

Date: 20 July 2022

Item: London Underground Infrastructure Renewals Programme

This paper will be considered in public

## 1 Summary

|                            | Existing Financial Authority (to 2024/25) | Existing Programme and Project Authority 2022/23 and future years | Additional Authority Requested 2022/23 & 2023/24 | Total Authority | Prior Years | Forecast 2022/23 to 2027/28 | Total Forecast |
|----------------------------|---|---|--|-----------------|-------------|-----------------------------|----------------|
| LU Infrastructure Renewals | £1,279.4m                                 | £1,192.2m   | £0.0m  | £1,192.2m       | £631.1m     | £627.8m                     | £1,258.9m      |

*Table 1: Summary of Programme and Project Authority*

- 1.1 This paper updates the Committee on the progress of the London Underground Infrastructure Renewals Programme (the Programme). Table 1 shows that no additional Programme and Project Authority is requested at this time. The Programme includes the following sub-programmes: Built Environment and Civils, Systems (Power, Electrical, Fire, Mechanical and Communications, Lifts and Escalators), and Safe Track Access. The Programme maintains the safety, operability, and reliability of London Underground (LU) assets through a prioritised programme of renewals.
- 1.2 This submission builds upon previous updates to the Committee in March 2021 for the LU Renewals Programme, and December 2021 for Lifts and Escalators, and brings these into a single Financial Authority of £1,279.4m. The balance of this is carried forward as set out in table 6 below.
- 1.3 The focus of this paper is to:
- present the Programme’s achievements since the previous submissions;
  - provide assurance to the Committee on the progress of the Programme; and its future plans; and
  - set out the existing Programme and Project Authority alignment to the current forecasts for 2022/23 and 2023/24.
- 1.4 Financial Authority is currently provided through the two-year Budget for 2022/2023 and 2023/2024, approved by the Board on 23 March 2022. The current funding agreement with Government expires on 13 July 2022.

- 1.5 If additional funding is not available, a prioritisation of the TfL Investment Programme will be required, and some programmes and projects will not be taken forward and revised authority will be sought as appropriate. All approvals given will be overseen in accordance with TfL Business controls in respect of draw down

## **2 Recommendations**

### **2.1 The Committee is asked to note the paper and:**

- (a) agree that the London Underground Renewals and Lifts & Escalators Programmes be consolidated into a London Underground Infrastructure Renewals Programme with a total Programme and Project Authority of £1,192.2m; and**
- (b) agree that the London Underground Fleet, Track and Signals Programmes be consolidated into a London Underground Train Systems Programme with a total Programme and Project Authority of £1,790.3m.**

## **3 Background**

### **Strategic Context**

- 3.1 The Mayor's Transport Strategy (MTS) has three key themes: healthy streets and healthy people; a good public transport experience; and new homes and jobs. Maintaining a state of good repair of LU assets is key to delivering all these plans. All LU Renewals are directly related to a good public transport experience by maintaining the asset in a state of good repair. Increased public transport use supports Healthy Streets and delivers growth in locations with high public transport capacity.
- 3.2 At present each of the asset groups is managed as separate programmes with individual authorities. In order to deliver more efficiently reduce the duplication of reporting and allow the business to consider how asset work together as a system we are combining the asset groups into larger programme authorities. These are Infrastructure Renewals (Built Environment and Civils, Building Systems, Power and Electrical, Lifts and Escalators), and Enhancements (Accessibility, Station Development).
- 3.3 Following approval in March 2021 of the LU Infrastructure Renewals Programme and Project Authority, in May 2021 a revised budget was adopted. Expenditure of £68.5m on renewals was constrained below the planned amount in 2021/22 and was significantly lower than the £168m 'Do Minimum' scenario under the Long Term Capital Plan (LTCP) to maintain a stable asset condition.
- 3.4 We are now working under the "Managed Decline" scenario where Renewals across the whole of TfL are budgeted to a total spend of £600m in 2022/23 and an estimated £700m from 2023/24 onwards.

## **Asset duties and responsibilities**

- 3.5 The regulations that govern our operations with regards to assets include:
- (a) the Railways and other Guided Transport Systems (Safety) Regulations 2006, require TfL to apply to the Office of Rail and Road (ORR) for certification and authorisation to operate trains, stations, and infrastructure safely. Authority was approved by ORR in January 2022 for a further 5 years;
  - (b) the 2010 Rail Vehicle Accessibility (non-Interoperable rail systems) Regulations 2010 under the Equality Act 2010; and
  - (c) regulations under the Health and Safety at Work etc. Act 1974 including working at height, electricity, noise, manual handling, personal protective equipment, control of hazardous substances, and Construction Design Management.

