WATERSIDE RAIL RE-OPENING

STRATEGIC OUTLINE BUSINESS CASE

February 2021

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Executive Summary

This is the Strategic Outline Business Case (SOBC) prepared by Hampshire County Council (HCC), with input and support from Network Rail, that appraises whether there is a case for restoring passenger rail services along the Waterside branch line linking Totton with Fawley in accordance with Department for Transport (DfT) Transport Appraisal Guidance (TAG).

The proposed scheme is to re-introduce passenger rail services to the existing freight only line between Totton (where it connects onto the South West Main Line) and Fawley, as shown on the map below. This would include rebuilt stations at Marchwood and Hythe, and a new parkway style station referred to as Hythe and Fawley Parkway. A long list of station calling points and six train service options was sifted down to three shortlisted options. For each of these three shortlisted options, the rail infrastructure requirements have been quantified and costed, rail timetabling analysis and multi-modal transport modelling has been undertaken to understand train service and transport user impacts. This analysis has then been used to conduct an assessment of Value for Money (VfM).

Source: Three Rivers Community Rail Partnership

This is one of ten schemes being appraised as part of the Department for Transport (DfT) Restoring Your Railway (RYR) Ideas Fund Round 1 programme.

The purpose of this SOBC is to:

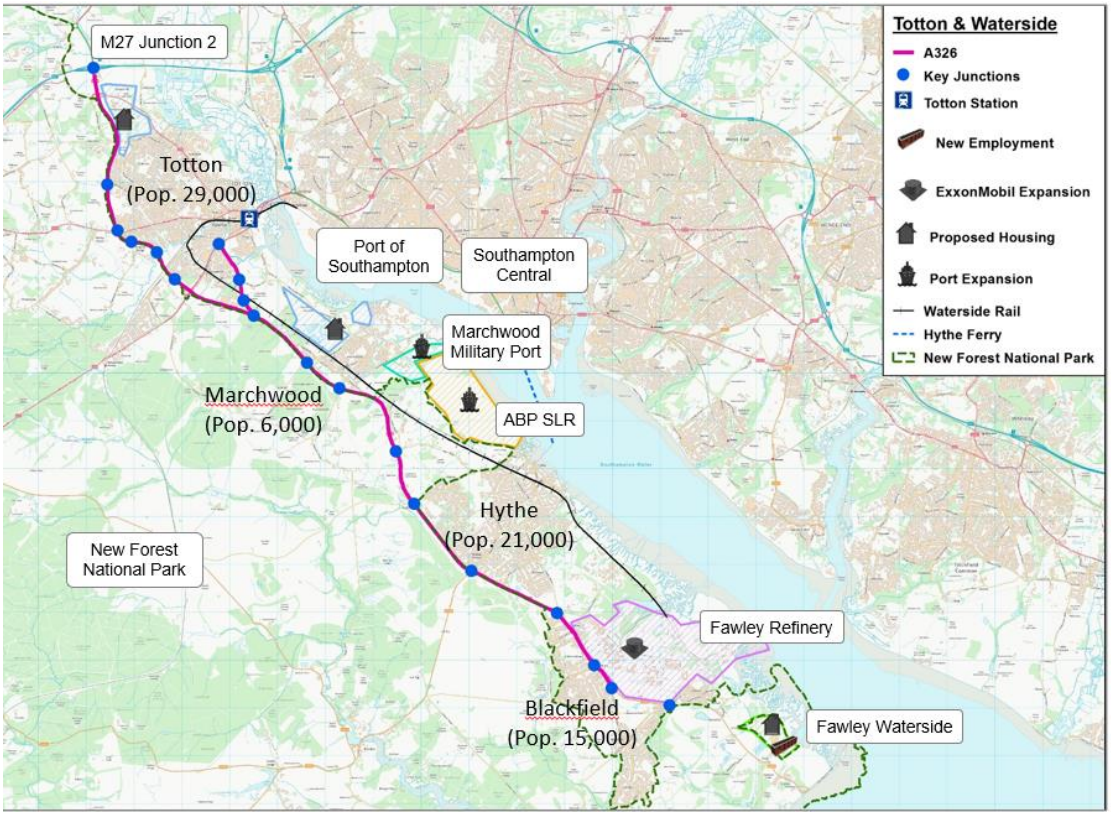
- define the scope of the project and its outputs and benefits;
- make the case for change by identifying the transport issues facing the Waterside area and why doing nothing (i.e. not investing in transport improvements) is not desirable;

- confirm the strategic fit with the DfT's business plan and wider Government objectives;
- state the assumptions made on future useage and forecast future levels of travel demand with and without a re-opened railway and assess overall Value for Money (VfM) – i.e. whether the benefits exceed the costs;
- set out how achievements would be measured if a scheme were to be delivered;
- outline options, including innovative options, to tackle the problem and carry out an initial sift of options;
- consider and confirm that a robust project governance structure is in place and that the project is affordable;
- outline the sequence in which the project and benefits will be delivered;
- identify and analyse its stakeholders; and
- confirm the assurance arrangements that would be applied to future development and delivery of the proposed scheme.

The Strategic Case – The case for change

The problem

The Totton and Waterside area is shown in the map below. It forms the eastern part of New Forest District in Hampshire, and is located on the western side of Southampton Water. It contains 75,700 residents[1]. The 46,700 residents who live in the Waterside area (which encompasses the urban areas of Marchwood, Hythe and Dibden, Holbury, Blackfield and Fawley) face transport connectivity challenges due to the area's limited road connectivity and capacity. The A326 forms the primary link between the Waterside area, western parts of Totton and the strategic road network and in conjunction with the A35 is used to access the city of Southampton, where 7,064 (18% of) working age residents of Waterside work[2].



[1] HCC 2018 Population estimates
[2] 2011 Census Travel to Work data

In the other direction, 4,427 Southampton residents daily commute to work in the Totton and Waterside area.

The A326 is built to single carriageway standard through the Waterside area and for the majority of its' route around the west side of Totton. The busiest section (near Hounsdown) is used by nearly 26,450 vehicles per day, which is forecast to increase to almost 44,000 per day by 2036. It is frequently congested and this causes reduced journey time reliability which disrupts journeys by both private car and bus. Car travel is the dominant modal choice. The proportion of journeys to work made by bus by Waterside residents is lower than the average for Hampshire, and the mode share of commuter trips by private car at around 80% is above average.

A factor behind this is that journey times by bus are not competitive compared to those by private car taking twice as long from the Fawley area to Southampton City Centre. Poor air quality is also a major issue for the City of Southampton, which has been mandated to create a Clean Air Zone. High numbers of car journeys into the city centre via the A35 from the Waterside area is a contributor to this. Problems of journey time reliability and congestion on the A326 and routes into Southampton are forecast to worsen as a result of planned growth. By 2026, journey times on A33 Millbrook Road West are forecast to increase by 127% compared to current levels.

The opportunity

The New Forest Local Plan includes 4,000 new homes earmarked for the Waterside and Totton area. This includes 1,500 new homes and 2,500 new jobs on the site of the former Fawley Power Station. Additional housing development is planned in Totton (1,000) and Marchwood (1,000). Expansion of Fawley Oil Refinery is also planned. Additionally, proposals for the potential expansion of Southampton Port, owned by ABP, onto land at Dibden Bay are in the process of being developed and Solent Gateway (the former Marchwood Military Port) has plans to intensify use of its wharves and facilities. These expansions will generate an increase in the number of freight movements to and from the Waterside area via the A326.

If public transport alternatives such as a passenger rail service were to be restored, then this would ease the pressure on the A326 and the A35 Redbridge Causeway and A35 Redbridge Road/A33 Millbrook Road West into Southampton City Centre, all of which experience significant peak hour congestion.

At present the Fawley branch line is used by a small number of freight services going to Marchwood Military Port on an ad-hoc basis. Regular rail freight services to the refinery ceased in 2016. The line is also used for temporary storage of commercial freight wagons.

Scheme Objectives

Options have been considered in how well they contribute to the following four objectives:

a) Enhance connectivity between the Totton and Waterside area and Southampton, both for commuting and for travelling further afield;
b) Foster social inclusion by provision of improved access to education, employment and key services for those without access to a car;
c) Deliver a sustainable modal shift from the car to public transport; and
d) Support planned economic growth in the Waterside area

Options Considered

A long-list of fifteen train service and eight station options was sifted down to a shortlist of three train service and three station options.

In terms of stations, under all three shortlisted options, the existing solid infill platform at Marchwood would be restored to passenger use, there would be a new Hythe Town station

in a location to the west of the former station, and a new Hythe & Fawley Parkway station with an initial 500 space car park to the west of the Fawley Refinery western boundary.

The three train service options shortlisted are:

- **'Low Cost' Option: 1tph Romsey via Eastleigh – Hythe & Fawley Parkway.** This option assumes diversion of the existing Romsey – Eastleigh – Southampton - Salisbury service, with a new separate Southampton - Salisbury service to backfill for this diversion. This would be a relatively low-cost adaptation of the existing service.
- **'High Connectivity' Option: 1tph Romsey via Eastleigh – Hythe & Fawley Parkway + 1tph Victoria – Hythe & Fawley Parkway.** This option combines extensions of the existing services from Romsey (with a Southampton - Salisbury backfill service) and extension of the service from London Victoria to Southampton, offering a half-hourly frequency on the Waterside line and maximises connectivity across Southampton but this option would require third rail electrification of the branch (the costs of which have been included in the economic appraisal for this option).
- **'High Frequency' Option: 3tph Southampton – Hythe & Fawley Parkway shuttle.** This option requires additional mileage and staff costs, as well as construction of an additional passing loop between Totton and Marchwood, and upgrading the signalling on Platform 5 at Southampton Central (a west facing bay platform) so this can be used for passenger trains in service. Although higher cost, this option may be more 'transformational' in terms of passenger demand potential. It may be possible to take a phased approach to delivering this option, beginning with an interim option with a lower passenger service frequency, that would see the additional passing loop delivered at a later date this and the frequency increasing to 3tph once demand has built up, which would help to keep the cost more manageable.

The rail infrastructure requirements assumed under each option are summarised below:

Service option	Southampton Central Platform 5	Passenger trains permitted to use Totton Goods Loop	Additional passing loop between Totton and Marchwood	Marchwood Up Platform	Electrification
Low Cost - 1tph[3] Romsey Extension	✗	✗	✗	✗	✗
High Connectivity - 2tph Romsey and Victoria Extension	✗	✓	✗	✓	✓
High Frequency - 3tph Shuttle[4]	✓	✓	✓	✓	✗[5]

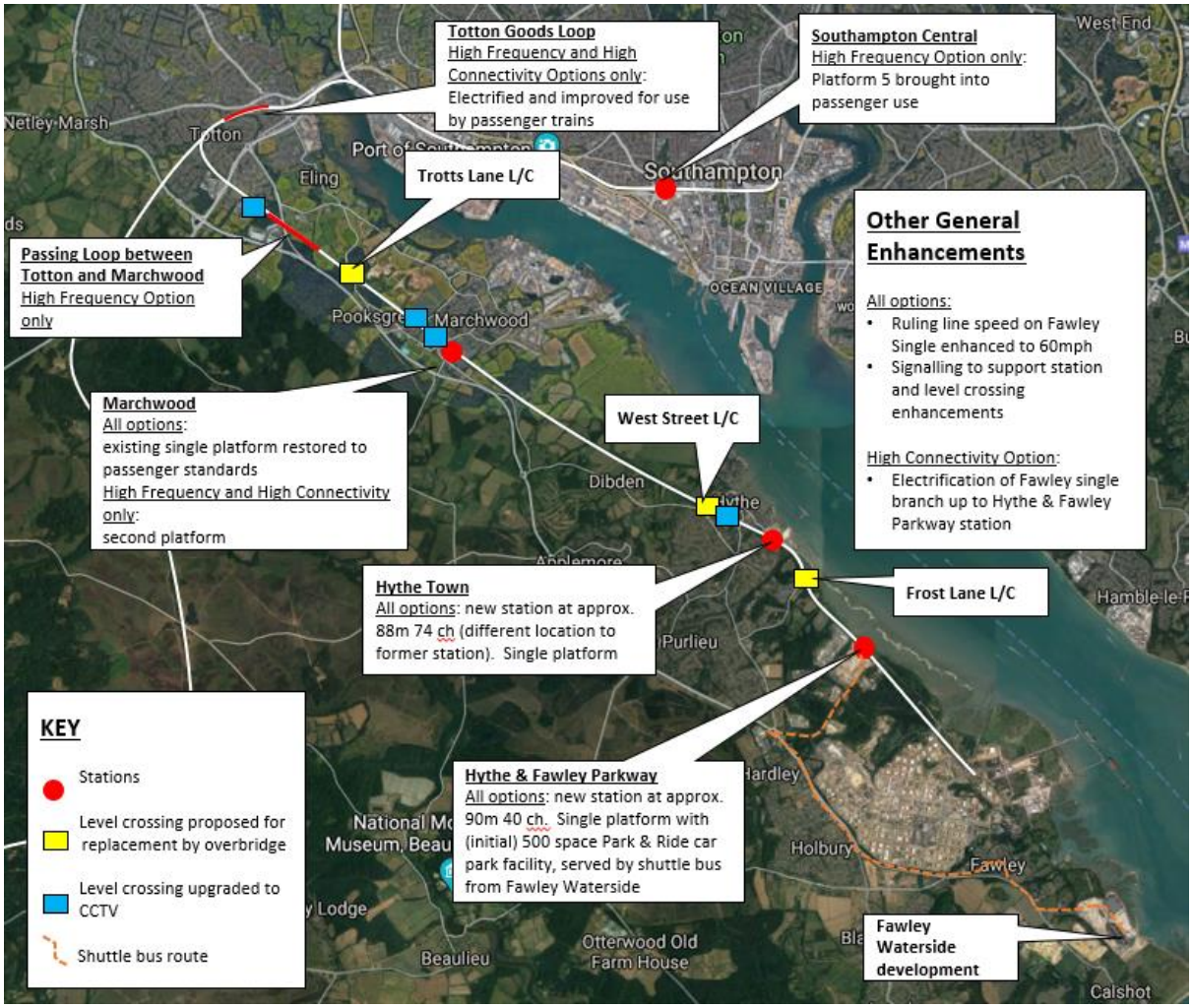
The line speed on the branch would be upgraded from 30mph to 60mph. For all three options, three level crossings would be replaced with overbridges and four level crossings

[3] tph = trains per hour

[4] A 2tph shuttle from Southampton Central – Hythe & Fawley Parkway has not been considered as part of the detailed operational assessment, but this option would require as a minimum the infrastructure works proposed for the 3tph shuttle. Platforming at Southampton Central would need to be examined in more detail

[5] Although electrification is not required, an electric variant could be considered.

would be upgraded to CCTV. The locations of these various infrastructure improvements are shown below.



The existing semaphore signalling along the branch would be replaced with a colour-light, track circuit block system.

In conclusion, the proposed three shortlisted options for the scheme are operationally deliverable and would improve connectivity to and from Waterside, helping to support labour markets and the local economy and support planned growth. The scheme is **supported by a robust case for change that fits with wider public policy objectives**.

The Economic Case – Value for Money

To demonstrate value for money (VfM) of the Waterside Rail re-opening scheme, transport modelling and appraisal has been carried out to assess the transport user impacts that would arise if it was to be delivered. The transport impacts were monetised in accordance with DfT's Transport Analysis Guidance (TAG).

Capital costs range from approximately £44m to £64m in 2Q20 prices, excluding Optimism Bias, depending on the option chosen and operating costs range from £1.8m to £3.7m per annum, in 2019/20 prices.

The transport impacts of the three shortlisted options were monetised across a 60-year appraisal period. The Solent Sub-Regional Transport Model (SRTM) – a multi-modal transport model covering the whole Solent area has been utilised.

The modelled benefits cover the following key areas:

- Time saving (journey time) benefits for transport users (transfer between transport modes only);
- Vehicle operating costs changes;
- User charges;
- Accident cost savings; and
- Greenhouse gas emission changes.
- Wider economic impacts, such as increased productivity and agglomeration, have not been included in the appraisal.

A connecting shuttle bus service (at same frequency as each of the train service tests) has been modelled between the Fawley Waterside development and Hythe & Fawley Parkway in each option. It has been assumed that the cost of running this is met by the developer and is free for passengers to use. HCC has received written confirmation of this from the developer.

Economic Appraisal analysis conducted using the SRTM and Transport Users Benefit Appraisal (TUBA) for the three scenarios found that:

Option	PVB	PVC	NPV	BCR
Low Cost (1tph Romsey extension with Salisbury backfill)	61,610	81,958	-20,348	**0.8**
High Connectivity (1tph Romsey extension with Salisbury backfill, plus 1tph extended Victoria service)	156,085	117,642	38,443	**1.3**
High Frequency (3tph Southampton - H&F Parkway, shuttle)	171,356	102,214	69,143	**1.7**

- Demand forecasts for the rail service range from 540,000 to 990,000 trips per year in 2036, not including any demand generation. Forecasts suggest that in 2036, the rail service would result in a reduction in car trips in 2036 of between 312,000 and 735,000 trips per year, helping to alleviate congestion on the busy A326 corridor;
- Central case BCRs for the scheme are estimated to range from 0.8 to 1.7, depending on the option. The Low Cost Option achieves Poor VfM (denoted by having a BCR of below 1.0). The High Connectivity Option achieves Low VfM (denoted by having a BCR of between 1.0 and 1.5) and the High Frequency Option achieves Medium VfM (denoted by having a BCR of between 1.5 and 2.0). A range of sensitivity tests have been carried out alongside this central case, including a low demand (Covid-19) sensitivity test that assumes demand is 33% lower than the Central Case. This takes account of the likelihood that the Covid-19 pandemic could have a long-term negative impact on rail passenger volumes, as more employees work from home regularly compared to before the pandemic or choose to travel by private car instead of rail. This Low demand (C-19) sensitivity test gave BCRs of 0.5 for the Low Cost Option, 0.8 for the High Connectivity Option and 1.1 for the High Frequency Option;
- Modelling suggests that the new Waterside passenger rail service will be highly abstractive from both the existing bus service and Hythe ferry. For social groups who are particularly reliant on these public transport services, such as either low-income groups or elderly people without access to a car, there is a risk that a reduction in bus frequencies could leave these social groups more isolated or needing to pay more in fares to use the rail service than current bus fares or using Concessionary

Travel passes and further consideration will need to be given to this issue as work progresses.

- The economic appraisal results indicate a similar or higher VfM is achieved compared with previous studies, despite revised, higher costs (that factor in upgrades to all level crossings) as a result of higher overall demand and hence public transport revenue.
- A qualitative assessment of the environmental impacts of the rail re-opening scheme using the seven-point scale in TAG guidance has been undertaken. This suggests that in the majority of cases, these impacts would be either 'slight beneficial' or 'neutral'. However, noise has been assessed as 'slight adverse'.
- A qualitative assessment of the accessibility and social inclusion impacts of the re-opening scheme using the seven-point scale in TAG guidance has been undertaken. This suggests the scheme would have a positive impact on journey time reliability on commuting, journey quality and option and non-use values. It also suggests that due to abstraction of demand from local bus services, the scheme would have adverse impacts on accessibility to services and social inclusion for some groups (such as low income households and those aged 66 and over) and is likely to result in increased localised severance as a result of increased level crossing barrier down time - further consideration will need to be given to these issue as scheme work progresses.
- Wider Economic Impacts (Level 2 and Level 3 impacts) have not been monetised at the SOBC stage, but could be considered at the OBC stage.

In conclusion, the 2tph and 3tph options appear to represent Value for Money and these options would merit more detailed development to refine capital and operational cost estimates to and undertake further economic appraisal as part of preparation of an Outline Business Case (OBC). At the OBC stage, the potential adverse impacts of the scheme on accessibility (through abstraction), social inclusion and severance (increased level crossing barrier down time) would need to be fully understood and ways of addressing and mitigating these impacts identified.

The Financial Case – Affordability

The total out-turn costs for the Waterside Rail Re-opening scheme, for each of the three shortlisted options has been calculated from cost estimates prepared by commercial teams.

Construction cost inflation of 18.5%[6] has been applied to convert 2020 prices into out-turn costs. The out-turn for each of the three shortlisted options (mid-construction point, 2025 Q2 prices) are:

Low Cost - £52.063m

High Connectivity - £75.895m (including third rail electrification costs)

High Frequency - £59.362m

The assumed construction cost profile is summarised below:

	2022/23	2023/24	2024/25	2025/26	2026/27	Total
Cost Profile	3.75%	20.35%	36.40%	36.40%	3.10%	100.00%

The outturn Cost profile for each of the three shortlisted options are summarised below:

[6] Source: BCIS General Civil Engineering Cost Index (quarterly index, 5 years' inflation applied from 2020 Q2 - 2025 Q2)

Low Cost	2022/23	2023/24	2024/25	2025/26	2026/27	Total (£m)	%
RNEP/NR	£1.85	£10.07	£18.00	£18.00	£1.53	£49.46	95%
Third party	£0.10	£0.53	£0.95	£0.95	£0.08	£2.60	5%
Total	£1.95	£10.59	£18.95	£18.95	£1.61	£52.06	100%
High Connectivity	2022/23	2023/24	2024/25	2025/26	2026/27	Total (£m)	%
RNEP/NR	£2.70	£14.67	£26.24	£26.24	£2.24	£72.10	95%
Third party	£0.14	£0.77	£1.38	£1.38	£0.12	£3.79	5%
Total	£2.85	£15.44	£27.63	£27.63	£2.35	£75.89	100%
High Frequency	2022/23	2023/24	2024/25	2025/26	2026/27	Total (£m)	%
RNEP/NR	£2.11	£11.48	£20.53	£20.53	£1.75	£56.39	95%
Third party	£0.11	£0.60	£1.08	£1.08	£0.09	£2.97	5%
Total	£2.23	£12.08	£21.61	£21.61	£1.84	£59.36	100%

This cost profile assumes that:

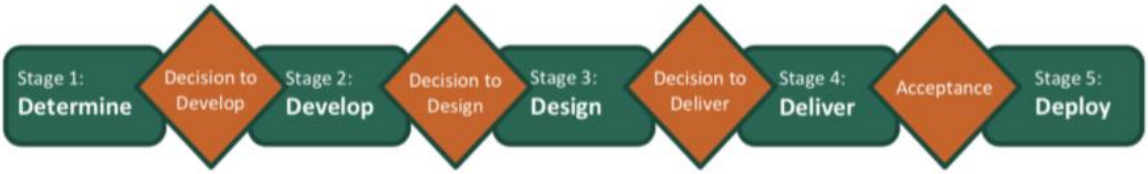
- Detailed design would commence in January 2023 and take 12 months to complete;
- Construction would commence in January 2024 (duration 28 months);
- Construction mid-point would be in March 2025 (14 months from construction start);
- Passenger services would commence in May 2026;
- Design team fees 15% of overall capex, spent at a consistent rate over the 12 months prior to construction start (15% assumption is consistent with the design fees calculated); and
- The remaining 85% has been treated as construction cost and spent at a consistent rate across the 28-month construction period.

In conclusion, the Waterside Rail re-opening scheme as a Restoring Your Railway scheme is **financially affordable**.

The Commercial Case – Viability

The physical works for this project essentially involve the upgrade of an existing freight railway to passenger standards, encompassing the construction of two new stations, safety improvements to some level-crossings (including potential replacement with bridges), and other works depending on the chosen solution. These works are largely confined to railway land owned by Network Rail.

If the DfT approves the scheme to move to the next stage of development – the Outline Business Case stage, it is envisaged that the Waterside Rail scheme would be progressed via the Rail Network Enhancements Pipeline (RNEP) process, with Network Rail acting as promoter. This scheme is currently approaching the 'Decision to Develop' gateway.



A preferred strategy for procurement for capital works would be identified by Network Rail (NR) during the Outline Business Case development stage. In line with NR processes, the preferred strategy would be selected in order to ensure that value for money is achieved, and that all procurement is compliant with all relevant processes and standards.

NR has a mature framework in place for managing contractors on major projects, fully audited to ensure they meet expectations around safety and sustainability.

It has been assumed that enhancement work to the highway network in order to serve the proposed rail stations, and at any locations where level-crossings are to be replaced by bridges, would be managed by HCC as the highway authority, in conjunction with the local planning authority New Forest District Council (NFDC). HCC has a range of procurement options open to it to deliver such works.

In terms of rail operating options, it has been assumed that the current Network Rail/Train Operating Company (TOC) arrangements would apply. Network Rail would maintain the track and signalling infrastructure and an existing TOC, assumed to be South Western Railway, would operate the train services on the Waterside rail branch

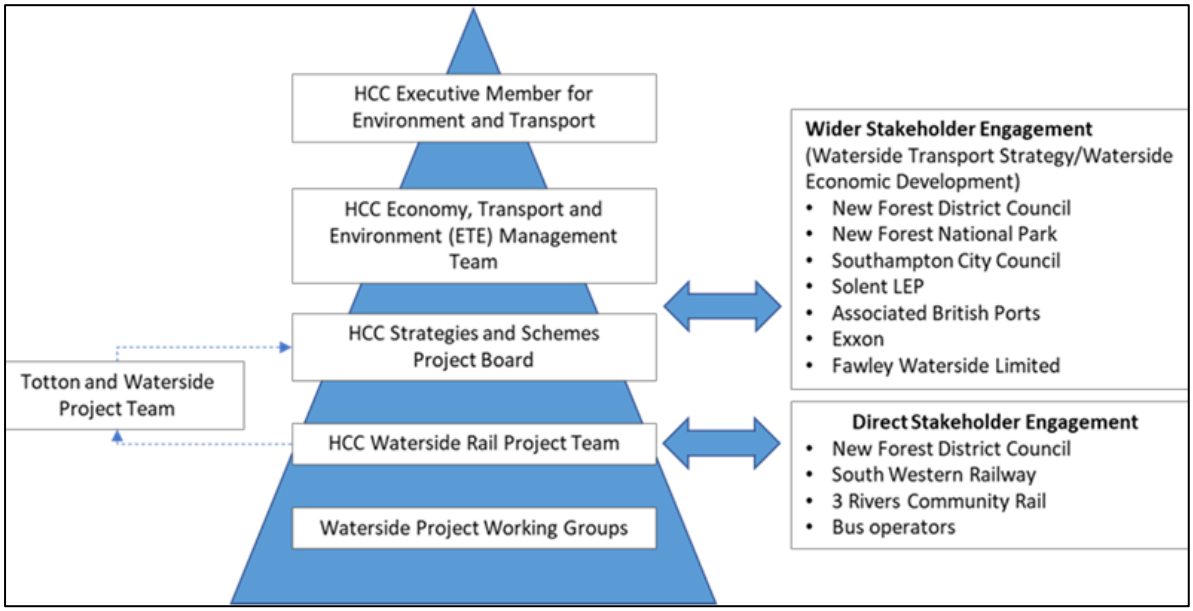
A risk register has been produced, which will be kept updated as further scheme development work is undertaken.

In conclusion, the Waterside Rail re-opening scheme is **commercially viable**.

The Management Case – Deliverability

Over the past ten years, both HCC and Network Rail have implemented a number of large-scale complex transport infrastructure projects to time and budget. These range from large improvements like East-West Rail, Reading Station upgrade, the Gosport-Fareham Eclipse busway, construction of a new Chandlers' Ford station and multi-modal transport interchanges.

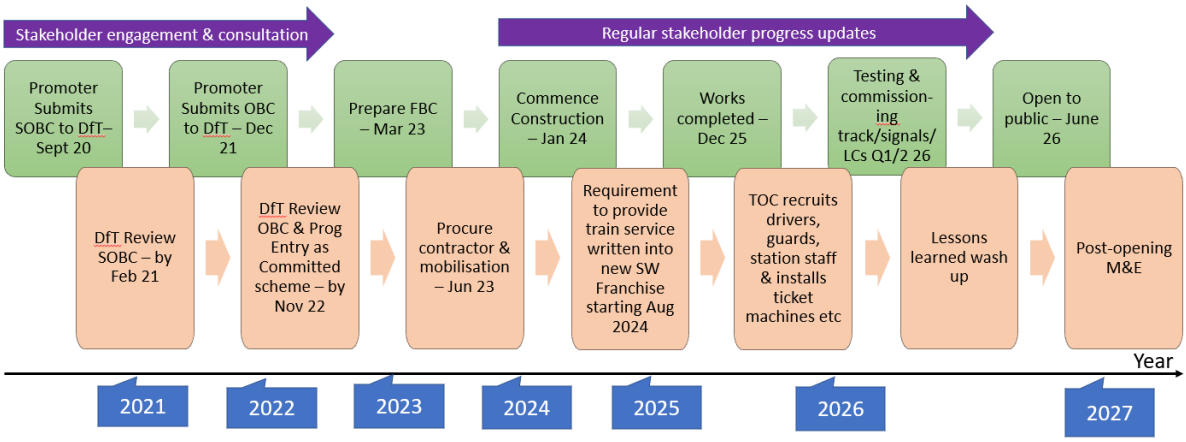
A clear governance structure has been developed to ensure political and close joint working between the DfT RYR team and NR and HCC. Monthly progress meetings have been held between these organisations. The diagram below summarises the current project governance arrangements for the scheme within HCC. The SOBC preparation process is being overseen by the HCC Strategies and Schemes Board to provide political oversight and provide direction on the development and implementation of the Waterside Rail re-opening scheme up to the point at which the responsibility for promoting the scheme is passed from HCC to Network Rail (post SOBC stage). If the DfT, having reviewed this SOBC, decide to progress the development of this scheme further, then it is assumed that the scheme would be added into the Rail Network Enhancements Pipeline (RNEP) process.



There are also key delivery partners such as South Western Railway and the bus operator Bluestar, that will be engaged.

Project risk will be actively managed according to best practice principles and the risk register will be updated on an iterative basis to reflect the design stage the schemes in the TCF Programme have reached.

An outline programme for delivery of the scheme has been developed, which is summarised below.



A communication plan has been developed by HCC which sets out the approach to managing and engaging with stakeholders and interested parties. This is a living document that will be regularly updated as the scheme evolves.

In conclusion, Network Rail and HCC have the necessary project management experience to deliver the Waterside Rail reopening scheme, hence it is considered **achievable**.

1. Introduction

The Totton & Waterside area has a population of 75,700 people[7]. It accounts for 42.5% of the population of New Forest District. This sub area is comparatively young compared to other sub-areas of the District, with higher proportions of people in the child (0-15yrs) and working age groups. The population density in this area is notably higher at 9.1 people per hectare and reflects a mostly urban landscape.

The Waterside area of eastern New Forest is on the western side of Southampton Water. It faces transportation challenges as car travel is the dominant modal choice despite limited road connectivity and capacity. The A326 forms the primary link between the area's towns and the strategic road network, bypassing Hythe, Marchwood and Totton then linking to the M27 at Junction 2.

The A326 is frequently congested and this disrupts car and bus journeys. Despite heavy investment by over recent years by main bus operator Bluestar in its bus fleet, offering customers in the Waterside area both a good frequency of bus services and a range of ticketing products, bus use remains low. A factor behind this is that journey times by bus are not competitive compared to those by private car. Committed investment through the Transforming Cities Fund will improve bus journey time reliability and speed up journey times, but a significant differential will still remain.

As the Strategic Case in Chapter 3 will explain, a significant amount of growth is planned in the Totton and Waterside area which will increase the overall demand for travel to and from the area, which will see vehicular trips using the A326 increase. The busiest section (near Hounsdown) is used by nearly 30,000 vehicles per day, which is forecast to increase to almost 44,000 per day by 2036.

Over the last 11 years, there have been various calls to re-open the freight-only railway line from Totton to Fawley for passenger use. The first such call was made in 2009 by Association of Train Operating Companies (ATOC) - the predecessor to today's Rail Delivery Group. Their report "Connecting Communities: Expanding Access to the Rail Network" identified the Waterside line as one of 14 potential rail re-opening schemes within England that should be pursued. It performed well in the analysis, because the track infrastructure was in place in and use. Since then, a series of other studies have been carried out.

In 2011 and 2013, Hampshire County Council (HCC) undertook feasibility studies (to the equivalent of Network Rail GRIP 3 level of detail) to explore the costs and benefits of potential re-opening of the line for passenger use to establish whether or not this proposal would represent Value for Money (VfM). This concluded re-opening the line for passenger use was technically and operationally possible, the scheme had a good strategic case and

[7] Source: ONS, Mid Year Estimates,2017.

strong community support. However, the costs of the scheme would outweigh the benefits, with a BCR of 0.7, so the scheme was not progressed further.

In November 2017, HCC agreed an Interim Waterside Transport Policy statement which stated that:

- The preferred route for access to and from the Waterside peninsula is the A326; which continues to be heavily congested and needs improvements to accommodate future growth in the area;
- If Southampton Port expands to the site near Marchwood, it requires direct access from the A326 to avoid traffic building up in residential areas;
- The port expansion will also need to consider further freight routes that use the branch, which were not considered in previous work (although this has since been addressed by the Network Rail study);
- Appropriate bus, cycle and walking improvements should be provided;
- Any future transport plans for the area must consider the impact on the Air Quality and the emerging Clean Air Zone designations.
- The 2013 Halcrow study indicated that Waterside Rail re-opening (based on a shuttle train service did not represent good Value for Money), having a BCR of less than 1; therefore, the stated HCC position on reopening passenger rail services on the Waterside remains unchanged (that no further work should be carried out by HCC to develop the scheme) until further evidence is forthcoming.

Part of the purpose of this SOBC is to review the most up to date evidence and transport modelling information to look afresh at whether a Strategic Case or a Value for Money Case now exists for Waterside Rail re-opening.

In 2018, Fawley Waterside Ltd, the developer of a large mixed-use development on brownfield land on the site of the former Fawley Power Station did a feasibility study. This concluded (as a result of quicker journey times and additional demand from the new development and evidenced by a BCR) there was now a stronger strategic and VfM case for re-opening the line.

In 2018/19 Network Rail were commissioned by ABP to undertake a pre-GRIP timetable study to investigate the infrastructure requirements and timetabling solutions for accommodating increased freight traffic on the Fawley branch to service a proposed expansion of Southampton Port onto the Strategic Land Reserve (SLR) site at Dibden Bay, in the Marchwood area. This study also considered the impacts of any future passenger services and how these could interface with freight. The results of this study are currently in draft but it concluded the base timetable can accommodate an additional 12 trains per day and further timetable paths (8 trains per day) could be accommodated to give a total of 20 trains per day. It was also considered operationally feasible to have a two train per hour shuttle on the Waterside line to Southampton Central.

Due to this increased quantum of local development, the emerging findings of wider transport work and the need to take a multi-modal approach to transport for the Waterside, HCC agreed in 2019 to re-look at the evidence base for Waterside Rail re-opening and develop a business case for the scheme if appropriate.

In March 2020, HCC submitted an Expression of Interest (EoI) to the DfT's RYR Ideas Fund for Waterside Rail re-opening. In June, HCC was advised that the scheme had been shortlisted to progress to the next stage of carrying out a feasibility study. This study was concluded in October 2020. It identified that there was a VfM case for re-opening. As part of this study, various options for passenger rail services were considered, and could either be provided in the form of a shuttle service or an extension of existing services that currently terminate at or run via Southampton. The findings of this feasibility study have been analysed and incorporated into this SOBC.

2. The Approach to this Business Case

2.1 Introduction

This document sets out the Strategic Outline Business Case (SOBC) for the reopening of the Waterside freight-only line from Totton to Fawley for passenger use to the Department for Transport (DfT) Restoring Your Railway Fund.

2.2 The Five Case Model

The purpose of this Strategic Outline Business Case is to provide evidence-based information in relation to the Waterside Rail re-opening scheme. It follows DfT's guidance for the preparation of Business Cases for Transport Schemes based on HM Treasury advice on evidence-based decision making as set out in the Green Book. It follows the best practice five case model approach to assess whether schemes:

- Are supported by a robust case for change that fits with wider public policy objectives – the 'strategic case';
- Demonstrate value for money – the 'economic case';
- Are financially affordable – the 'financial case';
- Are commercially viable – the 'commercial case', and
- Are achievable – the 'management case'.

