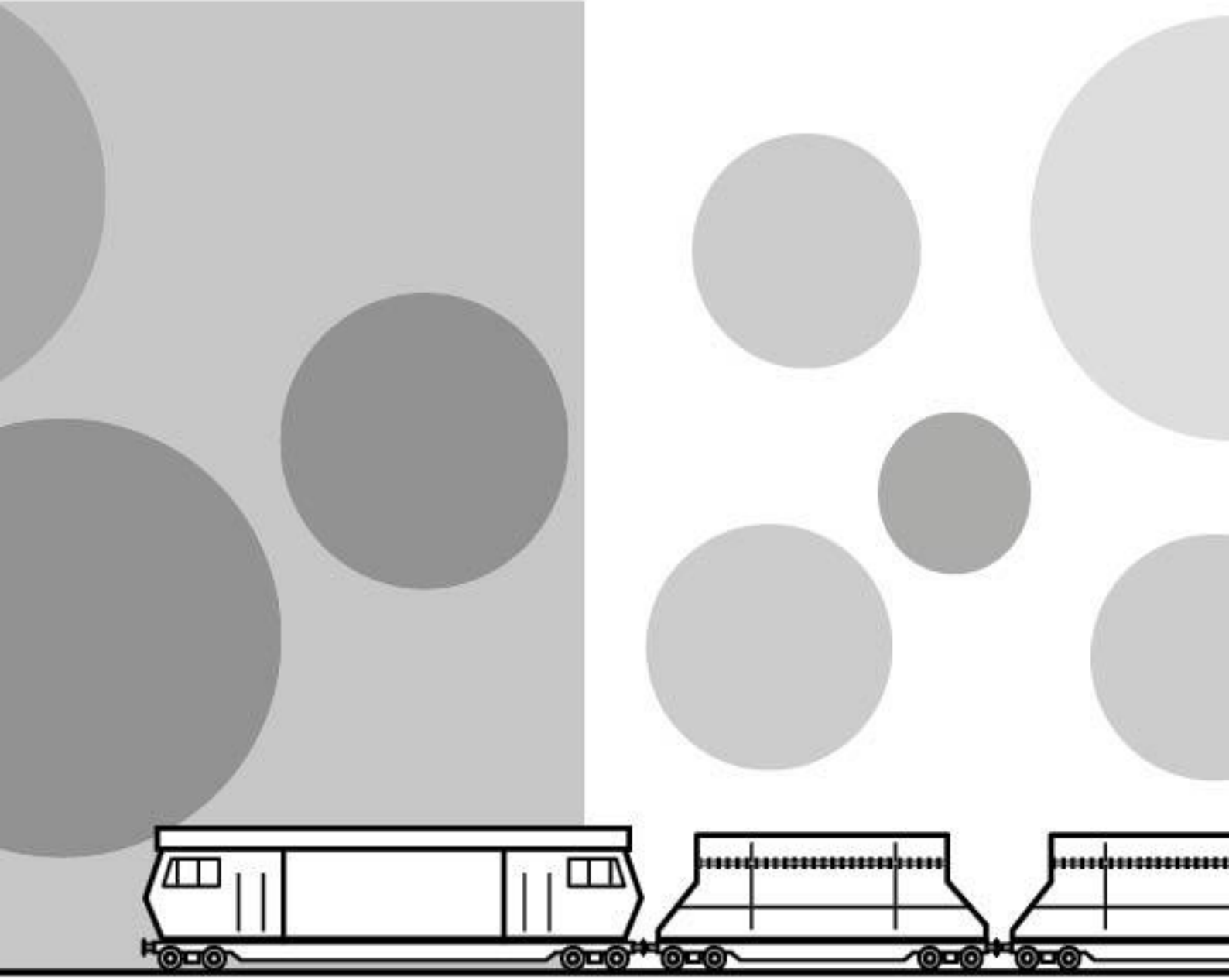


TARGET 26

A LONDON RAIL FREIGHT STRATEGY WORKSTREAM

CONTENTS

CONTEXT

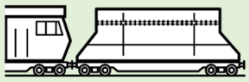
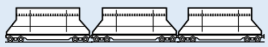
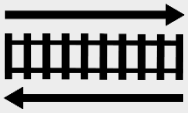
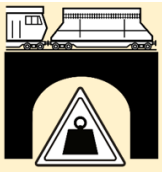
The rail freight industry aims to increase train lengths and trailing weights to achieve the greatest possible payload per train, thereby deriving maximum efficiency from its operations. The Freight Network Study (FNS) established aspirational standards for the major commodity sectors, including construction materials:

'…the industry is targeting a baseline of 2,000 tonne – 2,600 tonne trailing weight for construction flows, which equates to approximately 450m trailing length.'[1]

Network Rail leads, on behalf of the industry, studies to identify long-term strategies for the development of rail freight. These may focus on a particular issue, market, or area of railway geography, within which they will consider how key wider ambitions such as train lengthening can be progressed. Two recent examples, the London Rail Freight Strategy (LRFS) and Construction Strategy, made a joint recommendation for a dedicated workstream to investigate opportunities to increase the operable length of construction trains serving London.[2]

Industry stakeholders view 20-wagon operation of construction trains across the London area, equivalent to a standard load of about 2000t, as an achievable minimum to work towards. Trains of this length equate roughly to half a 'jumbo' aggregates train, as deployed on flows from the Mendip quarries to London. These are typically split at Acton yard before proceeding in sections to multiple points of delivery, hence the ability to consistently operate cross-London legs at the maximum length of a divisible portion of a jumbo makes for an appropriate threshold target.