## **Asset Strategy – Maintaining assets in a State of Good Repair**

- 3.6 The State of Good Repair (SoGR) describes the condition in which TfL seeks to maintain assets to provide a safe and reliable network that minimises whole life costs and, where appropriate, meets customer expectations. The SoGR is based on industry standard condition measures which differ by asset type, for example the standard that describes the specific condition of track is different to the condition for a lift. TfL records the asset condition using a combination of a five-point physical condition (Very Good, Good, Fair, Poor, Expired) and where the SoGR is below the preferred range it reflects the need for renewals investment to deliver a safe and reliable network and reduce the risk of injuries, restrictions, and closures arising from critical failure.
- 3.7 Data for LU assets is being collated to monitor both trends and forecast future performance. Asset Strategies are in place and are being enhanced.
- 3.8 Details of how SoGR is measured and calculated are provided in Appendix 1. The level of maturity of asset data varies between asset groups. Currently there is no overall SoGR measure that can be reported. Work is ongoing to address this. Some data is available with Lifts and Escalators being the most mature.

## **Impact on Operations**

- 3.9 Due to the managed decline funding position, the SoGR for all assets across TfL is expected to deteriorate further in 2022/23 although the data in some assets is less mature and will require engineering assessment based on asset knowledge as condition changes. The consequence is that there will be increased likelihood of assets being restricted or taken out of service to maintain safety. There will be an increased need for interim measures specific to the asset group and condition, such as making stations 'exit only' if lift or escalator failures severely impact pedestrian circulation, or service restrictions should communication systems fail.
- 3.10 Available funding is targeted towards the most critical assets held in the Asset Condition Register (ACR), prioritised as Code 1 (legal compliance) and Code 2 (safety issues). The ACR is reviewed annually. Renewals are prioritised to ensure

we maintain safety and reliability as much as possible reducing the need for additional inspections and maintenance work. There is insufficient funding to address all Code 1 and Code 2 issues as proactive renewals and an increased level of inspection, reactive maintenance and service restrictions are required to maintain safe operations. This leads to increased costs and reduced service availability and reliability.

- 3.11 As the proposed programme of renewals is below the Do Minimum investment required in our Asset Strategy and the LTCP, the burden on maintenance and operational budgets will increase, and network operability and reliability will decrease. There are increasing risks of asset deterioration that will require further prioritisation of those assets most in need of renewal.
- 3.12 The most significant business risks in terms of staff and customer injuries, customer experience, costs, revenue loss arising from journey time increases, and reputational damage are listed below and are mitigated through maintenance inspections and service restrictions if required:
- (a) ageing Lift and Escalator assets limiting station access (e.g., Holloway Road, Kentish Town) especially where these form the primary means of access;
  - (b) ageing communication systems (e.g., Jubilee Line Extension) in the event of incidents impacting our safety obligations and leading to station evacuations;
  - (c) Polychlorinated Biphenyls (chemicals) in power capacitors and other assets leading to increased risk and enforcement action by the Environment Agency; and
  - (d) Embankment, bridge, or tunnel failures resulting in service restrictions and wider asset damage.

## 4 Programme Delivery in 2021/22

- 4.1 The coronavirus pandemic and the resulting impact upon TfL's finances had a significant impact upon programme delivery, particularly in 2021/22, with supply chain issues, material shortages and internal resource constraints all contributing to delays on several projects. The total expenditure for this programme in 2021/22 was £68.5m against the revised budget (May 2021) of £68.0m. A summary by sub-programme asset group is shown in Table 2 below. There was a decline in spend during the height of the pandemic with stronger delivery performance in 2021/22. Figure 1 provides photographic evidence of delivery.

**Table 2: Actual spend by year (£m)**

| <b>Programme £m</b>                      | <b>2017/18</b> | <b>2018/19</b> | <b>2019/20</b> | <b>2020/21</b> | <b>2021/22</b> |
|--|----------------|----------------|----------------|----------------|----------------|
| <b>Sub-programme - Asset Group</b>       |                |                |                |                |                |
| Systems - Lifts and Escalators           | 40.7           | 26.0           | 25.3           | 13.8           | 27.8           |
| Systems - Power and Electrical           | 10.5           | 10.1           | 15.3           | 5.0            | 14.7           |
| Systems - Mechanical, Fire, Comms        | 0.0            | 0.0            | 7.4            | 8.8            | 12.9           |
| Building & Civils – Built Env. & Welfare | 1.7            | 3.5            | 10.1           | 4.9            | 11.5           |
| Safe Track Access                        | 0.0            | 0.0            | 0.0            | 0.0            | 1.6            |
| <b>Programme Total</b>                   | <b>52.9</b>    | <b>39.7</b>    | <b>58.6</b>    | <b>32.5</b>    | <b>68.5</b>    |