The evidence gathered as part of this business case preparation process has been prepared using the tools and guidance provided by the DfT, notably TAG. This approach ensures that the evidence produced is robust and consistent for the Waterside Rail re-opening scheme. This applies equally to those options proposed for investment and those, which following sifting, will not be further developed.

2.3 Business Case Process

The process, of which this Strategic Outline Business Case forms part, usually takes place in three phases, summarised in Figure 2-1. Each phase includes the preparation of a business case that builds upon the evidence and information previously prepared with evidence reviewed to ensure it is up to date, and is followed by an investment decision point.

Figure 2-1– Three Phase Business Case Process

With award of any RYR funding or approval to progress to the next stage, our intention is to progress scheme appraisal to Phase 2 - the Outline Business Cases (OBC) stage.

The OBC for the scheme will:

- Confirm the strategic fit and the case for change of the scheme;
- Identify the preferred option and progress design work on this;
- Provide details of Value for Money and the overall balance of benefits and costs; and
- Set out further detail on the approach to procurement and project Governance arrangements

3. Strategic Case

3.1 Developing the Strategic Case

This subsection gives an overview of how we developed the Business Case including option generation, shortlisting and selection. These were formulated and undertaken following the guidance given in The DfT's TAG transport scheme appraisal process. Table 3-1 outlines the key steps as defined in TAG, how these were approached in the context of this SOBC, and where in this report relevant documentation can be found.

Table 3-1 – Summary of key TAG Steps Followed and location within Strategic Case

Key steps in TAG	How these were approached in this SOBC	Outcomes	Location within the Strategic Case
Step 1: Understanding the Current Situation	A range of socio-economic, demographic, and travel data (e.g. 2011 Census, ONS, BRES, traffic counts, public transport patronage, cycle counts), air quality monitoring and IMD data on deprivation for the Waterside area was analysed.	Series of Figures and Maps to show socio-economic and travel data.	Sections 3.2 and 3.4
Step 2: Understanding the Future Situation	Summarising data on forecast housing and employment and ABP future port freight growth as set out in regional and local strategy and policy documents. The Sub Regional Transport Model (SRTM) strategic modelling tool was used to produce forecast changes in congestion and journey times for 2026 2031, and 2036 in the Waterside area.	A series of forecasts on changes in vehicle flows, bus delays, future demand for public transport.	Section 3.3 (Policy Context)
Step 3: Establishing the Need for Intervention	Through a series of discussions with Network Rail, the DfT and other key stakeholders, the 'case for change' has been developed, utilising and applying evidence and forecasts from Steps 1 & 2 to refine and inform this logic and provide a clear, coherent rationale for Waterside rail passenger re-opening.	Case for change for Waterside Rail passenger re-opening established.	Section 3.4 (Case for Change – the problem); Section 3.5 (Impact of Not Changing); Section 3.13 (Drivers of Change)
Step 4: Identifying Objectives	HCC and Network Rail have taken account of their own policy objectives and priorities to develop a set of locally specific objectives for against which options for re-introduction of passenger rail services are to be assessed.	4 objectives have been agreed.	Section 3.8 (Identifying Objectives)
Step 5: Generating Options	Option assessment work involved scoping of a series of options for initial consideration.	15 train service and 8 station call options selected for sifting.	Refinement and selection of options is explained in Section 3.10 (Option Assessment)
Step 6: Initial Sifting	The 6 train service options were sifted down by scoring them against four criteria: 1. Operational viability; 2. Impact on existing rail services; 3. Abstraction from other public transport services; and 4. A financial assessment.	All options sifted using Multi-Criteria Analysis (Appendix C)	Sifting Process is explained in Section 3.10 (Option Assessment).
Step 7: Development and Assessment of Potential Options	Three options were subject to work to develop design and construction cost estimates and perform timetabling analysis.	Cost estimates developed for 3 options. The three were subject to economic appraisal using SRTM and TUBA.	Section 3.11 (Detailed Assessment of Shortlisted Options). Modelling of 3 options set out in Economic Case.

3.2 Background to the proposed Waterside Rail re-opening scheme

Over the last 11 years, there have been various calls to re-open the freight-only railway line from Totton to Fawley for passenger use. The first such call was made in 2009 by Association of Train Operating Companies (ATOC) - the predecessor to today's Rail Delivery Group. Their report "Connecting Communities: Expanding Access to the Rail Network" identified the Waterside line as one of 14 potential rail re-opening schemes within England that should be pursued. It performed well in the analysis, because the track infrastructure was in place in and use.

In 2011 and 2013, HCC undertook feasibility studies (to the equivalent of Network Rail GRIP 3 level of detail) to explore the costs and benefits of potential re-opening of the line for passenger use to establish whether or not this proposal would represent Value for Money (VfM). This concluded re-opening the line for passenger use was technically and operationally possible, the scheme had a good strategic case and strong community support. However, this study also found that based on the then levels of expected planned growth, the costs of the scheme would outweigh the benefits, with a BCR of 0.7. Given this, HCC decided not to progress the scheme further.

A Waterside Transport Study was carried out for HCC by consultants Atkins and completed in September 2017. The study collected and analysed data from across the area to form a detailed evidence base of the existing situation in the Waterside in terms of land use, travel patterns, transport facilities, traffic congestion hotspots, public transport, and relevant Policy background. It also assessed the forecast future travel demand in the Waterside area by way of strategic transport modelling and this was used to evidence the forecast future issues for all travel modes.

The Waterside study concluded that the A326 needs to be improved to accommodate planned growth on the Waterside and that there is a need to seek to improve cycling walking and bus facilities.

The findings of this study helped inform the adoption by HCC of a 'Waterside Interim Transport Policy' in November 2017. The Interim Policy sets out HCC's emerging view on transport infrastructure requirements for the Waterside area, to support the Local Planning Authorities in planning for strong and sustainable economic and housing growth, and to provide clear guidance on the scale and type of transport infrastructure developers may be expected to provide when development proposals come forward.

In 2018, Fawley Waterside Ltd, the promoter of a large mixed-use development on brownfield land on the site of the former Fawley Power Station did a feasibility study into reopening of the rail line for passenger use, which differed from previous studies in three ways. Alongside reopening Marchwood station, and providing a station at Hythe, this also considered a Parkway station near Fawley which would serve the Fawley Waterside development via a shuttle bus. The study assumed that the line speed would be increased from the current 30mph to 60mph and that all level crossings would be either closed (and replaced with an overbridge) or updated. This study concluded (as a result of additional demand from the new development and evidenced by a BCR) there was now a stronger strategic and VfM case for re-opening the line.

In 2018/19 Network Rail were commissioned by ABP to undertake a pre-GRIP timetable study to investigate the infrastructure requirements and timetabling solutions for accommodating increased freight traffic on the Fawley branch to service a proposed expansion of Southampton Port onto the Strategic Land Reserve (SLR) site at Dibden Bay, in the Marchwood area. This study concluded the base timetable can accommodate an additional 12 trains per day and further timetable paths (8 trains per day) could be accommodated to give a total of 20 trains per day. It was also considered operationally feasible to have a two train per hour shuttle on the Waterside line to Southampton Central.

Due to this increased quantum of local development, the emerging findings of wider transport work and the need to take a multi-modal approach to transport for the Waterside, HCC agreed to re-look at the evidence base for Waterside Rail re-opening and develop a business case for the scheme if appropriate.

In March 2020, HCC submitted an Expression of Interest (EoI) to the DfT's RYR Ideas Fund for Waterside Rail re-opening. In June, HCC was advised that the scheme had been shortlisted to progress to the next stage of carrying out a feasibility study – to assist in reconsidering the evidence base and case for rail reopening.

This study was carried out during 2020 and was completed in October 2020. It considered the transport user benefits based on the full pipeline of expected growth and identified that there was a positive strategic and VfM case for re-opening and that this was operationally deliverable taking account of timetable constraints. In the autumn of 2020, the DfT RYR team invited HCC to work with NR to prepare an SOBC for the scheme. This SOBC document draws on the analysis done within the 2020 feasibility study to appraise the case for re-opening in accordance with DfT TAG guidance and RYR guidance. If the DfT, having reviewed this SOBC, decide to progress the development of this scheme further then further work would be led by Network Rail, and this would need to consider more detailed issues aligned to whatever the preferred option becomes, relating to additional closure time at level crossings and impacts upon local buses and the local environment etc. If the DfT decide to progress the scheme to the next stage of development, it would be added into the Rail Network Enhancements Pipeline (RNEP) process.

3.3 The Strategic Context

South Hampshire is the most urbanised and highly populated area in the South East of England (outside London) and is a key gateway to mainland Europe via ferry services. The economy is worth about £30bn, of which 20% is driven by the maritime sector.

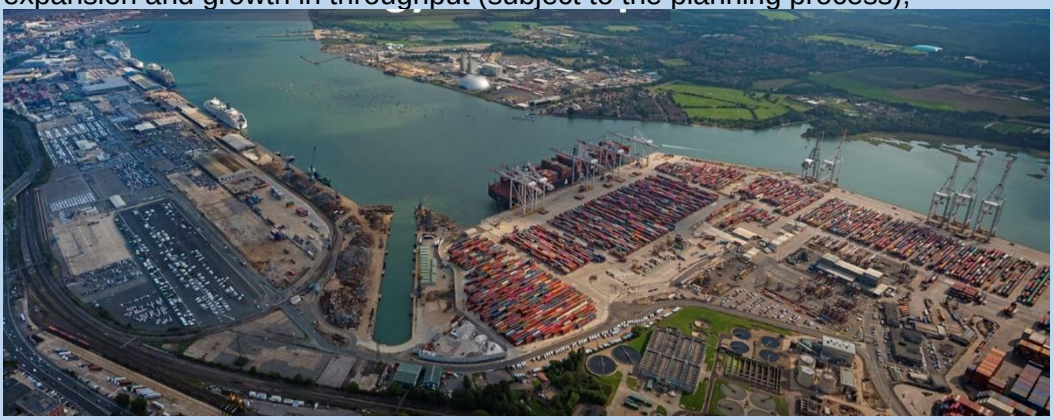
Figure 3-1 – Strategic Transport Connections between South Hampshire and other regions

In South Hampshire, there are three international transport hubs; namely the Port of Southampton, the Port of Portsmouth and Southampton International Airport, with excellent strategic road and rail connections to and from London, the Midlands and the North via the M3 and A34 and South West Main Line and Great Western Main Line via Oxford.

These international gateways represent key assets to the local and national economy, but act as significant traffic generators on the local network.

Box 1: Summary of Economic Role of Port of Southampton

- The Port of Southampton, overseen by ABP, stretches along Southampton Water and includes the oil terminal berths at Fawley) is a major economic driver for City Region employing 5,000 people locally, and for the wider UK – ensuring reliable access and connectivity to/from the port helps support local and national jobs;
- Taking into account supply chain impacts, there are 15,000 jobs nationally supported by the port, generating £71bn to the UK economy;
- Currently the UK's third busiest port, with plans to double throughput by 2036;
- It is the largest Port in the UK in terms of exports to non-EU markets, meaning that if new trade deals are struck with non-EU countries following the end of the Brexit transition period, Southampton is well placed to see growth, particularly in deep sea containers;
- Annually, 34.4m tonnes of cargo passes through it, including 1.9m containers (TEUs) in a 365 day 24 hour operation;
- It is the UK's number one vehicle handling port, handling in the order of 900,000 automotive units – which includes plant and machinery – every year;
- Alongside these freight flows, the Port is the UK's biggest cruise passenger turnaround port, with the four terminals used by Cunard, Princess Cruises, Royal Caribbean and other cruise operators and is an important cross-Solent ferry port for passengers, cars and freight travelling to and from the Isle of Wight;
- The Port has a Strategic Land Reserve on a site on Southampton Water between Marchwood and Hythe which is earmarked to be used to enable future Port expansion and growth in throughput (subject to the planning process);



- Whilst the Covid-19 pandemic has had resulted in no passenger cruise departures from the Port since March 2020, once most of the adult population have been vaccinated, it is expected that this industry will begin to recover, although it could take a number of years for cruise passenger numbers to return to pre-pandemic levels. Cross-Solent passenger volumes have also significantly reduced as a result of fewer cross-Solent car travel and commuting trips;
- Deep-sea intermodal container freight volumes have not been significantly affected by the pandemic, whilst the demand for automotive produces has reduced due to changes in consumer demand; and
- There will be a need for Port expansion, but due to the longer-term impacts of the pandemic, but will be necessary over a longer timeframe.

The natural coastal geography of the Solent is a challenge as it results in severance, longer travel costs and time and focuses 3.2m daily trips along the M27 corridor between Portsmouth with Southampton and trips from the Waterside area onto the A326. The M27 is an important strategic motorway used by people and goods wanting to travel to the Port,

Southampton City Centre, and employment and suburban areas in South Hampshire, including the Totton and Waterside area. Highways England have undertaken extensive modelling and assessment of the M27 corridor as part of the Roads Investment Strategy 1 2015-2020 Solent to Midlands Route Study. Sections of the M27 which is used by residents of the Waterside area to reach destinations beyond Southampton, are among some of the worst performing for journey time reliability in the South East.

Both the M27 and A326 are important connections that operates near or at capacity at certain sections at peak times and can be frequently impacted by traffic incidents. Both corridors have a large number of junctions in close proximity which experience congestion at peak times.

As volumes of time sensitive port-related freight movements increase as a result of forecast port growth, these important movements will be adversely affected by congestion and journey time variability, with the potential to impact adversely on the competitiveness and productivity of the Solent economy. The M27 and A326 should be an asset but is acting as a constraint on economic growth. The M27 is currently being upgraded to Smart Motorway between Junction 4 (the M3/M27 intersection) and Junction 11 (Fareham), which will help to improve journey time reliability on this strategically important corridor serving the Port and local trips.

The A326 plays an important role as a high-quality transport link that supports both local and national economic growth. It serves critical national infrastructure including: Fawley Oil Refinery; Marchwood Military Port; and is a gateway to the New Forest National Park (visited by circa 13.5m people each year). It also provides the only major road link between the Waterside settlements and employment and education opportunities within the wider South Hampshire area (including those within the City of Southampton).

On a local level the A326 is a key highway link connecting the Waterside area to Southampton with the wider strategic road network (SRN) at Junction 2 of the M27.The A326 is a Primary route of significant regional importance and has been designated as part of the Major Road Network (MRN). It provides a critical connection between the SRN and the communities and businesses located in the Waterside area along the western side of Southampton Water.

The Waterside area faces transportation challenges as car travel is the dominant modal choice despite limited road capacity. The reliable operation of the A326 and making effective use of the current freight only rail branch line will be essential to supporting the access to employment and quality of life of residents of the Waterside, and to enable the significant levels of growth planned for the Waterside to be achieved. Upgrading the freight only branch line to accommodate passenger rail services would significantly improve the utilisation of the existing freight only rail infrastructure, has the potential (with reopened and new rail stations) to connect the same settlements within Waterside that the A326 serves, and would offer Waterside residents and employees, a more attractive alternative to travelling by private car, by offering them faster journey times than travel by bus, helping reduce the pressure on the A326.

3.3.1 National Context

The **UK Industrial Strategy** (2017) identified five foundations of productivity which are "the essential attributes of every successful economy". Of the five foundations, two ‘Infrastructure’ and ‘Places’ are most relevant. The ‘Infrastructure’ foundation covers upgrading of the UK’s broadband, energy and transport infrastructure. ‘Places’ foundation seeks to deliver prosperous communities across the UK by tackling regional disparities in productivity and growth. A scheme which improves connectivity between the Waterside area, Southampton and other urban areas in South Hampshire would improve both transport infrastructure and places.

The DfT's **Transport Investment Strategy** published in 2017, outlines the government's four key objectives for transport infrastructure which are to:

- Create a more robust, less congested, and better connected transport network that works for the users who rely on it;
- Build a stronger, more balanced economy by enhancing productivity and responding to local growth priorities;
- Enhance the UK's global competitiveness by making Britain a more attractive place to trade and invest; and
- Support the creation of new housing.

As part of this the "rebalancing toolkit" has been produced to assist scheme promoters in explaining how their scheme contributes towards tackling regional disparities in productivity.

The Transport investment Strategy also published details on the creation of the **Major Road Network** in England as a way to respond to the transport challenges for economic growth. The MRN is part of a hierarchy for road infrastructure to bridge the gap in funding, provision and standards between the Strategic Road Network (SRN) managed by Highways England, and the Local Road Network (LRN) managed by Local Highway Authorities.

The MRN is focused on the most important strategic local authority controlled 'A' Roads that are heavily trafficked, this aims to provide improved connectivity across England by filling in the gaps in the SRN. The DfT have identified a network that consists of 4,200 miles of SRN and a further 3,800 miles of MRN combining to 8,000 miles of strategically important road in England. This is supplemented by the remaining LRN in both rural and urban areas.

Following consultation in 2018 the DfT has released the proposed MRN to the Sub-Regional Transport Bodies along with a call for funding through the new National Roads Fund. In the Totton and Waterside area, the proposed MRN includes:

- A326 from Junction 2 of the M27 to Hythe/Fawley; and
- A33 Redbridge Road-Millbrook Road West-Mountbatten Way-West Quay Road from junction with M271 (located to the east of Totton) to Dock Gate 4 of the Port of Southampton Eastern Docks.

Both of these MRN corridors currently experience significant traffic volumes and congestion at peak times, which is forecast to increase as a result of background traffic growth and new trips from new development.

The DfT's **Restoring Your Railway Ideas Fund** was announced in February 2020, and sets out that the Government would welcome proposals for projects to restore lost rail connections to communities. These proposals could include:

- upgrading a current freight line to include passenger services and restoring stations on it - such as the line to Ebbw Vale in South Wales;
- restoring track and services to an old alignment - as is being done between Bicester and Bletchley; and
- modifying an old route due to construction or other unavailability over the original route.

HCC made a submission to the Ideas Fund for Waterside Rail line re-opening as it fitted well within the first of these three categories of eligible proposals. This was assessed by the Expert Panel and was one of ten schemes in England shortlisted to progress to the next stage of preparing a feasibility study, in order to inform the development of an SOBC.

3.3.2 Regional Context

The New Forest and Southampton lie within the Solent Local Enterprise Partnership (LEP) area, which is anchored by the Isle of Wight, two cities of Southampton and Portsmouth, the M27 corridor and the Solent waterways itself. This geography creates unique circumstances

for economic geography with the two cities being the traditional employment centres but over the past 30-40 years there has been a decentralisation of employment to edge of city business parks along the M27 corridor. The Solent LEP's **Transforming Solent Strategic Economic Plan (2014 -2020)** highlights that Southampton is a key part of the £30.6bn[8] Solent economy with a focus on the Port of Southampton, which is expected to increase the volumes it handles significantly over the next 10-20 years (see Section 3.6). Improving transport infrastructure in the Solent is one of the LEP's priority areas for investment to achieve annual growth in the area of 2% per annum. However, productivity in the Solent is 8.4% lower than the South East average[9]. The gap is accounted for in part by the concentration of jobs in lower productivity sectors but there is an acknowledgement that congestion and infrastructure is a constraint on job growth. Congestion on the M27 and on other key corridors such as the A326, has been identified by businesses as a key constraint on their competitiveness and productivity, and businesses in Portsmouth have reported difficulties in recruiting skilled labour from the western part of the Solent area as a direct result of poor connectivity.

Planning into the long term the Partnership for South Hampshire (PfSH), a grouping of all the Local Planning Authorities in the Solent area, has identified that the sub-region (South Hampshire and Isle of Wight) will require an additional 104,350 net new homes by 2036[10].

The LEP's **draft Local Industrial Strategy (2020)** will provide a vision for the Solent in 2050 and will focus on how the LEP and partners envisage the economy to grow and productivity to improve in the Solent. It will focus on the Solent's strategic position as a global gateway through its ports and air connections, with the Port being the central hub. Reliable and efficient transport infrastructure and connectivity is expected to form a vital component of that approach to create a better performing Solent economy.

Highways England's **International Gateways and the Strategic Road Network** report (2017) identifies the role that the Strategic Road Network plays in supporting the UK's International Port Gateways including the Port of Southampton. The SRN, and the MRN, provide direct connections to ports within England, as such they see a high proportion of HGV movements. The SRN links within southern Hampshire (M27 and M3) are among the top 30% for total vehicle delays nationally and further growth in freight volumes handled by the Port would exacerbate this. HE RIS1 investment in accessing Southampton is improving the SRN at M271/A33 Redbridge Roundabout.

Transport for the South East (TfSE), the shadow sub-national body for South East England, published a Regional **Transport Strategy** in 2020. This identifies the need for economic growth, but not at any cost. The strategy supports sustainable economic growth that delivers positive social and environmental outcomes. This would be achieved by investment in attractive, sustainable alternatives to the car and cleaner transport freight, while seeing how to manage demand.

TfSE also produced an **Economic Connectivity Review** in 2018 to take a comprehensive strategic review of the transport networks in the South East and how they can support sustainable economic growth, boost productivity, and improve access to international gateways. The review identified a number of strategic transport corridors that have key roles in supporting economic growth in the UK. Urban South Hampshire, including the New Forest (of which Totton and Waterside is a part) is on the M27-A27/West Coastway strategic transport corridor and the M3/South Western Main Line strategic transport corridor (which provides access to the International Gateway at the Port of Southampton). Both corridors serve major growth areas in South Hampshire. An assessment of the annual delay to business and freight on the M27-A27 strategic transport corridor indicates that per km the

[8] Solent LEP draft Local Industrial Strategy Consultation 2019

[9] Solent LEP Productivity & Growth Strategy Update 2017

[10] PUSH Spatial Position Statement 2016

value of this delay is £534,000 today, by 2041 this delay per km is predicted to more than double to £1.24m even with 'Do-Minimum' interventions. The Port is highlighted as one of the UK's main international gateways that requires reliable access from the Strategic and Local Road Networks. With the amount of port-related activity on the Waterside set to increase as a result of ABP and Solent Gateway expansion plans it will be important to ensure that these port activities have reliable transport access and connectivity.

Re-opening of the Fawley branch for passenger rail services fits well with both of these TfSE strategies, as it gives people living and working in the Waterside area an attractive alternative to travelling by private car.

The LEP's **Strategic Transport Investment Plan (2016)** identified a range of infrastructure investments to strengthen access to and within the Solent. Analysis predicts that by 2026 car trips in the Solent will grow by around 13% and that total time lost in delays will increase by more than 50%. Capacity issues along the M27 will have impacts on local traffic and freight movements. Highways England are upgrading the M27 to Smart Motorways between Junction 4 and 11 to reduce congestion and alleviate the frequent stop-start flows so the M27 can carry out its strategic function for the Solent. The Plan identifies that strategic access to Southampton needs to be improved. The primary route for the Port and City Centre is via M271-A33 corridor. This corridor is also heavily used by local traffic between the Waterside area and Southampton City centre. If car dependency from the Waterside communities can be reduced, this would help support continued reliable road access to the Port of Southampton within is of national economic importance as a gateway for international trade – which handles significant volumes of trade in goods with non-EU markets.

HCC is also a joint partner in Solent Transport – a voluntary partnership of the four Local Transport Authorities (Portsmouth, Southampton, Hampshire and the Isle of Wight) - who is responsible for planning and delivering transport improvements in the Solent area.

The **Joint South Hampshire Local Transport Plan Strategy (2011-2031)** identifies the M27 as a major route providing access to the 'international gateways' of Hampshire (Southampton Port, Southampton Airport and the Port of Portsmouth). Furthermore, it recognised a number of challenges that need to be addressed, including widening travel choice to offer people reasonable alternatives to the private car for everyday journeys, reducing the need to travel, and moving towards a low-carbon economy. The policies in the joint strategy include:

- To work with rail operators to deliver improvements to station facilities and where practical, better infrastructure and services for people and freight;
- Developing transport improvements to support sustainable economic growth and development;
- Working with Highways England, Network Rail, the Ports and Airport to ensure reliable access to and from the International Gateways for people and freight; and
- Support measures that improve quality of life and place, including better air quality.

Solent Transport's **Transport Delivery Plan** (2013), developed from an evidence base from the Solent Sub Regional Transport Model, identifies five key objectives which future strategic transport infrastructure investments in the Solent area should look to support:

- Enable higher levels of economic growth by improving local employment opportunities, deepening the labour market and therefore increasing productivity;
- Enhance business performance particularly at the international gateways, by increasing the efficiency of the transport network and managing congestion;
- Improve sustainable access linking people to jobs and facilities in cities and towns;
- Reduce emissions (particularly carbon) from the transport sector by reducing highway vehicle kilometres; and
- Reduce unemployment in areas of high deprivation through improved sustainable access to employment centres.

The TDP identified the re-introduction of passenger services to the Waterside Line, connecting Hythe with Southampton as one of three rail schemes that would be beneficial to deliver.

HCC's Interim Waterside Transport Policy statement (November 2017) stated that:

- The preferred route for access to and from the Waterside peninsula is the A326; which continues to be heavily congested and needs improvements to accommodate future growth in the area;
- If Southampton Port expands to the site near Marchwood, it requires direct access from the A326 to avoid traffic building up in residential areas;
- The port expansion will also need to consider further freight routes that use the branch, which were not considered in previous work (although this has since been addressed by the Network Rail study);
- Appropriate bus, cycle and walking improvements should be provided;
- Any future transport plans for the area must consider the impact on the Air Quality and the emerging Clean Air Zone designations.
- The 2013 Halcrow study indicated that Waterside Rail re-opening (based on a shuttle train service did not represent good Value for Money), having a BCR of less than 1; therefore, the stated HCC position on reopening passenger rail services on the Waterside remains unchanged" (that no further work should be carried out by HCC to develop the scheme) until further evidence is forthcoming".

Part of the purpose of this SOBC is to use the most up to date evidence and transport modelling information to look afresh at whether a Strategic Case or a Value for Money Case now exists for Waterside Rail re-opening.

SCC **published Connected Southampton 2040**, their Local Transport Plan 4 Strategy for Southampton in 2019. This Strategy identified three strategic goals for transport in the city:

- Support **A Successful Southampton** – enable growth and regeneration and provide better transport connections and options for accessing the main economic drivers (key employment areas);
- A transport **System for Everyone** – investment in a high-quality public realm, road safety improvements and support more inclusive travel; and
- Ensuring people have **Better Ways to Travel** - deliver mode shift from private car to sustainable modes to improve health and air quality.

The delivery of Waterside Rail re-opening scheme would support these policy goals by improving connectivity by public transport between the Waterside and jobs opportunities in Southampton city centre and enabling mode shift from the private car.

3.4 The Problem Identified (Case for Change)

The need has been identified to improve transport connectivity to and from the Totton and Waterside area. The area has a population of 75,000. In formulating the case for change, the following sources of data and evidence have been reviewed and analysed:

- Analysis produced for the Waterside (Draft) Transport Strategy;
- Evidence prepared for the Southampton City Region TCF SOBC and for the A326 Corridor Large Local Major Improvements;
- Data on traffic volumes, average speeds, vehicle delays and data on car and bus journey times
- National data sets including 2011 Census, BRES, DEFRA, Index of Multiple Deprivation, Public Health England - on productivity and employment, environment, physical activity, socio-economic, and Travel to Work data;

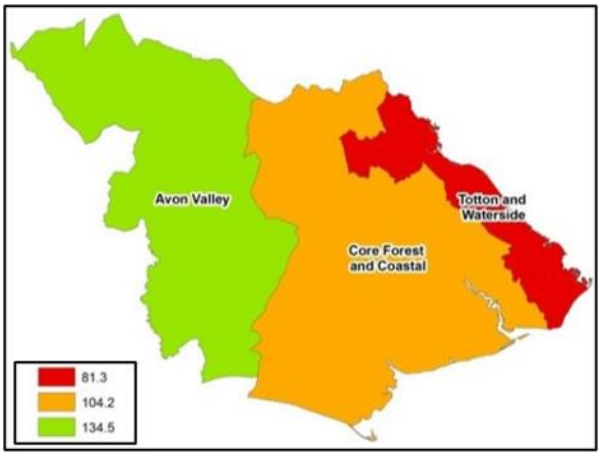
- Accessibility data developed by the National Infrastructure Commission that considers how easy it is to get to and from the various different communities which included within the Totton and Waterside area;
- Outputs from the existing Solent Sub-Regional Transport Model;
- TfSE's Transport Strategy for the South East and Economic Connectivity Review;
- Solent LEP's Transport Investment Plan; and
- Data from operators on the use of cycle, bus and rail across the Waterside area.

3.4.1 Issue 1: Weak Productivity levels and low proportion of knowledge economy jobs

GVA per head of population

In 2017, the Gross Value Added (GVA) per head of population for South Hampshire (Eastleigh, Fareham, Gosport and Havant Boroughs, Southampton, Portsmouth and parts of New Forest, Test Valley and Winchester districts/ boroughs) was £23,700. This is below the average for Hampshire as a whole and for the South East. GVA per head in the New Forest is about 10% below the Hampshire average. As Figure 3-2 shows, the Totton and Waterside area has the lowest level of GVA per head of the three sub-areas within New Forest District.

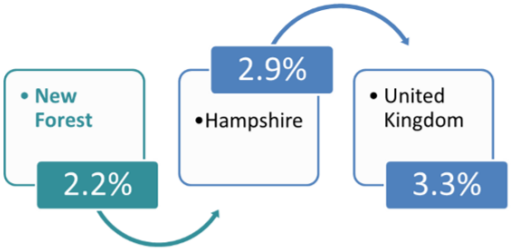
Figure 3-2 – GVA per head for sub-areas of New Forest District relative to the GVA per head for the District as a whole (=100), 2015 (Source: ONS 2016 and HCC 2017 estimates)



Trends in GVA growth

As Figure 3-3 below shows, the level of total GVA growth per year over the period 2010-2015 has been lower in the New Forest (2.2%) than in Hampshire (2.9%) and the UK (3.3%). Over this period, the Totton and Waterside area saw GVA growth per year of just 1.9%.

Figure 3-3– % GVA Growth per annum over the period 2010-2015 for New Forest District, Hampshire and the UK (Source: ONS 2016 and HCC 2017 estimates)



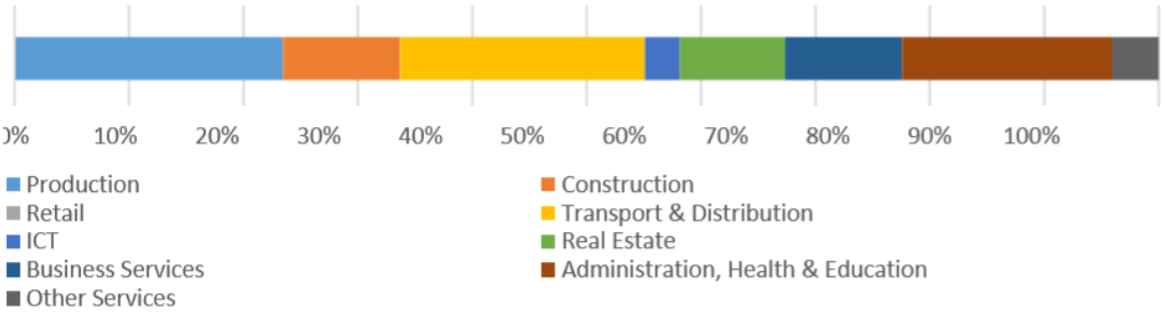
Between 1998 and 2017 New Forest District and Southampton saw the 3rd and 4th slowest growth respectively in real (inflation adjusted) economic output GVA of all the lower tier and unitary local authorities in the South East region. A significant contributory factor to this productivity gap is the higher concentration of lower productivity jobs in these areas than in the South East as a whole.

Since 2010 there has been an overall employee contraction of 1,000 jobs within the Totton & Waterside area.

Contribution of economic sectors to GVA

Figure 3-4 below shows the contribution of different economic sectors of the Totton and Waterside economy to overall GVA. The sectors that make the largest contributions to GVA are Production, Transport & Distribution and Administration, Health & Education.

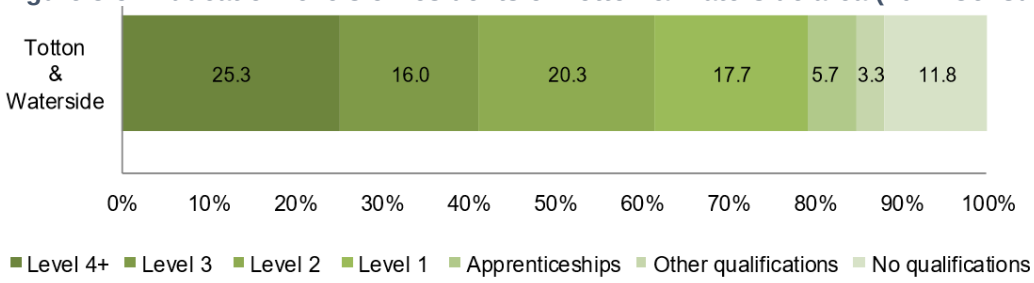
Figure 3-4– % Contribution to GVA of different economic sectors in Totton & Waterside (Source: HCC 2017 estimates)



The clinical, knowledge and digital sectors of the Solent area's economy, which already contribute over £1bn to the economy, are forecast by the LEP to see strong growth. However, only one in ten employees in New Forest District are 'knowledge intensive employees' and on this measure the New Forest, and the Totton and Waterside area is unrepresented in the area relative to both the Hampshire and the UK average, meaning there is a risk that this productivity gap could widen further.

Just 54% of the local resident population of Totton and Waterside are of working age, 17.6% are aged 0-15 and 24.1% are aged 65 and over[11]. The working age population is projected to contract. 37.5% of residents are in higher skilled occupations and 18.2% in lower skilled occupations. In terms of education, 8.9% of people of working age in New Forest District have no skills which is close to double the Hampshire average of 4.6%. As Figure 3-5 summarises, the Totton and Waterside area has 25.3% of residents with NVQ Level 4 and above education (equivalent to graduate level) and 11.8% have no qualifications.

Figure 3-5– Education levels of residents of Totton & Waterside area (2011 Census)



This is lower than the average for the Hampshire and the South East England region (where 31.3% and 42.2% respectively have a degree).

3.4.2 Issue 2: The Waterside area has poor transport connectivity and high dependence on the private car

The Totton and Waterside area is constrained to the east by Southampton Water – a wide estuary with no crossing points until road and rail bridges across the River Test between

[11] ONS, Mid Year Estimates,2017. 1 person per hectare

Totton and Redbridge, although passenger ferry services do connect Hythe with Town Quay in Southampton. To the southwest, it is bordered by the New Forest National Park.

In transport terms, the choice of access routes to and from the towns and villages in Waterside are very limited and are highway focussed along a northwest to southeast axis, with the A326 the primary access route running between the National Park and Southampton Water, like it were on a peninsula. The A326, is used by up to 30,000 vehicles a day on its' busiest sections. Part of the route is dual carriageway and part is single carriageway. The A326 experiences significant congestion and journey time delay on the single carriageway links and at junctions, particularly during peak periods. The link delays from 2017 are shown in Figure 3-6 below.

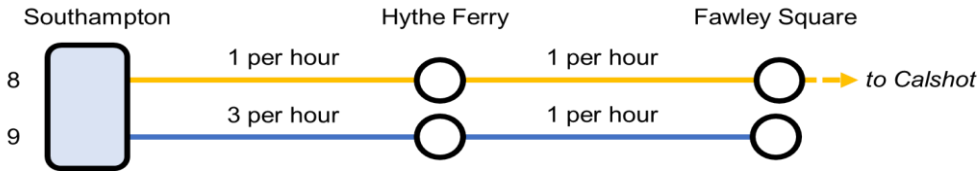
Figure 3-6- Map showing sections where A326 is operating above or near capacity in 2017
('RFC' refers to Ratio of Flow to Capacity, where a value of 1.0 indicates the junction is at capacity)

As well as most of the link capacity on the northern half of the A326 having an RFC in excess of 1.0, in addition, the majority of junctions on the A326 corridor north of Applemore also have an RFC in excess of 1.0.

