this Feasibility Study.

The Terminal Business Model

The hugely successful growth in the number of warehouses near to rail terminals is largely down to the success of the Strategic Rail Freight Interchange (SRFI) model. SRFIs are large developments (>60 Hectares) where developers have incentives to build and operate rail terminals. The cost of the rail terminal is generally seen as an infrastructure investment cost supported by the gains from large scale warehouse development. In some cases, initial rail terminal operating costs are subsidised by the developer.

This model has worked well and led to successful developments such as DIRFT and iPort Doncaster, with further new SRFIs under construction.

However, there is a question mark over the most appropriate business model for stand-alone rail terminals in places where there is no space for an SRFI, or, like Avonmouth, where warehouse development has progressed without a requirement for a rail terminal.

An important feature of the feasibility work, therefore, has been understanding the potential demand and the certainty of base traffic loads, as well as a pragmatic approach to design.

Access to Main Markets

While the focus of intermodal rail freight has been on maritime traffic, Avonmouth was seen as being too close to compete against road freight for container movements to Southampton or

London. While Felixstowe is further away, there have only been occasional periods with rail freight services to the Bristol area, partly due to the indirect rail route via London or Birmingham; and partly due to the lack of obvious destination warehouses at that time in Avonmouth.

More recent development of domestic intermodal has focused strongly on services to and from DIRFT which is near Rugby on the West Coast Main Line. There is no direct rail route from DIRFT to Avonmouth and so services on this corridor have not been competitive. However, that has changed now that East West Rail has opened a new rail freight route from Oxford to Bletchley, providing a highly efficient route from Avonmouth to DIRFT and the new major SRFI near Northampton.

At the same time, the success of more distant SRFIs, such as iPort, also offers opportunities for services to Avonmouth in the future.

Local Rail Freight Constraints

Access to Avonmouth for rail freight is limited by the capacity of the local rail network and, until now, by the lack of a route for larger containers. This means that specialist low platform wagons must be used, which increases rail costs.

Loading gauge is the size of the structural envelope through which trains must fit. Modern intermodal rail freight requires bigger tunnels and bridges to carry larger intermodal containers. W10 loading gauge is considered a requirement for routes serving intermodal terminals. Until recently routes to Avonmouth were not cleared for W10.

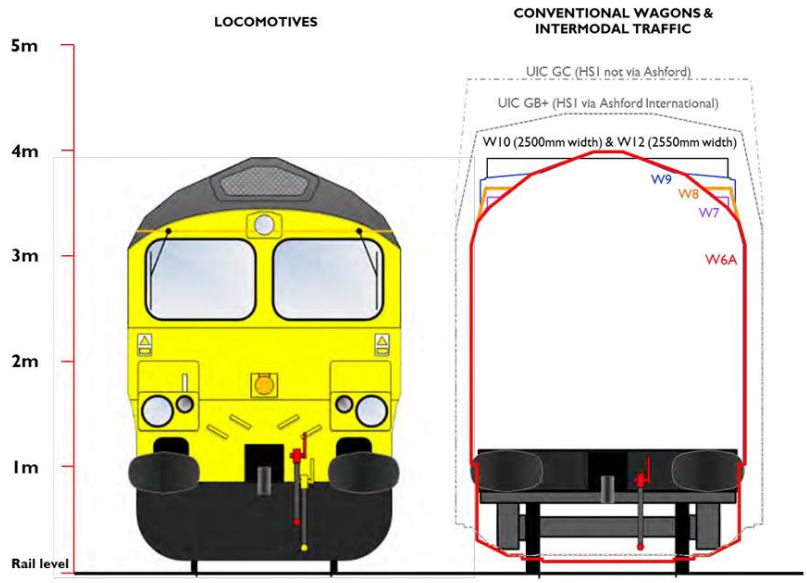

Figure 1 Loading gauges. Network Rail

The configuration of the SUEZ terminal also means that any terminal accessed via this route needs trains to reverse at least once to gain access. This adds time and costs.

However, with electrification of the Great Western Main Line to Bristol Parkway/Cardiff that route is effectively cleared to the current best rail freight loading gauge, W12. The study has identified now that the routes are cleared for freight with no physical constraints, finally enabling rail freight access into the area. The report explores this in more detail.

2.4 What is a Rail Freight Terminal and how does operate

A RFT is a specialised logistics facility designed to transfer goods between rail and road transport systems. It plays a vital role in modern supply chains by enabling the efficient movement of freight over long distances via rail, while allowing for local distribution by road. These interchanges are strategically located to serve industrial areas, ports, or major distribution hubs, helping to streamline the flow of goods across regions and countries.

The infrastructure of a rail freight terminal includes rail sidings—dedicated tracks where freight trains can be loaded and unloaded—alongside well-developed road access for trucks. Large cranes or reach stackers are used to lift containers or bulk cargo between trains and lorries. Some interchanges also include warehousing facilities for temporary storage, sorting, or consolidation of goods before they continue their journey. RFTs also serve neighbouring warehouses with transfers made by road.

The operation of a rail freight terminal follows a coordinated process. Freight trains arrive at the facility carrying containers, bulk materials, or other cargo. These goods are then unloaded and either transferred directly onto trucks for local delivery or stored temporarily in warehouses or in stacks of containers. Outbound goods are similarly loaded onto trains for long-distance transport. This seamless transfer between transport modes is supported by advanced scheduling systems, tracking technologies and sometimes customs and security checks, especially at international interchanges.

RFTs handle a variety of cargo types, including intermodal containers, bulk commodities like coal or grain and even vehicles. They can also be used for retail goods, allowing for distribution of production from National Distribution Centres to Regional Hubs, for onward distribution to stores. The use of standardised containers allows for quick and efficient transfers between ships, trains, and trucks, making interchanges a key component of global trade logistics.

The benefits of RFTs are significant. They help reduce road congestion and lower carbon emissions by shifting long-haul freight from road to rail, which is more environmentally friendly. It also supports improved road safety aspirations. They also offer cost savings for bulk and long-distance shipments and improve overall logistics efficiency by integrating multiple modes of transport in one location.

2.5 Links with Regional and Local Freight Strategies

Freight needs to be considered in connection with not just the specific area in which the RFT is being considered but also how it interacts with neighbouring authorities, regions.

Nationally, CO_2 targets are driving freight strategies and are supported by targets for modal shift to rail freight or waterways. These drivers mean that a well-placed RFT could act as a strategically important scheme which enables regional development.

An RFT in Avonmouth could play a role in implementing the Freight Strategy for the South West, as well as supporting other regional ambitions, such as removing HGVs from key road routes from the Midlands.

Locally, Avonmouth has grown into a major logistics hub, shaped not only by the presence of the port but also by excellent strategic road access leading to the organic expansion of warehousing and distribution activity. This evolution is reflected in planning policy, which seeks to safeguard industrial and logistics land to support economic resilience and strategic infrastructure. However, the area continues to face significant challenges related to traffic congestion and the achievement of carbon

reduction targets. A RFT offers a potential solution aligned with these policy ambitions and this study seeks to assess the degree to which such a development could help address transport and environmental constraints, while reinforcing Avonmouth's role within the wider logistics network.

3 METHODOLOGY

Overview of the Approach

- *Making good use of work already completed*
- *Effective consultation with key stakeholders*
- *Presenting available data that clearly tells a story*
- *Making clear recommendations for priorities and next steps*

This section is a summary of the key tasks within the feasibility study, with outputs in brackets after each task. The detailed methodology is included in the Project Inception Report (PIR), issued on 03/07/25 which can be found in Appendix 1: Project Inception Report

Appendix 1: Project Inception Report

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Deliverable	
Task 1:	Project Inception Report (PIR)
Task 2:	Alternative Sites Assessment report, Primary Site Assessment and Constraints Report and Summary in Final Report
Task 3:	Demand and Market Analysis chapter in Final Report
Task 4:	Outline concept layout for the terminal as a chapter in the Final Report
Task 5:	Technical Feasibility Report and Summary in Final Report
Task 6:	Environmental and Planning Feasibility Report and Summary in Final Report
Task 7:	Financial and Economic Appraisal as a chapter in the Final Report
Task 8:	Stakeholder Engagement Log
Task 9:	Risk Assessment Chapter in the Final Report
Task 10:	Final Feasibility Report and Executive Summary

Table 3 Tasks and Deliverables

Each task follows the following steps:

- A research phase, during which relevant data and contextual information are gathered, including, where relevant, stakeholder interviews;
- An analysis phase which involves critically evaluating the findings to derive meaningful insights; and finally
- The drafting stage, where the results are clearly articulated and presented in a structured and coherent format into reports which will be summarised in the Final Report, with the detail contained in appendices.

3.1 Task 1: Inception and Startup

The project was initiated with a Project Inception Meeting, held on 26th June at the Bristol Port. The outcome of this stage of the project is described in more detail in the Project Inception Report (PIR) in Appendix 1.

Output: Project Inception Meeting and PIR. (Appendix 1).

3.2 Task 2: Site Assessment and Constraints

In addition to the site suggested in the brief, several nearby locations were considered for a rail freight terminal. Early project work involved assessing the strengths and challenges of each.

Working with the client and stakeholders, and drawing on existing knowledge and studies, eight potential sites were identified for multi-function rail freight use. A high-level Alternative Sites Assessment (ASA) was conducted using readily available data and a multi-criteria approach, considering factors such as land size, rail and road access, proximity to logistics users and environmental constraints.

The agreed scope provided for one detailed site assessment. The assessment covered features such as site area and shape, rail and road access, topography, structures, loading gauge and capacity of access routes.

Output: Alternative Sites Assessment Chapter and Selected Site Assessment Chapter. (Chapters 5 and 6)

3.3 Task 3: Demand and Market Analysis

The study addressed why a rail terminal had not yet been successfully developed in the Avonmouth area. This was explored through discussions with key stakeholders, including the Port of Bristol, Maritime Transport, freight operators (FOCs), Network Rail and local business groups.

An assessment of potential demand for both maritime and domestic intermodal services was also undertaken. Maritime demand was evaluated based on national trends and forecasts and competitiveness of routes from Avonmouth to key markets. For domestic intermodal, a forecast was developed by identifying which new terminals would be accessible from Avonmouth, considering competitive rail distances and routes, particularly the impact of the new East West Railway providing direct access to the East Midlands' Golden Triangle.

The study prioritised insights from rail freight industry stakeholders over top-down theoretical demand forecasts.

Output: Rail freight forecasts for 2027, 2037 and 2047 for terminal use for intermodal services as part of a chapter on Demand and Market Analysis in the Final Report, covering current and projected rail freight demand, key freight commodities and flows, plus market trends. (Chapter 7)

3.4 Task 4: Operational and Design Options

The project did not involve railway permanent way designers at this stage, as it was felt their costs could dominate the budget before basic feasibility was understood.

A key challenge identified was that rail freight terminals require long, straight sections of track, which can limit access to other parts of a site. The terminal needs to balance efficient rail operations with internal site movements, including space for container storage and truck/trailer processing. For the proposed terminal, two additional design principles were considered, flexibility and scalability.

A schematic design has produced, compliant with rail and road constraints (e.g. siding lengths, curve radii) and suitable for future conversion to a formal engineering design.

Output: Outline concept layout for the terminal as a chapter in the Final Report. (Chapter 8)

3.5 Task 5: Technical Feasibility Assessment

Task 5 focused on operational and capability challenges at the site, including loading gauge, route availability, track category and network capacity. The work drew on Network Rail and ORR documentation and involved collaboration with Network Rail's freight team.

Output: Technical Feasibility Assessment which has been merged with Operational and Design Options as a Chapter in the Final Report. (Chapter 8)

3.6 Task 6: Environment and Planning Feasibility

The study considered environmental sensitivities in the Avonmouth and Severnside area, as part of assessing terminal feasibility. Despite the construction of 17 km of coastal flood defences, flood risks remain and development could increase exposure. The site's proximity to the Severn Estuary,

designated as an SPA, Ramsar site and SSSI highlighted the need to protect sensitive habitats. Historical industrial activity also raised the potential for contaminated land.

Particular attention was given to the rhines, historic drainage ditches designated as Sites of Nature Conservation Interest (SNCI) which support species like water voles, otters and kingfishers, and are part of local wetland mitigation efforts.

A Preliminary Environmental Impact Assessment (PEIA) was initiated to determine the likely environmental effects and whether further specialist input or budget would be needed at this stage. A Planning Policy Review was also completed, aligning the project with relevant frameworks and identifying any policy conflicts.

Consultation with Local Planning Authorities was undertaken to clarify applicable regulations across sectors such as waste, water, heritage, ecology, and transport. A Consents and Permits Register was considered but, given the location, only a detailed planning application to the local planning authority is deemed necessary.

Output: Environmental and Planning Feasibility Report as a chapter in Final Report. (Chapter 9)

3.7 Task 7: Financial and Economic Appraisal

It is difficult to develop a profitable stand-alone intermodal terminal that covers its investment costs. Successful terminals are often developed as part of SRFIs, where operators like Freightliner or Maritime Transport can manage profitability across the logistics process.

The Polaris Terminal Viability Model was used to assess infrastructure capacity, estimate capital and operating costs, forecast revenue and run sensitivity tests. This helped evaluate to what extent the terminal could recover its initial investment.

Output: Financial and Economic Appraisal Report as a chapter in Final Report. (Chapter 10)

3.8 Task 8: Stakeholder Engagement Summary

Stakeholder engagement is a critical component of a feasibility study, as it ensures that the perspectives, needs and concerns of all parties involved are considered. Engaging stakeholders early and throughout the process helped to build trust, foster collaboration and enhance the overall quality and acceptance of the study's outcomes. The approach taken was outlined in the PIR in Appendix 1.

Output: See Chapter 4 for the Stakeholder Engagement approach.

3.9 Task 9: Risk Assessment

The study has included a systematic risk assessment to identify, analyse and mitigate potential risks affecting the terminal's feasibility. As part of stakeholder engagement and earlier analysis, perceived risks and possible mitigation strategies were reviewed, with top risks identified.

Output: Risk Assessment Chapter in the Final Report. (Chapter 0)

3.10 Task 10: Final Reporting

This Final Report serves as the culmination of all preceding phases of work, synthesising the insights, findings and outcomes into a coherent and accessible document.

The report outlines recommended next steps, offering a clear path forward based on the evidence and analysis conducted. The executive summary provides stakeholders with a high-level overview of the project's outcomes. In addition, several presentations were prepared and delivered to the client which facilitated discussion and ensured alignment on the findings and proposed actions.

Output: Final Feasibility Report and Executive Summary together with a presentation (Appendix 2).

4 STAKEHOLDER ENGAGEMENT SUMMARY

Objective of this Chapter

- *To outline the approach taken to engage with stakeholders*

Deliverables

- *Stakeholder Engagement Log*

4.1 INTRODUCTION

Stakeholder engagement is a critical component of any logistics feasibility study, as it ensures that the perspectives, needs and concerns of all parties involved are considered. Engaging stakeholders early and throughout the process helps to build trust, foster collaboration and enhance the overall quality and acceptance of the study's outcomes.

4.2 THE APPROACH

Stakeholder identification was informed by early project team discussions and further refined during the initial Inception Meeting, ensuring a comprehensive and representative engagement approach. Stakeholders were actively engaged throughout all stages of the project, providing technical input, validating the rationale and helping to identify and assess potential risks. This collaborative approach has established a strong foundation for joint working as the RFT project progresses beyond the initial feasibility phase. The approach taken is described in the PIR.

Principally stakeholders were engaged on a 1-2-1 basis, on Teams, with an initial in person Inception Meeting on 26th June Bristol Port, with a follow up on 12th September at the Suez site.

4.3 STAKEHOLDERS

The following list outlines the stakeholders engaged throughout the project, many of whom participated in multiple discussions and provided valuable input. During the engagement process, several gaps in representation were identified. These gaps are acknowledged in the "Next Steps" section, where it is recommended that a formal consultation process be initiated to ensure broader and more inclusive stakeholder involvement as the project progresses.

Stakeholder	Inform/Consult/ Involve/Collaborate	Method of Communication
A46 Partnership	Inform	Via STB
Apollo for $7CO_2$	Consult	Inception Meeting, 1-2-1, Update Meeting
Bath and North East Somerset Council	Inform	SOG, TOG & ROG
Bournemouth, Christchurch and Poole Council	Inform	SOG, TOG & ROG
Bristol City Council	Consult	Inception Meeting, 1-2-1, Update Meeting
Bristol Port	Consult	Inception Meeting, 1-2-1, Update Meeting
Chartered Institute of Logistics and Transport	Inform	1-2-1, Update Meeting
Community Rail Partnerships	Inform	Via STB
Dorset Council	Inform	SOG, TOG & ROG
England's Economic Heartland	Inform	1-2-1

Stakeholder	Inform/Consult/ Involve/Collaborate	Method of Communication
FOC: Freightliner	Consult	1-2-1
FOC: GB Railfreight	Consult	1-2-1
FOC: Maritime Transport	Consult	Inception Meeting, 1-2-1
Freight Arranger	Consult	1-2-1, Update Meeting
Gloucestershire County Council	Inform	SOG, TOG & ROG
Heidelberg Materials	Consult	1-2-1
Industrial Estate Tenants (SevernNet)	Consult	Communication Via SevernNet
Logistics UK	Inform	1-2-1, Update Meeting
M5 Corridor Working Group	Inform	via Western Gateway
Midlands Connect	Inform	1-2-1
Monmouthshire Council	Inform	Email via Western Gateway
National Highways	Consult	1-2-1
Network Rail	Consult	Inception Meeting, 1-2-1, Update Meeting
North Somerset Council	Inform	SOG, TOG & ROG
OCO Technology	Consult	1-2-1
Oxfordshire County Council	Inform	Via England's Economic Heartland
Peninsula Transport	Consult	1-2-1
Rail Freight Group	Inform	TBC
ROG: Rail Officers Group	Consult	1-2-1
SevernNet	Consult	Inception Meeting, 1-2-1, Update Meeting
Severnside Land Distribution Limited	Consult	TBC
SOG: Senior Officers Group	Consult	1-2-1
South Gloucestershire Council	Consult	Inception Meeting, 1-2-1, Update Meeting
Stoford	Consult	1-2-1
Suez	Consult	1-2-1, Update Meeting
SusCon	Inform	1-2-1
TOG: Transport Officers Group	Consult	1-2-1
Transport for Wales	Inform	Email via Western Gateway
UKWA	Inform	1-2-1, Update Meeting
Walters Group (via Alder King)	Consult	1-2-1
West of England Combined Authority	Consult	Inception Meeting, 1-2-1, Update Meeting
Wiltshire Council	Inform	SOG, TOG & ROG

Table 4 Stakeholder Engagement Log

4.4 Overarching Feedback

Stakeholder feedback has been integrated throughout the report, with individual comments aligned to the relevant sections. Overall, the prevailing sentiments expressed by stakeholders were as follows:

- Stakeholders expressed strong support for the RFT concept, recognising its strategic potential to advance both economic growth and carbon reduction targets.
- While stakeholders acknowledged the importance of accommodating rail freight, they also emphasised the need to balance its development with the demands of passenger services.

Notably, the potential for a complementary, rather than conflicting, relationship between the two modes, was highlighted.

- The feasibility of the RFT is rooted in its commercial viability. Although the public sector has an important role to play in enabling and supporting the scheme, the private sector is seen as essential to its establishment, operation and long-term use.
- Further investigation is required to understand the potential impacts of the RFT on local traffic and transport dynamics.
- Feedback indicated that businesses primarily focused on warehousing are not yet prioritising decarbonisation. Their current concerns centre around operational costs, recruitment & retention and optimising space utilisation. However, it was acknowledged that decarbonisation may become a higher priority in the future. As such, the development of a RFT at Avonmouth could be seen as a proactive step in anticipation of evolving business priorities. This also influences how the case for rail freight should be presented to warehouse operators.

4.5 Conclusions

While initial engagement has taken place, it has largely remained at a strategic, high level. As plans evolve, it is essential to transition towards meaningful and sustained dialogue with key stakeholders. This includes active involvement from Network Rail, developers and landowners, as well as potential customers — each of whom will play a critical role in shaping, delivering and, ultimately, benefiting from the project. Their participation should be embedded in the process, to ensure shared ownership, alignment of interests and the practical feasibility of emerging proposals.

4.6 Next Steps

Maintaining proactive and ongoing dialogue with stakeholders is essential to ensure transparency, strategic alignment and responsiveness throughout the development process. This includes regular updates, collaborative workshops and open channels for feedback to build trust and foster shared ownership of the project's outcomes.

A formal consultation process should be planned and executed to:

- Build broad-based support across public, private and community sectors.
- Gather deeper insights into demand, particularly from end users, to ensure the scheme reflects real-world needs and aspirations.
- Identify potential concerns early, allowing for mitigation strategies to be developed collaboratively.
- Strengthen the business case by demonstrating stakeholder backing and demand validation.

Special attention should be given to engaging with:

- Freight operators and logistics providers, to understand operational requirements and future growth plans.
- Local businesses and industry groups, to assess economic impact and opportunities.
- Community representatives, to ensure local priorities and environmental considerations are addressed.
- Public sector partners, including WECA, Western Gateway, and South Gloucestershire Council, to align planning and delivery responsibilities.

5 ALTERNATIVE SITES ASSESSMENT

Objective of this Chapter

- *To identify and evaluate potential sites for a RFT within the Avonmouth area.*
- *To determine the most suitable location based on strategic, operational and environmental criteria.*

Deliverables

- *Alternative Sites Assessment report.*

5.1 INTRODUCTION

This chapter considers a range of potential locations for an intermodal terminal to serve the Avonmouth area.

A high-level Alternative Sites Assessment (ASA) of these locations has been undertaken, using readily available information which has been used to identify alternative sites which could potentially be investigated and developed for rail freight use.

The ASA uses a multi criteria assessment approach to consider factors including land area, dimensions, rail access, road access, proximity to main logistics users and environmental constraints.

The objective is to find a preferred location which will be assessed in more detail. Some other locations may be rejected, while alternative locations may need to be investigated further, if the primary site is not suitable.

5.2 LONG LISTING

The primary objective of developing an intermodal terminal in Avonmouth is to serve the large cluster of distribution centres (DCs) and warehouses in the area which are mainly on the former ICI site, notably the Central Park development.

The competitiveness of intermodal rail freight is heavily influenced by the cost of transporting containers by road between DCs and the rail terminal. A collection just a few kilometres from the terminal could cost over £100, making the entire intermodal route uncompetitive. At the other extreme, a short distance collection could be made in with an intensive shuttle operation and could cost as little as £25 - £50.

Therefore, the initial criterion is to identify potential rail freight sites within a reasonable distance of the Avonmouth cluster of DCs, in particular the Central Park Distribution Park. This is illustrated in Figure 2.