- 4.2 The State of Good Repair declined in 2021/22 due to reductions in funding related to the pandemic. This is evidenced in Appendix 1, Table 8 for Lifts and Escalators where there is quantitative data. In other areas asset data is less mature and the SoGR assessment has a higher degree of engineering assessment based on asset knowledge.
- 4.3 At the start of 2021/22 planned investment on the Programme was £83.8m but financial constraints revised this in May 2021 to a budget of £68.0m. An outturn of £68.5m was delivered against the revised budget demonstrating strong delivery performance during a challenging recovery from the pandemic. While some projects were paused in response to available funding, the Programme had a number of notable successes including: completion of critical platform to train CCTV that protects customers at the platform train interface; 19 significant Lift and Escalator renewals; 100 per cent milestone completion for future design work in the Civils and Structures area building a strong future work pipeline.
- 4.4 To ensure efficient and effective management of the Programme and to react to changes in asset condition in year adjustments to individual budget allocations were made. As a result of this the Programme was able to address seven Code 1 (legal compliance) and Code 2 (safety) concerns. However some milestones in de-prioritised programmes had to be rephased with a Tier 1 and Tier 2 milestone re-forecast to May 2022 (South Kensington Escalators and Hounslow West Lift) which are now complete.
- 4.5 Appendix 2 contains a full breakdown of this successful delivery by sub-programme in 2021/22.

**Figure 1 – Key deliverables in 2021/22**

**South Kensington**  
5 escalator renewals including motor's  
Daily Users – 45,712



**Rickmansworth to Chorleywood**  
Embankment Strengthening  
Daily users – 14,751



**Neasden Depot**  
LED lighting in depot pit road  
supporting 898,050 daily users



**Waterloo**  
Bakerloo platforms new camera view to  
enhance safety – daily users 70,070



**Greenwich**  
Power & Electrical, static compensator  
plinth to retain resilience and improve  
safety, network daily users 6.8m



**Chigwell to Grange Hill**  
Embankment Strengthening  
Daily users 2,596



- 4.6 The TfL Capital Efficiencies Plan was developed in June 2021, this has focussed on driving efficiency and delivering ‘value for money’ across all programmes. Key examples of efficiencies delivered within this programme include savings through lift specification at Tottenham Hale (£140k), and through various savings in escalators (estimated at £322k). The delivery team converted six additional stations to LED lighting (estimated at £393k) with no increase in labour costs as a result of continuity of labour and process efficiency throughout the year.

## 5 Programme delivery for 2022/23

### Option assessment

- 5.1 Several strategic options have been considered at the TfL level and are set out below. Due to funding constraints, we are working to Managed Decline:
- (a) **Managed Decline (Do Minimum minus 30 percent)** (this is the planned level of investment): The Managed Decline scenario reflects the £600m TfL budget for capital renewals in 2022/23 across TfL, but this is insufficient to meet the minimum asset condition. Under this scenario, asset condition will deteriorate, resulting in increased likelihood of restrictions and closures to keep the network safe. This will result in decreased reliability and increased operational expenditure. The backlog of renewals will increase in both scale and time to address it. Future renewals schemes are likely to need more extensive, and therefore costly, interventions. The approach to efficiently manage the programme is outlined below in paragraphs 5.2 and 5.3.
  - (b) **Do Minimum:** Maintains a basic level of service at minimum cost to maintain safety and operability. This option represents an absolute lower bound level of investment to hold level of state of good repair. This option will likely result in significant peaks in investment as some assets become unmaintainable through operating expenditure interventions and will require significant capital investment to keep assets safe and operable.
  - (c) **Moderate:** Aligns with the 2020 TfL Business Plan with amendments to account for coronavirus pandemic impacts on delivery in 2020/21. This can support the key themes of the MTS, however, at a slower rate and to a lower level of customer experience than the ‘High Ambition’ option.
  - (d) **High Ambition:** This scenario aims to deliver the proposals of the MTS. It prioritises walking, cycling and public transport. Areas of focus include supporting Vision Zero, and carbon reduction.
- 5.2 Given the high risks presented by the ‘Managed Decline’ scenario, TfL has implemented a prioritisation of work process consistent across Portfolios to deliver the best possible outcomes from limited funding. Projects have been categorised based on the criticality of the asset and impact of failure as follows:
- (a) “In-scope” projects aligns to the budget available and is the highest priority; and
  - (b) “Additional In-scope” represents additional scope that is higher priority and provides additional flexibility in-year should additional funding become

available from Government or other programmes and to reflect delivery risks.

- 5.3 Periodic reviews will be used to assess the level of delivery achieved, risks, and whether additional commitments can be made through Change Control. This approach gives maximum flexibility to target funds to deliverable priorities.

