

1. Financial Case

1.1 Purpose

The purpose of this section is to demonstrate the affordability of the programme and to set out the anticipated funding profile over the lifetime of the programme. **Figures given are in cash prices.**

This financial case does not cover funding for or anticipated cash flows from the East Midlands franchise, although the operational cost impacts are considered in the Economic Case.

1.2 Funding and budget profile

1.2.1 Recommendation and remit of Financial Case

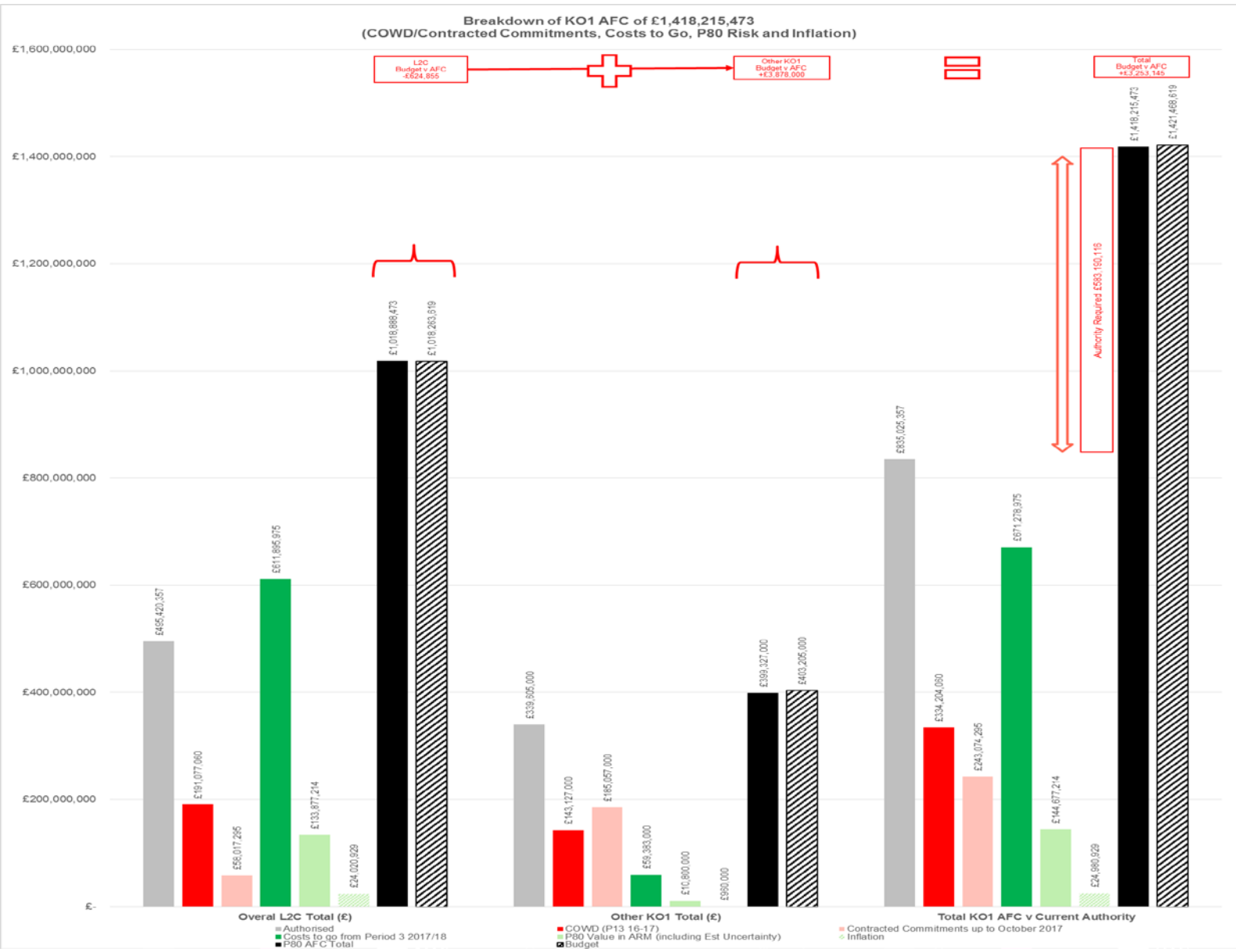
The total Anticipated Final Cost (AFC) for KO1 is **£1.418bn** and is affordable within CP5 identified budget (vs AFC £1.096bn) and the CP6 “Hendy Review” forecast (vs AFC £0.322bn). 94% of this AFC is to P80 certainty or greater. This is outlined in the table at section 1.2.2.

This Financial Case seeks authority for £583.19m. This constitutes the total KO1 AFC minus the AFC for works for which authority has already been granted through internal NR processes prior to the Memorandum of Understanding between DfT and NR (see section 1.2.4), as well as the costs for work done or committed to be done (see section 1.2.4).

This programme is affordable against the CP5 Portfolio defined by the Hendy Review in 2015 and the Hendy Review forecast for the MML in CP6 - affordability of the CP6 elements of this business case will be subject to overall decisions during autumn 2017, which will be heavily dependent on the outcome of the funding to be agreed for operations, maintenance and renewals for CP6.

