Grays South Underpass – Updated Value for Money assessment

4 March 2022

1. Executive summary

Thurrock Council in partnership with Network Rail has proposed to construct an underpass to replace the level crossing that currently provides access between Grays South and the town centre to the north.

A Full Business Case (FBC) for the project was submitted and approved by South East Local Enterprise Partnership (SELEP) in 2019 ("the 2019 FBC").[1] In this the 'Preferred option' is to construct an underpass to replace the level crossing. This option also includes an enhancement of the public realm as well as the creation of new modern commercial/mixed use floorspace and residential units. The 'Preferred option' is assessed relative to a 'Do minimum' scenario in which there is, no viable alternative to the underpass proposed by Thurrock Council.

Since the production of the 2019 FBC, the delivery timeline for the project has changed and the estimated cost of the project has increased from £28.7m to £37.9m. The increase in project costs are to be met through a re-direction of funding from the Thurrock Capital Programme. Elements of the value for money analysis also required updates for a number of reasons:

a. The core underlying assumptions are no longer valid and need to be updated to reflect the current status of the plans for the level crossing/ the proposal for the underpass.
b. The internal or external data that was used for the analysis has been superseded by more recent data.

Therefore, the purpose of this report is to update the assessment of the costs and benefits of the project, where they have changed since the submission of the 2019 FBC. Section 3 of this report provides an overview of the key changes that have been made to the value for money analysis since the 2019 FBC, setting out what has changed and why. While the report considers whether the project still delivers benefits over and above the public sector cost of constructing the underpass, it does not set out the full value for money assessment. This report should be read in conjunction with the 2019 FBC.

Table 1 below presents the updated summary of net benefits, the projected costs for the project and the benefit-cost ratio (BCR) for the project. These represent the net benefits of the project relative to the 'Do minimum' scenario. All figures are presented in 2022 prices and NPV terms.

Table 1: Summary of net benefits, costs and BCR for the 'Preferred option'

		Net values (in NPV terms, 2022 prices) over 30 years
Benefits	Journey time saving	£20.3m
	Reduction in accidents	£2.1m
	Reduced risk of premature death	£6.2m
	Absenteeism	£1.2m
	Reduction in externalities from cars including vehicle operating costs	£9.8m
	Social impacts from public realm[2]	£22.8m
	Land value uplift from new houses	£2.1m
	Change in economic usage of redeveloped commercial space	-£0.8m
	Total net benefits	**£63.7m**
Costs	Projected costs	£37.1m
	Cost spent to date	£4.8m

[1] Grays South SELEP Full Business Case" 2019
[2] Assessed over a 10 year period.

	Remaining cost	**£32.2m**
BCR		**2.0:1**

Overall, it is estimated that the project will generate £63.7m in net benefits (in NPV terms in 2022 prices) over the 30 year appraisal period.

The BCR for the project, based on the total remaining project costs, is 2.0:1.

This BCR does not capture a number of unmonetised benefits associated with the project. These were detailed in Section 3.6 of the 2019 FBC and are still relevant to the updated analysis so should continue to be taken into account when assessing the overall value for money of the project. These unmonetised benefits are summarised in Section 4 of this report.

In particular, it is expected by Thurrock Council that the underpass and associated public realm improvements are expected to have greater impacts in terms of the benefits for the town centre from improving connectivity, increasing the flow and footfall of pedestrians to the town centre, and supporting wider regeneration of the town centre.

2. Introduction to the report

Thurrock Council in partnership with Network Rail has proposed to construct an underpass to replace the level crossing that currently provides access between Grays South and the town centre to the north. The project is in response to a number of issues, including:

a) the level crossing being amongst the most dangerous crossings in the eastern region and is the only pedestrian crossing that features in the top 10 most dangerous in Britain;

b) the need to support and enhance the viability and vitality of the town centre;

c) the need to address the significant barrier to pedestrians moving to and from the town centre created by the level crossing. Gates can currently be closed for up to 12 minutes in normal operation. The frequency and duration of closures is expected to continue to increase as the passenger rail service becomes more frequent and commercial rail freight from DP World and Port of Tilbury increases, also increasing the risks of accidents;

d) recognition that the area around the rail station does not provide a welcoming arrival point to Grays and that the quality of the public realm needs to be uplifted in response to the South Essex College development; and

e) the need to provide a modern approach to delivery of the Council's services in flexible multi-purpose accommodation.