Traffic flows to the M27 SRN/ Southampton city centre are therefore concentrated onto one route the A326, the primary access to Waterside, which suffers from congestion during much of the day (30,000 vehicles travel along the A326 every day). The lack of alternative routes reduces network resilience and results in unpredictable journey times. 82% of people that live in Totton and Waterside travel to/from work in a private vehicle.

As Figure 3-7 and Figure 3-8 show, the public transport offer is primarily bus-based. The bus provision is by operator Bluestar, with their Bluestar 8 (1 bus per hour Calshot service via Marchwood) and Bluestar 9 service (3 buses per hour).

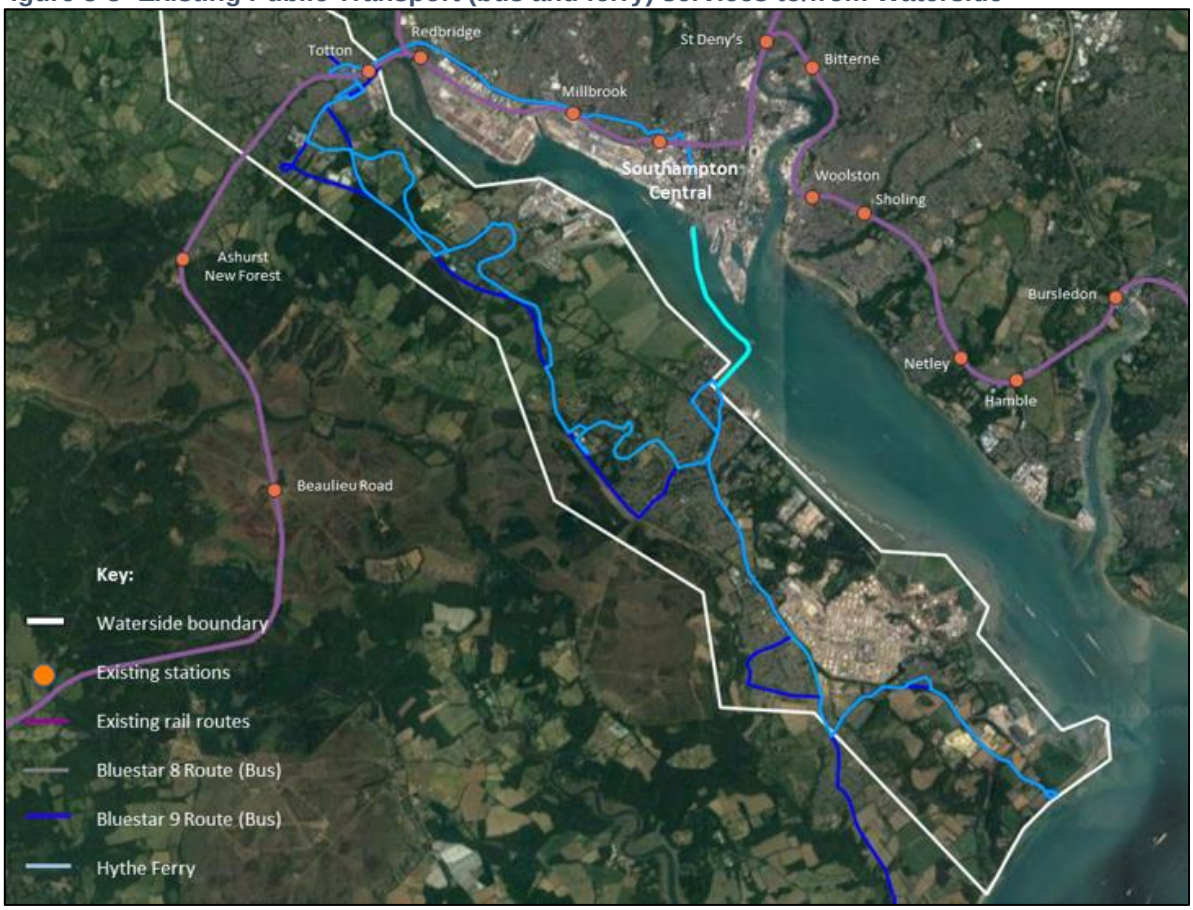
Figure 3-7- Simplified bus route 8 and 9 frequencies



This gives a combined 4 buses per hour frequency. There is also a ferry connection between Hythe and Town Quay, Southampton, which is a 20 minute walk from the city centre. There are no longer any direct bus services from Marchwood/Hythe/Fawley to Totton College, as these were withdrawn in 2016. Students wishing to access it now need to use Bluestar 8/9 then have a 15 minute walk to reach the campus.

The bus services are currently adversely impacted by congestion and have journey reliability issues due to there being limited bus priority provision. Data indicates that bus punctuality is worst in the morning and evening peaks when the road network is busiest. The bi-directional nature of travel flows between the Waterside and Southampton means that buses suffer reduced punctuality both in the inbound and outbound directions in both peaks.

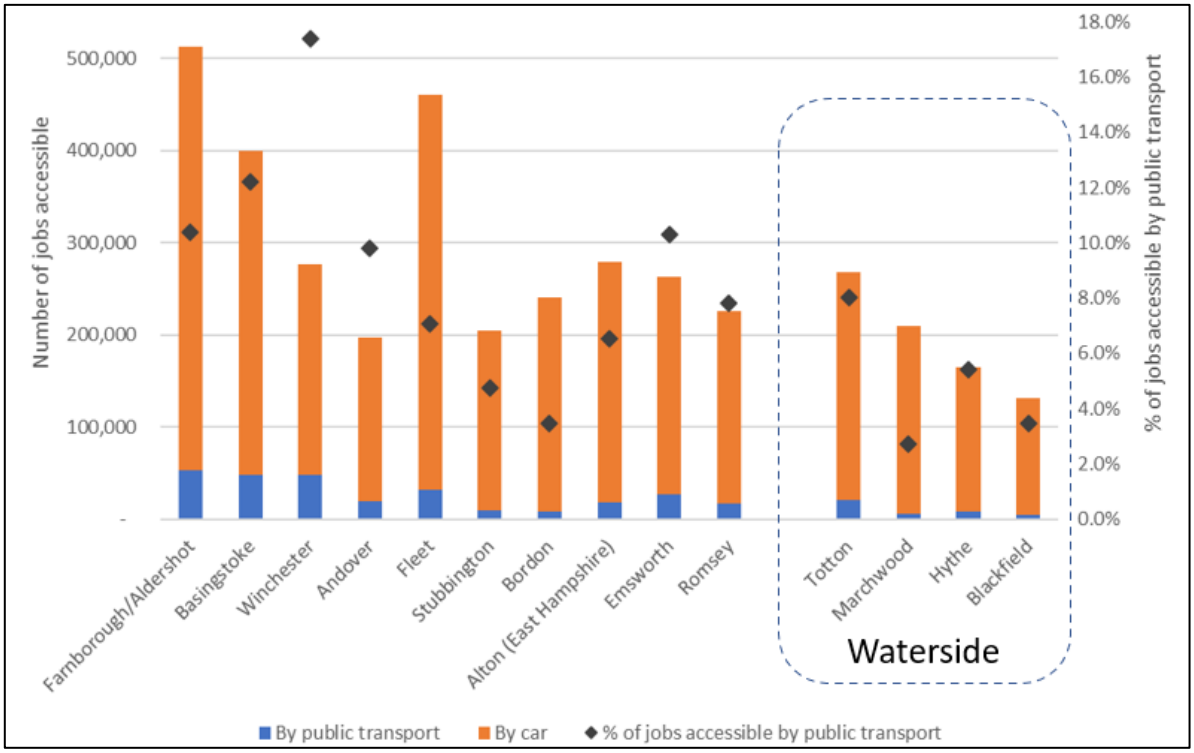
Figure 3-8- Existing Public Transport (bus and ferry) services to/from Waterside



A competitive transport network that provides effective connections between people, their homes and jobs, as wider social infrastructure, and between businesses and their customers is vital for achieving economic growth in the Totton and Waterside area.

As Figure 3-9 shows, the Waterside area has some of the worst connectivity to jobs of anywhere in Hampshire; connectivity by public transport is especially poor. A strategic study recently completed by HCC has shown that current congestion on the A326 is likely to be further exacerbated by forthcoming regionally and nationally significant development proposals in the Waterside area (as summarised below as part of Issue 3).

Figure 3-9– Number of jobs accessible within a 60 minute travel time and % of these jobs accessible by public transport for different urban areas in Hampshire including Waterside area[12]



Within New Forest District,13% of households do not have access to a car, narrowing access to the employment opportunities that are available.

Improvements that help to deliver more efficient use of existing assets and provide more reliable transport connections to and from the Waterside area would allow existing businesses in the area to benefit from agglomeration, and benefit from easier access to supply chains, broaden access for employers to labour markets within Waterside and improve productivity. Investment is needed to help deliver an efficient and better-connected transport network for the Waterside area. This will be crucial for creating the environment to attract highly skilled labour and new high value industries that will be necessary to improve productivity.

Significant investment to improve capacity on the A326 is proposed through a Large Local Majors (LLM) funding bid, supplemented by a series of junction improvements that will be developer funded to mitigate the impacts of new trips.

The provision of a passenger rail service would complement this highway investment by providing Waterside area residents with improved public transport connectivity as journey times would be significantly quicker than by bus. Re-introduced passenger rail services could provide the following journey opportunities:

- Direct access to employment opportunities in Southampton, particularly major new employment development around Southampton Central station, and the wider Southampton City Region for residents in the Waterside
- Easier and quicker access for residents of Waterside to tertiary and higher education institutions, such as Totton College (the nearest sixth form college), Southampton

[12] Source: Hampshire CC analysis transport performance indicators related to transport connectivity from a dataset developed by the National Infrastructure Commission (NIC)

University, Southampton Solent University and other education facilities in Southampton and the wider area;

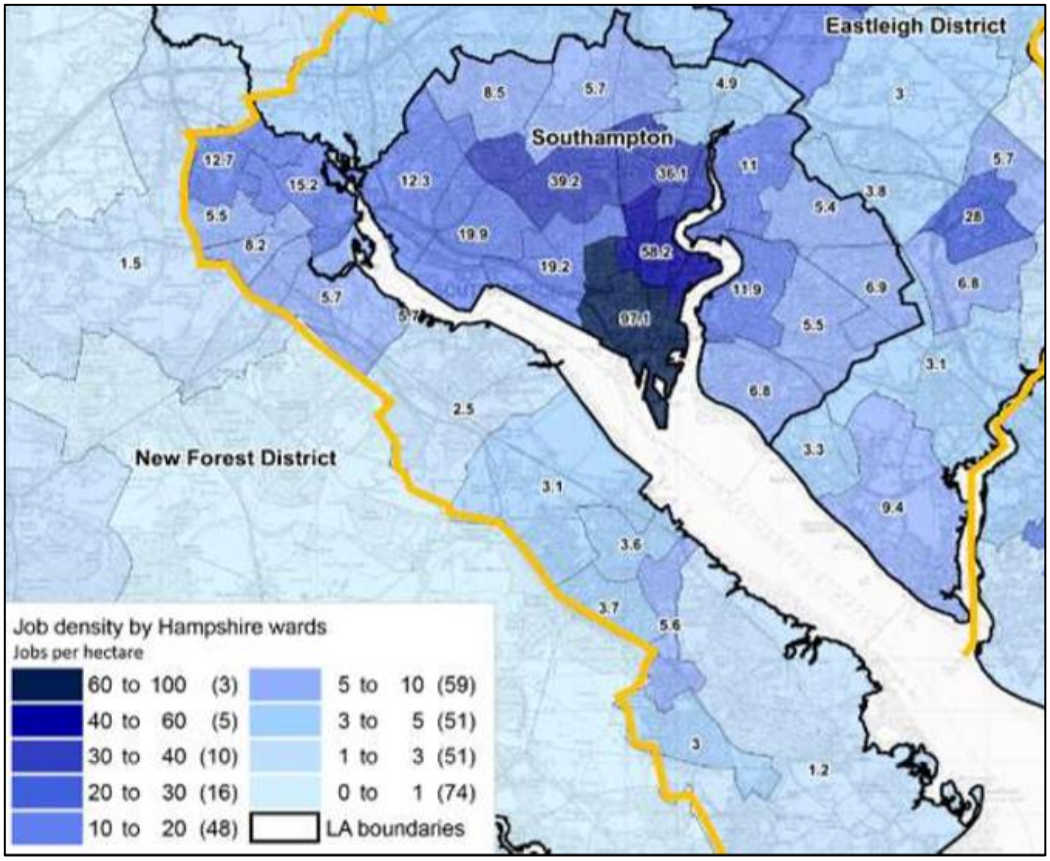
- Access to wider employment opportunities in Hampshire, Portsmouth City Region and other areas from either direct rail services or interchange at Southampton Central;
- Access to employment in the Waterside area for residents of Totton and Southampton/ Eastleigh Borough area;
- Direct access to Southampton Airport under some of the service options; and
- Improved access by rail into tourist locations such as Beaulieu Motor Museum and Estate or Bucklers Hard in the New Forest National Park.

If the proposed targeted highway capacity investment can be matched with improved utilisation of the existing freight only rail branch line, then this could help to enable and bring forward a combined investment in the area of over £3bn across several key developments, all of which are collaborating under the "Waterside Partnership".

3.4.3 Issue 3: Waterside has a low level of self-containment for travel to work increasing pressure on transport networks

The Totton and Waterside area forms part of the Southampton City Region. As shown in Figure 3-10, employment density within the City Region varies considerably.

Figure 3-10 - Employment Densities within Southampton and the Totton and Waterside area



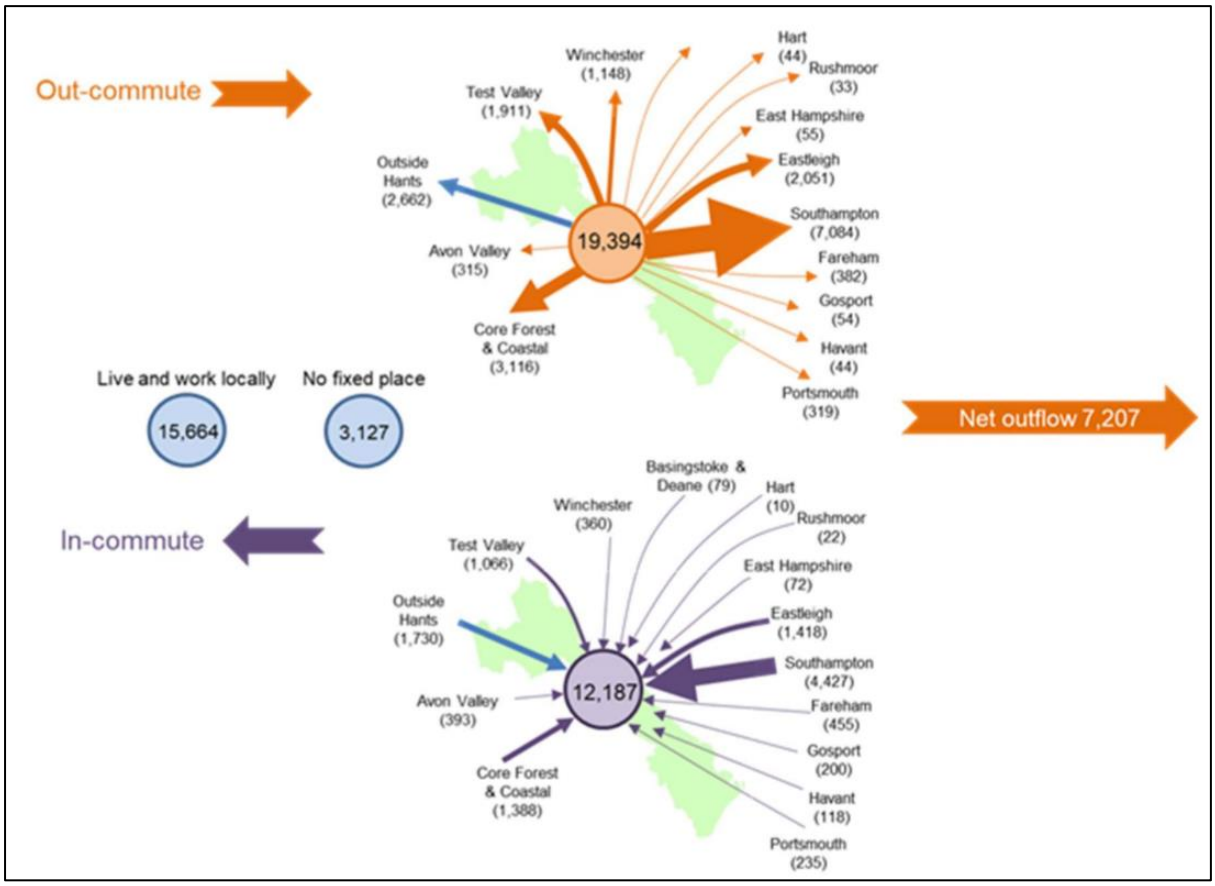
The New Forest District has a job density of 5.83 jobs per hectare. This is lower than in neighbouring Eastleigh Borough (9.78 jobs per hectare), and Southampton City (27 jobs per hectare). The Fawley area has one of the lowest employment densities of 1.2 jobs per hectare. In contrast, the Bargate Ward of Southampton has one of the highest employment densities of 97.1 jobs per hectare. Within the Totton and Waterside area, the ward with the

highest employment density is central Totton (15.2 jobs per hectare). The majority of wards within Totton and Waterside have densities of 2.5 and 3.7 jobs per hectare. The Millbrook and Redbridge areas of Western Southampton are close to Totton, and have a large number of port and industrial employment opportunities, with densities of around 19-20 jobs per hectare).

The Totton & Waterside area has a workplace population of 25,000 employees[13], which is much lower than the resident population in employment 44,100[14].

These low levels of employment density and imbalance between resident population in employment and workplace jobs within Totton and Waterside mean that a proportion of workers need to travel out of the area for work. As Figure 3-11, based on 2011 Census Journey to Work data shows, a high proportion of people who live in Totton and Waterside either work in the Totton Waterside area or commute to Southampton. The private car is the dominant mode of travel for commuter trips.

Figure 3-11– Commuting (Journey to Work) flows to and from the Totton and Waterside area taken from 2011 Census



There are high levels of out-commuting from the area, 19,400 trips per day, particularly to Southampton, with a net outflow of 7,200 trips, of which 69% are by car/van. Conversely, nearly 12,200 commuters a day commute into the area. Nearly 15,700 people live and work locally. This gives the sub-area a low resident worker self-containment ratio of 0.50, whereby only half of residents in work are employed locally. This means that there is potential for rail to provide an alternative to the A326 for a number of these out-commuting and in-commuting travel movements, particularly to and from central Southampton.

[13] ONS 2016. excludes farm labourers (SIC 0100)

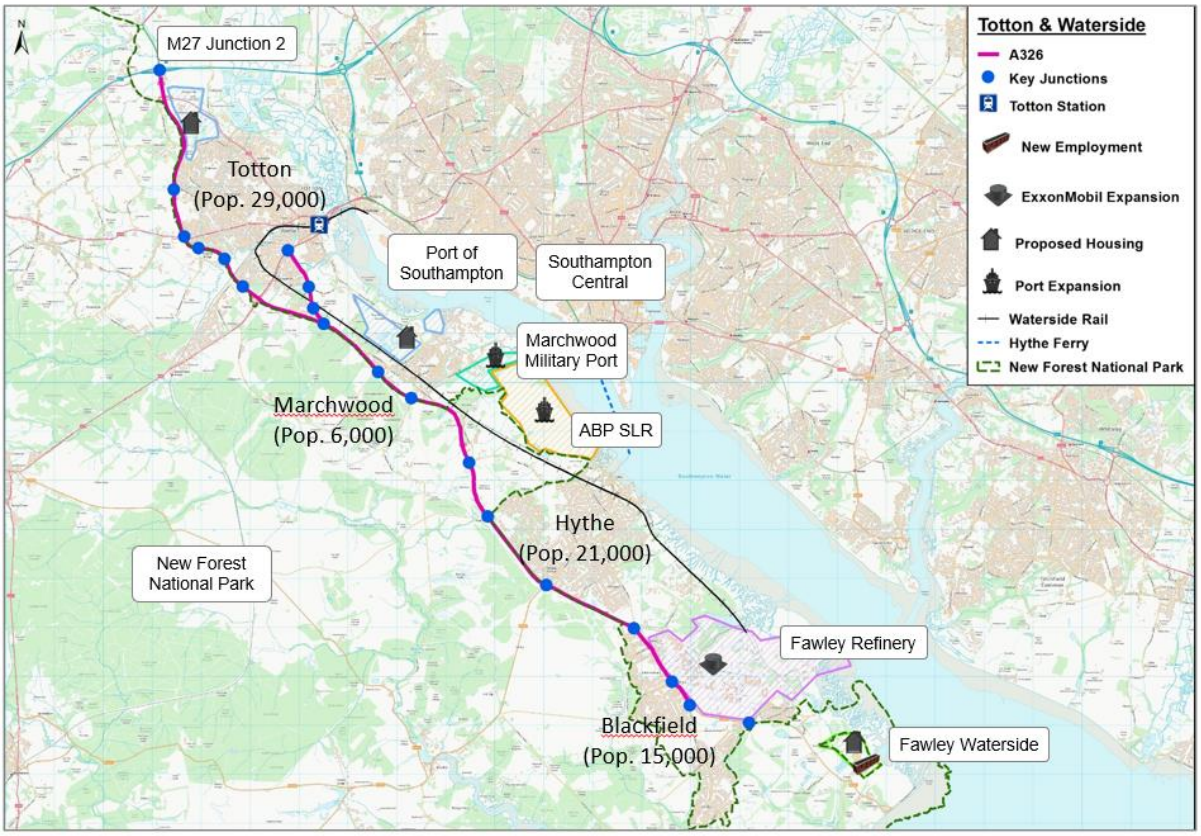
[14] ONS 2017 Annual Population Survey

3.4.4 Issue 4: A significant amount of Growth is Planned for the Totton and Waterside area increasing travel demand

Substantial new employment is planned in both Southampton city centre and in the Waterside area (the geographical locations of which are shown in Figure 3-12), which without investment to improve end to end journey times (bus journey times are not competitive with those by private car) and quality of public transport offer, these additional trips will primarily be car based.

There are committed plans to deliver 1,600 new homes at Fawley Waterside (the former Fawley Power Station site). This scheme was granted Outline Planning Permission in July 2020. A further 2,500 are planned in the Waterside area (including 1,060 at Marchwood & 990 at two sites on the edge of Totton).

Figure 3-12 – Locations of planned growth in the Totton and Waterside area and their proximity to A326 and freight only rail branch.



Significant employment growth is planned in the following locations:

- ABP port expansion on Strategic Land Reserve (SLR) site between Marchwood and Hythe (as explained in 3.6).
- The Fawley Waterside development is a mixed-use scheme, which is expected to provide 40,000m2 of commercial floorspace, supporting 2,500 new jobs.
- There are proposals for Eling Wharf, which could see approximately 60 000m2 of new mixed commercial floorspace.
- Exxon Mobil have an ongoing major investment programme which will make Fawley Refinery the most productive refinery in the UK and which will increase output in ultra-low sulphur diesel by 45%. The major investment programme has a value of around £700m which will help secure around 2,000 jobs.

Modelling carried out for the Partnership for South Hampshire (PfSH,) grouping of Local Planning Authorities using the Solent SRTM has forecast the growth in travel demand as a

result of planned growth (housing, employment and port), and the impact of the resulting additional trips on the network. There are significant increases in traffic flows on most highway corridors in the Solent area in the AM peak. The greatest increases in flows are on motorways rather than the local road network. The largest increase on the M27 is between Junctions 8 and 10, and M3 between Junctions 10 and 14. During the AM peak flows on these sections increase by 2,000, and in the PM there is a similar increase.

Away from the SRN, the greatest increases in flows are entering or in the densely populated centres and where significant growth in proposed. In the AM peak these largest increases in 2036 are on:

- A326 Marchwood By-pass northbound – up to 350 Passenger Car Units (PCUs),
- A33 Mountbatten Way approaching the City Centre – up to 430 additional PCUs.

Journey times into Southampton City Centre, where 18% of working age Waterside residents currently commute to work, are also predicted to increase, with A33 Millbrook Road West anticipated to see a 127% increase in journey time by 2026. These increases in trips, delay and journey times will have negative impacts on congestion, the reliability of bus journeys, and also result in worsening air quality.

Improving connectivity by restoring passenger rail services to the Fawley branch, is likely to improve the attractiveness of living and working in the Waterside area, helping to improve the viability of planned development, and as a result of this improved viability, may enable the pace at which new developments located on or near the railway line can be built out to be accelerated.

Analysis set out on demand in Section 4.32 of the Economic Case shows, the restoration of a passenger rail service is forecast to result in a reduction in the number of car trips made by residents. Modelling (the results of which are summarised in Table 4-5) suggests that in 2036, there would be between 312,000 and 735,000 fewer car trips made to/from the Waterside area (depending on the train service frequency provided). If the 44,000 daily two-way vehicle movements on the A326 (on its' busiest section near Hounsdown) in 2036 is scaled up to give the number of movements a year, this suggests that there would be around 14.8m[15] vehicular movements a year, based on an assumption that Sunday vehicle volumes being half that of Monday to Saturday levels. The reduction in car trips represents between 2% and 5% of total vehicle movements. Therefore, this evidence suggests that it is likely that restoring the passenger rail service could enable a modest reduction in the levels of vehicular congestion on the A326 corridor in particular. There will be scope to quantify this impact further at the Outline Business Case stage.

3.4.5 Issue 5: The Waterside contains a number of wards with deprivation & health inequalities – limited access to services can contribute to social exclusion

Whilst much of the New Forest is affluent, the Totton and Waterside area has pockets of socio-economic deprivation. The wards of Netley View, Dibden and Blackfield- shown in red on Figure 3-13 below, are among the top 10% most deprived areas in England, based on the Index of Multiple Deprivation (2019). One contributory factor behind such deprivation is poor connectivity, meaning residents face difficulties and barriers in accessing jobs and services.

Those who live in households without access to a cars can find it more difficult or more expensive to travel by public transport and so are excluded from employment, education and training opportunities, as well as social networks and health services.

[15] In estimating the total number of vehicular movements on the A326 per year in 2036, this figure is likely to be an over-estimate, as no allowances have been made for lower than average traffic volumes on Bank Holidays or during school holiday periods (13 weeks a year). This is a deliberately conservative approach, so as to provide a robust estimate of the reduction in vehicle journeys as a direct result of the Waterside passenger rail re-opening scheme. The actual percentage figure for reduction in car trips is likely to be slightly higher than the range 2-5% presented.

Figure 3-13– Map of Totton and Waterside area, showing Index of Multiple Deprivation (2019) score by LSOA *(most deprived wards shown in red)*

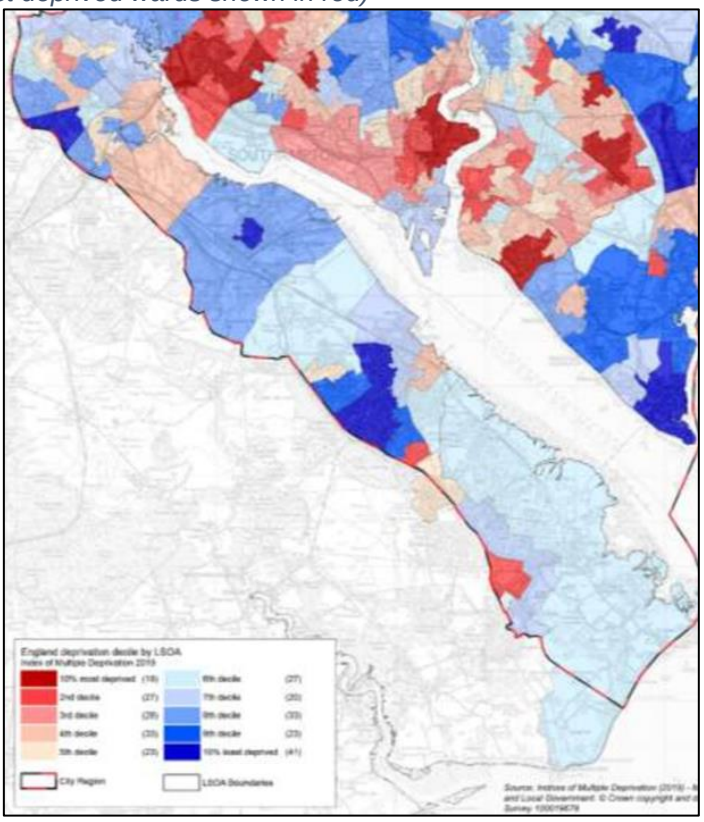


Table 3-2 below summarises the proportions of households in the Totton and Waterside area have and do not have access to a car.

Table 3-2– Analysis of levels of access to a car or van within Households in Totton and the Waterside (by MSOA, 2011)[16]

Middle Super Output Area	No cars or vans in household		1 car or van in household		2 cars or vans in household		3 cars or vans in household		4 or more cars or vans in household	
	number	%	number	%	number	%	number	%	number	%
Totton Town – NF002	420	16.5	1,161	45.5	709	27.8	193	7.6	67	2.6
Totton Town – NF 003	274	8.2	1,417	42.5	1,280	38.4	275	8.3	86	2.6
Totton Town – NF 004	692	20.8	1,416	42.6	893	26.9	231	7.0	90	2.7
Totton Town – NF005	289	9.9	1,227	42.0	1,054	36.0	268	9.2	86	2.9
Marchwood – NF008	300	8.3	1,606	44.5	1,281	35.5	307	8.5	114	3.2
Hythe – NF009	511	14.7	1,494	42.9	1,131	32.5	249	7.2	95	2.7
Dibden Purlieu/ Buttsash – NF011	717	16.3	1,823	41.4	1,394	31.6	351	8.0	121	2.7
Blackfield/ Holbury – NF013	348	15.8	921	41.8	695	31.6	165	7.5	72	3.3
Fawley – NF014	405	10.9	1,501	40.3	1,292	34.7	360	9.7	165	4.4
Total Totton & Waterside MSOAs	3,956	13.4%	12,566	42.5%	9,729	32.9%	2,399	8.1%	896	3.0%

[16] 2011 Census – Table KS404EW - Car or van availability

Within the MSOAs in the Waterside area (excluding Totton), a total of 2,281 households do not have a car or van available. The percentage of households without access to a car is highest in parts of Totton (20.8% and 16.5%) and in Dibden Purlieu and Buttsash (16.3%).

This social exclusion affects different groups in society differently. Young people face particular mobility barriers, including the lack of affordable public transport fares to access education, training and employment and very high car insurance premiums mean the costs of running a car are high and potentially unaffordable. People with disabilities face extra costs and barriers and difficulties in getting around.

Within Totton and Waterside, the population aged 65+ is projected to grow at 1.3% per annum[17]. Many of this age group travel shorter distances, often within the Totton and Waterside area, to access services and activities.

3.5 Impact of Not Changing

Without investment to provide a passenger rail service that would significantly improve transport connectivity between the Waterside area and employment areas such as Southampton, growing levels of congestion and lack of resilience on the A326 corridor and continued high levels of dependency on the private car will act as a constraint on job growth. Inefficient and unreliable transport connections will make the area increasingly unattractive for people to come to and live or businesses to locate in. In surveys, businesses based in South Hampshire have reported difficulties in recruiting and retaining highly mobile skilled labour as a direct result of poor connectivity. This will reduce the pool of applicants who are willing to apply for higher paid jobs in the wider South Hampshire and Southampton City Region area and reduces the ability to support larger numbers of these jobs. There is a risk that without investment in better connectivity, there will be a trend of relocation of some businesses/ jobs away from Waterside to more accessible business parks nearer to the M27, leading to even higher levels of out-commuting.

Also, an environment that is designed primarily to cater for the movement of vehicles will detract from quality of place. This is also a factor in businesses and individuals' choices about where to locate and where to seek out job opportunities. The ease of access by different travel modes and the commuting time will be a factor in their decision. Suitably skilled people without access to a car are often very reluctant to consider or apply for job opportunities located further afield if they consider their commuting time by bus to be excessive.

Analysis by Solent Transport indicates that if congestion on the SRN and local networks is left unchecked, it could potentially suppress employment growth. Businesses will find it difficult attracting or retaining the skilled staff they need to perform well and deliver profits. This will impact on the contribution the Totton and Waterside economy can make to the UK economy, and result in adverse implications for competitiveness. This dampening of labour market mobility will act as a brake on productivity, meaning that the Solent LEP is less likely to achieve its GVA targets in the emerging Local Industrial Strategy of increasing GVA by 2.36% per annum in the period between 2013 and 2030.

A lack of investment in additional transport capacity may result in a slower pace of delivery of new housing and employment development due to congestion-related access and journey time reliability issues. Missing out on investment in new housing and job opportunities will mean that the Waterside area doesn't achieve its full economic potential. Perhaps of even greater concern to the wider UK economy is that growing levels of congestion could mean that the Port of Southampton becomes less competitive and less efficient in its areas of specialism (as a deep-sea container, automotive and cruise passenger hub) over and above

[17] Source: ONS 2015, HCC 2016

any short to medium term adverse impacts resulting from Covid-19, meaning the forecast significant levels of port-related employment growth are not realised.

If improvements to public transport connectivity are not delivered, residents of communities within the Waterside will see reduced quality of life as a result of more limited travel horizons for employment and training opportunities, which will impact on health and wellbeing. Inequalities of deprivation and health would be less likely to narrow, meaning less 'levelling up' of prosperity within Hampshire.

3.6 Internal Drivers of Change

The **Hampshire 2050** report identified climate change as the most important driver for change facing the county. Agreed actions from the 2050 report are that:

- HCC will work to ensure that climate resilience and mitigation (e.g. energy and water efficient; flood and heat adapted) is a primary objective for infrastructure and buildings.
- HCC will work to prioritise the reduction of carbon emissions from the key sectors of housing and transport.
- HCC maximise opportunities for employment and inclusion through targeted upskilling both in terms of key sectors and softer skills such as creativity, innovation and work readiness.

HCC are also in the process of preparing a new LTP4 strategy which will contain a vision for how transport in Hampshire will be improved looking ahead to 2050. One of the proposed outcomes of the strategy is to reduce carbon emissions from transport to net-zero by 2050. One of the proposed guiding principles of the emerging strategy is to significantly reduce dependence on the private car.

Other HCC strategies for Public Health and Wellbeing identify the need to address economic and social deprivation, reduce health inequalities, obesity and increase physical activity.

An important way that HCC can achieve these goals is to work to widen travel choice, to help reduce dependence on the private car for everyday travel needs. Another way is by working with developers and Local Planning Authorities to ensure new areas of housing have a range of viable transport access options. An important step to reducing carbon emissions will be to improve the efficiency of use of existing transport infrastructure – using road and rail corridors to move larger flows of people in more space efficient ways. The Waterside freight only line is already in place, and is an underutilised asset.

Re-introduction of passenger rail services would help promote increased use of public transport and reduce dependence on the private car as well as improve access to training and employment opportunities.

3.7 External Drivers of Change

Solent LEP have identified the need the to improve productivity and see Solent area's maritime strengths as an area of opportunity and are in the process of preparing a Local Industrial Strategy looking ahead to 2050. The well-developed port and maritime infrastructure within the Solent area means it is currently very well positioned to exploit new trade opportunities that may be created following the UK's departure from the European Union (EU) with non-EU markets. The levelling up agenda is reliant on generating economic growth in areas of low productivity. The Waterside area, through its various the development opportunities, enabled and supported by investment in better road and rail connectivity, has the potential to help drive economic success through attracting high value jobs, supporting both agglomeration and a move to more productive jobs. If it can be demonstrated that

passenger rail reopening can enable growth and help to improve the viability of planned development, then the prospects of securing third party funding contributions towards the cost of the scheme from the LEP (who would also be doing the same for highway capacity improvements) could be favourable.

