ATKINS

Member of the SNC-Lavalin Group

State of the City Report

Year 3 – 2020-21

LoTAG

27 September 2022

Notice

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This document has 43 pages including the cover.

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 1.0	State of the City – detailed report	CH/AL	JA	MM	JP	27/09/2022

Client signoff

Client	LoTAG
Project	State of the City Report
Job number	5182012
Client signature / date	

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1. Introduction

1.1. Background

London's highway network infrastructure is a vital and valuable asset, its serviceability impacts the lives of London's residents, businesses, and visitors. High-quality highway network infrastructure is essential for the safe, efficient and effective movement of people and goods across the city and beyond. Effective and efficient asset management of highway network infrastructure provides benefits such as:

- Reduction in:
  - Maintenance costs
  - Emissions contributions from maintenance works
  - Claims
- Improvements to:
  - Road safety
  - Customer satisfaction
  - Network availability
  - Travel times
  - Socio-economic benefits

2021 was a challenging year for all local Highways Authorities. The impacts of the Covid pandemic are being felt by the sector local authorities reporting challenges on various fronts; from diminishing funding streams, to supply chain issues, to delaying and deferring work, and finally stretched budgets. This has led to a need for re-assessment of how the Capital views and manages key asset classes within the Highways portfolio.

Since 2016, LoTAG (London Technical Advisers Group) has commissioned a 'State of the City' report to illustrate the size of London's highway infrastructure, the condition, maintenance spend, annual need and maintenance backlog. This year's State of City analysis extends the work that has been delivered in previous versions of SotC, capitalising on the use of the digital solution (stateofcity.co.uk). Data has been collected and collated using the bespoke repository.

1.2. Aim of the Report

The aim of the SoC Report is to support building up an objective picture of the extent of the highway infrastructure asset, its condition and maintenance spend. This further expands on the summary report developed under the SoC commission and works hand in hand with the reporting elements of the State of City online solution. Additionally, the data collected as part of the analysis provides a better understanding of the asset health and trends in areas of the Highway Service, such as Asset Management Maturity allowing LoTAG to identify and agree actions to migrate the identified risks.

1.3. Approach

A multifaceted approach was adopted to create and complete the State of the City report, which focused on continuous stakeholder engagement and progress of updates, as presented below:

- **Update of Questionnaire and online solution –** Atkins worked collaboratively with input from LoTAG to incorporate additional questions regarding drainage and climate change into this year's 'State of the City'.
- **Stakeholder engagement –** the boroughs were invited to attend engagement webinars providing a forum for the aims of the report, data requested and queries to be discussed. A series of webinars were held, these included training and guidance. Additional 1-2-1's drop-in sessions were provided to support boroughs who need assistance or clarification.
- **Data Analysis –** online responses were collated with other datasets (historical and data received from other sources), the information was extracted and analysed to generate the outputs required to produce the two-page 'State of the City' report, providing the assessment of London's highways infrastructure.
- **Conclusions and recommendations** – ascertained through the analysis of the data, discussed, and agreed through consultation with LoTAG.

The following asset types have been included in the 2021 ‘State of the City’ report:

- Carriageway
- Footway
- Cycleways
- Structures
- Lighting
- Drainage
- Street furniture
- Mechanical and Electrical equipment
- Trees

2. Stakeholder engagement

2.1. Introduction

The success of the State of the City Report relies on the collaboration between all the stakeholders including London Boroughs, TfL and Atkins.

Atkins was appointed to bring together all stakeholders and set up an interactive procedure to make the most out of the report. This process aimed to:

- Inform stakeholders about the purpose and content of the report
- Make sure they were able to provide this information
- Obtain feedback on how elements of the report can change or be improved

Atkins carried out the following activities to engage with stakeholders:

- Online solution workshops
- Bi-weekly emails and calls, reminders and 1-2-1's to address any queries
- Data validation and feedback integration

2.2. Online Solution Workshops

Two online workshops were held via Microsoft Teams with stakeholders from the local boroughs, the contacts were provided by LoTAG. In these workshops, Atkins presented the State of the City Questionnaire portal, its purpose, the information that was gathered from previous years and changes compared to the previous year. Open discussions were held where borough representatives could pose questions and provide feedback for different elements of the questionnaire. The feedback was used after each workshop by Atkins staff to improve the questionnaire in an iterative and interactive process in consultation with LoTAG.

Both workshops were recorded, and the video distributed via the Atkins Secure FTP.

Additionally, five drop-in sessions were also held via Microsoft Teams, allowing stakeholders from the boroughs to gain clarification regarding any aspects of the questionnaire.

2.3. Updates

Progress updates were presented at LoTAG steering groups and a draft version of the SoC report was presented at the London Authorities' annual conference. All feedback was collated and embedded within the analysis and subsequent outputs in consultation with LoTAG.

3. Data analysis

The online database records from each participating authority were assessed for data gaps; any gaps were manually infilled using either historic records or information and engineering assumptions shared from LoTAG and chairs of relevant LoTAG groups. Maintenance need and maintenance backlog calculation methodologies for the 2018 to 2020 reports were reviewed as part of the project; improvements identified were discussed with LoTAG and if approved, the changes were implemented. None of the amendments were significant, ensuring consistency of the analysis, comparable results to previous years and continuity in reporting key figures.

3.1. Definitions

Maintenance backlog represents the investment required to bring an asset to a 'State of Good Repair' (SOGR). and is calculated by determining the proportion of the asset quantity (for each asset type) that falls below the SOGR and by assigning a renewal rate to that part of the network.

To calculate the Maintenance Backlog and Annual Maintenance Need, the following definitions apply throughout the analysis.

- **Service Life:** Average lifespan of asset prior to renewal or major refurbishment.
- **Renewal Rate:** Maintenance unit rate to bring asset back to SOGR or rate for a finite life asset to be replaced.
- **Maintenance Rate:** Rate to enable asset to remain in a SOGR, a hybrid of shorter- and longer-term treatments. For a finite life asset, such as a sign, would be renewal at end of asset service life.
- **OpEx Rate:** Reactive maintenance rate introduced in analysis to align with typical annual CapEx vs OpEx breakdown. This reflects typical reactive works across networks and is a function of asset type.

3.2. Assumptions

Earlier assumptions pertaining to maintenance rates (steady state, backlog) and service lives for each asset type were reviewed in consultation with a Focus Group and approved by LoTAG in Year 3. The refined assumptions are aligned to SoC Report Year 1 submission and represent maintenance backlog and annual maintenance need founded upon a series of engineered assumptions. The relevant asset specific assumptions (service lives and relevant rates) are presented in Table 3-1 in a format similar to Year 1 submission.