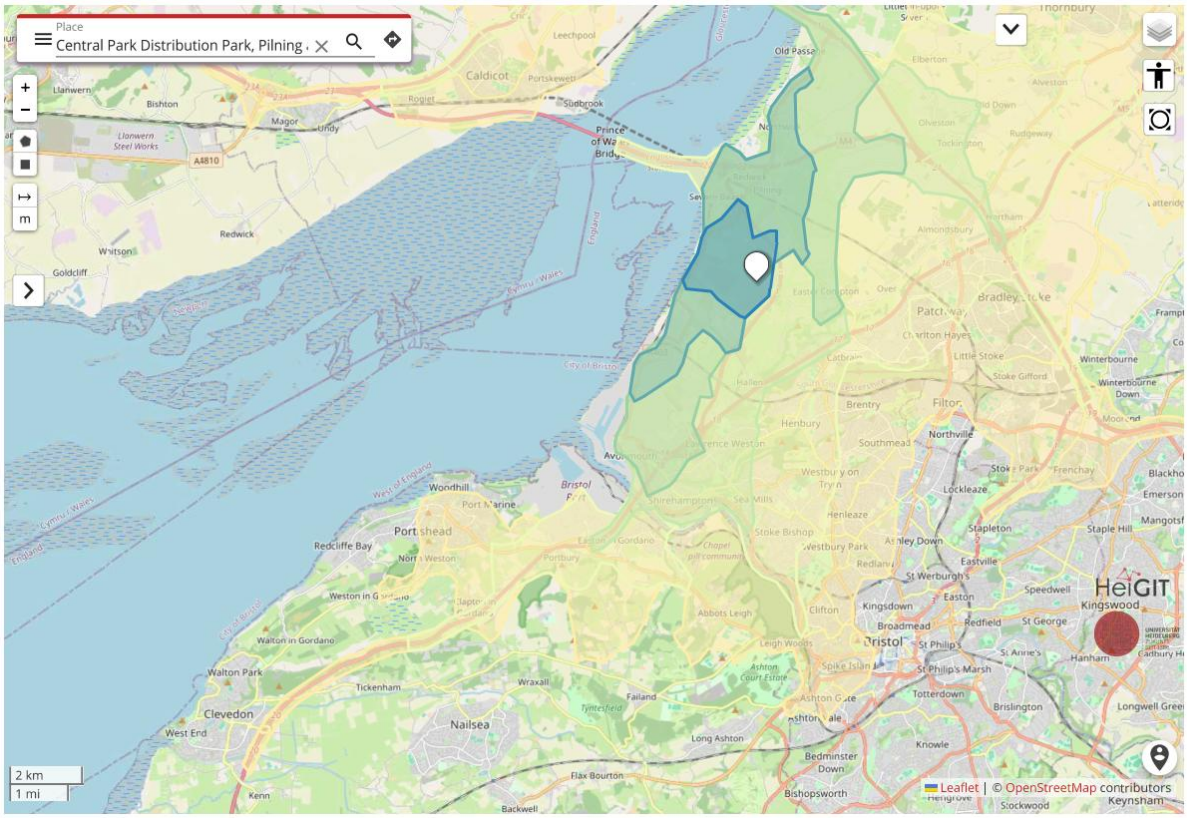

Figure 2 Drive Time From Central Park - Yellow = 30-minute drive time for HGVs.

Using this information, 8 sites have been identified as being within the potential catchment area for the Avonmouth DC cluster. While some sites in Wales, particularly at Magor, could theoretically be within a reasonable distance, they are at the edge of what would be likely to be viable and would suffer from risks associated with congestion and bridge closures and therefore have been discounted.

The sites identified for assessment are:

Site A: Site adjacent to SUEZ site
Site B: Chittening Industrial Estate
Site C: Avonmouth North
Site D: Bulk Storage Site
Site E: Bulk Rail Terminal/Eastern Arm (Avonmouth Port)
Site F: Vehicle Storage Site (Avonmouth Port)
Site G: Portbury Rail Terminal (Royal Portbury Dock)
Site H: Bristol (Freightliner)
Site I: Severn Road

The locations are shown on the map in Figure 3

Figure 3 Site Options

5.3 Site Assessment Criteria

When assessing a location for the development of a RFT, a range of strategic, transport, logistical, environmental and economic factors need to be considered. These criteria help determine whether a site is suitable for supporting efficient, sustainable and commercially viable freight operations.

Location: The site should be close to the Avonmouth logistics cluster and ideally within or adjacent to the logistics parks in the area.

Rail Network Access: A suitable location must have direct access to the national rail network, ideally with the capacity to handle long freight trains (minimum 600m, ideally 775m to allow for future growth). The rail line should support freight-friendly paths, with minimal conflict with passenger services.

Loading Gauge: Sites should benefit from at least a W10 loading gauge connecting to the main Great Western Main Line (GWML). Network Rail have provided informal feedback that routes are clear to Severn Beach and Avonmouth from both Bristol Parkway and Bath for W9/9a and also for 9'6"X 8' wide containers on most standard flat wagons. Technically this does not confirm W10 gauge but is certainly adequate for an intermodal terminal of the type proposed.

Road Connectivity: The site should be easily accessible HGVs, with good links to the strategic road network. This reduces congestion on local roads and ensures efficient last-mile delivery.

Size and Shape: There must be sufficient flat land to accommodate rail sidings, container handling areas and internal roadways. The site should also allow for future expansion as demand grows. Rail terminals should ideally be rectangles and laid out in a way to avoid tight curves on the rail tracks

providing access. A terminal should generally be at least 450m long but 600m to 1,000m is better. Terminals would be likely to be 100m or more in breadth.

Land Availability: Land ownership may not always be clear from desk research. However suitable sites should ideally be vacant, including possibly green field sites.

Environmental and Planning Considerations: Any specific environmental impacts, such as noise, air pollution and disruption to wildlife or greenbelt land.

Cost assessment: Level of capital investment needed and operational issues, i.e. access charges.

Utilities, Services and Security: Access to utilities (electricity, water, drainage, broadband) is essential for operations. Sites near existing infrastructure will be more cost-effective to develop.

Community and Stakeholder Support: Community or stakeholder conflicts for the location and the degree of mitigation may impact the location's viability.

5.4 Detailed Stakeholder Feedback

A series of key detailed discussions have been held to assess the suitability of carious sites, notably with Network Rail, 7CO_2, Bristol Port and SUEZ. Feedback provided has been used to support the formulation of the RAG assessment.

Network Rail provided some useful technical data on rail facilities, rail gauge and background on their own assessments undertaken in 2022, which has helped with this assessment. Network Rail have confirmed the route is gauge cleared. They were very supportive of any plans to develop a terminal in the area.

7CO_2, short for the Severnside Carbon Capture & Shipping Hub Ltd, is a major UK initiative based at Avonmouth Docks, Bristol, aimed at accelerating the South West's transition to low-carbon energy. The project is designed to support the UK's net-zero ambitions by receiving, processing, storing and loading up to 6 million tonnes of captured CO_2 annually. This liquefied CO_2 will be transported to Avonmouth by pipeline (locally) or by rail (further afield) before shipping to permanent geological storage or for industrial reuse, enabling safe and efficient carbon management. By reducing industrial emissions, 7CO_2 will play a vital role in delivering zero-emission regional power by 2030. The plan involves using facilities at the port for up to 6 trains per day and therefore has implications for the rail route into Avonmouth. While discussions have confirmed that the project and the Rail Freight Terminal (RFT) can operate together from a rail capacity perspective, there are considerations around space usage within the port that will need to be addressed if those locations for a RFT are taken further forward.

5.5 Overall Site Assessment Results

Table 6 provides a red, amber, green assessment of each of the locations against each of the identified criteria. This is then presented as a high-level assessment of each of the alternative sites considered.

	Location	Loading Gauge	Rail Access	Road Access	Size / Shape	Land Availability	Environmental	Cost	Utilities	Community
Site A: Adjacent SUEZ										
Site B: Chittening										
Site C: Avonmouth North										
Site D: Bulk Storage Site										
Site E: Bulk Rail Terminal										
Site F: Vehicle Storage Site										
Site G: Portbury Rail Terminal										
Site H: Bristol Freightliner										
Site I: Severn Beach										

Key	
No issues / good location	
Possible issues OR needs further investigation	
Major challenges	

Table 5 Site Assessment RAG

5.6 Individual Site Summaries

Site A: Adjacent to SUEZ Plant

This site has long been considered for a rail terminal, linked to the existing SUEZ facility that receives daily containerised waste by train. When the SUEZ terminal was built, space and access agreements were agreed with Suez and Network Rail to allow for a future intermodal terminal. Further investigation is needed to confirm land availability. The location offers excellent access to nearby distribution centres, due to short travel distances.
However, rail access is complex, possibly requiring two train reversals and facing length constraints.

Location	This is the closest location to the Avonmouth cluster of DCs.	**Gauge**	Adequate.
Rail Access	Rail connection already in place. Two reversals are required which add to rail costs and time. Current length limit seems to be <600m but this needs to be confirmed.	**Road Access**	Good access onto the estate road network. Very close to the major DCs in the area.

Site A: Adjacent to SUEZ Plant			
Size and Shape	The available land appears long enough for 775m trains, though its width varies. Subject to confirming ownership, the site seems suitable for an intermodal terminal.	**Land Availability**	The site is earmarked for rail development but ownership and other constraints need clarification. A suitable terminal could likely be accommodated.
Environmental	The industrial estate and SUEZ terminal were developed with flood constraints and the Red Rhine corridor in mind. A rail terminal is expected to fit within these limits. Power lines run along eastern boundary.	**Cost**	Development costs at this site are likely lower than alternatives due to the existing rail link and potentially straightforward road access.
Utilities	Likely to be good given the location.	**Community**	No nearby residential nor community buildings.

Figure 4 Site Assessment - Site A

The site is a strong candidate for a rail terminal as it offers excellent road access to nearby distribution centres and appears to have space for 775m trains, though land ownership and width need confirmation. Rail access is challenging due to required train reversals and possible length limits. That said development costs are likely low thanks to existing infrastructure, and the site is free from nearby residential areas, making it suitable for industrial use. Whilst the location is not without its challenges, it is the preferred location for the RFT.

Site B: Chittening Industrial Estate			
This industrial estate was originally a munitions factory but since WWII it has been developed by Bristol Port as an industrial estate.			
Location	This site is very close to the Avonmouth logistics cluster.	**Gauge**	Adequate.
Rail Access	The site had an active rail terminal in the past. It is understood that the connection from the main line is still signalled but it appears that all internal tracks have been removed.	**Road Access**	The site has good road connections, with direct access to the A403, which provides access to the whole Avonmouth industrial area.

Site B: Chittening Industrial Estate			
Size and Shape	At 500m long, this site may not be long enough to be developed as a rail terminal.	**Land Availability**	The estate has been intensively developed for warehousing, light industry, etc. In 2007 Massey Wilcox acquired a large warehouse and land which were promoted as a rail connected warehouse and terminal. However, since then the rail tracks have been removed. The site is mainly built up.
Environmental	This is an existing development so assumed no environmental constraints.	**Cost**	The existence of a rail connection will reduce the cost of development. However, if the site were to be developed for intermodal use it would require some demolition / closure of existing buildings.
Utilities	Likely to be in place.	**Community**	Existing facility.

Figure 5 Site Assessment - Site B

Site B, located in Chittening Industrial Estate near the Avonmouth logistics cluster, was formerly a munitions factory and later developed for industrial use. It has good road access via the A403 and retains a signalled rail connection, though internal tracks have been removed. The site is largely built up and may be too short (500m) for a rail terminal without significant redevelopment. While utilities are likely in place and no major environmental constraints are expected, converting it for intermodal use would require demolition of existing buildings and therefore has been discounted at this stage.

Site C: Avonmouth North			
This industrial estate was originally a munitions factory but since WWII it has been developed by the Bristol Port as an industrial estate.			
Location	This site is close to the Avonmouth logistics cluster.	**Gauge**	Adequate.
Rail Access	Would require new junction to the Henbury Loop Line.	**Road Access**	The site has good road connections, with direct access to the A403, which provides access to the whole Avonmouth industrial area. Needs to cross an access road to Malcolm Logistics.

Site C: Avonmouth North			
Size and Shape	The site is 550 meters long and at least 100m wide. The site is at right angles to the railway and so providing a curve for access could reduce the length of the site available for development.	**Land Availability**	It is understood the land is owned by Bristol City Council.
Environmental	This is a green field site immediately adjacent to the new Hallen Marsh wetlands and flood alleviation scheme.	**Cost**	Likely to be very high due to new connection and green field site.
Utilities	Green field site so may need to be provided.	Community	No local residents but potential recreational / open space value.

Figure 6 Site Assessment - Site C

Site C – Avonmouth North is a greenfield site owned by Bristol City Council, located near the Avonmouth logistics cluster with strong road connectivity via the A403. However, development is likely to be cost-prohibitive due to several concerns. The site's proximity to the Hallen Marsh Wetlands and associated drainage infrastructure poses environmental and planning challenges. The usable terminal area is limited to 550m unless extended into an adjacent industrial site, which would complicate train operations due to insufficient siding length and the need to split trains. Rail access would require a costly new junction to the Henbury Loop Line and would cross the sole access road to Malcolm Logistics, potentially blocking it with up to 12 train movements per day. Additionally, the landowner's position remains unclear. While the location is strategically placed, these constraints significantly impact its viability for development.

Site D: Avonmouth Bulk Storage			
This is the site of the former major coal loading terminal serving Avonmouth docks. The site itself is Network Rail-owned land and is separated from the port itself by the operational Severn Beach Branch. Currently the terminal sidings are used to run round (reverse) the SUEZ waste trains from London. It is understood that the terminal has recently been leased to an aggregates company, although it should still be possible to use the terminal to run round.			
Location	The location by the port is good for the logistics cluster, although a closer location would be preferred and there congestion issues on the road route.	**Gauge**	Adequate.
Rail Access	The site has a rail connection which provides direct access to and from Bristol Parkway without reversal.	**Road Access**	The site joins St. Andrew's Road providing excellent access to the M5 and to the logistics cluster.

Site D: Avonmouth Bulk Storage			
Size and Shape	The former bulk facility is a very long but narrow site. It is likely to be long enough for the longest intermodal trains but provision of adequate width / space for container handling would require use of land currently occupied by Maritime Transport and another business.	**Land Availability**	Site understood to be leased and not currently available.
Environmental	No known constraints.	Cost	Low due to existing infrastructure.
Utilities	Assumed to be available.	Community	No known constraints.

Figure 7 Site Assessment - Site D

Site D, the former coal loading terminal near Avonmouth docks, is owned by Network Rail and currently used for reversing SUEZ waste trains. Though recently leased to an aggregates company, it may still support rail operations. It has direct rail access to Bristol Parkway without reversal and excellent road links via St. Andrew's Road to the M5. The site is long enough for intermodal trains but narrow, with additional space needed from adjacent businesses. While development costs are low due to existing infrastructure, the site is not currently available and has therefore been ruled out at this stage.

Site E : Bulk Rail Terminal/Eastern Arm (Avonmouth Port)			
This is one of several areas of the port served by the internal rail network. However, it is understood to be currently in active use as an aggregates terminal.			
Location	The location by the port is good for the logistics cluster, although a closer location would be preferred and there congestion issues on the road route.	Gauge	Adequate.
Rail Access	The port is connected to the main line providing direct access towards Bristol Parkway.	Road Access	The port has good access to St Andrew's Road and thence to the logistics cluster and M5.

Site E : Bulk Rail Terminal/Eastern Arm (Avonmouth Port)			
Size and Shape	The site is long enough to handle intermodal services. The width available depends on how existing uses of the port can be rearranged – but this location would seem to have a good size and shape for an intermodal terminal.	Land Availability	While this site could be made available it is also being considered as a location for part of a major carbon capture project, bringing carbon in by rail for offshore permanent geological storage. This which would also see intensive rail freight traffic.
Environmental	No known constraints.	Cost	Low due to existing infrastructure.
Utilities	Assumed to be available.	Community	No known constraints.

Figure 8 Site Assessment - Site E

Site E, located in the Eastern Arm of Avonmouth Port, is currently used as an aggregates terminal but has potential for intermodal development. It benefits from direct rail access to Bristol Parkway and good road links via St Andrew's Road to the M5 and logistics cluster. The site is long enough for intermodal trains, with width depending on how existing port operations are rearranged. While development costs would be low due to existing infrastructure, the site is also being considered for a major carbon capture project, which the proposed RFT would not want to detract from. As a result this has been discounted as the primary site but could be used as a temporary RFT.

Site F: Vehicle Storage Site (Avonmouth Port)			
The location in the port is only 15 minutes' drive away, so well located to serve the cluster. Could also provide services for shipments through the port.			
Location	The location by the port is good for the logistics cluster, although a closer location would be preferred and there are congestion issues on the road route.	**Gauge**	Adequate.
Rail Access	The port is connected to the main line providing direct access towards Bristol Parkway.	**Road Access**	The port has good access to St Andrew's Road and onwards to the logistics cluster and M5.
Size and Shape	The site used to be an intermodal terminal. It appears that the sidings are now crossed by an internal road, meaning the area would need significant rearrangement to be suitable for reuse as an intermodal terminal.	**Land Availability**	While this site could be made available it is also being considered as a location for part of a major carbon capture project, bringing carbon in by rail for offshore permanent geological storage. This which would also see intensive rail freight traffic.

Site F: Vehicle Storage Site (Avonmouth Port)			
Environmental	No known constraints.	**Cost**	Low due to existing infrastructure.
Utilities	Assumed to be available.	**Community**	No known constraints.

Figure 9 Site Assessment - Site F

Site F, located within Avonmouth Port, was formerly an intermodal terminal and retains good road access via St Andrew's Road and direct rail links to Bristol Parkway. Although the site is well-positioned to serve the logistics cluster, its sidings are now crossed by an internal road, requiring significant reconfiguration for reuse. While development costs would be low due to existing infrastructure, the site is also being considered for a major carbon capture project, which the proposed RFT would not want to detract from. As a result, this has been discounted as the primary site but could be used as a temporary RFT.

Site G: Portbury Port			
Royal Portbury Dock is well served by rail and has various plots of land that could potentially be used as an intermodal terminal.			
Location	This facility is around a 30 minute drive from the logistics cluster, so less than ideal for collection and delivery.	**Gauge**	It is understood that W10 gauge does not extend to Portbury.
Rail Access	Direct access to Bristol Temple Meads and Patchway. Freight services will have to compete for capacity with the new passenger service along the branch from 2028 – TBC.	**Road Access**	Excellent access to the M5.
Size and Shape	The area used for intermodal services appears to be only 500m long. Trains would have to be divided on site and the operational feasibility of this would need to be confirmed.	**Land Availability**	Available – in port ownership.
Environmental	No known constraints.	**Cost**	Low due to existing infrastructure.
Utilities	Assumed to be available.	**Community**	No known constraints.

Figure 10 Site Assessment - Site G

Site G, located at Royal Portbury Dock, has good rail and road infrastructure and is owned by the port. It offers direct rail access to Bristol Temple Meads and Patchway, though future passenger services may affect freight capacity. Road access to the M5 is excellent, but the site is about 30

minutes from the Avonmouth logistics cluster, making it less ideal for short-distance transfers and as such this location has been discounted at this stage.

Site H: Bristol (Freightliner)

This location, to the South West of Bristol city centre, was one of the original Freightliner city terminals. It closed in 1992 but was reopened in 2010, mainly to handle imported wine traffic. The terminal closed again in 2019 and was subsequently used as an aggregates terminal. Currently the terminal is in use by a self storage company.

Location	This is potentially too distant to economically serve Avonmouth, with a road journey of over 30 minutes.	**Gauge**	Adequate.
Rail Access	The terminal is located on the Taunton Main Line with direct access towards Bristol Temple Meads.	**Road Access**	Local road access is poor, with a particular constraint being the narrow, traffic light-controlled bridge on Liberty Lane.
Size and Shape	The terminal is only 400m long, so trains would need to be divided and it is not clear where this could take place.	**Land Availability**	Network Rail ownership - available.
Environmental	No known constraints.	**Cost**	Low due to existing infrastructure.
Utilities	Assumed to be available.	**Community**	Road access passes through residential streets.

Figure 11 Site Assessment - Site H

Site H, located southwest of Bristol city centre, was a former Freightliner terminal now used by a self-storage company. It has direct rail access via the Taunton Main Line and is owned by Network Rail, making it potentially available for redevelopment. However, poor local road access and a 30+ minute drive to Avonmouth make it less suitable for serving the logistics cluster. It is for these reasons that this location has been ruled out.

Site I: Severn Road

This location has permission to be developed for warehousing and is being marketed as Carbide Park. It is adjacent to the northern end of the Severn Beach railway branch. This means that the site could be rail connected, particularly if combined with other landholdings.

Location	Excellent location as it is part of the logistics cluster.	**Gauge**	Adequate
Rail Access	Potential for direct rail access at low cost.	**Road Access**	The site has good road connections, with direct access to the A403, which provides access to the whole Avonmouth industrial area.

Site I: Severn Road			
Size and Shape	Length could be constrained and might require trains to be split.	**Land Availability**	Currently being developed and marketed for other purposes.
Environmental	No known constraints.	**Cost**	Low due to existing infrastructure.
Utilities	Assumed to be available.	**Community**	Northern end of the terminal would be close to the Severn Beach residential area.

Figure 12 Site Assessment - Site I

Site I, known as Severn Road and marketed as Carbide Park, is part of the Avonmouth logistics cluster and offers excellent road access via the A403. It has potential for low-cost rail connectivity due to its proximity to the Severn Beach railway branch, especially if combined with adjacent land. While currently being developed for warehousing, the site's length may require train splitting. There are no known environmental constraints but the northern end is close to residential areas and it is for this reason that this location has been discounted at this stage.

5.7 PREFERRED SITE AND WHY

Site A, adjacent to the SUEZ facility, is the preferred location, despite having some challenges which need further investigation. The main attractions of this site are the location (at the heart of the logistics cluster), existing rail access and potential for a usefully sized and shaped facility.

The site was ruled out by Network Rail during a previous investigation due to rail operating constraints. Initial research suggests that the site can be served by intermodal trains, albeit with a convoluted journey from Bristol Parkway that adds time and costs. The other key issues to be addressed are land ownership and the ability of landowners to provide land for a rail terminal.

It was noted that SUEZ did not see any operational reason why a facility could not work on Site A and provided some context to support the site feasibility assessment, which is also included in Chapter 6.

The sites within the Avonmouth Dock area are also potentially suitable but slightly further away from the logistics cluster. This largely depends on the port's plans for the land.

The availability of large areas of prepared land with existing or past rail sidings means that the locations identified within the port should not been seen as exclusive and a new terminal could be developed elsewhere in the port. The potential for a terminal depends largely on what the port would like to do with its land, including existing plans for new rail-related uses such as the CO_2 Capture facility.

Therefore, it is also recommended that further discussions are held with the port, with potentially at least one site being investigated in parallel with or as an alternative to the preferred site.

The other sites have been rejected due to lack of land availability, high cost, or poor location.

5.8 Conclusion

Site A, located adjacent to the SUEZ facility, is identified as the preferred location for the RFT. Its central position within the logistics cluster, existing rail access and potential for a well-sized and shaped facility make it a strong candidate, despite some challenges requiring further investigation. These include previous concerns raised by Network Rail regarding rail operating constraints and uncertainties around land ownership and willingness to release land for development.

Sites within the Avonmouth Dock area also present viable alternatives, offering prepared land and existing or former rail sidings. Their suitability will depend largely on the port's strategic intentions, including plans for rail-related developments such as the proposed CO_2 capture facility.

It is recommended that ongoing discussions with the port authorities continue, to maintain momentum and foster collaborative working relationships. These discussions are critical for understanding operational constraints, future development plans and potential synergies with the proposed scheme. This dual-track approach will:

- Mitigate risk by ensuring that viable fallback options are available, should Site A prove unsuitable due to planning, environmental or land ownership constraints.
- Enhance flexibility in site selection, allowing for comparative assessment of location benefits, infrastructure readiness and integration with existing freight operations.
- Strengthen the business case by demonstrating a thorough and objective site evaluation process.
- Support stakeholder confidence by showing a commitment to due diligence and adaptability.