TfSE have identified the need to deliver sustainable economic growth (in their Regional Transport Strategy). Whilst they will continue to press for becoming designated as a Sub National transport Body (STB), TfSE are in the process of preparing a number of area based and thematic studies to identify the specific infrastructure investment schemes and policy initiatives that will be needed in different parts of the region. They will assess the impact of these measures against the vision and objectives of the Transport Strategy.

ABP have aspirations to increase the throughput of containers and other types of tonnage handled by the Port of Southampton. Over the last 10 years, ABP have been investing to intensify usage of their existing facilities in the Western and Eastern Docks, through enlarging container berths, investing in larger cranes and automation and increasing storage for automotive goods, through providing a number of decked parking areas. This process of intensification within the existing port estate has been exploited as far as it possibly can, so some form of expansion is now required. Having considered how best to expand the capacity of the Port, ABP has reached the view that there is no feasible option other than to expand the Port onto the Strategic Land Reserve (SLR) which the Port holds – which is located between Marchwood Military Port and Hythe Marina Village within the Waterside area.

A new masterplan is in the process of being prepared that is expected to propose relocation of some port activities onto their SLR. The new masterplan will set out the types of port activity that could be relocated to the SLR site. It is expected that this will include proposals for the Port to transition all the automotive activity from Southampton to the SLR at Waterside, which will enable rationalisation of activities within the current port estate to focus on handling increased volumes of containers and cruise ship passengers. Over the medium term, as more port activities are transferred to the SLR, this is expected to result in more freight movements to and from the site, primarily by road via the A326, with potential for some freight services by rail, depending on the particular types of port traffic handled. Investment in track and signalling associated with the Waterside Rail passenger rail reopening could deliver spin-off benefits for future SLR related railfreight services.

SCC have growth aspirations for employment within Southampton City centre and reducing car dependency. Their Local Transport Plan 4 sets out goals of increasing use of public transport and active travel and supporting sustainable economic growth. Re-opening of the Waterside branch line for passenger rail services would help support their policy goals by removal of between 312,000 and 735,000 car trips by 2036, a significant proportion of which would be travelling into the city. This mode shift would also have a positive impact on air quality, another policy goal of their LTP4.

3.8 Scheme Aims and Objectives

Re-introducing passenger rail services to the Fawley freight only branch line would restore rail connections between a number of communities in the Waterside peninsula and the wider Solent area, supporting growth and development, and improve sustainable travel opportunities.

The station and train service options considered have been assessed in terms of how well they address the following four objectives:

1. Enhance connectivity between the Totton and Waterside area and Southampton, both for commuting and for travelling further afield;

2. Foster social inclusion by provision of improved access to education, employment and key services for those without access to a car;
3. Deliver a sustainable modal shift from the car to public transport; and
4. Support planned economic growth in the Waterside area.

3.9 Measures for Success

HCC will work collaboratively with the DfT RYR team, Network Rail and South Western Railway to supporting monitoring and evaluation of Waterside Rail re-opening. HCC and South Western Railway have experience of monitoring and evaluation of the effectiveness and success of transport infrastructure projects, including Chandlers Ford station which re-opened in 2003.

HCC, NR and DfT will agree a series of stretching but achievable targets that would be adopted as measures of success. An initial suggested set of targets are set out below:

- Increased PT mode share for journeys to work from the current 3.5% to 6% by 2031.
- Reduce private car mode share for journeys to work from 81% to 78.5% by 2031.
- That the GVA for Totton and Waterside area increases by 2.3% a year by 2031.
- A better performing labour market, with reduced rate of staff turnover for businesses and reduced number of job vacancies, enabled by reduction and removal of transport-related barriers to accessing employment.

Over and above the benchmarks listed above, the programme delivery team would monitor other criteria to help evaluate the impact of the RYR scheme. These 'other criteria' include factors which could be influenced by Waterside Rail re-opening, but which could equally be influenced by other matters affecting the local economy, such as:

- The level of deprivation;
- The level of development and regeneration taking place in Totton and Waterside

3.10 Options Identified

The optioneering process considered two strategic options for public transport using the existing freight only line between Totton and Fawley. The two strategic options explored non-rail and non 'heavy' rail solutions.

The existing branch line from Totton to the Hythe & Fawley Parkway station location is freight-only with a maximum permissible speed of 30mph. The route is single track, with a passing loop at Marchwood. A total of fourteen level crossings exist between Totton and the proposed Hythe & Fawley Parkway station location, comprising: two Manual Level Crossings with gates (MCG), six Automatic Half Barrier Crossings (AHBC), one crossing with Miniature Red/Green Warning Lights (R/G) and five User Worked Crossings (UWC).

One strategic option would be conversion of the branch line beyond Marchwood to light rail standard, using tram-train rolling stock to operate the passenger rail service instead of heavy rail rolling stock. With this option, there would be a need for the tram-trains to operate using heavy rail signalling and design standards from Southampton Central to Marchwood (as there would be freight train services running to Solent Gateway), then light rail standards beyond this. It is likely that station construction costs and signalling costs for the light rail section would be lower than for heavy rail. This option would require electrification of the branch and a new depot to be constructed for tram-trains to be maintained and stabled. The cost of purchasing or leasing a small fleet of tram trains and the need for drivers to be trained up to operate them would reduce operational flexibility and efficiency for a Train Operating Company. These requirements would increase costs compared to options involving heavy rail rolling stock. If the Port of Southampton expands in the future onto the

Strategic Land Reserve site, and results in regular railfreight movements to and from it, this would require track and signalling infrastructure to be built to heavy rail standards, so would not be readily compatible with light rail signalling. This scenario would either mean the bulk of the branch should be signalled to heavy rail standards to futureproof it or that light rail signalling would need to be updated before this reaches the end of its' design life. Either way this would increase costs. For reasons of cost and the need to accommodate future heavy rail freight, a light rail tram-train option has been discounted.

A second strategic option would be to remove the existing heavy rail track bed and replace this with a guided busway, from Totton to Fawley or Hythe which could see local bus services re-routed onto it to serve urban areas within Waterside. This option would have a number of disadvantages. The route is currently owned by Network Rail, who would need to transfer ownership to Hampshire County Council. There would be a cost associated with this transfer and a source of funding would need to be found to remove the track bed and construct a guided busway and stops. Buses would need to use the existing congested highway network between Totton and Southampton city centre, so journey times would be longer than the heavy rail options. The conversion of the branch to a guided busway would be expensive in terms of construction. The existing track bed is single line apart from the passing loop at Marchwood, so would be too narrow to accommodate a two-way guided busway. To construct a guided busway would require extensive civil engineering works and considerable loss of vegetation. New screening and planting would be needed to reduce the visual impact of the busway. Conversion to a guided busway would mean that Solent Gateway would lose its' direct access onto the rail network. A new unloading terminal for military vehicles would need to be constructed at Totton Down Goods Loop, and there would be additional costs to the MoD in driving tanks and other equipment from Totton to Solent Gateway. The conversion would also preclude being able to operate freight trains to and from the Port of Southampton Strategic Land Reserve site in the future. This would require all freight from this site to travel by road, which would result in higher numbers of HGV movements via the A326, M27 and M3 to destinations in the Midlands and North of England. For the reasons of cost and adverse impacts on rail freight, this option has been discounted.

Therefore the main focus of optioneering work has been considering heavy rail options for the re-introduction of passenger rail services to the Fawley line. The passenger re-opening proposal would include a rebuilt station at Marchwood, a new station at Hythe, and a new parkway style station referred to as Hythe and Fawley Parkway. Rail services could either be a stand-alone shuttle from the above stations to Southampton Central via Totton; or an extension of existing services that terminate at Southampton Central.

A long list of 15 train service and 8 station options was developed in accordance with DfT TAG guidance on option identification (Step 5), following a review of previous studies (including Network Rail's capacity assessment), Atkins' own analysis of the opportunities present in the current service provision, and discussions with HCC and stakeholders. The approach to developing the options long list is summarised in Table 3-3.

Table 3-3– Waterside Rail re-opening approach to Option Development

Topic	Approach to New Option/Scenario Development
Service Options	• Capture operationally-viable options from previous work (e.g. Southampton – Fawley shuttle service). • Develop options that may unlock additional demand by amending existing services (e.g. potentially extending to London or TransWilts services via Salisbury). • Use connectivity analysis to understand options that may deliver greatest benefits.
Station Location	• Consider if station placement assumed in previous studies is optimal given new areas of development, and consider potentially utilising the full length of the existing branch line and construction of a new alignment to serve the development itself. • Ensure station location aligns with travel needs for existing residents, business and infrastructure, and consider future (with new developments).
Infrastructure	• Re-assess requirement for contingency at level crossings and consider impacts on barrier down time. • Identify potential low-cost works that could deliver benefits. • Investigate need for electrification or signalling works.
Rolling Stock	• Test options including different rolling stock assumptions – diesel, electric (with associated works) or others such as bi-mode, battery-powered or other fuel sources.

3.10.1 Assessment of Options Long List

Fifteen train service and eight station options were initially considered; with sifting carried out in accordance with DfT TAG guidance on initial sifting (Step 6), and a Red-Amber-Green (RAG) rating was assigned to each option based on a high-level assessment against the following criteria to sift options that are unlikely to be viable.

Train Service options:

- **Operational viability** – the likelihood that a timetable will be able to run given constraints on infrastructure, rolling stock, performance and service flexibility;
- **Impact on existing rail services** – the potential for abstraction from neighbouring services, or indeed a loss of demand if an existing service has to be amended to cater for the proposed Waterside option;
- **Abstraction from other public transport services** – the expected potential abstraction from other modes, such as the existing bus services in the area;
- **Financial assessment** – a high-level view of the potential revenues and costs for the option, based on benchmarked assumptions.

Station options:

- **Feasibility** – assessment of the feasibility of constructing the station based on information from previous reports (particularly the GRIP 3 study);
- **Indicative demand potential** – a high-level view of the potential demand from the station catchment, based on benchmarked assumptions;
- **Indicative cost estimate** – a high-level view of the likely construction/upgrade cost for the station, where applicable, based on benchmarked assumptions.

In addition to the above assessment criteria, the shortlisting process also took into account feedback from a stakeholder workshop, held at HCC offices in Winchester in October 2019, which was attended by Atkins, HCC, Network Rail, South Western Railway, Go South Coast and Three Rivers Community Rail Partnership.

A detailed assessment of the RAG for each of the rail service and station options is presented in Appendix C with a summary of key findings in the following sections.

3.10.2 Operational Viability

Several options were ruled out on the basis of expected financial viability and stakeholder feedback. The remaining options underwent an initial timetable review, whereby Atkins sought to create a compliant timetable for a 2-3 hour daytime period in the May 2019 timetable.

The following assumptions were made:

- The timing of services east of Southampton would remain fixed.
- The new service would call at all stations, although Millbrook and Redbridge could be omitted if operationally beneficial.
- The line speed on the branch would be upgraded to 60mph where possible and Sectional Running Times (SRTs) would be as per the Network Rail Study. All options used Class 158 SRTs on the branch irrespective of the expected traction type.
- The terminus of the branch could be Hythe Town, Hythe & Fawley Parkway or Fawley Waterside.
- Marchwood would be the preferred location where trains would pass on the branch. The need for additional / alternative passing locations would not necessarily rule out an option, but the increased capital cost of this would impose would need to be highlighted and considered in the option evaluation process.
- Platform 5 at Southampton could be used by passenger services if required.
- Services could be provided by 750V DC electric traction if required.
- 2020 Timetable Planning Rules were used (modified where appropriate in cases where existing infrastructure was assumed to be upgraded).
- Generally no change to other paths unless inherent of option; paths flexed by exception if possible (normally class 4/5/6 freight paths only).

This exercise enabled a commentary of expected operational viability to be provided for each option to inform the option selection process. The following general conclusions were drawn from this initial assessment:

- Intermediate calls in the new service at Millbrook and Redbridge would not be possible without timetable impacts to other services.
- 2tph and 3tph options would require trains to pass at Marchwood, so a new ‘up’ platform would need to be constructed under both of these options. In both these scenarios, it is possible for the service to operate to and from Hythe & Fawley Parkway. An extension beyond the proposed parkway station towards Fawley would require trains to pass again on the branch, requiring the construction of a passing loop. Given the expected capital cost of extension to Fawley by-passing the oil refinery, and the further cost of providing a passing loop, this study focussed of options that ran to Hythe & Fawley Parkway

3.10.3 Summary of Findings on Train Service Options

The following sections summarise the various train service options considered and high-level findings for each from the RAG assessment and operational review. It should be acknowledged that the train service options will (to varying degrees) have an adverse impact on level crossing barrier down time in a number of locations. Of particular concern to HCC is the likely impact of running additional train services at Junction Road level crossing in Totton. There is existing traffic congestion at this location at times when barriers are down, and any worsening of the situation is not desirable. At the next stages of scheme development (or if additional train services are introduced as a result of Solent CMSP work or growth in rail freight), ways of mitigating this will need to be investigated and solutions identified.

Southampton – Hythe / Fawley Shuttle

This option assumes that the Waterside service would operate as a standalone shuttle operation from Southampton Central, where passengers could interchange with other services. 1tph, 2tph and 3tph options were considered, as well as a shuttle service terminating at Totton.

Following the RAG assessment, it was determined that both the 2tph and 3tph shuttle service from Southampton Central should be investigated further, as these appear to be operationally viable between Hythe and Southampton, although further detailed investigation is required at Southampton Central itself. There is also minimal impact on existing passengers, as the services would be additional to the current timetable and also would improve the service frequency between Southampton and Totton. The 3tph option would potentially offer a more 'transformational' service for the area and encourage stronger modal shift from car.

The 1tph option was ruled out as unlikely to encourage sufficient modal shift from car to rail due to the low frequency and the Totton option was excluded due to the likely requirement for additional infrastructure to terminate services from the west and that this would result in no direct train service connectivity between Waterside and Southampton.

Romsey – Salisbury diversion to serve Hythe / Fawley and new backfill service

This option involves diverting the existing Romsey – Salisbury via Southampton and Redbridge to Hythe / Fawley, with a new backfill stopping service provided between Salisbury and Southampton Central via Redbridge, which would maintain existing connectivity to Southampton. It was determined that this option should be taken forward as relatively low cost, providing direct connectivity across Southampton to Southampton Airport and Eastleigh, as well as being an appropriate 'local' service to extend.

Extension of London Victoria-Southampton service

This option would not be as attractive in terms of revenue and benefits as some other extension options; however, from an operational perspective it was found to be an appropriate service to extend to Hythe / Fawley from Southampton Central. It was therefore taken forward as part of a combined option to maximise connectivity across Southampton. Potentially if timetables are revised in the future as a result of the Solent CMSP work to increase train service frequencies on the Netley Line, then these services may be more suitable for consideration for extension beyond their current Southampton Central terminating point.

Summary of Other Train Service Extension Options Considered and rejected

Several other services approaching Southampton Central from the east were also considered for suitability of extension to Fawley and rejected. The factors considered and the reasons for sifting out these options are summarised in Table 3-4:

Table 3-4 - Other Train Service Options Considered and rationale for sifting out

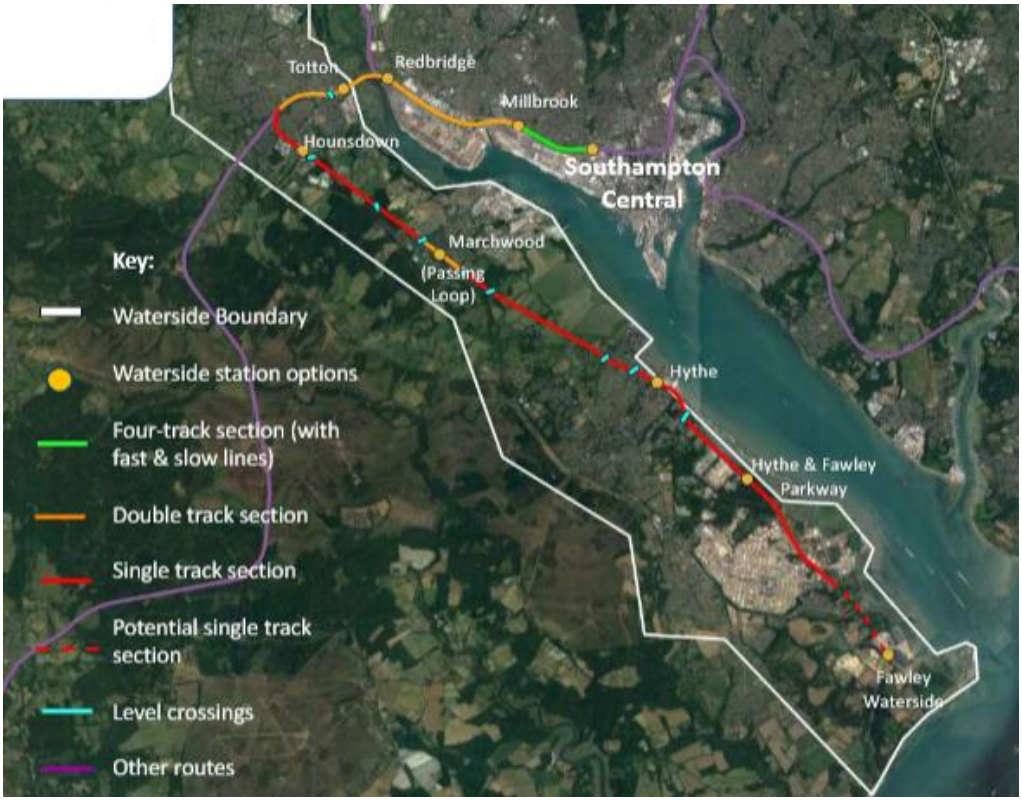
Train service	Rationale for sifting this option out
Portsmouth & Southsea-Southampton Central SWR service (1tph)	This service would be an appropriate service to extend to Hythe / Fawley and would provide direct connectivity across Southampton as well as potentially releasing platform capacity at Southampton Central itself as services would no longer need to reverse there. However, the operational assessment determined that no suitable timetable path exists to the west of Southampton resulting in a long dwell time at Southampton Central and insufficient time to run to Hythe / Fawley and back to form the next service back to Portsmouth.
Brighton-Southampton Southern service (1tph)	The findings for this option were similar to the Portsmouth option, with there being no suitable path to the west of Southampton to extend the service
London Waterloo-Poole (1tph)	This option was deemed to be broadly feasibly operationally and could potentially generate a stronger financial return due to direct connectivity to employment centres such as Winchester, Basingstoke and London. However, the option was ruled out following feedback from stakeholders that it wasn't a suitable service to extend due to the severance of the Poole service and lack of compatibility with existing rolling stock diagrams. A backfill service would also be required to maintain existing service levels between Southampton and Poole. This may need to be reviewed in the light of possible conclusions from Network Rail's Dorset Connectivity CMSP which include options severing the Waterloo-Poole service at Southampton.
New Winchester-Southampton service (1tph)	This option was proposed at the stakeholder workshop and involves running an additional service from Hythe / Fawley to Winchester, with the added benefit of enhancing local service frequency in the Southampton area. However, this service failed the operational assessment as no suitable path existed at Eastleigh and between Eastleigh and Winchester in the correct part of the hour.

The findings above are based on an assessment against the current timetable (May 2019). A recast of the timetable in the Solent area, made possible as a result of the Solent CMSP work, such as the proposed increase in frequency of the Portsmouth – Southampton stopping service may present new opportunities for extending train services beyond Southampton that may be preferable to extending the London Victoria to Southampton service). These other options may represent better services to extend in terms of enhancing connectivity within the Solent area. As part of the Solent CMSP work, Network Rail are undertaking further timetable analysis which will look to align both outputs. Any changes to timetables should fully consider the implications for barrier down time at level crossings. Therefore, if this scheme is taken forward to the Outline Business Case stage of development, there is scope to consider this alternative extension option further if the further CMSP timetable analysis work being undertaken suggests that this is viable.

3.10.4 Station Options

An assessment was also made of various station options on the branch to determine the optimal stopping pattern for the Waterside service. The locations of existing and proposed stations are shown in Figure 3-14.

Figure 3-14 – Long List of Locations of existing and proposed stations that have been considered for Waterside Rail services



Terminus Options (Hythe or Fawley area)

Three station terminus options for the new train service have been considered:

- **Hythe Town:** terminating the rail service at Hythe Town would discourage car use and provide connections with the existing bus service. However, it would also not be a suitable location to attract residents of the proposed Fawley Waterside development to rail due to the relatively unattractive journey time by a combination of bus and rail. It was concluded that Hythe Town should be an intermediate station call. Hythe Town could potentially be a temporary terminus station if undertaking a phased approach to re-storing passenger services **Outcome: Intermediate station**
- **Fawley Waterside**: a station at Fawley itself would be a far better location to serve the new development and reduce the proportion of abstracted trips from bus, but this option was ruled out due to additional expense of constructing the additional new track alignment required, bypassing the oil refinery at Fawley, which would require land and encroach on the New Forest National Park. **Outcome: No**
- **Hythe & Fawley Parkway:** a parkway station was proposed in the Markides report as a means of serving the Waterside development indirectly without a costly extension of the Waterside branch line around the site of the existing oil refinery at Fawley. As part of this option, a shuttle bus would be provided to connect the station with the Waterside development. It was decided that the parkway station should be taken forward as the preferred terminus of the service as it increases the revenue potential of the service compared to having the terminus station at Hythe Town for limited additional cost, and it is the preferred option for Fawley Waterside developer and local stakeholder groups. **Outcome: Yes**

Intermediate Station Call Options

The following intermediate stations have been considered:

- **Marchwood:** this option would involve re-opening the existing mothballed station on the branch, so it would be a relatively low cost option, and the station is well placed to serve intermediate markets between Hythe and Totton. Operationally, the location of the station on a passing loop allows for an efficient passing of trains. The 1tph option would see trains in both directions using the existing platform, whereas the 2tph and 3tph train service options would require construction of a new platform on the passing loop for use by trains travelling towards Totton and Southampton. **Outcome: Yes**
- **Hythe Town:** this would be a new intermediate station that would be constructed at approximately 88m 74ch, between School Road and New Road, with the platform face on the north side, with pedestrian access provided from the station to both New Road car park and New Road. This site differs from the former Hythe Town station located further to the east by Dominy Close. **Outcome: Yes**
- **Hounsdown:** it was determined that there would be insufficient demand to justify the construction of an additional station that would be in relatively close proximity to existing stations at Totton and Marchwood..**Outcome: No**
- **Totton:** as the largest town on the route between Fawley and Southampton, which would benefit from more frequent rail services, a call at Totton would be essential for a Waterside service. Calling at Totton also provides connections with services towards Bournemouth and Poole. **Outcome: Yes**
- **Redbridge and Millbrook:** This corridor is already well served by frequent bus services and additional calls would use up scarce rail capacity and increase journey times from the Waterside for relatively small numbers of additional passengers, so calls at these stations were ruled out. **Outcome: No**

3.10.5 Summary of Options Taken Forward

As a result of the sifting process, the following options were taken forward for detailed assessment:

- **'Low Cost' Option: 1 train per hour (tph) Romsey via Eastleigh – Hythe & Fawley Parkway.** This option assumes diversion of the existing Salisbury – Romsey – Eastleigh – Southampton – Salisbury service with a new separate self-contained Salisbury – Southampton service as a backfill. This would be a relatively low cost adaptation of the existing service, although some direct connectivity across Southampton would be lost (e.g. Redbridge and Millbrook would lose their direct connection to Eastleigh and Southampton Parkway).
- **'High Connectivity' Option: 1tph Romsey via Eastleigh – Hythe & Fawley Parkway + 1tph Victoria – Hythe & Fawley Parkway.** This option combines extensions of the existing services from Romsey (with a Salisbury – Southampton backfill service) and London Victoria, offering a half-hourly frequency on the Waterside line and maximises connectivity across Southampton but requires third rail electrification of the branch.
- **'High Frequency' Option: 3tph Southampton – Hythe & Fawley Parkway shuttle.** This option requires additional mileage and staff costs, as well as construction of an additional passing loop between Totton and Marchwood, but may be more 'transformational' in terms of demand potential. It may be possible to take a phased approach to delivering this option, beginning with an interim option with a lower passenger service frequency, that would see the additional passing loop delivered at a later date this and the frequency increasing to 3tph once demand has built up, which would help to keep the cost more manageable.

These train service options were chosen to assess affordability and Value for Money (VfM) across a wide range of service frequencies, capital and operating costs. It was also decided that service options would only be included where this could be achieved with only minor alterations to the existing timetable, which was established in the operational viability assessment described above.

For this reason, the core 2tph Southampton – Hythe Town / Hythe & Fawley Parkway option tested in the previous studies was not included, as the initial operational assessment determined that this service could not be compliantly timetabled at Southampton Central with several services failing to achieve the minimum turnaround time; this is consistent with the findings of the Network Rail study. Benefits of the 2tph option can be broadly ascertained from the 'high connectivity' option taken forward.

The 'high connectivity' option assumes service extensions from London Victoria and Romsey to Hythe & Fawley Parkway, as these were the two services that could be compliantly timetabled through Southampton Central based on the timetable to the east of Southampton. It is acknowledged that there may be more attractive services to extend to Hythe & Fawley Parkway from a benefits perspective; for example, the stopping service between Portsmouth and Southampton. Any wider timetable recast of the Solent area may present an opportunity to develop compliant alternative service extension options which deliver great passenger and operational benefit as part of future scheme development.

3.11 Detailed Assessment of Shortlisted Options

The three shortlisted options taken forward underwent detailed operational assessment. Timetabling was carried out for the whole standard weekday (SX), to check that each option remained workable for non-standard hours of the day, especially peak periods. This process also confirmed infrastructure works required for the branch line and whether platform 5 at Southampton would be required.

Workable timetable solutions were found for the following three options:

- Low Cost Option (1 tph)
- High Frequency Option (2 tph)
- High Connectivity Option (3 tph)

In each case, some minor changes were required to other operators' services and freight services. Although workable solutions have been found for each option, no performance modelling has been undertaken.

3.11.1 Rail infrastructure enhancements

The rail infrastructure enhancements set out in this section are assumed to be required to reintroduce a passenger service, largely irrespective of which of the three shortlisted service options are chosen.

These interventions are derived from the work previously undertaken by Markides and Network Rail.

Stations

The following station construction/ improvement works would be required.

- *Marchwood station*: the existing solid infill platform at Marchwood would be restored to passenger use with compliant stepping distances, resurfacing, lighting, ticket machine and improved access from Main Road. (Note: construction of a second platform referred to in Markides' report is not included in the baseline infrastructure assumptions).
- *Hythe Town station*: a new station site has been proposed that would be constructed at approximately 88m 74ch, which differs from the former Hythe Town station and the

location proposed in the 2013 study. The proposed new location provides better access to Hythe and better interchange with other transport modes, being located adjacent to New Road public car park and close to the existing bus route and Hythe Pier, although the platform would need to be constructed on the railway embankment. The station would require lighting, ticket machine, waiting shelter and step-free access.

- *Hythe & Fawley Parkway station*: a new station would be constructed at approximately 90m40ch to include a bus stop and a 500-space car park, as well as lighting, ticket machine, waiting shelter and step-free access.

Platform length requirements vary by service option and are summarised in Table 3-5 below. Note: these lengths represent the length of the assumed rolling stock and do not include any allowance for inaccurate stopping or signal stand back.[18] The platforms would need to accommodate the proposed rolling stock and include an allowance for inaccurate stopping.

Table 3-5 - Assumed rolling stock lengths for Fawley train service options

Service option	Rolling Stock Assumption	Length
Low Cost - Romsey service diversion & backfill	Max 3-car Class 159	70m
High Connectivity - Romsey and Victoria Extension	Max 4-car Class 377	82m
High Frequency 3tph shuttle	Max 3-car Class 159	70m

Track and signalling infrastructure

It has been concluded for costing purposes that there is sufficient evidence that only minor track upgrades would be required to accommodate the increased use and higher line speed, although this would need to be confirmed as part of detailed feasibility work.

The signalling system would need to be upgraded to enable the line speed to be increased to 60mph. The principal changes would be:

- The relocation of the existing fixed distant signals on approach to Marchwood station in line with the increased braking distances required from 60mph.
- The upgrading of the line between Marchwood and Hythe & Fawley Parkway to Track Circuit Block signalling using axle counters for long lengths of plainline.

Level Crossings

The three train service options would have very different levels of impacts on the level crossings on the route. Clearly, the 3tph option would result in more barrier down time than the 2tph option and the 2tph option would result in more down time than the 1tph option.

The level crossing that would be most affected by Waterside Rail re-opening would be Junction Road in Totton, which already sees a significant amount of barrier down time from existing train services. Preliminary assessment at Totton suggests ‘down-time’ of the level crossing per hour could increase by 1 to 3 ½ minutes under the 2tph option, which would result in adverse impacts on the length of traffic queues, air quality and journey time reliability of bus services. However the potential for running up and down train services at the same time and other adjustments may provide opportunities to reduce these adverse impacts.

[18] As stated in Rail Industry Standard RIS-7016-INS: ‘The usable length of platforms shall be long enough to accommodate the longest train regularly booked to stop at a platform, with allowances for inaccurate stopping and operational requirements.’ It is also necessary for the stopping position of a train to be sufficiently back from a platform starter signal to ensure the driver can clearly see the signal. A stand back of 25m is commonly used.

HCC is in the process of undertaking a feasibility study to consider options that would address this issue. Options being considered include replacing the level crossing with an overbridge. As part of the next stage of scheme development, NR will need to consider the steps needed to mitigate adverse impacts of running additional train services through Junction Road level crossing.

In terms of level crossings on the Fawley branch itself, a study by Markides reviewed the 20 level crossings on the route and recommended the upgrades summarised in Table 3-6 below.

Table 3-6 – Assumptions made on level crossing upgrades along Fawley Branch

Level Crossing	Type	Assumed works
Jacob's Gutter Lane	***Automatic Half Barrier***	***Upgrade to CCTV***
White's	User Worked Crossing (UWC)	No change
Trotts Lane	**Automatic Half Barrier**	**Replacement with overbridge**
Howells	UWC	No change
Tavell's Lane	***Automatic Half Barrier***	***Controlled barrier with obstacle detection (CCTV assumed)***
Marchwood	***Manually Controlled Gates***	***Replace with CCTV***
Pumpfield Farm	UWC with Miniature Signals	No change
McGee No. 2	UWC	No change / explore closure
Veals Lane	***Automatic Half Barrier***	***Controlled barrier with obstacle detection (CCTV assumed)***
McGee No. 3	UWC	No change / explore closure
McGee No. 4	UWC	No change / explore closure
Church Farm No. 1	UWC	No change / explore closure
Church Farm No. 2	UWC	No change / explore closure
West Street	**Automatic Half Barrier**	**Replacement with overbridge**
School Road	***Manually Controlled Gates***	***Upgrade to CCTV***
Frost Lane	**Automatic Half Barrier**	**Replacement with overbridge**
Developing Co. No. 2	UWC	No change / explore closure
Developing Co. No. 3	UWC	Requires further investigation (*no change assumed*)
Developing Co. No. 5	UWC	No change
Developing Co. No. 7	UWC	No change / explore closure

The same scope of upgrades has been assumed for infrastructure costing purposes for the scheme in the Economic Case, with the exception of the use of controlled barrier crossings with obstacle detection, where CCTV crossings have been assumed for consistency.

The Markides document states that on advice from the Department for Transport, as many level crossings should be eliminated as possible, even if increasing the capital costs of the scheme.

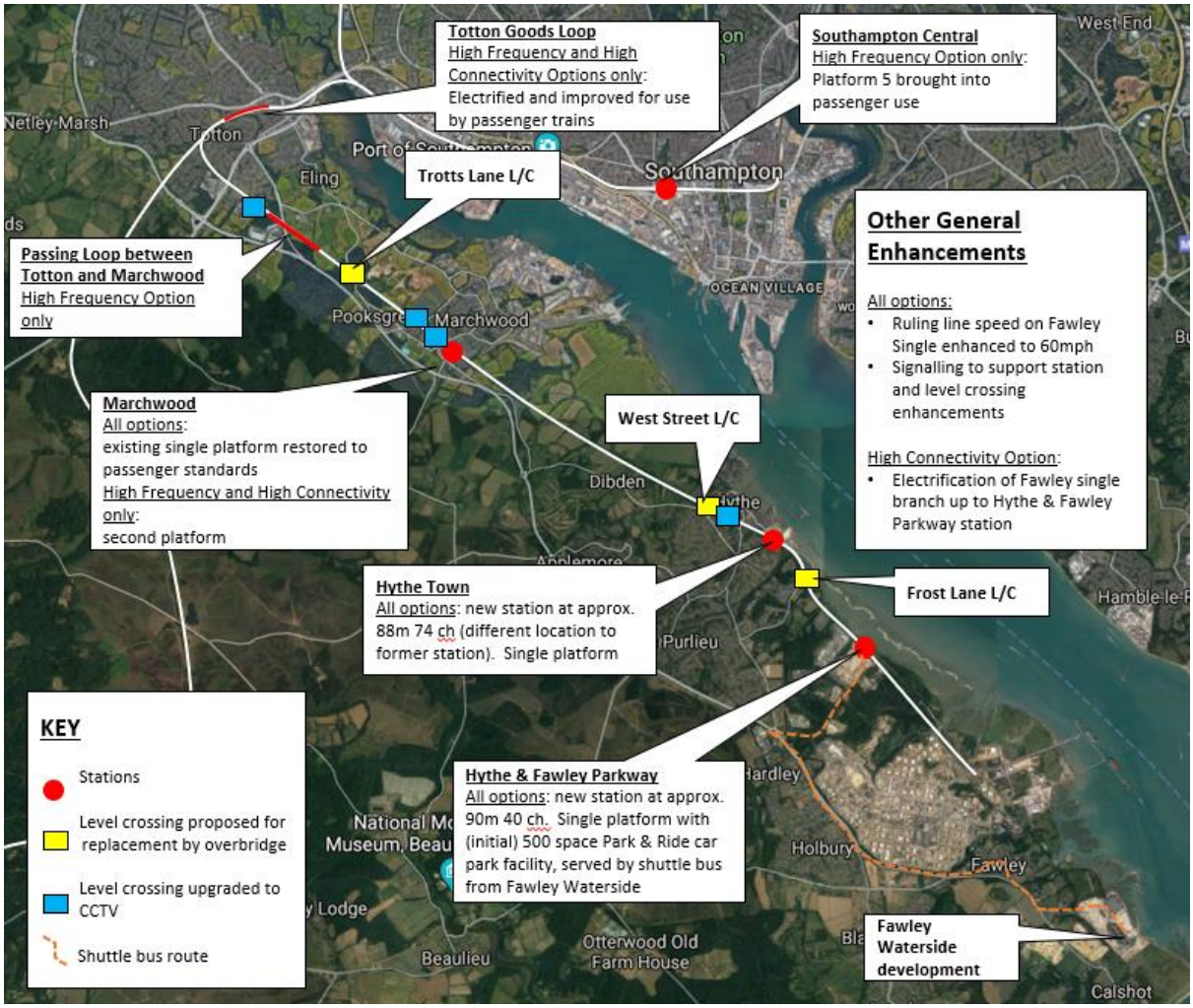
At three level crossing locations (Trotts Lane, Marchwood and West Street and Frost Lane in Hythe), indicative costs have been included for the construction of a new overbridge and associate works as part of the overall scheme cost estimate, which has a significant impact on the overall capital cost estimate for all options. The visual and environmental impacts of these proposed overbridges would need to be carefully considered at the next stage of

scheme development. The locations of these three level crossings are shown in yellow in Figure 3-15 below.