Table 1: Aspired standard train types for construction traffic

Designation	No. of wagons	Approx. length[3]	Approx. trailing weight
			
Threshold length	20	300m	2000t
Super single	26	390m	2600t
Jumbo	40	600m	4000t

However, the upper limit for a standalone train around London is 26 wagons, which aligns with the top of the trailing weight range specified in the FNS. This represents the

[1] *Freight Network Study*, Network Rail (2017)
[2] *The London Rail Freight Strategy*, Network Rail (2020); *Construction Strategy*, Network Rail (2021)
[3] There are a variety of wagon designs employed on contemporary construction flows, featuring a range of actual vehicle lengths; however, for the purposes of this workstream a datum 15m vehicle length is assumed.

established contemporary maxima for single loco operation, as evidenced by trains now operating cross-London serving Essex Thameside terminals. The construction market in the capital would benefit from an increase in the number of railheads that can accommodate these 'super single' train formations.

This requires enhancements to connecting infrastructure at some terminals that do not currently meet this level of capability. The Target 26 workstream has therefore assessed all London construction terminals to determine their current capability and, where this does not permit 26-wagon trains, identified sites where there are opportunities for enhancements to achieve this.

This report sets out the findings of this exercise and is intended to provide the basis for a cross-London programme of works to realise a more consistent operational standard for construction sector terminals.

SCOPE

Target 26 investigated every London railhead used for movements of materials serving the constructions sector. The list below records all such sites currently operating, or with firm plans for introduction, inside the Greater London Authority boundary area (plus a handful that are fractionally outside of it but are in practice London-serving terminals), for which relevant data could be sourced from industry stakeholders.

Comprehensive details on each of these terminals were gathered in order to baseline existing capability, identify opportunities and constraints and facilitate comparison so that a priority shortlist of sites with the greatest prospects for enhancement could be identified.

This information was gathered from end users, FOCs and NR sources for each of the following rail freight terminals:

- Acton Yard (Aggregate Industries)
- Stewarts Lane Battersea (Tarmac)
- Stewarts Lane Battersea (Day Aggregates)
- Brentford (Day Aggregates)
- Bow Midland East (DB Cargo)
- Bow Midland West (Aggregate Industries)
- Cricklewood (Down Side, DB Cargo bulk campus)
- Dagenham (Hanson)
- Dagenham (Hope Cement)
- Murphy's Wharf (Tarmac)
- Angerstein Wharf (Aggregate Industries)
- Ferme Park (London Concrete)
- Neasden (former Aggregate Industries)
- Neasden (Brett Aggregates / Capital Concrete)
- Neasden Freight Terminal (former Tibbett & Britten connected site)
- Park Royal (Tarmac)
- Purley (Day Aggregates)
- King's Cross (DB Cargo)

- Colnbrook (Aggregate Industries)
- Thorney Mill (Ashville Aggregates)
- Tolworth (Day Aggregates)
- Chessington South (DB Cargo / Express Concrete)
- West Drayton 1, Stockley (Hanson)
- West Drayton 2, Tavistock Rd (Hanson and Tarmac)
- Paddington New Yard (Tarmac)
- West Thurrock (Tarmac)
- Purfleet (Aggregate Industries)
- Hayes (Tarmac)

Consideration was also given to the capability of quarries and wharves across the country, from which construction trains operate to terminals in London, as well as any network constraints affecting operable lengths en route (although it may be possible to challenge these where necessary).

DELIVERY

The delivery of this workstream was undertaken in three phases:

Phase 1 – Information Gathering

Information sought was within the following categories:

- Terminal name, tenant/owner, FOC(s) operating rail services
- The maximum length of train that could be accommodated at the terminal, in total metres and number of wagons
- The average length of trains operating to and from the terminal at present
- The primary governing feature or features of the infrastructure at the terminal that sets the limit to train length e.g. reception siding, discharge siding, reversal siding etc.
- Any associated infrastructure outside the terminal site itself that was used by trains for access and egress of the terminal, which may have also impacted on maximum train lengths e.g. all trains to and from Stewarts Lane must use the Battersea Loop to reverse to get in or out of the terminals
- The maximum length of train that could be accommodated by associated pieces of infrastructure, where applicable
    - Known constraints to increasing the maximum train lengths operating to and from the terminal – these may be physical or operational, on or off the railway network/land footprint
    - Known opportunities for increasing the maximum train lengths operating to and from the terminal – for instance, where work to achieve this has been developed in the past but not yet progressed, or based on local operational knowledge

Flows to and from

To obtain an understanding of what the flows to and from the terminals in the remit were and their typical current operating lengths, data was extracted from the Network Rail Track Access Billing System (TABS). A spreadsheet was produced with information for all trains that arrived in period 11 (10/01/21-06/02/21) alongside an additional sheet with notes which explained how the schedules are shown in TRUST to particular locations. It was noted some locations within the original remit did not have any regular traffic.