The majority of the funding for the AFC is taken from the CP5 budget and CP6 forecast allocated under the Hendy Review, however some other funding sources are required (totalling approximately £78.397m). These sources are expected to be available and are assumed in this Financial Case. Some of these sources are not yet guaranteed and should this funding prove to be available extra budget will be required or some descoping of KO1 will need to take place (further detail is at section 1.3).

1.2.2 Summary and remit of financial case



1.2.3 Background

On 10 October 2016 the Strategic and Outline Business Case for KO1 was approved by BICC. The anticipated AFC for KO1 and KO2 under the Hendy Review was £2.552bn at this stage. On 20 July 2017 the Secretary of State confirmed that KO2 (electrification of the line from Kettering to Nottingham and Sheffield) would not proceed. Cancellation of KO2 entails some costs, which are included within the AFCs for KO1 presented in this Financial Case.

To more effectively deliver the programme, Network Rail integrated the four MML Enhancement Delivery Plan line items (*Midland Main Line Electrification KO1 (MMLe)*, *Bedford to Kettering Capacity (B2K)*, *Long Distance High Speed services Platform Lengthening phase 1 (LDHSs)* & *Kettering Electric Stabling (KES)*) into one larger, single integrated project, London to Corby (L2C).

This integration was approved by the MML Programme Board in July 2017, and the detailed costs are at section 1.4.1 below. While L2C constitutes 71% of the AFC of KO1, there are some projects that are required in addition to L2C for KO1 to be delivered. These are:

- Derby to Sheffield Journey Time Improvement;
- Market Harborough;
- Leicester South Line Speed Improvement;
- CP5 MML Kettering to Corby Capacity (K2C);
- Derby Remodelling; and
- Ambergate – contribution to track renewal.

L2C combined with these projects forms KO1, and this division of projects synchronises with the Work Breakdown Structure at section 1.8 of the Programme Management Case.

Additional costs for works to enable bi-mode train operation will be covered by a future business case to BICC.

1.2.4 Authority sought by this Financial Case

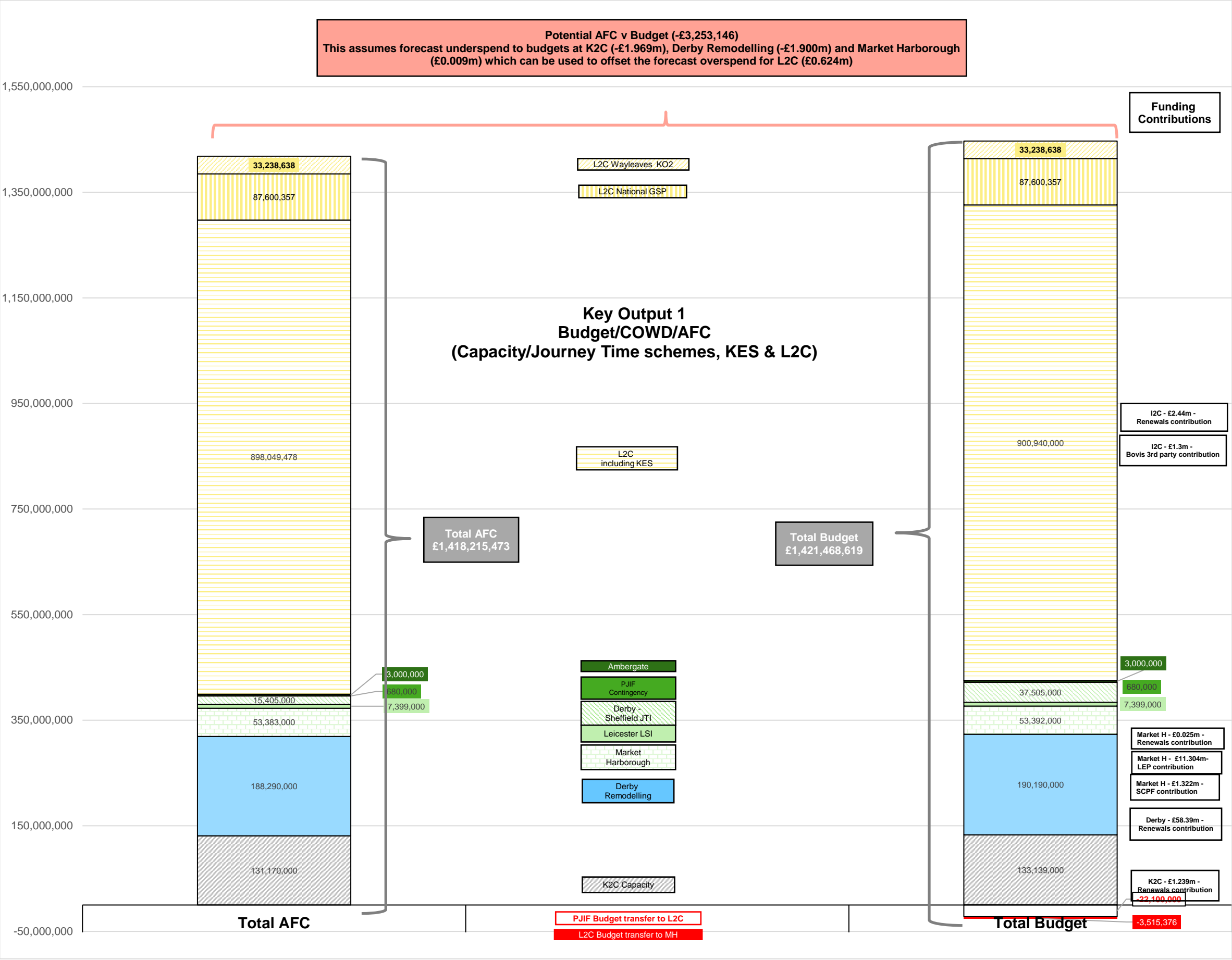
NR have already received GRIP 4-8 authorisation to deliver CP5 Kettering to Corby Capacity works (K2C) and Derby Remodelling works, as well as authorisation up to GRIP 4 for the L2C project and Market Harborough, and so these are not included in the authority sought by this Financial Case. These authorisations were gained through internal NR processes prior to the Memorandum of Understanding between DfT and NR, and accordingly DfT were not required to grant approval for them. Costs for work done and contractual commitments are not included within the authorisation sought.