The upgrading of four level crossings (Jacob's Gutter Lane, Tavells Lane, Veals Lane and School Road level crossings – shown in blue in Figure 3-15 below) to CCTV has been included as part of the scheme cost estimate. This will require new protecting signals to be provided at these level crossings.

As part of the next stage of scheme development, NR will need to conduct full risk assessments at each level crossing to determine the optimum solution.

Figure 3-15 – Map showing locations of proposed infrastructure improvements including new road overbridges and Level Crossing upgrades to CCTV.



Other Rail Infrastructure Improvements Required under the shortlisted options

The further rail infrastructure enhancements required for each option are summarised in Tables 3-7 and 3-8 below.

Table 3-7– Summary of infrastructure requirements by service option

Service option	Southampton Central Platform 5	Passenger trains permitted to use Totton Goods Loop	Additional passing loop between Totton and Marchwood	Marchwood Up Platform	Electrification
1tph Romsey Extension	✗	✗	✗	✗	✗
2tph Romsey and Victoria Extension	✗	✓	✗	✓	✓
3tph Shuttle[19]	✓	✓	✓	✓	✗[20]

Table 3-8 - Summary Overview of Further infrastructure improvements

Improvement	Summary Description of works to be undertaken
Southampton Central Platform 5	Southampton Central station currently comprises four through platforms. Platform 5, a west facing bay platform, described on the diagram below as the Down Bay Siding, also exists but is not signalled to passenger standard. The 'High Frequency' 3tph shuttle would require the use of Platform 5 for passenger services. The cost of a number of necessary signal upgrades and Interlocking alterations have been included in the cost estimates for this option.
Permit passenger trains to use Totton Goods Loop	Where frequencies in excess of 1tph are considered, one of the greatest risks to consequential delay to other services is the scenario where a Down train bound for Hythe & Fawley Parkway reaches Totton but is unable to proceed because a late running service is still occupying the branch. This could be mitigated by permitting passenger services to use the Goods Loop at Totton (as recommended by the Solent CMSP study report), enabling the Down train to wait clear of the Down Main. It is not known what works, if any, would be required to permit this as the Goods Loop is already fully signalled. It has been assumed for the purposes of costing that no physical works are required, and that a risk assessment and network change process would be sufficient.
Passing Loop between Totton and Marchwood	The option of introducing a 20 minute interval service would result in a high occupancy of the single line between Totton and Marchwood by passenger trains. This would not leave sufficient time for any freight services to operate between Totton and Marchwood. Therefore, it has been assumed that a new 775m passing loop would be constructed approximately mid-way between Totton Junction West and Marchwood. The exact location is flexible for the purposes of timetabling, so a site requiring minimal earthworks and structures would be preferred.
Marchwood Up platform	Where passenger trains are required to pass at Marchwood (2 and 3tph), a second platform is required with associated access ramp, basic shelters and lighting.
Electrification	For the High Connectivity (2tph) option, existing electric services are to be extended to Hythe & Fawley Parkway. The branch would be electrified with 750V DC third rail electrification.

[19] A 2tph shuttle from Southampton Central – Hythe & Fawley Parkway has not been considered as part of the detailed operational assessment, but this option would require as a minimum the infrastructure works proposed for the 3tph shuttle. Platforming at Southampton Central would need to be examined in more detail (see Section 3.10.5 for further explanation as to why this option was not taken forward).

[20] Although electrification is not required, an electric variant could be considered.

3.11.2 Timetable Validation

Shortlisted options have been analysed in greater detail for a full SX day to confirm that the assumed infrastructure is capable of supporting the proposed train service. In each case, a compliant timetable was successfully produced.

The following assumptions were made:

- 10 additional freight paths in each direction would run between Marchwood and Bramley, as identified in Network Rail's Fawley Area Freight and Passenger Capacity Study
- Infrastructure is as set out in Section 3.11.1 above
- 2020 Timetable Planning Rules (TPRs) were used
- 1 minute dwells at all stops unless a longer dwell is mandated in the TPRs
- Trains are assumed to terminate at Hythe & Fawley Parkway. The impact of the additional run time to Fawley Waterside has not been considered.
- The service would operate approx. 06:00 – 23:00
- Impact on other operators' services was limited to 'non-material' changes.

The run times tabulated in Tables 3-9 and 3-10 below were used.

Table 3-9 – Assumed run times – Southampton Central to Hythe & Fawley Parkway

From	To	Type	Run time	Remarks
Southampton Central	Redbridge	S/P	3.5	159 SRT from B-plan
Redbridge	Totton	P/S	1.0	159 SRT from B-plan
Totton	Totton Yard	S/P	0.5	IRT
Totton Yard	Marchwood	P/S	6.0	IRT
Marchwood	Hythe Town	S/S	5.0	IRT
Hythe Town	Hythe & Fawley Parkway	S/S	1.0	IRT. Further 0.5 min adjustment added to match MRTech.

Table 3-10– Assumed run times – Hythe & Fawley Parkway to Southampton Central

From	To	Type	Run time	Remarks
Hythe & Fawley Parkway	Hythe Town	S/S	1.5	IRT
Hythe Town	Marchwood	S/S	5.0	IRT
Marchwood	Totton Yard	S/P	5.5	IRT
Totton Yard	Totton	P/S	0.5	IRT
Totton	Redbridge	S/P	1.5	159 SRT from B-plan
Redbridge	Southampton Central	P/S	3.5	159 SRT from B-plan

Low Cost (1tph) Option

This service option has the following features:

- This option involves splitting the existing Romsey – Eastleigh – Southampton – Salisbury at Southampton, with the Romsey – Southampton portion extended to Hythe & Fawley Parkway, and the Southampton – Salisbury portion run as a standalone service.

- Requires one additional unit to operate, as the existing Romsey – Salisbury service requires three units, and the proposed Romsey – Hythe (via Eastleigh) and Salisbury – Southampton services require two units each.
- Trains are not timetabled to pass each other on the Fawley Single.
- Up trains (Hythe – Romsey) mostly use platform 1 at Southampton Central, with a few trains using platform 2
- Down trains mostly use platform 3, with some trains using platform 4.
- The Salisbury – Southampton service mostly uses platform 2B to turnaround.
- This option does not require use of platform 5 at Southampton Central.
- Turnaround at Hythe & Fawley Parkway would be 13 minutes, with some variation between trains. This is well above the minimum turnaround of 4 minutes. Dwell time at Southampton Central is mostly 2 minutes (minimum permitted) in the up direction and 4-5 minutes in the down direction.
- The Salisbury – Southampton service usually has a 5½-minute turnaround at Southampton Central.
- Freight to and from Marchwood can be accommodated alongside passenger services with no additional infrastructure. A degree of flexing is required to some of the freight paths to ensure only one train is on the single line between Marchwood and Totton Yard at a time.

A typical sample from the passenger timetable is shown in Table 3-11 below. The Southampton – Romsey portion of the service retains the current train paths.

Table 3-11 – Typical standard hour passenger timetable – low cost option – Hythe to Romsey service

Romsey	dep	**11 07**
Chandlers Ford	dep	**11 14**
Eastleigh	dep	**11 21**
Southampton Airport Parkway	dep	**11 25**
Swaythling	dep	**11 27**
St. Denys	dep	**11 30**
Southampton Central	arr	**11 36**
	dep	**11 40**
Totton	dep	**11 45**
Marchwood	arr	**11 52**
	dep	**11 52**
Hythe Town	dep	**11 58**
Hythe & Fawley Parkway	arr	**11 59**

Hythe & Fawley Parkway	dep	**12 12**
Hythe Town	dep	**12 14**
Marchwood	arr	**12 20**
	dep	**12 20**
Totton	dep	**12 28**
Southampton Central	arr	**12 33**
	dep	**12 35**
St. Denys	dep	**12 40**
Swaythling	dep	**12 43**
Southampton Airport Parkway	dep	**12 46**
Eastleigh	dep	**12 50**
Chandlers Ford	dep	**12 55**
Romsey	arr	**13 03**

The impact of this option on other operators' services has been assessed and would have a minor impact on one GWR service per hour – requiring 30seconds of pathing time adding in. Two freight services and four empty carriage stock movements would require a small timing adjustment.

High Connectivity (2tph) Option

This option builds on the Low Cost Option (Romsey Extension) and adds the extension of the of London Victoria – Southampton Central service to Hythe & Fawley Parkway and has the following features:

- Requires two additional units to operate over the Do Minimum (one for the Romsey extension and the other for the Victoria extension).
- Trains would pass at Marchwood on the single line.
- Due to timing and minimum reoccupation constraints on the single line, trains have longer dwell times at Marchwood compared with the Romsey Extension option.
- Turnaround at Hythe & Fawley Parkway would be 9 minutes for the Romsey service and 20 minutes for the Victoria service.
- Up trains (Hythe & Fawley Parkway – London Victoria) mostly use platform 2.
- Down trains (London Victoria – Hythe & Fawley Parkway) mostly use platform 3.
- Platforming of Romsey services at Southampton Central is as per the Low Cost Option.
- This option does not require platform 5 at Southampton Central.
- Freight to and from Marchwood can be accommodated alongside passenger services. A degree of flexing is required to some of the freight paths to ensure only one train is on the single line between Marchwood and Totton Yard at a time.

A typical sample from the passenger timetable is shown in Table 3-12 below.

Table 3-12– Typical standard hour passenger timetable – high connectivity option

Origin		London Victoria	Romsey
Southampton Central	dep	**12 04**	**12 40**
Totton	dep	**12 09**	**12 45**
Marchwood	arr	**12 16**	**12 52**
	dep	**12 18**	**12 54**
Hythe Town	dep	**12 25**	**13 00**
Hythe & Fawley Parkway	arr	**12 26**	**13 01**

Destination		London Victoria	Romsey
Hythe & Fawley Parkway	dep	**12 46**	**13 10**
Hythe Town	dep	**12 48**	**13 12**
Marchwood	arr	**12 54**	**13 18**
	dep	**12 56**	**13 20**
Totton	dep	**13 03**	**13 28**
Southampton Central	arr	**13 09**	**13 34**

The Southampton – Salisbury service is as per the low-cost option.

The impact of this option on other operators' services has been assessed and would have a minor impact on one Southern and one SWR service per hour – requiring variation in departure time of 1 minute, and one other SWR service having 30 seconds of pathing time adding in. Four freight services and two empty carriage stock movements would require a small timing adjustment.

High Frequency (3tph) Option

This option provides a regular shuttle service between Southampton and Hythe & Fawley Parkway and has the following features:

- Requires three rolling stock units to operate
- Passenger Train services on the single line Fawley Branch would pass using the existing loop at Marchwood station (with new 'up' platform required)
- Most services use Platform 5 at Southampton. On a small number of occasions Platforms 2 and 3 need to be used.

- Turnaround at Hythe & Fawley Parkway would be 4 minutes (minimum turnaround). To mitigate the risk this imposes to performance, most Down trains have 2 minutes' performance time approaching Marchwood and a dwell of at least two minutes at Marchwood. This use of minimum turnarounds makes this option sensitive to the accuracy of the IRTs used.
- Turnarounds at Southampton range between 5 and 15 minutes, with most being 9 to 11 minutes.
- Freight to and from Marchwood has been assumed to pass a passenger service travelling in the opposite direction between Totton and Marchwood on a new passing loop (see Section 4.2). No timings have been calculated to or from this new loop; timings have been based on using the existing single line for modelling purposes.

A typical sample from the passenger timetable is shown in Table 3-13 below.

Table 3-13– Typical standard hour passenger timetable – high frequency option

Southampton Central	dep	**12 16**	**12 36**	**12 56**
Totton	dep	**12 22**	**12 42**	**13 03**
Marchwood	arr	**12 31**	**12 51**	**13 11**
	dep	**12 32**	**12 52**	**13 12**
Hythe Town	dep	**12 38**	**12 58**	**13 18**
Hythe & Fawley Parkway	arr	**12 40**	**13 00**	**13 20**

Hythe & Fawley Parkway	dep	**12 24**	**12 44**	**13 04**
Hythe Town	dep	**12 26**	**12 46**	**13 06**
Marchwood	arr	**12 32**	**12 52**	**13 12**
	dep	**12 32**	**12 52**	**13 12**
Totton	dep	**12 39**	**12 59**	**13 19**
Southampton Central	arr	**12 45**	**13 05**	**13 27**

The impact of this option on other operators' services has been assessed and would have a minor impact on ten passenger services per hour – requiring minor variation in departure/arrival times small changes to pathing times. Five freight services and five empty carriage stock movements would require a small timing adjustment.

3.12 Overview of stakeholders

Table 3-14 summarises the roles of various stakeholders in the development of the Waterside Rail re-opening feasibility and SOBC work undertaken to date.

Table 3-14– Summary of roles and responsibilities of key stakeholders in development of the Waterside Rail re-opening scheme

Stakeholder	Role in Waterside Rail RYR scheme development
Department for Transport	The RYR team have been involved in monthly progress meetings with HCC and NR since July 2020 to help provide feedback on the feasibility study work and provide advice and guidance that has informed the preparation of this SOBC. DfT will review this SOBC and make a decision as to whether scheme development should progress to the next (OBC) stage.
Network Rail	The owner and operator of Britain's rail infrastructure. NR attended workshops to inform feasibility and optioneering study and scheme development process. They have helped provide feedback on the feasibility study work and have assessed the impacts of the shortlisted options on rail timetable operation. Supported HCC in reviewing scheme cost estimates and providing feedback on a draft version of this SOBC. If DfT decide that this scheme should progress to the next stage of development (OBC), then Network Rail would take over the role of scheme promoter from HCC.
South Western Railway	Attended workshops to inform feasibility and optioneering study and scheme development process. Ran fact-finding passenger rail service along Fawley branch for Minister and Chairman of NR on 24 July 2020. Provided information about staffing and operational costs that have been applied in the preparation of Opex costs. Involved in discussions around overnight stabling.
Dr. Julian Lewis – MP for New Forest East and RYR Sponsor	Kept updated with process of RYR submission and SOBC development through meetings and correspondence. He has highlighted a number of issues and risks that would need to be addressed. This include the need for passenger demand forecasts to be robust, the impacts of additional train services on Junction Road level crossing, Totton and Main Road, Marchwood need to be understood and adverse impacts mitigated. Also, he would like to avoid Waterside rail re-opening having a detrimental impact on the frequency and quality of local bus services.
New Forest District Council	Attended workshops to inform feasibility and optioneering study and scheme development process. Kept regularly updated with process of RYR submission and SOBC development. Meetings held with District Councillors.
New Forest National Park Authority	Attended workshops to inform feasibility and optioneering study and scheme development process. Kept regularly updated with process of RYR submission and SOBC development.
Town/ Parish Councils	Attended a Waterside transport engagement event
Southampton City Council	Kept appraised on progress of feasibility and optioneering work through regular correspondence.
Fawley Waterside Ltd	Kept appraised on progress of feasibility and optioneering work through regular correspondence.
Three Rivers Community Rail Partnership	Provided information to support RYR Ideas Fund submission. Attended workshops to inform feasibility and optioneering study and scheme development process. Worked with SWR to arrange fact-finding passenger rail service along Fawley branch for Minister and Chairman of NR on 24 July 2020.
Bus Operators	Attended workshops to inform feasibility and optioneering study. Kept updated with process of RYR submission and SOBC development.

A technical workshop was held in summer 2019 with Network Rail, South Western Railway and local bus operators to consider potential station and train service options and issues related to the reopening scheme, such as the potential for abstraction.

A wider stakeholder event was held to help shape the development of a new Waterside Multi-Modal Transport Strategy on 28 November 2019. This sought views from stakeholders on options for improving highway, public transport and active travel access within the Totton and Waterside area. Train service and station options for Waterside Rail re-opening were discussed and feedback on these were obtained. Since the workshop, HCC has communicated regularly with all the key stakeholders to obtain evidence and information that has helped to inform feasibility and the optioneering process as well as to inform scheme costings.

In Spring 2021 an extensive public consultation is planned to be undertaken on a number of proposed transport improvements for the Waterside area. As part of this process, views on the passenger rail re-opening scheme options and potential wider community impacts such as abstraction of demand from local bus services and the Hythe Ferry service and increased severance resulting from increased barrier down time, particularly at Junction Road level crossing in Totton, and Main Road in Marchwood will be sought.

3.13 Constraints

Table 3-15 below summarises the main expected constraints that could affect Waterside Rail scheme development and delivery and what HCC and NR would do to manage and take account of these constraints:

Table 3-15 - Summary of main constraints relating to Waterside Rail scheme

Constraint	Issue or Potential Risk	How Impact will be Mitigated
Land	Land owned by a Third Party would be required for Hythe and Fawley Parkway station, including car park and access road and some land may be needed for new passing loop	The approach that is being proposed will minimise the requirement for land take outside the current Network Rail boundary. Early engagement to take place with third party landowners to discuss options for minimising land take. Early engagement with landowners on station design and access arrangements. Look to find consensus and agreement on way forward.
Planning consent/ Legal objections	Construction of new platforms/ car park and forecourt at Hythe & Fawley Parkway may require planning permission. Interested parties could object	Early pre-application engagement with Local Planning Authority to agree design principles and requirements for lighting, landscaping etc of car parking and forecourt areas. Keep affected/ interested parties informed about design process and seek views on design.
Traffic Management/ rail possessions during works/ construction	Significant congestion and traffic delay impacts during construction if works not carefully phased. This could worsen air quality	NR to undertake possession planning for any signalling or track work where the branch meets the SWML. NR to work closely with Solent Gateway to minimise impact of construction works along the branch on their operations. HCC as highway authority to have a say on the timing of upgrade work to level crossings and to engage with local stakeholders as appropriate to keep them informed on timings and duration of these works.
Protected Landscapes	Part of the branch runs within the New Forest National Park	No stations or significant civil engineering work is envisaged to be required within the NPA boundary. NR to engage with NPA on any vegetation removal and mitigation.

Barrier down time and Safety at Level Crossings	Community severance as a result of increased level crossing down time and safety risk of vehicles ignoring stop lights at level crossings	It has been assumed that three existing level crossing will be replaced with overbridges. The design of any new overbridges would need to minimise visual impacts on the landscape of the New Forest – a sensitive local environment. Additionally, NR would need to assess the adverse impacts of increased down time at Junction Road level crossing in Totton, which is a particular area of concern. HCC will work with NR to develop solutions that mitigate and reduce adverse impacts. The amount of barrier down time would depend on the particular train service option chosen and further analysis to quantify this would be undertaken by NR at the next stage of scheme development. The need for potential mitigation measures on the Fawley branch (e.g. pedestrian overbridges) to address community significant severance issues could be considered at as part of level crossing upgrade plans. Risk scores have been generated from Network Rail studies. Where upgrades to level crossings are to be delivered, NR to apply best practice from experience elsewhere in the UK and communicate with residents and businesses to raise awareness of importance of obeying lights.

In most cases, early engagement with technical specialists and robust programme management, by building in time and resource to address issues, will be an important guiding principle to avoid unforeseen or adverse impacts on scheme delivery

3.14 Inter-dependencies

3.14.1 Alignment with other Planned Transport Schemes

There are a number of other transport investment schemes either committed or planned (subject to successful funding bids) over the next 3-6 years in the vicinity of Totton and the Waterside that will be complementary to the Waterside Rail re-opening scheme.

These schemes will benefit the Waterside area and enhance connectivity but are independent of RYR funding for Waterside Rail re-opening.

A key issue will be the coordination of works with other rail enhancements to minimise disruption to the local rail network, and to consider the timing of works to upgrade level crossings for Waterside Rail so as to avoid clashing with the delivery of A326 improvement works and therefore minimise adverse impacts on the highway networks in the Waterside area.

3.14.2 Committed (fully funded) schemes:

A326 Fawley Waterside Highway Improvements
The Transport Group Delivery team are working with the Fawley Waterside developers to design and deliver an **£8.5m** package of junction improvements on the more southerly part of the A326 between Main Road (north of Dibden) and Church Lane (Fawley), for which around £5.5m of Solent LEP funding has been secured. The junction schemes and pedestrian/cycle improvements will be delivered by HCC but funded entirely by the combination of the Solent LEP and the Fawley Waterside developer, who will meet the remaining scheme costs. The improvements are required as mitigation for the development, as part of the recently approved planning application for the Fawley Waterside site.

A35 Redbridge Causeway Major Maintenance Major Road Network (MRN) scheme
A causeway carries the A35 dual carriageway (a major non-motorway crossing) across the mouth of the River Test and a railway line. Inspections by HCC have determined that due to corrosion by salt water, the bridge structures are deteriorating to the extent that weight and/or lane restrictions need to be imposed. Funding for this scheme was committed in January 2021, and once a Full Business Case has been prepared and a contractor appointed, works will be carried out to fully replace all the existing reinforced concrete piers that carry the to ensure the continued resilience and reliable operation of this important bridge connecting the Waterside area, Totton and the New Forest with Southampton.

Southampton City Region TCF
In March 2020, the DfT confirmed that the City Region had secured £57m from the TCF. Of this investment, approximately **£9m** is for improvements for buses and active travel modes in the Waterside area. The funding will deliver bus priority improvements at three key locations / junctions in the Waterside area. These are at one location in central Totton, one at the A326/A35 Rushington roundabout; and one at the A326 fork south-east of Totton to allow two way bus movements, helping to shorten bus journey times and improve bus journey time reliability by avoiding an area of peak period traffic congestion where delays occur. The TCF funding will also deliver the creation of a continuous cycle facility between Eling and Fawley, which involves the creation of several new sections of shared-use cycleway, and connects fragmented existing sections. Some of this route runs alongside the A326 and some routes along adjacent roads and through residential areas. This will connect with the route from Eling to Southampton City Centre. Delivery of these TCF schemes will be taking place between March 2022 and March 2023, in line with the spend deadline for TCF funds.

M3 Smart Motorways (Junctions 9-14) (Highways England RIS2 scheme) 2020-2025 – Although outside the Waterside area, this scheme will upgrade the M3 between Winchester and Southampton to Smart Motorways standard to provide additional strategic capacity on important route for access to the Port of Southampton, Solent Gateway and ABP Strategic Land reserve near Hythe.

M3 Junction 9 free flow for A34 traffic joining and leaving the M3 (Highways England RIS2 scheme) 2020-2025- Although outside the Waterside area, this scheme will upgrade Junction 9, allowing free flow of traffic joining and leaving the M3 from the A34 – a major freight corridor that connects the Port with industry and logistics supply chains in the Midlands and North West.

These two HE schemes will help improve journey time reliability for freight movements by HGV to and from the ports along Southampton Water.

3.14.3 Other schemes to be progressed subject to NSIP/ Planning consent and satisfactory business cases:

Solent CMSP proposals to electrify Totton Goods Loop and identify a solution to the issue of down time at Junction Road Level Crossing, Totton resulting from additional train services extended to serve Totton
In May 2020, Network Rail published the Solent Continuous Modular Strategic Planning (CMSP) study. This study was jointly carried out by Solent Transport and Network Rail and assessed a long-list of 27 potential passenger rail service improvements that could help support growth in rail use in South Hampshire. A shortlist of five high-potential rail service options were progressed to more detailed timetable and economic evaluation. Out of this process the CMSP then identified five rail infrastructure measures that would enable these additional train services to be accommodated. One of the five projects to be taken forward in the Rail Network Enhancements Pipeline (RNEP) process is the electrification of Totton

Down Goods Loop to the west of Totton, and the closure of the level crossing and replacement with an overbridge. This infrastructure schemes will enable existing trains from the east that currently terminate at Southampton Central, occupying one of the four available platforms to instead terminate at Totton whilst also providing enhanced connectivity for Totton which has been identified as an under-served station. The electrified siding will enable additional passenger train services along the Netley Line to operate, helping to support higher levels of public transport use in a corridor with significant amounts of planned growth.

A326 Capacity Improvements LLM Scheme

HCC submitted an initial bid to Transport for the South-East (TfSE) in August 2019 for between **£98-119 million** from the DfT Large Local Majors (LLM) fund, to use for improvements to the A326 corridor in the Waterside area, with a total scheme value of £115-140m. The final 'preferred scheme' is yet to be decided (it will come out of the SOBC option assessment process currently underway), but it is likely to involve a series of link and junction capacity improvements along the more northerly part of the A326, between the Strategic Road Network at M27 Junction 2 to the north and the junction with Sizer Way at Dibden to the south. If LLM funding can be secured, the scheme would deliver improvements to 12 existing junctions and between 2.5-7.5km of existing single carriageway links will be upgraded to dual carriageway (on two main sections under consideration - to the West of Totton; and to the south-east of Totton past Marchwood up to Dibden). The scheme would address a forecast rise in traffic on this route by 15% between 2017 and 2036, and would support planned new development in the Waterside area at Totton, Marchwood and Hythe through improving journey time reliability and additional capacity on the A326. If the SOBC is accepted and the scheme becomes committed, works would be likely to start in 2025 and be completed by 2027.

Expansion of Port of Southampton onto Strategic Land Reserve site

Although the Covid-19 pandemic has reduced some port activities and freight volumes, ABP Southampton is continuing to plan for long-term growth in port traffic. In the coming years, ABP will be reaching the limit for volumes of freight, cross-Solent ferry services and cruise passenger numbers that can be handled within the existing port estate and has acknowledged that in the future, subject to planning approval, there will be a need to transfer some port activities to the Strategic Land Reserve (SLR) site between Solent Gateway and Hythe (shown on Figure 3-12). Depending on the port activities that are relocated to the SLR, this could present opportunities for new railfreight services to operate on the Fawley Branch. The infrastructure improvements for passenger rail re-opening could therefore have spin-off benefits for existing (Solent Gateway) and future (SLR-related) rail freight traffic. The value of these spin-off benefits could be assessed and monetised at the OBC stage.

4. Economic Case

This chapter sets out the economic case for the Waterside Rail Re-opening scheme. The economic appraisal brings together the scheme costs, revenue and benefits, and employs standard economic appraisal assumptions to discount these over the appraisal period. The key performance metric for the economic appraisal is the benefit to cost ratio (BCR), which takes all costs into account, irrespective of whether these are borne by the public or private sector.

4.1 Overview of Economic Appraisal Methodology

Economic appraisal of the transport user impacts of the three shortlisted options for Waterside Rail has been carried out as per DfT's TAG guidance using the Solent Sub-Regional Transport Model (SRTM) and have used TUBA[21] to generate TEE, AMCB & PA tables. In accordance with TAG, a 60-year appraisal period has been used.

At this stage, we have not monetised Level 2 or 3 Wider Economic Impacts (such as Move to More Productive Jobs/ Imperfect Competition/ Dependent Development/ additional jobs enabled by the Waterside Rail re-opening scheme). These would be considered at the Outline Business Case stage of scheme development, if approval is given by DfT to progress to this stage.

The overall methodology is based on the following key considerations and principles:

- **Selection of appropriate transport and economic modelling tools.** As the scheme would deliver transport user benefits that will be felt across the wider Solent, a modelling tool capable of assessing transport impacts across multiple modes over a large geographical region was required. The existing Solent Sub Regional Transport Model (SRTM) is a suitable tool for this purpose as it is a strategic multi-modal model encompassing all modes that are likely to be affected by the re-opening of the Fawley branch for passenger rail services. It was chosen for the following four reasons:
  - It has the ability to model changes to trip making decisions across relevant modes;
  - The model extent covers the full geographic area of interest; and
  - The model was developed in accordance with TAG guidance; and
  - It is a proven tool for economic appraisal, having been successfully applied to develop transport evidence and support business cases unlocking schemes in the region (e.g. the Southampton City Region TCF bid and M27 Smart Motorways).
- **Derivation of scheme costs**: Capital cost estimates are based on infrastructure designs are at an early stage of development, appropriate to GRIP stage 1 / 2. These cost estimates have been prepared by Faithful & Gould using the Rail Method of Measurement based on the infrastructure requirements identified by the detailed operational assessment for the shortlisted options. Operating cost estimates have been prepared by Atkins based on assumed rolling stock and calculated round trip times and mileages for the three service options, as well as operating costs for the stations on the Waterside line. Optimism Bias of 64% has been applied to these estimates as part of the economic appraisal, in line with industry guidelines for the GRIP 1 / 2 stage of development;
- **Value for money assessment following the latest DfT guidelines**: A progressive approach was followed, taking on board quantified impacts with varying analytical certainty as well as qualified impacts;

[21] Transport User Benefit Appraisal (TUBA) is software for undertaking economic appraisal for a multi-modal transport study, commissioned and published by DfT

- **Collation of the Appraisal Summary Table (AST), Transport Economic Efficiency (TEE) Table, Analysis of Montetised Costs and Benefits (AMCB) Table, Public Accounts (PA) Table** and tables for supporting analyses; and
- **Sensitivity analysis**: to complete the overall value for money assessment

4.2 Costs of the Shortlisted Options

The appraisal of the Waterside Rail re-opening scheme captures the life-cycle costs (capital, operating, maintenance and renewal costs) over the 60-year appraisal period.

Calculation of the Present Value of Costs (PVC) follows the guidance in TAG Unit A1.2. All costs in the Economic Case have been treated as per TAG guidance. Specifically, these include:

- Conversion of monetary figures to 2010 prices and values;
- Real inflation;
- Optimism Bias (OB) adjustment; and
- Market price adjustment.

This section outlines how the PVC has been derived. The estimation of costs for the proposed programme of interventions sought to consider a full range of components including:

- Investment / capital costs (both from public sector and transport operators);
- Operational costs for the public transport assets; and
- Grants, Subsidies, Developer Contributions and Revenue.

At subsequent stages of scheme development, effort should be made to monetise the noise, air quality and environmental impacts (e.g. carbon) of the scheme, considering these impacts in greater depth than the qualitative analysis that is summarised in sections 4.7 and 4.9. Such further analysis should consider the costs of any additional subsidies for bus services and option values of loss of ferry or bus service frequencies.

4.2.1 Capital Costs

Capital cost estimates have been prepared by Faithful and Gould using the Rail Method of Measurement, based on the infrastructure requirements identified for each option. Key cost assumptions are highlighted below:

- Cost estimates are based at 2nd quarter 2020 price levels. To calculate outturn costs (see Table 4.2), inflation to a mid construction point of Q2 2025 has been included.
- The infrastructure designs are at an early stage of development, appropriate to GRIP stage 1 / 2. More detailed feasibility and design work may result in changes to quantities and rates assumed and potentially identify further infrastructure requirements, which could result in substantial changes to cost estimates presented here.
- Bottom-up cost estimates have been prepared using unit rates where possible; where firm assumptions are not yet available top-down asset level benchmarks have been used.
- Prices are inclusive of contractor's indirect costs (Preliminaries and Overheads & Profit) as well as employer's indirect costs (Project Management, Design and Other costs). These are calculated as a percentage uplift on Base Construction cost and Total Construction cost, respectively.
- At this stage, no further allowances have been made for cost of infrastructure renewals, maintenance or end of life costs.
- Optimism Bias of 64% has been applied to these estimates as part of the economic appraisal, in line with industry guidelines for the GRIP 1 / 2 stage of development. No additional risk and contingency allowances have been applied.

Table 4.1 below summarises capital cost point estimates for each option, disaggregated by group element.

Table 4-1 - Summary of capital costs for each option, excluding Optimism Bias (£k, 2Q20 prices, undiscounted)

Group Element	Test A: Low Cost	Test B: High Connectivity	Test C: High Frequency
Railway Control Systems	3,455	3,465	4,503
Train Power Systems	-	9,116	-
Electric Power and Plant	50	50	80
Permanent Way / Track	1,475	3,455	3,384
Telecommunication Systems[22]	218	218	218
Buildings and Property[23]	2,804	2,845	2,874
Civil Engineering	17,435	17,844	17,823
Enabling Works	94	226	229
DIRECT CONSTRUCTION WORKS COSTS (A)	25,532	37,219	29,111
Preliminaries (30%)	7,659	11,166	8,733
Contractor Overheads and profit (12%)	919	1,340	1,048
INDIRECT CONSTRUCTION WORKS COSTS (B)	8,579	12,505	9,781
TOTAL CONSTRUCTION COST (C = A + B)	34,110	49,724	38,892
Project Design Team Fees (15%)	5,117	7,459	5,834
Project Management Team Fees (12%)	4,707	6,862	5,367
EMPLOYER INDIRECT COSTS (D)	9,824	14,321	11,201
POINT ESTIMATE Construction + Development Cost (E = C + D)	**43,934**	**64,045**	**50,093**

Table 4.2 below shows the treatment of these capital cost point estimates in the appraisal.

Table 4-2 - Summary of capital cost inputs to appraisal (£k)

Description	Test A: Low Cost	Test B: High Connectivity	Test C: High Frequency
POINT ESTIMATE (2020 prices)	43,934	64,045	50,093
OUTTURN COST (nominal)	52,063	75,895	59,362
DISCOUNTED COST (2010 market prices)	29,058	42,359	33,131
GRIP 1/2 Optimism Bias (64%)	18,597	27,110	21,204
CAPEX INPUT TO APPRAISAL Discounted Cost (2010 Market Prices) + Optimism Bias	**47,655**	**69,469**	**54,355**

[22] Telecommunications Systems includes 2 CCTV cameras per platform, 1 for station building and 2 for station car park (Hythe & Fawley Parkway only), PA system

[23] Buildings and Property includes access ramps, lighting, utility connections, basic modular station building (for Hythe Town and Hythe & Fawley Parkway)

The following key observations can be made regarding the cost estimates presented above:

- Capital cost estimates are generally higher than those quoted in previous studies, due to a number of factors, including:
  - Level crossing works assume replacement of three crossings with overbridges and upgrade of five others to CCTV;
  - Increased indirect costs, including preliminaries, overheads and employer costs;
  - Increased station costs relative to earlier studies (Atkins 2011 and Halcrow), due to a revised station location at Hythe Town and the addition of Hythe & Fawley Parkway;
- Costs for Test B include third rail electrification of the Waterside branch, which results in increased permanent way costs and the addition of power systems costs relative to Tests A and C;
- Costs for Test C include construction of an additional passing loop between Totton and Marchwood and costs associated with bringing Southampton Central Platform 5 into use, which are not included in Tests A and B. It would be possible to take a phased approach to delivering this option. This could involve the initial delivery of an 'interim' option with a lower passenger service frequency (with train services that could potentially terminate at Hythe Town instead), that would see the additional passing loop delivered at a later date, and see the frequency increasing to 3tph at a later date once passenger demand has built up. Such a phased approach to delivery could offer benefits by helping to reduce the initial scheme costs and make them more manageable;
- Costs for Tests B and C include construction of an Up platform in addition to the reinstatement of the existing Down platform at Marchwood.

4.2.2 Operating Costs

Operating cost estimates have been prepared for the three service options, based on the following key assumptions:

- **Infrastructure Charges:** includes the Network Rail Variable Usage Charge, diesel costs (Tests A and C only), and Electric Current for Traction (EC4T) and Electric Asset Usage Charge (Test B only);
- **Station:** operating costs have been included for the restored station at Marchwood and new stations at Hythe Town and Hythe & Fawley Parkway, and include the following elements:
  - Cleaning
  - Light maintenance
  - Utilities
  - Ticket vending machine (TVM) maintenance, assuming one TVM per platform;
  - Station car park maintenance, assuming a 10-space car park at Marchwood and 500-space car park at Hythe & Fawley Parkway;
  - CP6 Long Term Charge, based on an average across similar-sized stations in the Solent area.
  - Stations are assumed to have no building / ticket office and are ungated and unstaffed.
- **Rolling Stock:** for Tests A and C it is assumed that services to Hythe & Fawley Parkway will be operated with two-car Class 158 diesel multiple units (DMU), with the Victoria service in Test B operated with a 4-car Class 377 electric multiple unit (EMU). Following assessment of the loading profile for Test A the cost of an additional two-car Class 158 DMU (and associated mileage-based diesel cost) was included in the appraisal as a four-car train was required to accommodate the forecast demand for the service. Notional mid-life capital lease costs per vehicle have been used for both units with capital lease costs assumed to grow by RPI, to provide a high-level representation of rolling stock renewal costs over the appraisal period. Maintenance costs have been

included based on industry data. The working assumption is that the additional rolling stock could be stabled at no additional cost.