Objective of this Chapter

- *To undertake a second level site assessment for the preferred site identified in Chapter 5.*

Deliverables

- *Primary Site Assessment and Constraints Chapter.*

6 Selected Site Assessment

6.1 Introduction

This chapter considers a more detailed assessment of the preferred site against the criteria identified in Chapter 5.

The preferred site is part of what was once the ICI Severnside Chemical Works, an area which has been rapidly redeveloped over the last 10-15 years, mainly for logistics and energy uses.

Immediately South of the preferred site is the SUEZ Severnside Energy Recovery Centre. This site has a relatively new rail terminal used to receive daily trains of refuse from London. The preferred site

would use the same rail access as SUEZ, branching off to a new site, along the south side of land in the Central Park Distribution Park.

The ICI works benefitted from extensive rail sidings, including a fan of sidings on the land which makes up the preferred site.

Figure 13 below shows the approximate possible site location.

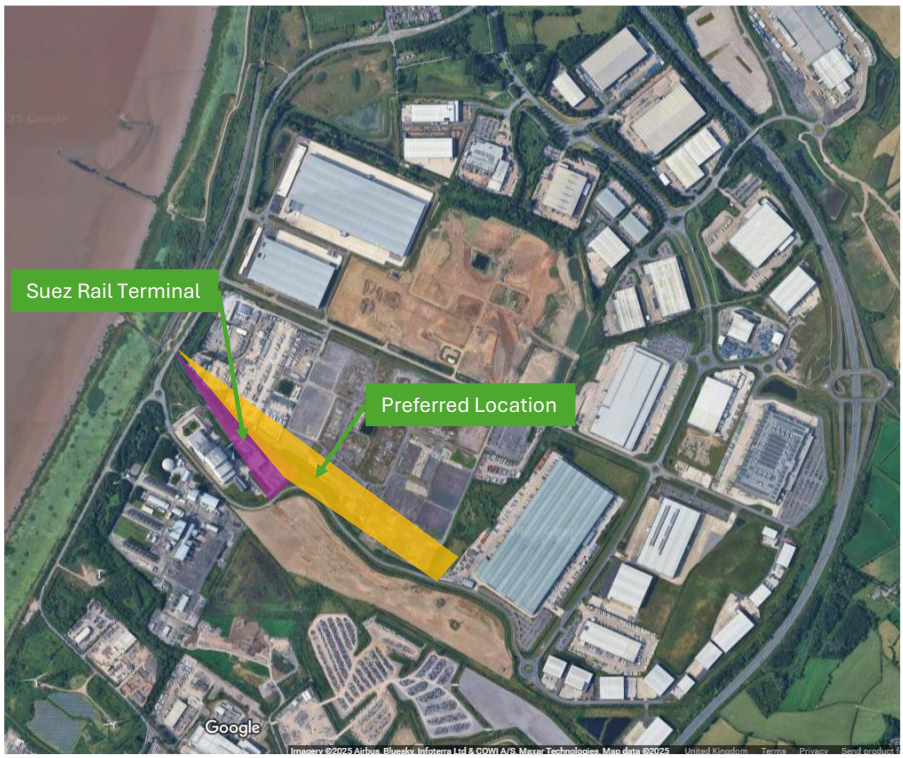

Figure 13 Approximation location of the preferred site. Boundaries are for illustration only.

6.2 Site Assessment

The following provides a more detailed assessment of the preferred location at Site A, adjacent to SUEZ. The assessment considers the following areas and builds on the information gathered in Chapter 5:

- Land ownership
- Rail access issues and opportunities
- Potential layout (size and shape)
- Road access
- Environmental and neighbour constraints
- Potential for a range of rail freight uses

Terminal Specification

In order to assess the suitability of the site, it is necessary to have an indication of the potential scale of the terminal. Chapter 7 provides a more detailed assessment of demand but a typical RFT would need to be able to accommodate up to 6 intermodal services per day. Given the location on the main line network, trains would be likely to be up to 600 metres long and would be composed of around 30 wagons, each of which could carry up to three 20’ containers or one 40’ container plus one 20’ container, giving a total number of containers up to 40-50 per train.

The terminal must have enough space to load and unload containers from trains, store containers and deal with associated vehicle movements and other requirements. This is considered in more detail in Chapter 8 but, for the purposes of the initial assessment, a rectangular terminal would be required, either 650m long or 350m long and up to 100m wide. A longer terminal, able to handle trains up to 775m long, would provide for future proofing but is not essential at this stage.

Land Ownership

The site has been identified as a potential location for future rail freight development. Preliminary observations suggest that the physical characteristics of the land could accommodate a suitably sized and configured terminal. However, several key constraints must be addressed before the site can be confirmed as viable.

Ownership of the land appears to be divided between Severnside Land Distribution Limited and the Walters Group, though this requires formal verification through stakeholder engagement, Land Registry and/or legal channels

Further engagement with the landowners and relevant planning authorities is recommended to clarify these issues and to assess the site's deliverability for rail-related infrastructure.

As it stands, there appears to be a narrow gap between the Suez rail siding and developed land. This would be adequate to accommodate a single access rail track – although space for two tracks would be preferable. The terminal could then open out to provide a series of sidings for unloading, plus an additional siding to allow the locomotive to run round and return to the rear of the train.

Figure 14 Possible operational layout - illustration only

Rail Access Issues and Opportunities

Getting to the SUEZ site by rail involves two reversals of trains, also known as run rounds as the locomotive usually changes ends. Trains from London approach via Bristol Parkway and Filton West Junction. This branch line joins the Severn Beach Branch but in the wrong direction to serve the site. Therefore, trains are taken to sidings at St. Andrew's Road (the former Bristol Bulk Handling Terminal) where the locomotive runs round before pulling the train onto the Severn Beach Branch. Part-way up the Severn Beach Branch, the train leaves the branch to enter Network Rail's run round sidings. Here the locomotive could run round the train and pull it into Suez but the current operation sees the locomotive pushing the whole train backwards into the Suez sidings. The following is an extract of the procedures used for train arrival and entry.

Arrival and Entry

- PIC arrives, parks, opens gates, and walks to Ground Frame (GF).
- Train stops at signal SA627.
- PIC contacts signaller, requests GF release, operates controls.
- Train enters siding at ≤5mph, stops between Point Machines 1 and 3.
- PIC confirms train is clear and hands back to signaller.

Entry into SERC

- Option 1: Locomotive detaches, runs around, reattaches, enters SUEZ.
- Option 2: Train reverses; GSTM ensures path is clear under A403.

SERC Operations

- SUEZ unloads/loads containers (~3.5h), checks twist-locks.
- Train returns to Reception Siding 1.

Exit from SERC

- Option 1: Forward move, run-around, brake check, GF release, depart.
- Option 2: Reverse move, brake check, GF release, depart.

Pre-Departure Checks

- PIC inspects both sides of train and provides documentation.

Exit from Siding

- PIC requests GF release (before 04:50).
- If missed:
  - Option 1: Train held until next evening.
  - Option 2: DBS arranges alternate path with Network Rail.

Return to Main Line

- Signal GF4 green: train exits via Points 2A.
- PIC restores GF, confirms with signaller, and departs via walkway.

Figure 15 Suez Rail Access/Egress Process

There are several issues with this operation that would need to be addressed for a busier intermodal terminal:

- The double reversal takes time, approximately 90 minutes from Parkway to the Suez terminal
- The run round sidings at Severn Beach are slightly less than 600m long – 600m is required but extending the run round may involve acquiring non-Network Rail land
- Reversing long trains regularly under the bridge into the terminal may be considered unsafe
- There is a forthcoming change of control of the Bulk Handling area at Avonmouth where the trains would need to run round. Coordination with the incoming operator will be essential to understand future compatibility and integration opportunities

The following actions should be considered to address these constraints:

- Investigation of the land ownership challenges to extending the run round. Any extension should be considered as part of a strategy to eventually enhance passenger services to Severn Beach.
- Consideration of "topping and tailing" trains serving the new terminal. A locally based locomotive would attach to the rear of the train at Avonmouth and pull the train and its locomotive to Severn Beach where the front locomotive could take over and pull the train into the terminal. This would considerably reduce the time taken to reach the terminal.
- Possible consideration of providing a new curve from the Hallen Marsh Branch northwards to the Severn Beach Branch. This may not be feasible or viable. (Illustrated below).

Figure 16 Possible East to North Curve. Illustrative only.

It would also be desirable to provide a south-facing curve to serve the terminal, avoiding the reversal at Severn Beach. However, this looks more challenging, as it would require a new road bridge and interfaces with the Severn Way cycle path, a drainage Rhein and flood defence works.

Gauge Compatibility

Network Rail have confirmed, informally, that the route from Bristol Parkway to Avonmouth and Severn Beach is clear for 9'6" tall, 8' wide containers on standard flat wagons – which is adequate for most intermodal services. Formal gauge clearance is expected to be confirmed in due course. This removes a major constraint for the area.

A report by Balfour Beatty for Suez, made at the time of construction of their terminal, confirms that the bridge carrying the A403 over the Suez rail access is clear for all freight loading gauges up to and including W12. However, the curve on the Suez side of the bridge is quite sharp, so the clearance at the exit to the bridge should be continually reviewed, particularly if track is realigned.

Rail Capacity and Future Plans

Existing Rail Services: The Avonmouth area is currently served by both freight and passenger services operating on two key branches:

- Severn Beach Branch Line
- St Andrews Road / Avonmouth Docks Branch

Current train frequencies are broken into passenger services which are operated by Great Western Railway (GWR), with regular services between Bristol Temple Meads and Severn Beach and freight services which includes bulk cargo, intermodal and waste-related movements. Frequency varies depending on terminal activity and port operations.

It is understood that there is an ambition to increase passenger service frequency on the Severn Beach Line up to 2 or 3 trains per hour. This could reduce available freight capacity unless mitigated through infrastructure enhancements, timetable rebalancing or creation of strategic freight windows.

Current Operation

Severn Beach is served by an hourly passenger service from Bristol (sometimes starting at Weston-Super-Mare). The current timetable is illustrated below.

WESTON-SUPER-MARE AND BRISTOL TO CLIFTON DOWN, AVONMOUTH AND SEVERN BEACH

MONDAYS TO FRIDAYS

Weston-super-Mare ⇄	d	·	·	·	·	·	0710	·	0810	·	0910	·	1010	·	1110	·	1210	·	1310	·	1410	·	1510	·
Weston Milton	d	·	·	·	·	·	0713	·	0813	·	0913	·	1013	·	1113	·	1213	·	1313	·	1413	·	1513	·
Worle	d	·	·	·	·	·	0717	·	0817	·	0917	·	1017	·	1117	·	1217	·	1317	·	1417	·	1517	·
Yatton	d	·	·	·	·	·	0723	·	0823	·	0923	·	1023	·	1123	·	1223	·	1323	·	1423	·	1523	·
Nailsea & Backwell	d	·	·	·	·	·	0729	·	0829	·	0929	·	1029	·	1129	·	1229	·	1329	·	1429	·	1529	·
Parson Street	d	·	·	·	·	·	0737	·	0838	·	0937	·	1037	·	1137	·	1237	·	1337	·	1437	·	1537	·
Bedminster	d	·	·	·	·	·	0740	·	0841	·	0940	·	1040	·	1140	·	1240	·	1340	·	1440	·	1540	·
Bristol Temple Meads ⇄ Ⓜ	d	0510	0537	0603	0644	0712	0746	0812	0846	0910	0946	1012	1046	1112	1146	1211	1246	1312	1346	1412	1446	1512	1546	1612
Lawrence Hill	d	0514	0540	0606	0647	0715	0749	0815	0849	0914	0949	1015	1049	1116	1149	1215	1249	1315	1349	1415	1449	1515	1549	1615
Stapleton Road	d	0516	0543	0609	0650	0718	0752	0818	0852	0916	0952	1018	1052	1118	1152	1218	1252	1318	1352	1418	1452	1518	1552	1618
Montpelier	d	0520	0547	0613	0653	0722	0756	0822	0856	0920	0955	1021	1055	1122	1155	1221	1255	1321	1355	1421	1455	1521	1555	1621
Redland	d	0522	0549	0615	0656	0724	0758	0824	0858	0923	0958	1024	1058	1125	1158	1224	1258	1324	1358	1424	1457	1524	1558	1624
Clifton Down	a	0525	0552	0618	0658	0727	0801	0827	0901	0925	1000	1026	1100	1127	1200	1226	1300	1326	1400	1426	1500	1526	1600	1626
Clifton Down	d	0525	0552	0622	0659	0728	0801	0828	0901	0927	1001	1027	1101	1128	1201	1227	1301	1327	1401	1427	1500	1527	1601	1627
Sea Mills	d	0529	0556	0626	0703	0732	0805	0832	0905	0931	1005	1031	1105	1132	1205	1231	1305	1331	1405	1431	1504	1531	1605	1631
Shirehampton	d	0533	0600	0629	0706	0735	0809	0835	0909	0934	1008	1035	1108	1136	1208	1235	1308	1335	1408	1435	1508	1535	1608	1635
Portway Park & Ride	d	0535	0602	0631	0708	0737	0811	0837	0911	0936	1010	1037	1110	1138	1210	1237	1310	1337	1410	1437	1510	1537	1610	1637
Avonmouth	a	0537	0604	0634	0711	0740	0813	0840	0913	0939	1013	1039	1113	1140	1213	1239	1313	1339	1413	1439	1512	1539	1613	1639
Avonmouth	d	0538	0605	0644	0712	0744	0814	·	0914	·	1014	·	1114	·	1214	·	1314	·	1414	·	·	1541	1614	·
St Andrews Road	d	0541	0608	0648	0716	0748	0817	·	0917	·	1017	·	1117	·	1217	·	1317	·	1417	·	·	1544	1617	·
Severn Beach	a	0548	0615	0655	0723	0755	0824	·	0924	·	1024	·	1124	·	1224	·	1324	·	1424	·	·	1551	1624	·

Figure 17 Severn Beach Timetable, 2025. GWR

This shows that the hourly pattern of xx:24 arrivals at Severn Bridge is disrupted by a longer gap at 15:51. This gap is to allow the daily Suez train to arrive from London. More extensive disruption to the service pattern for new freight services would be unlikely to be accepted by the passenger operator / GBR.

Looking at the passenger service in more detail, the standard pattern is xx12 and xx46 from Temple Meads arriving Avonmouth xx39 and xx13, with the latter going through to Severn Beach to arrive xx24. In the opposite direction, Avonmouth departures for Temple Meads are at xx12 and xx46, with the former starting back from Severn Beach at xx01. The xx39 arrival at Avonmouth turns round to form the xx46 departure.

For the Suez train, the 1512 arrival at Avonmouth turns around to form the 1546 departure instead of going through to Severn Beach, with the 1539 arrival going through to Severn Beach, to form the 1601 departure from there.

One possible operational solution would be to apply the 15:xx pattern, which allows for the Suez service, throughout the day. Avonmouth would still get a half hourly service and Severn Beach would still get a regular hourly service but the branch would be free for 40 minutes each hour (outside the morning peak) – enough to get a freight to or from Severnside, which takes 30 minutes.

On this basis, there would be 15 paths on the branch between 0810 and 2315 and 12 paths between 2315 and 0540, so 27 a day. Allowing for one Suez path, this gives scope for 12 intermodal trains in and out each day: beyond the likely demand.

A half hourly passenger service to/from Severn Beach would, however, eliminate any chance of daytime freight paths without investment in re-signalling and, probably, double tracking.

Planned Freight Developments

A major planned development is the CO_2 capture project, which is expected to introduce new, regular freight flows. This will increase demand for train paths and may require:

- Additional sidings or loops
- Upgrades to signalling or control systems
- Coordination with other freight operators

Road access

There is an existing unnamed road that accesses the SUEZ site, to the south of the site. There is also potential to extend Road Two to the north of the proposed site.

The preferred site benefits from excellent road access, with direct connectivity to the estate road network and close proximity to the major DCs in the Avonmouth area. One of the key advantages of this location is its ability to bypass known congestion points when taking containers from the terminal to local warehouses. While routes via St Andrew's Road, Smoke Lane, Chittening Road, and Severn Road often experience delays and bottlenecks, the preferred site can be accessed from the East, via Palmer Avenue, offering a more efficient and reliable approach.

This alternative route significantly enhances the site's attractiveness for logistics operations by reducing travel time and avoiding traffic pinch points. The road access will be further enhanced with the opening of the currently incomplete M49 motorway junction.

Figure 18 Road Access

Environmental and neighbour constraints

The development of the industrial estate and the existing SUEZ rail terminal has been carefully planned and delivered in accordance with flood risk management requirements and the environmental corridor of the Red Rhine watercourse. These constraints have shaped the layout and design of infrastructure in the area, ensuring that development remains resilient to flooding and sensitive to ecological considerations. Given this precedent, it is expected that a new rail terminal can be successfully accommodated within the same parameters, provided that appropriate mitigation and design measures are maintained. This will need to be formally assessed and incorporated into the site design and development. See also Chapter 9 which covers the initial environmental considerations.

In addition, the site's Eastern boundary is lined with overhead power lines, which may influence the layout of any new structures or rail alignments. While these do not preclude development, they will require careful coordination with utility providers and may impose clearance or operational restrictions. Overall, the site presents a viable opportunity for rail expansion, with environmental and infrastructure constraints already well understood and managed through previous phases of development.

As part of the environmental assessment, however, it is essential to evaluate the potential impact on local traffic. As outlined in the Road Access section of this chapter, traffic associated with the RFT can be strategically routed through less congested parts of the port area, thereby minimising pressure on existing pinch points.

Moreover, given that the area already accommodates significant volumes of HGV traffic, the net impact is expected to be neutral, at worst. In an optimal scenario, overall road traffic could decrease, as a portion of freight, currently delivered entirely by road, would instead arrive by rail. This would limit road use to the final leg of the journey—from the RFT to the end destination—which could increasingly be handled by electric vehicles (as is already the case for deliveries of Tesco products from the rail terminal at Wentloog), further reducing environmental and traffic impacts on local roads.

The area is already well established for industrial use and the introduction of an RFT is expected to further enhance its commercial value. Neighbouring businesses may benefit directly from improved access to rail freight services, potentially reducing their reliance on road-based logistics for longer hauls.

Security/safety issues

There are several potential security issues relevant to the site, which are more general for the area, rather than this specific site. These include:

- Fire or explosion (e.g. fuel, electrical, container)
- Flooding (tidal or surface water)
- Hazardous material spill or gas release
- Rail incident (derailment, collision, shunting accident)

The site will benefit from the area's established and comprehensive emergency response plans, which can be leveraged to enhance resilience and preparedness for a range of potential incidents. This mainly relates to flood emergency response or incidents related to the COMAH status of several industrial residents on the area. Individual Tier 1 and 2 COMAH sites manage their own emergency response, however there is also a procedure for the management of a major incident through the Severnside Emergency Planning Forum.

The port itself is a secure site and is policed by the Port Police.

Security and Infrastructure Considerations:

Given the proximity of the site to the port, the area holds strategic significance, which may elevate the overall security risk profile. Potential threats could include bomb threats, politically motivated protests, or other forms of civil unrest. These risks should be factored into both the planning and operational phases, with appropriate mitigation strategies such as enhanced surveillance, access control, and coordination with local law enforcement and port authorities.

Flood Risk and Management:

The site is located within a designated flood management area. However, ongoing flood mitigation efforts are actively reducing the associated risks. Any future infrastructure development must comply with the relevant flood management requirements, including those specified in the local and regional Flood Plans. This may involve elevation of structures, incorporation of flood-resistant materials and ensuring unimpeded flow paths for stormwater.

Utilities and Underground Services:

The area contains several overhead power lines and an established network of underground pipelines. While these utilities do not currently present a significant constraint to development, they must be carefully considered during the design phase. Accurate and up-to-date plans of these services should be obtained prior to any detailed design or construction activity. Coordination with utility providers will be essential to avoid service disruptions and ensure safety during construction.

Public rights of way:

There are no public rights of way or footpaths that intersect directly within the operational area of the port itself. The port is a secure and strategically important site and public access is restricted for safety and security reasons. However, the surrounding areas of Avonmouth, including parts of the Severn Estuary and nearby industrial zones, do have public rights of way. These include:

- Footpaths and bridleways in the wider Avonmouth and Severnside area.
- Coastal and riverside paths that may run near but not through the port boundary.

There does not appear to be any rights of way near to or through the potential site.

See also Chapter 9 which also discusses major accidents and disasters.

6.3 Site Specific Stakeholder Feedback

A number of key discussions have been held as part of this element of the feasibility, notably Network Rail, 7CO_2, Bristol Port and SUEZ. Feedback provided has been used to support the assessment.

In particular, it was noted that SUEZ did not see any operational reason why a facility could not work on Site A.

Network Rail provided some useful technical data on rail facilities, rail gauge and background on their own assessments undertaken in 2022 which has helped with this assessment. Network Rail have confirmed the route is gauge cleared. They were very supportive of any plans to develop a terminal in the area.

6.4 CONCLUSIONS

From the above analysis, the following concludes the key constraints identified and the potential mitigations required as part of the next phase.

Theme	Constraint	Mitigation
Land Ownership	Land ownership on the area likely to be required appears to be split between Severnside Land Distribution Ltd and the Walters Group. Formal confirmation is pending via land registry and/or legal review.	Initiate legal and land registry review to confirm ownership. Maintain communication with both parties to ensure alignment during planning.
Rail Access	Current layout requires two run around manoeuvres, increasing time and costs and potentially affecting service efficiency. Train length constraints may influence terminal design.	A simple solution would be to stable a locomotive locally to "top and tail" intermodal trains. The potential to provide a new curve should also be investigated.
	Control of the neighbouring bulk terminal is expected to change, potentially impacting operations, access and costs.	Engage with the current and incoming terminal operators to understand transition timelines and operational implications. Establish coordination protocols to ensure future compatibility.
	Future rail capacity may be constrained if passenger service extensions are implemented, reducing freight slot availability.	Ensure that freight potential is included in any consideration of passenger enhancements.
	Planned CO_2 rail freight terminal will introduce new, regular freight flows, which may affect network capacity and integration.	Maintain active engagement with 7CO_2 and the port. Ensure evolving plans for both the CO_2 capture project and the RFT project are aligned and integrated into broader infrastructure and operational planning.

Table 6 Site Constraints Assessment

6.5 NEXT STEPS

The mitigations will need to form a component of the next steps in the proposal development process. Each identified constraint must be addressed through targeted actions, integrated into the project's planning, design and stakeholder engagement strategies. This includes commissioning technical assessments, initiating legal and operational reviews and establishing coordination mechanisms with relevant third parties. Incorporating these mitigations early will help de-risk the project, ensure regulatory and operational compatibility, and support the development of a robust and deliverable proposal. These have been included in the Project Risks in Chapter 0 and in Next Steps in Chapter 12.

7 DEMAND AND MARKET ANALYSIS

Objective of this Chapter

- *To research the potential demand for a rail freight terminal in the Avonmouth area.*

Deliverables

- *A chapter on Demand and Market Analysis in the Final Report, covering current and projected rail freight demand.*

7.1 INTRODUCTION

The purpose of this section is to forecast potential demand for a new rail freight facility at Avonmouth.

The approach to demand forecasting for this report is to use the background demand forecasts used by Network Rail and others, which are derived from the Great Britain Freight Model (GBFM) but also to assess demand on known market behaviour and feedback from freight operators and other industry stakeholders who know the market and its needs.

The forecast focuses on intermodal rail freight, rather than bulk materials such as aggregates and other construction products. There is a thriving and growing market moving construction materials by rail but his can be provided for on other sites nearby, particularly the Bristol Port.

