

Independent Investment Programme Advisory Group

Asset Information in TfL – Part 1: Senior Management Information

Status: Final Draft

Version: V3

Date: 8th June 2021

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Document control

Document History

Version	Date	Changes since previous issue
V01	16 th April 2021	First Draft for review
V02	29 th April 2021	Incorporated review amendments
V03	8 th June 2021	Final draft

Distribution:

To be confirmed.

1. EXECUTIVE SUMMARY

This report is the first part of a two part study into the way information on assets is generated and used within TfL. This first part considers how data on asset condition, risk and performance (asset health) is presented at senior level, how it is interrogated and used, and how this translates to business decisions. The second part of the study, later this year, will consider how asset information is generated, its completeness and quality.

TfL is an asset intensive organisation: reliable asset performance underpins customer experience across all modes and the business spends a significant proportion of its budget on sustaining and renewing its fixed and mobile assets. With this background, the importance of maintaining a good understanding at senior level of current asset health and trends is evident. In addition, good practice suggests that visible senior level leadership and commitment is crucial to effective asset management.

We found that improvements have been made in several areas over the past two years. For example, awareness of asset health and focus on asset issues at senior level has been increasing and spending is being prioritised on renewals through the business planning process. Concerns remain however that availability of transparent asset data at senior level and visibility of asset health 'on the ground' and its implications, in terms of costs and impact on service levels, could be improved.

An assessment of current asset health across TfL would be a major undertaking which is beyond the scope of this report. Anecdotally though there are concerns over the level of renewals undertaken over the past few years and the impact on asset health in some areas. This is evidenced for example in recent renewals authority papers for both Surface and LU.

We found that improving the visibility of asset health and risks at senior level could be greatly helped by developing a common set of metrics across the whole of TfL, such as the 'state of good repair' used by Surface for their highways assets, by which key trends could be tracked. Such metrics could be consolidated into an assets scorecard which, if well designed, would aid concise communication of asset information at senior level.

We also think that the inclusion of designated asset strategy or engineering specialists in senior level meetings could aid focus on asset issues, demonstrate TfL's commitment to sound management of its asset base and create a direct 'flow down' to the business from the highest level on asset related issues.

2. INTRODUCTION

Transport for London is an asset intensive organisation. It depends on the reliable functioning of a large number of fixed and mobile assets to deliver its services. Any general reduction in asset condition over time will lead to a decline in customer experience if it continues long enough and, eventually, to a raised level of safety risk. Spending on asset maintenance and renewals (as distinct from enhancements) made up approximately 11% of TfL's total spending in the year preceding Covid19 (excluding Crossrail). The trend over the last ten years for maintenance and renewal spending has been downwards in absolute terms and as a proportion of TfL's total spending, as shown in Table 2.1 below.

Year	2010/11	2015/16	2018/19
Total Spend (operating & new capital) (£m)	7083	8791	7929
Maintenance & Renewal spending (£m)	1499	1487	871
Maintenance & Renewal spending as a % of total	21%	17%	11%

Table 2.1: Maintenance and Renewal Spending as a Percentage of TfL Total Spending

This cross cutting review was prompted by a general reduction in asset renewal budgets for 2018/19 and 2019/20 which followed the loss of TfL's government grant. The plan was that, following a freeze on assets spending, renewal budgets would be restored for 2020/21 and beyond. As a result of Covid19 however spending for 2020/21 generally failed to reach planned levels because of the impact of the safe stop. As an example, Surface renewals in 2020/21 were only around 70% of what had been planned.

To understand the impact of this three-year reduction in renewals spending we looked at fixed assets in Surface and LU. The State of Good Repair (SOGR) measure for Surface highways assets has declined and the number of assets requiring closure or interim measures to manage safety has increased (Surface Renewals PIC paper). The situation for LU assets is similar. Budgets for asset renewal in LU are considered to have been below the level required to sustain the assets in a steady state for the past five years and in 2020/21 only the most critical issues are being addressed within the available budget (LU Renewals PIC paper).