**Table 3 – Planned spend (£m) by programme**

| Programme £m (values rounded) |   | In-scope           | 2022/23 Additional schemes if funding becomes available |
|-------------------------------|---|--------------------|---|
| Sub-programme & Asset Groups  |   | 2022/23 TfL budget |   |
| Systems                       | Lifts & Escalators                                      | 23                 | 5   |
| Systems                       | Power & Electrical, Mechanical, Fire and Communications | 32                 | 8   |
| Buildings and Civils          | Built Environment & Civils                              | 16                 | 3   |
| Safe Track Access             |   | 5                  | 1   |
| <b>Total Programme Budget</b> |   | <b>76</b>          | <b>17</b>   |

- 5.4 The overall budget for TfL Capital Renewals is £600m for 2022/23. £320m of this is apportioned for the LU Renewals Portfolio including £76m for this Programme.
- 5.5 The request is to combine sub-programmes into a single Programme and Project Authority. This gives greater flexibility to manage the Programme and reduces the risk of delays from seeking revised Programme and Project Authority for sub-programmes, but the controlling factor is the overall Financial Authority and budget. Contractual controls will be used to delay projects if required to remain within budget. No additional Programme and Project Authority in 2022/23 and 2023/24 is requested to that previously approved.
- 5.6 The Programme delivers repeatable work. A top-down flat forecast of £107.0m per annum is shown in Table 6 (section 8.3) from 2023/24 to 2027/28 (inclusive), where this is 15 per cent higher per annum than in 2022/23, excluding inflation. Future work details will be presented in annual submissions and prioritised in accordance with our Asset Strategies. A proportion of future year's spend is contractually committed, with break points where they will be reviewed.

### **Benefits and value**

- 5.7 Asset modelling and historic performance trends have been used to assess the SoGR achieved by the planned investment. Appendix 1 shows this specifically for Lifts and Escalators. Work on other assets is ongoing. The managed decline scenario will result in deteriorating asset condition and is expected to increase the backlog of renewals required for the network to comply with legal requirements and to keep the network safe. This means whole life costs and best value are unlikely to be achieved as investment will not be at the optimum.

## Scope in 2022/23

- 5.8 Appendix 3 summarises a full list of planned renewals in-year with costs and brief descriptions and prioritised against our Asset Strategies. The work types include:
- (a) refurbishments and renewals of lifts and escalators;
  - (b) renewals of communication and fire systems to assist safety;
  - (c) renewals of power and electrical assets including cabling, and switchgears;
  - (d) renewals of tunnels, embankments, and other civils infrastructure.
- 5.9 Due to reduced funding a number of schemes had to be removed from the programme and are categorised as “not in scope”. They will be paused with an increased risk of asset failures, missed carbon reduction targets, increased maintenance costs, and risks for the delivery pipeline.
- 5.10 The programme delivery has been reviewed in detail for 2022/23, and there is high confidence that the planned work will be delivered. Close management of resources, existing contracts and programme risks, will be required as normal and should further funding become available an additional pipeline of opportunities is in place.
- 5.11 Many activities will continue beyond 2022/23 as they have project lifecycles beyond one year, with ongoing contractual commitments. The scope of work in 2023/24 will include schemes continuing from 2022/23 (shown in Appendix 3) and newly initiated projects that will be presented in the next annual submission.

## 6 Programme risks and milestones

### Programme risks

- 6.1 Table 4 below shows top risks associated with delivery of the Programme to address asset resilience and a decline in the SoGR.

**Table 4: Top risks for LU Renewals Programme**

| Risk No | Risk Description  | Mitigation Actions   |
|---------|---|--|
| 1       | Reduced funding and increased materials cost affect objectives so we deliver less. Spending less than required under the LTCP. Declining SoGR increases risk of asset failure. Increased risk of asset failures resulting in the programme needing to be re-prioritised in-year | Prioritise projects on whole life cost and risk to ensure best value. Strengthen regular reviews. Develop greater asset health awareness through data collection to prioritise critical assets in line with our Asset Strategies |
| 2       | Lack of attractiveness to supply chain due to smaller contracts let on a case-by-case basis   | Review commercial strategy within the duration of available funding  |
| 3       | Resource levels in planning, delivery, and supporting teams and long lead times impacts delivery  | Larger combinations to consolidate work may reduce supply chain uncertainty and make more efficient use of commercial resource. Regular deliverability reviews   |
| 4       | Access to the network for delivery of works   | Early engagement and co-ordination. Aggregate work in delivery to reduce overall disruption and cost   |
| 5       | Maturity of Asset Strategies is variable. Data may be unreliable or incomplete.   | Ongoing development of our Asset Strategies to identify data gaps and address these. Use tacit knowledge whilst Asset data matures   |



6.2 The Programme does not include a programme wide risk allowance so increases in costs above known and planned project risk need to be balanced by reductions or deferrals into future years. It is comprised of hundreds of schemes that, experience has shown, enable risk to be effectively managed across the programme using the workbank approach.