Table 3-1 - Backlog and Steady State Assumptions Comparison of 2019 & 2020

Asset Type	Asset Group		Service Life (Years)		Renewal Rate (Backlog)		Maintenance Rate (Steady State)		Width (m)	Target PI		OpEx Rate	
			2019	2020	2019	2020	2019	2020	All years	2019	2020	2019	2020
Carriageway **(rates per unit area)**	Principal Roads (A Roads)		15		£45	£60	£40	£40	3.5	90%		30%	30%
	Local Roads (B, C, U Roads)		25		£25	£40	£22	£30	8	85%		30%	30%
Footways **(rates per unit area)**	Category 1a		30		£90	£120	£90	£90	2	90%		30%	80%
	Category 1		30		£90	£120	£90	£90	2	90%		30%	30%
	Category 2, 3, 4		40		£40	£70	£30	£30	2	85%		30%	30%
Street Lights **(rates per unit)**	Lighting columns	up to 6m	40	40	£4,000	£2,500	£4,000	£1,250	-	95%		10%	10%
		up to 8m	40	40	£4,000	£3,000	£4,000	£1,500	-	95%		10%	10%
		up to 10m	40	40	£4,000	£3,500	£4,000	£1,750	-	95%		10%	10%
		up to 12m	40	40	£4,000	£4,000	£4,000	£2,000	-	95%		10%	10%
	Feeder Pillars		20	20	£1,500	£2,000	£1,500	£1,000	-	95%		10%	10%
	Illuminated Bollards		20	20	£460	£460	£460	£230	-	95%		10%	10%
	Illuminated Signs		20	20	£550	£2,500	£550	£1,250	-	95%		10%	10%
Drainage **(rates per unit)**	Gullies (structural life)		50	50	£1,000	£1,500	£1,000	£1,000	-	95%		-	
Trees **(rates per unit)**	Trees		100	100	N/A	£1,000	£1,000	£1,000	-	95%		-	
Structures **(rates per unit area)**	Road Bridge		60		£3,000		£2,700	£2,700	-	95%		-	
	Footbridge		60		£3,000		£2,700	£2,700	-	95%		-	
	Retaining/River Wall		30		£7,500		£6,750	£6,750	-	95%		-	
	Subway/Pipe Subway		60		£3,000		£2,700	£2,700	-	95%		-	
	Cellar and Vault		30		£5,000		£4,500	£4,500	-	95%		-	
	Culvert		30		£2,000		£1,800	£1,800	-	95%		-	
	Sign/Signal Gantry		30		£2,000		£1,800	£1,800	-	95%		-	
	Tunnels / Underpasses		60		£7,500		£4,500	£4,500	-	95%		-	

4. Results

4.1. Inventory Information

4.1.1. Carriageways

Figure 4-1 illustrates the overall breakdown of carriageway length across the capital. In total, Local Roads sum up to c. **12,953km** with Principal Roads (A Total) to c. **1,905km** (excluding TfL's inventory); TfL's Principal Roads carriageway length is **c. 512km** long.

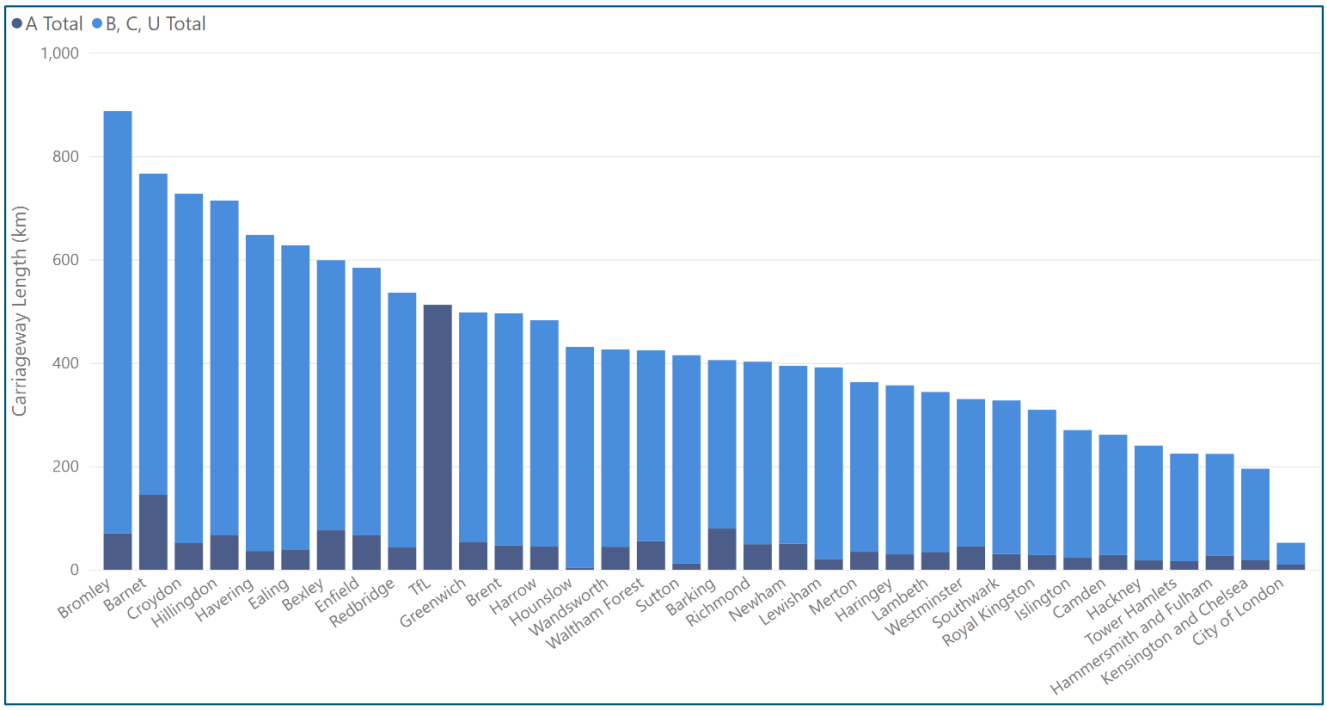

Figure 4-1 - Carriageway Length across London (split between Principal "A" and Local "B, C & U" Roads)

4.1.2. Footways

Collated footways inventory data indicates that across the capital there is a total of c. 28.1km of footways. Hierarchies 1 and 1A amounts up to 1.8km. The breakdown is displayed in Figure 4-2.