The project as proposed is comprised of two phases:

- Phase 1: Extension to Civic Offices.
- Phase 2a: Creation of an underpass to replace the level crossing and creation of public squares at each end, designed to provide active urban spaces suited to a wide range of events, markets and similar activities.
- Phase 2b: Creation of new, modern commercial/mixed use floorspace (c.1300sq.m) and residential units above (c.84 flats) on land created by phase 2a to provide definition to the public squares, street cafes, residential and commercial space and opportunities for urban living. These will contribute towards generating additional footfall within the town centre, support the development of an evening economy, and respond to a lack of town centre facilities to serve the c.4 million passenger movements per year through the rail station.

It should be noted that Phases 2a and 2b are the focus of this report.

A Full Business Case (FBC) for the project was submitted and approved by South East Local Enterprise Partnership (SELEP) in 2019 ("the 2019 FBC").[3] Since the production of the FBC, the delivery timeline for the project has changed with the underpass element of the project now being expected to be completed by late 2024 and the public realm elements of the project expected to be completed 6-9 months following completion of the underpass.

Further, the estimated cost of the project has increased from £28.7m to £37.9m. The increase in project costs are to be met through a re-direction of funding from the Thurrock Capital Programme.

Therefore, the purpose of this report is to update the assessment of the costs and benefits of the project, where they have changed since the submission of the 2019 FBC. While the report considers whether the project still delivers benefits over and above the public sector cost of constructing the underpass, it does not set out the full value for money assessment. This report should be read in conjunction with the 2019 FBC.

[3] Grays South SELEP Full Business Case" 2019

As in the 2019 FBC, this report assesses the value for money of the 'Preferred option' which is to construct an underpass to replace the level crossing. This option also includes an enhancement of the public realm as well as the creation of new modern commercial/mixed use floorspace and residential units. For more detail of the other options that were considered previously please refer to Section 3.1 of the 2019 FBC.

The 'Preferred option' is assessed relative to a 'Do minimum' scenario. The analysis still assumes that under the 'Do minimum' scenario, no viable alternative to the underpass proposed by Thurrock Council is available. Therefore, when the level crossing is decommissioned, the alternative crossing would be the road bridge 200m from the level crossing.

It is noted, however, that if Thurrock Council does not proceed with the 'Preferred option' (constructing the new underpass), Network Rail will be required to construct an underpass (or equivalent) before it is permitted to close the level crossing. Thurrock Council does not consider that the proposals put forward by Network Rail for this present a suitable alternative (and as such do not constitute a 'Do minimum' option) given that the Network Rail underpass (as currently proposed) would not be accessible for wheelchair users and others with mobility issues, so the strategic objectives for the project would not be met. The designs also do not include the public realm upgrades in the 'Preferred option'.

Network Rail has provided an estimated construction cost of its underpass design of [redacted]. This does not include necessary land purchase costs[4] and the costs are not on a like for like basis as for the Thurrock Council proposed underpass due to different design aspects (e.g. not meeting accessibility requirements or including public realm improvements).

[4] Network Rail has not yet estimated these additional costs.

3. Update to the value for money assessment

This section provides an overview of the key changes that have been made to the value for money analysis since the 2019 FBC, setting out what has changed and why. Where external data and information has been used, the sources of the data/ information have been provided.

Elements of the value for money analysis required updates for a number of reasons:

c. The core underlying assumptions are no longer valid and need to be updated to reflect the current status of the plans for the level crossing/ the proposal for the underpass.
d. The internal or external data that was used for the analysis has been superseded by more recent data.

Where elements of the value for money analysis were identified as requiring update for either of the reasons above, the analysis has been updated.

Specifically, the analysis has been updated in the following areas:

- **The cost inputs to the analysis have been updated to reflect the most recent costs projections.** As noted in Section 2, the estimated cost of the project has increased from £28.7m to £37.9m with the increase in project costs to be met through a re-direction of funding from the Thurrock Capital Programme. Table 2 below sets out the projected profile of project funding.