- **Staff:** on-board staffing requirements (drivers and guards) have been estimated based on service frequency, the round-trip time for each service and an assumed 35-hour working week, accounting for 50% non-productive time. Training costs have been included at 10% of staff pay.

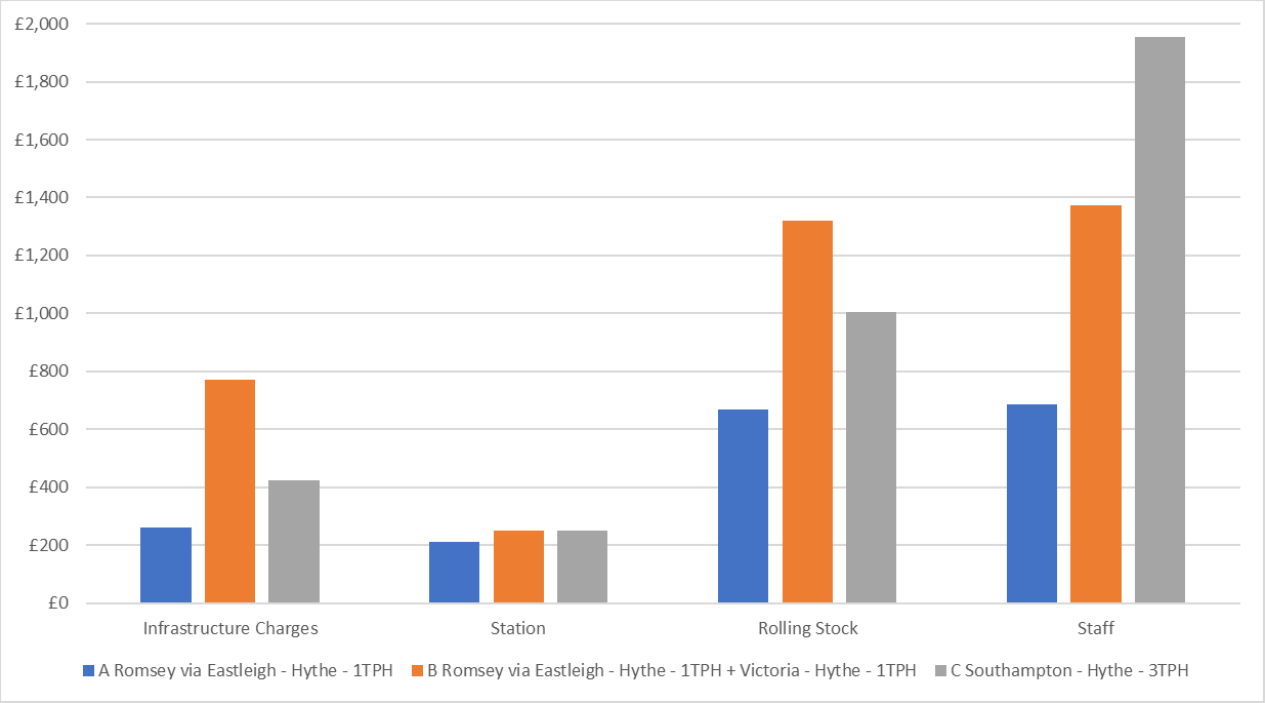
Optimism Bias of 1.6% per annum has been applied to operating costs as part of the economic appraisal, in line with industry guidelines for the GRIP 2 stage of development.

Table 4.3 below summarises the resulting annual operating costs for each option, while Figure 4.1 disaggregates these costs by category.

Table 4-3 - Summary of total annual operating costs for each option, excluding Optimism Bias (£k, 2019/20 prices, undiscounted)

Option		Annual Operating Cost (£k)
Test A	1tph Romsey extension with Salisbury backfill	1,826
Test B	1tph Romsey extension with Salisbury backfill, plus 1tph Victoria extension	3,709
Test C	3tph Southampton - H&F Parkway, self-contained	3,631

Figure 4-1– Annual rail operating costs for each option and cost category, excluding Optimism Bias (£k, 2019/20 prices, undiscounted)



The following differences can be identified between the options:

- Rolling stock costs are highest for Option B due to the higher lease and maintenance costs associated with the 4-car EMUs assumed to operate the Victoria service (all other services are assumed to be operated by 2-car DMUs);
- Infrastructure charges are highest for Option B due to electricity costs per vehicle mile for the Victoria service being higher than diesel costs, and the Victoria service being operated by 4-car units as opposed to 2-car;

- Staff costs are broadly proportional to service frequency, with staff costs for the 3tph shuttle option being highest and the 1tph extension from Romsey being lowest.

4.3 Modelling Approach and Assumptions

For the purposes of the SOBC it has been assumed that a conventional delivery of the infrastructure enhancements and the rail services is undertaken. In that respect it would be Network Rail that delivers the infrastructure enhancements and South Western Railway that would provide the rail service. It is anticipated that as the scheme progresses into the next stage of delivery (the RNEP 'Develop' stage and the production of the scheme's OBC) that these delivery assumptions will be challenged as alternative delivery models are explored.

The following rail operational assumptions have been made in the modelling:

- May 2019 timetable base
- Rail services outside the Waterside area will largely retain their existing timings
- Avoiding material change to existing services within the study area, except where directly affected by a service option
- Assume line speed on the Fawley branch line of 60mph
- All other running times to be estimated using Route Runner

4.3.1 Do minimum SRTM Assumptions

The SRTM outputs provided as part of this study are based on a 'do-minimum' reference case to which the tests are compared for 2036. This reference case has core land use and highway network changes that are part of the base case as outlined in Table 4.4 below; these assumed changes drive the base travel demand reflected in the do-something tests.

Table 4-4 - Do-minimum (reference case) modelling assumptions

Modelling Area	Included Schemes	Assumptions on level of certainty/ uncertainty
Land Use	1. New housing at Totton (900 houses) and Marchwood (1,000 houses) [local plan allocation] 2. Fawley Waterside developments (1,500 additional houses plus mixed-use employment) [outline permission granted] 3. Solent Gateway: 200,000 sqm commercial development of Marchwood Military Port (MMP) 4. Development of Associated British Ports (ABP) site at Dibden Bay (Southampton Port expansion) 5. Eling Wharf (395 houses and 60,000 sqm employment) 6. Fawley Refinery: 98,000 sqm employment 7. Former Versalis site, Fawley: 75,200 sqm employment	1. Totton 'More than likely' – a planning application for Totton is expected soon. Marchwood 'reasonably foreseeable' - timeframe for application not known. 2. Fawley Waterside – 'committed' 3. Solent Gateway – 'More than likely' – application expected soon 4. ABP SLR – 'More than likely' whilst a planning application is not "imminent" we know one will be forthcoming soon, 5. Had been considered 'reasonably foreseeable' - due to land-ownership changes that there is now more uncertainty around how soon a planning application will come forward 6. Had been considered 'more than likely' 7. Had been considered 'reasonably foreseeable' – however, no applications for anything on this site are anticipated in the near future
Highway Network	Marchwood Military Port access via current route New A326 Access Junction to ABP site at Dibden Bay Fawley Waterside Mitigation (junction upgrades)	N/A

4.3.2 Demand and Revenue Forecasts

The demand and revenue forecast for each mode of travel for the three tests are summarised in Table 4.5. The key drivers and headlines from these results are:

- This modelling does not assume any additional trip generation from the enhanced rail service, with the new rail line instead being abstractive from other modes. The rationale for this is that it was considered best to adopt a conservative approach to new rail trip generation. Instead, there is a sensitivity test presented in section 4.6 that includes additional generated demand). There is scope at the OBC stage to model additional trip generation arising from Waterside having passenger rail services restored.
- As a result of this abstraction, whilst rail revenues are relatively strong (especially in tests B and C), overall public transport revenue is not substantially increased due to the impact of abstraction on bus and ferry revenue.
- A connecting shuttle bus service (at same frequency as each of the train service tests) has been modelled between the Fawley Waterside development and Hythe & Fawley Parkway in each option. This has been discussed with the developer assurances have been provided that is a complementary measure that they would provide free for passengers to use. The figures presented show increased bus demand; however this includes shuttle bus trips to/from Hythe & Fawley Parkway; excluding shuttle bus trips from the overall bus demand figures results in a decrease in demand compared to the base case (see Figure 4.3).
- Test C, which provides the highest frequency of service between Waterside and Southampton, results in the greatest rail demand benefit.
- All tests result in substantial abstraction from bus (when excluding shuttle bus journeys to and from Fawley Waterside), ferry and highway modes.

Table 4-5 - Demand and revenue outputs from SRTM vs do-minimum reference case (2036)

		Test A (1tph Romsey Extension)	Test B (1tph Romsey + 1tph Victoria)	Test C (3tph Southampton - H&F Parkway)
Annual Revenue Change (£000s)	Rail	£4,279	£7,258	£8,638
	Bus	-£3,028	-£4,146	-£4,913
	Ferry	-£878	-£1,130	-£1,314
	Total Revenue Change	**£373**	**£1,982**	**£2,410**
Annual Demand Change (000s)	Rail	541	820	991
	Bus (total)	4	102	132
	Ferry	-77	-89	-99
	Highway	-312	-570	-735
	Active	-154	-261	-291

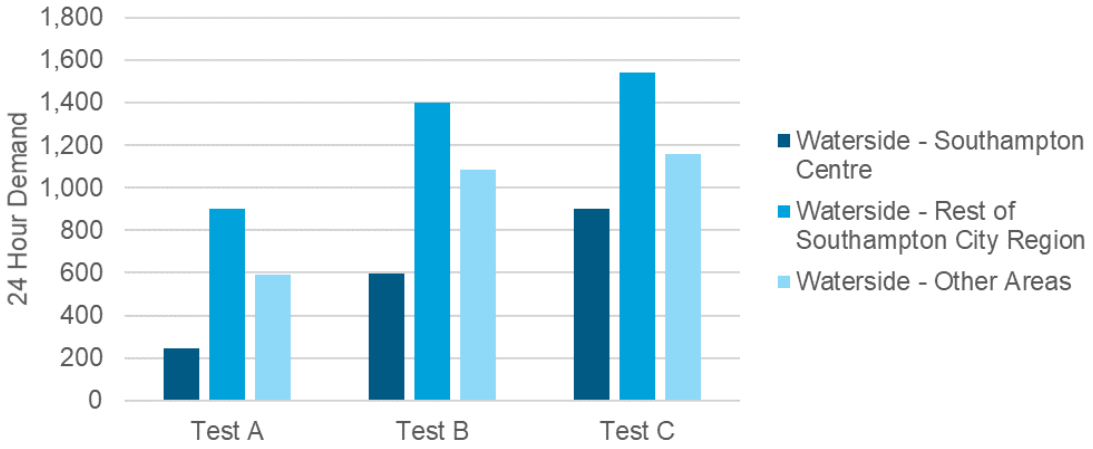
The above demand forecasts from SRTM assume that rail passengers can only arrive at the stations either by active travel (walking or cycling) from a local catchment area or by local bus or the shuttle bus from Fawley Waterside, which means that there has been some underestimation of demand. The modelling did not allow for passengers to arrive by private car and to park at either a station car park or nearby public car park. At Marchwood, the station would have 10 spaces and Hythe and Fawley Parkway would have an initial 500 spaces. Hythe Town has a nearby public car park with 154 long-stay spaces. If the scheme is progressed to the next stage, then this assumption can be changed to as to give a more accurate understanding of the impact of availability of this car parking at the station on passenger demand.

Demand to/from Waterside

The three modelled tests have different public transport demand profiles that vary by modelled area. The Southampton – Hythe +& Fawley Parkway shuttle (Test C) mainly affects demand between Southampton and the Waterside area as expected, with Tests A and B having benefits in other areas as a result of their higher connectivity provision.

Figure 4.2 below summarises the demand between Waterside and 'central Southampton' (as per the SRTM definition which means the city centre area, where most office and retail employment is located), the wider Southampton City Region (including the City of Southampton, Totton, Chandlers Ford, Hedge End and Hamble) and all other areas, which includes Romsey, Winchester, Fareham and Portsmouth.

Figure 4-2- Modelled demand change (all modes) between Waterside, Southampton City Region and other areas



Journey Time Comparison

The tested options provide enhanced connectivity between the Waterside area, Southampton and beyond. Table 4.6 illustrates the relative journey times and frequency of each public transport mode in the do-something scenarios compared to the equivalent journeys by car (the journey time ranges for car cover both off-peak and peak periods).

Table 4-6 - Summary of journey times for four common journeys and service frequencies

Journey	Car[24]	Bus[25]	Ferry *(1per hour off peak, 2 per hour in peak)*	Rail (3tph shuttle)[26]
Fawley village centre – Southampton City Centre (West Quay)	28-40 mins	63 mins *(2bph)*	n/a	23 mins (rail) + 8 mins (shuttle bus)
Hythe – Southampton City Centre (West Quay)	23-30 mins	40 mins *(4bph)*	15 mins (ferry) + 25 mins walk time - Hythe Pier (10 mins) & Town Quay to City Centre (15 mins)	21 mins
Marchwood – Southampton City Centre (West Quay)	17-26 mins	37 mins *(1bph)*	n/a	15 mins
Fawley Waterside – Hythe Town Centre	11-16 mins	23 mins *(2bph)*	n/a	2 mins (rail) + 12 mins (shuttle bus)

[24] Journey times taken from Google Maps (lower figure is for the off peak, higher figure is during AM peak)

[25] Journey times taken from Bluestar 9 timetable except Marchwood which is based on Bluestar 8 timetable (off peak)

[26] Rail journey times are to/from Southampton Central station – would need to add 5-7 minutes walk time to reach West Quay. For trips from Fawley Waterside add 12 mins (shuttle bus)

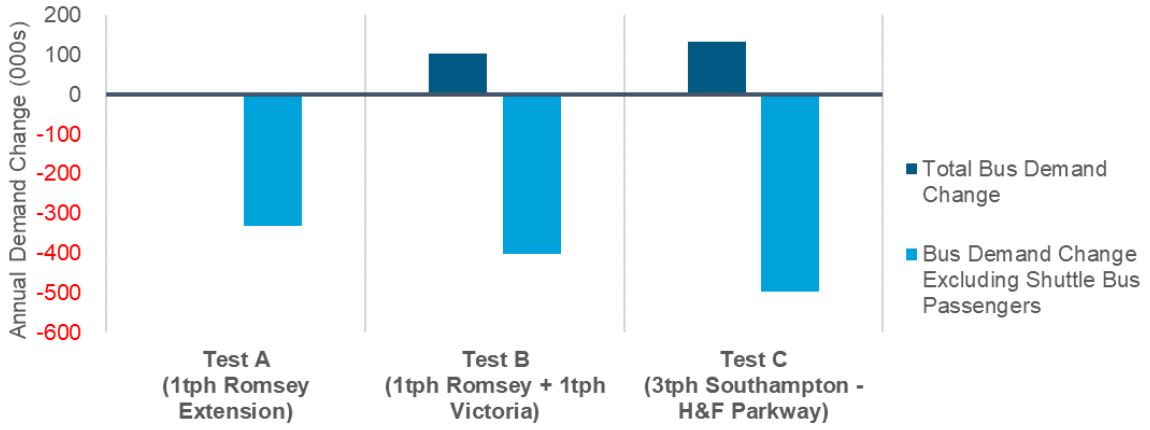
The competitive journey times and frequencies offered by rail drive the shift from other public transport modes to rail (see section 4.3.3 below), however the nature of the bus service (which has multiple stops in the area) means door to door journey times may be less competitive by rail than indicated above, once allowances have been made for additional time for travel to/from the station; this additional time has not been tabulated in Table 4-6.

4.3.3 Abstraction of Demand from other modes

The overall SRTM results (Table 4.5) highlight a large amount of abstraction from existing ferry and car trips with growth in total bus demand. However, these overall figures do not split out the impact of the free Hythe & Fawley Parkway shuttle bus. Analysis using the SRTM's route-level outputs shows that across all tests there is a reduction in non-shuttle bus usage, with passengers switching from the existing Bluestar bus services (routes 8 and 9) to the rail service. These local bus services are run on a commercial basis. Ferry services do receive a level of financial support towards operating costs.

Figure 4.3 illustrates the variance in bus demand across the three tests including and excluding the estimated level of demand for the free shuttle bus to Hythe & Fawley Parkway; this demonstrates a significant overall reduction in existing bus route usage as a result of the rail service. Given the nature of this scheme and rail's competitiveness with bus along a similar corridor, this is to be expected. This also aligns with findings from previous studies, as the logical public transport option without the rail intervention is the bus.

Figure 4-3- Bus demand (2036) change including and excluding shuttle bus passengers



After accounting for the shuttle bus usage, all modes show a decrease in demand as a result of the rail interventions across all tests modelled in SRTM. This is partially driven by the lack of additional demand generation in these model runs; however even with additional generation resulting from improved regional connectivity, abstraction from other modes would still be high. This abstraction of demand is expected to result in adverse impacts on bus and ferry services in the Waterside area. Without a competing rail service, bus service frequencies would be expected to increase by 2036 from their current levels as a result of increased passenger demand. If a rail service is provided, then there would not be the increase in bus passenger demand to justify future bus service frequency increases. During periods when bus passenger demand is low, such as early mornings or evenings or Sundays, there is a risk that bus frequencies could be reduced from current levels. If passenger train services are re-introduced, then there is an opportunity to work closely with bus operators to reconfigure the local bus service network within the Waterside. This could include looking at the scope that exists for new feeder shuttle services from urban areas away from the rail corridor such as Blackfield, Hardley and Holbury, which if introduced, have the potential to help offset some of the abstraction of bus demand. If the scheme is progressed, to the next stage of development, then further discussions can take place with bus operators to understand how such a reconfiguration could be made to work. The

accessibility and social exclusion impacts of the Waterside Rail reopening scheme are considered in more detail in Section 4.9.

A sensitivity test is presented in Section 4.6 which allows for additional demand generation and how it would alter the case for Waterside Rail.

4.4 Appraisal of Transport User Benefits

Economic benefits have been modelled for each test scenario using methodology consistent with DfT TAG guidance using TUBA. This economic benefit analysis captures the benefits of user travel time for each mode, operating costs, and user charges. These benefits are monetised for appraisal and combined with revenues and costs to produce the BCR (benefit-cost ratio).

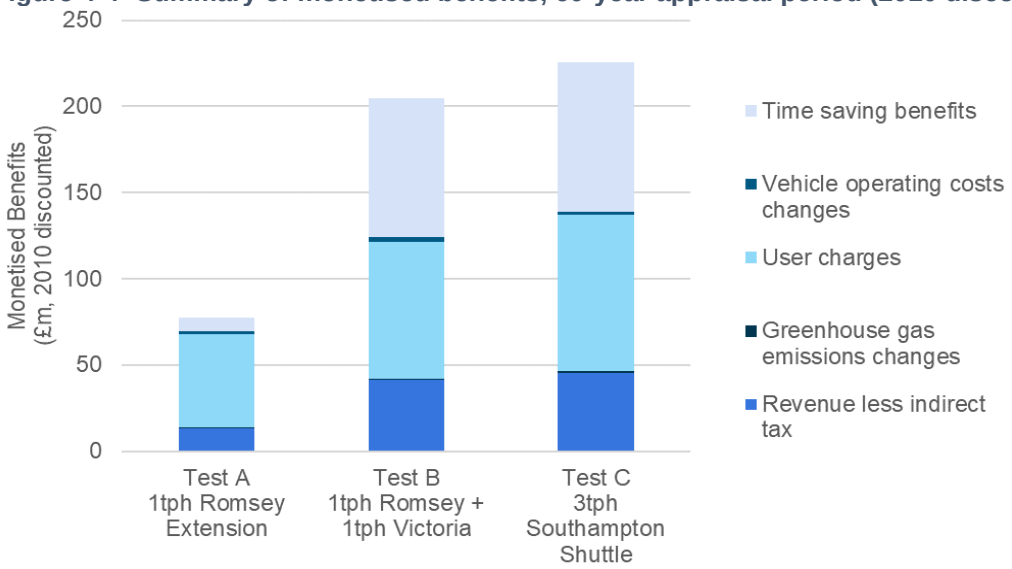
The modelled benefits cover the following key areas:

- Time saving (journey time) benefits for transport users (transfer between transport modes only);
- Vehicle operating costs changes;
- User charges;
- Accident cost savings; and
- Greenhouse gas emission changes.

Wider economic impacts, such as increased productivity and agglomeration, have not been included in the appraisal as they are considered likely to be marginal. We have assumed no dependent development.

Error! Reference source not found. Figure 4.4 outlines the value of benefits for each option, split into user benefits (time savings, vehicle cost changes, user charges and accident cost savings) and other benefits (provider impacts, wider public finances and greenhouse gases

Figure 4-4- Summary of monetised benefits, 60-year appraisal period (2010 discounted)



The level of benefits for each test is related to the expected usage of rail and abstraction from other modes of transport; generally, the greater the expected rail demand the greater the overall economic benefits. For Test A, the main driver of user benefits are user charge savings, resulting from no longer paying parking and other associated costs. For Tests B and C, rail also delivers time savings for journeys in many cases which translates to a benefit for new and existing transport users.

The indirect tax revenues have been calculated in line with TAG guidance for rail scheme appraisal and constitute the tax impacts of:

- Modal transfer from car (less fuel duty);
- Changes in public transport demand (greater use of public transport and spend on zero-rated fares); and
- Changes in diesel train use (more fuel duty).

Full economic benefit tables (TEE, PA and AMCB tables) for each of the three shortlisted options are set out within Appendix D.

4.5 Appraisal of monetised costs and benefits

Table 4.7 below summarises the value of benefits and costs in line with TAG guidance, which have been used to calculate a Benefit-Cost Ratio (BCR) for each test. The full appraisal tables, splitting out the source and value of benefits, are supplied in Appendix D, with additional sensitivity tests outlined in section **Error! Reference source not found.**. BCRs for the scheme are estimated to be between 0.8 and 1.7, depending on the option, putting the scheme into Value for Money (VfM) categories ranging from Poor (below 1.0) to Medium (between 1.5 and 2.0).

Table 4-7 - Summary of NPV and BCR for each option (£k, 2010 discounted)

Option		PVB	PVC	NPV	BCR
Test A	1tph Romsey extension with Salisbury backfill	61,610	81,958	-20,348	**0.8**
Test B	1tph Romsey extension with Salisbury backfill, plus 1tph Victoria extension	156,085	117,642	38,443	**1.3**
Test C	3tph Southampton - H&F Parkway, self-contained	171,356	102,214	69,143	**1.7**

Previous studies saw BCRs in the range of 0.7 – 1.6 for the 2tph shuttle service, which is equivalent to Test B in terms of frequency. The results for this study show indicate a similar level of VfM despite revised, higher costs as a result of higher overall public transport revenue even after accounting for abstraction from existing public transport modes (particularly bus).

4.6 Sensitivity tests

To assess the potential range of BCRs for each test and validate the robustness of the modelling undertaken, three high-level sensitivity tests have been created using the appraisal model. These sensitivity tests assess the impact of revised assumptions on revenue and economic benefits:

- **Yield sensitivity** – the SRTM modelling assumed rail fare yields would be lower than bus, this test increases the rail yield to be in line with bus fares on the relevant flows.
- **High demand sensitivity** – the modelling did not assume additional trip or demand generation as a result of improved public transport services. This test increases rail demand using PDFH v6 diversion factor assumptions[27] to account for an overall uplift in rail travel (+17%) in addition to abstracted journeys.
- **Low demand (C-19) sensitivity** – it is recognised that the Covid-19 Pandemic has had a significant adverse effect on levels of regular public transport usage. During 2020, both local bus, coach and rail service passenger numbers remained significantly below pre-pandemic levels. This test takes account of the likelihood that the Covid-19 pandemic could have a long-term negative impact on rail passenger volumes, as more employees work from home regularly compared to before the pandemic. This Low demand (C-19) sensitivity test assumes demand for the new rail

[27] PDFH v6 Table B2.7

service is reduced by a third (33%), modelled as a lower abstraction from car travel, to test the impact of lower demand forecasts (either as a result of lower reference case demand or lower abstraction from other modes) on the appraisal. If DfT feel that this 33% reduction is unlikely to be representative of Covid-19 impacts, then at the OBC stage, it would be possible to test various scenarios both overall volume changes, type and spread during the day and changes around weekdays and weekends. The longer-term impacts of the Covid-19 pandemic on travel behaviour patterns will be both negative (lower levels of use of public transport due to some switching to travel by private car or increased regular home working) and positive (reduced congestion and delay due to some reduction in private car commuting and business travel and leisure travel to and from cruise terminals both in peak and interpeak periods due to higher levels of regular home-working and more widespread use of video-conferencing).

The yield and high demand sensitivities increase BCRs across all three tests, as summarised in Table 4.8. Each sensitivity moves the VfM Category for Test B to Medium and Test C to High, while Test A remains in the Poor VfM Category. The low demand sensitivity moves Test C into the Low VfM Category and Test B to Poor.

Table 4-8 - Summary of sensitivity test BCRs

Option		***Central Case***	Yield Sensitivity	High Demand Sensitivity	Low Demand (C-19) Sensitivity
Test A	1tph Romsey extension with Salisbury backfill	*0.8*	0.8	0.8	0.5
Test B	1tph Romsey extension with Salisbury backfill, plus 1tph Victoria extension	*1.3*	1.5	1.5	0.8
Test C	3tph Southampton - H&F Parkway, self-contained	*1.7*	2.2	2.0	1.1

4.7 Environmental Impacts

The level of environmental impact assessment is proportionate to the early stage of scheme development, and are qualitative. These qualitative assessments are presented in Table 4.9. The assessments have used the TAG seven-point scale: Large/Moderate/Slight Beneficial and Large/Moderate/Slight Adverse and Neutral.

Table 4-9 – Summary of qualitative environmental impacts of scheme

Impact Category	Level of Impact across all three shortlisted options	Summary of impact
Water	Neutral	The basis for the scheme is an existing operational railway, where the physical interventions will be limited to the construction of some new stations or the restoration of some old station buildings (and for Option 3 a new passing loop). These will be designed so that negative impacts are mitigated and full consultation with the appropriate body e.g. Environment Agency will be carried out. It is not envisaged at this stage that there will be any appreciable impacts on floodplains, groundwater, sea/estuaries or lakes/ponds.
Historic	Neutral	The basis for the scheme is an existing operational railway, and at this stage it is not envisaged that there will be any adverse impacts on buildings of architectural or historic significance, nor areas or sites of historical significance.

Biodiversity	Neutral	At this stage no environmental ecological surveys have been undertaken in the corridor at those locations where physical interventions are planned as part of the scheme, namely station sites. Surveys would be undertaken as part of the next stage of the project development.
Townscape	Neutral	The basis for the scheme is an existing railway, where the physical interventions within the urban areas will be limited to the construction of some new stations or in the case of Marchwood, bringing back into operational use some old existing station buildings/platforms and upgrades to level crossings. It is likely that existing railway infrastructure will be refurbished/ replaced as appropriate. Some new construction may have an adverse visual impact, so careful design and planting and screening would be required to reduce their visual impact on surrounding properties. Network Rail as the infrastructure owner seeks to be a good neighbour to local communities living adjacent to operational railway lines. In broad terms, the impact on townscape at this stage is envisaged to be neutral.
Landscape	Neutral	Overall, negative visual amenity impacts will also be minimal as the passenger services will use the existing operational freight only line. Some reduction in vegetation along the railway line is likely to be required, as in places, it has become overgrown and is encroaching close to the tracks. At new stations and their forecourt and car parking areas, there will be appropriate screening and landscaping of these areas to reduce their visual impact. The three proposed new rail overbridges would be likely to have an adverse impact on landscape, which could be mitigated by careful design (e.g. using brick materials rather than concrete) and existing vegetation together with additional planting could assist with screening of new overbridges.
Noise	Slight Adverse	An increased frequency of trains compared to the existing freight services will have a noise impact on receptors backing onto the railway. Where existing manual gated level crossings are upgraded to CCTV control, the audible warnings that the barriers are about to be lowered will result in noise disturbance, but the noise of swinging and locking into place the manual gates would reduce. At the three level crossings that would be replaced by overbridges, there is a likelihood of localised adverse impacts for nearby receptors as noise from traffic may carry further, although these receptors would no longer experience audible warnings.
Air Quality	Slight Beneficial	Overall, air quality will be improved by reducing car miles and through mode shift to public transport. In the vicinity of level crossings (apart from the three that would be replaced by overbridges), there may be short periods of queueing traffic, which could experience localised increases in NO2 and particulates. These localised impacts would need to be assessed and understood at the next stage of scheme development.
Greenhouse Gases	Slight Beneficial	Greenhouse gas emissions are assumed to be proportionate to the number of litres of fuel burnt or the number of kilowatt-hours (kWh) of electricity used, with different rates for different fuels and vehicle types. The introduction of a regular rail passenger service in the corridor, which is not electrified (Option 2 would see the line electrified), will introduce more diesel trains that will generate some greenhouse gas impacts. These would be offset by a saving in emissions associated with car-km removed from the road network.

4.8 Impacts During Construction

Disruption impacts will be incurred by transport users during construction and then subsequent major renewals works. The main impact will be disbenefits during construction of the scheme where elements interface with the South West Main Line (SMWL) and the public highway – such as the proposed upgrades to level crossings. In line with TAG guidance to promoters on the need to take a proportionate approach to appraisal, this has been considered to be more suitable to be assessed at subsequent stages of business case development ahead of scheme delivery given that at the SOBC stage its focus is on establishing overall Value for Money based on high level designs rather than detailed understanding of such impacts, which would be dependent on the approach to construction taken. Traffic management plans will be developed at the next stage of business case development, considering the following:

- Design, packaging, phasing and delivery of individual schemes need to minimise disruption during construction and maintenance; and
- Traffic management plans and the approaches will vary significantly in accordance with the nature of scheme elements and their local context.

4.9 Accessibility and social inclusion impacts

Accessibility and social inclusion benefits are among the key objectives for the Waterside Rail Re-opening scheme. Expected qualitative impacts have been identified in the following areas:

- Journey time reliability impact on Commuting and Other Users
- Journey quality
- Accessibility
- Social inclusion
- Severance
- Option and non-use values.

Journey time reliability impact on Commuting and Other Users

The introduction of a fixed link public transport service in the corridor will provide better journey time surety for journeys between the towns and villages served on the Waterside corridor and the employment and retail centre of Southampton. At the moment, all transport options rely on the car or bus on this corridor and this is becoming increasingly unreliable in terms of journey times, particularly in the peak periods due to congestion on the A326 and A33/A35. The overall impact on journey time reliability is likely to be slight beneficial.

Journey Quality

The introduction of a new rail service on the Waterside corridor can be considered to improve traveller care (aspects such as cleanliness, level of facilities, information and the general transport environment), travellers' views (the view and pleasantness of the external surroundings for the duration of the journeys) and traveller stress (frustration, fear of accidents and route uncertainty), especially in the context of encouraging modal switch from car to rail. The estimated volumes of passengers using the new rail service would therefore make this impact moderate beneficial.

Accessibility

The appraisal of accessibility focuses on the public transport accessibility aspect of accessing employment, services and social networks. This provides a holistic approach to considering the accessibility needs of different groups of people, taking into a wide range of factors, including journey times to reach key destinations, service frequencies and provision of accessible boarding at stations. There are expected to be some groups who would see an

improvement in accessibility and other groups who may experience a reduction in accessibility.

The introduction of a new rail service in the study corridor provides a new and alternative transport option to existing bus and ferry services for different groups of people to access employment and services, particularly linking areas of Waterside with employment and education and training opportunities in Southampton, providing greater opportunities for social mobility. It is assumed that the rail facilities at stations will be designed in line with the latest accessibility regulations and guidance (e.g. step-free access onto platforms).

Abstraction of demand from existing bus and ferry services could result in a decline in provision following implementation of the new rail service. If service frequencies are reduced, or bus routes are altered in response to lower demand, this could disadvantage existing bus users. If some areas are no longer served by bus, then residents could have to travel further to access the rail service or remaining re-routed local bus corridors. Elderly people aged over 66 are able to use their Concessionary Travel passes to travel for free on bus services and these passes are not valid on rail. If bus frequencies are reduced, elderly people could experience a reduction in accessibility to services and opportunities.

There will be a need to ensure that the three proposed stations are designed so as to be fully accessible to passengers with mobility impairments. Under most of the train service options, the stations would have a single platform, which could be accessed by a ramp. Under the High Frequency option, there would be two platforms at Marchwood. The new ‘up’ platform could have step free access via the level crossing. However, there will be a need to ensure that wheelchair users can board and alight from trains using a ramp.

At this stage no formal strategic accessibility assessment has been undertaken. If the scheme is progressed to the next stage, this would be considered in more detail by Network Rail at the OBC stage. In broad terms, therefore, the accessibility impact at this stage is envisaged to be that the overall impact is likely to be on balance neutral.

Social inclusion

There are expected to be some demographic groups who could see an improvement in social inclusion and other communities and demographic groups who may experience increased social exclusion as a result of Waterside passenger rail reopening.

Provision of a passenger rail service to the Waterside will also facilitate opportunities for greater levels of social inclusion in the area. In particular, there will be better links for areas defined as deprived by the 2019 Index of Multiple Deprivation (IMD). There are 2 wards that are among the 20% most deprived in England (Netley View in Dibden and Blackfield). By reducing journey times, households with low skill levels or without access to a car will be able to consider applying for jobs (or better paid jobs) or undertaking tertiary education or training (to enable them to then apply for better paid jobs) in further afield locations. This will increase the number of those actively participating within the labour market.

It is recognised that, with the re-introduction of passenger services on the railway line, this could result in a change to the existing commercial bus network, should there be a reduction in demand from some locations. Whilst it is not possible to forecast the impact on the bus network and service commercial viability at this stage, it is recognised that any reduction to commercial bus services could impart an increased risk of social exclusion for some communities, such as those households with low incomes or elderly households who utilise Concessionary Travel passes to use local bus services for free.

If the Waterside Rail scheme is developed further, then these potential adverse impacts would need to be analysed and considered in more detail and ways of mitigating them identified. Overall, without mitigating measures, the impact on social inclusion is likely to be slight adverse.

Severance

Community severance is defined as the separation of residents from facilities and services they use within their community caused by substantial changes in transport infrastructure or by changes in traffic flows. Severance will mainly be an issue where either vehicle flows are significant enough to significantly impede pedestrian movement or where infrastructure presents a physical barrier to movement.

In this scheme the new rail service is using an existing railway line, which remains a physical barrier for the communities it runs through. There are, however, a number of level crossings along the route which will need to operate more often given the increase in the number of rail services per day compared to today. This will have an impact on car journey times in the local area. These potential disbenefits have not been quantified. Based on the TAG guidance, it is anticipated that the overall severance impact could be 'slight adverse', given the volumes of road traffic using some of the level crossings, although this could be partly offset through reduced use of the private car for some journeys instead made by rail as well as replacement of some level crossings with overbridges.

Option and Non-Use Values

An option value is the willingness-to-pay to preserve the option of using a transport service for trips not yet anticipated or currently undertaken by other modes, over and above the expected value of any such future use. Non-use values are the values that are placed on the continued existence of a service (i.e. transport facility), regardless of any possibility of future use by the individual in question. Option and non-use values should be assessed if the scheme being appraised includes measures that will substantially change the availability of transport services within the study area (e.g. the opening or closure of a rail service).

The number of households around each new station has been calculated, based on existing populations. Marchwood would serve 2,470 households, Hythe Town would serve 7,640 households (in Hythe and Dibden) and Hythe and Fawley Parkway would serve approx. 7,170 households (across Buttsash, Hardley, Holbury, Blackfield, Langley and Fawley).

