Sheffield City Region Mass Transit
Outline Business Case – Executive Summary

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1. Introduction

Sheffield's Supertram System was built in the early 1990s and is currently operated by South Yorkshire Supertram Limited (SYSL, a subsidiary of Stagecoach) under a concession agreement with South Yorkshire Passenger Transport Executive (SYPTE). Owing to significant elements of the system reaching the end of their economic life and the concession agreement ending in March 2024, there is a need to consider investment in the system.

While SYSL is currently responsible for the maintenance of the system, life cycle renewals are the responsibility of SYPTE and the Sheffield City Region (SCR). All options for the future of the tram system have significant capital cost implications. SYPTE and SCR were successful in securing Development Funding from the Department for Transport (DfT) to identify and develop options for the future of the network, including consideration of conversion to alternative Mass Transit modes.

A Strategic Outline Business Case (SOBC) was submitted to DfT in November 2017, which included an initial assessment of the case for renewal and an assessment of the potential options. Following this, an Outline Business Case (OBC) was produced which sets out the overall Strategic Case. It identifies a range of options for the renewal of the Sheffield City Region Mass Transit system, including an assessment based on a range of criteria. It identifies a preferred scheme option to take forward, informed by detailed modelling and appraisal, in this case a renewed network with an improved frequency. Consideration is also given to the procurement options for the capital renewal scheme and operation of the network post March 2024, in addition to the management arrangements. It is envisaged that the OBC will provide DfT with sufficient information to make a decision regarding whether to grant the project Programme Entry based on the grant requested.

The OBC has been prepared in line with DfT business case guidance using the five-case model (i.e. Strategic Case, Economic Case, Financial Case, Commercial Case and Management Case). This document provides context regarding the development of the network, sets out the work undertaken to support the OBC development, and summarises the key information from each of the five cases.

2. History of Supertram

Construction of the Sheffield Supertram system began in 1991 with the first section opening in March 1994 and the final section in October 1995. The network has three legs - north from the city centre to Middlewood and Malin Bridge, east to Meadowhall, and south to Halfway with a short spur to Herdings Park. These are operated as the Blue, Yellow and Purple routes (see **Figure 1**). Tram-Train services on the network began operating between Rotherham Parkgate and Sheffield Cathedral in October 2018, including running on Network Rail track between Tinsley and Rotherham. SYPTE also purchased 3 additional Trams (SAV - Supertram Additional Vehicles) with the four Tram-Trains. These are being used to improve the robustness of the current service offered.

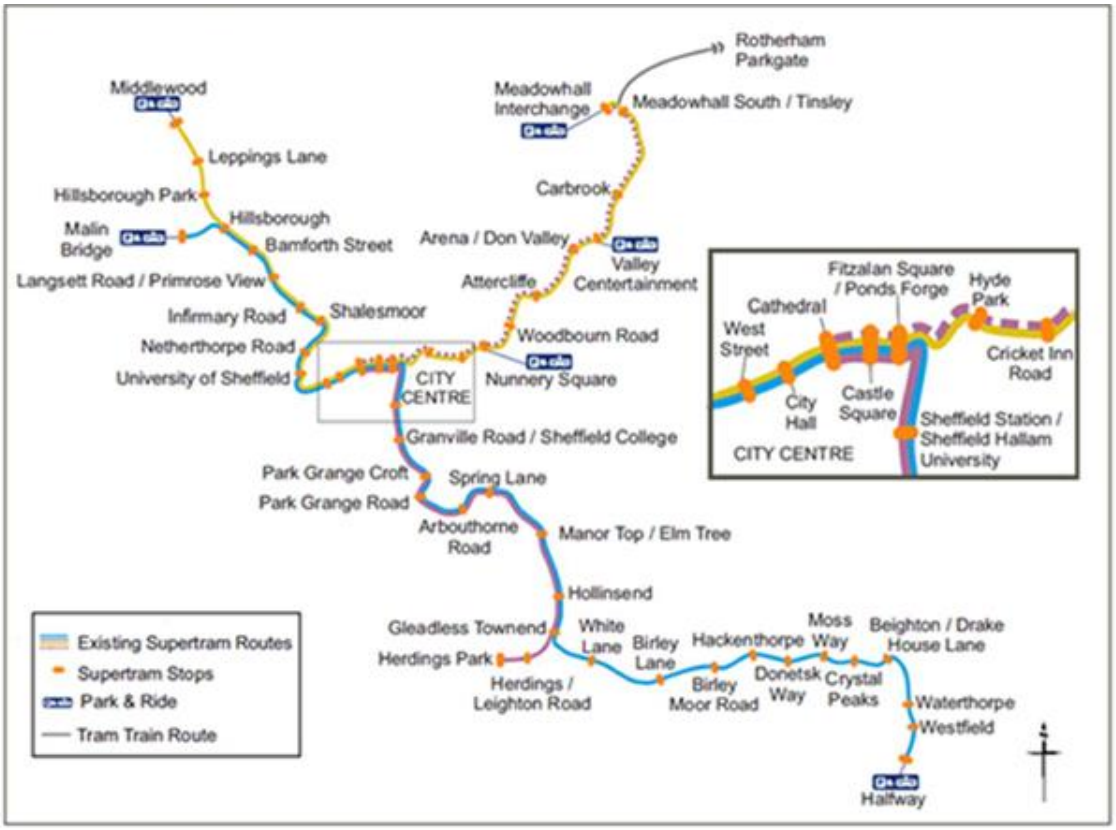
The original system cost approximately £241m (outturn prices) to build, which was funded partly through Government grants (£80m) and partly through issued Non-Trading Credits and supported through Revenue Support Grant (RSG).