Phase 2 – Sift

On completion of Phase 1, the information collected was shared for review by Route Freight Manager teams and the Head of Freight Development, prior to a workshop. A shortlist of the terminals where there were the strongest opportunities for enhancement was agreed upon and those locations were taken forward to Phase 3.

From the discussions in the workshop, terminals were each allocated to one of the following categories:

Not to progress – insufficient information

It was agreed that the terminals listed could be discounted from consideration for enhancement as part of Target 26, due to insufficient stakeholder response to information requests during Phase 1.

Not to progress – sufficient information

It was agreed that Phase 1 had determined there was little or no opportunity for enhancement at these locations and therefore the terminals listed could be discounted from consideration for enhancement as part of Target 26.

Opportunities (Discounted at the workshop)

It was agreed to not progress infrastructure enhancements for these terminals as part of this workstream, without discounting them indefinitely.

Opportunities (Progressed at the workshop)

The remaining terminals either had previous design work completed or required new sketches to be commissioned from the Scheme Design Team. These were:

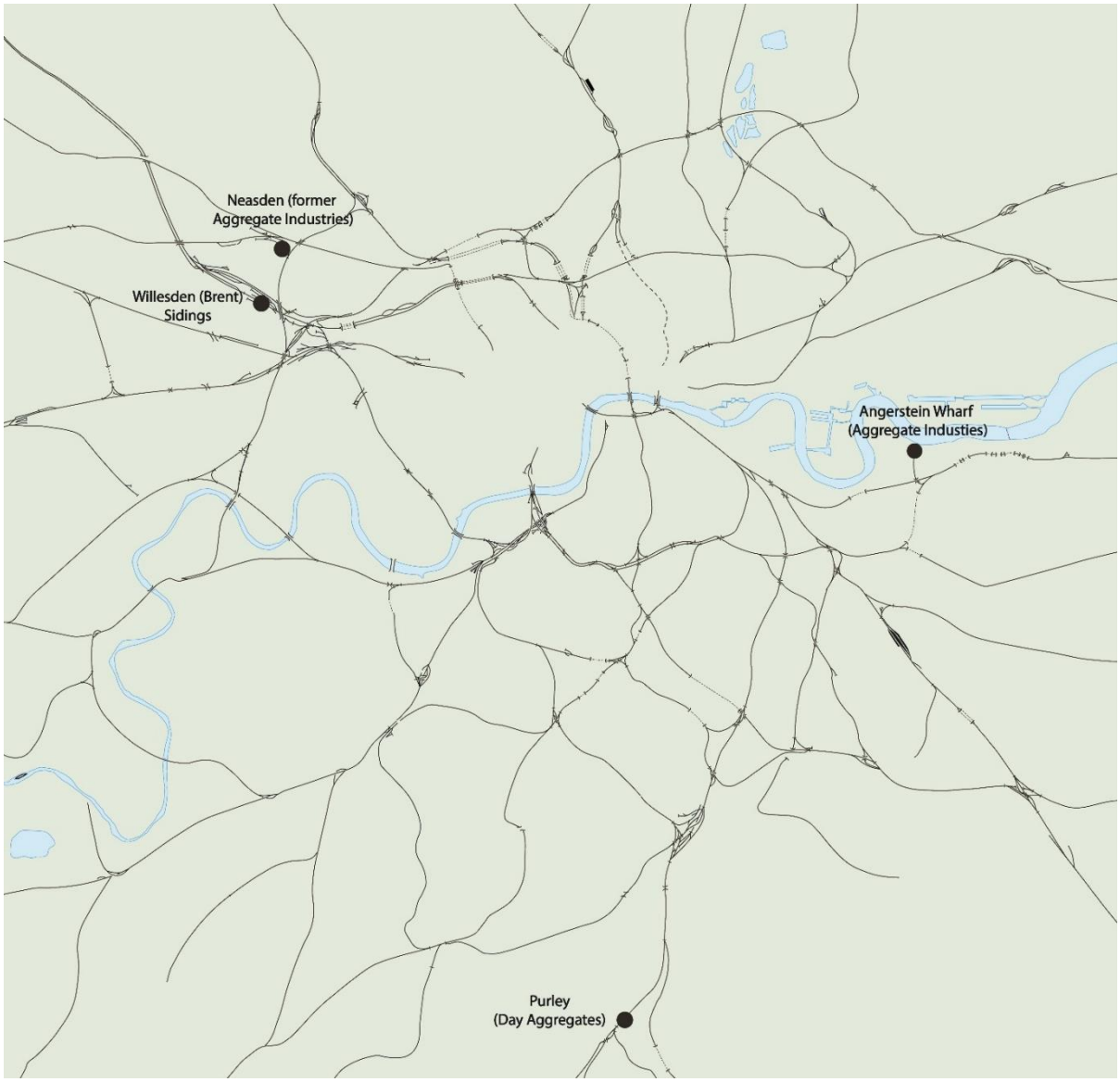
Progress – design work previously completed

