Appendix 1: TfL Climate Change Adaptation Update

SSHR Panel

24 February 2022

Summary & contents

Severe weather events as a result of climate change are a major strategic risk for TfL

This deck:

- summarises TfL's review of the severe surface water flooding events over the summer of 2021
- summarises recent progress on TfL climate change adaptation
- outlines the actions still required to adapt to climate change

Contents

July 2020 flooding events

TfL performs well in terms of operational resilience, but needs to focus additional effort on adaptation to reduce the impacts we experience in the first place.

- Multiple networks experienced severe disruption during the extreme surface water flooding events on 12 and 25 July 2020. The first pan-TfL review of flooding impacts and response was undertaken.

A photo of the M11 dual carriageway which has heavily flooded, with cars stuck in the water

A photo showing London floods: Swamped DLR station near Olympic Park still deserted after TfL reopening

A photo of a rail line which has heavy flooding over the lines, part of the track cannot be seen due to water

- Once severe weather alerts were received, TfL reacted quickly. Almost all our services were back to normal the next day.

- As a result of the review, it was highlighted that we must:
  - give higher priority to improving the way climate related risks are considered
  - automate data collection and expand the range of data collected on weather-related impacts to include costs
  - develop more robust measures to tackle the challenges of a constantly changing climate
  - continue to collaborate both within TfL and with external organisations, such as Thames Water, Environment Agency, GLA and London Boroughs

We have been lucky not to be hit by more extreme weather

Recent reports by the Environment Agency highlight that 'it is only a matter of time' until such events happen in the UK. Without action, we will see major H&S, financial, legal and reputational impacts.

The costs in Germany of the one flooding event was £10bn and over 90 lives lost. **93 mm of rain** fell in one day, compared to London's **48 mm on 12th of July.**

A photo from BBC News, showing multiple cars having crashed in flooded road conditions

In New York, **82 mm** of rain fell in **one hour** and 45 people lost their lives in New York area as a result of storm Ida.

A photo of a New York subway station, which has flooded to a very high level. A woman is walking on the stairs next to the flooded area.

The Stonehaven derailment on 12 Aug 2020 happened when a passenger train hit a **landslip following severe rain.** Three of the nine people onboard died.

A photo of a derailed train in Stonehaven, with emergency services around the train.

On the 4th Oct 2021, Rossinglione on northern Italy experienced **740 mm of rain in 12 hours** leading to widespread impacts including a bridge collapse

A photo of flooding on a road between Liguria and Piedmont in Italy, cars are fully submerged in the water.

Flooding is not the only climate impact on London's transport networks

We need to prepare for all climate hazards and interdependencies that will affect TfL's infrastructure, customers, staff and contractors – not just flooding of our assets.

- Climate hazards also include high temperatures, storms and high winds, drought and water use restrictions. All of these affect London's transport networks:

Harrow-on-the-Hill points failures on 'very hot days', resulting in delays, or even line closure.

A photo of Harrow on the Hill Tube station's platform, with a train.

Hammersmith Bridge microfractures widened by 2020 heatwave, leading to closure.
Temperatures surpassed 34°C in central London.
A photo of Hammersmith Bridge

Piccadilly Line wheel flats issue in 2017 was exacerbated by an autumn storm, taking many trains out of service.
A photo of a train on the tracks of the Piccadilly line

- Climate change is a 'threat multiplier', i.e. more than one climate hazard can occur at the same time, and climate hazards can exacerbate other risks. Climate disruption of other key networks, such as power, can cascade to us via interdependencies.

Meeting TfL's long term goals

Without adaptation, we will not be able to meet our mode shift or financial sustainability goals.

- Severe weather events will become more frequent and more intense.
- Resilience alone will no longer be sufficient to maintain asset integrity, safety and service reliability, ultimately affecting our mode shift goal.
- Severe weather events will become an increasing drain on our financial resources, affecting our long term sustainability.
- By reducing / avoiding climate impacts, adaptation contributes to, and reduces our dependence on, resilience.

A graph outlining a climate variable over timescale 'past, present, future'

The graph shows two sections, the bottom section is 'coping range' and the top section is 'vulnerability' for the climate variable. The border between this is called the critical threshold.
The line on the chart staggers up and down over a large range of values, but over time the line moves more regularly into the vulnerability section from the coping range.
The first instance where the line moves into the vulnerability section is defined as 'Extreme event leading to harm (requiring resilience)'
The critical threshold moves higher in the graph, between the present and the future, this is defined as when 'Adaptation raises harm threshold (reducing dependence on resilience)'

Adaptation actions to date

We are making progress, but there is more to do to fill the gaps in our knowledge, understand what actions to take based on that, and then implement them.