As part of the re-financing of the tram (which was required as part of the Government's funding), in 1997 SYPTE sold the operations subsidiary South Yorkshire Supertram Limited (SYSL) to Stagecoach

Holding plc and let a concession for the operations which runs until March 2024. The contract covers responsibility for the operation and day to day maintenance of the system. SYPTE/SYSL has responsibility for maintenance of the part of the highway that sits between the running rails and 18 inch either side of the running rails. Responsibility for maintenance of the remainder of the highway sits with Sheffield City Council.

As with other light rail schemes, the assumption has been that any major renewals would need to be funded by significant national grant with a local contribution, as was the case with the original construction funding.

Figure 1: Sheffield Mass Transit Network



3. Summary of Current Position

Current Asset Condition

Based on work carried out in 2017, the trams were found to be mainly in good condition for their age but there are issues with obsolete parts, particularly in the motor and auxiliary power supply systems on the vehicle. The option to refurbish the current fleet in 2024 to extend its life by up to 15 years was considered, but further work to assess the vehicles (undertaken by SNC Lavalin and completed October 2017) and the infrastructure (completed by Mott Macdonald in November 2017) indicated that the fleet should start to be replaced from 2024. Traction power supply/substations, supervision, control and communication system need to be replaced in the next few years. Significant elements of the depot are beyond their anticipated life expectancy. Stops are also in need of refurbishment. Maintenance investment has been made on other areas and therefore less investment would be required were the system to be renewed. For example, a significant amount of track has recently been replaced and most of the overhead line equipment has another 30 years of economic life.

Patronage and Revenue
Patronage peaked at 15.0 million passengers per annum 2010/11. The first phase of a programme of essential rail replacement began on the "in Highway" (street-running) sections of route in 2013, to continue safe operation of the network. This activity has had a significant impact on patronage, with ridership falling 23% to 11.5m by 2014/15. Whilst rail replacement contributed to declining patronage, other factors include:

- Reduced footfall in Sheffield City Centre;
- Increased availability and relative cost of city centre parking;
- Improved bus offering through Bus Partnership; and
- Reductions in the reliability of services offered to public.

Although passenger journeys did rise by 10% to 12.6m in 2016/17, subsequently numbers have continued on a previous downward trend.

Preparation of the OBC
Following the submission of the SOBC in November 2017, work began in 2018 to develop the scheme options in more detail, including development of the modelling and appraisal tools. The following commissions were let in order to progress the technical work to meet the requirements of the OBC.

- Quantity Surveyor (Turner and Townsend);
- Engineering and Rolling Stock Advisor (AECOM);
- Financial Advisor (Grant Thornton);
- Legal Advisor (DLA Piper);
- Modelling and appraisal (SYSTRA/AECOM); and
- OBC co-ordination (AECOM).

The engineering work included the development of design work for the options, which were subsequently costed by the Quantity Surveyor. Options for the refurbishment or replacement of the rolling stock were also developed. The Financial Advisor was responsible for the development of the financial model and consideration of commercial, procurement and financing options in conjunction with the Legal Advisor. Prior to the economic appraisal, a full update of the transport model was undertaken including re-validation of the highway and public transport models, and calibration and realism testing of the demand model. The model developed covers the whole of the Sheffield City Region and will be used for a variety of schemes across the Sheffield City Region modelled area.

Alongside development of the OBC, a number of pieces of additional work have been undertaken as part of the Mass Transit project, to develop knowledge of scheme options and facilitate decision-making as to a preferred option. Work has also been conducted to investigate cost saving opportunities and, more recently, interventions for increasing patronage and revenue.

4. Strategic Case

The Case for Change
The current Mass Transit network provides a vital service to Sheffield and the wider City Region, offering a strong platform for facilitating more sustainable travel choices. Securing the long-term future of the network is a key priority and is important in delivering future growth and development plans.

The Strategic Case sets out the investment rationale and demonstrates how the scheme is aligned with key transport, spatial and economic objectives at the national, sub-national and local level. The policy review identified that there is a need to address congestion, air quality and promote smarter integrated journeys. High-quality public transport is essential for supporting economic development in the city centre and regionally, and this is also referenced.

A new draft Sheffield Local Plan is being prepared which will guide the future of the city by setting out how and where development will take place up to 2038.

The strategic policies will set out an overall strategy for the pattern, scale and quality of development and make sufficient provision for housing, employment, retail, leisure and other commercial development, infrastructure, community facilities, and conservation and enhancement of the natural, built and historic environment, as well as including policies designed to secure contribution towards mitigation of and adaption to climate change.

The Government's standard methodology for the number of homes needed in each Local Authority is 2,124 net per year for Sheffield which is approximately 40,000 over the Plan period.

The success of the Mass Transit network is particularly important to meeting the air quality targets set out in the Sheffield Clean Air Strategy and specifically the legal mandates for roadside emissions of Nitrogen Dioxide.