6.3 The strategic milestones for this Programme are shown in Table 5 below.

**Table 5: Strategic Milestones Programme Milestones 2022/23**

| <b>Project</b>                           | <b>Milestone Description</b>   | <b>Date</b> |
|--|--|-------------|
| UPS Control Centres                      | Commissioning of installed equipment at Hammersmith control centre to provide a stable, resilient power supply   | 13-02-2023  |
| Asset Data Integrity Surveys – Tranche 1 | Completion of asset condition data gathering for 91 stations   | 13-06-2022  |
| West Acton Programme                     | Completion of improved lighting in ticket hall as part of West Acton station refurbishment and Completion of new tiling and decorations to ticket hall and stairs to platforms | 20-06-2022  |
| CO56 CTS4B Grange Hill to Chigwell       | Completion of installation of concrete piles to strengthen railway embankment between Chigwell and Grange Hill   | 08-02-2023  |
| RDP – Staff Welfare                      | Completion of phase one staff welfare improvement works to 14 operational locations  | 25-11-2022  |
| Lift and Escalator Milestone 2022-23     | Fourteen new escalators installed and brought into customer use  | 31-03-2023  |
| Lift and Escalator Milestone 2022-23     | Seven new escalators installed and brought into customer use   | 18-07-2022  |
| PMVT Lift Refurb Borough PL 1 & 2        | Borough station lift renewal and ticket hall enhancement complete  | 17-10-2022  |

## **7 Commercial Strategy**

7.1 The Programme is predominantly delivered by our internal Direct Labour Organisation and by contractors using existing frameworks for rolling renewal interventions. These include the Pan-TfL Facilities contract and Lift and Escalator contracts covering capital and maintenance spend with the three main manufacturers. Where this is not the case specific procurement strategies are developed for each project and set out the selected route to market and how value for money can be identified during the procurement process and what benefits can be achieved.

## **8 Financial Implications**

8.1 The 2022 TfL Budget provides the Financial Authority needed to deliver the scope of the works set out in this request. The Programme's Financial Authority and the Programme and Project Authority is shown in Table 6 below.

**Table 6: Summary of the costs and funding**

| LU Infrastructure Renewals |   | Actuals     | Budget |       | Forecast |       |       |       | Total | Future Years |
|----------------------------|---|-------------|--------|-------|----------|-------|-------|-------|-------|--------------|
| Rounded to £m              |   | Prior Years | 22/23  | 23/24 | 24/25    | 25/26 | 26/27 | 27/28 |       |              |
| Financial Authority        |   |             |        |       |          |       |       |       |       |              |
| Budget                     | TfL Element                               | 631         | 72     |       |          |       |       |       |       |              |
| Programme Forecast         |   |             |        |       |          |       |       |       |       |              |
| Plan                       | TfL Element                               |             | 93     | 107   | 107      | 107   | 107   | 107   | 1259  |              |
| Authority request          |   |             |        |       |          |       |       |       |       |              |
| Prog. & Project Authority  | Existing Authority                        | 1192        |        |       |          |       |       |       | 1192  |              |
|                            | Additional Authority granted or requested | 0           | 0      | 0     | 0        | 0     | 0     | 66*   | 66    |              |
| Future Authority Requests  |   |             |        |       |          |       |       | 66*   | 1259  |              |

*Notes – All future costs exclude Inflation; \* request is subject to available funding*

8.2 The current funding agreement with Government expires on 13 July 2022 but recognises that TfL will need to enter new financial commitments that extend beyond this date. Any Authority granted which relates to both the current funding period and commitments that extend beyond the period of the Business Plan and Budget may need to be revised as part of future budgets to be considered by the Board.

8.3 If additional funding is not available, a prioritisation of the TfL Investment Programme will be required, some programmes and projects will not be taken forward and revised authority will be sought as appropriate. All approvals given will be overseen in accordance with TfL Business controls in respect of draw down

## 9 Equality and inclusion

9.1 TfL has an obligation under the Equality Act 2010 to:

- (a) eliminate discrimination, harassment, victimisation, and any other conduct that is prohibited by or under the Equality Act 2010;
- (b) advance equality of opportunity between persons who share a relevant protected characteristic and persons who do not share it; and
- (c) foster good relations between persons who share a relevant protected characteristic and persons who do not share it.

9.2 Most of the Programme is like-for-like renewals maintaining existing provision however we seek opportunities to improve access where possible in all projects. There are temporary impacts for customers during the delivery of works. Equality Impact Assessments will be completed on projects as required. A deteriorating SoGR, particularly in lifts and escalators, has a higher adverse impact on older and disabled customers.

## **10 Assurance**

- 10.1 TfL Project Assurance conducted an Integrated Assurance Review (IAR) on the Programme in June 2022. There were four recommendations by the IAR. No critical issues were identified. IIPAG have made five recommendations. These observations and recommendations are all in line with the TfL view of the programme and we are grateful for the support from the additional assurance. Details of these recommendations and our Management Response have been shared with the Committee.
- 10.2 An agreed Integrated Assurance Plan (IAP) for the Programme, covering the next 12 months, has been produced that sets out those projects that are expected to be reviewed. The IAP will be reviewed and updated quarterly.