Table 2: Breakdown of funding sources (£m)

	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Total
Network Rail (NR) contribution	0.70						**0.70**
Local Growth Fund (LGF)		3.66	0.83	0.35	6.00		**10.84**
Thurrock Council Capital, s106 funding and development receipts				7.72	10.30	8.30	**26.32**
Total							**37.90**

- **Whilst £10.8m in funding has already been drawn down by Thurrock Council for the project, this amount has not yet been spent in full**. Up to 31 December 2021, £4.8m had been spent on the project. This represents the sunk cost of the project. As per HM Treasury Green Book guidance, the value for money analysis should consider the value of the remaining public sector cost going forward. Therefore, when estimating the BCR of the project, the cost denominator does not include the funding that has already been spent on the project (i.e. the £4.8m).

- **The analysis has been updated to reflect the change in project timescales for completing the underpass** (see Table 3 below for the revised key project milestones). The public realm elements of the project are expected to be completed 6-9 months following the completion of the underpass. The appraisal period has been updated to cover the 30 years from 2022 to 2052.[5]

[5] It should be noted that, as with the 2019 FBC analysis, that 30 years is the maximum appraisal period for the benefits. Some categories of benefits, such as the public realm benefits, are expected to last only 10 years. The assume appraisal periods for categories of benefits have not changed.

Table 3: Key project milestones

Description	Start	Finish
Procurement and contracts for next stages	01/06/2021	02/11/2021
Land Assembly 1	Autumn 2021	11/04/2022
Single Option Development	11/04/2022	12/09/2022
Detailed Design	12/09/2022	06/02/2023
Implementation 2	13/02/2023	06/05/2024
Project Handback	07/05/2024	05/08/2024
Project Close Out 3	06/08/2024	11/11/2024

Note:
All dates are indicative until a revised programme is issued from Network Rail.
[1]: If CPO is required 15-18 months could be added to this part of the programme and moves start point of Implementation [2]
[2]: Assumes all possession not changed and subject to ground conditions.
[3]: This date is for the completion of the underpass, steps, and ramps. Public squares complete after this date.

- **All monetary values have been converted to 2022 prices** using Office for National Statistics[6] (ONS) and Office of Budget Responsibility (OBR) data[7].

- **The assumed travel mode behaviour changes have been updated to reflect more recent travel patterns.** As in the 2019 FBC, the analysis estimates the impact that the closure of the level crossing would have on the behaviours of the local population and how it may affect the mode of travel that people adopt. The travel mode change assumptions in the analysis have now been updated to account for more recent National Transport Survey (NTS) data.[8] It should be noted that whilst NTS data for 2020 was available, it is not considered representative of general travel patterns due to the Covid-19 pandemic impacting travel patterns. The analysis therefore uses 2019 NTS data.

  To understand the potential change in travel mode that may result from being faced with a longer journey (as under the 'Do minimum' scenario), the analysis considers NTS data relating to the average number of trips by trip length and main mode and the relative difference in mode between journeys of less than a mile and between 1 and 2 miles. This data is summarised in the table below.

Table 4: Travel patterns for journeys under 1 mile and journeys between 1 to 2 miles, by mode of transport (NTS 2019)

Main mode	Under 1 mile		1 to under 2 miles	
Total trips per person per year	231		177	
Walk	185	80%	55	31%
Bicycle	2	1%	5	3%
Car/van	41	18%	105	59%
Bus	2	1%	9	5%
Other	1	1%	4	2%

[6] ONS (2022) CPIH INDEX 00: ALL ITEMS 2015=100 - Office for National Statistics (ons.gov.uk)
[7] OBR (2022) Inflation - Office for Budget Responsibility (obr.uk)
[8] Department for Transport (2021) National Travel Survey. Available at: https://www.gov.uk/government/collections/national-travel-survey-statistics

Based on the number and proportion of journeys made by each mode by trip length, it was assumed that under the 'Do minimum' scenario 50% of those who currently walk would continue to walk whilst the other 50% would switch to a different mode of transport. This assumption is unchanged from the 2019 FBC and is based on evidence from an academic study.[9] Based on this assumption, the mode shift by those who currently walk was estimated. This is set out in Table 5 below.