7.2 CONTEXT

Ignoring recent fluctuations in the biomass market, rail freight movements in the UK are dominated by intermodal traffic and construction materials. The key intermodal commodities have yet to reach their pre-covid levels but are currently the fastest growing rail freight commodities. Growth on a quarterly basis to March 2025 reached 12% and 18% for these commodities respectively, based on the same quarter a year earlier.

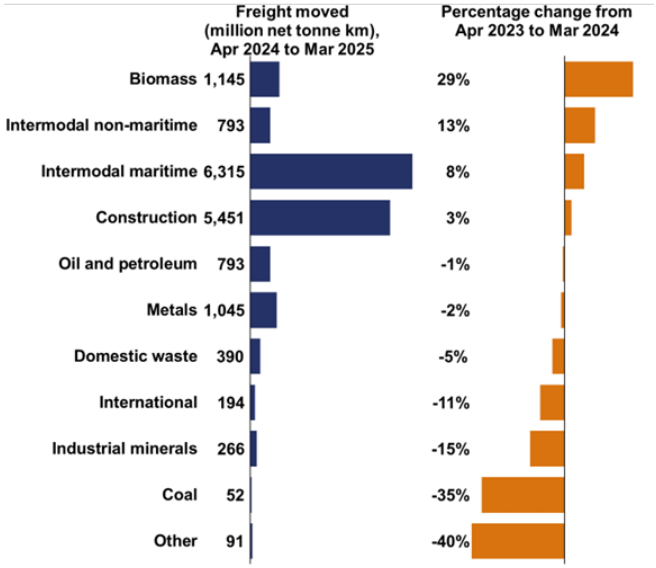

Figure 19 Freight Moved - from Freight rail usage and performance January to March 2025, ORR

The Government target to grow rail freight by 70% by 2050 is based on extensive consultation but is underpinned by the growth forecasts published by Network Rail in 2020 and subsequently updated but not published. The Network Rail forecasts are based closely on the forecasts in the Great Britain Freight Model which is also used to underpin freight road traffic forecasts.

The GBFM uses various assumptions to forecast the factors which impact rail freight market share, particularly the relative cost of road and rail freight transport. It also uses economic and other approaches to forecast the total freight market (road plus rail, plus other modes) as an input.

The Importance of Rail Connected Warehousing

For intermodal freight, one factor stands out as determining the market share of rail: the area of rail connected warehousing. When a warehouse is adjacent to a rail terminal, the cost of transporting containers between the warehouse and the terminal is significantly reduced. This makes the end-to-end cost of the intermodal rail journey significantly cheaper, which increases the rail market share. This is the theory, and it is proven in practice, with new rail terminals such as East Midlands Gateway Doncaster iPort quickly generating new rail freight traffic. So:

- For maritime traffic, rail freight growth is the result of growth in the movement of deep-sea containers through ports plus growth in the area of warehousing served by rail, plus changes in the relative cost of road and rail freight
- For domestic traffic, rail freight growth is the result of growth in the area of warehousing served by rail, plus changes in the relative cost of road and rail freight

Case studies of recently developed rail terminals are provided in Appendix 4: Terminal Case Studies

The Network Rail forecasts made in 2020 assumed that there would be 20 – 40 thousand square metres of rail connected warehousing in the Avonmouth area by 2033 and 50 - 100 thousand square metres by 2043. Currently, of course, the figure is zero. The definition of “rail connected” is rather vague. It includes both warehouses with a rail siding (increasingly rare) and warehouses close to an intermodal terminal. Close could be considered to be within approximately 1-2 miles.

7.3 Avonmouth Demand Context

There have been various attempts to develop intermodal facilities in the Bristol area, including:

- Freightliner terminal at Liberty Lane
- Intermodal facilities at Portbury and Avonmouth
- A proposed SRFI at Cabot Park in the early 1990s
- Identification of a site for a rail terminal in the Central Park development – now preferred Site A

The Freightliner terminal was based largely on wine traffic to the bottling plant at Avonmouth but poor road and rail access and distance from other main logistics customers led to closure of this facility.

The intermodal facilities at the Bristol Port were aimed largely at serving maritime containers using the port but there was insufficient demand for regular services.

Regarding Central Park, the huge success and rapid development of warehousing in the area removed one of the incentives to develop a rail terminal: to attract investment in warehousing. This is distinct from SRFIs such as DIRFT, East Midlands Gateway, and iPort Doncaster where the rail terminal was obligated in the Development Consent Order. In these cases, the developers accepted

the cost of developing the rail terminal as a necessity in order to open the site for development. A similar pattern was seen at Cabot Park in the 1990s where the area was successfully developed without the need for a rail terminal.

A key issue is whether intermodal services from Avonmouth to major ports and other destinations would be financially viable due to some relatively short distances.

The main constraints for a rail terminal have now been removed:

- Development of a large quantum of warehouses at Avonmouth provides strong potential demand for rail services
- Removal of the gauge constraint now makes the area viable for intermodal services
- Opening of London Gateway provides a new potential source of intermodal traffic
- Opening of East West Rail from Oxford to Bletchley provides a new, direct, rail route to the main concentration of warehouses in the East Midlands
- Rail is becoming increasingly competitive against road transport for intermodal services

Stakeholders each confirmed that they could now see potential demand for a rail terminal in the area.

7.4 Demand Forecast

As has been explained earlier, the main demand forecasts used by Network Rail, the Department for Transport (DfT) and the GBR Transition Team are based, to a large extent, on the forecasts in the GBFM. The GBFM is very much a “top down” model using national data to forecast modal share. Growth in intermodal rail mode share is driven largely by the availability of rail-connected warehouses in an area. More rail connected warehouses mean more rail freight. It is understood that updated versions of the GBFM have been provided for the DfT but are not publicly available. The last published GBFM outputs were published by Network Rail in 2020 but the results were recorded at a very high level and can’t be used to identify volumes for individual locations.

The approach to demand forecasting for this study is based on a bottom-up approach used for many similar projects. The approach was as follows:

- Identify potential end users in the locality
- Identify potential destinations which could viably be served
- Estimate the volume of trains per day that could operate between each destination and Avonmouth based partly on comparable terminals elsewhere
- Test the volume forecast with stakeholders who understand the rail intermodal market

This may be less precise than a modelled approach but it has the benefit of relying on factors which intermodal operators understand and use in their own demand forecasting.

Potential end users in the locality

Provision of major logistics hubs across the UK is growing, within Avonmouth being the preferred location to serve the South West. Commercial property agents Savill’s reported for the UK Warehousing Association (UKWA) in 2024 that warehouse space in the South West increased by 90% between 2015 and 2024 to over 4 million square metres.

The following table shows businesses with major distribution facilities in the area. Amazon and Tesco are particularly important as they are known to be significant users of rail freight.

Central Park Logistics Park	Westgate Park (Western Approach)	"Old" Avonmouth
Amazon	Tesco	GXO (Co-op)
Lidl	UK Mail	Ocado
The Range	Malcom Group	Encirc Beverages
DHL	Next	Asda
Davies Turner	Harveys	Evri
Farmfoods	Dixon Stores Group International	Hovis
CHEP UK	GKN	John Lewis
Network Rail	Gaymers Cider	Amazon
Pilkington		Culina (Part of Amazon site)
SIG Roofing		

Table 7 Examples of current local warehouse occupiers.

This growth is set to continue, with several logistics and industrial developments locally in the pipeline, as set out in the following table.

Project	Timescale	Reference
M49 connection	Short: completed July 2026	
Carbon Capture Project	Longer term: 2030 in service	https://www.7co2.co.uk/
Access 18	Short: Available now	www.indurent.com/industrial-estates/indurent-park-access-18-avonmouth/
Axis Works	Medium: In construction	https://axis-works.com/
Westgate Distribution Warehousing	Medium term: Not yet started	www.westgatebristol.com/location.php PT11/3510/RM
Panattoni Park Avonmouth	Short: Available now	https://panattoni.co.uk/our-properties/avonmouth/
Matrix 586	Medium: Under construction	P24/01803/RVC
Matrix 235	Short: Near completion	P22/02510/RM
Matrix Apex	Medium: Not yet started	P22/02775/CLP
PT11/3510/RM	PT11/3510/RM	PT11/3510/RM
Plot N	Medium: Not yet started	P25/00329/RM
Plot M - Tungsten	Medium: Not yet started	P25/00328/RM https://www.tungsten.uk.com/bristol
Unknown Developer (Savills)	Medium: Not yet started	https://hosted.southglos.gov.uk/callforsites/SG780.pdf
Severnside Development Logistics Ltd	Medium: Not yet started	https://hosted.southglos.gov.uk/callforsites/SG959.pdf
Opus 40	Medium: In construction	https://www.opusland.co.uk/project/opus49/

Table 8 Developments in Avonmouth Area

This would suggest that Avonmouth could become the largest cluster of warehouses and logistics hubs outside of the Midlands "Golden Triangle".

Each warehouse will be served by significant numbers of HGVs each day, including long distance trips to and from ports, trips between hubs in each supply chain (largely between Avonmouth and

National Distribution Centres in the Midlands) and more local distribution either direct to customers or to last mile logistics hubs in the South West for final delivery.

Looking at the volume of rail traffic forecast to use comparable intermodal terminals in England (including DIRFT III, East Midlands Gateway, and Hinckley), on average there is a forecast equivalent to 0.25 trains per day per 10,000 square metres of rail connected warehousing.

For example, Northampton Gateway includes 468,000 square metres of warehousing and is forecast to handle 12 train services per day = 0.26 trains per 10,000 sq m per day.

NB In all cases above, a train equates to an inbound train. Including outbound trains would double the numbers.

As discussed earlier, the definition of "rail connected warehousing" is vague. But the Central Park development alone consists of 288,000 sq m of floorspace, which would suggest potential demand of 7 trains per day.

However, some factors would suggest that demand from Avonmouth would not reach these heights. These include its location relative to ports and the Midlands (see next section) and that most of the warehouse space is already occupied: occupiers have not moved to Avonmouth in order to be near a rail terminal, whereas occupiers at SRFIs may have moved in order to access rail services.

Potential destinations which could viably be served

For maritime intermodal services the key ports which could generate trains to Avonmouth would be Felixstowe, London Gateway, and Southampton.

For domestic intermodal, the key market is to and from DIRFT, near Rugby, which will accommodate 1.2 million square metres of space, consisting mainly of national distribution centres. Ultimately other terminal to terminal flows are expected to develop between regions but forecasting domestic demand beyond DIRFT would be speculative.

Of note is the successful Tesco operation which links the Tesco DC cluster at DIRFT to various locations in the UK including Wentloog (Cardiff). Currently up to 2 trains per day link Wentloog with DIRFT in each direction. It is understood that some of the Tesco traffic through Wentloog is delivered by road to the Tesco DC in Avonmouth.

This would suggest the following possible services to Avonmouth:

- Felixstowe
- London Gateway
- Southampton
- DIRFT

The table below shows several existing comparable intermodal terminals, the distance from them to the key destinations and the current volume in trains per day handled by the terminal.

Current Service	From	To	Miles	
4tpd	**Wentloog**	Felixstowe	250	
		Southampton	137	
		DIRFT	130	
		London Gateway	199	
3tpd	**East Midlands Gateway**	Felixstowe	164	
		Southampton	160	
		DIRFT	50	Not served
		London Gateway	141	
8tpd	**Doncaster iPort**	Felixstowe	187	
		Southampton	210	
		DIRFT	98	Not served
		London Gateway	180	
		Mossend	234	
Proposed	**Avonmouth**	Felixstowe	224	
		Southampton	114	
		DIRFT	104	
		London Gateway	173	
Too early	**Segro Northampton**	Felixstowe	128	
		Southampton	112	
		DIRFT	20	Not served
		London Gateway	92	

Table 9 Distances to key destinations

Comparing the distance to Avonmouth for each destination to the distance to the other terminals, both Felixstowe (224 miles) and London Gateway (173 miles) fall within the distance range where rail services already operate to the other terminals.

At 114 miles, the distance to Southampton is shorter than the distance to Southampton from the other three terminals. However, it is not significantly shorter than Wentloog (137 miles). Of note, a rail service recently commenced linking Southampton with Northampton at only 112 miles by road.

The service to DIRFT may be more marginal, at only 104 miles by road, but noting that Wentloog (130 miles by road) sends 2 trains per day to DIRFT. The current Wentloog rail services use a convoluted rail route to reach DIRFT via the Midlands. Opening of East West Rail to Bletchley would offer both Wentloog and Avonmouth a far more direct and less congested option.

This analysis would suggest that services to Felixstowe and London Gateway would certainly be viable from Avonmouth and services to Southampton and DIRFT would be likely to be viable.

The South West Peninsula

Another potential opportunity is to operate intermodal services between Avonmouth and cities in the South West Peninsula. Plymouth and Exter are a very long distance from the main container ports and the Golden Triangle for logistics in the Midlands. Yet there are no general goods or container rail freight services to Devon or Cornwall. All non-bulk goods to and from these counties are delivered by road.

There are two key reasons that these markets aren't served by rail:

- Lack of W10 loading gauge – or even W8 beyond Exeter. This means that inefficient low platform wagons would have to be used

- Lack of demand – overall there would be demand for a rail freight service, but there is unlikely to be demand between a pair of locations such as Felixstowe to Exeter, or for a single flow such as for a single supermarket from the Midlands to Exeter.

This is where Avonmouth could play a role. Many of the warehouses at Avonmouth serve the Peninsula and so may be able to generate demand for a train. Additionally, containers from Felixstowe and other ports could be combined at Avonmouth to form a single train.

We have not included the further South West as a primary opportunity in the demand forecast, but the opportunity is worth further investigation.

The 7CO2 Carbon Capture Opportunity

Section 5.4 reports on this project to develop a carbon capture hub at Avonmouth. In rail terms, the min opportunity would be to bring several trains per day carrying bulk CO_2 in tank wagons directly to the port. However, not all carbon dioxide generators could produce enough CO_2 to fill regular trains. In such cases the CO_2 could be loaded into tank containers and then transported by rail in the same way as any other container, then transferred by road from the new terminal to Avonmouth. It is not possible to forecast the volume of containers that could be moved this way, but this could provide another source of volume and revenue for the terminal.

Forecast trains per day

Taking all of the above factors into account, the forecast to be tested is for 6 trains per day inbound to Avonmouth. The assumption is that 4 trains would be maritime services from Felixstowe, London Gateway, or Southampton and two would be domestic services from DIRFT. Due to space constraints within the terminal and current length constraints on strategic routes to the terminal. It is assumed that trains would be 600 meters long. In the future 775 meters will be possible.

Each train could potentially carry 40 x 40'containers, although space utilisation on the trains would average at 80%, suggesting that most trains would carry 32 containers.

The forecast assumes that it would take up to 10 years to reach the full level of demand. However, evidence from other terminals is that initial demand could be quickly built up and so the forecast assumes that 35% of the forecast demand would be delivered in Year 1.

Alternative forecasts of up to 3 trains per day and up to 12 trains per day have been used to test the possible minimum volume for a viable terminal and the maximum potential capacity of the terminal.

		2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Number of Units / Anum												
Maritime		25,795	30,586	35,376	40,167	44,957	49,748	54,538	59,329	64,119	68,910	73,700
Domestic Intermodal		12,705	15,065	17,424	19,784	22,143	24,503	26,862	29,222	31,581	33,941	36,300
Total		**38,500**	**45,650**	**52,800**	**59,950**	**67,100**	**74,250**	**81,400**	**88,550**	**95,700**	**102,850**	**110,000**
Rounded Up Trains / Day												
Maritime		2	2	2	2	2	3	3	3	3	4	4
Domestic Intermodal		1	1	1	1	1	2	2	2	2	2	2
Total		**3**	**3**	**3**	**3**	**3**	**5**	**5**	**5**	**5**	**6**	**6**
Train Utilisation												
Maritime		56%	67%	77%	88%	98%	72%	79%	86%	93%	75%	81%
Domestic Intermodal		56%	66%	76%	86%	97%	54%	59%	64%	69%	74%	79%

Table 10 Base Case Forecast

NB the model suggests that trains would only be half full in the early years. Operators try to operate full trains (>80%) and so in the first few years there may be fewer trains than forecast.

Stakeholder feedback

The concept of a 6 trains per day level of demand was discussed with industry stakeholders. There was broad consensus that this would be a typical target volume for a regional intermodal terminal and that such a volume would be likely to be necessary for the terminal to operate viably.

8 OPERATIONAL AND DESIGN OPTIONS

Objective of this Chapter

- *To outline broad options for the operation and design of the terminal and assess its business case*

Deliverables

- *Outline concept layout for the terminal and cash flow forecasts*

8.1 TERMINAL DESIGN OBJECTIVES

All the locations identified, including the preferred location, are space constrained in terms of width, length, or both. This means that compromises will need to be made to achieve a deliverable and viable terminal.

Any layout needs to be operationally efficient in terms of rail operation, crane operation, and the movement of road vehicles.

Provision of storage for containers between road or rail trips is an important element. This can be loaded containers but mostly comprises empty containers. Providing container storage ensures that empty containers are available for customers who need them. Storing containers at the rail terminal takes pressure off the ports where space is a premium. Storing containers can also provide a revenue stream for the terminal operator although usually a day or so of storage is provided free for each container.

Finally, the terminal should be flexible and scalable, allowing for efficient operation during the initial period of low demand, and able to be cost effectively enlarged to deal with higher volumes when required.

8.2 KEY VARIABLES

The terminal layout is defined by several variables as set out below.

Rail Layout and Unloading Tracks

Trains need to be able to be shunted into and out of the terminal efficiently, ideally without having to divide the trains.

Enough unloading tracks need to be provided to unload and reload the forecast number of trains each day. (These are the tracks that can be reached by cranes.) In theory, a train can be unloaded and reloaded in as little as three hours. But moving the train on and off the terminal and other operations mean that few terminals achieve more than three trains per track per day – potentially four could be possible. An extra track usually needs to be provided to allow the locomotive to change ends of the train.

Lifting Technology

There are basically two options:

- Reach Stacker – a large forklift type vehicle. This has the benefit of flexibility in that reach stackers can move containers around the terminal and reach odd-shaped spaces.
- Investment costs are lower than for gantry cranes but lifetime costs may be higher.

- Rail Mounted Gantry Crane (RMG) – these machines have a much higher investment cost but are more efficient in terms of space utilisation.

Storage

Adequate container storage needs to be provided and, ideally, an extra quantum which can be used to earn storage revenue. Containers can be stacked 5 or more high but taller stacks are less efficient, because lifts are needed to access containers low in the stack. They can also be considered unsightly.

Wider Site Operations

In addition to core RFT infrastructure, there may be opportunities to incorporate support functions that will significantly influence the site's design, layout, and technical requirements. These considerations include:

- HGV Parking Facilities: Provision for secure, well-managed HGV parking can support driver welfare, reduce congestion, and improve operational efficiency. This may require dedicated access routes, lighting, security systems, and welfare amenities.
- EV Charging Infrastructure: As the logistics sector transitions to electric fleets, integrating high-capacity EV charging stations—both for HGVs and smaller vehicles—will be essential. This will impact power supply planning, grid connectivity, and future-proofing of the site.
- Energy Supply and Resilience: The site may require enhanced energy infrastructure to support warehousing, automation, and EV charging. Options such as on-site renewable generation (e.g., solar PV), battery storage, and smart grid integration should be explored to ensure sustainability and operational resilience.

These support functions not only enhance the site's attractiveness to tenants but also align with broader goals around decarbonisation, driver welfare, and future logistics readiness.

8.3 The Terminal Site

The figure below illustrates the proposed location at the proposed site.

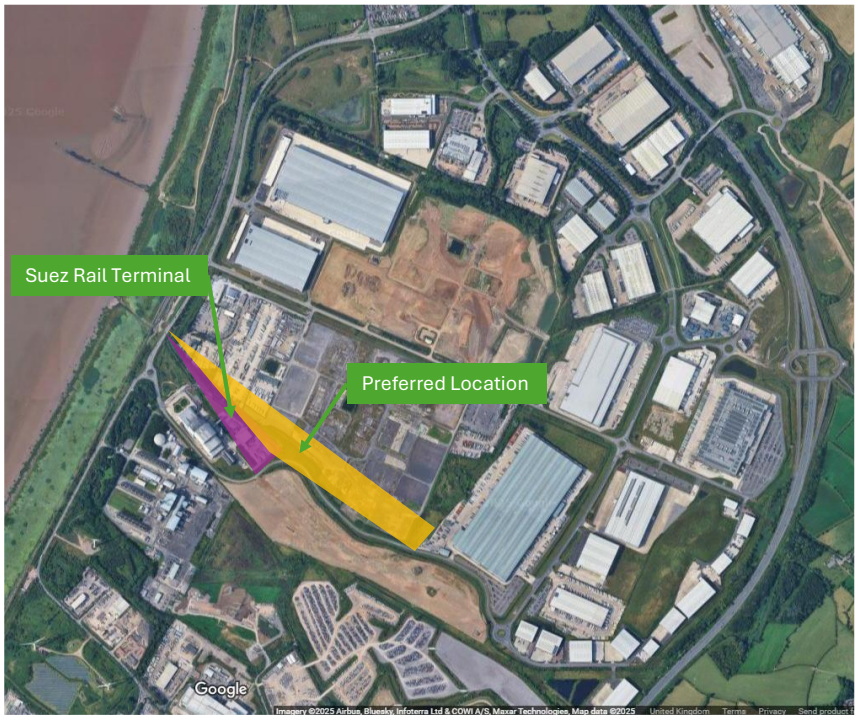

Figure 20 Terminal Site

The dimensions of the site are tight and don't meet the ideal specification set out in Section 5.3. The rectangular section of the yellow shape illustrated above for the terminal is just under 600m long by 90m to 100m across. The actual space available depends on land availability, which has not yet been confirmed, plus the constraints of the road to the South and already developed or under developed land along the other three sides.

As well as accommodating the rail facilities and storage, the terminal needs an access gate with security checks, space to park and move vehicles, and an admin and maintenance building.

8.4 Proposed Arrangement for this Terminal

Rail Layout and Unloading Tracks

To unload 600m long trains without splitting, the terminal would need to be well over 600 meters long (as the tracks need to come together at each end of the terminal). It does not appear to be possible to achieve this at this location, so trains will have to be split, meaning that unloading tracks must be at least 300m long, although longer unloading tracks, even though less than a 600m full train, may offer some flexibility and additional capacity.

Taking into account experience of the number of trains that can be unloaded and reloaded per track, the proposed terminal would need 4 x >300m unloading tracks. Each pair of tracks would handle 3 trains per day, providing combined capacity for 6 trains per day.

An additional track would be required to allow the locomotive to change ends. This track would need to be extended using space where the terminal narrows, to allow the locomotive to run round a full-length train.

The diagram below is a suggestion of a suitable layout. Providing the full desirable length of over 750m after the Suez siding junction will be tight and therefore the layout needs to be tested once land ownership and topographic issues are addressed.