On the basis of the above, there would be a total of 17,280 households obtaining an option value across 3 stations, at an average of 5,760 households per station. On that basis, and in line with the TAG guidance, this impact can be scored as large beneficial.

4.10 Level 2 and Level 3 Wider Impacts

Increased economic output in imperfect competitive markets is a Level 2 impact that could been monetised using the methodology prescribed in TAG Unit 2.1 - Wider Economic Impacts Appraisal. As the RYR guidance asked promoters to take a light touch approach to transport modelling and economic appraisal, this has not been monetised at the SOBC stage, but could be considered at the OBC stage.

Static agglomeration and tax revenue from increased labour participation are two other Level 2 economic impacts that have not been quantified at this stage. Given the nature and focus of the programme on encouraging mode shift from private car to bus and active travel modes, the expected scale of both impacts is likely to be marginal. Level 3 impacts such as induced housing or commercial supply (dependent development) have not been explicitly considered at the current stage. This will be considered in more detail after the final SOBC submission if requested by the DfT.

5. Financial Case

The total out-turn costs for the Waterside Rail Re-opening scheme, for each of the three shortlisted options has been calculated from cost estimates prepared by Atkins' commercial cost estimation team (Faithful and Gould).

Construction cost inflation of 18.5%[28] has been applied to convert 2020 prices into out-turn costs. The out-turn for each of the three shortlisted options (mid-construction point, 2025 Q2 prices) are:

Low Cost - £52.063m

High Connectivity - £75.895m (including third rail electrification costs)

High Frequency - £59.362m

The assumed construction cost profile is summarised in Table 5.1 below:

Table 5-1 - Assumed construction cost profile

	2022/23	2023/24	2024/25	2025/26	2026/27	Total
Cost Profile	3.75%	20.35%	36.40%	36.40%	3.10%	100.00%

The outturn Cost profile for each of the three shortlisted options are summarised in Table 5.2, below:

Table 5-2 - Cost profile for the three shortlisted options and assumptions on source of funding

Low Cost	2022/23	2023/24	2024/25	2025/26	2026/27	Total (£m)	%
RNEP/NR	£1.85	£10.07	£18.00	£18.00	£1.53	£49.46	95%
Third party	£0.10	£0.53	£0.95	£0.95	£0.08	£2.60	5%
Total	£1.95	£10.59	£18.95	£18.95	£1.61	£52.06	100%
High Connectivity	2022/23	2023/24	2024/25	2025/26	2026/27	Total (£m)	%
RNEP/NR	£2.70	£14.67	£26.24	£26.24	£2.24	£72.10	95%
Third party	£0.14	£0.77	£1.38	£1.38	£0.12	£3.79	5%
Total	£2.85	£15.44	£27.63	£27.63	£2.35	£75.89	100%
High Frequency	2022/23	2023/24	2024/25	2025/26	2026/27	Total (£m)	%
RNEP/NR	£2.11	£11.48	£20.53	£20.53	£1.75	£56.39	95%
Third party	£0.11	£0.60	£1.08	£1.08	£0.09	£2.97	5%
Total	£2.23	£12.08	£21.61	£21.61	£1.84	£59.36	100%

This assumes that:

- Detailed design would commence in January 2023 and take 12 months to complete.
- Construction would commence in January 2024 (duration 28 months)
- Construction mid-point would be in March 2025 (14 months from construction start)
- Passenger services would commence in May 2026
- Design team fees 15% of overall capex, spent at a consistent rate over the 12 months prior to construction start (15% assumption is consistent with the design fees calculated)

[28] Source: BCIS General Civil Engineering Cost Index (quarterly index, 5 years' inflation applied from 2020 Q2 - 2025 Q2)

- The remaining 85% has been treated as construction cost and spent at a consistent rate across the 28 month construction period.

At present, no third-party funding has been identified to meet the assumed 5% third party funding contribution towards the scheme. However, with both commercial and residential development expected to come forward in the area served by the Waterside Line, it is possible that developer contributions may be secured as part of the planning process. Given that the scheme is likely to support delivery of planned growth, and would enhance connectivity, it is likely that the scheme would be a good fit with the objectives of Solent LEP's Solent Prosperity Fund, so a third party funding contribution from the LEP could be sought. It is probable that the Waterside Rail reopening scheme would be looked on favourably, given that LEP funding contributions have been forthcoming for highway capacity improvements on the A326, linked to the Fawley Waterside development.

6. Commercial Case

6.1 Introduction

The Commercial Case provides evidence on the commercial viability of the Waterside Rail re-opening scheme and the emerging procurement strategy that will be used to engage the market. At SOBC stage an outline of the procurement strategy is required.

In March 2018, the DfT published the Rail Network Enhancements Pipeline (RNEP) document setting out a revised process for the development and approval of major enhancement projects. As the Management Case explains in more detail, it is envisaged that the Waterside Rail scheme would be progressed via the RNEP process. This scheme is currently approaching the 'Decision to Develop' gateway.

The Strategic Case has scoped out three shortlisted delivery options for Waterside Rail reopening, which would deliver the key outputs in a way that meet programme aspirations. As set out in the Strategic Case, the physical works for this project essentially involve the upgrade of an existing freight railway to passenger standards, encompassing the construction of two new stations, safety improvements to some level-crossings (including potential replacement with bridges), and other works depending on the chosen solution. These works are largely confined to railway land already under the full ownership of Network Rail (the existing rail trackbed, and land on either side of the trackbed marked by boundary fencing, including embankments and cuttings).

6.2 Sourcing Options and Procurement Strategy

A preferred strategy for procurement for capital works would be identified by Network Rail (NR) during the Outline Business Case development stage. In line with NR processes, the preferred strategy would be selected in order to ensure that value for money is achieved, and that all procurement is compliant with all relevant processes and standards.

NR has a mature framework in place for managing contractors on major projects, fully audited to ensure they meet expectations around safety and sustainability. In 2019, Network Rail established a series of procurement frameworks for schemes being delivered during Control Period 6, covering aspects such as track and signalling. In many cases, specific contractors have been appointed for the Wessex region as part of these frameworks.

In terms of any enhancements to the highway network in order to serve the proposed stations, and at any locations where level-crossings are to be replaced by bridges, these works would typically be managed by the highway authority (HCC), in conjunction with the local planning authority (NFDC). HCC has a range of procurement options open to it to deliver such works. Potentially, the contract for overbridge construction could be led by NR.

In terms of rail operating options, it has been assumed that the current Network Rail/Train Operating Company (TOC) arrangements would apply. Network Rail would maintain the track and signalling infrastructure and an existing TOC, would operate the train services on the Waterside rail branch as part of the specification of a future concession arrangement (in line with expected rail industry reform). An existing TOC would be able to operate services more efficiently than a new TOC who would need to secure the relevant Licences, Safety Management System and competencies under a fixed period concession arrangement as well as negotiate traincare maintenance and recruit traincrew. The TOC that is geographically most aligned and that could be operationally best suited to operate train services on the branch is South Western Railway.

In order to operate the service following reopening for passenger use, agreements will be needed to:

- procure and maintain the necessary rolling-stock;
- to formalise the payments by the operator to Network Rail for operating and maintaining the infrastructure;
- to hire additional railway staff; and
- to extend (or replace) existing supply arrangements which would support the new operation (for example – ticketing systems, timetable systems etc etc).

6.3 Procurement Timescales

For construction work and re-signalling, the procurement timescales would be determined by Network Rail in accordance with the RNEP process.

For the purposes of this SOBC, it has been assumed that these works would commence in January 2024, so procurement activity would need to be complete in 2023.

The current South Western Railway Franchise is due to end in August 2024, and based on expected rail reform to the franchising system could be replaced by a fixed term concession, where the DfT takes on full revenue risk. If the Waterside Rail re-opening scheme is progressed to delivery, then a requirement to run rail services on the Fawley branch can be written into the new specification for the concession agreement that would start in August 2024 by the DfT.

6.4 Commercial Risks to Delivery – Land and consents

The majority of construction works associated with Waterside Rail reopening are predominantly within land that is in the control or ownership of NR and HCC. There are some instances in which land is needed which is owned by, or in the control of, outside parties. For example, land for construction of access, a forecourt and car parking for Hythe and Fawley Parkway. Additionally, land may be required at some or all of the three locations where it is proposed that the existing level crossing be replaced by an overbridge. In the case of the stations, these are in the ownership of either key partners or stakeholders who HCC are engaged with as part of the development of this scheme. Further discussions would take place with these third party landowners if scheme development is progressed as part of OBC development work.

It is expected that planning permission will be required to be able to construct a new rail station at Hythe and at Hythe and Fawley Parkway. Whilst neither would have a station building, the Local Planning Authority would have an interest in the design of access arrangements for both and in the case of Hythe and Fawley Parkway the car parking and bus and station forecourt layout.

7. Management Case

7.1 Introduction

This section sets out how Hampshire County Council (HCC) and Network Rail (NR) plan to manage the delivery of Waterside Rail re-opening to ensure that interventions are completed to budget, and to the right standard and by the planned timescales.

To date, promotion of the scheme has been led by HCC, supported by their retained consultants Atkins. As a result of the scheme development work undertaken to date, in this SOBC we have been able to identify a viable project scope, delivery strategy and operating/ownership option that will meet the required outputs of the project.

Should the scheme progress further through the Rail Network Enhancements Pipeline (RNEP) process, however, it is anticipated that promotion and sponsorship will pass to DfT/NR – both organisations having mature, well-established frameworks for procuring and delivering such projects, as well as significant relevant experience.

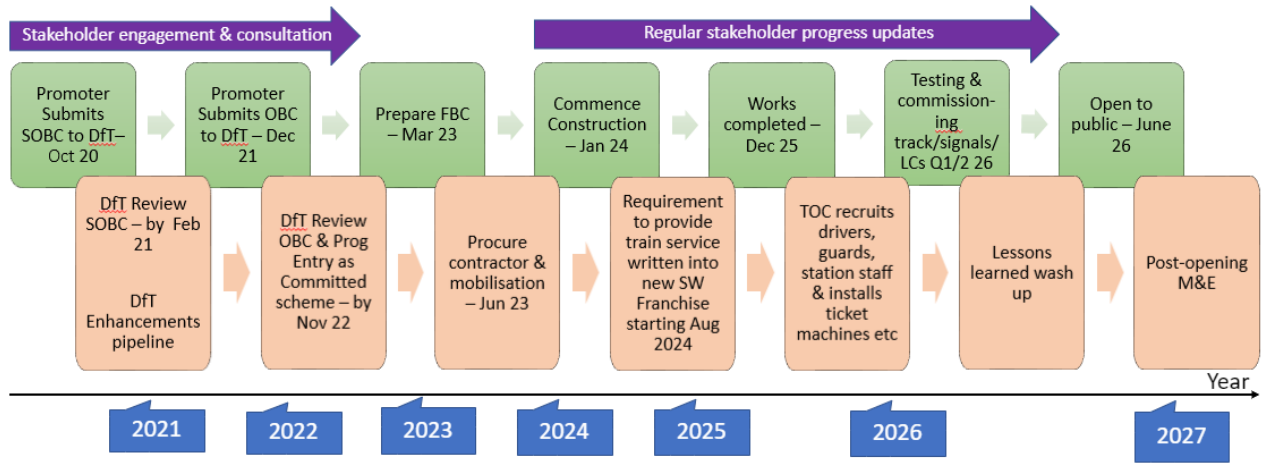
7.2 Evidence of Similar Projects Delivered by HCC/NR

Over the past ten years, both HCC and Network Rail have implemented a number of large-scale complex transport infrastructure projects to time and budget. Network Rail has overseen large improvements like the Reading Station upgrade and the Borders Railway scheme. HCC have delivered the Gosport-Fareham Eclipse busway, construction of a new Chandlers' Ford station and multi-modal transport interchanges. The knowledge and lessons learnt on all of these projects will be invaluable in developing the Waterside Rail reopening proposals further.

7.3 High level Project Delivery Programme

An indicative timeline for delivery of the Waterside Rail re-opening scheme is shown in Figure 7.1 below:

Figure 7-1- Waterside Rail Re-opening - High Level Programme of Key Milestones

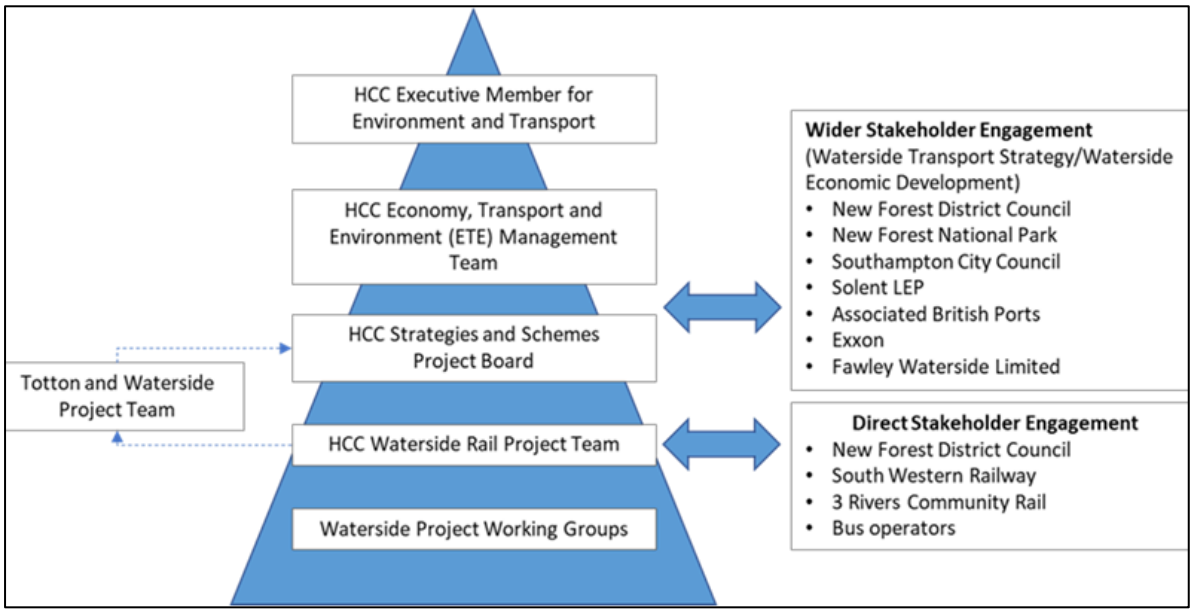


7.4 Governance & reporting arrangements

A clear governance structure has been developed to ensure political and close joint working between the DfT RYR team and NR and HCC. Monthly progress meetings have been held between these organisations.

Figure 7.2 below summarises the current project governance arrangements for the scheme within HCC, based on existing arrangements. The SOBC preparation process is being overseen by the HCC Strategies and Schemes Board to provide political oversight and provide direction on the development and implementation of the Waterside Rail re-opening scheme up to the point at which the responsibility for promoting the scheme is passed from HCC to Network Rail (post SOBC stage).

Figure 7-2– Current governance arrangements for the project within HCC



If the DfT, having reviewed this SOBC, decide to progress the development of this scheme further, then this will allow Network Rail and DfT to prepare the Decision to Develop, to support the next stage of the RNEP process, the preparation of the Outline Business Case. It is proposed that Network Rail will take the lead in preparation of an Outline Business Case as scheme promoter, with DfT as project client and Hampshire County Council represented on the Project Board.

Before Network Rail can formally become the scheme promoter, there will be a number of stages to go through before this can happen including (but not exhaustive):

- Confirmation and review of what outputs have been delivered the documents refers to GRIP1/2;
- Validation of the estimate and alignment with the review of the GRIP stage achieved; and
- Reach agreement on what the assumptions are to allow NR to prepare a cost for the next stage to support the Decision to Develop.

There are also key delivery partners such as South Western Railway, New Forest District Council and the bus operator Bluestar, that will be engaged.

7.5 Communications and Stakeholder Management/ Engagement Plan

A technical workshop was hosted by Atkins to inform the development of station and train service options in 2019. A public consultation is planned for May/June 2021, covering a range of proposed highway and public transport improvements in the Waterside area, and this will include the rail re-opening scheme. If the DfT decides that scheme development should continue to the OBC stage, then additional stakeholder engagement will be needed as the proposals and delivery mechanisms develop through the RNEP framework. To help plan this, a Stakeholder Management Plan will be prepared. This will set out how the following key stakeholders will be engaged with and kept informed of progress:

- New Forest District Council (Local Planning Authority)
- New Forest National Park
- Southampton City Council (neighbouring Local Transport Authority)
- Dr Julian Lewis MP (RYR sponsoring MP)
- South Western Railway
- Rail Freight Operators (probably via Rail Freight Group)
- Three Rivers Community Rail Partnership
- Solent Local Enterprise Partnership
- Associated British Ports
- ExxonMobil
- Fawley Waterside Limited
- Local Bus and Ferry Operators
- Marchwood Parish Council
- Hythe and Dibden Parish Council

7.6 Risk Management Strategy

Project risk will be actively managed according to best practice principles and the risk register will be updated on an iterative basis to reflect the design stage the scheme has reached. A process of hazard identification and preliminary system definition, to establish whether the project represents a 'significant' risk in respect of CSM, will be undertaken.

Table 7.1 below provides a summary of the main project risks identified to date and the proposed approach to mitigate these.

Table 7-1 – Summary of Main Project Risks Identified and approach to mitigate these

Description	Probability	Potential Impact	RAG Status	Mitigation
As a result of third party land being required to deliver some elements of the scheme, securing this could potentially take time and could result in delays to programme	Medium	High	Amber	Promoter to engage with third party landowners at an early stage to negotiate timeframes and quantity of land needed for the scheme. Seek to address any issues/ concerns through negotiation.
Some elements of the scheme will require planning permission. Securing this could take longer than the programme may allow	Medium	Medium	Amber	A phased approach to re-opening could be taken whereby elements of the scheme that do not require planning permission could be delivered more quickly.
As a result of rail infrastructure having been mothballed for last few years, there is a risk of increased construction costs which could result in delays to programme and budget exceedances	Medium	High	Amber	Early involvement of Quantity Surveyor team at NR to ensure scheme costs are calculated accurately. Make 64% Optimism Bias allowance in Costs. Robust contractor / programme management expertise. Regular dialogue and meetings with contractor and early warning process to flag / escalate risks and issues.

A shortfall in funding arises as a result of additional unforeseen project costs	Medium	High	Amber	Robust design, programme and contractor management processes to be in place. High level of Optimism Bias at early stages to reflect uncertainty and unknowns, which will reduce as cost estimates improve.
As a result of faster journey times by rail, there is a risk of abstraction of Public Transport demand from parallel bus and ferry routes which could result in timetable reductions on these services.	High	Medium	Amber	Early engagement and regular communication with bus and ferry operators throughout scheme development stage. Opportunity for operator to win contract to provide feeder new bus services to Fawley Parkway.
Potential difficulties in securing a Train Operating Company to operate train service or the additional rolling stock required	Medium	High	Amber	Passenger rail franchising reform may make it easier to add additional timetabled passenger rail services in the middle of a concession period – no longer a need to write it into the franchise specification.
Potential rail industry supply chain issues with signalling or contractors could delay civils work and commissioning of new equipment, affecting re-opening timeframes.	Medium	Medium	Amber	Network Rail could identify a procurement route that reduces these risks (e.g. early contractor engagement).
Increased level crossing barrier down time could cause localised air quality and congestion problems	Medium	Medium/ High	Amber	Level of additional level crossing barrier down time would depend on train service option. A phased approach of initially starting a passenger service with a lower frequency could reduce down time. Scope for co-ordination of timetables to minimise down time
As a result of weaker economy as result of C-19, there is a risk of lower than forecast passenger demand, which could lead to farebox income not covering operating costs.	Low/Medium	Medium	Green	Promoter and TOC to work with NFDC, NFNPA, Three Rivers CRP and Town/Parish Councils to build awareness of reopening date and promote community use of it.

A more detailed risk register has been produced (Appendix E), which will be kept updated as further scheme development work is undertaken. Regular risk review meetings will be held, as part of which, the quantification of all risks, new and existing, will be assessed, and any changes to mitigating actions identified.

7.7 Monitoring and Evaluation

TAG guidance emphasises the importance of evaluation and recommends that an evaluation plan be drawn up as part of the development of the business case for a transport project.

If the Waterside Rail reopening scheme is delivered, then it will be important to monitor and evaluate to test whether the project has been a sound investment of public money, to assess what the outcomes are compared to the objectives, and provide evidence for future rail reopening interventions and investment projects in England.

It is proposed that a two-stage approach will be adopted to evaluation of the scheme:

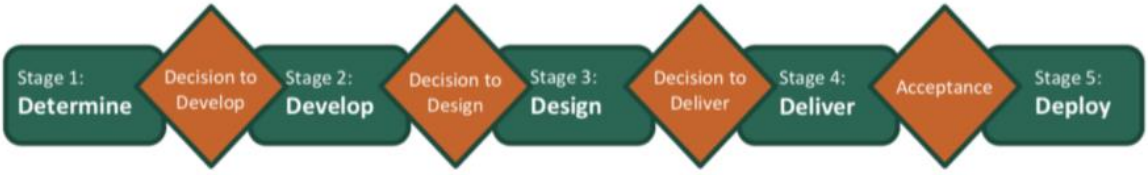
- **Stage 1 Evaluation** – would be carried out around a year following the completion of a project. This would be a high level assessment of the extent to which the project is on track to reach its objectives, through the examination of relevant monitoring data (usage/ patronage levels, journey times, journey time reliability and abstraction/displacement from other modes and routes). An assessment of outturn versus predicted cost can also be made.
- **Stage 2 Evaluation** – a more comprehensive evaluation be carried out when the completed scheme has had sufficient time to bed in. This would be between 3 - 5 years after the completion of the project. It would draw upon the existing types of data outlined for Stage 1 but also collect primary data to assess if the project has achieved its objectives. Surveys of passengers and stakeholders would typically be conducted. Where possible this data should be compared with information collected as part of the baseline studies. Additional elements such a recalculation of Benefit Cost Ratio may also be included. If considered appropriate, an in-depth assessment of Wider Economic Benefits and Accessibility could also be carried out.

As a first step towards the drafting of an evaluation plan, a logic map or intervention logic chain has been prepared to map out the inputs, outlining the context in which the project was delivered, and the expected outputs, outcomes and impacts of the rail scheme. The Logic Map is in Appendix F.

7.8 Summary of overall approach for project management

The project is proposed to be developed through the RNEP process, illustrated in Figure 7-3 below. Although the elements of the RNEP process do not necessarily align with the Network Rail GRIP process, there are elements of GRIP with Network Rail in asset protection mode that form key Gateways for the project, e.g Option Selection Report, Approval in Principle, Authorised for Construction.

Figure 7-3: RNEP Process



If the DfT approve the scheme to progress to the OBC stage, then an Integrated Assurance and Approvals Plan will be prepared.

Appendices

A Letters of Stakeholder Support
B Technical background note on SRTM
C RAG rating for Long List of Train Service and Train Station Options
D Economic Appraisal Tables for the three Shortlisted Options
E Risk Register
F Logic Map for Waterside Rail Re-opening

Appendix A – Letters of Support (see separate pdf document)

Solent LEP

New Forest District Council

New Forest National Park Authority

Southampton City Council

Hampshire Chamber of Commerce

Future South

Cllr Malcolm Wade - County Councillor for Dibden & Hythe

Three Rivers Community Rail Partnership

Appendix B – Technical overview of Solent Sub Regional Transport Model (SRTM)

Introduction to the Solent Sub-Regional Transport Model (SRTM)

The SRTM is a multi-modal transport model, covering highway and public transport modes, which allows testing of the impacts and benefits of land use and transport interventions. It also has capabilities to test the economic impacts of these interventions.

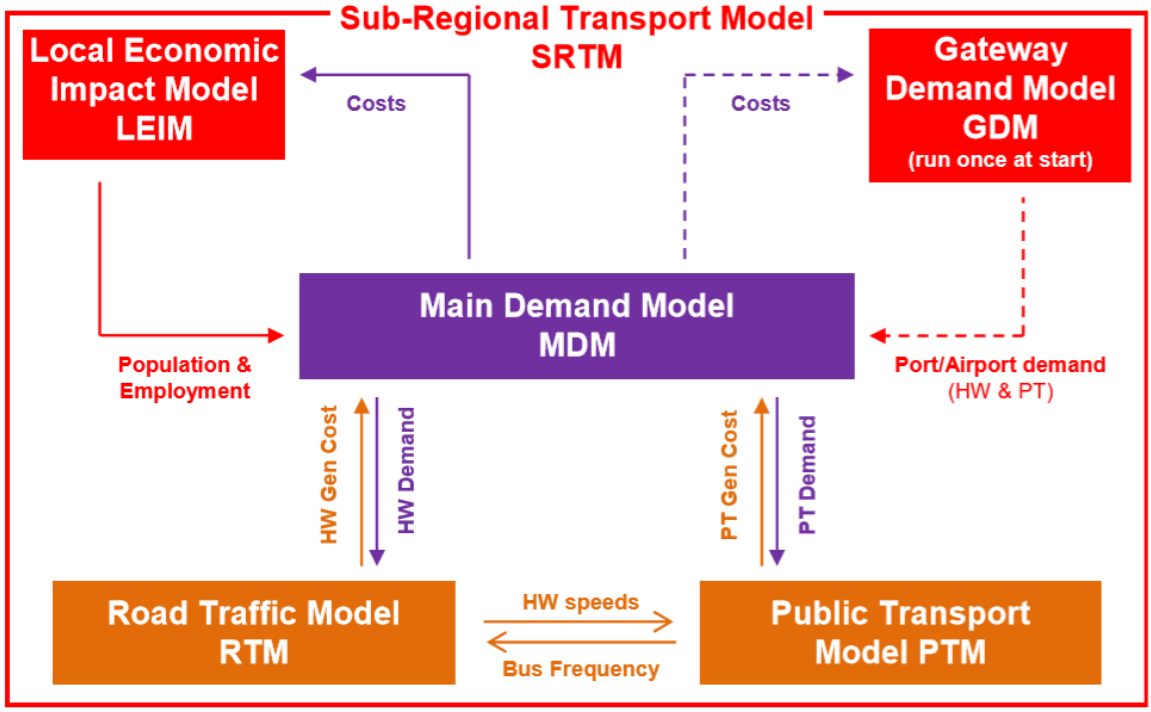
SRTM is fully TAG compliant and is capable of providing outputs which can robustly support the development of transport strategies and schemes, provide information to support development of funding bids and business cases, and can inform land use strategies and development transport assessments.

The SRTM has a base year of 2015 with five forecast years; 2019, 2026, 2031, 2036, and 2041.

The SRTM is a suite of linked models comprising the following components as shown in Figure 1:

- The Main Demand Model (MDM) which predicts when (time of day), where (destination choice) and how (choice of mode) journeys are made;
- The Gateway Demand Model (GDM) which predicts demand for travel from ports and airports;
- The Road Traffic Model (RTM) which determines the routes taken by vehicles through the road network and journey times, accounting for congestion;
- The Public Transport Model (PTM) which determines routes and services chosen by public transport passengers; and
- The Local Economic Impact Model (LEIM) which uses inputs including transport costs to forecast the quantum and location of households, populations and jobs

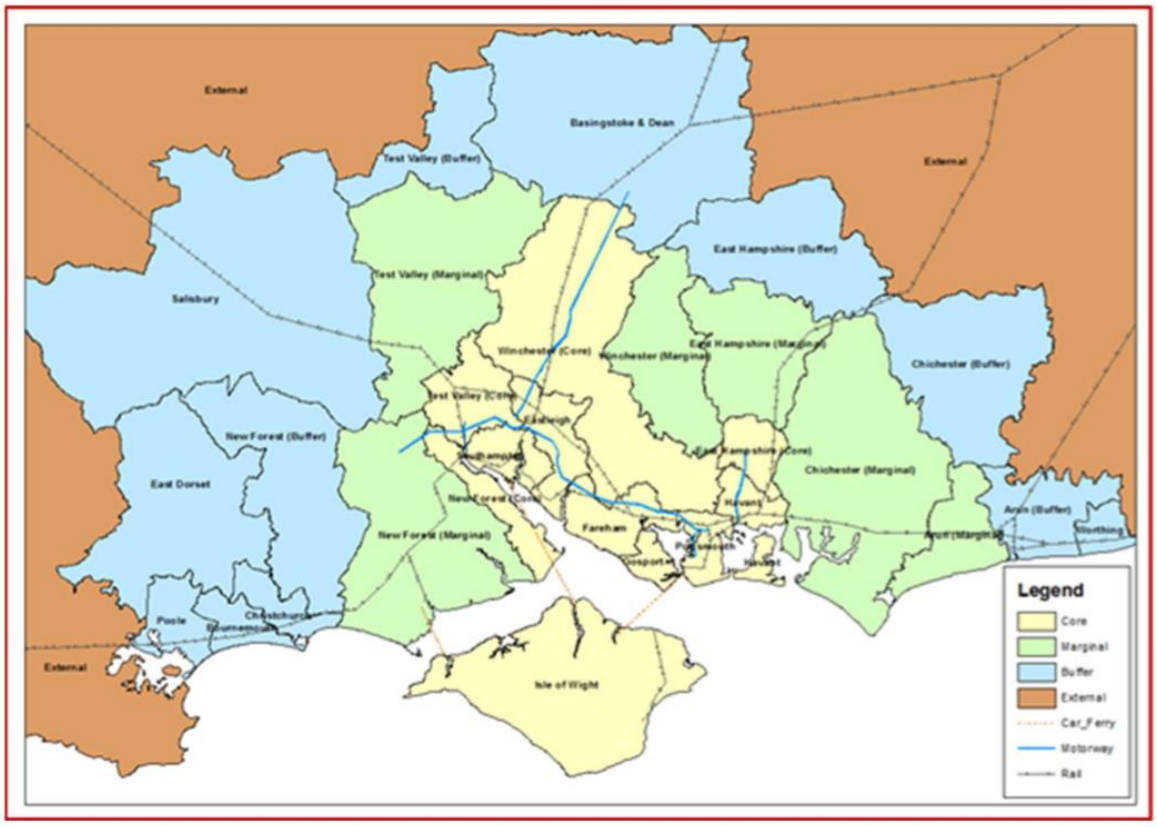
Figure 1. Solent Transport Sub Regional Transport Model



From base year (2015) costs, the LEIM produces population and employment forecasts for the next forecast year. Along with the adjusted trip rates, these forecasts are used to calculate growth factors for the productions and attractions. The trip rates vary by period and mode of transport, for the 12 person-type/household categories.

The modelled area of the SRTM is divided into four regions, shown in Figure 2, which differ by zone aggregation and modelling detail. The study area for this commission is within the Core (most detailed) model region.

Figure 2. SRTM Model Area and Model Regions



Three weekday periods are modelled in the SRTM:

- AM Peak: busiest hour between 0700 and 1000, (defined as 40.5% of the three hours for Highway and 40% for Public Transport);
- Inter peak: average of 1000 and 1600 (i.e. 16.7% of the six hours for both modes); and
- PM peak: busiest hour between 1600 and 1900 (defined as 36.8% of the three hours for Highway and 40% for Public Transport).

For personal trips, six trip purposes are modelled. These are home-based work, homebased employer's business, home-based education, home-based other, non home-based employer's business, and non home-based other.

Three car availability classes and 4 person-types are also defined. The three car availability classes are defined for households: households with no car, households with car competition (fewer cars than adults) and households with no car competition (number of cars is greater or equal to the number of cars). The four person types are: child, working adult, non working adult, retired.

The scale and location of development growth within the model is determined through the LEIM module and overall growth is constrained to TEMPRO v7.2 population/household and employment growth forecasts.

Model development, validation & calibration

As the key transport evidence base for the Solent, the SRTM is supported by a number of technical reports. These provide background information on the development of the SRTM, including surveys and calibration and validation, to demonstrate that the SRTM is compliant with Government appraisal guidance.

A series of technical reports for the current (2015 base) version of SRTM can be accessed via the links below:

- **Road Traffic Model: Model Development & Validation Report and appendices**
- **Public Transport Model: Calibration & Validation report**
- **Model Forecasting Report**
- **Main Demand Model - Model Development and Validation Report**
- **Reference Cases 2018/19 - Update Report**

Appendix C- Red Amber Green Assessment of Long List of Train Service and Train Station Options

Table C1- Assessment of individual service options - decision, stakeholder feedback, operational viability, impact on existing rail users

Key Service Attributes				Decision		Stakeholder Feedback	Operational Viability		Impact on Existing Rail Users	
Option	Service	Trains per hour	Totton LC	Include/Exclude from Shortlist?	Rationale for Decision	Summary from 23/10/19 Workshop	Rating	Reviewer Comments	Rating	Reviewer Comments
1	Southampton Central - Hythe/Fawley	1	+1tph each way	Exclude	2tph shuttle (Option 9) would provide additional revenue and benefits, relative to additional operating cost.	1tph frequency deemed to be insufficient to persuade residents to shift from car to rail.	Pass	1 additional unit required.	Low	Minimal impact - separate service, unlikely to have significant impact on existing services between Totton and Southampton. Current service at Totton, Redbridge and Millbrook is 1tph, so shuttle service could be used to improve service frequency.
2	London Waterloo - Hythe/Fawley	1	+1tph each way	Exclude	High level assessment suggested this option was broadly feasible and could potentially generate strong financial return. However, not deemed to be a suitable service for extending to Fawley by stakeholders, including SWR and Three Rivers CRP, due to the severance of the Poole service and lack of compatibility with existing rolling stock diagrams.	Not a popular option as would likely need to be a self-contained diesel service and removal of the Poole-London service unlikely to be popular with stakeholders. SWR appeared to suggest that longer term (Dec 2020 timetable change) there were plans to reconfigure the Poole service.	Not assessed in detail	N/A	High	It is assumed that a backfill service would be provided between Southampton Central and Poole. However, passengers using stations between Poole and Totton not served by London Waterloo - Weymouth services would lose their direct service to Southampton Airport, Winchester and London.
3	Romsey - Hythe/Fawley via Eastleigh	1	+1tph each way	Include	Represents a relatively low cost option with minimal infrastructure required. Provides local connectivity across Southampton between Fawley and Eastleigh / Southampton Airport.	Popular option as an appropriate local-type service to extend. The service calls at Millbrook and Redbridge already (subsequent work determined that the Salisbury – Southampton service would provide these calls).	Pass	The optimal timing for the residual Southampton – Salisbury service has not yet been explored. Turnaround at Hythe approx. 15 mins. 1 additional unit required. Could release the residual Salisbury - Romsey - Southampton service from some of the constraints of the Southampton corridor, removing some of the challenges to extending this service west of Salisbury (to Westbury / Swindon). Service is already diesel operated. Option to be pursued with diesel traction option only.	Medium	Some impact on existing passengers as option serves existing Salisbury - Romsey loop service, although frequency to Southampton Central is maintained through addition of residual Southampton – Salisbury service.
4	Portsmouth & Southsea - Hythe/Fawley	1	+1tph each way	Exclude	Provides local connectivity across Southampton between Fawley and Fareham / Portsmouth, however, fails operational assessment. This finding could be reviewed in the light of any future timetable recast.	Makes sense to include as an option to extend a service that currently terminates at Southampton Central.	Fail	No path exists at the right time west of Southampton. Holding the service for an available path means it cannot get to Hythe and back within the hour.	Low	Would be an extension of current service with minimal impact - additional service per hour between Southampton and Totton. Would also reduce the number of services terminating at Southampton Central.
5	Newcastle - Hythe/Fawley	0.5	+0.5tph each way	Exclude	Discontinued following initial operational assessment and stakeholder feedback.	Disregard as not an hourly service and unlikely to be desirable to the CrossCountry operator	Not assessed in detail	Only provides a train every 2 hours. Trains would pass on the branch, making inefficient use of stock while offering a poor service. Option discontinued.	Discontinued	
6	Winchester - Hythe/Fawley	1	+1tph each way	Exclude	Provides enhanced local connectivity with higher frequency services across Southampton to Eastleigh / Southampton Airport / Winchester, however, fails operational assessment.	Opportunity to enhance Southampton 'suburban' service. NR not necessarily opposed to additional services between Southampton and Winchester.	Fail	This service was assumed to run in the opposite half hour to the existing Romsey service; however, no path existed at Eastleigh and between Eastleigh and Winchester in the correct quadrant of the hour. This was because of Class 4 freight paths which occupy a gap in the passenger service and run between Eastleigh and Worting Junction without being recessed. The option of recessing at Wallers Ash, with an extension of freight journey time, was explored, but not found to be viable owing to other freight services recessing at Wallers Ash at the same time and no suitable alternative path south of Eastleigh.	Low	Additional service would improve service frequency for existing passengers in the Southampton area.
7	Brighton - Hythe/Fawley	1	+1tph each way	Exclude	Fails operational assessment.	Suggested as a service that currently terminates at Southampton Central so may be operationally beneficial to extend.	Fail	No suitable paths exist west of Southampton at the correct time to extend this service	Low	Would be an extension of current service with minimal impact - additional service per hour between Southampton and Totton. Would also reduce the number of services terminating at Southampton Central.
8	Totton - Hythe/Fawley	1	+1tph each way	Exclude	Limited impact on existing main line rail services, but would still require a solution for terminating services at Totton. Lower revenue potential given the requirement to interchange at Totton for main line services.	Suggested as a possible alternative option - likely to be difficult to terminate services at the current Totton station - would likely only work if Totton station was relocated to the west with a bay platform.	Not assessed in detail	N/A	Low	Low impact on existing services as option only serves the branch line.
9	Southampton Central - Hythe/Fawley	2	+2tph each way	Include	Should be tested as the core option for comparison with previous work, and appears to be broadly operationally feasible. However, requires tight turnaround at either Southampton or Hythe & Fawley Parkway,	Core service option, but would be preferable to extend services beyond Southampton for both operational and connectivity reasons.	Pass	Turnaround at 4 minute turnaround at Hythe Town, approx. 17 minute turnaround at Southampton. No option to extend to Hythe & Fawley Parkway unless turnaround at Southampton is reduced to 4 minutes, which leaves no scope to flex the service. 2 additional units required.	Low	Minimal impact - separate service, unlikely to have significant impact on existing services between Totton and Southampton. Current service at Totton, Redbridge and Millbrook is 1tph, so shuttle service could be used to improve service frequency.

