

Date: 12 March 2014

Item 19: Transport for London Road Network Capital Renewals

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**This paper will be considered in public**

**1 Summary**

- 1.1 This paper provides an overview of the 2014/15 capital renewals programme for the Transport for London Road Network (TLRN). This is a mature business-as-usual programme.
- 1.2 At its meeting on 26 February 2014, the Projects and Planning Panel noted the proposals in this paper and supported the recommendations to the Committee.

**2 Recommendations**

- 2.1 **That the Committee note the paper and:**
  - (a) **approves Project Authority of £56.6m in financial year 2014/15 to deliver the TLRN Capital Renewals Programme; and**
  - (b) **approves an increase of £2.590m to the 2013/14 budget, taking the estimated final cost from £54.904m to £57.494m.**

**3 Background**

- 3.1 The TLRN is 580km long, constituting approximately five per cent of London's roads but carrying around one third of London's traffic. The TLRN consists of 2,554 lane km of carriageway; 1,100km of footway; approximately 1,800 structures; 12 road tunnels; over 40,000 lit assets; as well as traffic signs, drainage, street furniture, vehicle restraint barriers (VRS) and green estate.
- 3.2 Capital Renewals is business-as-usual planned maintenance that lengthens the useful life of an asset, either by replacing it with a new one, typically like for like, or with a modern equivalent. Examples of capital renewals on the TLRN include carriageway resurfacing, re-laying footways, component repairs and replacement for bridges and tunnels, replacing street lighting, drainage repairs and re-planting trees.

**4 Strategic Alignment**

- 4.1 TLRN Capital Renewals supports and aligns with TfL's duty under the Highways Act (1980) and supports the Mayor's Transport Strategy (MTS) goal of bringing and maintaining all assets to a State of Good Repair. The programme also supports one of the key themes of the TfL Business Plan: maintain underlying infrastructure so that it is fit for purpose and the Surface Outcome: Ensuring

reliable operation of London's road network for all users, while reducing congestion.

4.2 Table 1 summarises how TLRN Capital Renewals support the aforementioned legislation and objectives.

**Table 1 – Alignment to Strategic Objectives**

<b>Source</b>	<b>Duty, Goals and Outcomes</b>	<b>How this is supported by the TLRN Capital Renewals Programme</b>
The Highways Act (1980)	Maintain the public highway	This programme directly supports this duty through the timely and appropriate renewal of assets.
Mayor's Transport Strategy	Bringing and maintaining all assets to a State of Good Repair	Capital renewals are essential for achieving and maintaining the State of Good Repair, this cannot be achieved through routine and reactive maintenance alone.
TfL Business Plan	Maintain underlying infrastructure so that it is fit for purpose	The primary role of the programme is to maintain TLRN infrastructure (roads, footways, bridges, tunnels etc) to the appropriate level of safety and reliability.
Surface Outcome	Ensuring reliable operation of London's road network for all users, while reducing congestion	Appropriate safety and reliability are achieved by maintaining the assets to the right level of service and condition. This minimises risks of network disruption, e.g. due to asset failures, closures or restrictions. Disruption due to roadworks is minimised by co-ordinating capital renewals with other TfL and third party works.

## **5 Options Considered**

5.1 The programme is developed in accordance with latest asset management standards and guidance: British Standards Institution's Publicly Available Specification 55 (BSi PAS 55) and the International Standards Organisation 55000 (ISO 55000). Some of the practices are recognised as Best Practice and were commended by the TfL Programme Management Office (PMO) and the Independent Investment Programme Advisory Group (IIPAG) under the Annual Integrated Assurance Review.

5.2 Embedded asset management practices include Asset Investment Modelling and Value Management, which are used to determine the optimum investment levels and how it is allocated. These techniques were used to analyse a wide range of investment scenarios and assumptions, including severe weather impacts for 2014/15 and further ahead.