- Stewarts Lane Battersea (Tarmac)
- Brentford (Day Aggregates)

Progress – commission sketches from the Scheme Design Team (SDT)

- Angerstein Wharf (AI) / Murphy's Wharf (Tarmac)
- Neasden (former Aggregate Industries)
- Purley (Day Aggregates)
- Willesden Brent Sidings
    - Although not one of the terminals considered by Phase 1 of the project, it was decided to commission a conceptual design for enhancing this location to 26-wagon capability, given its potential as a useful location for construction flows serving London.

Map 1: The locations progressed and sketches commissioned



Phase 3 – Development

Network Rail's Scheme Design Team undertook conceptual design work for the locations on the map above. This produced sketches for enhancement of the run-round loop on the Angerstein branch (to enable longer trains to serve both the Angerstein Wharf and Murphy's Wharf terminals) and a proposal to provide rail access to an additional end user site, adjacent to Angerstein Wharf. A sketch for the currently disused terminal at Neasden was also produced, illustrating how it could be reinstated with capability to accommodate 26-wagon trains. A design for a remodelling of Willesden (Brent) Sidings to provide longer roads was also included.

No unusual or notable construction issues are anticipated for these proposed enhancements, but all proposals are tentative and subject to the completion of appropriate site investigations, topographic surveys, asset condition assessments and detailed design.

In addition, a short technical note was produced, giving an assessment of a minor signalling intervention at the Purley terminal. This examines the feasibility of installing an additional ground position light signal, and associated track circuits, in order to increase the length of trains able to serve the facility.

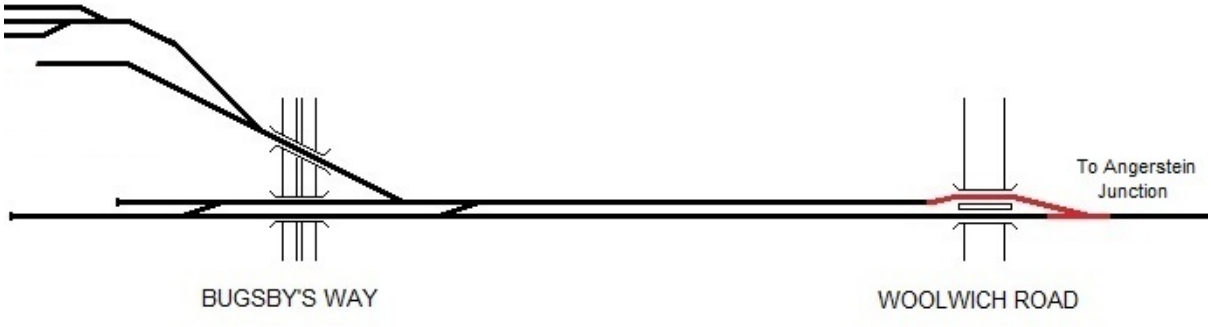
Order of magnitude estimating, using the sketches and schedules of principle quantities produced by the SDT, was completed by the Southern Region estimating team. This indicated high-level order of magnitude costs, based purely on the conceptual design work undertaken. They were calculated in current prices at the time of production (early 2022).

PROPOSED ENHANCEMENTS

SDT designs (newly produced for this project)