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

Appendix 1: State of Good Repair

Appendix 2: 2020/21 actuals / forecast outputs

Appendix 3: 2021/22 budget allocations and outputs

### **List of Background papers:**

TfL Project Assurance Reports

Management response to TfL Project Assurance Reports

Contact Officer: David Rowe, Interim Director of Investment Delivery Planning  
Email: [DavidRowe@tfl.gov.uk](mailto:DavidRowe@tfl.gov.uk)

Contact Officer: Bruno Carr, Head of IDP LU and Elizabeth Line  
Email: [BrunoCarr@tfl.gov.uk](mailto:BrunoCarr@tfl.gov.uk)

## Appendix 1: State of Good Repair (SoGR)

A1.1 SoGR, where possible, is based on industry standard condition measures. SoGR helps inform prioritisation of interventions, although not in isolation (other factors, such as asset criticality, risk, safety, and service are considered alongside SoGR). TfL has mapped these industry measures to a consistent five category scale of asset condition – the condition categories are Very Good, Good, Fair, Poor and Very Poor. The percentage of assets in these categories is used to calculate SoGR, namely:

- 1) SoGR – the sum of the percentages in the Very Good, Good and Fair categories. These assets, in general, do not require planned asset renewal in the next one to three years, although in some instances it does reduce whole life costs to intervene when an asset is in the Fair category.
- 2) Not in a SoGR – the sum of the percentages in the Poor and Very Poor categories. Typically, these assets have a higher probability of failure and should be considered for a renewal within the next one-to-three-year period (subject to assessment through prioritisation processes).

A1.2 The current scorecard target for LU assets differs by asset type.

A1.3 Table A1 below provides examples based on currently measured LU assets.

**Table A1: State of Good Repair – scorecard targets (\*asset included in this Programme)**

| Asset*      | SoGR Target 2021/22 | SoGR Performance 2021/22 |
|-------------|---------------------|--------------------------|
| Signals     | 91%                 | 91%                      |
| Escalators* | 82%                 | 82%                      |
| Track       | 76%                 | 76%                      |
| Lifts*      | 71%                 | 71%                      |
| Fleet       | 68%                 | 68%                      |

A1.4 Current scorecard targets are set based on an assumption that SoGR should be maintained based on current available investment. All assets are safety managed; where the SoGR is below the preferred range it reflects the need for renewals investment to deliver a reliable network and reduce the risk of restrictions and closures. Safety is maintained through appropriate inspections, minor repairs, and restrictions.

A1.5 SoGR in LU is calculated using a range of methodologies, primarily using data from Asset Condition Reporting. There are however some gaps across LU's asset base limiting our ability to calculate a total SoGR for LU. In these cases, other condition and asset health metrics are used to support prioritisation. Currently SoGR covers the following asset groups in LU; Track, Fleet, Signals, Escalators and Lifts and Buildings (approximately 75 per cent of the LU renewals investment programme). This makes comparison of condition using SoGR alone a challenge. A maturity plan has been developed with the aim of developing the data to inform a consistent approach to SoGR analysis across all asset areas that

make up LU's asset base. Work is ongoing to set targets in the maturity plan for 2022/23.

A1.6 Table A2 below shows data currently measures or forecast via modelling for the Lifts and Escalator asset types indicating trends referred to in paragraph 4.2.

**Table A2: Current and Predicted State of Good Repair (per cent) – Lifts and Escalators**

| <b>Asset</b>                          | <b>19/20</b> | <b>20/21</b> | <b>21/22</b> | <b>22/23</b> | <b>23/24</b> | <b>24/25</b> | <b>25/26</b> |
|---------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Lifts – SoGR existing asset base      | 74           | 73.5         | 70.7         | 69.4         | 68.1         | 66.9         | 65.6         |
| Lifts – SOGR revised asset base       |              |              |              | 71.0         | 71.4         | 71.7         | 72.1         |
| Lift Assets (no)                      | 226          | 248          | 259          | 311          | 312          | 313          | 319          |
| Escalators – SoGR existing asset base | 85.6         | 83.6         | 82.1         | 78.8         | 75.8         | 72.8         | 69.8         |
| Escalators – SOGR revised asset base  |              |              |              | 79.7         | 77.6         | 75.5         | 73.4         |
| Escalator Assets (no)                 | 458          | 458          | 463          | 524          | 526          | 526          | 529          |

A1.7 The modelling results for Lifts and Escalators reflects investment of £28.0m in 2022/23 and increased by 15 per cent for following years. For Escalators a declining overall trend is predicated both with and without additional assets to be installed. The position for lifts does show the overall SoGR is influenced by additional assets introduced (e.g. as part of Northern Line Extension) in addition to levels of investment. For the existing asset base for Lifts the SoGR is predicted to decline even with the future investment assumed, but the overall SoGR is improved when the new assets are taken into account. These forecasts will help inform prioritisation of investment decisions for renewals and allow benefits to be monitored against forecasts supported by performance data.