In the context of competing demands for funding and overall reductions in TfL's revenue, the importance of reliable asset information to support decision making at senior level cannot be overstated. To be of maximum use, such asset information should include trends in asset condition, capability, performance and risk. For brevity, in this report we refer to this as 'asset health' data.

TfL's assets vary greatly in their lifecycle but the common feature of them all is that to maximise their useful life at the lowest whole-life cost, they require planned maintenance, based on their condition and observed or predicted deterioration rates.

3. REVIEW SCOPE AND METHODOLOGY

This report is the first part of a two part cross cutting study into asset information within TfL. This first part considers how and to what extent asset information is currently presented at senior level leadership and board meetings, how it is interrogated and used, and how this translates to business decisions.

The second part of this study, to be presented later this year, will consider at a more granular level the quality of asset data available, its completeness and how it is generated and analysed to generate reliable information and forecasts for use in managing TfL's asset base.

This report is based on a number of interviews with TfL Directors and Managers in Engineering, Asset Strategy, Asset Operations, Business Strategy and Finance.

4. WHY DOES ASSET HEALTH MATTER?

The Institute of Asset Management (IAM) defines asset management – of which the management of asset health is a part – as using assets to deliver value and achieve an organisation's business objectives. In an asset intensive organisation such as TfL, customer experience within each mode depends on the reliable and safe performance of multiple asset types, each of which deteriorates in different ways and at varying rates.

Maintaining asset health at appropriate levels underpins TfL services across all modes, whilst its deterioration generally results in reductions in reliability, increasing levels of risk and negative customer impacts. Deteriorated assets are generally more costly to maintain in service and if not carefully managed can become a safety risk. Just as assets have differing lifecycles, the impact of their failure on safety and services varies greatly.

The health of an asset population is maintained through planned cycles of maintenance and renewal. Because different types of asset deteriorate at different rates, their economic life and optimal cycles of renewal vary, ranging from decades for mechanical and electrical plant and rolling stock, to over 150 years for some civil engineering assets. Reductions in renewal spending for some asset types may have little immediate apparent impact; they will however result in a backlog of deferred renewal work which will reduce asset health across the population and, if not addressed by subsequent increased spending, will impact customer experience at a point in the future.

Asset health also matters because managing it, through spending on maintenance, renewals and asset operations, represents a significant proportion of TfL's expenditure. Deferring renewal work is likely to cost more over an asset's life, through spending on mitigating the risks posed by deteriorated assets and through the need to make larger and more costly interventions. It may also require more extensive network interruptions to carry out the work, with potentially negative reputational effects. Maintaining optimum levels of asset health, through techniques such as whole-life cost management, will reduce overall costs and minimise negative impacts on customer experience.

When spending on assets has to be reduced, a detailed understanding of current asset health and its recent trend becomes even more important in order to help manage increasing safety risk, and to mitigate impacts on services.

5. HOW SHOULD SENIOR MANAGEMENT ENGAGE WITH ASSET HEALTH

Good practice in asset management, as defined by the IAM, views senior level leadership and commitment as crucial in organisations that aspire to maximise value from their assets. This requires clear connectivity between an organisation's strategic plan and asset management activities. The IAM defines this as 'alignment' or 'line of sight', enabling everybody to understand how they contribute to success. Effective 'line of sight' means that senior management decisions on spending priorities, strategies and plans must be informed by robust information on asset health across the organisation.

Since assets are fundamental to the delivery of TfL's services and to meeting customer experience targets, deterioration in asset health increases organisational risk. Understanding the level and potential impacts of risk across the key asset types within each mode is therefore an essential function for senior management. This understanding can be strengthened by regular review of trends in asset health and risk.

6. OUR FINDINGS

6.1 Current Perceptions of Asset Health

We think that, in general, asset health in TfL is being effectively managed and safety risks are being successfully mitigated. Our view is that the processes for monitoring assets and generating maintenance and renewal workbanks are generally robust. However in some areas, the volumes of renewal work being delivered over the past few years have been inadequate to maintain the asset population in a steady state over the long-term; the trend has, in the main, been one of gradually deteriorating condition and an associated increase in risks requiring mitigation across TfL's asset population.