Appendix C

Key Service Attributes				Decision		Stakeholder Feedback	Operational Viability		Impact on Existing Rail Users	
Option	Service	Trains per hour	Totton LC	Include/Exclude from Shortlist?	Rationale for Decision	Summary from 23/10/19 Workshop	Rating	Reviewer Comments	Rating	Reviewer Comments
					depending on terminus selected - to be investigated further.					
10	Totton - Hythe/Fawley	2	+2tph each way	Exclude	As per Option 8.	As per Option 8 but with 2tph frequency.	Not assessed in detail	N/A	Low	Low impact on existing services as option only serves the branch line.
11	Southampton Central - Hythe/Fawley	3	+3tph each way	Include	Pursue as high frequency option. Expensive operationally and requires extension of Marchwood loop, but likely to be more 'transformational' in terms of demand, revenue and benefits.	Suggested that a 3tph frequency (service every 20 minutes) should be investigated, as likely to attract stronger modal shift from car.	Pass	Pass subject to a passing loop being provided between Totton and Marchwood to enable freight to run to and from Marchwood. Turnarounds approx. 9 minutes. 3 additional units required.	Low	Some impact on existing passengers as option server existing Salisbury - Romsey loop service, although frequency to Southampton Central is maintained through addition of residual Southampton – Salisbury service.
12	Totton - Hythe/Fawley	3	+3tph each way	Exclude	As per Option 8.	As per Option 8 but with 3tph frequency.	Not assessed in detail	N/A	Low	Low impact on existing services as option only serves the branch line.

Table C2 - Assessment of individual service options - abstraction, indicative financial assessment

Key Service Attributes				Abstraction from Other PT Services		Indicative Assessment of Financial Viability					
Option	Service	Trains per hour	Totton LC	Rating	Reviewer Comments	Demand Potential ('000 per year)	Revenue Potential (£'000 per year)	Capital Costs (£'000)	Incremental Operating Costs (£'000 p.a.)	Rating	Reviewer Comment
1	Southampton Central - Hythe/Fawley	1	+1tph each way	Medium	Based on previous studies rail service would abstract from buses serving the peninsular and the Hythe ferry, but abstraction would not be as high as for higher frequency/connectivity options.	176 - 405	417 - 1,088	26,000 - 37,000	1,090 - 1,990	Low	Other options provide greater connectivity (and therefore revenue and benefits) for the same operating costs.
2	London Waterloo - Hythe/Fawley	1	+1tph each way	Medium	Higher abstraction than shuttle service to Southampton due to enhanced connectivity to stations beyond Southampton Central. However, has increased potential to generate new trips due to connectivity to London.	285 - 653	1,623 - 3,920	26,000 - 37,000	1,090 - 1,990	High	Service would generate revenue from trips from the Waterside peninsular to Southampton and beyond, which is likely to outweigh additional operating costs from diverting the Waterloo service and replacing with a backfill between Southampton and Poole.
3	Romsey - Hythe/Fawley via Eastleigh	1	+1tph each way	High	Higher abstraction than shuttle service to Southampton due to enhanced connectivity to stations beyond Southampton Central.	196 - 453	535 - 1,381	26,000 - 37,000	1,090 - 1,990	Low	Alteration of current service, therefore only additional operating costs are from Southampton - Waterside. Revenue potential stronger than for the shuttle service option, but remains low compared with other extension options.
4	Portsmouth & Southsea - Hythe/Fawley	1	+1tph each way	Medium	Higher abstraction than shuttle service to Southampton due to enhanced connectivity to stations beyond Southampton Central. However, has increased potential to generate new trips due to connectivity to Fareham/Portsmouth.	251 - 572	975 - 2,394	26,000 - 37,000	1,090 - 1,990	Medium	Service would generate revenue from trips from the Waterside peninsular to Southampton and beyond, which may outweigh additional operating costs from extending the service.
5	Newcastle - Hythe/Fawley	0.5	+0.5tph each way	Discontinued							
6	Winchester - Hythe/Fawley	1	+1tph each way	High	Higher abstraction than shuttle service to Southampton due to enhanced connectivity to stations beyond Southampton Central. Some abstraction from bus services within the Southampton area as well due to increased service frequency.	244 - 560	803 - 2,023	26,000 - 37,000	4,260 - 7,740	Low	This would be a new service, therefore all operating costs would be additional. Revenue potential for new service not sufficiently strong to offset additional costs.
7	Brighton - Hythe/Fawley	1	+1tph each way	Medium	Higher abstraction than shuttle service to Southampton due to enhanced connectivity to stations beyond Southampton Central. However, has increased potential to generate new trips due to connectivity to Fareham/ Portsmouth and Sussex.	253- 576	1,003 - 2,461	26,000 - 37,000	1,090 - 1,990	Medium	Service would generate revenue from trips from the Waterside peninsular to Southampton and beyond, which may outweigh additional operating costs from extending the service.
8	Totton - Hythe/Fawley	1	+1tph each way	Low	Unlikely to abstract high levels of demand as buses on the peninsular are frequent and connect directly to Southampton.	12 - 28	19 - 53	26,000 - 37,000	580 - 1,480	Low	Relatively low operating costs, but the revenue potential is too low to make this a viable option financially.
9	Southampton Central - Hythe/Fawley	2	+2tph each way	High	Based on previous studies abstraction from buses and the Hythe ferry would be high.	Not assessed in detail				Medium	Enhanced frequency will generate additional revenue relative to 1tph, and this is expected to be greater than the increase in operating costs.
10	Totton - Hythe/Fawley	2	+2tph each way	Low	Unlikely to abstract high levels of demand as buses on the peninsular are frequent and connect directly to Southampton.	Not assessed in detail				Low	As per 1tph – without direct connectivity to Southampton this option is unlikely to generate sufficient revenue
11	Southampton Central - Hythe/Fawley	3	+3tph each way	High	Based on previous studies abstraction from buses and the Hythe ferry would be high for 2tph option - 3tph option would be higher.	Not assessed in detail				Medium	Enhanced frequency will generate additional revenue relative to 2tph, but there may not be sufficient demand to justify a 20 minute service, given the additional infrastructure and operating costs required.
12	Totton - Hythe/Fawley	3	+3tph each way	Medium	Will abstract some demand from bus due to high frequency.	Not assessed in detail				Low	As per other Totton options

Appendix C

Combined Options

Table C3- Assessment of combined service options - decision, stakeholder feedback, operational viability, impact on existing rail users

Key Service Attributes				Decision		Stakeholder Feedback	Operational Viability		Impact on Existing Rail Users	
Option	Service	Trains per hour	Totton LC	Include/Exclude from Shortlist?	Rationale for Decision	Summary from 23/10/19 Workshop	Rating	Reviewer Comments	Rating	Reviewer Comments
13	London Waterloo - Hythe/Fawley (Option 2) + Southampton - Hythe/Fawley (Option 1)	2	+2tph each way	Exclude	As per Option 2.	Not discussed	Not assessed in detail	N/A	High	Passengers using stations between Poole and Totton not served by London Waterloo - Weymouth services would lose their direct service to Southampton Airport, Winchester and London.
14a	Romsey - Hythe/Fawley (Option 3) + Southampton - Hythe/Fawley (Option 1)	2	+2tph each way	Exclude	Technically operationally feasible, but highly inefficient and uses up valuable platform capacity at Southampton Central.	Not discussed	Pass	Pass, but the service would need to wait at Southampton for almost an hour. Turnaround at Hythe approx. 15 minutes. 3 additional units required.	Medium	Some impact on existing passengers as option serves existing Salisbury - Romsey loop service, although frequency to Southampton Central is maintained through addition of residual Southampton – Salisbury service.
14b	Romsey - Hythe/Fawley (Option 3) + London Victoria - Hythe/Fawley (extension of existing service)	2	+2tph each way	Include	Pursue as high connectivity option. Maximises connectivity across Southampton to both Southampton Airport / Eastleigh and Fareham / Portsmouth. Requires electrification of the branch.	Not discussed	Pass	Pass, subject to electrification. Turnaround at Hythe approx. 15 minutes. 2 additional units required (1x158 + 1x377).	Medium	Some impact on existing passengers as option servers existing Salisbury - Romsey loop service, although frequency to Southampton Central is maintained through addition of residual Southampton – Salisbury service.
15a	Portsmouth & Southsea (Option 4) - Hythe/Fawley + Southampton - Hythe/Fawley (Option 1)	2	+2tph each way	Exclude	As per Option 4.	Not discussed	Fail	See Option 4	Low	Would be an extension of current service with minimal impact - two additional services per hour between Southampton and Totton.
15b	Portsmouth & Southsea (Option 4) - Hythe/Fawley + Southampton - Hythe/Fawley (extension of existing service)	2	+2tph each way	Exclude	As per Option 4.	Not discussed	Fail	See Option 4	Low	Would be an extension of current service with minimal impact - two additional services per hour between Southampton and Totton.

Table C4 - Assessment of combined service options - abstraction, indicative financial assessment

Key Service Attributes				Abstraction from Other PT Services		Indicative Assessment of Financial Viability					
Option	Service	Trains per hour	Totton LC	Rating	Reviewer Comments	Demand Potential ('000 per year)	Revenue Potential (£'000 per year)	Capital Costs (£'000)	Incremental Operating Costs (Extension Services (£'000 p.a.)	Rating	Reviewer Comment
13	London Waterloo - Hythe/Fawley (Option 2) + Southampton - Hythe/Fawley (Option 1)	2	+2tph each way	High	Higher abstraction due to 2tph frequency plus enhanced connectivity to stations beyond Southampton Central.	461 - 1,058	2,040 - 5,008	26,000 - 37,000	2,180 - 3,980	High	High connectivity and frequent services into Southampton result in relatively high revenue figures which could potentially offset the additional operating costs.
14a	Romsey - Hythe/Fawley (Option 3) + Southampton - Hythe/Fawley (Option 1)	2	+2tph each way	High	Higher abstraction due to 2tph frequency plus enhanced connectivity to stations beyond Southampton Central.	372 - 858	952 - 2,469	26,000 - 37,000	2,180 - 3,980	Low	Revenue potential stronger than for 1tph options, but does not appear to be sufficient to offset the additional operating costs.
14b	Romsey - Hythe/Fawley (Option 3) + London Victoria - Hythe/Fawley (extension of existing service)	2	+2tph each way	High	Higher abstraction due to 2tph frequency plus enhanced connectivity to stations beyond Southampton Central.	Not assessed in detail				Low	As above
15a	Portsmouth & Southsea (Option 4) - Hythe/Fawley + Southampton - Hythe/Fawley (Option 1)	2	+2tph each way	High	Higher abstraction due to 2tph frequency plus enhanced connectivity to stations beyond Southampton Central.	427 - 977	1,392 - 3,482	26,000 - 37,000	2,180 - 3,980	Medium	High connectivity and frequent services into Southampton result in revenue figures that come close to matching operating costs.
15b	Portsmouth & Southsea (Option 4) - Hythe/Fawley + London Victoria - Hythe/Fawley (extension of existing service)	2	+2tph each way	High	Higher abstraction due to 2tph frequency plus enhanced connectivity to stations beyond Southampton Central.	Not assessed in detail				Medium	As above

Appendix C

Terminus Station Options

Table C5- Assessment of terminus station options

		Decision		Stakeholder Feedback	Feasibility		Indicative Demand Potential		Indicative Cost Estimate		Rail Operations
Option	Station	Include/Exclude from Shortlist?	Rationale	23rd October 2019 Workshop	Rating	Reviewer Comments	Rating	Reviewer Comments	Rating	Reviewer Comments	Additional Comments
A	**Fawley Waterside**	Exclude	Would be a far better location to serve the new development and reduce the proportion of abstracted trips from bus, but ruled out due to additional expense of constructing the additional alignment required.	Would require new alignment bypassing the oil refinery so likely to be prohibitively expensive - although need to confirm with oil refinery that passenger services cannot operate through the site.	Low	It has been assumed that a new alignment would be required as the existing alignment doesn't not run as far as Fawley and it is unlikely to be possible to operate passenger services through the oil refinery. The additional rail alignment is likely to require a further 6-7km of track.	High	Fawley population: 15,000 (2011 Census) There are also plans to provide residential, commercial and leisure development which will provide 1,500 new homes and 2,000 new jobs. Demand potential based on destination (MOIRA): Southampton: 138,000 Romsey: 18,000 Winchester: 57,500 Fareham: 31,000 Portsmouth: 30,000 **Total: 274,500**	High	Assume easy topography, single track, price per km:£1.4m (based on benchmarking with recent projects) Estimated total cost of new track: £9m Cost per parking space (assuming the land is flat): £2,534 Assumed car park of 50 spaces:£0.1m **New station cost: £3.0m** **Estimated total costs associated with station, car park and new alignment: £12.2m**	Run times to Fawley have not been previously generated, so they would need to be estimated in Route Runner or RailSys.
B	**Hythe & Fawley Parkway**	Include	Parkway station option to be retained as increases revenue potential of service for minimal additional cost, the preferred option for Fawley Waterside developer and an alternative terminus if Hythe not feasible.	Will encourage car use and not a good location for bus interchange. Conversely, closer to the Waterside development and gateway to New Forest National Park.	Medium	Station location proposed by the Fawley Waterside developer - there appears to be sufficient space to construct a new station on the existing alignment and connect in to the road network. A parkway would encourage more car use as residents would likely need to drive to access the interchange.	Medium	Fawley population: 15,000 (2011 Census) Demand potential based on destination (MOIRA): Southampton: 138,000 Romsey: 18,000 Winchester: 57,500 Fareham: 31,000 Portsmouth: 30,000 **Total: 274,500**	Medium	Assumed car park of 750 spaces:£1.9m New station cost: £3.0m (based on benchmarking with recent projects) **Estimated total costs associated with station and car park: £4.9m**	Network Rail IRTs were provided in their report. Extension to Hythe & Fawley Parkway in Southampton shuttle option requires turnaround at Southampton to be reduced to 4 minutes, which leaves no scope to flex the service.
C	**Hythe Town**	Include	Preferred option for the terminus of the branch to discourage car use and provide connections with the bus service, although there are concerns about terminating services there due to the gradient through the station.	Located in town centre, good location for interchange with other public transport - preferred terminus	Medium	Suitable location identified for constructing a new station at Hythe, although it will be located on a greenfield site. Station would be well located in the town centre for public transport connections. Some concerns raised regarding the gradient of the rail alignment through Hythe. A station call would require a departure from Network Rail standards.	High	Population: 20,526 (2011 Census) Demand based on destination (MOIRA): Southampton: 120,500 Romsey: 15,500 Winchester: 50,500 Fareham: 27,000 Portsmouth: 26,000 **Total:239,500** *GRIP 3 report half-hourly demand forecasts:* Annual trips: 56,000	Medium	Halcrow cost estimate of station upgrade (2011 prices): £1.1m Assumed car park of 50 spaces:£0.1m New station cost: £3.0m **Estimated total costs associated with station and car park: £3.1m**	N/A

Appendix C

Intermediate Station Options

Table C-6 - Assessment of intermediate station options

		Decision		Stakeholder Feedback	Feasibility		Indicative Demand Potential		Indicative Cost Estimate		Rail Operations
Option	Station	Include/Exclude from Shortlist?	Rationale	23rd October 2019 Workshop	Rating	Reviewer Comments	Rating	Reviewer Comments	Rating	Reviewer Comments	Additional Comments
a	**Marchwood**	Include	Upgrade to mothballed station on branch, so relatively low cost, and well placed to serve intermediate market between Hythe and Totton. Operationally, location on a passing loop allows for an efficient passing of trains.	Existing station and well located for serving town.	High	Existing loop and the existing infrastructure is in a reasonable condition. Requires a platform refurbishment and lengthening by 21m, with two platforms required for half-hourly frequency. Upgrade the level crossing to CCTV. Replace rails, sleepers, top ballast. Station well located for local population.	Medium	Population: 6,141 (2011 Census) Marchwood Military Port (750 employees) Landowner, Baker-Mill Estates to develop 1,060 properties Demand based on destination (MOIRA): Southampton: 41,000 Romsey: 4,500 Winchester: 17,000 Fareham: 12,000 Portsmouth: 9,500 **Total: 84,000** *GRIP 3 report half-hourly demand forecasts:* Annual trips: 67,000	Low	Halcrow cost estimate of station upgrade (2011 prices): £0.2m Halcrow estimate of optional Marchwood level crossing upgrade (2011 prices): £1.5m Assumed car park of 50 spaces: £0.1m Station reopening (refurbishment and lengthening of platform):£1.0m **Estimated total costs associated with station and car park: £1.1m**	Highly desirable to utilise the existing fully-signalled passing loop to allow trains to pass. Freight will continue to move in and out of Marchwood Military Port.
b	**Hounsdown**	Exclude	Insufficient demand to justify additional new station close to stations at Totton and Marchwood.	Insufficient demand to justify cost of new station and through journey time impact - located very close to Totton.	Low	Located in the centre of Hounsdown town. Additional loop and new platform(s) required - causes significant earthworks movements.	Low	Demand based on destination (MOIRA): Southampton: 11,000 Romsey: 500 Winchester: 4,500 Fareham: 4,500 Portsmouth: 3,000 **Total:23,500** *GRIP 3 report half-hourly demand forecasts:* Annual trips: 16,000	Medium	Halcrow cost estimates in 2011 price base (hourly service): £0.8m Halcrow cost estimates in 2011 price base (half-hourly service): £3.4m Assumed car park of 50 spaces:£0.1m New station cost: £3.0m **Estimated total costs associated with station and car park: £3.1mil**	N/A
c	**Totton**	Include	Largest town on the route between Fawley and Southampton, which would benefit from more frequent rail services. Allows connections to services towards Poole and London.	Larger town on the main line which would benefit from a more frequent rail services.	High	Existing station with sufficient capacity to accommodate additional through calls. Level crossing at Totton and the location of the station is a major disbenefit for local residents. HCC are considering long term proposals for replacing the level crossing with an overbridge and relocating station to the west.	Medium	Totton will develop 990 new homes Population: 28,970 (2011 Census) *GRIP 3 report half-hourly demand forecasts:* Annual trips: 52,000	N/A	Existing station	N/A
d	**Redbridge**	Exclude	Rule out Redbridge call unless required to maintain service or to maintain an operationally efficient service pattern.	Station already well served by bus services and additional calls will use up capacity.	High	Existing station with sufficient capacity to accommodate additional through calls. Existing 1tph service needs to be maintained.	Low	*GRIP 3 report half-hourly demand forecasts:* Annual trips: 28,000	N/A	Existing station	May be beneficial from a timetabling perspective to include call at Redbridge to maintain spacing of services in Southampton area.
e	**Millbrook**	Exclude	Rule out Millbrook call unless required to maintain service or to maintain an operationally efficient service pattern.	Station already well served by bus services and additional calls will use up capacity.	High	Existing station with sufficient capacity to accommodate additional through calls. Existing 1tph service needs to be maintained.	Low	*GRIP 3 report half-hourly demand forecasts:* Annual trips: 6,000	N/A	Existing station	May be beneficial from a timetabling perspective to include call at Millbrook to maintain spacing of services in Southampton area.

Appendix D –Economic Appraisal Tables from TUBA (TEE, PA & AMCB) for the three Shortlisted Options

Appendix D

Waterside - Test A - 1tph Romsey extension with Salisbury backfill
(£, 2010 prices discounted to 2010)

Table 1: Economic Efficiency of the Transport System (TEE)

	ALL MODES TOTAL		ROAD	RAIL
Non-business: Commuting				
User Benefits				
Travel Time	4,958		4,412	547
Vehicle Operating Costs	296		296	0
User Charges	13,119		55	13,064
During Construction & Maintenance	0		-	-
NET NON-BUSINESS BENERTS: COMMUTING	18,373	(1a)	4,763	13,611
Non-business: Other				
User Benefits	ALL MODES TOTAL		ROAD	RAIL
Travel Time	-5,640		-2,559	-3,081
Vehicle Operating Costs	1,095		1,095	0
User Charges	40,262		-27	40,289
During Construction & Maintenance	0		-	-
NET NON-BUSINESS BENERTS: OTHER	35,717	(1b)	-1,491	37,208
Business				
User Benefits				
Travel Time	8,350		-746	9,096
Vehicle Operating Costs	287		287	0
User Charges	670		-31	701
During Construction & Maintenance	0		0	-
Subtotal	9,306	(2)	-490	9,797
Private Sector Provider Impacts				
Revenue	15,731			15,731
Operating Costs	-49,893			-49,893
TOC Profit	0			
Investment Costs	0			
Grant/Subsidy Payments	34,162			34,162
Revenue Transfer	0			
Subtotal	0	(3)	0	0
Other Business Impacts				
Developer Contributions	0	(4)	0	0
NET BUSINESS IMPACT	9,306	(5) = (2) + (3) + (4)		
TOTAL				
Present Value of Transport Economic Efficiency Benefits (TEE)	63,397	(6) = (1a) + (1b) + (5)		

Notes: **Benefits** appear as **positive** numbers, while **costs** appear as **negative** numbers

Table 2: Public Accounts

	ALL MODES TOTAL		ROAD	RAIL
Local Government Funding				
Revenue	142		142	0
Operating Costs	0		0	0
Investment Costs	0		0	0
Developer and Other Contributions	0		0	0
Grant/(Subsidy) Payments	0		0	0
NET IMPACT	142	*(7)*	142	0
Central Government Funding: Transport				
Revenue	0		0	0
Operating costs	0		0	0
Investment Costs	47,655		0	47,655
Developer and Other Contributions	0		0	0
Grant/(Subsidy) Payments	34,162		0	34,162
Revenue Transfer	0		0	0
NET IMPACT	81,816	*(8)*	0	81,816
Central Government Funding: Non-Transport				
Indirect Tax Revenues	2,262	*(9)*	950	1,312
TOTALS				
Broad Transport Budget	81,958	*(10) = (7) + (8)*		
Wider Public Finances	2,262	*(11) = (9)*		

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Table 3: Analysis of Monetised Costs and Benefits

Noise		*(12)*
Local Air Quality		*(13)*
Greenhouse Gases	475	*(14)*
Journey Quality		*(15)*
Physical Activity		*(16)*
Accidents		*(17)*
Economic Efficiency: Consumer Users (Commuting)	18,373	*(1a)*
Economic Efficiency: Consumer Users (Other)	35,717	*(1b)*
Economic Efficiency: Business Users and Providers	9,306	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	-2,262	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	61,610	*(PVB) = (12) + (13) + (14) + (15) + (16) + (1a) + (1b) + (5) + (17) - (11)*
Broad Transport Budget	81,958	*(10)*
Present Value of Costs (see notes) (PVC)	81,958	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	-20,348	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	0.75	BCR=PVB/PVC

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Appendix D

Waterside - Test B - 1tph Romsey extension with Salisbury backfill, plus 1tph Victoria extension
(£, 2010 prices discounted to 2010)

Table 1: Economic Efficiency of the Transport System (TEE)

	ALL MODES TOTAL		ROAD	RAIL
Non-business: Commuting				
User Benefits				
Travel Time	24,770		930	23,840
Vehicle Operating Costs	430		430	0
User Charges	17,869		-4	17,873
During Construction & Maintenance	0		-	-
NET NON-BUSINESS BENERTS: COMMUTING	43,070	(1a)	1,356	41,713
Non-business: Other	ALL MODES TOTAL		ROAD	RAIL
User Benefits				
Travel Time	30,878		11,404	19,474
Vehicle Operating Costs	2,096		2,096	0
User Charges	57,484		-99	57,583
During Construction & Maintenance	0		-	-
NET NON-BUSINESS BENERTS: OTHER	90,458	(1b)	13,401	77,057
Business				
User Benefits				
Travel Time	25,101		585	24,516
Vehicle Operating Costs	99		99	0
User Charges	3,822		474	3,348
During Construction & Maintenance	0		-	-
Subtotal	29,023	(2)	1,158	27,864
Private Sector Provider Impacts				
Revenue	48,637			48,637
Operating Costs	-96,166			-96,166
TOC Profit	0			
Investment Costs	0			
Grant/Subsidy Payments	47,529			47,529
Revenue Transfer	0			
Subtotal	0	(3)	0	0
Other Business Impacts				
Developer Contributions	0	(4)	0	0
NET BUSINESS IMPACT	29,023	(5) = (2) + (3) + (4)		
TOTAL				
Present Value of Transport Economic Efficiency Benefits (TEE)	162,550	(6) = (1a) + (1b) + (5)		

Notes: **Benefits** appear as **positive** numbers, while **costs** appear as **negative** numbers

Table 2: Public Accounts

	ALL MODES TOTAL		ROAD	RAIL
Local Government Funding				
Revenue	644		644	0
Operating Costs	0		0	0
Investment Costs	0		0	0
Developer and Other Contributions	0		0	0
Grant/(Subsidy) Payments	0		0	0
NET IMPACT	644	*(7)*	644	0
Central Government Funding: Transport				
Revenue	0		0	0
Operating costs	0		0	0
Investment Costs	69,469		0	69,469
Developer and Other Contributions	0		0	0
Grant/(Subsidy) Payments	47,529		0	47,529
Revenue Transfer	0		0	0
NET IMPACT	116,998	*(8)*	0	116,998
Central Government Funding: Non-Transport				
Indirect Tax Revenues	7,414	*(9)*	1918	5,496
TOTALS				
Broad Transport Budget	117,642	*(10) = (7) + (8)*		
Wider Public Finances	7,414	*(11) = (9)*		

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Table 3: Analysis of Monetised Costs and Benefits

Noise		*(12)*
Local Air Quality		*(13)*
Greenhouse Gases	949	*(14)*
Journey Quality		*(15)*
Physical Activity		*(16)*
Accidents		*(17)*
Economic Efficiency: Consumer Users (Commuting)	43,070	*(1a)*
Economic Efficiency: Consumer Users (Other)	90,458	*(1b)*
Economic Efficiency: Business Users and Providers	29,023	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	-7,414	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	156,085	*(PVB) = (12) + (13) + (14) + (15) + (16) + (1a) + (1b) + (5) + (17) - (11)*
Broad Transport Budget	117,642	*(10)*
Present Value of Costs (see notes) (PVC)	117,642	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	38,443	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	1.33	BCR=PVB/PVC

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Appendix D

Waterside - Test C - 3tph Southampton - H&F Parkway, self-contained
(£, 2010 prices discounted to 2010)

Table 1: Economic Efficiency of the Transport System (TEE)

	ALL MODES TOTAL		ROAD	RAIL
Non-business: Commuting				
User Benefits				
Travel Time	26,332		-8,426	34,758
Vehicle Operating Costs	221		221	0
User Charges	20,288		122	20,166
During Construction & Maintenance	0		-	-
NET NON-BUSINESS BENERTS: COMMUTING	46,841	(1a)	-8,083	54,923
Non-business: Other				
User Benefits				
Travel Time	41,903		6,561	35,342
Vehicle Operating Costs	2,080		2,080	0
User Charges	59,464		-45	59,509
During Construction & Maintenance	0		-	-
NET NON-BUSINESS BENERTS: OTHER	103,447	(1b)	8,596	94,852
Business				
User Benefits				
Travel Time	18,490		-8,364	26,854
Vehicle Operating Costs	-589		-589	0
User Charges	11,078		628	10,450
During Construction & Maintenance	0		-	-
Subtotal	28,979	(2)	-8,325	37,304
Private Sector Provider Impacts				
Revenue	54,280			54,280
Operating Costs	-100,879			-100,879
TOC Profit	0			
Investment Costs	0			
Grant/Subsidy Payments	46,599			46,599
Revenue Transfer	0			
Subtotal	0	(3)	0	0
Other Business Impacts				
Developer Contributions	0	(4)	0	0
NET BUSINESS IMPACT	28,979	(5) = (2) + (3) + (4)		
TOTAL				
Present Value of Transport Economic Efficiency Benefits (TEE)	179,267	(6) = (1a) + (1b) + (5)		

Notes: **Benefits** appear as **positive** numbers, while **costs** appear as **negative** numbers

Table 2: Public Accounts

	ALL MODES TOTAL		ROAD	RAIL
Local Government Funding				
Revenue	1,279		1279	0
Operating Costs	0		0	0
Investment Costs	0		0	0
Developer and Other Contributions	0		0	0
Grant/(Subsidy) Payments	0		0	0
NET IMPACT	1,279	*(7)*	1279	0
Central Government Funding: Transport				
Revenue	0		0	0
Operating costs	0		0	0
Investment Costs	54,335		0	54,335
Developer and Other Contributions	0		0	0
Grant/(Subsidy) Payments	46,599		0	46,599
Revenue Transfer	0		0	0
NET IMPACT	100,934	*(8)*	0	100,934
Central Government Funding: Non-Transport				
Indirect Tax Revenues	8,860	*(9)*	1889	6,972
TOTALS				
Broad Transport Budget	102,214	*(10) = (7) + (8)*		
Wider Public Finances	8,860	*(11) = (9)*		

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Table 3: Analysis of Monetised Costs and Benefits

Noise		*(12)*
Local Air Quality		*(13)*
Greenhouse Gases	950	*(14)*
Journey Quality		*(15)*
Physical Activity		*(16)*
Accidents		*(17)*
Economic Efficiency: Consumer Users (Commuting)	46,841	*(1a)*
Economic Efficiency: Consumer Users (Other)	103,447	*(1b)*
Economic Efficiency: Business Users and Providers	28,979	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	-8,860	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	171,356	*(PVB) = (12) + (13) + (14) + (15) + (16) + (1a) + (1b) + (5) + (17) - (11)*
Broad Transport Budget	102,214	*(10)*
Present Value of Costs (see notes) (PVC)	102,214	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	69,143	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	1.68	BCR=PVB/PVC

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Appendix E – Draft Risk Register for Waterside Rail reopening

Risk and Issues Register

Title	Cause	Event	Effect	Proximity Date	Planned Mitigating Actions	Implemented Mitigating Actions	RAG	Likelihood	Impact	Exposure	Owner
Insufficient funding	Unable to raise sufficient local contribution		Delay - Unable to progress scheme to next stage of development	Between OBC and FBC stage	Review available local match with Network Rail, New Forest District Council & DfT. Undertake value engineering.		Amber	M	H		HCC/ NR / DfT
Consents/ Legal challenge	National Park or other objector opposes scheme on environmental grounds		Delay to programame	Prior to scheme consent being given/ tender award	Engage with statutory consultees and NFNPA throughout scheme development. Seek to address issues/ concerns through modifications to design.		Amber/Green	M	H		HCC/ NR
Insufficient staff design resource	Lack of resource for preparation of detailled designs for construction		Delay to programame	In run up to OBC and FBC stages	Co-ordinated resource planning and regular communication between HCC and NR through Project Governance Meetings.		Amber/Green	L	L		HCC/ NR
Project Governance issues	Poor communication between HCC, NR, local MP, stakeholders and other interested parties		Scheme gets criticised at public consultation and in local media, support for re-opening is weakened.	Prior to SOBC and OBC submission/ mobilisation and construction stage	Set up clear Project Governance process between HCC, NR and DfT. Hold frequent meetings with MP, NFDC & NFNPA. Develop and apply Stakeholder Management Plan along RACI principles.		Amber/Green	L	M		HCC/ NR/ DfT
Increased construction cost	Inaccurate initial costing work or unforeseen techical issues/ scope creep		Promoter needs to find additional funding	At Construction stage	Early involvement of Quantity Surveyor team at NR to ensure scheme costs are calculated accurately. Make 66% Optimism Bias allowance in Costs.		Amber/Green	M	H		HCC/ NR
Works programme slippage	Geotechnical or sub-contractor issues		Railway reopening date is delayed 6 months or >	At Construction stage	Robust contractor / programme management expertise. Regular dialogue and meetings with contractor and early warning process to flag / escalate risks and issues.		Amber/Green	M	H		Network Rail
Next SW Franchise Specification (Aug 24) - train service not included	Funding for scheme not committed in time for it to be included in Franchise Spec		TOC would not be obliged to run a train service on re-opened route.	Summer 2023-Aug 2024	Work with DfT so that if re-opening scheme progresses to implementation that new rail service is included in spec for new SW rail f+F18ranchise.		Green	L	H		
Timetable not operable/ adverse performance impacts	Signalling issues or inacurate timetable planning		Potential reduction in train service levels	Post-opening	Early involvement of NR and SWR timetable planning teams to stress test and optimise timetable to minimise/ eliminate all potential performance issues. Hold regular performance		Green	L	H		
Passenger demand below forecast levels	Inaccurate modelling or rail service perceived to be unreliable.		Reduced farebox income, may need to reduce service frequency	Post-opening	Work with NFDC, NFNPA, Three Rivers CRP and Town/Parish Councils to build awareness of reopening date and promote community use of it.		Green	L	M		
Service cancellations due to lack of traincrew	Insufficient forward planning by TOC/ high level of leavers/ retirees		Service cancellations, reduced level of passenger demand, reduced farebox income	Post-opening	If TOC have the new train service included within the DfT Spec for new franchise, they will be required to resource up to recruit the necessary additional traincrew. Rest day working.		Green	L	H		
Negative impact on other local public transport services	Journey times slow compared to by new rail service		Reduced level of bus and ferry services or cessation of services that are no longer viable	Post-opening	Early engagement and regular communication with bus and ferry operators throughout scheme development stage. Opportunity to provide feeder new bus services to Fawley		Amber	H	M		

Appendix F - Logic Map for Waterside Rail Reopening