Objectives
A review of the problems and relevant strategic goals (local, sub-regional and national) led to the adoption of the six objectives listed below. These key objectives are supported by sub-objectives.

1) **To improve the financial sustainability of the Mass Transit network** - reduce operating costs and increase revenues so a larger proportion of lifecycle costs can be funded from fares revenue.

2) **Continuity of Service** – delivery of a smooth transition from the end of the current concession (March 2024) to ensure there is no unnecessary gap in the service or customer offer provided by the Mass Transit network.

3) **Increase patronage on the Mass Transit network -** to assist with the delivery of SCR's Transport Strategy and Local Plan. By providing mode shift from car to tram, this objective also covers the goal of a reduction in carbon use. This is now even more important since the declaration of a Climate Emergency in Sheffield City Region.

4) **Improve Air Quality in areas around the Mass Transit network** – facilitate the delivery of air quality targets set by the Department for Energy, Food and Rural Affairs (Defra) and local policy aims in the Air Quality Action Plan (AQAP) (2015) and Sheffield Clean Air Strategy (CAS) (2017).

5) **Secure investment in infrastructure where it will do most to support economic growth** - to help deliver the goals of the Strategic Economic Plan (SEP) and SCC Growth Plan, with a focus on sustainable growth and job creation.

6) **Contribute to a positive image for Sheffield and the City Region** - to assist with inward investment and the quality of life of residents, supporting the City Centre Plan to 2028 with a modern Mass Transit network that enhances the city's 'brand', footfall and cultural offer.

Option Identification and Assessment

A long list of options for the future of the network was identified and assessed against closure of the system in 2024, which is regarded as the 'Do Minimum' scenario (Option 1a), the likely scenario in the absence of investment in the network. Four groups of 'Do Something' options were identified:

A) **Delayed Closure** - Refurbish the fleet and maintain operations as long as possible at minimum cost. The network would then either close or it would operate reduced service frequencies with new vehicles;

B) **Reduced Network and/or Services** - Renew network with service frequencies similar or less than current;

C) **Renew** - with similar or improved services; and

D) **Replace** trams with Bus Rapid Transit.

Where appropriate, the refurbishment of the existing fleet of trams or their replacement with new has also been considered.

Table 1 presents the options that have been identified with reference to the groups above.

Table 1: Scheme Options

Group	Option No	Option	Description
	1a	Do Minimum	Closure in 2024. Base Case/Do Minimum option.
A	**1b**	Refurbish 25 trams by 2027 and close in 2042 (5-6tph)	Includes refurbishment of the existing fleet and critical repairs to infrastructure on an ad-hoc basis. Current service frequencies would continue until 2042 (6 trams per hour peak, 5 trams per hour inter-peak on the Blue and Yellow routes).
	1c	Refurbish 25 trams by 2027 and renew 2 trams by 2042 (1 tph)	This option is as per 1b, with 2 trams being renewed by 2042. Along with the 3 recently purchased Supertram Additional Vehicles (SAVs), the fleet size would be 5; sufficient to operate a service of 1 tram per hour.
	1d	Refurbish 25 trams by 2027 and then renew 7 trams by 2042 (2 tph)	This option is as per 1c, but with a more frequent service of 2 trams per hour from 2042. This would require 7 trams to be renewed by 2042 in addition to the 3 SAVs (total fleet size 10) to operate a service of 2 trams per hour.
B	**2**	Truncate by 2027 then renew with 17 new trams (5-6 tph)	The network would be truncated, closing the sections south of Gleadless and west of Hillsborough (to Malin Bridge). This would leave the remaining network in operation at 2018 frequencies (6 trams per hour peak, 5 trams per hour inter-peak on the Blue and Yellow routes). This would require 17 trams to be renewed in addition to the 3 SAVs (total fleet size 20).
	3a	Renew network with 11 new trams by 2027 (3 tph)	Renewal of the network by 2027, the purchase of 11 new trams and renewal of the 3 SAVs. The total fleet size of 14 would be required to provide a service of 3 trams per hour. Infrastructure works including track replacement, renewal of power supply and depot refurbishment would also be required.

Group	Option No	Option	Description
	3b	Renew network with 2 new trams by 2027 (1 tph)	This option is as per 3a, but with a service frequency of 1 tram per hour. Reduce the vehicle requirement in 2027 to new 2 trams in addition to the 3 SAVs (total fleet size 5).
C	**4**	Refurbish 25 trams by 2027, then renew 25 trams in 2042 (5-6 tph)	This option involves refurbishment of the fleet, track and infrastructure in 2027 and renewal of 25 new trams and the 3 SAVs in 2042 (total fleet size 28). Service frequency would be 6 trams per hour during peak and 5 trams per hour in the inter-peak on the Blue and Yellow routes to 2041. The introduction of new trams in 2042 would allow an improved service frequency in the inter peak of 6 trams per hour on the Blue and Yellow routes.
	5a	Renew network and purchase 25 new trams by 2027 (6 tph)	This option would renew 25 new trams, plus the 3 SAVs (total fleet size 28), track and infrastructure to improve performance in terms of reliability, journey time and quality for the next concession period. This would provide an improved service frequency of 6 trams per hour during peak and inter-peak on the Blue and Yellow routes.
	5b	Renew network and purchase 28 new trams by 2027 (7.5 tph)	This option is as per 5a with the purchase of an additional 3 new trams plus the 3 SAVs (total fleet size 31), to enable higher frequency of 7.5 trams per hour during peak and inter-peak on the Blue and Yellow routes.
D	**6**	Replacement of trams with BRT by 2027 (12 buses per hour)	Replace Supertram with Bus Rapid Transit system in 2027. This option would require closure and making good of redundant tram infrastructure, constructing of a bus 'guideway' and the purchase of a fleet of Compressed Natural Gas powered BRT vehicles.