Angerstein Wharf

Figure 1: Schematic drawing of proposed Angerstein Wharf enhancement

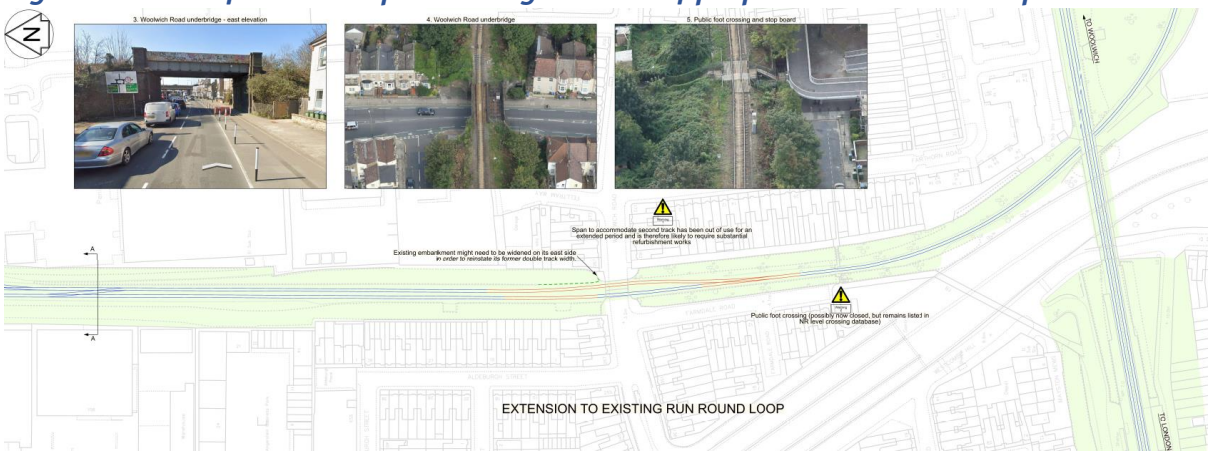


Engineering Commentary

This option would extend the existing run-round loop at its London end by refurbishing and bringing back into use a second track across Woolwich Road underbridge. Woolwich Road underbridge is of half through construction with a centre girder between the two tracks that that it historically carried. The section of the superstructure that is currently unused is likely to require steelwork repairs to its deck, repainting, new deck waterproofing and drainage repairs before being bought back into use.

Extending the run-round loop at its London end will move the turnout at the entry to the loop closer to a foot crossing (current ALCRM score D3), but it is understood that this crossing is due to be closed in the near future as part of signalling improvements in the area.[4] A stop board controlling the exit from the branch might also need to be relocated by a small amount.

Figure 2: Detail from conceptual design sketch of proposed run-round loop extension



[4] 'Highest Risk' Level Crossing in South East London to be closed with alternative route enhanced (networkrailmediacentre.co.uk)

Neasden (former Aggregate Industries site)

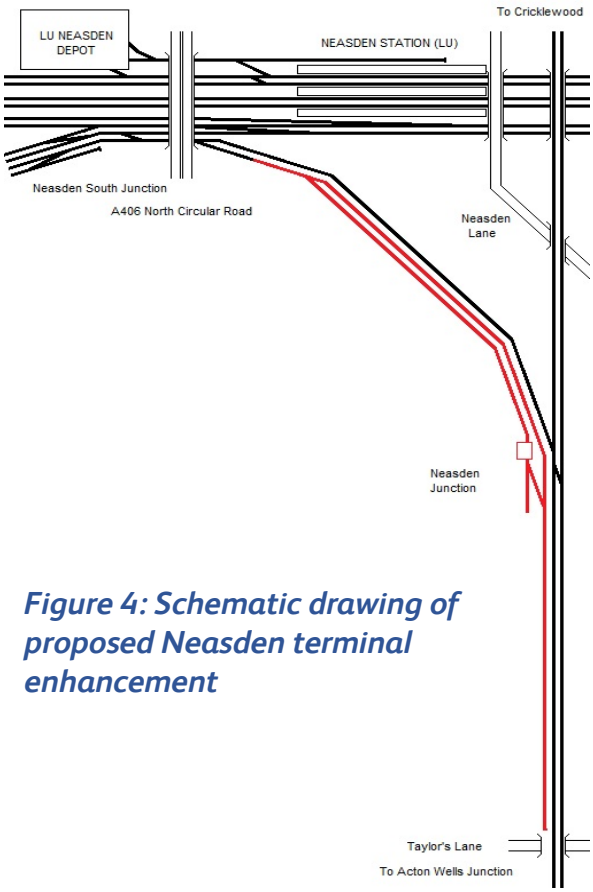


Figure 4: Schematic drawing of proposed Neasden terminal enhancement

Engineering commentary

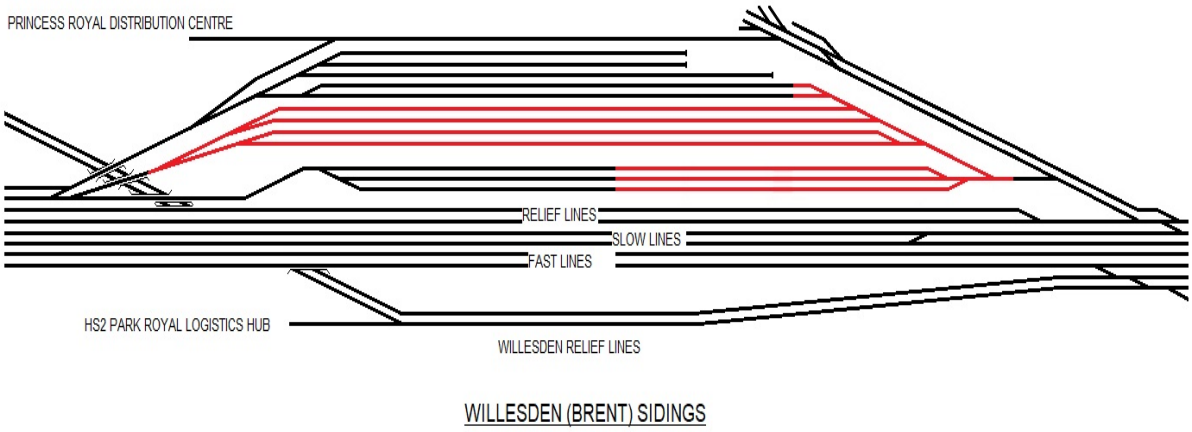
This option would provide sufficient length of siding for a 26-wagon train to run into the discharge siding, the locomotive to then run around and then propel its train across the discharge hopper before the departing (although other unloading sequences are possible). A small gabion retaining wall is proposed to regulate the toe of the existing embankment carrying the Neasden Curve (ELT: NJN).