## Appendix 2: 2021/22 actuals and outputs

Note: Whilst allocations and outputs for the year were part of the submission for the year 2021/22, they were reset by the TfL/DfT funding agreement as outlined in the letter from the DfT on 1 June 2021.

| Sub-programme and Asset Group  |  | July 2021 (post funding deal) (£m) | 2021/22 actuals March 2022 (£m) | Expected outputs July 2021 (post funding deal)   | Actual Outputs March 2022  | Comments  |
|--------------------------------|--|------------------------------------|---------------------------------|--|--|---|
| Built Environment & Civils     | Earth Structures                                   | 7.5                                | 7.5                             | Start of 2 works on site   | 2 works started, 1 complete, 1 in progress, 1 design   | Works started 100%  |
|                                | Bridges and Structures                             | 1.4                                | 1.5                             | Manual Boarding Ramps (MBR) at 4 stations. Completion of 23 assessments<br>Completion of 1 detailed design<br>Contract award for 1 project | Manual Boarding Ramps installed at 2 stations. Completion of 23 assessments. Completion of 1 detailed design | MBR 50%<br><br>Assessments 100%<br><br>Design 100%  |
|                                | Built Environment & Staff Welfare                  | 1.3                                | 2.5                             | Completion of 4 sites. 1 tranche of surveys completed another commenced  | Completion of 4 sites. 1 tranche of data surveys completed, 1 commenced                                      | 100% completion   |
| Systems - Lifts and Escalators | Primary Means of Vertical Transport (PMVT) Lifts   | 6.1                                | 1.8                             | 4  | 4  | 100% completion   |
| Systems - Lifts and Escalators | Secondary Means of Vertical Transport (SMVT) Lifts | 0.7                                | 1.7                             | 2  | 1  | 50% Hounslow West stairlift delayed due issues with the design/ location of the place of safety         |
|                                | Pan-TfL Escalators                                 | 11.0                               | 11.7                            | 6  | 1 completion, 5 works started  | 17% completion of escalators at South Kensington delayed by 2 months due to issues with civils works    |
|                                | Other Escalators                                   | 8.7                                | 9.4                             | 11   | 11   | 100% completion   |
|                                | Preventative Maintenance Programme                 | 2.7                                | 2.1                             | 6  | 5  | 83% - delivery of 1 escalator delayed due to issues with the controller (outside of the original scope) |
|                                | Other  | 1.0                                | 1.2                             |  | 200 Ultra Violet (UV) handrails completed  | 100% completion   |
| Systems - Power &              | Operation CCTV Obscured Views                      | 1.0                                | 1.0                             |  | Delivery completed   | 100% completion   |

| Sub-programme and Asset Group                                    |                       | July 2021 (post funding deal) (£m) | 2021/22 actuals March 2022 (£m) | Expected outputs July 2021 (post funding deal)   | Actual Outputs March 2022  | Comments   |
|--|-----------------------|------------------------------------|---------------------------------|--|--|--|
| Electrical, Mechanical, Fire and Comms systems                   | Electrical            | 3.8                                | 2.1                             | 22 sites UPS replacement   | 11 sites complete  | Supply chain issues continue, price rises for materials has slowed progress  |
| Systems - Power & Electrical, Mechanical, Fire and Comms systems | Power Workbank        | 6.3                                | 5.6                             | 16 Traction isolation switches<br>Holborn Direct Current (DC)switchgear<br>Tender for replacement of 35 Battery Lighting (OLBI)<br>Replace High Voltage (HV) switchgear at Greenford | 16 Traction isolation switches<br>Holborn DC switchgear<br>Tender issued for replacement of 35 OLBI's<br>Greenford switchgear at pre-commissioning | Holborn DC switchgear complete.<br><br>Tender was unsuccessful for OLBI's due to no complaint bids.<br><br>Greenford Switchgear project ran into issues. |
|  | LED Replacement       | 3.7                                | 3.6                             | 20 planned   | 26 completed   | Completed 130%   |
|  | Control upgrade       | 2.8                                | 1.8                             | Factory acceptance testing, site acceptance testing  | Factory testing completed  | Prolongation and issues led to delays on site  |
|  | Bakerloo RVAR         | 0.4                                | 0.6                             |  |  |  |
|  | Comms, Mech, and Fire | 7.4                                | 12.9                            | 116 sites Fire Assessments   | 116 sites complete   | Completions 100%   |
| Safe Track Access  | Signs, Mobile App     | 2.2                                | 1.6                             | Design and delivery of signs, mobile app   | 481 signs delivered  | Designs complete, 25% delivery. Mobile app started but paused  |
| <b>Total</b>   |                       | <b>68.0</b>                        | <b>68.5</b>                     |  |  |  |