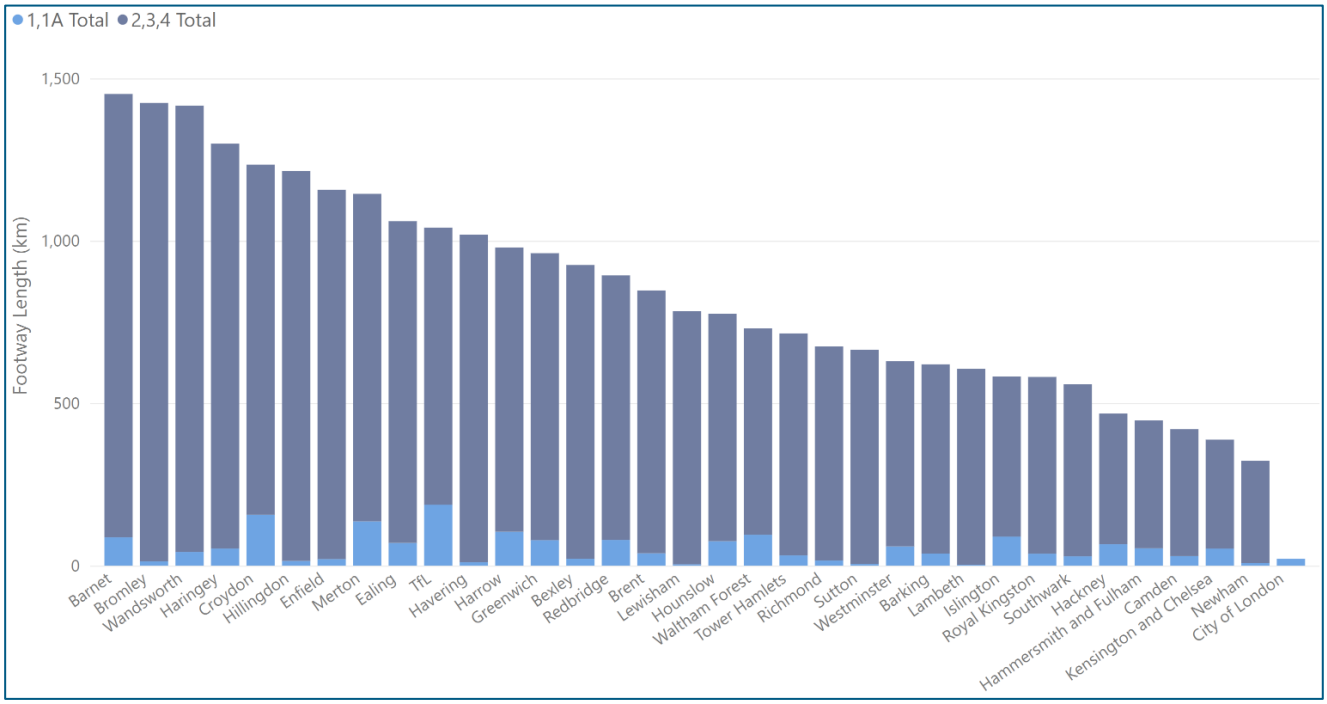

Figure 4-2 - Footway Length across London (Categories 1,1A against 2,3,4)

4.1.3. Structures

Structures inventory data is collated from Bridgestation. Figure 4-3 illustrates the structures' stock and summarises this utilising asset quantities (number of structures). The total equivalent area covered by these structures is 1.7 million m^2.

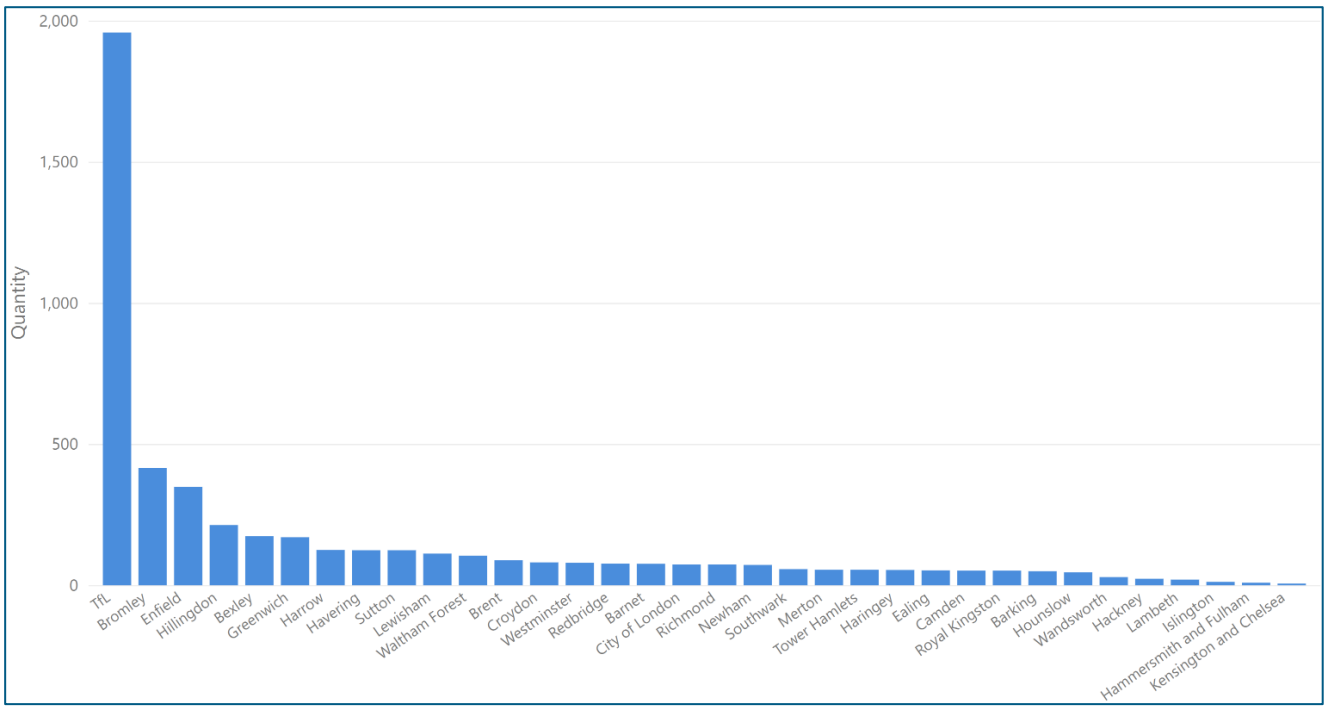

Figure 4-3 - Structures Stock - Quantities

A breakdown of the asset types held within Bridgestation inventory is presented in Figure 4-4. Across London there are a total of:

- 1,271 Bridges
- 7 Cellar and Vaults
- 775 Culverts
- 691 Footbridges
- 55 Piers
- 1,339 Retaining / River Walls
- 133 Sign/Signal Gantries
- 500 Subway / Pipe Stations
- 295 Tunnels / Underpasses

Including TfL, the total number of structures reported equals to **5,066**.