The proposed headshunt towards Taylor's Lane makes use of formation formerly occupied by Neasden power station sidings.

Figure 5: Detail from conceptual design sketch of proposed terminal remodelling

Willesden (Brent) Sidings

Figure 6: Schematic drawing of proposed sidings remodelling

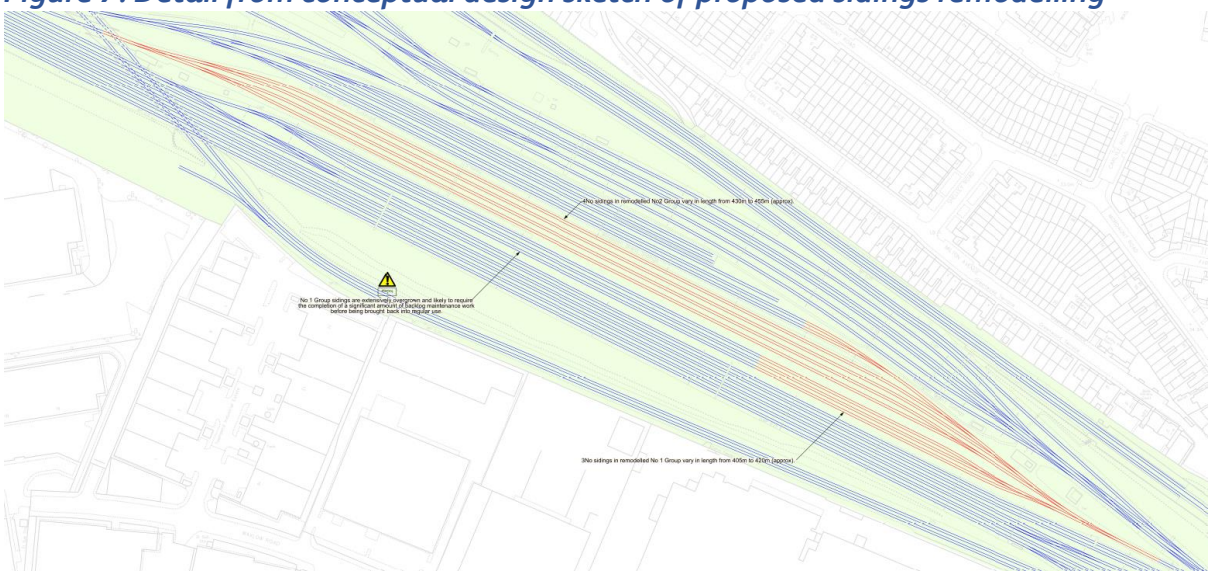


Engineering commentary

Remodelling No1 Group double-ended sidings will provide 3No sidings varying in length between 405m and 425m. However, these sidings are currently somewhat under-used, suffer a lack of regular maintenance and are therefore extensively overgrown. Those sections of this group of sidings that do not need to be wholly reconstructed to increase their length will nonetheless require extensive clearance of vegetation, ballast cleaning, spot replacement of sleepers, etc.

Remodelling No2 Group double-ended sidings will provide 4No sidings varying in length between 430m and 455m. While there are currently 5No sidings in this group, not 4No, the reduction in the number of sidings will increase the space available between the tracks in which to undertake examinations of any trains in transit.