- Existing TfL adaptation actions include:
  - installing green infrastructure and sustainable drainage systems (such as the Elspeth Road raingarden in Wandsworth)
  - managing a research programme to better understand weather impacts
  - collaborating with internal and external stakeholders to better understand, and share knowledge of how best to manage, climate risks
  - working with the Met Office and Network Rail to make their world-leading climate projections data more accessible and usable

- Following the July flooding events, the Mayoral roundtables and associated Task & Finish Group have highlighted London's lack of adaptation to climate change, particularly around:
  - data (TfL's flood review identified this as an issue we need to address)
  - governance (this is complex both in London and TfL, and requires improved internal and external collaboration)
  - funding (TfL's funding situation favours a culture of short-term cost-cutting that jeopardises the realisation of long-term savings)
  - strategy (see slide 9)
  - communications (as per governance)

Our proposed strategic approach

The severity of climate change risk requires the development of a pan-TfL adaptation strategy, covering six main areas of activity.

Research: Using data to understand correlations between weather and impacts, modelling future climate risks, and understanding asset vulnerability

Processes and tools: Embedding improvements to our management system, tools to model risks / benefits, incident / performance reporting and track activity

Reporting: Internal and external reporting on our performance, risks and progress toward improvements informed by our data and research

Communication: Guidance and communication for our customers and colleagues about how to improve their resilience, how to adapt and why adaptation is important

Case making: Informed by our research and data we need to proactively make the case for business area action, funding in the TfL business, communications messaging and funding opportunities

Collaboration & influence: Working with external stakeholders to shape London-wide adaptation activity, and share knowledge and best practice

External scrutiny on TfL's climate risk

There is intense Government scrutiny of organisations' climate risk and adaptation. To maintain investor confidence in TfL, we must demonstrate effective action on climate risk reduction.

Defra's Adaptation Reporting Power (ARP3)

- Submitted ARP3 reports will be publicly available.
- For the first time, a spreadsheet-based asset climate risk assessment is required. This will form the nucleus of the new TfL adaptation strategy.
- We have agreed with Defra that TfL will submit:
  - a preliminary report (without asset climate risk assessment) in Dec 2021
  - a final report (with the asset climate risk assessment) by April 2022

Taskforce for Climate-Related Financial Disclosures (TCFD)

- TCFD is a finance sector initiative designed to improve investor confidence in organisations' understanding of, and work to reduce, climate risks.
- TfL will be captured by the Government's roadmap for mandatory TCFD reporting in **2022/23.**
- TCFD was the subject of a paper to the TfL Audit and Assurance Committee on the 1 Dec 2021 and we beginning to incorporate it into our approach for the 2021/22 Annual Report, ahead of it being required. We already consider climate change risks in our annual report and statement of accounts; TCFD would involve a more comprehensive approach.

Key messages

- Climate change impacts are already affecting our assets, services, staff, contractors and customers, as well as our ability to meet strategic goals, including mode shift and financial sustainability
- Adaptation is likely to be an area of significant government and investor scrutiny and funding in the future
- We have some good work underway, but there is a lot more still to do

A photo of in buses in flood water in Battersea, south London, after heavy rainfall hit the capital

Key actions TfL is taking

Short term

- **External collaboration**, e.g. via Mayoral roundtables and associated Task & Finish Group, to improve data sharing and lobby for action / changes
- Continue identifying opportunities to install **green infrastructure and sustainable drainage systems** as part of TfL and borough projects
- Continue efforts to **quantify severe weather and climate impacts**. Identify required funding for key projects that are essential for cost-effective adaptation planning, e.g.:
  - seed funding for expansion of LUCRFR (London Underground Comprehensive Review of Flood Risk) to include key Surface assets
  - upgrades to existing performance reporting systems to allow for weather attribution

Medium term

- Signalling TfL's climate readiness to government and wider investment market through **ARP3 and TCFD reporting**
- Develop, and agree with business areas, a **pan-TfL Adaptation Strategy** by summer 2022 that is informed by the asset climate risk assessment being conducted for ARP3

Longer term

- Implementation of the pan-TfL Adaptation Strategy, incorporation of adaptation into business area decision-making and processes, and monitoring of progress. This will need to be taken into account in future budget discussions

High level programme

A diagram showing the high level programme for some of the key adaptation activities and milestones over the next 12 months.

This includes:
- 'Task and Finish Group', lasting from the present to Feb 22.
- 'Incorporate benefits of adaptation into Sustainability Comms campaign' lasting from Dec 21 to July 22.
- 'Subject to funding, progress future phases of LUCRFR, continue remaining research programme' lasting the whole period.
- 'Work with Met Office on UKCP18 tool', lasting from present to Feb 22.
- 'Continue to embed adaptation into relevant TfL processes and decision-making' lasting the whole period.

In addition to this there are key milestones outlining submissions and reports, this includes:
- 'Submit preliminary ARP3 report to Defra - COMPLETE' in Dec 21
- 'Submit final ARP3 report to Defra & trial TCFD reporting' in April 22
- 'SHE Annual Performance Report' in Jul 22
- 'MTS Annual Update to TfL board' in Jun 22
- 'Agree Adaptation Strategy' in Jun 22
- 'Consider funding requirements in future Budget/Business Plan' in Sept 22

Key

ARP3 – Adaptation Reporting Power

TCFD – Taskforce for Climate-Related Financial Disclosures

UKCP18 – UK climate projections 2018