- 5.3 The proposed 2014/15 programme represents the optimum allocation of resources. This will maintain the State of Good Repair (SOGR) of the carriageway at 91 per cent and footway at 94 per cent; this aligns with the lower and upper bounds of 90 and 95 per cent for SOGR that have been set using:
- (a) **Customers Surveys** – 90 per cent represents the lower level of condition that motorists are willing to accept; a survey of cyclists undertaken in November 2012 indicates their lower bound is slightly higher at 92 per cent. Improving/maintaining condition towards the upper bound (95 per cent) will improve customer satisfaction levels; and
  - (b) **Whole Life Costs** – long-term deterioration modelling (20 years plus) for carriageway and footway has demonstrated that maintaining condition towards the upper bound level (95 per cent) reduces whole life costs by (i) allowing timely and proactive intervention; (ii) reducing the impact of winter damage because there are fewer defects/weaknesses that can be exploited by the weather; and (iii) reducing the number of reactive defects and therefore the associated risk of liability claims.
- 5.4 Appendix 1 provides further details on how TfL defines the appropriate SOGR.
- 5.5 The Project Authority being sought is £56.6m in financial year 2014/15 to deliver the TLRN Capital Renewals Programme. This figure is budgeted in the TfL Business Plan. The £56.6m includes:
- (a) an additional allocation of £1.66m from the DfT for carriageway resurfacing in 2014/15;
  - (b) the transfer of £0.69m budgeted authority from Bus Stations and Stands delivery programme (ST-PJ27C) to deliver drainage repairs in tandem with carriageway works under profit centre ST-PJ188C in 2014/15; and
  - (c) the carry forward of £0.065m for the Network Asset Management System.
- 5.6 The increase of £2.59m to the 2013/14 budget, taking the estimated final cost from £54.904m to £57.494m, is projected to deliver an additional 57,000m<sup>2</sup> of carriageway resurfacing. This will take the 2013/14 outputs from 650,000m<sup>2</sup> to 707,000m<sup>2</sup>.

## 6 Programme Deliverables

- 6.1 A summary of the 2014/15 programme is provided in Table 2. The programme will be delivered through the London Highways Alliance Contracts (LoHAC).

**Table 2: 2014/15 Programme Outputs**

<b>Asset</b>	<b>Output measure</b>	<b>Budget (£'m)</b>	<b>Output Targets</b>	<b>Commentary</b> (all programmes include investigation and designs for the 2015/16 prog.)
Carriageways	m <sup>2</sup>	23.98	560,000	Carriageway resurfacing (includes £1.66m additional allocation from DfT)
Structures	Projects	12.38	37	Includes expansion joint replacement, bearing replacement, waterproofing, concrete repairs, metalwork repairs, and painting
Footways	m <sup>2</sup>	5.07	53,500	Footway relaying
Lighting	No. of columns	4.41	900	Replacement of life expire assets – luminaires will be replaced with energy efficient LEDs
	No of luminaires		1200	
Tunnels	Projects	3.51	10	Includes repair to tunnel structures and renewal of Mechanical & Electrical equipment
Vehicle Restraint System	m	3.93	13,000	Repairing and/or renewing, and, where supported by rigorous risk assessment, removing
Drainage	Network Treated (m <sup>2</sup> )	1.90	600,000	Repair, renewal and upgrade of highway drainage, e.g. gullies and pipes
Landscape	No. of trees	0.24	circa 700	The programme includes a mix of hard and soft planting
Furniture	km of PGR removed	0.35	TBC	PGR – Pedestrian Guard Rail High cost and high complexity schemes which will be assessed on a case-by-case basis
Pump Stations	Projects	0.54	12	Renewal of pumps and telemetry
Asset Mgmt System	N/A	0.29	n/a	Fixed service costs
<b>Total</b>		<b>56.60</b>		

## **7 Legal Implications**

- 7.1 All works in the programme follow well defined delivery processes that take account of the relevant legislative requirements.