Figure 7: Detail from conceptual design sketch of proposed sidings remodelling



Purley – Technical Note

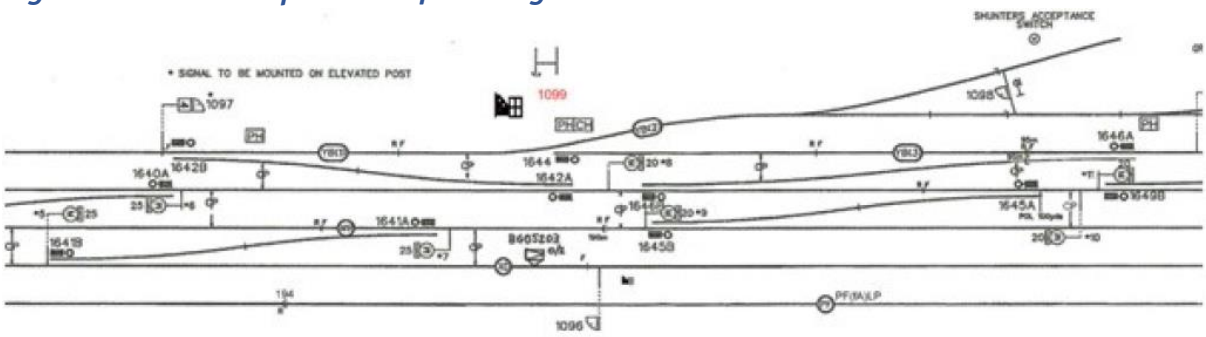
Background

The Freight and Network Strategy team have requested Network Rail Design Delivery (SDT) to undertake an initial assessment of the feasibility of installing an addition ground position light (GPL) signal on the Down Siding at Purley aggregates depot to increase the length of standage available in the siding and therefore the length of the trains that may serve the depot.

Details of proposed signalling changes

It is proposed that the new GPL be located on the approach to the toes of 1644 points as shown in Figure 8 below. Initial estimates indicate that an increase in the available siding length of around 60m would be achieved, providing standage for an additional four wagons based on current rolling stock type.

Figure 8: Indicative position of new Signal 1099



Signal 1097, an existing GPL signal, now controls the exit from the siding and provides the four routes described in Table 2 below.

Table 2: Existing Signal 1097's current routes

Signal	Route	Destination		Note
		Line	Sig	
1097	A	Sidings	1098	
1097	B	Down Loop	167	
1097	C (1)	Up Loop	165	
1097	C (2)	Up Loop	165	Via Down Slow

The introduction of an additional GPL signal, with the suggested No 1099, does not result in a major change to routes available from Signal 1097, but does alter Route A, which would now exit to the new Signal 1099 as described in Table 3. The remaining routes from Signal 1097 being unchanged.

Table 3: Existing Signal 1097's proposed routes

Signal	Route	Destination		Note
		Line	Sig	
1097	A	Sidings	1099	
1097	B	Down Loop	167	
1097	C (1)	Up Loop	165	
1097	C (2)	Up Loop	165	Via Down Slow

The new Signal 1099 would have three routes, replicating three of the routes from the existing Signal 1097, as shown in Table 4. The alternative route C (2) to Signal 165 via the Down Slow would not be possible as the train would now be standing beyond 1642B points.

Alterations to YB track circuit will be required to facilitate the new changes, with the joint between YB(1) relay end and YB(2) feed end moved towards the new 1099 signal, together with alterations to the interlocking and signaller's panel at Three Bridges signalling centre.

The interlocking is a free-wired Route Relay Interlocking (RRI) and controlled via a tiled eNtrance-eXit (NX) panel at Three Bridges signalling centre.

Table 4: Additional Signal 1099's proposed routes

Signal	Route	Destination		Note
		Line	Sig	
1099	A	Sidings	1098	
1099	B	Down Loop	167	
1099	C	Up Loop	165	

Future scope of works and associated costs

Further work required to implement the proposed changes includes:

- Full correlation of signalling records affected (where warning labels are present)
- Design signalling plan, interlocking, track circuit and signalling panel alterations to suit
- Update all affected signalling drawings and records
- Carry out changes, alterations and updates to interlocking and local circuits
- Relocate YB(1) and YB(2) insulated block joint and TC tails
- Supply, install and fit new GPL signal
- Update Three Bridges signalling panel with new tiles and buttons to show/facilitate changes
- Test and commission signalling alterations

Note full correlation of signalling records may be required, some existing signalling records have "Warning" labels attached.

It is envisaged the works could be completed within six months (resource and access permitting).