An option assessment framework was developed based on the scheme objectives, in addition to national criteria set out in the DfT's Transport Analysis Guidance (TAG) documents (e.g. business/commuter users and journey quality). Options were then assessed on a -7 to +7 scale against each of the criteria based on a series of indictors. A workshop consisting of the Project Team members was held in November 2019 to moderate the scores of all options.

Following the assessment of the long list of options identified above, Options 5a and 5b were found to be the strongest performing options, followed by Options 2 and 4. Options 5a and 5b were assessed as 'Strong Beneficial' overall, with Option 5b being the best performing of the two - Options 2 and 4 were assessed as 'Moderate Beneficial.

The following four options were therefore shortlisted for more detailed assessment within the Outline Business Case:

- **Option 2 – Truncation:** Truncate and renew by 2027 with 17 new trams + 3 SAVs (fleet size 20, 6 trams per hour (tph) in peaks, 5tph inter-peak);

- **Option 4 – Delayed Renewal:** Refurbish 25 trams by 2027 (6 tph in peaks, 5tph inter-peak), then renew 25 trams + 3 SAVs (fleet size 28) in 2042 (6 tph in peaks, 5tph inter-peak);

- **Option 5a – Renewal:** Renew network and purchase 25 new trams by 2027 + 3 SAVs (fleet size 28, 6 tph in peaks and inter-peak); and

- **Option 5b – Renewal with Enhanced Service:** Renew network and purchase 28 new trams by 2027 + 3 SAVs (fleet size 31, 7.5 tph in peaks and inter-peak).

The Strategic Case also makes the case for the selection of the Preferred Option. It does this by scoring the Options against the objectives set for the project, and by using the outputs of the appraisal from the Economic Case.

The outcome of this is the selection of Option 5b (Renewal with an enhanced service) as the Preferred Option. This is because it has the highest score across selection criteria. The Preferred Option:

i) Delivers the outcomes needed to achieve the Region's Strategies and Policies.
ii) Is compatible with the Region's other tram related projects.
iii) Has an adjusted BCR in the High Value for Money category.
iv) Provides the largest contribution to the Region's climate change requirements.
v) Delivers the largest increases in patronage.
vi) Delivers the highest mode share and contributions to air quality.
vii) Provides capacity for future economic growth.
viii) Is aligned with the outcomes of the consultation carried out.
ix) Is lower risk compared to some other Options.
x) Retains a full network and hence contributes to the Region's overall image.

It is noted that Option 5b does not have the highest score for all criteria. The Truncation Option has a higher BCR and a lower overall cost, however it has been rejected because compared to the Preferred Option:

xi) It delivers much less towards the Region's transport and climate change goals.
xii) It conflicts with the Region's goal to expand the use of low/zero carbon transport.
xiii) It conflicts with the Region's goal to increase tram trips by 47% by 2040.
xiv) It increases highway traffic leading to more congestion and related issues.
xv) It conflicts with the stakeholder and public consultation outcomes.

The scope of the Preferred Option can be best summarised as: ***"An improved service based on like for like replacement with modern equivalents".*** It includes:

xvi) A new fleet of 28 trams, to provide an enhanced service (up to 7.5 trams per hour, 3 SAVs retained).
xvii) Further rail and track renewals.
xviii) Improved passenger facilities.
xix) Refurbishment and extension of Depot
xx) Renewal of Control, Signalling and Communications systems.
xxi) Renewed and enlarged power supply.

The scope of the Preferred Option does not include:

- Any work on the new Tram-Train extension to Rotherham.
- Extensions to the existing network (including reinstatement of Closed rail lines for Tram or Tram-Train use).
- New or extended Park & Ride sites.
- The impact of known schemes where there are insufficient details of the proposals to evaluate.

5. Economic Case

This section of the OBC assessed the four shortlisted options identified in the Strategic Case to identify their impacts, including all benefits and costs. The initial assessment covered core appraisal outputs, informed by model and Transport User Benefits Analysis (TUBA) outputs, to inform identification of the Preferred Option from the shortlist. The Case also included appraisal of the Preferred Option in more detail, considering both monetised and non-monetised impacts, including the economic, environmental, distributional and social impacts of the proposal. In assessing Value for Money, all of these are consolidated to determine the extent to which the proposal's benefits outweigh its costs.

Modelling and Appraisal Methodology

The Sheffield City Region Transport Model v1 (SCRTM1) was used in the appraisal to forecast future year levels of demand and user benefits for public transport for all options and the Do Minimum. SCRTM1 is a multi-modal demand model that covers the Sheffield City Region and consists of a transport demand model, a highway assignment model and a public transport assignment model.