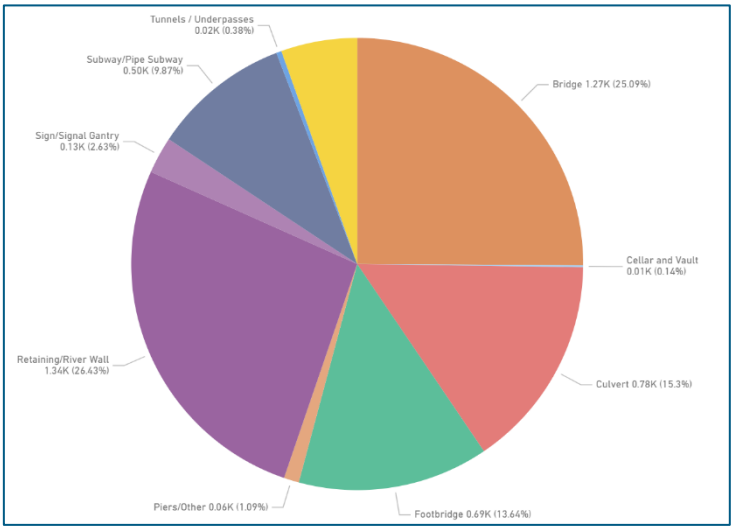

Figure 4-4 - Structures Quantities by Asset Type

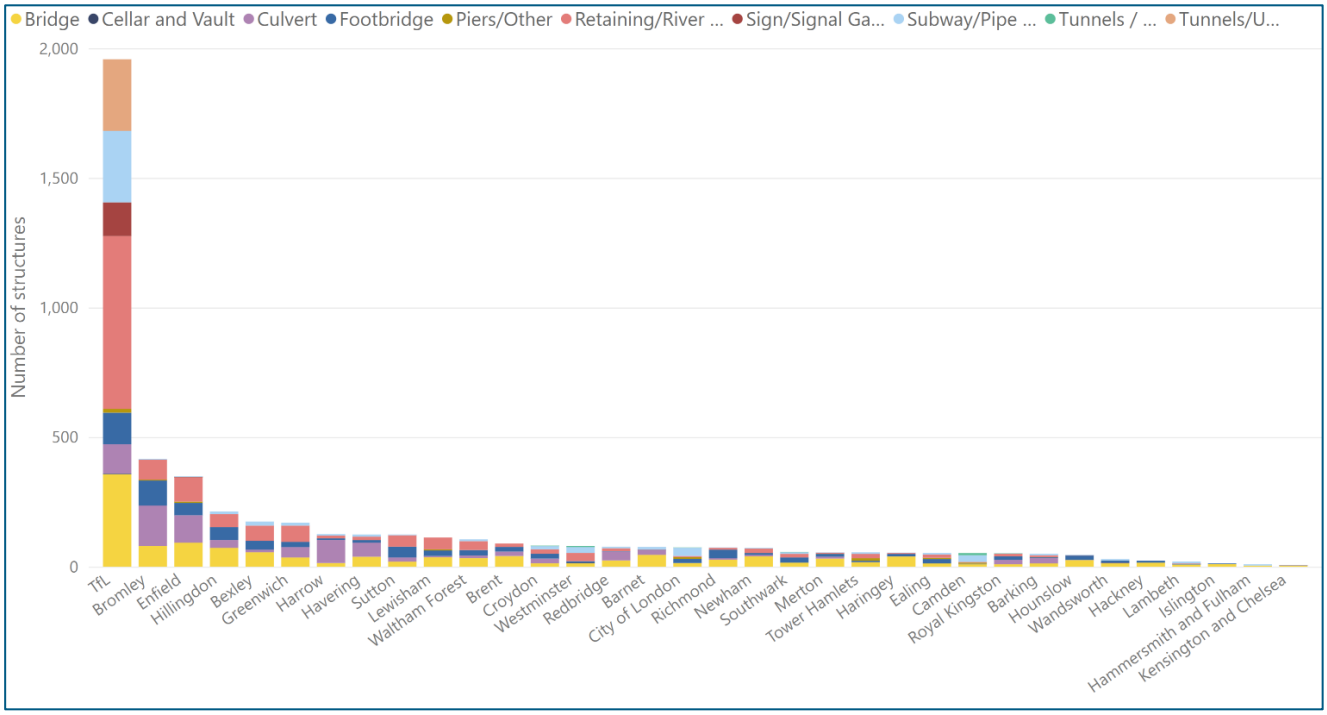

Figure 4-5 - Structures Inventory Breakdown and Asset Types across London

4.1.4. Lighting

Lighting inventory data collation focuses on:

- Feeder Pillars
- Illuminated Bollards
- Illuminated signs
- Lighting Columns
- Vehicle Charging Points (dedicated or integrated in columns)

In total, c. 643k individual lighting assets can be found in London and managed by local authorities. Figure 4-6 presents the overall Lighting assets breakdown across Local Authorities.

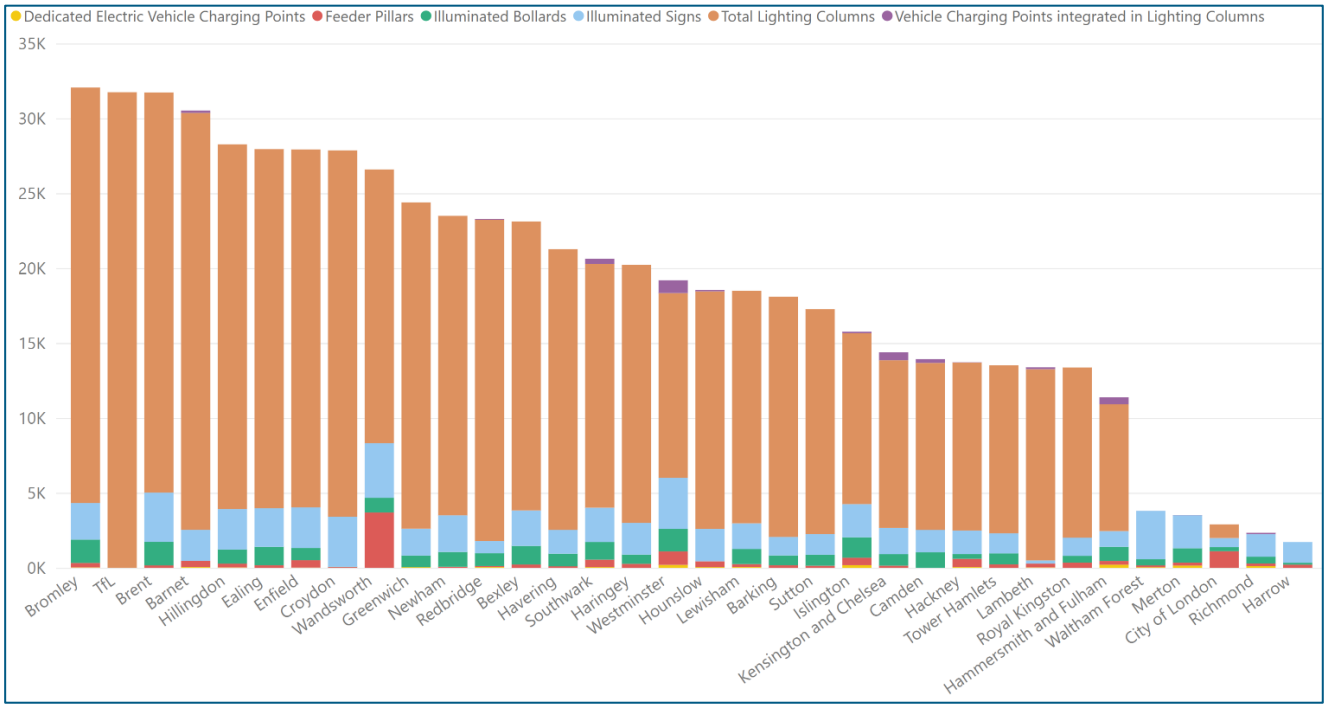

Figure 4-6 - Lighting Inventory Breakdown - London Authorities and TfL

The largest proportion of the lighting asset quantities are Street Lighting Columns; table 4-1 provides an aggregated breakdown of the quantities based on asset type across London.