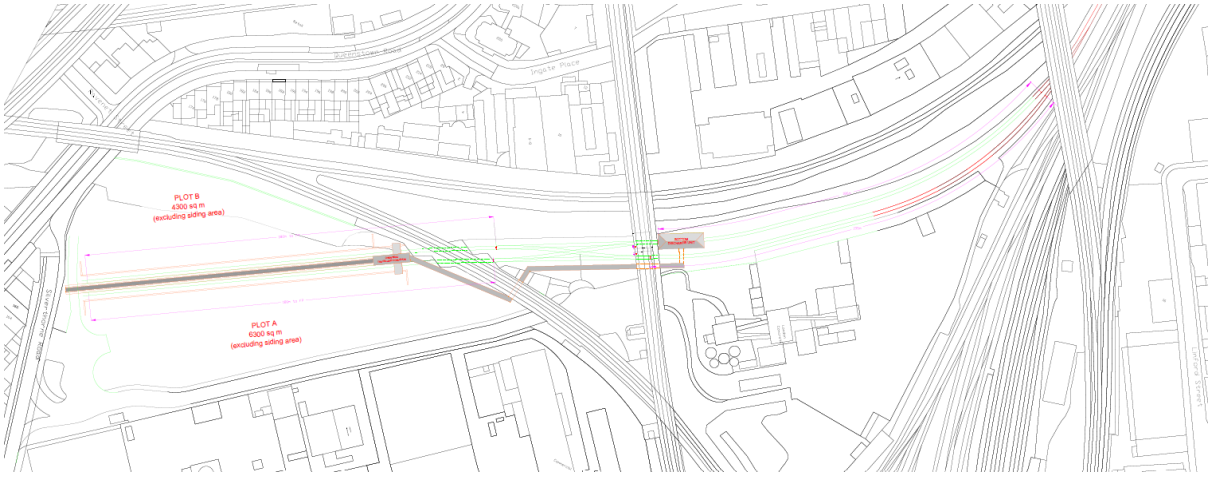
Designs available from past work

There are a number of terminals around London where initial design work had previously been carried out, for enhancements that would align to the aims of Target 26. They are therefore also included in the package of works proposed by this report.

The sketch extracts below are included for illustrative purposes only. No new design or engineering work has been carried out for these sites as part of this project and their progression would be subject to further review.

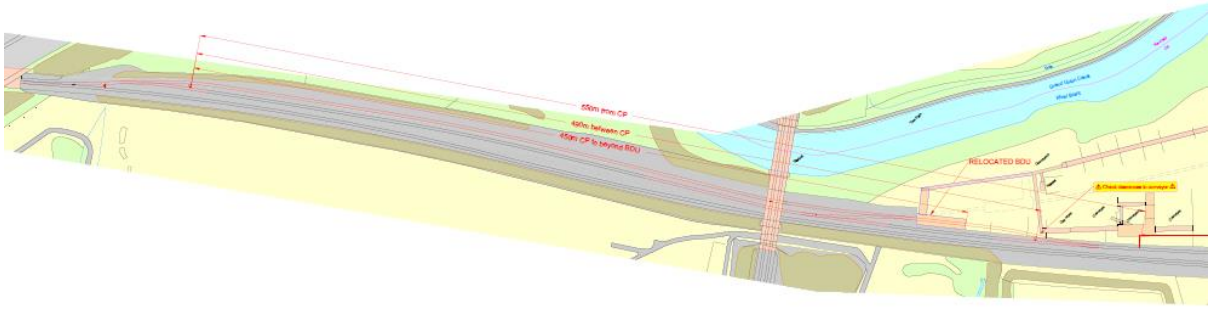
Stewarts Lane, Battersea

Figure 9: Detail from conceptual design sketch of proposed Stewarts Lane terminal enhancement



Brentford

Figure 10: Detail from conceptual design sketch of proposed Brentford terminal enhancement



Next steps

The proposals in this report have been deliberately identified alongside one another in order to offer a package of works across multiple sites, avoiding favouring any single beneficiary, whilst still all supporting the same strategic objective for this traffic commodity in this area. Network Rail and GBRtt freight colleagues are considering potential funding sources on an ongoing basis, with the aim of seeing delivery of these works at the earliest possible opportunity. The current climate for newly proposed rail enhancements is

particularly challenging, with traditional options for freight schemes (the DfT's Rail Network Enhancements Pipeline and Small Operational Enhancements Fund) unlikely to be in a position to provide an allocation to support the Target 26 proposals. Possible alternatives will therefore be explored.

FURTHER ENGAGEMENT

Following Network Rail's request for terminal details during Phase 1 of this project, one of the major construction materials end users took a particular interest in the aspiration to achieve train lengthening that Target 26 has worked towards. This led to a regular series of bilateral calls, which quickly broadened beyond the focus on infrastructure enhancements presented in this report, to consider a wide range of opportunities for incremental train lengthening. Many of these proved to be possible through the identification of operational solutions or minor infrastructure interventions and progress has already been made with trials adding additional wagons to a number of flows.

Train size data for 2021 indicates that these initiatives have supported strong recent performance, with this customer's trains on average consistently hauling just under 1500t of product for the four months to October 2021. This is reflective of a 7% increase overall when comparing 2021 to 2019.[5]

This additional tonnage represents nearly 300 trains' worth of product accommodated on existing services, the equivalent of over 16,000 Heavy Goods Vehicle journeys if these materials were moved by road transport. Increasing train lengths by 7% on average equates to the removal of 4.7 tonnes of CO_2 emitted for every train run, when compared with road freight.

Plans are in development to trial similar improvements on further services and to expand beyond London and the South East.

This engagement under the banner of Target 26 has been a positive example of industry collaboration. Network Rail would welcome interest from other end users in pursuing a similar approach, with a view to investigating further opportunities for train lengthening across the sector.

[5] 2019 used for comparison to avoid the impact of 2020 lockdown periods.