Table 5: Mode shift for those that currently walk (assumed <1 mile) when faced with a journey of 1-2 miles under the 'Do minimum' scenario

Travel mode	Percentage of people
Walk	24%
Cycle	2%
Car/van	45%
Bus	4%
Other	2%
Do not take journey	23%

The mode shift by 50% of those who currently walk was combined with the assumption that those who currently walk less than a mile will continue to make the journey by foot, generates the overall travel mode shift assumptions. These are set out in Table 6 below.

Table 6: Overall travel mode shift from walking as a result of the longer distance under the 'Do minimum' scenario

Travel mode	Percentage of people
Walk	62%
Cycle	1%
Car/van	25%
Other	0%
Do not take journey	1%

- **The analysis has retained the assumption of an average of 8,412 people use the underpass per day[10]** as there was no other more recent data available.

- **The analysis has been updated by using the latest version of the Department for Transport's (DfT) Active Mode Appraisal Toolkit,** released in September 2021[11]. In all other respects, the benefits associated with: journey time savings; safety; avoided premature death; absenteeism; reduced negative externalities (from a reduction in driving); and vehicle operating costs (VOC) have been estimated using the same approach as in the analysis for the 2019 FBC.

- **The analysis has been updated based on new data from Network Rail, in particular the Fatalities and Weighted Injuries (FWI) value has been updated to 0.0488.**

- **As the proposed public realm upgrades have not changed from the 2019 FBC, no changes have been made to the assessment of the public realm benefits** other than to update the values to 2022 prices.

[9] Rodriguez-Lopez et al. (2017) The Threshold Distance Associated With Walking From Home to School. Health education and behaviour.
[10] This is based on an average of Network Rail estimates for August 2017 of 9,541 and February 2018 of 7,283.
[11] Department for Transport (2021) Active Mode Appraisal Toolkit.

- **No changes have been made to the assumed levels of deadweight, displacement or leakage of benefits**. Please refer to the 2019 FBC for the additionality assumptions.

4. Value for money of the proposed Grays South Underpass

Based on the updates to the analysis that are set out in Section 3, the overall value for money assessment has also been updated. Table 7 below sets out routes to impact and associated costs/benefits of the 'Preferred option' relative to the 'Do minimum' scenario.

Table 7: Routes to impact of the 'Preferred option' relative to the 'Do minimum' scenario

Summary of impact	Type of impact	Value (gross terms, 2022 prices)	Toolkit used to assess
Reduced incidents as a result of closure of the level crossing	Safety	£2,080,033	DfT WebTAG Databook
Reduction in distance walked relative to 'Do minimum' route over road bridge	Reduced risk of premature death	-£5,807,287	DfT AMAT adjusted for journey distance
	Absenteeism	-£1,103,190	DfT AMAT
	Journey time	£15,474,657	DfT WebTAG Databook
	Public realm	£1,739,533	TfL Ambience Benefits Calculator
Reduction in driving and mode shift to walking relative to 'Do minimum'	Reduced risk of premature death	£9,011,862	DfT AMAT adjusted for journey distance
	Absenteeism	£1,778,687	DfT AMAT
	External costs	£3,321,075	DfT AMAT
	Vehicle Operating Costs (VOC)	-£968,960	DfT WebTAG Databook
Reduction in distance driven relative to 'Do minimum'	External costs	£3,987,158	DfT AMAT
	VOC	£1,153,020	DfT WebTAG Databook
	Journey time	£4,809,452	DfT WebTAG Databook
Reduction in cycling relative to 'Do minimum'	Reduced risk of premature death	£580,690	DfT AMAT
	Absenteeism	£70,326	DfT AMAT
Increase in walking and reduction in driving as a result of underpass and public realm under the 'Preferred option'	Reduced risk of premature death	£2,439,598	DfT AMAT
	Absenteeism	£480,848	DfT AMAT
	External costs	£1,761,119	DfT AMAT
	VOC	£501,405	DfT WebTAG Databook
	Public realm	£21,012,099	TfL Ambience Benefits Calculator
New housing units constructed under the 'Preferred option'	Land value uplift	£2,146,097	HIF ready reckoner
Redeveloped commercial space under the 'Preferred option'	Change in economic usage	-£797,835	UK economic multipliers

Table 8 below presents the summary of net benefits, the projected costs for the project and the benefit-cost ratio for the project. These represent the net benefits of the project relative to the 'Do

minimum' scenario. The figures presented in Table 8 are a summation of the gross impacts (as set out in Table 7) converted into net impacts by applying additionality assumptions. All figures are presented in 2022 prices and NPV terms.