We heard several times during this review that concerns over asset health do exist in particular areas and in some cases have been present for some time. Where safety or legal risks are identified they are being dealt with, or the risks arising are being managed, but this is not necessarily the case where the issue is simply one of deteriorating condition, with a backlog of renewal work that should be completed to minimise whole-life costs. Asset health concerns are magnified for some asset types by recognised gaps in asset data which could be masking condition issues: some types of civil engineering assets are examples of this issue.

In some areas, spending over the past 3 years (including the impact of Covid19) has been insufficient to keep pace with asset deterioration. As an example, within the LU Renewals sub-programme the number of Code 1 and 2 concerns (safety or legal) has been increasing for the past 2 years. In this context, concerns over gaps in asset data and unknown or hidden asset defects, that may be difficult to detect by normal inspection methods, are understandable.

There is also significantly more concern over the potential future direction of asset health and its implications for customer service levels and the management of safety, given current levels of asset health and the uncertain funding environment, which makes long-term commitment to increased asset renewal spending very difficult.

6.2 The Value of Asset Health Metrics

Given TfL's large and varied asset population, tracking asset health for the many types of asset that contribute to the functioning of, for example, the LU or Surface systems is complex.

Because TfL's operating units have developed separately, they track asset health in different ways and use indicators or metrics of asset health to differing degrees. For example, in LU the annual Asset Condition Report (ACR) provides data on asset condition, risk, mitigation and opportunity, whilst in Surface a State of Good Repair (SOGR) metric for key highway asset types has been developed.

The lack of a 'common language' on asset health across TfL reduces the transparency of asset health data and holds back the development of common processes and improved efficiency in asset management.

Also important are trends in asset health. The long life of many asset types and their varying rates of deterioration, together with the relative imprecision of all such measures, means that trends over time can be just as important as current values in interpreting the real condition of assets. Viewing trends over (say) a 10 year timescale provides perspective and tells its own story. When plotted with usage or spending levels they can provide validation of the meaningfulness of the metrics themselves. Given the generally slow response of asset populations to changes in expenditure, decisions on renewal spending levels should be informed by an understanding of long-term trends in asset health whenever possible.

Useful asset health metrics are not limited to condition indicators like SOGR. They can also include proxies for risk, such as the number of interim measures in place (used to mitigate risk, e.g. speed restrictions), or numbers of category 1 or 2 concerns. Like indicators of condition, when plotted as a trend, risk proxies such as these can give a helpful insight into the levels of risk being managed day to day on the network and how this is changing over time.

Standardising asset health metrics across TfL, to the greatest extent possible, would aid efficiency and transparency. Where national measures exist, TfL metrics should utilise them. For example, Surface use the UK national 'bridge condition indicator' score to form the basis of the SOGR for highway structures. Similarly for carriageway surfacing the UK 'pavement management system' scoring is used. This allows some comparison between TfL's condition metrics and those of other authorities, such as Highways England.

Our advice is that a common set of asset health metrics should be developed and implemented as soon as possible to enable asset health and trends for key assets to be compared across TfL. We understand that work is underway to define a SOGR as a leading asset health metric for assets outside Surface Highways and we endorse this approach. We think that all asset types need a measure of SOGR or similar metric, although this is likely to be defined and measured differently for different assets. In addition, it is important that a SOGR measure also recognises the varying impact of failure of different assets on both safety and service levels to maximise the value and comparability of the metric.

We also recommend that a new scorecard should be established specifically for TfL assets. To be of the greatest value this should capture standardised measures of asset health for key asset types and allow 'drill down' for greater detail. Whilst the recent inclusion of a general SOGR measure for all assets on the TfL scorecard is a positive step, we believe that the level

of detail provided by an asset specific scorecard would be of greater value to those needing a high-level understanding of asset health across differing modes and units. Such a scorecard could form the basis of quarterly senior level scrutiny of asset health by the responsible Boards. The Safety Performance Index dashboards produced for London Rail are a good example of how data of this type can be presented clearly and succinctly.