## Appendix 3: 2022/23 budget allocations and outputs

### Notes

- 1) This list reflects the latest view of the TfL renewals portfolio for 2022/23 as of 23/02/22
- 2) This list will be subject to change as deliverability and priorities continue to be assessed
- 3) Additional scope to progressed if funding becomes available.

| Sub-Programme              | Programme/Project                          | 2022/23 Cost | Description   | Target Measures   |
|----------------------------|--|--------------|---|---|
| Built Environment & Civils | Earth Structures                           | 9.8          | Embankments, Walls etc to stabilise condition   | Design and Build at 6 locations<br>Design and build of renewals at a further 12 structures  |
| Built Environment & Civils | Railway infrastructure - design and build  | 5.1          | Design and Build of a mini-programme and platform works, depot works, and other works             | Design and Build at 38 stations and other works at 7 locations, Design and Build at 1 depot<br>Complete feasibility at 5 stations of asset renewals |
| Built Environment & Civils | Programme Management                       | 1.0          | Staff resource  | Design and Delivery of the sub-programme for this asset group   |
| Built Environment & Civils | Surveys, data collection, and assessment   | 2.8          | Condition surveys to investigate the State of Good Repair for site where data is over 7 years old | Asset condition data and assessments to inform the State of Good Repair for identified assets   |
| Built Environment & Civils | Staff Welfare                              | 2.3          | Design and Delivery of renewals of welfare facilities   | Complete renewals at 12 locations, initiate design in other locations for future year delivery  |
| Built Environment & Civils | Bakerloo RVAR                              | 0.2          | LED lights as part of Rail Vehicle Accessibility Regulations (RVAR)                               | Completion and close out of project   |
| Lifts & Escalators         | Contractual commitments for refurbishments | 14.9         | Renewals of escalators and Primary lifts under existing contracts                                 | Escalator renewals at 10 stations, Lift renewals at 2 stations  |
| Lifts & Escalators         | Escalator renewals                         | 6.2          | Escalator components, controller parts  | Escalator parts for 6 stations, controller spares for 3 stations  |
| Lifts & Escalators         | Renewals of Lifts and Escalators           | 1.9          | Project mobilisation to start investigations.   | Feasibility of Escalator renewals at 1 station, or Lift renewals at 1 station   |



| Sub-Programme                               | Programme/Project   | 2022/23 Cost | Description  | Target Measures  |
|---|---|--------------|--|--|
| Lifts & Escalators                          | Lift Replacements   | 1.3          | Design and Build of a programme of Lift replacements for Secondary Mode of Vertical Transportation to maintain asset performance   | Design and build of a programme of Lift replacements to maintain asset performance   |
| Lifts & Escalators                          | Innovative Escalator Replacement Programme                    | 0.3          | Escalator renewal using new approaches   | Feasibility work to develop the future programme in line with plan   |
| Power, Electrical, Fire, Mechanical & Comms | Workbank of Mechanical and Communication system renewal       | 21.5         | Renewals of assets to maintain performance. Station communication upgrades of Public Address systems, help points, CCTV, Station Management systems. Improved surveillance for drivers of gaps at platforms for passengers boarding and alighting. Replace obsolete equipment. Renew ventilation systems, machine chambers, air control, heating and pump equipment. | Progress design and build of renewals at 9 stations in line with plan. Design and build to accelerate overall scope of renewals work at 8 stations. Feasibility, design and build work at 7 stations to improve visibility in line with plan (progress future design in line with agreed plan and additional scope if funding is available). |
| Power, Electrical, Fire, Mechanical & Comms | Workbank of Fire System assets                                | 4.7          | Renewals of existing hydrants and detection equipment to standards, scoping work to inform future design for renewing systems  | Progress feasibility, design and renewal work in line with plan. Mini-programme for design and build of 8 depots or sidings and 24 stations for hydrant renewals.  |
| Power, Electrical, Fire, Mechanical & Comms | Workbank of Power and Electrical assets                       | 17.3         | Legislative requirement to remove hazardous chemicals used in capacitors, replace obsolete/end of life equipment, improve power distribution, renew air circuit breakers, purchase spares, depot lighting  | Progress Design and Delivery of works in line with plan  |
| Safe Track Access                           | Safe Track Access   | 6.0          | 5 sub-projects: signs, permanent current rail indicator devise, access system, management system, and culture and behaviour.   | Progress of design, delivery of trackside signs, commence tendering, in line with plan   |
| Efficiencies                                | Contribution to overall efficiencies of £19m for LU Portfolio | -4.5         | Efficiency savings   | Efficiency savings realised on delivering the same overall programme   |