Table 8: Summary of net benefits, costs and BCR for the 'Preferred option'

		Net values (in NPV terms, 2022 prices) over 30 years
Benefits	Journey time saving	£20.3m
	Reduction in accidents	£2.1m
	Reduced risk of premature death	£6.2m
	Absenteeism	£1.2m
	Reduction in externalities from cars including vehicle operating costs	£9.8m
	Social impacts from public realm[12]	£22.8m
	Land value uplift from new houses	£2.1m
	Change in economic usage of redeveloped commercial space	-£0.8m
	Total net benefits	**£63.7m**
Costs	Projected costs	£37.1m
	Cost spent to date	£4.8m
	Remaining cost	**£32.2m**
BCR		**2.0:1**

Overall, it is estimated that the project will generate £63.7m in net benefits (in NPV terms in 2022 prices) over the 30 year appraisal period.

In addition to the benefits set out in Table 8, it is estimated that there would be £5.5m generated in total GVA (in net NPV terms) from the construction impacts (including the indirect and induced impacts as a result of the build phase of the project). As this impact is temporary in nature and may have high levels of displacement associated with it, it has been excluded from the BCR.

The BCR for the project, based on the total remaining project costs, is 2.0:1.

The BCR for the project is lower compared to the BCR estimated in the 2019 FBC, where it was 2.4:1. This reduction is primarily a result of the increase in the cost of the project. The benefits of the project have increased slightly from £59.3m (converted in to 2022 prices) in the 2019 FBC[13] to £63.7m in 2022. This is mostly driven by the reduction in externalities from car usage (including vehicle operating costs) and journey time savings. However, the increase in benefits is not sufficient to offset the increase in costs, leading to a reduction in the BCR and the value for money of the project.

There are a number of unmonetised benefits associated with the project. These were detailed in the 2019 FBC and are still relevant to the updated analysis so should continue to be taken into account alongside the BCR (which doesn't capture them) when assessing the overall value for money of the project. These unmonetised benefits are summarised below and are assessed in greater detail in Section 3.6 of the 2019 FBC:

- Additional safety concerns related to the expected increase in the frequent incidents of misuse of the crossing. The analysis of the 'Preferred option' uses current data on incidents involving the level crossing, however, it is expected that there will be an increase in incidents due to a greater number of freight trains using the trainline. Therefore, it is expected that the safety benefits will be higher than those quantified in the analysis.
- The cost of misuse of the level crossing, such as dealing with damage and vandalism.

[12] Assessed over a 10 year period.

[13] In the 2019 FBC, the total net benefits of the project were £55.2m in 2019 prices.

- There may be additional benefits to Network Rail in terms of a reduction in the costs of maintaining the level crossing and associated equipment as well as reduced travel times for passenger and freight trains which will no longer be required to slow down for the level crossing. However, it should be noted that these benefits would also be expected to arise under the 'Do minimum' scenario and have therefore not been quantified under the 'Preferred option'.
- The cost of the severance of closing the level crossing with no suitable replacement at the same location and the impact this would have on the highstreet.
- Potential higher public realm benefits that are realised as a result of an increase in footfall in the area driven by the construction of the underpass, the redevelopment of the public realm and the commercial development.
- The potential negative impact on the vibrancy and economy of the town centre if the 'Do minimum' scenario impacted the flow of people between the town centre and Grays South.
- The redevelopment of the commercial space that is undertaken as part of this project is expected to help attract more retailers to the town centre and to increase attractiveness to shoppers, including commuters who might otherwise have shopped in London.
- The redevelopment of the commercial space is expected to enhance the evening economy by increasing footfall in the evening, driving through later opening times and increased food and drink offerings.

There is evidence to suggest that the scale of unmonetised benefits from the project are now higher than at the time at which the 2019 FBC was produced, which improves the value for money of the project.