The model base year is 2016 and demand data is based on Origin-Destination survey data, ticket sales data, mobile phone data, traffic flow data, and passenger count data collected in 2016/17. The appraisal period is 2024-2056 (33 years) as this aligns with the Supertram operation contract renewal and operational life of the scheme's main capital assets. 'Do Minimum' and 'Do Something' scheme scenarios were modelled in SCRTM1 for three forecast years (2024, 2027 and 2042) as these are the years where service definitions may change in the appraised options. The 'Do Minimum' scenario assumes closure of the network in 2024 and includes a bus operator response where bus service frequencies are increased on corridors where Supertram is removed. As agreed with DfT at the early stages of development of the OBC, the Tram-Train pilot is not considered in the main part of the OBC, its asset life is different to the original network and any longer-term decisions regarding this service will have a different case. A sensitivity test for the original network with Tram-Train has been carried out.

Detailed capital cost estimates, including allowance for risk, were prepared for each of the shortlisted options. For the purposes of the appraisal, the estimates were adjusted for optimism bias in line with WebTAG guidance and discounted to 2010. Operating costs over the 33-year period were calculated by Grant Thornton and SYPTE using the operating cost financial model (see Financial Case) and discounted to 2010 prices.

Screening Appraisals and Preferred Option Identification

Screening appraisals were carried out on the shortlisted options, which included all monetised impacts and resulting Present Value of Benefits (PVB), Present Value of Costs (PVC), Net Present Value (NPV) and Benefit to Cost Ratio (BCR). A summary of the screening appraisal outputs is shown below.

Table 2: Analysis of Monetised Costs and Benefits Summary of Screening Appraisals (£m in 2018 prices discounted to 2010)

	Option 2 Truncate and Renewal 2027	Option 4 Refurbish 2027 Renewal 2042	Option 5a Renewal 2027	Option 5b Renewal 2027 Preferred Option
PVB - TOTAL	233.5	253.2	260.7	298.8
PVC	129.2	206.1	185.1	182.7
NPV	104.3	47.0	75.6	116.0
BCR	**1.81**	**1.23**	**1.41**	**1.63**

As noted before, the outcome of this analysis is fed into the selection of the Preferred Option in the Strategic Case.

Preferred Scheme Appraisal (including wider impacts)

An appraisal in line with DfT's Transport Appraisal Guidance (TAG), covering all four areas of Economy, Environmental, Social and Public Accounts impacts, has been undertaken for the Preferred Option. This includes production of a Transport Economic Efficiency table (TEE), Public Accounts table (PA), Analysis of Monetised Costs and Benefits (AMCB) and an Appraisal Summary Table (AST).

Table 3: Summary of Adjusted Analysis of Monetised Costs and Benefits (£000s) – Preferred Option

AMCB Summary	Core
Present Value of benefits (PVB)	**£298,768**
Present Value of Costs (PVC)	**£182,749**
Net Present Value (NPV) = (PVB) -(PVC)	£116,019
Benefit to Cost Ratio (BCR)	**1.63**
Wider Impacts	£48,537
Adjusted PVB	**£347,305**
Adjusted NPV	**£164,556**
Adjusted BCR	**1.90**

The Preferred Option appraisal has been summarised in a WebTAG-standard Appraisal Summary Table (AST). Although not all of the criteria have been monetised, each has been ranked qualitatively on the standard seven-point scale. **Table 4** shows the summary qualitative rating of each AST criteria.

Table 4: Summary of AST Assessment

Impacts		Qualitative	Quantitative
Economy	Business users & transport providers	Moderate Negative	-£94.7m
	Reliability impact on Business users	Slight positive	
	Regeneration	Moderate Positive	
	Wider Impacts	Moderate Positive	£48.5m
Environmental	Noise	Neutral	£0.2m
	Air Quality	Slight Positive	£0.01m
	Greenhouse gases	Slight Positive	£0.4m
	Landscape and Townscape	Neutral	
	Historic Environment / Cultural Heritage	Neutral	
	Biodiversity	Neutral	
	Water Environment	Neutral	
Social	Commuting and Other users	Large Positive	£354.9m
	Reliability impact on Commuting and Other users	Slight Positive	
	Physical activity	Slight Positive	
	Journey quality	Moderate Positive	
	Accidents	Slight Positive	£2.3m
	Security	Slight Positive	
	Access to services	Moderate Positive	
	Affordability	Neutral	
	Severance	Slight Negative	
	Option and non-use values	Slight Positive	

Sensitivity Testing and Supplementary Model Run

Sensitivity testing has been undertaken, including core, low and high growth scenarios, as well as tests including Tram-Train, reduced Supertram journey times and a further alternative option with 2 trams per hour, included at the request of the DfT. The low growth test shows that the scheme is relatively resilient to a lower than forecast level of growth with the BCR reducing to 1.65. The high growth sensitivity test increases the BCR to 2.38. By including the Tram-Train scheme the BCR reduces to 1.65. Following discussions with DfT, there was a request to test a scenario where a skeleton service was maintained with delayed renewal. This was defined as Option 1d (2 trams per hour) in **Table 1**. This was treated as a sensitivity test option as it was not shortlisted in the long list assessment. The economic appraisal of the options shows that the BCR for this option drops to 1.26. A two minute end-to-end journey time test was undertaken given ongoing work that is being undertaken to optimise the performance of the network. Whilst findings from this work have concluded that this level of saving should be achievable through changes to priorities, this has been treated as a sensitivity test in the current appraisal. Results of the test showed that the BCR for this option increases to 2.13.