£87.6m is required for National Grid costs. This was budgeted for under KO2, and funding has been transferred to KO1 by the MML Programme Board. Authorisation is therefore not required for this amount.

Accordingly, the authority sought by this Financial Case is £583,190,116 as shown in the below tables.

KO1 AFC	1,418,215,473
Previously authorised works – L2C	495,420,357
Previously authorised works – Other KO1	339,605,000
TOTAL DEDUCTIONS FOR AUTHORISED WORKS	835,025,357
AUTHORITY SOUGHT BY FINANCIAL CASE	583,190,116

1.2.5 Total KO1 AFC and budget



1.2.6 Current position

The AFC for L2C is forecast to be £0.625m over budget, while the AFCs for the remaining projects in KO1 are forecast to remain under budget by £3.869m (K2C (£1.969m), Derby Remodelling (£1.9m) and Market Harborough (£0.009m)). The forecast £0.625m overspend on L2C will be accommodated within the £3.868m underspend for the remaining KO1 projects. This gives a net forecast underspend for KO1 of **£3.253m**.

The total AFC for KO1 (to P80 certainty for L2C, K2C and Derby Remodelling (see 1.2.3)) and varying certainties for other projects), of **£1.418bn is therefore affordable within the available budget** (assuming the non-Hendy funding sources are received and the CP6 Hendy forecast is funded), **with a forecast underspend of £3.253m against the available budget**.

The table at section 1.2.5 shows the AFC and budget for KO1, divided by project and including the transfer of funds to cover of movement of utilities, as well as the transfer of £87.6m from KO2 funding outlined at section 1.2.4. This illustrated the forecast underspend for KO1. Spend for each project with annual phasing is shown at section 1.4.2.

The table at 1.3.6 details the Hendy allocation for each project within KO1, funding received from other sources, and the variance between the Hendy allocation and the project AFC. The difference between the AFC and budget is shown for each project and overall.

£33.2m is required to move utilities that cross the railway to make way for Overhead Line Equipment to allow the L2C project to complete. This cost was not originally anticipated and was not included within the Hendy budget as wayleave agreements place a legal obligation on the utility companies to cover these costs. However, utility companies have challenged their obligation under the wayleave agreements on the Great Western enhancements programme, and whilst no legal precedent has been established, to avoid delay in construction it is proposed that NR cover any costs in the short term, without prejudice to the commercial settlement in the long term.

NR have entered into binding Holding Agreements with the relevant utilities companies (UK Power Networks and Western Power) to ensure that no liability is accepted at this stage, and NR will use all reasonable endeavours to recoup this money once works are complete. The Holding Agreements preclude commencement of any legal action until after completion of the relevant works (at the latest 3 months before completion of L2C works, this completion being expected in August 2020). UK Power Networks are not challenging the costs on the Great Western enhancements programme, so can be expected not to challenge on this programme.

Funding to cover this has been transferred from a line speed improvement scheme and is comprised of £22.1m of Passenger Journey Time Improvement funding in CP5 and £11.138m of assumed funding in CP6. Any funds recouped would be managed by the MML Programme Board as decided to be most beneficial, in accordance with their terms of reference.

1.3 Summary of Non-Hendy Funding Arrangements

In addition to the Hendy allocation there are a small number of other funding sources required for KO1. These are:

Funding source and usage	Amount	Period of spend
Renewals contribution (works at Derby)	£58.390m	CP5
Renewals contribution (L2C)	£2.440m	CP5
Renewals contribution (K2C)	£1.239m	CP5
Renewals contribution (Market Harborough)	£0.025m	CP5
Bovis Homes contribution (bridge enhancement, L2C)	£1.3m	CP5
LEP contributions (Market Harborough)	£11.304m	CP5 (£3.3m in CP6)
Stations Commercial Property Fund (Market Harborough)	£1.322m	CP5
PJIF (Market Harborough)	£2.377m	CP5
TOTAL	£78.397m	

Renewals contributions for Derby and K2C are already authorised, while the renewals contribution for L2C is included in the approval sought by this paper. The renewals contribution for Market Harborough will be sought in late 2017 as this scheme matures.

The remaining funding sources are expected to be available, and are included in the expected budget for KO1. As they are not guaranteed though, should this funding not be available extra budget will be required or some descoping of KO1 will need to take place.