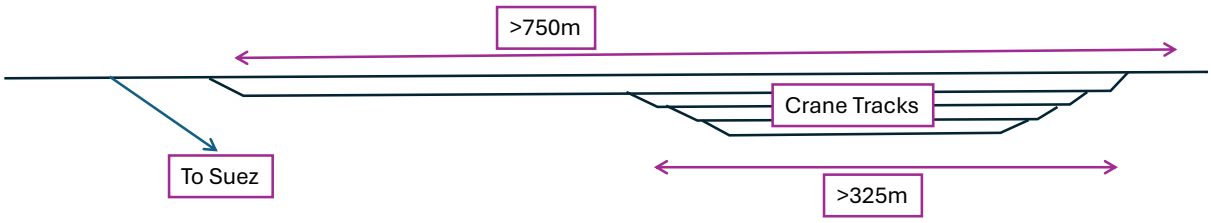

Figure 21 Possible terminal rail layout

Lifting Technology

Many terminal developers and operators favour reach stackers because of their flexibility and lower capital cost than RMGs. In terms of lifetime costs there is little difference between the two solutions.

A key constraint on this site is the width of the terminal. Subject to agreement on land, the handling area is likely to be between 80m and 95m wide. With fencing and earthworks, plus road access this could reduce to less than 70m. To maximise the density of operations and allow for adequate container storage, an RMG solution has been modelled. The area under the cranes would comprise:

- 4 train loading / unloading tracks
- 2 roadways or 1 double width roadway
- 6 lanes of containers stacked up to 4 high

In addition, the run round rail track would be outside the crane area, as would any access roads.

This would produce a terminal handling area approximately 60m in width, with a gantry crane span of 50m – 55m.

The terminal operator could start operations using a reach stacker, but the piled gantry crane rail foundations would ideally be constructed from the start.

Storage

6 lanes of containers 400m long and stacked 4 high would allow for storage of up to 720 containers (1,440 TEU) – although obviously that maximum volume would be inefficient in terms of crane movements.

It would be useful to have extra space available outside the "stack" to store refrigerated containers or swap bodies which aren't ISO compatible for stacking.

8.5 Modelled Terminal Capacity

This section reports on the results of using the Polaris Terminal Viability Model to test the ability of the proposed terminal to accommodate 6 trains per day (inbound).

Tracks

4 unloading tracks, with two tracks required per train, would be able to accommodate 6 trains per day and could potentially accommodate 8 trains per day.

Cranes

The use of 2 RMGs has been modelled. An RMG is capable of 25 lifts per hour. While 6 trains would require 385 lifts, about 8 lifts per crane per hour over 24 hours just to unload and reload, the model also estimates the number of lifts required to transfer a proportion of containers to and from the container stack. Each lift from the stack might require several moves to reach a "buried" container.

The model estimates that 6 trains per day could require 950 lifts per day which would see the 2 cranes working at 80% capacity throughout the day. The model forecast for crane utilisation is illustrated below. Red shading in the model outputs is a warning that, at nearly 80% through 24 hours per day, the forecast might be excessive in which case the operator could reduce the number of stored containers or introduce a third crane.

The capital cost of a crane is estimated to be around £4m, with the piled crane rails potentially costing £2.1m.

Crane Utilization	2027	2037	2047
% of maximum capacity.	21%	79%	79%

Figure 22 Crane Utilisation Assumptions

Storage

The terminal model can consider the capacity of the terminal to store containers based on assumptions of dwell time. The model splits containers into two groups: containers which are transported directly from a train to an end user or vice versa, or containers which need to be stored for some time. The direct transfer containers need little or no storage (they may be held in the stack briefly awaiting a road vehicle).

The assumption modelled for the terminal was that indirect containers – those requiring some storage – are stored for an average of 2.6 days. This would be for containers in each direction, so in total a container could be stored for 5.2 days. Using these assumptions, the container storage stack would be 80% utilised by 2037 for a 6 trains per day throughput. This is shaded red as it is close to the maximum efficient utilisation.

Space Utilization	2027	2037	2047
% of maximum capacity.	29%	82%	82%

Figure 23 Space Utilisation Assumptions

Conclusions On Terminal Layout

The theoretical analysis using the terminal model suggests that a terminal with 4 unloading tracks, 6 storage tracks and 2 RMGs could accommodate 6 trains per day. Some flexibility on container storage would be required to boost productivity in the start-up years and perhaps reduce activity in later years to maintain operational efficiency.

8.6 Terminal Costs and Revenues

The Polaris Terminal Viability Model also estimates costs and revenues for a terminal. It should be noted that estimated unit costs are used and these do not take into account any local conditions, nor the exact design of the terminal. Instead, the numbers are used mainly to consider the impact of varying demand on the likely viability of the terminal.

Cost Inputs

A breakdown of capital costs is provided in Appendix 3: Cost Model Assumptions

Appendix 1: . In total the capital cost of the rail handling area is estimated to be £8.7m, with the remainder of the terminal including road and rail access, gates, fences, buildings, etc. estimated to be £4.5 million leading to a total estimated capital cost of £13.2 million.

NB this excludes the capital cost of the cranes, which are treated as a terminal operating cost. It also excludes any capital cost for rail improvements outside the terminal, and any land acquisition costs.

A breakdown of operating costs is provided in the Appendix 3, but the following assumptions are made for staffing – the main cost:

Labour	Number FTE
Common Facilities	
Manager	1
Security	4
Admin	4
Handling	
Crane Operators	7.5
Others	6

Table 11 Staffing Assumptions

Revenue Inputs

Terminal operators can earn revenue from lifting containers, storing containers, charging to shunt trains, or for ancillary services including providing road haulage. In practice, where a terminal is

operated by an integrated intermodal operator, the terminal might be treated as a cost to be set against the end-to-end revenue to move the container, with profit coming, perhaps, from road haulage and added value activities.

The model uses two sources of revenue:

- £30 per lift for containers
- £15 per day to store containers, with the first day free

These numbers are based on discussions with stakeholders but may not reflect actual charges at other terminals or at this terminal in the future.

Cash Flow

The cash flow element of the model only looks at operating costs and revenues. Operating costs include providing the cranes (treated as a simple 20 year lease cost) but do not include the capital cost of building the terminal. This therefore provides the following information:

- Can the terminal be operated profitably?
- How much can the terminal operation contribute towards the cost of constructing the terminal?

Based on demand in Year 10 reaching 6 trains per day, the model suggests that the terminal would make an operating loss in the first three years. From Year 10 onwards, the terminal operation could generate an operating profit of nearly £2.25 million per annum. This is before any rental or contribution to the capital cost of the terminal.

Over a 20 year period, the Net Present Value of the net revenue from the terminal would be £18.2 million. This should be compared to a potential capital cost of £13.2 million, suggesting that the terminal could possibly cover its capital investment, but would be unable to pay a significant land rental – or alternatively could cover an element of land rental but not the capital investment required.

The shortfall on total costs – capital plus land rental – cannot be calculated without understanding the land availability situation.

There is also an element of risk for the operator. The model suggests that if only 3 trains per day used the terminal it could lose £9 million over 20 years. The operator could reduce costs and aggressively seek additional revenue, for example by storing empty containers, to aim to make a small profit. The “breakeven” point for the terminal operation would be 4 to 5 trains per day.

8.7 External Capital Costs

As explained in Section 6.2, while rail access to the terminal appears to be viable, ideally some rail network improvements would be needed for an efficient operation. These include:

- Extending the Severn Beach run round to at least 600m. This might involve a small land acquisition and rebuilding a bridge over a trackway
- Either a change to the timetable and operation of passenger services to Severn Beach or resignalling of the branch
- A possible curve from the Hallen Branch northwards onto the Severn Beach Branch.

The potential resignalling could be very simple and the extended run round might not require any changes to the bridge – the location is constrained and requires a detailed survey to assess feasibility. In contrast, providing a new curve could be costly.

Each of these changes could be steps towards the infrastructure required to improve the frequency of passenger services on the branch. A very rough estimate would be that capital costs could be between £10 million and £20 million for these works.

8.8 Conclusions on Terminal Viability

A terminal handling 6 trains per day could potentially be accommodated on the site. However, the site would not be capable of expansion. If rail growth into Avonmouth is achieved, it might be desirable to identify a second location to be developed in the future.

The terminal could be operationally profitable but could only cover a proportion of its capital and land costs. In addition, attracting rail business would be a risk for the terminal operator, leading to possible operating losses as traffic builds up.

8.9 Next Steps

In order to take development of a terminal at this location forward, some further initial high-level assessments would be required, including:

- An operations study to assess whether additional freight could be accommodated by a timetable recast or limited investment in resignalling
- Assessment of the property situation to establish boundaries and potential costs
- An initial engineering assessment of the potential to extend the Severn Beach run round and to construct a new curve to the Hallen Branch.

Following clarification on these issues, the next step would be to seek sources of external funding towards the investment required. This could be set against the mode shift benefit from moving goods by rail rather than road. The DfT approach to mode shift can generate significant values for external benefits – potentially in the hundreds of millions of pounds for 6 trains per day.

9 ENVIRONMENT AND PLANNING FEASIBILITY

Objective of this Chapter

- *To provide an overview of the initial potential environmental implications and planning requirements for a RFT in the preferred location*

Deliverables

- *Environmental and Planning Feasibility Report within the Final Report*

9.1 INTRODUCTION

Avonmouth and the wider Severnside area has been designated for industrial and logistics development for decades, with large plots of flat, developable land available, particularly within the Central Park Distribution Park, which is already home to major distribution centres and is being marketed as a future rail freight hub.

However, the area has some environmental sensitivities that need to be considered as part of understanding the feasibility of the terminal.

The site is near several protected ecological areas, including

- Severn Estuary
- Avon Gorge Woodlands
- River Wye

This section of the feasibility looks at the environmental and panning landscape and the associated requirements needed.

The project design is very much in the early stages of development and, therefore, the precise environment and planning impacts cannot be assessed. However, to progress the early assessment, the plans outlined in Chapter 6 are being used.

From an environmental perspective, a Preliminary Environmental Impact Assessment (PEIA) is an early-stage evaluation conducted to determine whether a proposed development is likely to have significant effects on the environment. This chapter assesses the early stages of the PEIA; screening and scoping. The outcome will be a recommendation to complete the PEIA at the next stage.

This Chapter then provides a project Planning Assessment that considers the high-level planning and environmental considerations that would need to be considered if a site were to be proposed and developed at the preferred location.

A PEIA needs to follow a number of steps:

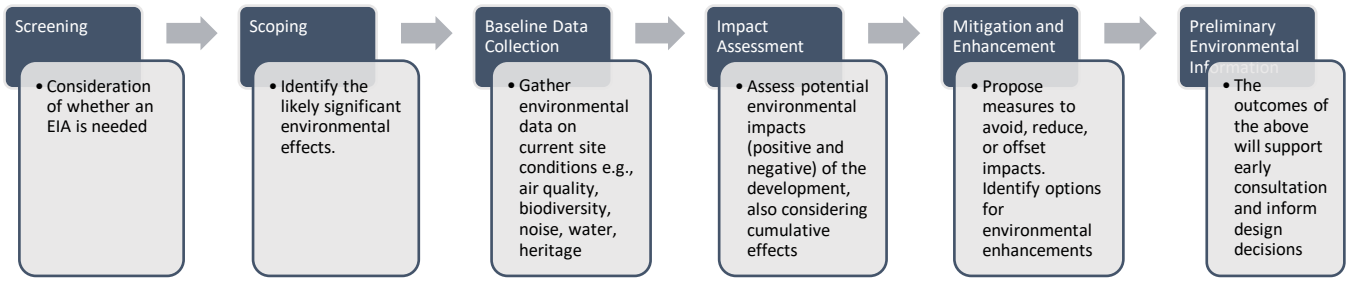

Figure 24 PEA Steps

9.2 Project Phases

A RFT generally has the following main elements as part of its design and construction:

- an intermodal area where containers are lifted between rail freight wagons and container lorries,
- administrative and maintenance buildings
- a security gate and gatehouse which allows lorries to have documentation and basic security checks
- space to park staff and visitor cars, handling equipment, swap bodies, refrigerated containers, tactor units and trailers.

Development phasing

The proposed development would take place in four main phases over a three-year period, subject to market conditions, once consents secured.

Phase Number	Phase	Detail
0	Consents	Landowner consent, Network Rail consent to design and LPA consent to the development
1	Enabling	Site earthworks, preparation, landscape, planting work, upgrades to rail connection (including procurement of long lead items, such as cranes or reach stackers)
2	Terminal Construction	Construction, including concrete pours, craneage, site buildings, access works
3	Mobilisation	Testing and Operation

Table 12 Development Phases

Phase 0 - Consenting

The project would require an element of consent from although the basic terminal would be covered by the 1957 planning permission for the surrounding area.

Network Rail consent is required if new track (e.g. a new curve access, changes to existing track configuration or changes to the system signals). The expectation is that these upgrades would not be necessary to support the day 1 operation of the RFT. Should upgrades to the network be desirable when the number of daily train services to the RFT increases, then consent from Network Rail will be required and, for this, the PACE process must be followed.

Phase 1 and 2: Preparation and Construction

The expectation is that the construction would consist of a single design and build contract, inclusive of enabling works. The enabling package is estimated to be a 52-week programme of mobilisation, discharge of planning conditions and terminal design. The main works package would also be structured to be a 52-week programme, subject to contractor design and availability of suppliers and suitable subcontractors.

Phase 3: Operation of RFT

The operational phase would see up to 6 train visits a day are provided for (i.e. up to 6 trains arriving and 6 departing, giving a maximum total of up to 12 train movements a day). However, this would develop over time and it is expected that the operation would start with 3 trains per day (each way).

The RFT would operate on 24 hour / seven days a week basis. Staff would generally work in shifts.

9.3 Environmental Feasibility

The Severn Estuary is the main sensitivity, given its closeness and degree of environmental protection. In addition, the area is sensitive to flooding and therefore 17 kilometres of flood defences have been built along the coastline to futureproof the area but there are still flood risks associated with the area and development would need to take full account of this.

There are three particular local environmental designations to the Severn Estuary:

- Special Protection Area (SPA),
- Ramsar site, and
- Site of Special Scientific Interest (SSSI).

These designations protect habitats for migratory birds, saltmarsh and mudflat ecosystems, making the area highly sensitive to development impacts. In addition, the history of chemical works may mean contaminated land assessments would be required.

Of particular interest are the rhines, a network of historical drainage ditches that play a crucial role in managing water levels across the low-lying floodplain near the Severn Estuary. Some of the larger rhines in Avonmouth are designated as Sites of Nature Conservation Interest (SNCI) due to their ecological value. They support a variety of species, including water voles, otters, kingfishers and diverse aquatic invertebrates. The rhines are also integrated into wetland habitat creation efforts as part of the Avonmouth Severnside Enterprise Area (ASEA) flood defence and ecological mitigation scheme.

Screening

Under the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, developments fall into two categories:

Schedule 1: EIA is mandatory (e.g., oil refineries, large chemical plants, major infrastructure).

Schedule 2: EIA is required only if the development is likely to have **significant** environmental effects due to their nature, size, or location. This includes **industrial estates over 5 hectares.**

The size of the project will likely take circa 8 hectares which may mean it requires an EIA however, it must also fulfil the requirements that it is also likely to have “significant” environmental impacts.

The purpose of the PEIA is to start to understand any significant impacts.

Local features and characteristics

The Avonmouth-Severnside area is a regionally significant employment location with considerable further economic potential. The Severnside part of this area lies in the coastal zone between the Avonmouth industrial area and the village of Severn Beach, comprising an employment area of approximately 650 hectares which benefits from planning permissions granted to ICI in 1957 and 1958. It is currently a mix of industrial and former industrial areas and greenfield sites not yet developed. The M49 motorway bisects the area. Bristol Port lies at the southern end of the Avonmouth-Severnside area.

There are a number of national and international nature conservation designations relating to the Severn Estuary and whilst there have been improvements to the flood defences, there continues to be risk of flooding from the River Severn due to breaching or overtopping of the existing flood defences, coupled with a rising tide level, as well as groundwater flooding. That said the preferred location is not located within a "sensitive area", although it lies within a flood susceptible area.

The Severn Estuary is covered by:

Designation	Key Features
Site of Special Scientific Interest	The Estuary includes a wide diversity of habitats including Sandbanks which are slightly covered by sea water all the time, Mudflats and sandflats not covered by sea water at low tide, Atlantic salt meadows, and Reefs, which are identified as Annex I habitat types in their own right.
Ramsar Site (wetland of international importance)	The features protected under Ramsar include: • Estuaries • Assemblage of migratory fish species (sea lamprey, river lamprey, twaite shad, allis shad, salmon, sea trout, eel) • Bewick's swan • European white-fronted goose • Dunlin • Redshank • Shelduck • Gadwall • Internationally important assemblage of waterfowl
Special Protection Area (SPA) under the Birds Directive	The Severn Estuary was classified as a Special Protection Area (SPA) in 1995 after being identified as having national and international importance for the breeding, feeding, wintering and migration of rare and vulnerable species of birds, covering nearly 25,000 ha of the Estuary.

Designation	Key Features
A Special Area of Conservation (SAC) under the Habitats Directive	The site is designated under Article 4(4) of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I: • Estuaries • Sandbanks which are slightly covered by sea water all the time. (Subtidal • sandbanks) • Mudflats and sandflats not covered by seawater at low tide. (Intertidal • mudflats and sandflats) • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) • Reefs It also has qualifying species: listed in Annex II of the Directive: • Sea Lamprey (Petromyzon marinus) • River Lamprey (Lampetra fluviatilis) • Twaite Shad (Alosa fallax)

Table 13 Environmental Protections for the Severn Estuary

As a result of the above, any development in or near Severnside must consider the potential impact on the above protections may require Habitat Regulations Assessment (HRA) and mitigation measures to avoid harm to protected features.

In addition, given the high level of industrial activity in the area, there is an acknowledgment of the limited capacity of the existing highway network and infrastructure in the area, which this project will impact.

As a result, South Gloucestershire Council has concerns that developments in the area could:

- have a significant effect on the ecology and conservation assets of the Severn Estuary and cause significant and irreparable damage to estuarine and floodplain ecology,
- reduce flooding capacity without improvement to flood defences and increase the risk of flooding to third parties,
- damage the network of rhines which provide the local drainage network and which are of ecological interest,
- worsen traffic congestion on the local road and motorway network, and
- result in the irretrievable loss of valuable archaeological assets.

Using available published data, the above concerns have been considered at a high level and would require a detailed assessment once plans were more technically evolved but are not thought to be significant and will be able to be mitigated as part of the scheme design.

The impacts have been considered as part of the operation of the RFT rather than the construction. The construction activity will be circa 24 months and any significant impacts will be occasional and temporary. That said, the implementation of a Construction Traffic Management Plan (CTMP) is recommended.

Impact	Description	Evidence	Comment/Potential Next Steps
Land use and socio-economic effects	Land use and socio-economic effects of the PEIA looks at the effects of the Proposed Development on communities, jobs and livelihoods and the local and regional economy.	The Proposed Development is within an industrial area, on a plot which is currently undeveloped. There is a positive impact in employment opportunities, albeit a relatively low-density operation. Employees during construction would be in the region of 50 and 9 employees in operation. Indirect employment is unlikely in the short term, however, there is evidence from other UK RFTs to suggest that the presence of a RFT would generate economic growth. by driving demand for warehousing utilisation and associated development.	Project is unlikely to be a significant impact.
Transport and traffic	Assess effects of the emerging RFT proposals on the road network.	There is likely to be a degree of construction traffic, particularly in the construction of the hard standing. The central purpose of the RFT is to divert existing movements of freight from road to rail so in these terms the project should, in principle, be inherently beneficial. There may be some short-term impacts of construction. A single freight train can typically remove circa 32 HGVs (Heavy Goods Vehicles) from the road, depending on the type of cargo and the train's configuration. Bulk freight trains (carrying aggregates, coal, or similar materials) can replace 60–76 HGVs, as they often carry heavier loads more efficiently. The exact number depends on: The length and weight capacity of the train. The type of goods being transported. The loading gauge and infrastructure of the rail network. Given that it is likely that intermodal will be the primary market, with 6 trains a day (each way with each train	Project is unlikely to be a significant impact, with some positive impact on HGV traffic movements when operational. This shift from road to rail not only reduces road congestion but also significantly cuts carbon emissions, as rail freight produces up to 76% less CO_2 per tonne-kilometre than road haulage. However, a number of mitigation measures could be considered: - Construction Traffic Management Plan (CTMP) - HGV Route Management Plan and Strategy - Green travel plan for workers

Impact	Description	Evidence	Comment/Potential Next Steps
		replacing a conservative 32 HGVs), meaning that as much as 384 HGVs per day could be taken off the roads. There would be short haul shunting between the RFT site and the final destination but this is likely to be less that 5 miles per container – round trip. The RFT would ultimately be designed to handle up to 6 freight trains a day, amounting to 12 inward and outward train movements.	Traffic assessment is out of scope for the feasibility, therefore further assessment needed once designs have been progressed further.
Air quality	During construction, air quality can be affected by the release of dust and very fine particles known as 'particulates' and by fumes from vehicles, plant and machinery. Once operational, vehicle and railway locomotive fumes and emissions from on-site energy generation might have a negative effect in the absence of mitigation.	The central purpose of the RFT is to divert existing movements of freight from road to rail so in these terms the project should, in principle, be inherently beneficial to air quality. There may be some short-term impacts of construction.	Further assessment needed once designs have been progressed further.
Noise and vibration	Proposed Development might give rise to noise and vibration. Noise and vibration can arise from groundworks, piling and machinery during construction and from traffic and rail movements and operation of the RFT during operation.	Intermittent and impulsive noise is common during container handling, especially from equipment like reach stackers, swing-through cranes and aggregate processing machinery. The arrival, unloading, and departure of freight trains contribute to elevated LAmax levels—a measure of peak noise—which can be disruptive to nearby communities. Noise from freight trains tends to be more variable and louder than passenger trains due to their composition and operational characteristics.	Once final designs are agreed, consider a site-specific noise impact assessment and explore mitigation options early in the design process Construction Environmental Management Plan (CEMP)

Impact	Description	Evidence	Comment/Potential Next Steps
		At most there will be 6 trains per day each way. Given the industrial nature of the area, the level of background noise may help mask operational noise.	
Landscape and visual effects	PEIR describes the landscape character of the Project Site and adjoining areas and considers the landscape and visual effects of the Proposed Development. Landscape and visual effects are independent but related. Landscape effects relate to changes to the landscape and the features that contribute to the landscape character and quality. Visual effects relate to the appearance of such changes within views and the resulting effect on visual amenity.	Given the industrial location of the RFT is unlikely to significantly contribute to the visual impact of the area. There may be some taller structures in the proposal such as the use of gantry/lifting equipment, but this is likely to be dwarfed by other structures in the area.	A visual and landscape assessment will need to be completed as part of the site design stage, which could incorporate both noise and visual impacts.
Ecology and biodiversity	Likely effects of the Proposed Development on features of nature conservation value.	The Severn Estuary is internationally important for biodiversity. At low tide, large areas of mudflat, salt marsh and coastal floodplain provide feeding grounds for populations of several species of waterbirds. The Avonmouth and Severnside Enterprise Area and the surrounding areas of coastal floodplain have been, and continue to be, the focus for development. This has reduced the amount of available habitat for wetland birds. To ensure economic development can continue within ASEA without adversely affecting the Severn Estuary, we will provide ecological mitigation in the form of newly created wetland habitat.	Further assessment needed once designs have been progressed further.