Value for Money

The culmination of the Economic Case and the appraisal is the value for money statement. This takes account of all monetised and non-monetised benefits and costs to assign a categorisation of value for money based on a combination of BCR and non-monetised impacts and DfT's specification of value for money.

The Preferred Option has an adjusted BCR of 1.90 and three Moderate and five Slight Positive non-monetised impacts. It is judged that such impacts are sufficient to lift the scheme above the BCR=2.0 threshold and therefore the scheme value for money is judged as high.

6. Financial Case

The Financial Case gives details of the costs and funding for the project and assesses affordability.

The Estimated Final Cost (EFC) for the works in the Preferred Option (renewal with improved services) is £312.5M at 2018/19 prices. The price at outturn (i.e. including inflation) is £439M. These are capital costs only and exclude costs associated with normal operation of the network while the works are carried out (2024 to 2028). It is proposed that the capital costs are funded by DfT grant and Local Contribution as below:

DfT Grant	£290.6M
Local Contribution	£21.9M (7%)
TOTAL	**£312.5M**

Table 5: Spend profile for costs at base and outturn prices

YEAR	SPEND (2018/19 prices)	SPEND (outturn prices)
2020/21	£2.3M	£2.5M
2021/22	£4.7M	£5.4M
2022/23	£5.0M	£6.1M
2023/24	£39.0M	£49.8M
2024/25	£88.6M	£118.5M
2025/26	£61.8M	£86.9M
2026/27	£48.5M	£71.5M

YEAR	SPEND (2018/19 prices)	SPEND (outturn prices)
2027/28	£35.9M	£55.6M
2028/29	£26.7M	£43.1M
TOTAL	**£312.5M**	**£439.4M**

The actual construction inflation for 2019/20 will be known soon and the outturn figures will be updated to reflect these.

While the bid to DfT is for a capital grant, the OBC also looks at the operating costs over the period. At present it is forecast that there will be a surplus of income over costs at nominal prices of £117M. In the early years there will be reduced income, and this is built into the forecast.

7. Commercial Case

Introduction
The Commercial Case sets out the options considered for procurement of the scheme. As the current concession is due to finish in 2024, this covers both the capital renewals and the ongoing operation of the system.

Procurement Strategy
Procurement for all consultant and contractor support for the project will be in line with SYPTE's Procurement Strategy. There are potential options to procure vehicles, renewals, operation and longer-term maintenance either on a combined basis or as separate procurements. Following the 2018 Autumn Budget, it was agreed with the DfT that the procurement options did not need to follow a Public Private Partnership (PPP) or Private Finance 2 (PF2) approach although SYPTE had already undertaken a qualitative assessment of PPP / PF2.

Preferred Delivery Structure
Following a long-listing exercise which considered 12 potential contract models, SYPTE shortlisted six key contract models to assess according to HM Treasury 'Green Book' principles. These six options were:

- **Option 1** - fully integrated delivery (e.g. infrastructure renewals, operation and maintenance of the rolling stock under one procurement).
- **Option 2** - fully integrated delivery, except rolling stock maintenance (same as above, but maintenance would be contracted separately).
- **Option 3** - Infrastructure and maintenance contract and an operation contract including rolling stock maintenance.
- **Option 4** - Infrastructure and maintenance contract and an operation contract excluding rolling stock maintenance (which would be procured separately).
- **Option 5** - Infrastructure renewals and an operation and maintenance contract, including rolling stock maintenance.
- **Option 6** - Infrastructure renewals, and an operation and maintenance contract excluding rolling stock maintenance (which would be procured separately).

Note, under each of the six options above it was assumed that the rolling stock would be procured and owned by SYPTE / SCR.

The top scoring options were **Options 1** and **5**. **Option 1**, fully integrated delivery of the renewals, operation and maintenance, scored highly owing to the minimisation of interface risk between different organisations. It would also benefit from a holistic approach to the procurement of all elements of the infrastructure and operation. **Option 5** is the current model for Supertram and also benefits from there only being two contracts. Once the infrastructure has been upgraded, the option becomes a wrapped contract similar to **Option 1**. Under this model, SYPTE would have the ability to procure, then manage and monitor the operation and maintenance of the infrastructure and assets.

Following the shortlisting exercise, it was decided that these two options should be compared against a public sector option and so the following three options were developed and quantitatively assessed:

- **Option 1** –public sector option where SYPTE establishes an arm's length organisation to operate the services and maintain the network and fleet. SYPTE would separately procure the delivery of the network renewal. Proposals for operation to be reviewed when works complete.

- **Option 2** – previously Option 5 – SYPTE would contract with a private sector organisation to operate the system, maintain the network and rolling stock and SYPTE procures the delivery of the network renewal (similar to existing arrangements except for revenue risk).

- **Option 3** –previously Option 1 – SYPTE would contract with a private sector organisation to operate the system, maintain the network and rolling stock and deliver the network renewal within a fixed budget.

The costs associated with each option were assessed using the financial model developed for the Financial Case. The assessment also utilised information from a market consultation exercise conducted in May and June 2019. The total cost of each option, plus the quantified risk assessment for each option, were combined to assess the preferred contracting option. The Market Testing also showed that there was no-one currently who would be prepared to take revenue risk as SYSL do now. Therefore, this will have to be managed by the public sector.