The Programme team in DfT also has admin and programme funding for interim staff and external consultants to support the delivery of the programme and the assurance requirements. This DfT funding has been bid for and allocated to the Network Services Intercity team and is subject to the normal Departmental rules on authorising expenditure and corporate planning routes. NR's Systems Integration function is funded through the L2C budget.

1.4 Budget Arrangements

The required funding is managed through the joint NR and DfT governance arrangement set out in the enhancement MOU¹. In this case that will be through the MML Programme Board and Enhancement Portfolio Board.

Changes to spend profiles or forecast costs will be governed through the joint change control process with impacts on the overall enhancement portfolio spending considered as part of this

¹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/509545/mou-dft-network-rail-rail-enhancements.pdf dated March 2016

process. The process for changes has been formalised through the Agreed Commitments Document between DfT and NR (see section 4.4.2 of the Commercial Case).

1.4.1 Detailed cost breakdown

	Budget			AFC			Total AFC	Total Budget
	Hendy KO1 Budget	Other Hendy Funding	Other Funding	Hendy/EDP Funded	Other Funding	Hendy Funded AFC Variance		
KO1 Other Sub-total (K2C & Derby Remodelling)	263,700,000	0	59,629,000	259,832,000	59,628,000	-3,869,000	319,460,000	323,329,000
CP5 MML Kettering to Corby Capacity	131,900,000	0	1,239,000	129,931,000	1,239,000	-1,969,000	131,170,000	133,139,000
Derby Remodelling	131,800,000	0	58,390,000	129,901,000	58,389,000	-1,900,000	188,290,000	190,190,000
PJIF Sub-total	56,484,000	10,740,410	12,651,590	56,484,000	23,383,000	-9000	79,867,000	79,876,000
Market Harborough	30,000,000	10,740,410	12,651,590	30,000,000	23,383,000	0	53,392,000	53,392,000
Leicester South LSI	7,399,000			7,399,000		0	7,399,000	7,399,000
Derby to Sheffield JTI	37,505,000			15,405,000		-22,100,000	15,405,000	37,505,000
Proposed budget transfer to L2C	-22,100,000					22,100,000	0	-22,100,000
Contingency/unallocated for PJIF	680,000			680,000		0	680,000	680,000
Ambergate Enhancement contribution to renewal	3,000,000			3,000,000		0	3,000,000	3,000,000
L2C Sub-total (including Master Wayleaves & National Grid costs)	915,784,624	98,738,995	3,740,000	898,049,478	120,838,995	624,854	1,018,888,473	1,018,263,619
L2C (including KES)	897,200,000		3,740,000	898,049,478		-2,890,522	898,049,478	900,940,000
Budget transfer to Market Harborough LDHSS	-3,515,376					3,515,376	0	-3,515,376
KES								
L2C National GSP - power 2 electric services (KO2)		87,600,357			87,600,357	0	87,600,357	87,600,357
L2C Master Wayleaves - powerline diversions	22,100,000	11,138,638			33,238,638	0	33,238,638	33,238,638
KO1 TOTAL	1,235,968,624	109,479,405	76,020,590	1,214,365,478	203,849,995	-3,253,146 <i>Forecast under budget</i>	1,418,215,473	1,421,468,619

1.4.2 Phased KO1 spend by project (£1000s)

	Previous Years	2014/15	2015/16	2016/17	2017/18	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
	COWD	COWD	COWD	COWD	COWD	Remainder	Remainder	Remainder	Remainder	Remainder	Remainder	Remainder	
Project		Yr 1	Yr 2	Yr 3	Yr4 P1-3)	Y4 P4-13)	Yr5	Yr 1	Yr 2	Yr 3	Yr4	Yr5	Total AFC
KO1 Other & PJIF													
CP5 MML Kettering to Corby Capacity	2740	9933	34333	47071	9552	24429	3112	0	0	0	0	0	131,170
Derby Remodelling	2546	3166	5078	14824	5160	50037	106769	711	0	0	0	0	188,291
Derby to Sheffield JTI KO1	1	101	449	249	289	208	1894	1433	3520	3600	3660	0	15,405
Market Harborough	-11	129	2277	4099	963	11533	31108	3250	44	0	0	0	53,392
Leicester South LSI	1	0	0	77	90	6635	596	0	0	0	0	0	7,399
Contingency/unallocated for PJIF	0	0	0	0	0	170	510	0	0	0	0	0	680
Ambergate Enhancement contribution to renewal	0	0	0	0	0	750	2250	0	0	0	0	0	3,000
MMLE - Overarching GRIP 1 to 8	0	18323			3402	6262	18	0	0	0	0	0	28,005
L2C Track and civils project	0	14859			7646	40209	52757	30236	1341	0	0	0	147,048
Grid Supply Points	0	18162			1247	11054	38287	9406	4528	1890	3025	0	87,600
L2C Route Clearance	0	41276			1780	17893	31003	0	0	0	0	0	91,953
L2C Kettering Electric Stabling	0	2709			452	1581	14330	200	0	0	0	0	19,272
L2C Primary	0	70965			2314	8752	21022	49820	11375	1955	190	0	166,394
L2C AT	0	0			0	0	0	0	0	0	0	0	0
L2C Distribution	0	3048			1577	15706	30624	32812	14906	0	0	0	98,673
L2C Enabling	0	1320			3878	8255	9946	5396	0	0	0	0	28,795
L2C OLE	0	6674			2996	27910	46144	41458	25487	0	0	0	150,668
L2C Ops and maintenance	0	2			121	4119	655	953	0	0	0	0	5,851
L2C Powerlines	0	31			16	2346	19695	11151	0	0	0	0	33,239
L2C Schedule 4 & Possession management	0	3175			407	550	14091	16164	1720	0	0	0	36,107
L2C Signalling & Telecoms	0	7455			1238	6225	35268	24956	7345	0	0	0	82,487
L2C Stations	0	3080			1790	1257	26710	9959	0	0	0	0	42,795
TOTAL	5,277	312,863			44,918	245,883	486,789	237,907	70,266	7,446	6,876	-	1,418,225