In particular, it is expected by Thurrock Council that the underpass and associated public realm improvements are expected to have greater impacts in terms of the benefits for the town centre from improving connectivity, increasing the flow and footfall of pedestrians to the town centre, and supporting wider regeneration of the town centre.

Thurrock Council is in the process of preparing a number of business cases for projects for town regeneration projects, including the proposed development of a Grays Town Jetty, the redevelopment of the Grays Riverfront and Beach, as well as the development of a Riverfront Activities Centre. While these developments may proceed without the underpass development and public realm improvements, for the reasons set out in the strategic case of the 2019 FBC (see Section 2 of the FBC), they are expected to be a key catalyst, without which the potential for the area will be held back and the benefits from wider developments reduced.

As these regeneration projects are still in the early stages of development, the overall social and economic impacts that they could generate, and therefore the value of the economic impact that the underpass may catalyse, have not yet been estimated. Estimates of the footfall that these developments would generate through the underpass have also not yet been produced although it is expected it would increase footfall above the current level.

Whilst the central case has been based on current footfall, new developments and wider regeneration of the town would be expected to increase this beyond the DfT WebTAG standard growth rate. In the absence of any footfall increase estimates the impact of a 5% increase in footfall has been modelled within the sensitivity analysis to understand how the overall benefits of the underpass would change if wider developments in the area drove increased use of it. The sensitivity analysis shows that a 5% increase in footfall would result in a total net benefits of £66.6m (in 2022 prices and NPV terms) and increase the BCR for the project to 2.1:1.

Sensitivity analysis

Sensitivity analysis of the economic impacts associated with the project has been undertaken. The main sources of uncertainty relate to the assumptions regarding mode shift in both the 'Do minimum'

compared to the status quo and as a result of the underpass and public realm work, the housing developments coming forward, and the cost estimates.

Five sensitivity scenarios have been analysed:

- Scenario 1: Reduced mode shift to car use in 'Do minimum' scenario relative to the status quo.
- Scenario 2: Higher mode shift as a result of the underpass and public realm work.
- Scenario 3: Increase in footfall as a result of the underpass and public realm work.
- Scenario 4: Only 50% of the wider development occurs.
- Scenario 5: Increased costs.

Table 9 below sets out the results of the five sensitivity scenarios that have been assessed.

Table 9: Results of the sensitivity analysis of the 'Preferred option'

Sensitivity scenario	Description	Net benefit (2022 prices, NPV terms)	BCR
Sensitivity 1	In the central case, the analysis assumes that, when faced with a longer journey, 62% of those that currently walk will continue to do so, 25% switch to car use, 1% cycle and 12% no longer make the journey. Sensitivity 1 adjusts the assumed mode shift to car use to 12.5% (half the 'Preferred option' assumption).	£62.0m	1.9:1
Sensitivity 2	Under sensitivity scenario 2, it is assumed a mode shift from car use to walking in line with the assumption of 11% applied in similar appraisals. This assumption leads to increased benefits from physical activity and a greater reduction in costs associated with car use.	£69.0m	2.1:1
Sensitivity 3	Under sensitivity scenario 3, it is assumed that there is a 5% increase in footfall as a result of the underpass and public realm improvements, as well as the wider developments and regeneration of the town centre. This assumption would lead to increased benefits from physical activity and public realm.	£66.6m	2.1:1
Sensitivity 4	Under sensitivity scenario 4, it is assumed that only 50% of the wider development would happen – meaning only 42 housing units are built on the site, and only half of the development receipts from wider development are achieved. This would have two effects which change the overall benefits and adjusted BCR for the project: (1) there would be a lower additional land value uplift generated through the housing units delivered; and (2) lower development receipts would increase the public sector cost of the project. Under this scenario the present value of public sector costs would increase to £33.7m.	£62.6m	1.9:1
Sensitivity 5	Under scenario 5, it is assumed that total remaining costs increase by 30% (relative to the baseline estimates excluding optimism bias). This cost increase is on top of the 30% risk allowance already included in the cost estimates. Under this scenario the present value of public sector costs would increase to £39.0m.	£63.7m	1.6:1