6.3 Senior Level Visibility of Asset Health

The Asset Management Maturity Assessment, carried out by Jacobs on London Underground (LU) approximately two years ago, highlighted the need for LU's top leadership to commit to and demonstrate ongoing belief and support for the asset management process. Although this assessment was restricted to LU only, we believe that, in respect of this recommendation at least, it was representative of the wider TfL organisation.

Since the Maturity Assessment was completed it is good to report that the perception, amongst those interviewed for this review, is that the situation is improving. Several people commented that a cultural shift is happening and that there has been a growing focus on asset health at senior level over the last 18 months.

Perceptions remain however that senior level understanding of asset issues, the reality of asset performance 'on the ground' and its implications could be further improved by access to more concise and easily digestible asset health data. This perception is echoed at Director level.

Our impression is that whilst asset issues are certainly considered at senior level meetings, for example when reviewing authority papers for renewals programmes, they are often not informed by review of data on asset health. As an illustration, we have noted that some authority papers to PIC for renewals funding contain little or no information on the current or planned health of the assets they are seeking funding for. This is certainly not helped in many cases by the lack of common metrics enabling concise communication of asset health. We think that effective senior level discussion would be helped if renewal authority papers included adequate information on asset health, together with the intended outcomes of the requested funding.

Whilst it is appropriate that the detail of asset condition is managed in detail at lower levels, we believe it would be a positive step for senior level meetings to regularly review summaries of information on asset health, risk and trends, as they do with financial and other business performance figures. We understand that, for example, quarterly SHE discussions at the LUX meeting do regularly consider issues of asset health and risk, but we suggest that there would be benefits in making this approach more systematic, regularly part of agendas and adopting it across all the senior level meetings.

Our advice is that each of the senior leadership meetings (Exco, LUX and ST Leadership) should consider reviewing asset health for their key assets each quarter and undertaking rotating 'deep dives' on different asset types. This would be helped by the establishment of an asset scorecard covering all key assets (see Section 6.2 above).

External perceptions of TfL's focus are vital at present and therefore we also recommend that the TfL Board and PIC should be offered the opportunity for an annual update on asset health.

In the case of PIC, this could conveniently be carried out as part of their consideration of renewals funding authority for different TfL units. This would entail the inclusion of data on current and planned asset health levels within renewal authority papers as proposed above. Implementing these proposals would demonstrate to Government TfL's commitment to the sustainability of its assets and that its renewal spending is based on robust asset information.

To further promote the importance of assets within TfL we recommend that designated senior asset strategy or engineering representation should be included in all senior level meetings, including Exco, LUX and the ST Leadership meeting. Such representation is already present in some of the senior meetings, but it is not uniform.

Designated senior asset specialists could also attend both PIC and the TfL Board when they consider asset health. These attendees would have particular responsibility for asset and technical issues in each of the senior meetings and could lead discussions on asset health and policy. Appropriately positioned they would provide a clear 'line of sight' and direct flow down to the business on asset issues from the highest level, thus demonstrating the importance of a strong asset management culture to TfL and addressing the issue raised in the external assessment of LU's asset management maturity (see above).

6.4 Long Term Capital Plan

We think that the introduction of the Long Term Capital Plan (LTCP) has been a very positive step for the planning of renewal expenditure and our impression is that it has been generally welcomed by those involved in asset management. The LTCP represents both an opportunity and a discipline, encouraging as it does longer term thinking in the management of TfL's assets. As a result of the requirement to predict the cost of sustaining the asset population in the long term under differing management scenarios, the LTCP process supports conversations within the business about the trade-offs between asset health outcomes and funding levels for the first time.

We heard comments about the level of detail and robustness which were achievable during the limited time available for the preparation of the first round of the LTCP. Nonetheless we think this is a valuable first step which can be improved upon as the process matures. A current weakness of the LTCP process with regards to renewal expenditure is that the capability to predict future asset condition and renewal requirements, based on a given level of funding, varies for different types of asset. Good historical data on renewal costs and deterioration rates exist for some assets types, but is lacking for others.