*note that figures vary slightly from overall tables due to rounding (£10k difference overall in CP5)

1.5 Cost of Work Done and Committed

	COWD & Contracted Commitments				
	COWD	Contracted Commitments	Total COWD (including Contracted Commitments)	AFC	% of COWD and Comm'd / AFC
KO1 Other Sub-total (K2C & Derby Remodelling)	134,403,000	185,057,000	319,460,000	319,460,000	100%
CP5 MML Kettering to Corby Capacity	103,629,000	27,541,000*	131,170,000	131,170,000	100%
Derby Remodelling	30,774,000	157,516,000†	188,290,000	188,290,000	100%
PJIF Sub-total	8,724,000	0	8,724,000	79,867,000	11%
Market Harborough	7,467,000		7,467,000	53,383,000	14%
Leicester South LSI	168,000		168,000	7,399,000	2%
Derby to Sheffield JTI	1,089,000		1,089,000	15,405,000	7%
Contingency/unallocated for PJIF				680,000	0%
Ambergate Enhancement contribution to renewal				3,000,000	0%
L2C Sub-total (including Master Wayleaves & GSP)	191,077,060	58,017,295	249,094,355	1,018,888,473	24%
L2C (including KES)	170,174,720	56,460,770	226,635,490	898,049,478	25%
KES	2,709,090	524,074	3,233,164		inc. in L2C
L2C National GSP - power 2 electric services (KO2)	18,162,000	0	18,162,000	87,600,357	21%
L2C Master Wayleaves - powerline diversions	31,250	1,032,451	1,063,701	33,238,638	3%
KO1 Total (includes L2C/KES/Other KO1 capacity/JTI projects)	334,204,060	243,074,295	577,278,355	1,418,215,473	41%

*NR advise that all further work is committed for this project, and project is in construction, so total cost included in work committed.

†NR advise that all contracts have been let for this project, and that there is potential financial exposure for the full amount of the AFC. This remains under review between DfT and NR, and should works be halted on this project there is a chance that some costs of work contracted may be recouped.

1.5.1 Risks

The key risks relating to the programme funding are set out below.

- **Cost estimates too low.** The outputs anticipated may not be deliverable within the current cost estimates. **Mitigation:** Project costs will be reviewed on a case by case basis and options to de-scope or defer work will be considered as appropriate. Economic value for money analysis takes into account optimism bias to consider more likely cost overruns. The majority of KO1 projects are at P80, presenting a high level of certainty of their costs. DfT continue to monitor and attend NR risk meetings.
- **Lack of contingency.** The contingency provision within L2C £133m. There is a risk that this contingency within the projects as per NR's risk processes may be too low (contingency is only being held for L2C, as explained at section 1.5.3.2). **Mitigation:** DfT are working with NR to agree a robust management reporting process for contingency on KO1, without seeking to duplicate NR's sponsor role, as well as checking that NR are diligently managing their risk profile and allocation of contingency where it is required.
- **Funding sources outside Hendy allocation not available.** As outlined at section 1.3, some funding sources are not guaranteed, and if not available further funding will be needed or KO1 will need to be descope. **Mitigation.** Work continues with NR to gain contractual guarantees of funding availability.

The Department has also piloted a new assurance approach for MML KO1, with the aim of carrying out robust assurance efficiently in a way that both NR and DfT can rely upon. An external consultant has been appointed by DfT to monitor NR's own assurance procedures and report back to the DfT with a report, the recommendations of which are being acted upon.

1.5.2 Opportunities

For L2C, known and quantified schedule opportunities have been included in NR's QCRA process (see section 1.5.3). NR are exploring and quantifying further opportunities regarding potential efficiencies through different methodologies of work, including the use of high output construction methodologies on the construction of Overhead Line Equipment (OLE). The approximate total forecast value of the potential efficiencies, if all were realised, is £5.663m.

There is also an opportunity to gain further access to conduct enhancements work at different periods. These are subject to industry consultation and are being explored by NR, with a potential reduction of 6 weeks on the delivery time of L2C. This will be considered by the MML Programme Board in Autumn 2017.

NR have been remitted by DfT to take on the Systems Integration role for KO1, which may present opportunities for efficiencies in schedule and cost.