Table 4-1 - Lighting Assets by Asset Type (overall and aggregated – incl TfL)

Asset Type	Quantity
Feeder Pillars	12,587
Illuminated Bollards	25,371
Illuminated Signs	65,850
Lighting Columns	528,190
Vehicle Charging Points (dedicated)	1,235
Vehicle Charging Points (integrated)	3,137
Wall Mounted Lights	6,733
Total Lighting Assets	**643,103**

4.1.5. Other Assets

The dataset presented in Figure 4-7 collates submissions from 2017 to 2020. The average number of trees across the capital (with no additional processing) is c. 19k trees per authority.

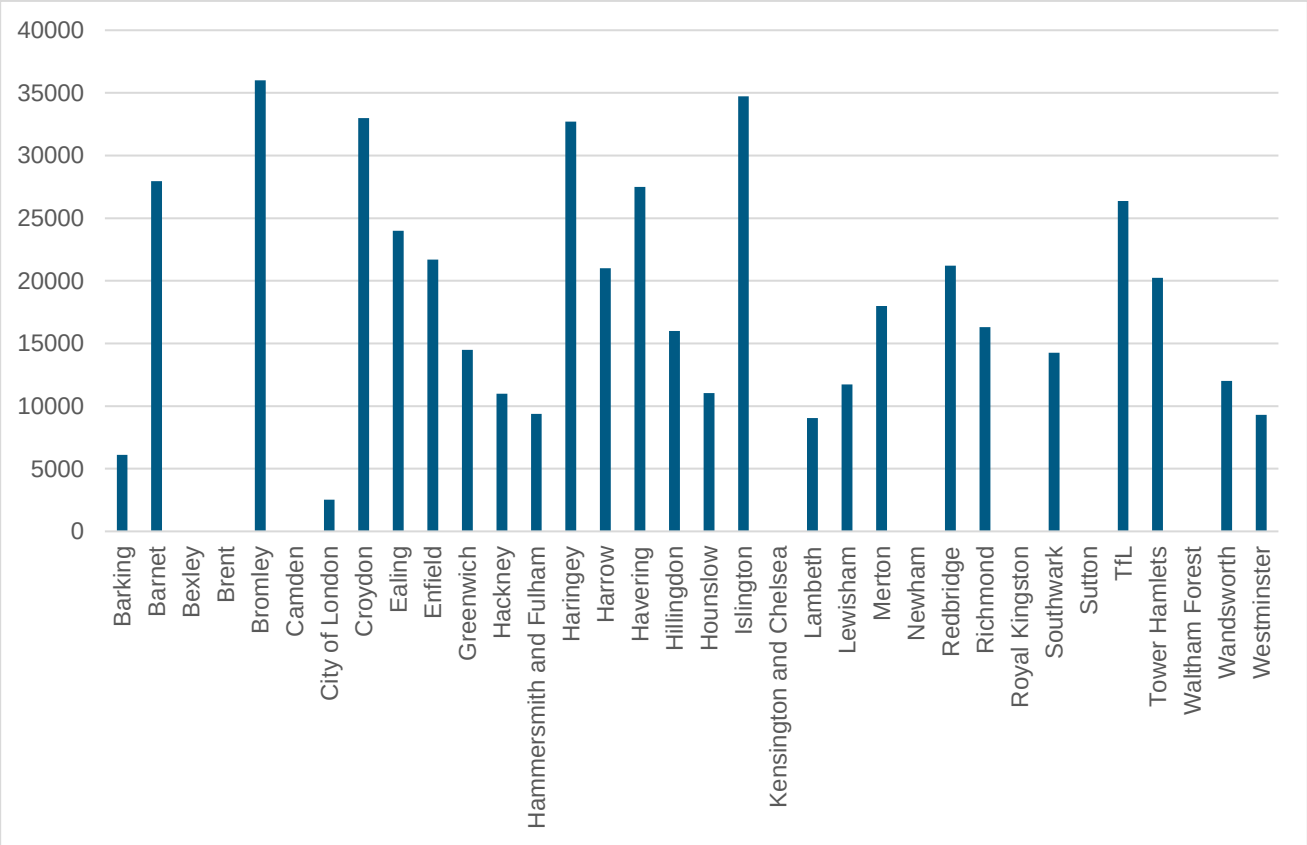

Figure 4-7 – Total number of highway trees

4.2. Condition Information

The condition information presented in this section aggregates the final set of submitted datasets from each participating authority. Gap filling exercises were completed to ensure no major gaps are presented in the figures discussed; it should be noted that for a sub-set of participating authorities more recent data for their asset classes diverged from historically presented condition trends. Where such outliers where identified, Atkins engaged with the relevant Authorities and retrospectively amended historically reported SoGR if and where required. This information is presented in Section 4.3 where the backlog comparisons are detailed. For all terms and purposes, the asset class yearly comparisons presented in Section 4.2 are based on the figures reported in 2019-2020 and 2020-2021 without retrospective post-processing; this is only applied at backlog calculation sections.

4.2.1. Carriageways

Figure 4-8 presents the reported condition for carriageways by authority and asset type. The predefined Performance Target for A (Principle) roads is 90% and the one for B,C,U (Local) roads is set at 85%. Where the overall network condition is reported at levels below these figures, the relevant backlog is calculated to represent the shortfall.

The overall average SoGR across all authorities for A roads is estimated to be 80.8% (80.2% in 2019-2020), whereas the figure for Local Roads 81.4% (80.3% in 2019-2020)

Table 4-2 illustrates the average SoGR (mean between Local and Principle roads), per participating Authority in each year of analysis

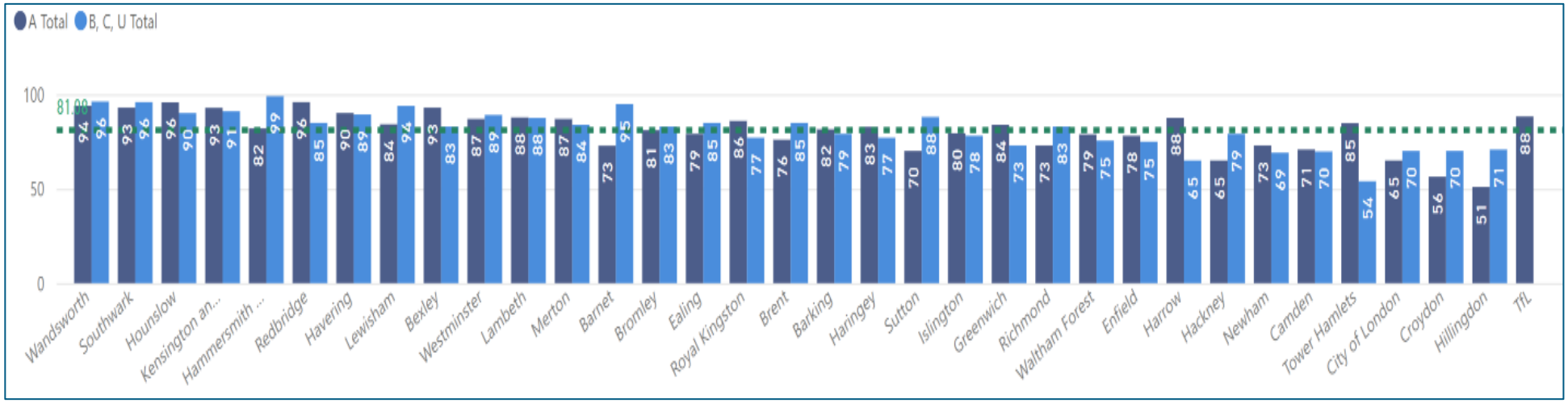

Figure 4-8 - Average of measured condition for carriageways by authority and asset type