Of these options**, Option 1** has the lowest overall cost and was considered best value for money. In parallel with this an option to enter into a short term (4-6 years) operating contract with a private sector operator (public sector retaining revenue risk) will be assessed alongside the public sector option. A review of how the system will be operated will be undertaken after the works are completed in 2028.

Sourcing Options

Following consideration of options, it has been concluded that the scheme would be procured through one or more OJEU procurements. As this would be a complex procurement, this is likely to require a Competitive Dialogue (CD) procedure or a Competitive Procedure with Negotiation (CPN).

8. Management Case

Introduction

The Management Case presents evidence which demonstrates that the scheme is deliverable and that it can be implemented effectively and managed / operated on an on-going basis. The Case also presents details of governance, communication and stakeholder management, programme, risk management, and monitoring and evaluation.

Evidence of Similar Projects

Evidence is provided of case studies where SYPTE and its partners have successfully delivered projects relevant to the scheme, including Supertram Track Replacement Works, Bus Rapid Transit North and Tram-Train. This relevant experience covers the involvement of delivery partners, a wide range of stakeholders working on operation networks, high levels of complexity as well as a range of funding and contractual environments.

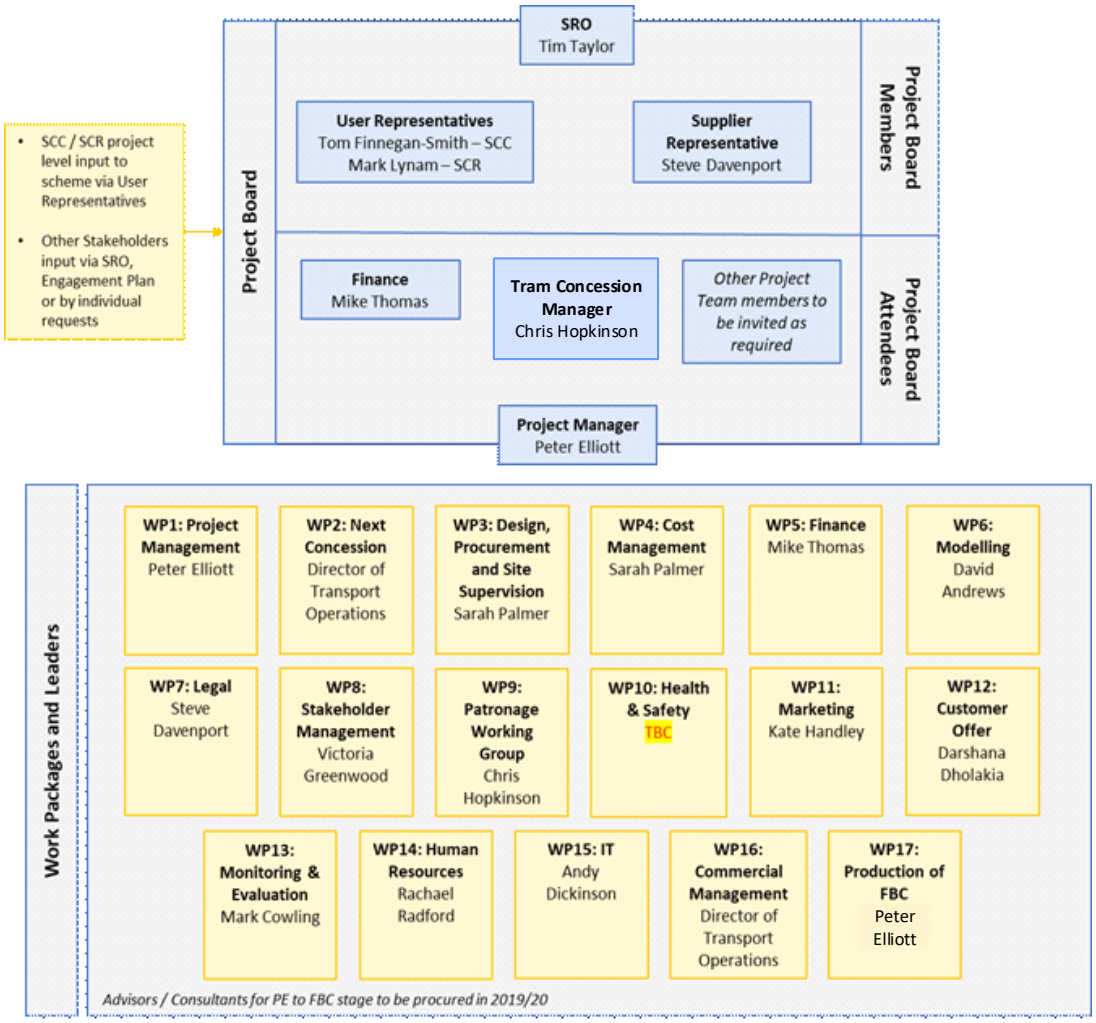
Programme / Project Dependencies

The works in this project can be delivered on a standalone basis as they are not dependent on any other schemes. However, the overall scheme's success does depend on the delivery of the Region's Transport and other Strategies. Equally, the scale of success for some of the Region's policies e.g. Air Quality, depends on the successful implementation of this project. There are also individual schemes in the Region e.g. Northern Powerhouse Rail, that rely on the successful delivery of this project.