The October 2016 KO1 OBC stated that DfT and NR were conducting a value management review to assess the scope of the electrification works and identify opportunities to reduce costs whilst minimising reductions in outputs, for example, the impact of deferring delivery of Bedford-Corby electrification 12 or 24 months. This option has been looked at and while there is potential for £150m scheme cost to be reclaimed in the short term, this would only be a deferral, and would therefore cause scheme benefits to be deferred also.

1.5.3 NR Quantitative Risk Assessment

1.5.3.1 L2C

A NR Quantitative Cost Risk Assessment (QCRA) has been undertaken on all cost elements of L2C. This process has reviewed the L2C project assumptions, risks and opportunities around cost and gives an uplift allowance based on the project's lifecycle including consideration made for risk likelihood and impact, cost certainty and scope certainty. The output of this QCRA process is a risk

exposure which has informed the contingency on the L2C project. A similar process has taken place with schedule, through a Quantitative Schedule Risk Assessment (QSRA).

The risk assessments were conducted between NR sponsors, project teams, supply chain and the Department. The Risks, Opportunities and Assumptions were taken from live project trackers, which have been subject to review prior to the risk assessments taking place.

QCRA has resulted in a contingency of £133m being held by NR for L2C, while QSRA gives a P80 date of August 2020 for full completion of KO1 works. For delivery of KO1's priority works, which would allow services to run on the upgraded infrastructure and delivery of KO1 benefits, the P80 date is May 2020 (this excludes electrification of slow lines between Wellingborough South Junction and Bedford).

1.5.3.2 Remainder of KO1

K2C and Derby Remodelling are authorised for delivery, and this included the QCRA process. NR are managing risks and the correct contingency for these works to ensure their delivery to the regulated milestones. For the remainder of KO1 schemes (accounting for 5.6% of KO1 AFC), NR risk processes including QCRA and QSRA will be carried out as they reach higher levels of maturity.

1.5.4 Reference Class Forecasting

Independent analysis has been conducted by Oxford Global Projects using the 'Reference Class Forecasting' (RCF) method to provide a benchmark comparison against nearly 180 similar Western European rail upgrade programmes. This analysis was then applied to L2C, as completion of L2C will see completion of KO1, and K2C and Derby Remodelling are at a high level of maturity so NR's contingency should be adequate for these projects.

Traditional assessment of cost and timeframes in projects is based on 'bottom up' inside view of what is required which is nearly always too optimistic about costs and timescales and overestimates benefits.

The Reference Class Forecasting method says that the best predictor of performance in a planned project is actual performance in a class of completed comparable projects. The studied reference class of projects also shows that there is a different level of cost risk exposure depending on the maturity of the project costing. As would be expected, cost risk reduces as the project matures due to the scope becoming clearer and uncertainty reducing. This continues until the project reaches the point of contracting for delivery with firm contract cost controls at which point there is a step change reduction in cost risk beyond that point.

Application of RCF shows a latest indicative date for delivery of L2C (which will signal completion of KO1) of May 2021 (with a date of January 2021 for KO1 priority works) and potential extra funding required of £131m in addition to the contingency already contained within the L2C AFC. RCF identifies factors likely to lead to delay or cost overrun, and these are being mitigated and managed through DfT and NR risk processes, as well as the actions identified at 1.4.1 and 1.4.2.

The RCF and QSRA dates are summarised in the table below.

Scope	Assumed DfT/SoS Authority Date	P50 Infrastructure Ready Date	P80 Infrastructure Ready Date	RCF multiplier average schedule slippage from the reference class is 30% to the number of months between Authority Date & P50 Date, 11.8% to the number of months between Authority Date & P80 Date	RCF Forecast Infrastructure Ready Date
Priority	October 2017	March 2020	May 2020	RANGE: 3.5 months on top of the P80 date 9 months on top of the P50 date	September 2020 – January 2021
Full	October 2017	June 2020	August 2020	RANGE: 4 months on top of the P80 date 11 months on top of the P50 date	December 2020 – May 2021