Table 4-2 – Change in SoGR for Authorities for carriageways (2019-2021)

Authority	2019-2020	2020-2021	% change in SoGR
Barking	81.5	81.5	0.0%
Barnet	72.8	72.8	0.0%
Bexley	93.0	93.0	0.0%
Brent	76.0	76.0	0.0%
Bromley	81.0	81.0	0.0%
Camden	75.7	70.7	-6.6%
City of London	65.0	65.0	0.0%
Croydon	80.2	56.4	-29.7%
Ealing	67.6	79.0	16.9%
Enfield	78.0	78.0	0.0%
Greenwich	84.0	84.0	0.0%
Hackney	65.0	65.0	0.0%
Hammersmith and Fulham	82.0	82.0	0.0%
Haringey	82.7	82.7	0.0%
Harrow	87.7	87.7	0.0%
Havering	87.0	90.1	3.6%
Hillingdon	78.0	51.0	-34.6%
Hounslow	96.9	95.9	-1.0%
Islington	79.5	79.5	0.0%
Kensington and Chelsea	92.8	92.8	0.0%
Lambeth	81.2	87.8	8.1%
Lewisham	84.2	84.2	0.0%
Merton	87.0	87.0	0.0%
Newham	73.0	73.0	0.0%
Redbridge	83.5	96.0	15.0%
Richmond	73.0	73.0	0.0%
Royal Kingston	86.8	86.0	-0.9%
Southwark	93.0	93.0	0.0%
Sutton	70.0	70.0	0.0%
TfL	88.2	88.2	0.0%
Tower Hamlets	84.8	84.8	0.0%
Waltham Forest	78.8	78.8	0.0%
Wandsworth	47.1	94.1	99.8%
Westminster	88.3	87.0	-1.5%

4.2.2. Footways

Figure 4-9 presents overall condition (Levels of Service) for footways across London. The average reported LoS for Cat 1/1a footways is 80.4%, and for Cats 2-4 is 79.7%.

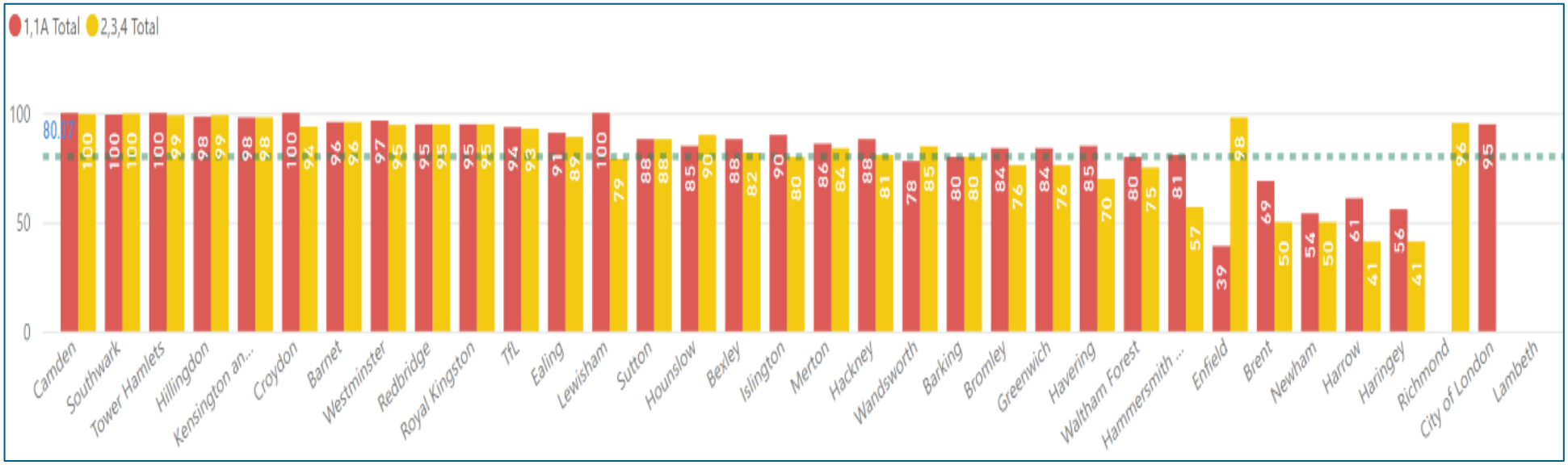

Figure 4-9 - Measured Condition for footways by Authority and Asset Type

Table 4-3 – Change in SoGR for Authorities for footways (2019-2021)

Authority	2019-2020	2020-2021	% change in SoGR
Barking	80.0	80.0	0.0%
Barnet	96.0	96.0	0.0%
Bexley	88.0	88.0	0.0%
Brent	69.0	69.0	0.0%
Bromley	84.0	84.0	0.0%
Camden	99.0	100.0	1.0%
City of London	95.0	95.0	0.0%
Croydon	100.0	100.0	0.0%
Ealing	84.0	91.0	8.3%
Enfield	39.0	39.0	0.0%
Greenwich	84.0	84.0	0.0%
Hackney	88.0	88.0	0.0%
Hammersmith and Fulham	81.0	81.0	0.0%
Haringey	56.0	56.0	0.0%
Harrow	61.0	61.0	0.0%
Havering	85.0	85.0	0.0%
Hillingdon	100.0	98.3	-1.7%
Hounslow	85.0	85.0	0.0%
Islington	90.0	90.0	0.0%
Kensington and Chelsea	98.0	98.0	0.0%
Lambeth	46.0	-	n/a
Lewisham	100.0	100.0	0.0%
Merton	86.0	86.0	0.0%
Newham	54.0	54.0	0.0%
Redbridge	65.0	95.0	42.2%
Richmond	-	-	n/a
Royal Kingston	84.0	95.0	13.1%
Southwark	84.0	99.5	18.5%
Sutton	88.0	88.0	0.0%
TfL	93.5	93.5	0.0%
Tower Hamlets	100.0	100.0	0.0%
Waltham Forest	80.0	80.0	0.0%
Wandsworth	78.0	78.0	0.0%
Westminster	99.0	96.7	-2.3%

4.2.3. Structures

Structural Levels of Service and SoGR %s across London are presented in Figures 4-10 through to 4-14. For **Culverts**, the average reported condition, is calculated to be 95.5%.

For **Footbridges**, the average reported condition is 88.6%.

For **Retaining Walls**, the average reported SoGR is 89.1% across authorities.

For **Road Bridges**, average reported SOGR is 86.2%.