## **8 Views of the Projects and Planning Panel**

- 8.1 At its meeting on 26 February 2014, the Projects and Planning Panel noted this programme and supported the recommendations to the Committee. The Panel was provided with details of recommendations and findings by the PMO and the IIPAG and was satisfied with the management responses to the findings.
- 8.2 The Projects and Planning Panel requested that the Finance and Policy Committee paper include detail on how TfL defines the appropriate percentage for State of Good Repair; this is provided at Appendix 1.

### **List of appendices to this report:**

Appendix 1: Defining the optimum State of Good Repair

### **List of Background Papers:**

None

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## Defining the optimum State of Good Repair

### General

This appendix provides an overview of how the Asset Management Directorate in Surface Transport defines the optimum State of Good Repair (SOGR) for assets.

### Asset Investment Modelling

Asset Investment Modelling techniques are used to inform the optimum State of Good Repair (SOGR) for infrastructure assets. These computerised tools enable a wide range of parameters and scenarios to be readily analysed, for example:

- Predicting how asset condition and performance will change over time
- Predicting the impact of severe weather events (e.g. rainfall and winter weather) on asset condition and performance – enabling assumptions around frequency of these events to be varied
- Assessing the impact that different levels of service and asset condition have on safety risk, functionality and customer satisfaction
- Assessing the impact and calculating the cost of different treatments and interventions on asset condition and subsequent deterioration
- Comparing and trading-off between capital and operational expenditure

This enables the costs, risks and opportunities, and customer satisfaction of alternative strategies to be readily assessed, for example:

- Assessing the impact of different investment strategies on SOGR
- Assessing the investment required to deliver target levels of SOGR

Investment modelling has been used to inform the optimum range for SOGR by balancing risk, whole life cost and customer satisfaction. The current Business Plan investment seeks to improve the SOGR of carriageway to 94 per cent by 2023. Investment modelling has demonstrated that delivering a SOGR for carriageway of above 95 per cent delivers sub-optimal whole life value. It indicates that the benefit achieved for every pound invested when SOGR is above 95 per cent is less than one pound – meaning the Cost/Benefit ratio is less than 1:1 when SOGR is over 95 per cent.

### Example: 94 per cent vs. 97per cent SOGR for Carriageway

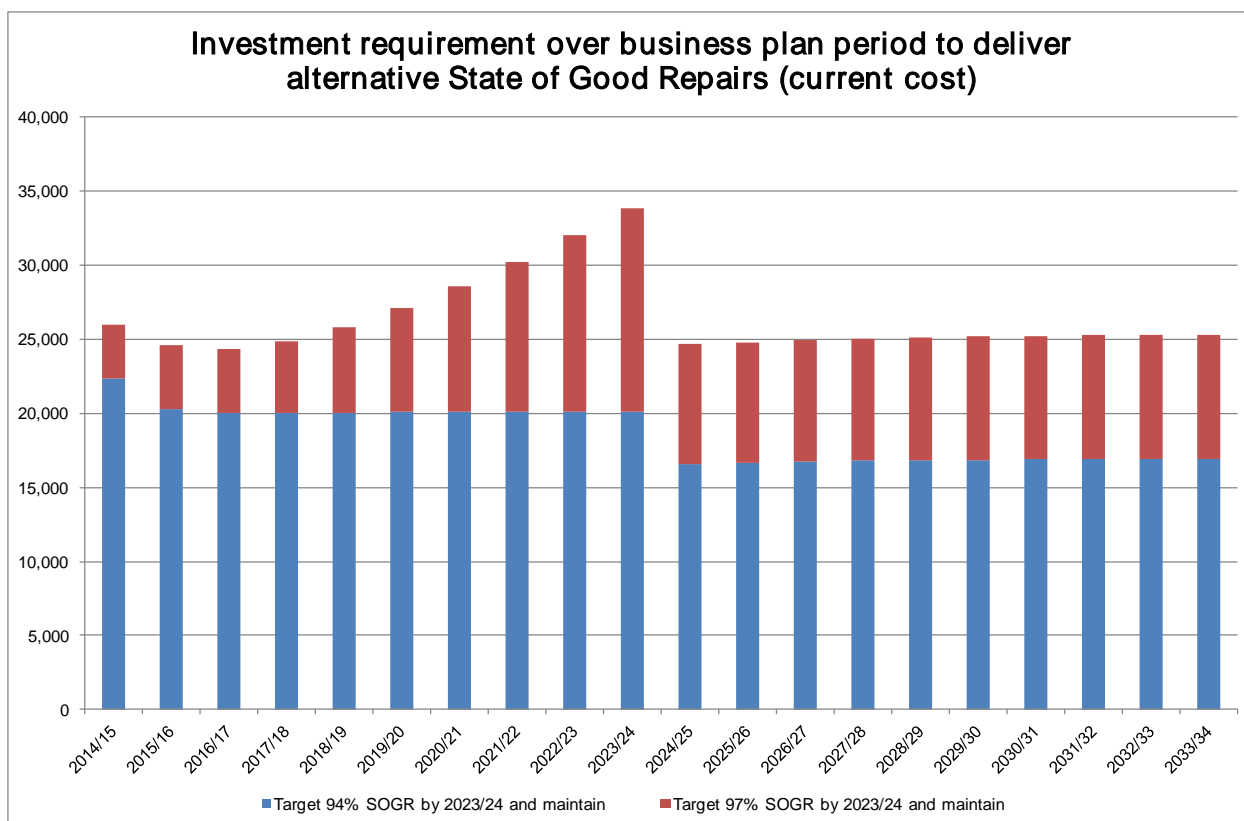
For the purpose of this appendix, the asset investment model has been used to compare two alternative strategies, both with a starting position of the current SOGR of 91 per cent.