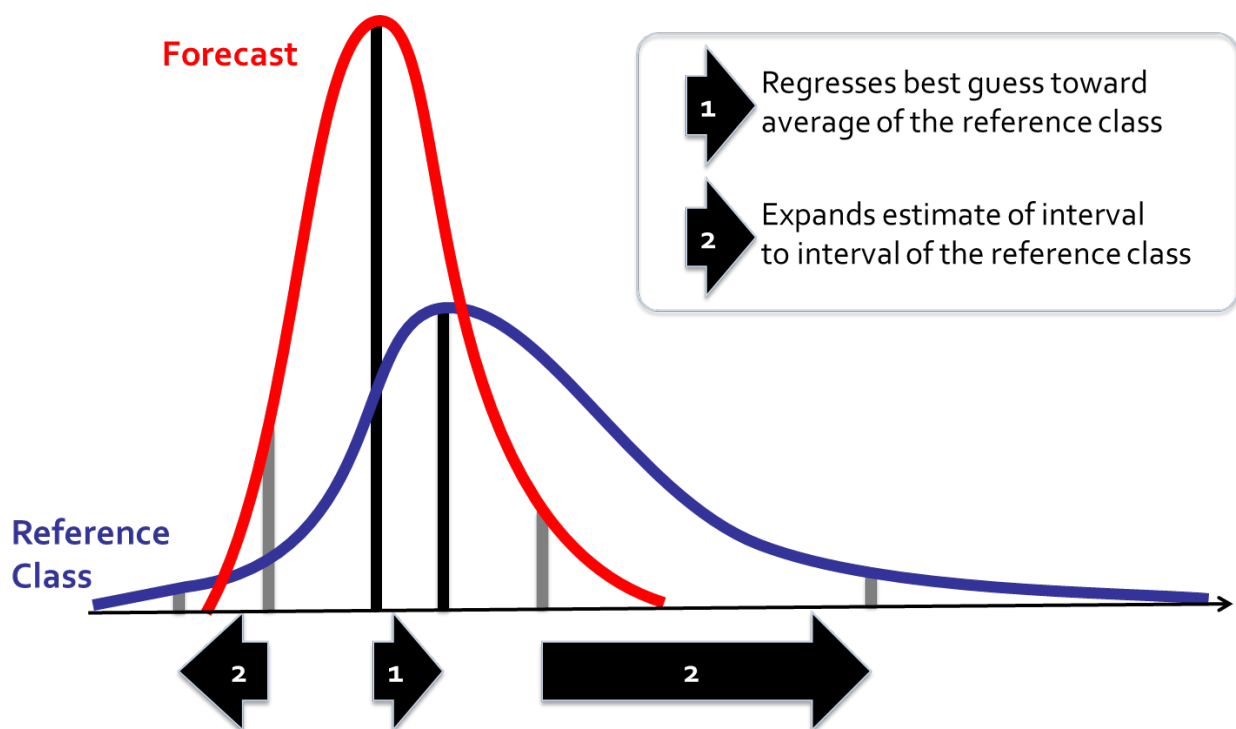


Figure 1 Reference Class Forecasting Regression

The RCF shows a level of schedule slippage can be expected based on previous comparable upgrade programmes. The average schedule slippage from the reference class is 30% to the number of months between the approval of the Full Business Case and the P50 delivery date, and 11.8% to the number of months between the approval of the Full Business Case and the P80 delivery date. This requires flexibility in the rolling stock procurement strategy as part of the East Midlands franchise competition.

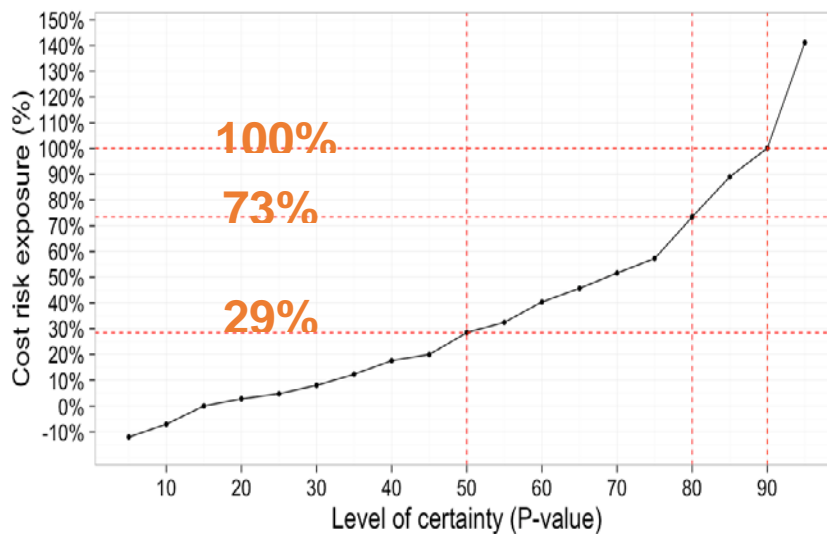
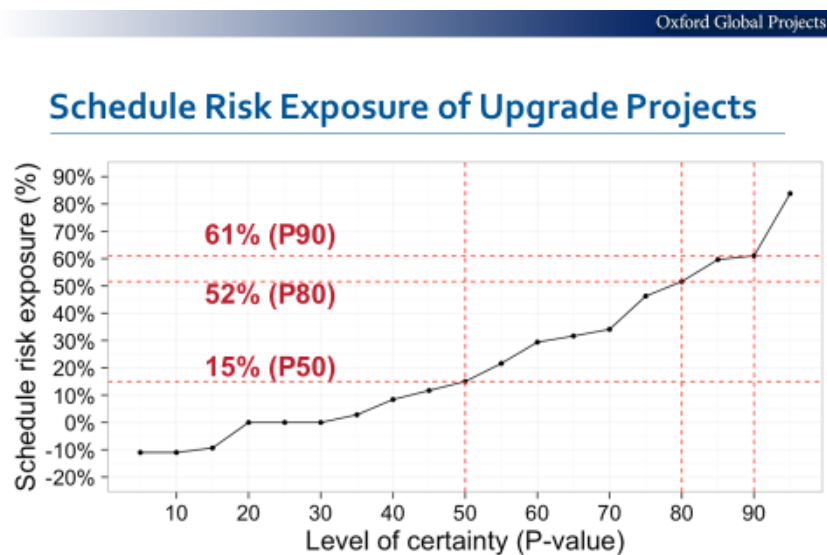


Figure 2 Cost Risk from RCF Modelling



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Figure 3 Schedule Risk from RCF Modelling

The studied reference class of projects also shows that there is a different level of cost risk exposure depending on the maturity of the project costing. As would be expected, cost risk reduces as the project matures due to the scope becoming clearer and uncertainty reducing. This continues until the project reaches the point of contracting for delivery with firm contract cost controls at which point there is a step change reduction in cost risk beyond that point.