Governance, Organisational Structures & Roles

The Governance arrangements for delivering this project build on experience gained from the successful delivery of similar projects. They are also based on current best practice and central Government guidance. The structure for delivery of this project is provided in **Figure 2**.

Figure 2: SCR Mass Transit Project Board and Team Structure



Assurance and Approvals

Local assurance is provided by the SCR Appraisal Panel, which reviewed and approved the OBC in February 2020. Approval to submit the OBC to DfT is being requested from the MCA. Subject to this, the next investment decision would be for DfT to consider awarding the project Programme Entry status prior to development of the Full Business Case. It is assumed that this decision would be made by the DfT's Board Investment and Commercial Committee (BICC) in 2020.

Programme/Project Plan

An outline delivery programme has been developed for the renewal scheme identifying the key stages of project development, implementation and anticipated timescales – key milestones are set out in **Table 6**. Confirmation of an agreed funding mechanism for the delivery of the scheme and discussion with DfT and delivery stakeholders will be required to further develop the programme.

Table 6: Forecast Key Project Milestones

Milestone	Date
Approved OBC submitted to DfT	April 2020
Programme Entry granted by DfT	2020
Detail Design and Procurement	2020 to 2022
FBC Approved	2023
Orders placed for vehicles	2023
Works on Site (that do not affect current concession)	2023
End of current Concession/new Concession starts	23 March 2024
Main Works on Site Start	March 2024
New Service Starts	2027
Works Complete	June 2028
Post Implementation Monitoring	2028-2031

Communication and Stakeholder Engagement

A Communication and Stakeholder Engagement (CSE) Plan has been developed to ensure that project information is clearly communicated and understood. Extensive public and stakeholder consultation will be required throughout scheme development and delivery. As such, the plan identifies key stakeholders and the level of engagement required for each. As part of the scheme development, an initial public consultation on the future of the network was carried out in September/October 2016, followed by a second phase between September and November 2018, which looked at specific options. Both phases of consultation showed high levels of support for investment in the network – the second phase of the consultation showed that 88% of respondents supported renewal and modernisation of the system.

Programme/Project Reporting

Monthly Highlight Reports on progress are submitted by the Project Manager to the Project Board and progress reports are submitted to the SYPTE Transport Executive Board every 8 weeks. It is expected that quarterly reports will be provided to DfT, with a formal Gateway Report at the end of each of the key project stages.

Risk Management

A Risk Management Strategy is in place to control threats and improve the ability of the scheme to deliver its objectives and meet its targets. Overall responsibility for the strategy sits with the SRO, with the day-to-day management of risk being led by the Project Manager. There are currently two linked

risk registers for the scheme – the first covers risks linked to the renewal works (up to 2028), with the second covering risks associated with operation of the network and all risks post-2028. Risks are recorded and assessed in terms of probability and impact – actions and mitigation measures are identified and an owner is assigned to each of the risks. Risks are reviewed on an ongoing basis and escalated if appropriate through the project governance structure. The outcome of a Quantified Risk Assessment (QRA) is included in the Cost Plan.

Benefits Realisation and Monitoring and Evaluation Plan

A Benefits Realisation Plan (BRP) has been prepared in order to ensure that the benefits envisaged by the project are actively managed and maximised throughout scheme delivery. Each of the benefits identified has been allocated an owner and a member of staff has also been identified with responsibility for sourcing the data required to monitor each benefit. Most outcomes can be collected from existing data sources including Stagecoach Supertram Overview Reporting, South Yorkshire Travel Survey, the Tram Passenger Survey (TPS) and City Centre Cordon Counts. It is anticipated that new data collection will include stakeholder interviews and a passenger survey, depending on the status of the TPS.

Monitoring and evaluation is required to assess the extent to which the scheme has delivered anticipated outputs and met its objectives. A Monitoring and Evaluation Plan has been prepared in line with DfT guidance on local major schemes. This has included preparation of an Investment Logic Map (ILM) which identifies the outputs, outcomes and the impacts of the scheme. Metrics for each outcome have been identified in addition to the relevant data sources. An initial budget of £150,000 has been allocated to the plan, which will be reviewed and developed further as part of the FBC.

9. Future Work

The OBC will form the basis of a bid to DfT for capital funding for the renewal works. However, the OBC looks at the tram network over the whole of the appraisal period and is affected by levels of patronage income and operating costs. Work on all of these will continue as the project develops as the Region prepares itself for the end of the current concession in 2024. This will look at:

- Improving delivery of the Region's Strategies to increase the viability of the network in the longer term (Strategy Led Growth).
- Improving levels of patronage in the short and medium term.
- A review of operating costs to determine the scope for further savings.
- Further investigations into achieving journey time reductions.
- Continuing the review of asset management to maximise asset life.

Following submission of the OBC and award of Programme Entry for the capital works, the Region will:

- Capital Works
  - Procure consultants for the Design stage
  - Seek tenders to provide prices for the Full Business Case (FBC)
  - Prepare and submit an FBC to allow implementation to start.

- Operating Issues
  - Prepare for the new operating arrangements when the current concession ends.