Impact	Description	Evidence	Comment/Potential Next Steps
		No part of the proposed site is covered by any internationally important statutory nature conservation designations, however, there are several national and international nature conservation designations relating to the Severn Estuary within 5 km of the proposed site. Given the site has already been developed to some degree and has historical industrial use there is likely to be a minimum site impact. However, once the final designs have been agreed, this needs to be assessed. This will need to include the impact of both the construction and operational phases.	
Cultural heritage	Cultural heritage of the PEIA considers the likely significant effects of the Proposed Development on the historic environment, including sites and buildings of historical, architectural, cultural and archaeological value, based on the current information available	The Avonmouth area has a rich archaeological record, including prehistoric, Roman and industrial-era features. However, much of the land has been heavily modified by 20th-century industrial development, which may reduce the likelihood of undisturbed archaeological remains.	Desk-based assessments and site walkovers are typically required to confirm this.
Surface water and flood risk	PEIA considers the potential effects of the Proposed Development on surface water and flood risk. It covers matters relating to several different aspects of water resources and the water environment, including: • flood risk. • surface water drainage. • surface water quality. • water supply. • surface and foul water sewerage capacity.	The site is in a flood sensitive area and therefore, consideration within the plans for surface water drainage system to improve drainage and water quality will need to be considered as part of the design process. Whilst there will be areas of impermeable surfaces, the land is currently in a semi derelict site rather than greenfield area. There is a series of wet ditches (rhines) situated in the area, and there appears to be one along the Site's southern boundary.	Further flood risk/surface water assessment needed once designs have been progressed further. It is likely mitigations will be required including Flood Emergency Planning and a Drainage Strategy.

Impact	Description	Evidence	Comment/Potential Next Steps
		The Site is located entirely within a Flood Zone 3 area that benefits from flood defences as it sits on the flood plain of the River Severn, although some distance away from it. This means the Site is protected via local flood defences and would otherwise be subject to a high risk of fluvial flooding. The Site is not located within an area at risk of reservoir flooding.	
Hydrogeology	PEIA assesses the potential effects of the Proposed Development on hydrogeology, which is the study of the distribution and movement of groundwater in soils and rocks.	As the site is built on previously used industrial areas it is unlikely to have a significant impact, however, given the flood risk area this will need to be factored into designs.	Further assessment needed once designs have been progressed further.
Geology, soils and contaminated land	PEIA considers the potential effects of the Proposed Development on the geology, soils and contaminated land beneath the site and in the local area.	A Phase 2 Due Diligence Land Quality Assessment was carried out in 2008 by SLR Consulting Ltd for the Sevalco 'North' site in Avonmouth. The investigation involved soil sampling, groundwater monitoring, and laboratory testing for a range of contaminants including metals, hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), and pH levels. The site was found to contain made ground—man-made fill material—typical of previously industrialised areas, with variable soil composition and shallow groundwater. The assessment identified elevated levels of heavy metals such as lead and arsenic, along with hydrocarbons and PAHs, consistent with the site's industrial history. Risks to human health and controlled waters were evaluated, leading to recommendations for remediation or containment of contamination hotspots, protective measures for groundwater, and ongoing monitoring during construction to ensure environmental safety.	It is recommended that this is assessed as part of the next phase of development.
Materials and waste	PEIA considers the likely effects of the Proposed Development on the	The RFT Site comprises of previously used industrial land, with existing infrastructure in the immediate vicinity,	Suggested Site Waste Management Plan for

Impact	Description	Evidence	Comment/Potential Next Steps
	generation and management of waste during construction and operation, and assesses the use of materials during the construction phase	including roads. Site clearance will create some waste. On an operational basis, minimal waste will be generated, but as a suggested mitigation, a Site Waste Management Plan could be developed.	Construction (SWMP) and Operation.
Climate change	Climate change considers the likely significant effects of energy and climate change, both upon and from the Proposed Development. The increasing concentration of greenhouse gases such as carbon dioxide (CO_2) and methane in the atmosphere restricts the Earth's ability to reflect solar heat back into space, resulting in global warming. This affects weather patterns and, amongst other things, is causing a rise in sea levels. These risks prompt an obligation to reduce greenhouse gas emissions, which arise from sources including vehicle exhausts and the generation of electricity and heat from non-renewable energy sources.	During the construction phase there will be some emissions of CO_2 arising from construction traffic, non-road mobile machinery and small generators temporarily used to power machinery and equipment. However, the assessment at this stage considers that these emissions will be intermittent and temporary and are highly unlikely to make a significant contribution to the overall UK GHG emissions, though they will lead to a net increase in carbon in the short term. In the longer term, the ongoing operation of the site is more likely to reduce CO_2 by enabling modal shift – see the earlier transport and traffic section. Based on typical UK emissions data and assumptions, removing 384 HGVs per day from the roads could result in: • Estimated daily CO_2 savings: 90.4 tonnes • Estimated annual CO_2 savings: 32,850 tonnes These savings assume: • An average HGV trip distance of 150 km • CO_2 emissions of 1.57 kg per km per HGV • Operations running 365 days a year Compared to the emissions of HGVs carrying an equivalent volume of freight, emissions of CO_2 from railway locomotives serving the RFT are predicted to be 76% lower.	

Impact	Description	Evidence	Comment/Potential Next Steps
		Instead of emitting nearly 33,000 tonnes of CO_2 annually, operating 12 train movements per day will result in just 7,919 tonnes of CO_2 emissions per year—achieving a net reduction of over 25,000 tonnes and delivering a significant environmental benefit.	

Table 14 High Level Environmental Impact Assessment

Major incidents and disasters

There are no identified pathways through which the Proposed Development would increase the risk of significant environmental effects arising from external natural or man-made hazards.

Furthermore, freight transported by rail in the UK has a demonstrably better safety record compared to road freight. By facilitating a modal shift from road to rail, the Proposed Development is expected to contribute to a reduction in road traffic accidents and associated risks.

As the project progresses, ongoing consultation will be essential with key stakeholders including local police, fire, ambulance and health services, as well as Network Rail. These consultations will ensure that considerations such as emergency service access and response capabilities are fully integrated into the design and operational planning.

Additionally, the site will benefit from the area's established and comprehensive emergency response plans, which can be leveraged to enhance resilience and preparedness for a range of potential incidents. This mainly relates to flood emergency response or incidents related to the COMAH status of several industrial residents on the area. Individual Tier 1 and 2 COMAH sites manage their own emergency response, however there is also a procedure for the management of a major incident through the Severnside Emergency Planning Forum.

The port itself is a secure site and is policed by the Port Police.

Cumulative and in-combination effect

There are numerous developments proposed and underway in the Avonmouth area which may lead to a cumulative impact on the local environment, infrastructure and community. However, this region is formally designated for industrial development under Policies E4 and E5 of Bristol's Local Plan.

Together, the Avonmouth and Bristol Port area (640 hectares) and the Industry and Distribution Areas (237 hectares) form the backbone of Bristol's industrial and distribution land provision. Owing to their strategic economic significance, these areas are safeguarded for industrial, distribution and related uses, helping to promote a diverse and inclusive economy and supporting long-term employment and investment opportunities across the city region.

Specific developments of note:

Project	Timescale	Reference
M49 connection	Short: completed July 2026	
Carbon Capture Project	Longer term: 2030 in service	https://www.7co2.co.uk/
Access 18	Short: Available now	www.indurent.com/industrial-estates/indurent-park-access-18-avonmouth/
Axis Works	Medium: In construction	https://axis-works.com/
Westgate Distribution Warehousing	Medium term: Not yet started	www.westgatebristol.com/location.php PT11/3510/RM
Panattoni Park Avonmouth	Short: Available now	https://panattoni.co.uk/our-properties/avonmouth/
Matrix 586	Medium: Under construction	P24/01803/RVC
Matrix 235	Short: Near completion	P22/02510/RM
Matrix Apex	Medium: Not yet started	P22/02775/CLP
PT11/3510/RM	PT11/3510/RM	PT11/3510/RM

Project	Timescale	Reference
Plot N	Medium: Not yet started	P25/00329/RM
Plot M - Tungsten	Medium: Not yet started	P25/00328/RM https://www.tungsten.uk.com/bristol
Unknown Developer (Savills)	Medium: Not yet started	https://hosted.southglos.gov.uk/callforsites/SG780.pdf
Severnside Development Logistics Ltd	Medium: Not yet started	https://hosted.southglos.gov.uk/callforsites/SG959.pdf
Opus 40	Medium: In construction	https://www.opusland.co.uk/project/opus49/

Table 15 Significant and Relevant Developments in the Avonmouth Area

In addition, a "call for sites" identified in Figure 25 has been issued for the development of an updated Local Plan. A Call for Sites is a public invitation issued by a Local Planning Authority (LPA) asking landowners, developers, community groups and other stakeholders to submit land they believe could be suitable for future development. This could include land for housing, employment, infrastructure, or mixed-use purposes.

This illustrates that there is a lot of potential opportunity for further future development in the area which needs to be considered in terms of impacts on the local environment and infrastructure.

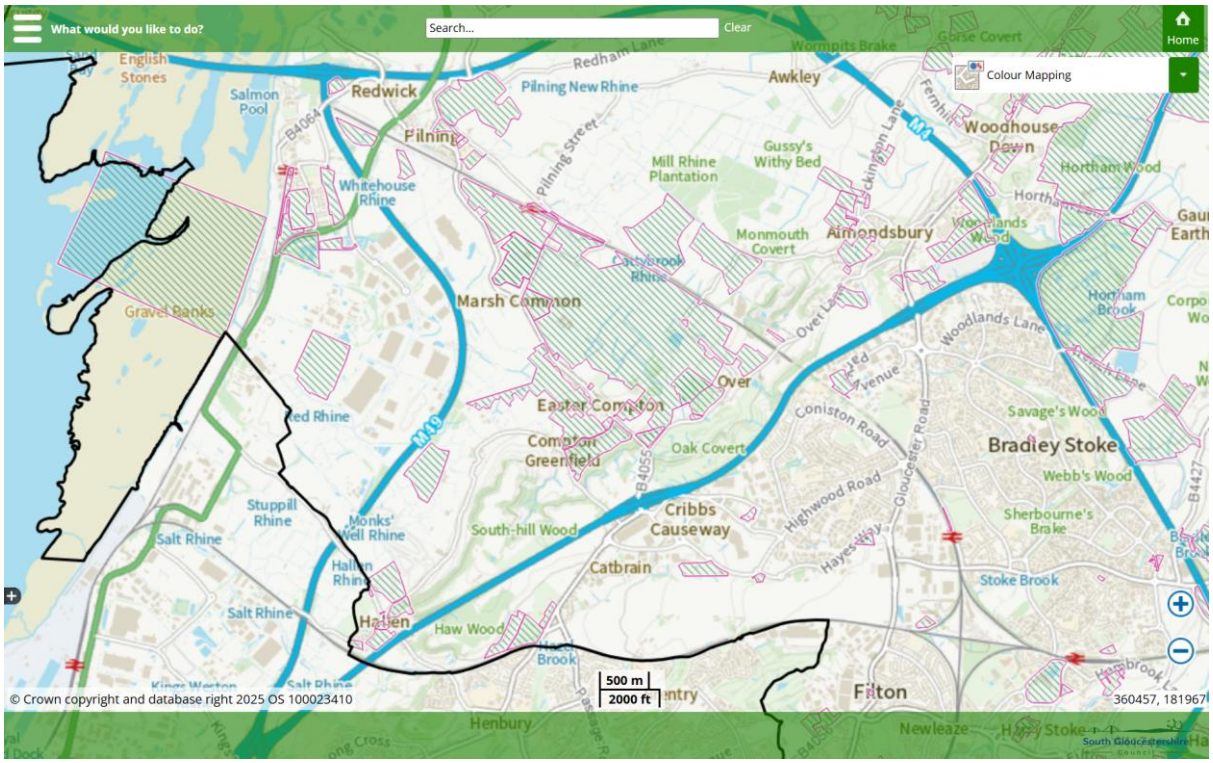

Figure 25 Local Plan Call for Sites

The RFT is a modest development within this context, however, it will need to be considered as part of this wider landscape, especially traffic impacts. However, the availability of a RFT may help businesses taking up residence in these locations mitigate their traffic impacts.

Mitigation and Enhancement

To ensure the project achieves optimal environmental performance and long-term sustainability, it is recommended that environmental impacts continue to be systematically assessed and addressed as part of the evolving design. This proactive approach enables the identification of risks, mitigation strategies, and opportunities for positive environmental outcomes.

In UK environmental planning, the proximity of sensitive receptors such as homes, schools, hospitals, and nature reserves, is a key factor in determining whether mitigation measures are needed for developments that may cause noise, vibration, air pollution, or other environmental impacts.

There is no fixed national distance threshold but typical guidance and practice suggest:

- Within 50–300 metres: Often considered close enough to warrant detailed assessment and potential mitigation, especially for noise and air quality impacts.
- Within 500 metres: May still be relevant depending on the scale and nature of the development (e.g. large industrial sites, rail freight terminals).
- Beyond 500 metres: Usually considered less critical but still assessed if the development has significant emissions or transport impacts.

For the preferred site, the key sensitivity is the Estuary, which lies, circa 600 meters from the proposed site, potentially reducing the significance of the impact. That said, there may well be key areas that may require sustained attention, including:

- Flood Risk Management
    - Integrate robust flood prevention and resilience measures, addressing both current and future climate scenarios.
    - Employ sustainable drainage systems (SuDS), permeable surfaces, and strategic landscaping to reduce surface water runoff.
    - Align with local flood defence infrastructure and contribute to wider catchment-based management strategies.
- Habitat Enhancement and Biodiversity
    - Conduct ecological surveys to map existing habitats and species.
    - Identify opportunities for habitat creation and enhancement, such as wildflower corridors, green roofs and tree planting schemes.
    - Strengthen ecological connectivity between adjacent green spaces to support wildlife movement and population health.
    - Consideration of noise of rail movements and the terminal can be mitigated if assessment identifies risks to any near-by receptors.
- Sustainable Traffic and Transport
    - Promote low-carbon mobility through infrastructure that supports electric vehicles (EVs), including EV charging points for freight and staff vehicles.
    - Develop active travel options such as pedestrian and cycle routes that are safe, accessible and integrated with public transport.
    - Model traffic impacts to minimise congestion and air quality degradation, particularly during construction and peak operation periods.
- Rail Infrastructure
    - Assess opportunities to transition to electrified rail where possible, reducing reliance on diesel-powered transport.

These measures should be embedded into a cyclical, iterative design process where feedback, data and stakeholder input inform ongoing refinement. This not only helps to offset adverse impacts but also identifies compelling opportunities to leave a positive legacy for the local environment and community. It is recommended that a more formal environment impact assessment is undertaken when proposals are more established.

Conclusions

Whilst the project is in a sensitive area, it remains within a highly industrial area and sensitive receptors are some distance from the site itself, the main one being the Estuary. Of the developments in recent years, this is likely to be of relative low impact. However, the flood risk and sensitive habitats surrounding the location will need due consideration. It is likely that sufficient mitigation can be identified and agreed to offset any environmental consequences because of the proposal.

9.4 Policy Support

The West of England Combined Authority and local councils have identified the Avonmouth / Severnside area as a key growth zone for logistics and freight. This aligns with national strategies to shift more freight from road to rail, reducing emissions and congestion.

All the land required for the proposal falls under South Gloucestershire Council.

This section looks at National, Regional and Local Policy that provides the policy context for the RFT.

National

National Industrial Strategy 2025

The UK Industrial Strategy 2025 is a ten-year plan designed to stimulate business investment and accelerate growth in future-facing industries. It aims to simplify the investment process for businesses, offering greater certainty and stability to support long-term decision-making. The strategy reflects the government's commitment to creating a competitive, innovative and sustainable economy.

The strategy identifies several priority sectors for targeted support: advanced manufacturing, creative industries, clean energy, digital and technology, professional and business services, financial services and life sciences. These sectors are seen as critical to the UK's economic resilience and global competitiveness.

The National Industrial Strategy 2025 acknowledges the strategic importance of freight and logistics to the UK economy, particularly in regions like Avonmouth, which serve as major distribution and industrial hubs. While logistics is not formally designated a "foundational sector," the strategy recognises its role in enabling productivity, supply chain resilience and decarbonisation - key themes that align closely with Avonmouth's ongoing development.

To support growth in logistics, the strategy commits £600 million to accelerate the development of logistics and industrial sites. This funding will be deployed through a new Strategic Sites Accelerator, which aims to unlock high-potential land by addressing planning delays, infrastructure gaps and grid connection challenges. For Avonmouth, where land competition and infrastructure constraints are well-documented, this initiative could help bring forward new rail freight and intermodal facilities.

The creation of a National Supply Chain Centre will coordinate investment across freight corridors, intermodal infrastructure and warehousing clusters - directly relevant to Avonmouth's role in

national and regional freight movement. Additionally, a Supply Chain Observatory will monitor vulnerabilities and dependencies, helping to future-proof logistics operations in areas like Avonmouth that are exposed to global supply chain shifts.

Supporting this is the UK Infrastructure 10-Year Strategy, which includes upgrades to rail freight capacity, improved port connectivity, and the development of digital freight corridors. These infrastructure improvements could enhance Avonmouth's connectivity to national networks and support modal shift from road to rail - an objective shared by local stakeholders and the $7CO_2$ cluster.

Overall, the strategy provides a framework that could unlock investment, infrastructure and policy support for Avonmouth's logistics ambitions, particularly in relation to rail freight, carbon capture and low-carbon industrial growth.

National Planning Policy Framework (NPPF) 2024

The NPPF 2024 places strong emphasis on the need to plan positively for freight and logistics infrastructure. It encourages local planning authorities to:

- Safeguard existing freight sites from incompatible development.
- Support the expansion of logistics hubs, including rail freight terminals and intermodal facilities.
- Promote modal shift from road to rail and water to reduce congestion and emissions.
- Ensure transport infrastructure is integrated with land use planning to support economic growth and decarbonisation.

This policy direction aligns closely with Avonmouth's role as a major logistics and industrial cluster, reinforcing the importance of protecting and enhancing its freight infrastructure.

The updated NNNPS 2024 provides detailed guidance for nationally significant infrastructure projects (NSIPs), including:

- SRFIs.
- Enhancements to rail and road freight corridors.
- Development of intermodal connectivity and low-carbon freight solutions.

It highlights the urgent need for new rail freight capacity to meet growing demand and reduce reliance on HGVs. The policy supports projects that improve network resilience, port connectivity, and integration with distribution centres, all of which are directly relevant to Avonmouth's strategic location and infrastructure.

This has implications for Avonmouth. Avonmouth is uniquely positioned to benefit from both the NPPF and NNNPS due to its:

- Existing rail freight infrastructure and proximity to the Bristol Port.
- Concentration of warehousing and logistics operations.
- Role in supporting low-carbon industrial development, including the $7CO_2$ projects cluster of businesses.

These policies strengthen the case for advancing projects such as the proposed Avonmouth RFT, which, whilst isn't a "nationally significant project", does support the sentiments in the NNNPS and provide a supportive framework for planning applications, infrastructure investment and stakeholder engagement.

Regional

Local Growth Plan (in draft)

The West of England Combined Authority have embarked on the development of a Local Growth Plan (LGP) for the region. The Local Growth Plan is a government-mandated initiative for Mayoral Combined Authorities (MCAs) to create 10-year plans to unlock regional economic growth. It aligns with national missions such as clean energy, reducing barriers to opportunity, and supporting health and wellbeing. Whilst still in draft the key focus areas are on:

- Growth in diverse jobs (blue and white-collar) and a transition to green jobs.
- Regional transport improvements, housing development and innovation.
- Tackling barriers to growth, such as transport, housing and skills gaps.
- Aligning with net zero and nature recovery goals.

Several Growth Zones have been identified which include the Severn Estuary, where there is a focus on logistics and green energy (e.g., tidal, hydrogen, nuclear).

To deliver this, several areas are being targeted:

- Transport: Improved bus services, rail electrification and a 10-year transport plan.
- Employment & Skills: Devolution of adult skills budgets, childcare initiatives and training programs.
- Housing: Accelerating stalled housing projects and utilising small brownfield sites.
- Net Zero: Retrofit programs, clean energy investments, and a new national forest.
- Culture & Place: Strengthening creative industries and exporting cultural assets.

The Local Growth Plan is a strategic initiative to drive long-term economic growth, innovation, and sustainability in the West of England. It integrates regional priorities with national missions and aims to unlock funding, improve infrastructure, and create opportunities for residents and businesses.

South West Freight Strategy 2022

The South West Freight Strategy is a 30-year evidence-based plan developed jointly by Western Gateway and Peninsula Transport, the region's two Sub-national Transport Bodies (STBs). It aims to build a resilient, efficient and sustainable freight network that supports economic growth, environmental goals and community wellbeing across the South West.

The strategy focuses on three core pillars:

- Environment: Supporting the transition to a zero-emission freight system.
- Economy: Enhancing supply chain resilience and enabling regional growth.
- Society: Improving connectivity and reducing the impact of freight on communities.

Key interventions include:

- Modal shift to rail and maritime.
- Investment in intermodal infrastructure.
- Establishment of a South West Freight Forum to foster collaboration.

Avonmouth is central to the South West Freight Strategy's ambitions, due to its strategic location near the Bristol Port, its existing and potential rail freight infrastructure and its role in supporting

low-carbon logistics and industrial decarbonisation. The proposed RFT can be seen as a key opportunity to decarbonise freight logistics, support modal shift from road to rail, and unlock economic growth for the wider South West region.

Local

South Gloucestershire Core Strategy 2006-2027

The Core Strategy document sets out a vision for future development in South Gloucestershire to 2027. It covers the general location, type and scale of development, as well as protecting what is valued about the area. The Core Strategy was adopted on 11 December 2013.

POLICY CS35 – SEVERNSIDE

Land at Severnside will be safeguarded and developed for distribution and other extensive employment uses, including energy generation, broadly in line with the extant planning permissions dating from 1957 and 1958.

Notwithstanding the differing planning status of individual land parcels, the Council will continue to work with landowners, Bristol City Council, the Local Enterprise Partnership and statutory agencies to provide a strategic development approach which will help to deliver development while mitigating site constraints, including flood risk, coastal protection, biodiversity, archaeology and transportation.

Opportunities to enhance the sustainability of the area through, for example development of an energy grid, will also be explored and delivered where feasible.

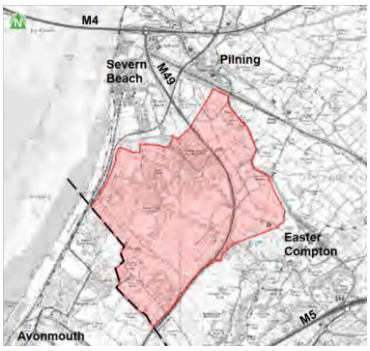

Figure 26 Core Strategy Related to Severnside

1957, ICI Consent (SG4244)

The 1957 ICI Consent (SG4244) refers to a historic planning permission granted on 27th November 1957 for land in the Severnside/Avonmouth area, originally associated with ICI (Imperial Chemical Industries).

The consent permits development for B1 (business), B2 (general industrial) and B8 (storage/distribution) uses. It covers a large area of land—approximately 650 hectares.

The consent is extant, meaning it remains valid and continues to shape development in the area without requiring new full planning applications for qualifying uses.

1995, (P94/400/8)

The 1995 planning consent P94/400/8, refers to a significant planning approval related to the Severnside/Avonmouth area, building upon the earlier 1957 ICI consent (SG4244). While specific details of the 1995 consent are not fully published online, it is widely understood to have:

- Reaffirmed and updated the development rights granted under SG4244.
- Provided a more modern planning framework for the continued development of the Western Approach and surrounding industrial land.
- Supported the transition of the area from its historic chemical industry use to a logistics and distribution hub, enabling large-scale B1, B2, and B8 developments.

This consent has been instrumental in shaping the current industrial landscape of Avonmouth and Severnside, including the development of major facilities and infrastructure improvements.