The main challenge to the future development of the LTCP for renewals is therefore to improve modelling and forecasting capability across all asset types, such that robust predictions of asset condition outcomes can be prepared for different funding levels. This capability would provide senior management with sound data on which to base funding decisions and we recommend that its development should be a priority.

7. IMPROVEMENT OPPORTUNITIES

We recognise the good work and progress that is already being made in improving asset information, measures of asset health and asset management generally. Some of the

opportunities for improvement which we have noted in this report are already known to the business and are being worked on but, for completeness, we list below the main areas in which we believe development would bring the greatest benefit.

Prioritising Renewals Funding

Changes have been made over the last 18 months to 2 years by giving renewal programmes priority over enhancements through the business planning process. TfL's recent proposal, within the Financial Sustainability Plan, for a move to control period funding, within a revised structural framework, demonstrates an ambition to manage its assets in an entirely new manner. This could lead to a funding model based on predicted asset need and would move TfL towards the models adopted for other asset intensive organisations such as Network Rail and Highways England.

Should this proposal not be taken forward, consideration should be given as to how renewals budgets could best be protected, possibly by determining minimum safe levels of spending over a fixed period of several years, to inform decisions on any future deferral of planned renewals. Better data on asset health and improved predictive models would assist this process by informing strategic prioritisation decisions between renewals and foregone benefits elsewhere.

Continue Drive for Common Processes

We find that there is still too great a variation in asset management processes across TfL, of which the lack of a common method of scoring asset health across the business is an important example. Work is ongoing to remedy this and should be given senior level support. Real differences between asset types and operational models must be recognised and accommodated, but the end goal should be TfL-wide policies and metrics, applied appropriately at a local level, resulting in processes and outputs which are comparable across business areas.

Consistent Levels of Renewals Funding and Growth in Capability

Within the constraints imposed by limited funding, the importance of setting renewal budgets at a level that can be sustained consistently over time cannot be overstated. With consistent funding, renewal workbanks, delivery and other activities can be planned on a continuing basis year on year. Preferably of course this should be at a level which will enable asset populations to be maintained in a 'steady state' condition. Even if this level is not possible though, 'peaky' renewals budgeting should be avoided, since it will lead to inefficiencies as the organisation attempts to 'gear up' to deliver increased volumes, followed by reduction in succeeding years. Any increase in funding levels should be made at a steady rate which can be matched by growth in renewals delivery capacity, including within TfL's supply chain, such that value for money can be maximised through long-term planning and routine, repetitive delivery.

Improve Forecasting Capability

The LTCP includes predictions of renewals expenditure required to maintain asset condition at three different levels over the long-term, representing a large and increasing proportion of TfL's future spending. At present these forecasts are largely based on current condition, data on historic renewals expenditure and typical rates of deterioration. This data varies in quality

across the business and is poor for some asset categories. The development of improved modelling and predictive capability across all asset categories should be a priority for TfL, to ensure that forecasts of the funding needed to sustain asset health can be defended against external scrutiny if required. The ability to model the impacts of climate change on assets is also likely to become increasingly important in future.

8. SUMMARY OF RECOMMENDATIONS

Finally, we summarise below the recommendations made in the body of the report:

- A common set of **asset health metrics** should be established for key asset types across TfL. These should include inter alia, indicators of condition, risk and asset performance presented as trends over time. When possible these metrics should consider the relative impact of asset failure on safety and service. The current initiative to extend the use of SOGR should be supported.
- An **asset health scorecard** should be established for TfL, to contain asset health metrics and other key data, increasing the visibility of asset health and forming the basis of senior level discussion and interrogation.
- Consideration should be given to including a **quarterly review of asset health** at senior leadership meetings: EXCO, LUX and ST Leadership, with deep dives of key asset types carried out in rotation. We also recommend that PIC should consider reviewing asset health annually, as part of granting authority for renewal programmes, with the TfL Board undertaking an annual review.
- The inclusion of **asset strategy or engineering representatives**, with designated responsibility for asset issues, at senior leadership meetings (Exco, LUX and ST Leadership) should be considered.