- Strategy 1 – improve SOGR to 94 per cent by 2023 and maintain thereafter (current Business Plan investment)
- Strategy 2 – improve SOGR to 97 per cent by 2023 and maintain thereafter

The investment required to deliver these strategies is shown in Figure 1 (shown as current cost). Figure 1 shows that a substantial increase is required to achieve 97 per cent SOGR by 2023 and maintain thereafter. The increase in investment is a result of the earlier interventions required to maintain the higher standard. That is, looking at the conversion of SOGR, the percentage classified as not in SOGR changes from 6 per cent to 3 per cent, meaning a 50 per cent reduction in the amount of the network classified as not being in a SOGR. The difference, in actual cost, is shown in the table below. It shows a 40 per cent to 50 per cent increase in investment is required to deliver and sustain a 3 per cent improvement in SOGR.

**Table A1: Long-term investment (actual cost)**

Target condition	Total investment 14/15 to 23/24	% difference	Total investment 24/25 to 33/34	% difference
94% SOGR	£238m	38% increase	£278m	49% increase
97% SOGR	£328m		£415m	



**Figure 1: SOGR investment comparison**

Other key factors in the current strategy:

- **Network Access** – the increased frequency of intervention and increased volume of work required to maintain a higher standard would be challenging in terms of network access
- **Economies of scale** – maintaining a higher SOGR for carriageway and footway reduces the size of individual projects, i.e. smaller/localised areas of the network in poor condition. This exacerbates network access but also removes the economies of scale that are achieved from defining larger projects that offset design and traffic management overheads.

The parameters and approaches in the asset investment models are reviewed annually and analyses re-run with the latest asset condition and cost data. The outputs are used to inform and update the Business Plan.

### Cycling

Further work is planned in 2014/15 to improve TfL’s understanding of the quality of carriageway surface required by cyclists. Initial work has indicated that that cyclists requirements align with the upper end of the SOGR range (95 per cent).

## **TLRN and Borough Roads**

Across London the SOGR of roads vary significantly, depending on location, usage and class of road. TfL maintain the strategic roads (the TLRN), which accounts for around 5 per cent of London roads, London Boroughs maintain the rest of the road network and each borough has their own asset management strategies, plans and levels of service.