In the **Subway / Pipe Subway** category, the average reported SoGR is 88.1%.

Lastly, for the **Tunnels and Underpasses** category, the average SoGR reported is 73.6%.

Figure 4-10 - Culverts Condition breakdown across London

Figure 4-11 - Footbridge Condition breakdown across London

Figure 4-12 – Road Bridges Condition across London

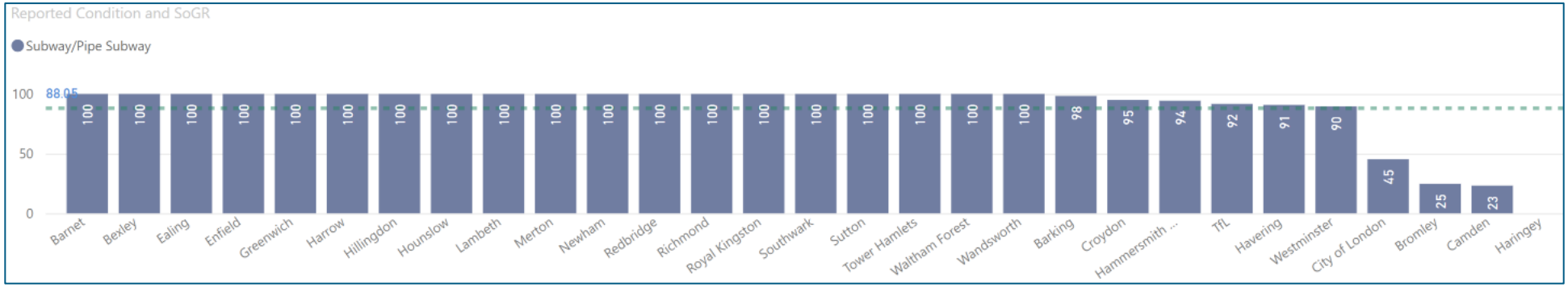

Figure 4-13 – Underpasses and Subway Condition across London

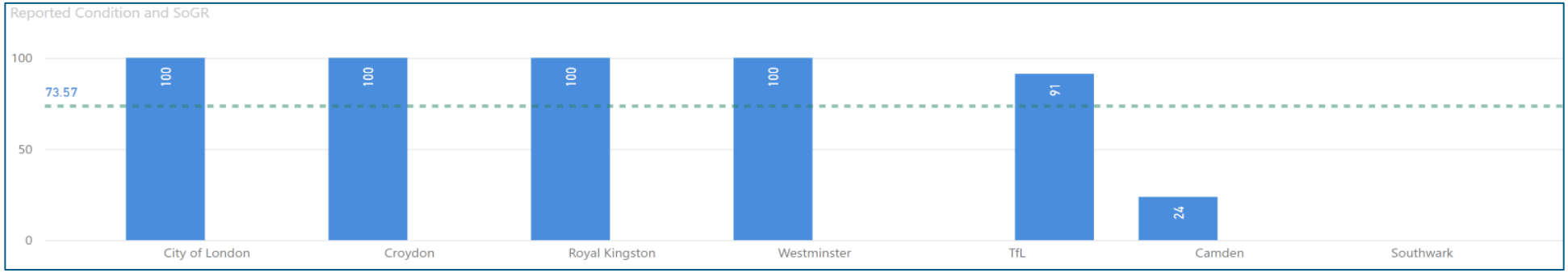

Figure 4-14 – Tunnel Condition across London

4.2.4. Lighting Assets

The four asset types collating condition data through the questionnaires are:

- Lighting Columns
- Feeder Pillars
- Illuminated Signs
- Illuminated Bollards

Condition data are visualised in Figures 4-15 and 4-16.

The average reported condition for **Lighting Columns** is 85.2%;

The average reported condition for **Feeder Pillars** is 82.5.

The Illuminated signs LoS London average is calculated at 86.8%. Lastly, the average LoS for **Illuminated Bollards** is calculated to be 91.3%.