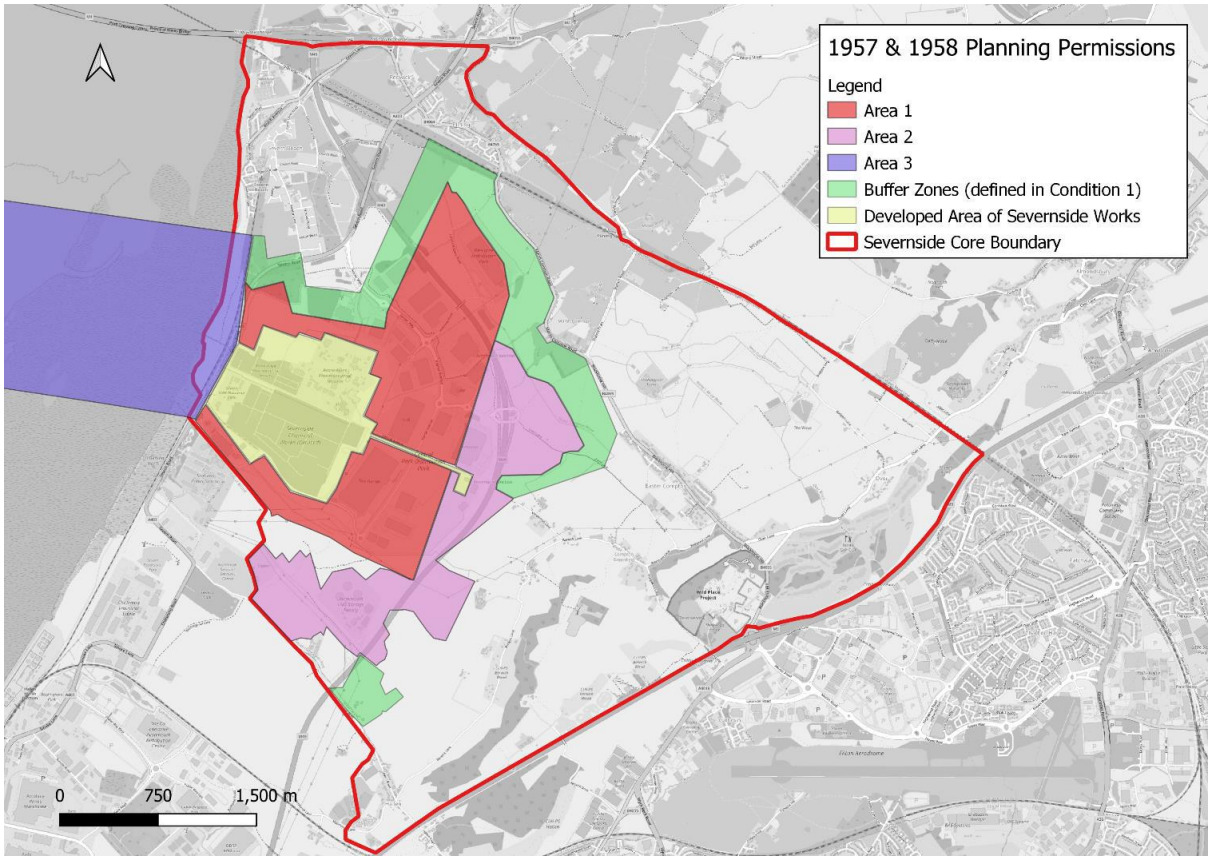

Figure 27 1957 and 1958 Planning Permission Areas

Based on the information provided by South Gloucestershire, the proposal would fall within the definition of 'development' under section 55 of the Town and Country Planning Act 1990 (as amended), and therefore planning permission would be required.

Neighbourhood Development Plans in Avonmouth

Neighbourhood Development Plans (NDPs) are community-led frameworks that guide land use and development in a local area.

The Neighbourhood Planning Network has produced a report focused on Avonmouth Village, aiming to encourage positive thinking and community-led development. While not a formal Neighbourhood Development Plan (NDP), it reflects local aspirations and could inform future planning initiatives.

Avonmouth itself does not currently have an adopted NDP but the area is influenced by broader strategic planning, including the South Gloucestershire Local Plan (2026–2041), which includes major housing and employment growth near Avonmouth.

The South Gloucestershire Local Plan (2026–2041)

The South Gloucestershire Local Plan sets out a strategic vision for the district over a 15-year period, guiding decisions on housing, employment, infrastructure, and environmental development. It is currently progressing towards submission for independent examination in Autumn 2025, following the Regulation 19 consultation that closed in April 2025. The plan aims to shape the places where people live, work, and socialise, while supporting climate change mitigation, promoting a green economy, and reducing inequalities.

A major focus of the plan is housing and employment growth. It identifies a target of 22,573 new homes to be delivered between 2026 and 2041, with around 12,000 of these allocated to new sites and the remainder expected to come from existing permissions and smaller applications. Significant residential expansion is planned in the North and East Fringe of Bristol, including areas currently designated as greenbelt land.

Although Avonmouth itself falls within the boundary of Bristol City Council, the adjacent Severnside area lies within South Gloucestershire and plays a key role in the Local Plan's employment strategy. The plan continues to support logistics and industrial development in Severnside, particularly under historic consents such as SG4244 and P94/400/8. It recognises Severnside as a strategic employment location, especially for freight, distribution and low-carbon industry. The Local Plan also aligns with regional strategies like the South West Freight Strategy and Western Gateway's decarbonisation agenda, supporting infrastructure improvements in transport, energy and carbon capture that are directly relevant to Avonmouth's future development.

Bristol City Local Plan

Bristol City Council is currently working on an update to the Local Plan, which will reflect new priorities including climate resilience, housing delivery, and inclusive economic growth. This update is part of a broader effort to align with regional strategies and national planning reforms

Planning Policy Review

The South Gloucestershire Core Strategy 2006–2027 outlines a specific vision for Severnside as a key strategic employment location. It identifies Severnside as a Strategic Employment Area with an important economic role as a regionally significant employment location, particularly for distribution, logistics and manufacturing.

The strategy supports the continued development of Severnside to meet employment needs across the West of England.

The area benefits from existing planning permissions and is supported for further development, especially where it aligns with sustainability and infrastructure improvements.

Emphasis is placed on improving access, including road and rail links and ensuring flood risk management is addressed.

It is noted that developments must respect environmental considerations, in particular the Severn Estuary's international environmental designations (e.g., Ramsar, SPA, SAC) and proposals must include mitigation measures to protect biodiversity and manage environmental impacts.

In essence the Core Strategy includes policies to:

- Safeguard Severnside for employment use.
- Support infrastructure delivery (e.g., drainage, transport).
- Encourage green infrastructure and sustainable design.

9.5 Identification of Consents and Permits Required

In consultation with the LPA and rail freight operators, the expectation is that a detailed planning application to the LPA is required. Operational permits are not expected to be required. Approval from Network Rail according to their PACE process will be required for new track and signalling, potentially aligned with a Phase 2 operation if the RFT were to grow from 3 trains per day, to say, 6

trains per day. Network rail consent is not expected for a day 1 operation but confirmation in terms of train paths will be necessary.

An overview of the planning application components and rationale is set out below.

Consent	Comment
Full/Detailed Planning Permission	Required for new buildings, infrastructure and changes of land use. Submitted to Bristol City Council or South Gloucestershire Council, depending on the exact site location. If location A it would fall within South Gloucestershire Council. If the site falls under historic consents (e.g. SG4244, 1957 ICI Consent), some development may be permitted without full new applications, subject to conditions.
Preliminary Environmental Impact Assessment (PEIA)	Identifies significant impacts and identify if a full EIA is required.
Environmental Impact Assessment (EIA)	May be required due to the scale and potential environmental impacts and sensitive receptors, however, it is felt this will be unlikely.
Transport Assessment	Required to evaluate the impact on local and strategic transport networks. Must include rail connectivity, HGV movements and integration with existing infrastructure.
Flood Risk Assessment	Avonmouth lies in a flood-prone area; any development must demonstrate resilience and mitigation measures.
Land Contamination and Remediation	Historic industrial use may require investigation and remediation of contaminated land.
Ecological and Biodiversity Surveys	Required to assess impacts on protected species and habitats, especially near the Severn Estuary.
Highways and Access Consent	Coordination with National Highways and Network Rail for access, sidings and loading infrastructure
Permits for Hazardous Materials (if applicable)	If the RFT is likely to handle materials like CO_2 (as proposed in the 7CO_2 project), therefore additional permits from the Environment Agency may be required.

Table 16 Consent Register

9.6 Stakeholder Considerations/Feedback

Consultations were held with South Gloucestershire Council and the West of England Combined Authority to gain an understanding of the policy landscape, which is notably complex due to overlapping regional priorities, evolving legislative frameworks and the interplay between local and national strategic objectives. These discussions helped to identify key policy drivers, constraints, and opportunities that would shape the direction and implementation of the project

9.7 Conclusions

The proposed RFT at Avonmouth is situated in a region with significant environmental sensitivities, particularly due to its proximity to the Severn Estuary. This area is protected under multiple international and national designations, including SPA, SAC, Ramsar, and SSSI, which safeguard habitats for migratory birds and unique ecosystems. Additionally, the site is in a flood-prone zone, despite existing defences and development could heighten flood risks. Historical industrial activity also raises concerns about land contamination, necessitating thorough assessments and remediation plans.

A PEIA has been initiated, focusing on screening and scoping stages. Given the scale of the development, approximately 8 hectares and its potential to cause significant environmental effects, a full Environmental Impact Assessment (EIA) may, but is unlikely, to be required. That said, key areas identified for further investigation include air quality, noise and vibration, biodiversity, flood risk and traffic impacts. The site's industrial context and distance from sensitive receptors will help mitigate impacts, but more detailed studies are essential.

From a planning perspective, the site may not benefit from historic consents, such as the 1957 ICI permission, meaning new planning approval is likely necessary. However, the project aligns well with national and regional strategies that promote modal shift from road to rail, aiming to reduce emissions and congestion. Local planning frameworks also support logistics development in the Avonmouth-Severnside area, provided environmental safeguards are in place.

Operationally, the RFT offers substantial benefits. It could remove up to 384 HGVs from roads daily, significantly reducing traffic congestion and carbon emissions. Estimated annual CO_2 savings could reach over 25,000 tonnes, with rail freight producing up to 76% less CO_2 per tonne-kilometre than road haulage. The impact is greater if it can be used to take vehicles off the road between Avonmouth and the Southwest.

Reducing traffic volumes, including HGVs, can significantly ease congestion across key transport corridors. This not only enhances air quality and road safety but also frees up capacity within the transport network. Such improvements create opportunities for new forms of development, including housing, community infrastructure and green spaces, which may have previously been constrained by traffic-related limitations.

By shifting freight movement to more sustainable modes, such as electrified rail or consolidated logistics hubs, valuable road space can be reclaimed. This enables planners to bring forward housing allocations and other developments that support inclusive growth and improved accessibility. The approach aligns closely with Bristol's broader sustainability goals, promoting cleaner transport and more efficient land use.

Overall, reducing HGV traffic contributes to unlocking future growth potential. It supports policy objectives aimed at driving economic development, enhancing transport connectivity and creating more liveable urban environments.

Mitigation and enhancement strategies are recommended to ensure environmental performance and sustainability. These include flood resilience measures, habitat creation, sustainable transport infrastructure, and noise and visual impact mitigation.

Although the RFT is a relatively small development within a broader industrial landscape, its cumulative impact, especially on traffic, must be considered. The availability of such a terminal may help nearby businesses mitigate their own environmental impacts.

9.8 Next Steps

There are several next steps that fall out of the Environmental and Planning Feasibility. These are outlined below:

Immediate Actions

Update and continue with the PEIA and engage a qualified environmental consultant to revise the PEIA as the project design progresses.

If the PEIA indicates significant environmental effects, initiate a full EIA, however, it is unlikely that a full EIA will be required.

Mitigation Planning

Consider implementing, in addition to mitigation that results from the PIEA, measures such as:

- CTMP: Mitigate short-term construction-related traffic impacts.
- SWMP: Address waste generation during both construction and operation phases.

Planning and Policy Alignment

- Clarify Planning Permission Requirements: It is believed that a new planning approval is needed, however, this needs to be formally confirmed.
- Policy Integration in Design Phase: Align project design with national, regional, and local planning priorities.
- Prepare a detailed Consents and Permits Register: Identify required consents, responsible authorities, timelines, and interdependencies.

10 FINANCIAL AND ECONOMIC APPRAISAL

Objective of this Chapter

- *Overview of the financial considerations in delivering and operating an RFT*
- *The economic benefits associated with an RFT at Avonmouth*

Deliverables

- *Financial and Economic Appraisal as a chapter in this report*

10.1 INTRODUCTION

This chapter sets out the key aspects of the financial and economic considerations for the project. The financial aspects include the financial arrangements to secure the project's delivery and an assessment of the operational sustainability. The economic appraisal here provides the framework for the assessment of wider economic benefits occurring because of the delivery and operation of the project.

10.2 FINANCIAL CONSIDERATIONS - DEVELOPMENT

Usually, RFT's are funded by the local development gain associated with warehousing at scale. The quantum of new development is deemed insufficient to justify planning contributions from future growth of warehousing within Severnside. The development costs must therefore be financed through a combination of operational income and external public capital funding support.

Key elements of the development costs are expected to include:

Land, either on a long leasehold or freehold basis. The terminal is expected to require 8 hectares of land. The expectation is that all land will need to be purchased by the project. The options for who purchases the land can be addressed at the next stage but it may be necessary for the public partners to assemble the land and consents required for the project and either finance the delivery of the project or procure a delivery and operation partnership with the industry.

Consenting (pre-development costs), the pre-development process will rely on two key components:

- **Scheme design and operational confirmation** - the design to confirm pathing and operational viability, as well as construction delivery and pre-tender cost plans
- **Planning Strategy -** the studies and surveys required to support a detailed planning application

Development Costs, the tendered sum to deliver the project. The contingency will be linked to the form of contract, to be agreed. Regardless of the approach to pricing, a client contingency, appropriate for projects of this type, will be required. Further work is required to build the rationale for client contingency.

The project could be delivered in two phases on the basis that the infrastructure investment is proportionate to the level of operational use. Phase 1 could be a two track RFT accommodating 3 trains per day. A Phase 2 project could be to add two additional sidings to allow the efficient operation of 6 trains per day.

10.3 Financial Considerations - Operational Model

A high-level operational model has been prepared to support the assessment of viability and the extent to which an RFT is profitable, such that it could support a lease payment to the RFT developer. Section 8 sets out the key aspects of the terminal model and financial considerations.

10.4 Economic Impacts

To justify any public investment, the level of economic value has to exceed the public sector investment. A key aspect of the next phase of this project is a full 'Five Cases' Business Case which sets out the basis for the financial considerations and the necessary investment from the public sector. A key component of the Value for Money (VfM) Assessment (as set out in the Department for Transport Value for Money Framework May 2025) is the Benefit to Cost Ratio (BCR). The BCR is the ratio of the present value of benefits over the present value of costs. The VfM is assessed by the BCR and illustrated in Table 17 below.

Value for Money Categories	
Very high	4.0 or above
High	2.0 to less than 4.0
Medium	1.5 to less than 2.0
Low	1.0 to less than 1.5
Poor	0 to less than 1.0
Very Poor	less than 0

Table 17 Value for Money Categories

The central value for carbon dioxide saved is £260 per tonne in 2025 prices, as set out in the Government's policy paper 'Valuation of greenhouse gas emissions: for policy appraisal and evaluation'. If 25,000 tonnes of carbon are saved by converting HGV miles to rail, the economic benefit of the carbon reduction would be £6,500,000.

In addition, the Sensitive Lorry Mile approach to assessing the benefits of transport investments provide a way of valuing impacts such as reduced collisions, reduced congestion, and reduced local pollution. The result always provides a high value for mode shift benefits for freight. Although we have not assessed the value of SLM benefits, thy would typically comfortably exceed investment and operating costs.

The operational model suggests that the operational incomes can support the terminal investment costs leaving the land as the public sector contribution. Although the land value is unknown, the likely land value requirement would suggest a public contribution would achieve at lease a 'High' value for money assessment based on modal shift (including carbon) and other benefits.

The DfT Value for Money Framework provides the basis for the assessment of economic benefits and how these benefits can be monetised as part of a Value for Money assessment. The HM Treasury's Green Book 2022 and the Transport Analysis Guidance (TAG) transport appraisal process provide the basis for calculating benefits. The assessment should be undertaken by an experienced transport economist.

In broad terms, the project is expected to generate economic benefits from its own operations and from wider transport and freight operations benefits to local warehousing providers and logistics firms.

Direct project economic benefits include:

- **Employment during construction,** the direct and indirect jobs supported on site and through the supply chain during the construction period.
- **Employment during operation**, the direct and indirect jobs created by the operations of the RFT
- **Modal shift** (congestion, CO_2, accident/collisions), the economic value of moving goods via rail vs road. The benefits are modelled based on HGV miles avoided and relate to the wider benefits to relieving congestion, reducing carbon emissions and other negatives associated with accidents and collisions.

Along with the assessment above, but not duplicating any assumptions, there are a series of wider benefits, which will be assess in the project business case, these include:

- reductions in strategic highway congestion which directly increases productivity and potentially unlock capacity for growth in other sectors
- proximity to an RFT (which reduces freight transport costs or improves reliability) has the potential to increase the attractiveness and utilisation of existing warehousing in Avonmouth, driving throughput and job creation.
- proximity to an RFT (which reduces freight transport costs or improves reliability) has the potential to drive the pace of development of the remaining development plots across Avonmouth, accelerating economic development and local job growth. Future developments that could benefit from the RFT are set out in Table 8.

10.5 Local Benefits and Impacts

Strong government and policy support for RFTs results from an understanding of the strategic environmental and economic benefits of modal shift. But are these benefits also reflected locally?

In the case of a terminal in Avonmouth the modal shift impact is very clear. All of the warehouses in the area are currently being served by road. Broadly this comprises trunk haulage to and from ports or logistics hubs, and then more local or regional deliveries to customers / from suppliers.

Introducing a rail terminal will mean that a proportion of these road movements could switch to rail – the forecast is for around 384 lorry trips per day to be saved. Obviously the last few hundred meters would be by road. This would reduce traffic on some roads but also increase traffic near the terminal.

However there would be important second order benefits locally including:

- It would be much easier to haul these short distance local deliveries by battery powered HGV
- The start of the delivery journey would be the local rail terminal. Without rail, the start of the journey would be, for example, Felixstowe or Daventry. That means that deliveries by rail would never be early or late. Early or late deliveries add to traffic as trucks circulate waiting for their slot. Local deliveries would not need to park before or after delivery. Local deliveries could react to local incidents such as road closures. A busy rail terminal will significantly reduce the impact of HGVs locally.
- Access to a rail terminal provides an alternative transport option for local businesses. Even businesses that do not use rail are considered in Treasury guidance to have an economic benefit in terms of now having choice.

10.6 CONCLUSIONS

An RFT in Avonmouth is determined to be operationally viable and generate a contribution to the development costs.

The project's construction costs are expected to be supported by the operational incomes. A grant from the public sector is required to assemble the land and under-pin the delivery. Delivery options will be evaluated at the next stage but the delivery options would allow an appraisal of the role required from the public sector including land assembly, gap funding, and scheme delivery. In all options, the operations would be undertaken by an existing freight operator.

In support of the public sector investment, a VfM Assessment should be undertaken to determine the monetised economic benefits and the case for public investment in value for money terms. Transport projects tend to drive high value for money assessments and the expectation is that an RFT in Avonmouth could be supported with a positive BCR.

11 RISK ASSESSMENT

Objective of this Chapter

- *To outline the key risks at this stage of the project and outline mitigations to be considered as part of future project phases.*

Deliverables

- *Risk Assessment Chapter in the Final Report*

11.1 INTRODUCTION

The development of a RFT in Avonmouth presents a range of opportunities but also carries inherent risks due to its environmental sensitivity, industrial legacy and complex planning landscape. This Risk Register provides a structured overview of the key risks identified at this stage of the project, covering environmental, technical, planning, financial and stakeholder-related factors.

Each risk is assessed in terms of its potential impact and likelihood, with suggested mitigation strategies to reduce or manage exposure. The register is intended to be a live document, updated regularly as the project evolves and should inform decision-making, stakeholder engagement, and design development. It supports proactive risk management and helps ensure that risk mitigation is embedded into future phases of the project.

The process for identifying risks was woven into the tasks undertaken within the overall feasibility study, including:

- Questions were included as part of the stakeholder engagement relating to risk and mitigation
- The data and analysis produced as part of the feasibility work were used to identify risks and mitigations. This was undertaken as an iterative process by creating a Risk Register.
- A high-level assessment of the impact and likelihood of those risks occurring and the suggested mitigation strategies. This will allow for prioritisation of risk, based on impact and likelihood.

As future phases of the project are agreed, the risk register needs to identify risk owners, together with a view of timescales for mitigations.

11.2 RISK REGISTER

The following is the Risk Register as completed at this stage of feasibility.

Risk	Risk Title	Risk Description	Likelihood	Impact	Risk Rating	Mitigation
R1	Last Mile	A dispensation may be required for transporting goods between the rail terminal and customers on the industrial estate. Without it, transport costs could rise significantly (from £20 to £120), negatively affecting the project's CBA. While Maritime Transport has indicated this may not be a major barrier, the outcome remains uncertain.	Medium: Dispensation is not guaranteed, though stakeholders suggest it's not a significant blocker.	High: A fourfold increase in transport costs could materially affect the project's viability and value for money.	Medium	Engage early with relevant authorities to clarify licensing requirements and explore alternative transport arrangements if needed. Document Maritime Transport's position to support the case for dispensation.
R2	Reduced Demand Due to Short Rail Distances	While short-distance rail freight is technically feasible, it typically relies on existing infrastructure and is used primarily to maximise the utilisation of existing assets. In the absence of such infrastructure, demand for short-distance rail services may be limited, potentially affecting the viability of the proposed terminal.	Medium: Demand may be constrained unless existing assets can be leveraged or new efficiencies demonstrated.	Medium – Reduced demand could affect the business case and long-term sustainability of the terminal. However it is only one market for the terminal.	Medium	Explore opportunities to integrate with current logistics operations to enhance asset utilisation and justify short-distance rail use. Discuss with Southampton Port.
R3	Impact on Bristol Port Business Model	The development of a new rail freight terminal could disrupt the ports existing business model. However, it also presents an opportunity to enhance the port's attractiveness by improving rail connectivity, potentially increasing its competitiveness Site I: Severn Road Per day and market reach.	Low to Medium – Depends on how the terminal is integrated with existing port operations and stakeholder engagement.	Medium – Potential for both negative disruption and positive strategic gain.	Low-Medium	Engage early with the Bristol Port to align objectives, explore partnership opportunities and ensure the terminal complements rather than competes with existing operations.