The cost risk exposure is shown at Figure 4 for different levels of project maturity and this is related to the optimism bias guidance for DfT transport business cases in Figure 5. The optimism bias guidance recognises that a different level of risk should be applied depending on the maturity of the project with significantly more risk applied to early stage projects.

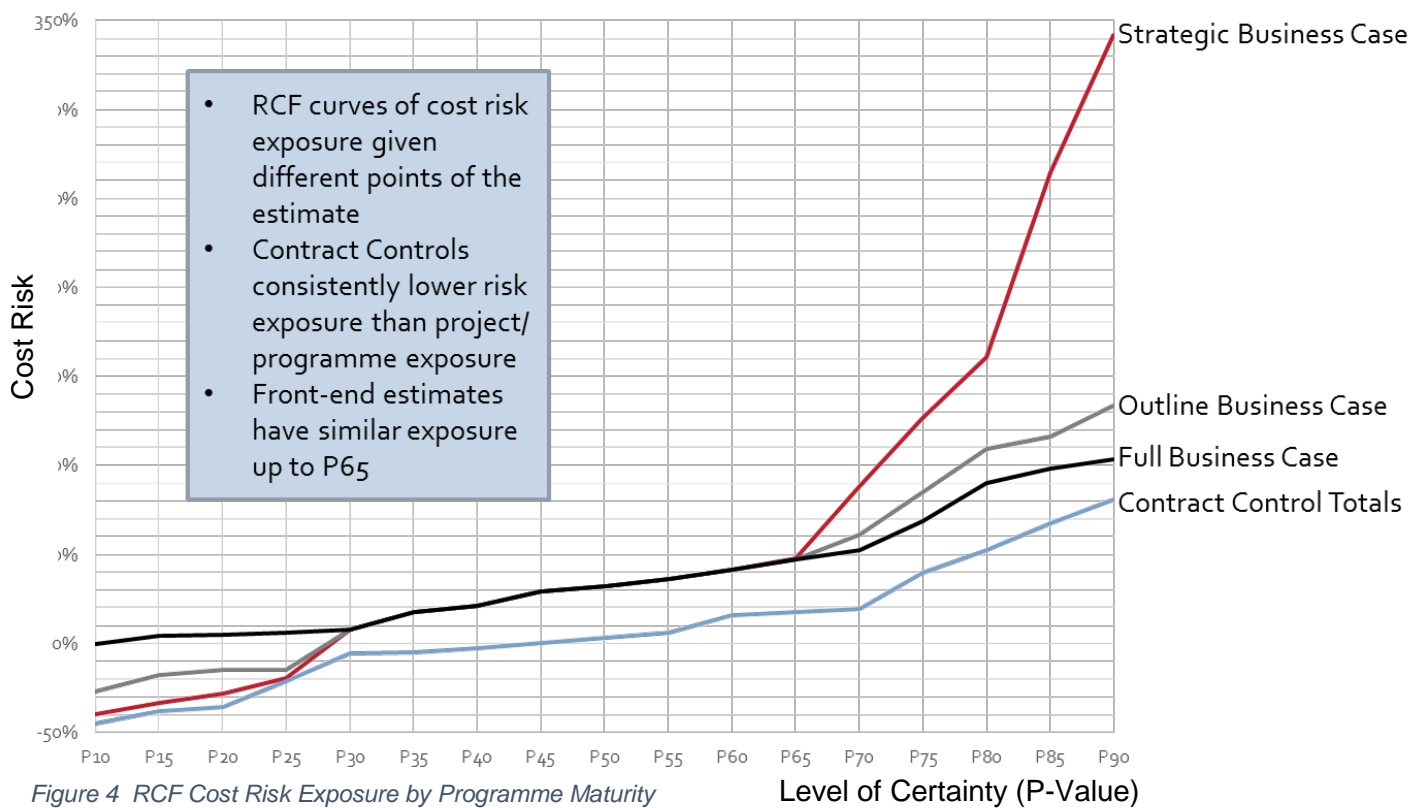


Figure 4 RCF Cost Risk Exposure by Programme Maturity

DfT Guidance		Project definition	Pre-feasibility	Option selection	Single option refinement	Design development
	QRA contingency	NA	NA	NA	QRA at mean estimate	QRA at mean estimate
	Optimism uplift	66%	50%	40%	18%	6%

RCF	Cost Risk Exposure	Strategic Business Case	Outline Business Case	Date of Decision to Build (Final Business Case)	Contract Control Totals
	P50	32.0%	32.0%	32.0%	3.2%
	P80	160.7%	109.1%	90.2%	52.5%
	P90	341.7%	133.4%	103.4%	80.6%
	P(MEAN)	72.6%	38.7%	39.6%	9.8%

- RCF database shows that P50 cost risk exposure is unchanged during the front end
- P(Mean) – which is comparable to DfT guidance – reduces from 73% to 10% throughout the front end

Figure 5 RCF Cost Risk Exposure Compared to DfT WebTAG Guidance