Risk	Risk Title	Risk Description	Likelihood	Impact	Risk Rating	Mitigation
R4	Rail Diversionary Route	The rail diversionary route is in place one weekend out of every six, which could affect operations. However, operational workarounds are feasible, making this a low-risk issue.	Medium – The diversionary schedule is known and predictable.	Low – Minimal disruption expected due to effective operational planning.	Low-Medium	Incorporate diversionary route schedule into operational planning and maintain flexibility in service timetabling.
R5	Road Infrastructure Capacity	There is a risk that the project may face political opposition due to perceived negative impacts on the local road network. This is a sensitive issue that could influence stakeholder support and planning approvals.	Medium – Concerns about traffic impacts are common in infrastructure projects and may gain traction locally.	High – Political resistance could delay or obstruct project progress.	Medium - High	Engage proactively with local authorities and communities to communicate the project's benefits, including potential reductions in road freight. Include traffic impact assessments and mitigation strategies in early planning.
R6	Uncertainty Around Project Funding	The source of funding for the project is currently unclear. While alignment with the emerging Local Growth Strategy may offer opportunities, the strategy is still in development. Reliance on funding from WECA presents a risk if their priorities or budgets do not align with the project.	Medium to High – Funding strategies are not yet confirmed, and WECA funding is not guaranteed.	High – Lack of secured funding could delay or prevent project delivery.	High	Monitor the development of the Local Growth Strategy and engage with WECA and other potential funders early to align the project with regional priorities and secure financial backing.
R7	Capacity Constraints	There may be conflicts between passenger and freight services due to limited rail network capacity, particularly during peak travel times. This could restrict freight train scheduling and reduce operational flexibility. Future rail capacity may be constrained if passenger service extensions are implemented, reducing freight slot availability e.g. Severn Beach Line, Metrowest to Brabazon, extend Severn Beach line services towards Bristol Parkway .	Medium – Capacity pressures are common on mixed-use rail lines, especially during peak hours.	Medium – Could limit freight service frequency or reliability if not managed effectively.	Medium	Explore off-peak scheduling for freight services and engage with Network Rail to assess and optimise available capacity. Perform a comprehensive timetable analysis to assess: Daily train path usage, peak vs off-peak availability, potential conflicts between freight and passenger services.

Risk	Risk Title	Risk Description	Likelihood	Impact	Risk Rating	Mitigation
R8	Lack of Gauge Clearance Beyond Exeter	The rail route beyond Exeter is not currently cleared to the required freight gauge, limiting the potential reach and efficiency of services. Full gauge clearance would significantly enhance the strategic value and connectivity of the proposed terminal.	High – Current infrastructure limitations are known and unresolved.	Medium to High – Limits the geographic scope and flexibility of freight services, reducing potential benefits.	High	Engage with Network Rail to explore future gauge clearance plans and assess the feasibility and cost of infrastructure upgrades.
R9	Land ownership	There is a risk of complex access charges which will impact the cost/benefit of any operation.	Medium	Low to Minimal - there are rules to access and charges monitored by ORR	Low-Medium	Understand ownership of the potential sites.
R10	Land ownership	Land ownership appears to be split between Severnside Land Distribution Ltd and the Walters Group for the Priority site. Formal confirmation is pending via land registry or legal review. This may add complexity to the project viability.	High – it is likely that is the case.	Medium to High – could restrict the design and preferred site location.	Medium-High	Initiate legal and land registry review to confirm ownership. Maintain communication with both parties to ensure alignment during planning.
R11	Competition for land	There is significant demand for land in the preferred site area, particularly from competing sectors such as manufacturing, and renewable energy. This may result in competition for the location, potentially delaying acquisition, increasing costs, or limiting the scale of logistics development.	High	Medium to High – could restrict the design and preferred site location.	High	Identify opportunities to combined site uses where there are synergies and potential partnerships.
R12	Infrastructure	Current layout requires two run round manoeuvres, increasing time and cost and potentially affecting service efficiency. Train length constraints may influence terminal design.	High	Medium to High – could restrict the design and preferred site location.		Conduct a detailed technical assessment of track layout and operational requirements. Consider alternative configurations during the detailed design phase to minimise inefficiencies.

Risk	Risk Title	Risk Description	Likelihood	Impact	Risk Rating	Mitigation
R13	Land ownership	Control of the neighbouring bulk terminal is expected to change, potentially impacting operations, access and costs.	High – it is likely that is the case.	Medium-Low - restrictions options, however this is not the preferred locations	Medium-Low	Engage with the current and incoming terminal operators to understand transition timelines and operational implications. Establish coordination protocols to ensure future compatibility.
R14	Capacity Constraints	Wider rail capacity issues, principally the Severn Tunnel, and Westerleigh Junction (near Yate) – both known capacity constraints on the rail network.	Medium – Capacity pressures are common on mixed-use rail lines, especially during peak hours.	Medium – Could limit freight service frequency or reliability if not managed effectively.	Medium	Work with Network Rail to establish the implications of this and potential options. Support and align with regional and national infrastructure improvement programmes that target capacity enhancements at key pinch points.
R15	Capacity Constraints	Planned CO_2 rail freight terminal will introduce new, regular freight flows, which may affect network capacity and integration.	Low - it is likely that the CO_2 project is longer term and could be managed.	Low - early evidence suggests there is sufficient capacity for both activities (subject to passenger services).	Low	Maintain active engagement with 7CO_2, the port and Network Rail. Ensure evolving plans for both the CO_2 terminal and the RFT project are aligned and integrated into broader infrastructure and operational planning, which may include phased introduction of services.
R15	Market Demand	Insufficient demand or commitment from existing tenants may undermine project viability.	Medium - market analysis indicates high demand.	High - would impact financial sustainability of the project.	Medium-High	Engage Early with Market: Reach out to potential users to assess interest and secure early commitments. Design for Flexibility: Use modular infrastructure to allow phased development and reduce upfront costs. Offer Commercial Incentives: Provide attractive lease terms and support packages to draw anchor tenants. Build Strategic Partnerships: Collaborate with freight operators to integrate the terminal into wider logistics networks.

Risk	Risk Title	Risk Description	Likelihood	Impact	Risk Rating	Mitigation
						Use Demand Modelling: Apply tools like the Polaris Terminal Viability Model to test scenarios and refine the business case.
R16	Delivery	Commercial and construction risks associated with the delivery contract.	Medium - risk allocation and contingency necessary to accommodate design and delivery risks	Medium - appropriate contingency and pro-active risk management should allow any unresolved risk impacts to be managed	Medium	Engagement with qualified PM/EA/QS and rail designers to prepare a detailed risk register with cost risks identified and reported throughout. General contingencies and optimism bias will be initially high and worked through into an acceptable pre-contract position.

Table 18 Risk Register

11.3 Conclusions

There are many technical and project risks associated with a complex infrastructure project of this nature. The key risks are understood to be:

- **Landowner consent -** at the time of this report we were unable to determine if the proposals for an RFT have the support of the landowners. Addressing this is the essential next step.
- **Business case -** it is likely that the business case for implementation will require public funding and attracting such funding is a material risk until such time as it is secured.
- **Delivery** - commercial risks associated with contractor delivery and range of construction risks (cost, programme, supply) that are typical for a project of this type.

11.4 Next Steps

As future phases of the Rail Freight Terminal (RFT) project in Avonmouth are confirmed, the risk register must evolve to reflect increasing complexity and accountability. Each identified risk should be assigned a clear risk owner—an individual or team responsible for monitoring, managing and reporting on that risk. This ensures accountability and enables timely decision-making.

In addition, the register should include indicative timescales for implementing mitigation measures. This allows project teams to prioritise actions, track progress and align risk management with key project milestones. Where appropriate, mitigation timelines should be linked to design stages, stakeholder engagement activities, or regulatory submission deadlines.

This structured approach supports proactive risk management, improves transparency and helps ensure that risks are addressed before they escalate or impact project viability.

12 CONCLUSIONS AND RECOMMENDATIONS

12.1 INTRODUCTION

This section summarises the key findings from the preceding analysis and outlines recommended next steps to support the successful progression of the project. Drawing on stakeholder input, technical assessments and strategic considerations, the recommendations aim to address identified risks, enhance deliverability and ensure alignment with broader planning and infrastructure objectives. The actions proposed are intended to guide decision-making and support the development of a robust, well-informed proposal.

12.2 CONCLUSIONS

The assessment confirms a strong strategic case for developing a rail freight terminal in Avonmouth, underpinned by stakeholder engagement, infrastructure improvements, and regional logistics growth.

Demand and Feasibility

Consultation with stakeholders and analysis of market conditions indicate clear potential demand for a rail freight terminal. Two major developments have shifted the feasibility landscape:

- Warehouse Expansion: The scale and pace of warehousing development in the Avonmouth area have created a critical mass of logistics activity, increasing the relevance of rail freight as a viable transport mode.
- Gauge Clearance: Recent infrastructure upgrades have resolved previous limitations, making rail access technically feasible for modern intermodal freight services.

Site A has emerged as the preferred location due to its strategic positioning and physical suitability. However, two key uncertainties remain:

- Landowner Engagement: The attitude and willingness of the primary landowner to engage in the project is yet to be confirmed.
- Rail Operational Feasibility: While initial assessments suggest manageable challenges, further technical validation is required.

A secondary option, involving a terminal within the port is technically feasible and lower cost but presents limitations in terms of space, strategic fit, and long-term scalability. However, this could provide an interim solution.

Operational Strategy

The proposed terminal is designed to be scalable and responsive to demand:

- A three-train-per-day operation is expected to cover operating costs, providing a sustainable starting point.
- A six-train-per-day scenario offers profitability, enabling contributions to capital expenditure or land acquisition costs.

The infrastructure allows for phased development, beginning with two tracks and expanding to four, and potentially starting with reach stackers and expanding to RTGs when required. These would ensure flexibility and future-proofing.

Planning and Environmental Context

The planning environment is broadly supportive, aligning with regional and local development aspirations. While environmental sensitivities exist, particularly due to proximity to protected habitats, these are considered manageable through appropriate mitigation measures. A formal Environmental Impact Assessment (EIA) may not be required but should be screened to ensure compliance and stakeholder confidence.

Benchmarking and Case Studies

Evidence from comparable rail freight terminals reinforces the viability of the Avonmouth proposal:

- iPort Doncaster has exceeded expectations in train volumes and is undergoing expansion.
- East Midlands Gateway has become a key national hub with strong modal shift outcomes.
- Northampton Gateway has demonstrated rapid uptake and operational success shortly after opening.

These examples illustrate the potential for Avonmouth to replicate similar success, particularly if infrastructure is delivered ahead of demand.

Economic and Strategic Benefits

The terminal is expected to deliver a range of benefits:

- Direct Benefits: Job creation during construction and operation and measurable reductions in road freight through modal shift.
- Indirect Benefits: Improved regional connectivity, enhanced business resilience and potential to unlock housing and commercial development by alleviating congestion.
- Initial modelling suggests the terminal could remove up to 384 HGVs per day from the road network, contributing to carbon reduction and easing pressure on the strategic road network.

12.3 Next Steps

The following outlines the key next steps, structured around a set of strategic principles:

- **Proceeding iteratively**, addressing each constraint to avoid wasting time on undeliverable options
- **Acting decisively** to capture first-mover advantage in linking the South West with the Golden Triangle and major ports.
- **Planning for phased delivery**, scaling investment in line with confirmed demand.
- **Aligning strategically** with national freight and decarbonisation policies to strengthen funding bids.
- **Maintaining optionality** by developing both Site A and one dockside alternative to final business case stage.
- **Embedding resilience**, through proactive risk management, diversified funding and sustained stakeholder collaboration.

In order to do this a number of specific actions that need to be undertaken.

The programme timeline is expected to span approximately three years from the start of work on consenting, with phasing as outlined in Chapter 9. However, before entering the consenting phase, several key next steps must be considered.

The central focus during this preparatory stage is the development of a robust business case, a clear understanding of the delivery model and the progression of the scheme design.

To progress towards the consenting phase and ensure successful delivery, the following key areas require focused action:

- Secure landowner consent
- Address key operational questions
- Develop the project business case
- Agree the delivery model
- Agree a planning strategy
- Agree a scheme design
- Continue to engage stakeholders

Confirmation of landowner support

Further engagement with the landowner to confirm support and the expectation of land value. This should be formalised either through an Option Agreement or some other form of confirmation acceptable to project partners. Connected to this is confirmation of the delivery route (i.e. who would enter into an Option Agreement). This may also need to include pursuing alterative site locations, for example at the Port.

Address Operational Concerns

To take development of a terminal at this location forward, some further initial high-level assessments would be required including:

- An operations study to assess whether additional freight could be accommodated by a timetable recast or limited investment in resignalling
- An initial engineering assessment of the potential to extend the Severn Beach run round and to construct a new curve to the Hallen Branch.

Business Case Development

Aligned to the development of the business case, there should be a reasonable expectation that the quantum of public funding is available. The cost of the business case itself is relatively minor in the pre-development cost plan but the technical studies required to confirm the key aspects are not. In general terms, the business case would secure the following:

- case for an RFT in this location, addressing key constraints and dependencies
- key options, including delivery options (the exploration of options for purchase, pre-development, delivery and operation)
- financial, further testing with partners on the financial viability and funding delivery
- the value for money assessment of public investment as well as setting out the basis for public, social and economic benefits
- the contractual arrangements necessary to secure delivery alongside an assessment of the commercial risks and their allocation and mitigation
- the management arrangements necessary to achieve the project outcomes and impact

Delivery Model

The Economic Case within the Business Case would explore the role of key stakeholders including:

- Local Authority (South Gloucestershire Council)

- West of England Combined Authority (WECA)
- Western Gateway Sub-national Transport Body

The project should consider the long list of delivery options and evaluate these against the project's Critical Success Factors to determine the preferred option. Options should consider the following:

- Can the consents and funding be packaged in such a way to allow the private sector to acquire, develop and operate?
- Is there a role for the public sector to undertake pre-development works at risk?
- Should the public sector be in a control position, with regard to the land, early, such that it is secured and that element of the project de-risked?
- Are the construction and delivery risks such that the public sector would either need to undertake them, or they can be contained such that the private sector can accommodate them?
- What delivery and operational models have been achieved elsewhere, and to what extent are they useful considerations for an RFT at Avonmouth?
- Engage with relevant bodies to identify **funding mechanisms** and understand **application processes**.

Planning Strategy

- Prepare a planning strategy to set out the scope of work necessary to secure detailed planning submissions.

Scheme Design

Crucial to the next step is the development of the project itself, such that there is an agreed design for the project that can be costed and programmed. As well as considering the core operational design, the scheme can explore support functions such as **HGV parking**, **EV charging infrastructure**, and **energy supply**.

To ensure the design is viable in terms of train access, the project should undertake an **Operational Capacity Study** to assess:

- Current and future network capacity.
- Passenger growth aspirations.
- Integration with strategic projects (e.g., CO_2 reduction initiatives).
- Identify infrastructure, scheduling, and service improvements to meet projected demand.
- Engage with WECA on Passenger Growth Planning to ensure freight needs are incorporated.
- Develop a joint framework or working group to coordinate freight and passenger planning, ensuring freight access and capacity are protected in future upgrades.

Stakeholder Engagement

Maintain ongoing dialogue with stakeholders to ensure **transparency, alignment** and **responsiveness**.

Plan for a **formal consultation process** to build support and gain deeper insights into demand, particularly from **end users**, to better understand their aspirations.

APPENDIX 1: PROJECT INCEPTION REPORT

APPENDIX 2: PROJECT PRESENTATION

APPENDIX 3: COST MODEL ASSUMPTIONS

Capital Costs				
			Unit Cost 2025	Total Cost
Storage Area	0.98	Hectares	£ 1,400,000	£ 1,365,000
Internal Track	2,200	Metres	£ 1,400	£ 3,080,000
Internal Roadways	1,100	Metres	£ 280	£ 308,000
Rail Points	8	Units	£ 56,000	£ 448,000
Crane Rails	1500	metres	£ 1,400	£ 2,100,000
Lighting / Drainage etc.			£ 1,400,000	£ 1,400,000
Total				**£ 8,701,000**
Terminal Common Facilities				
Access Roads	500	Metres	£ 392	£ 196,000
Gateway	1	Unit	£ 280,000	£ 280,000
Admin Building	1	Unit	£ 1,400,000	£ 1,400,000
Access Tracks	500	Metres	£ 1,960	£ 980,000
Exchange Sidings	0	Points	£ 78,400	£ -
	-	Metres	£ 1,960	£ -
Common Track (terminal only)	750	Metres	£ 1,960	£ 1,470,000
Common Points (terminal only)	2	Units	£ 78,400	£ 156,800
Signalling	-	System	£ 700,000	£ -
Total Common Facilities				**£ 4,482,800**
Grand Total				**£ 13,183,800**
Cranes	2	Cranes	£ 4,000,000	£ 8,000,000
Operating Costs				
Labour	Number		Annual Cost	Total Cost
Common Facilities				
Manager	1		£ 80,000	£ 80,000
Security	4		£ 40,000	£ 160,000
Admin	4		£ 40,000	£ 160,000
Crane Operators	7.5		£ 50,000	£ 375,000
Others	6		£ 40,000	£ 240,000
Maintenance				

Common				
Building	1	Unit	£ 70,000	£ 70,000
Track	1,250	Metres	£ 75	£ 93,750
Roads	500	Metres	£ 140	£ 70,000
Grounds	1	Hectares	£ 30,000	£ 30,000
Cranes	2	Cranes	£ 120,000	£ 240,000
Track	2,200	Metres	£ 75	£ 165,000
Roads	1,100	Metres	£ 140	£ 154,000
Storage	0.98	Hectares	£ 30,000	£ 29,250
Crane Lease				
	2.00	Cranes	£ 348,738	£ 697,476
Other Costs				
Crane Energy	4	Kwh/lift		
Energy Cost	0.0867	£/ KWh		
Charges				
Lifts	Per Unit			
Train to Trailer	£ 30			
Train to Stack	£ 30			
Storage				
Free Days	1			
Rate Per Day	£ 15			

APPENDIX 4: TERMINAL CASE STUDIES

Case Study: iPort Rail – Driving Modal Shift in Doncaster

Overview

iPort Rail, located within the iPort logistics hub in Doncaster, is a state-of-the-art inland rail freight terminal that exemplifies the strategic integration of rail into modern supply chains. Developed by Verdion, the terminal is part of a broader multimodal logistics park designed to support sustainable freight movement across the UK.

Strategic Importance

Situated close to the East Coast Main Line, iPort Rail offers direct rail connectivity to major UK ports including Southampton, Felixstowe, Immingham, and Teesport, as well as access to European markets via the Channel Tunnel. This location enables efficient inland distribution and supports businesses seeking to reduce road freight dependency.

Operational Highlights

Daily Intermodal Services: Regular services connect iPort Rail to key maritime gateways, facilitating containerised freight movement.

Infrastructure Capacity

- 800m reception siding
- Two 400m handling sidings
- Storage for up to 3,000 TEUs
- Capability to handle 775m trains (maximum UK length)
- Flexible Handling: Equipped with reach stackers and designed to accommodate a range of cargo types including automotive, steel, energy, and retail goods.

Sustainability and Modal Shift

While many warehousing-focused businesses have yet to prioritise decarbonisation, iPort Rail positions itself as a forward-looking solution. Its integration into the iPort logistics park encourages modal shift from road to rail, aligning with future sustainability goals and reducing carbon emissions.

Expansion and Future Growth

In 2024, Verdion initiated Phase 2 of iPort Rail's development:

- Doubling terminal size and storage capacity
- Increasing daily train accommodation
- Enhancing operational flexibility for diverse freight sectors

Completion was in Q1 2025, reinforcing iPort Rail's role as a national freight hub and a catalyst for sustainable logistics.

Lessons for Avonmouth

The success and expansion of iPort Rail demonstrate the value of investing in rail freight infrastructure ahead of widespread industry decarbonisation. For locations like Avonmouth, this case highlights the importance of anticipating future logistics priorities and building capacity that supports long-term modal shift.

Case Study: East Midlands Gateway – A Strategic Rail Freight Interchange Driving Sustainable Logistics

Overview

The SEGRO Logistics Park East Midlands Gateway (SLPEMG) is a 700-acre multimodal logistics hub located near Castle Donington, Leicestershire. Officially opened in 2020, it integrates rail, road, and air freight—situated adjacent to East Midlands Airport and junction 24 of the M1 motorway. Operated by Maritime Transport, the site is recognised as a Nationally Significant Infrastructure Project (NSIP).

Strategic Importance

EMG is positioned within the UK's logistics "Golden Triangle," offering direct rail access via a dedicated 3.5 km branch line to the Castle Donington freight line. This enables connectivity to major UK ports including Southampton, Felixstowe, London Gateway, and the Channel Tunnel, supporting both domestic and international freight movement.

Operational Highlights

Rail Capacity:

- Up to 16 daily intermodal services
- Trains up to 775 metres in length
- 24/7 operations

Storage & Handling:

- Over 5,000 TEU container capacity
- Reach stackers and container handlers for efficient turnaround
- Tenants: Includes Amazon, DHL, Kuehne + Nagel, XPO.

Sustainability and Modal Shift

EMG plays a pivotal role in reducing road freight dependency:

- Rail freight is 76% more carbon efficient than road haulage2.
- The terminal helps remove thousands of lorry journeys annually, contributing to improved air quality and reduced congestion.

Its development aligns with national goals for net-zero logistics and supports the UK's modal shift strategy.

Expansion and Future Growth

The terminal has doubled in capacity since opening, with additional intermodal loops and expanded container storage.

Maritime Transport has invested in a dedicated maritime intermodal division, enhancing service frequency and operational resilience.

Planning consent exists for up to 15 million sq ft of logistics space, representing £1 billion in future investment.

Lessons for Avonmouth

EMG demonstrates how strategic investment in rail freight infrastructure can:

- Enable long-term modal shift
- Support decarbonisation goals
- Attract high-profile tenants
- Deliver regional economic benefits
- For Avonmouth, EMG offers a blueprint for integrating rail into logistics planning, even before decarbonisation becomes a top priority for warehousing businesses.

Case Study: SEGRO Northampton – A Strategic Rail Freight Interchange Driving Sustainable Logistics

Overview

SEGRO Logistics Park Northampton (SLPN) is a 450-acre strategic rail freight interchange located adjacent to Junction 15 of the M1 motorway in Northamptonshire. Developed by SEGRO and operated in partnership with Winvic Construction, the site integrates rail and road freight and is recognised as a Nationally Significant Infrastructure Project (NSIP). The terminal is designed to support modal shift and sustainable logistics.

Strategic Importance

SLPN is positioned along the West Coast Main Line via the Northampton Loop, offering direct rail connectivity to major UK freight routes. Its location near the M1 enables efficient road distribution across the Midlands and beyond. The site supports national logistics strategies by facilitating rail-based freight movement and reducing reliance on HGVs.

Operational Highlights

Rail Capacity:

- 35-acre intermodal rail terminal
- Trains up to 775 metres in length
- Direct access to the West Coast Main Line

Storage & Handling:

- Up to 6 million sq ft of warehousing
- Units ranging from 100,000 sq ft upwards
- Designed for 24/7 logistics operations

Sustainability and Modal Shift

SLPN plays a key role in supporting the UK's modal shift strategy:

- Each train can remove up to 76 HGV journeys
- All units built to net-zero carbon standards
- Over 60,000 trees and 30,000 shrubs planted
- 80 acres of parkland and 18 km of footpaths for community use
- The terminal contributes to reduced emissions, improved air quality, and aligns with national decarbonisation goals.

Expansion and Future Growth

SLPN is designed for long-term scalability:

- Planning consent for full build-out of warehousing and infrastructure
- Major road upgrades including the Roade bypass and M1 Junction 15 improvements
- Expected to create up to 7,500 jobs across logistics, construction, and operations

Lessons for Avonmouth

SLPN demonstrates how strategic rail freight investment can:

- Enable long-term modal shift
- Support net-zero logistics goals
- Deliver regional economic uplift
- Integrate environmental and community benefits
- For Avonmouth, SLPN offers a blueprint for embedding rail into logistics planning, ensuring future resilience and sustainability in freight operations.