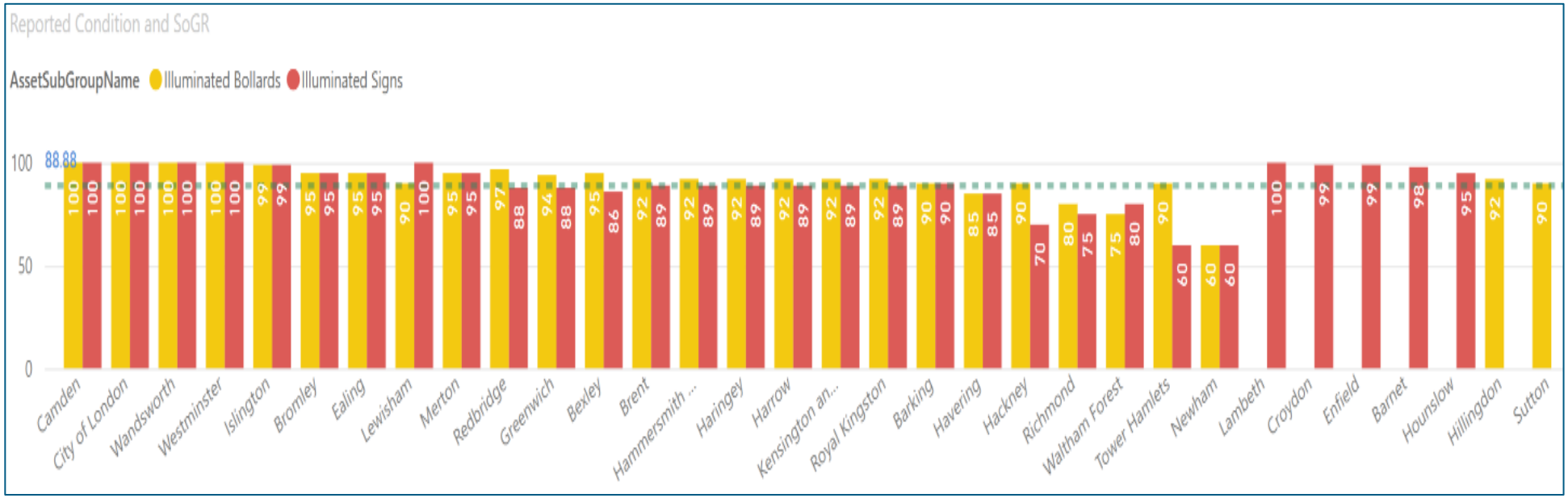

Figure 4-15 – Illuminated Bollards and Signs Condition across London

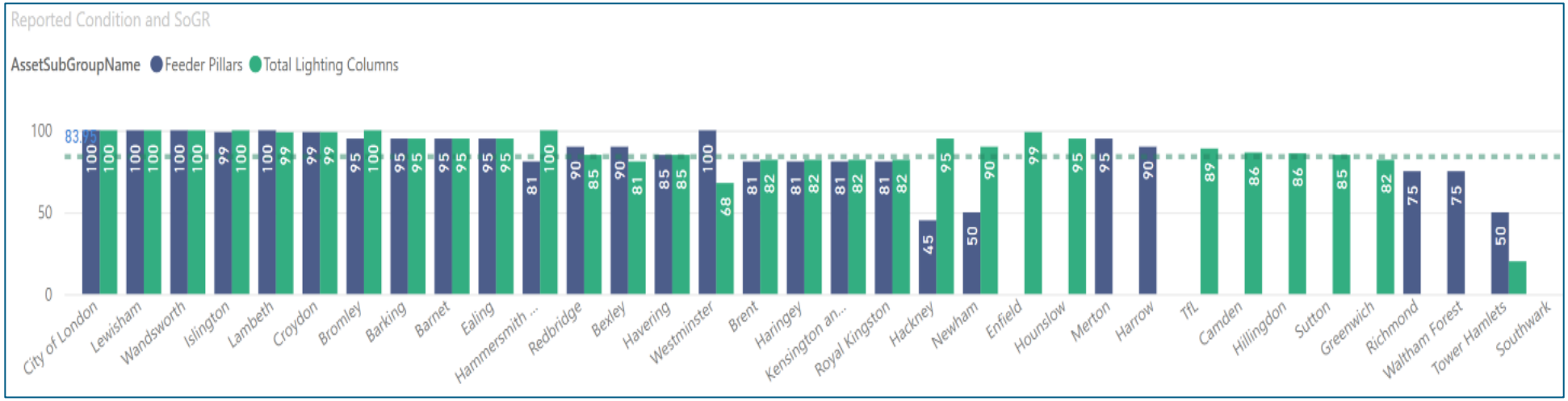

Figure 4-16 – Pillars and Columns Condition across London

4.3. Maintenance Backlog

4.3.1. Overall Backlog

The total backlog across all London authorities for 2020/2021 is estimated to be **c. £1.6bn;** The split between Asset Groups can be seen in Figure 4-17. This reflects the overall increase in Structures Backlog this year

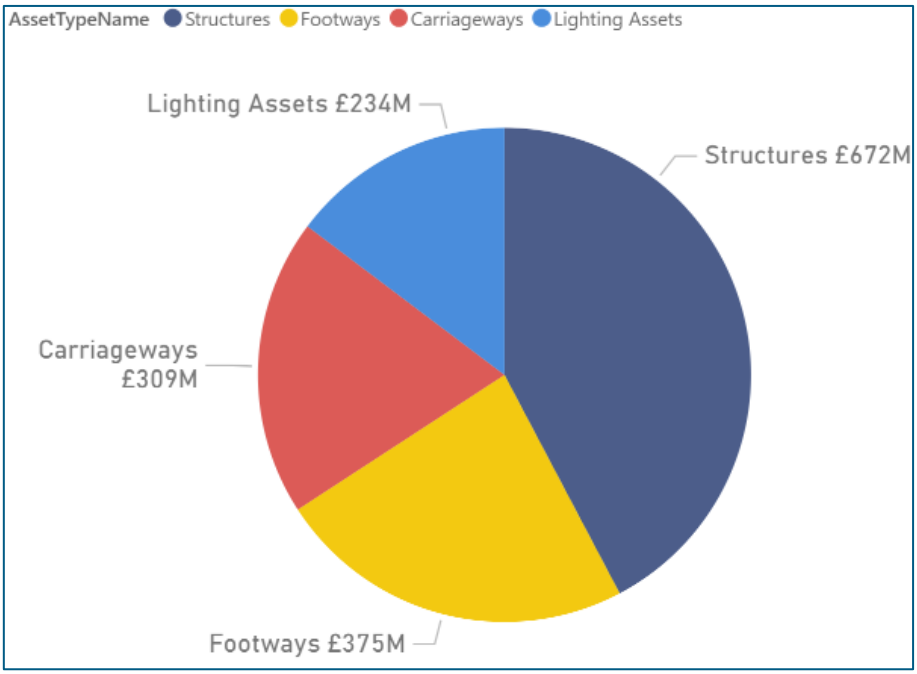

Figure 4-17 - Backlog by Asset Group

4.3.2. Maintenance spending

The overall maintenance expenditure in 2020/21 is estimated to be **c. £329m** across all authorities and asset groups**.** Figure 4-18 exhibits the annual maintenance spend by authority.

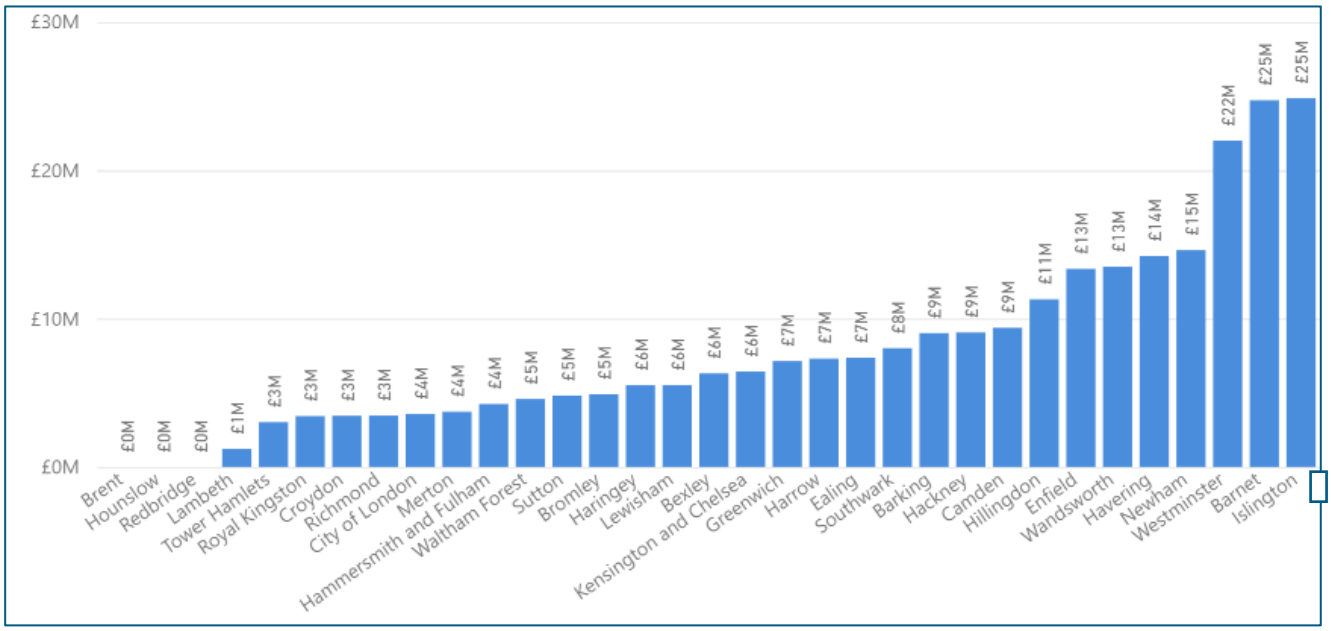

Figure 4-18 - Maintenance Total Spending by Authority

London boroughs spend between £1m and £25m in maintenance with the average figure calculated at **c. £10m (£8m excluding TfL)**.

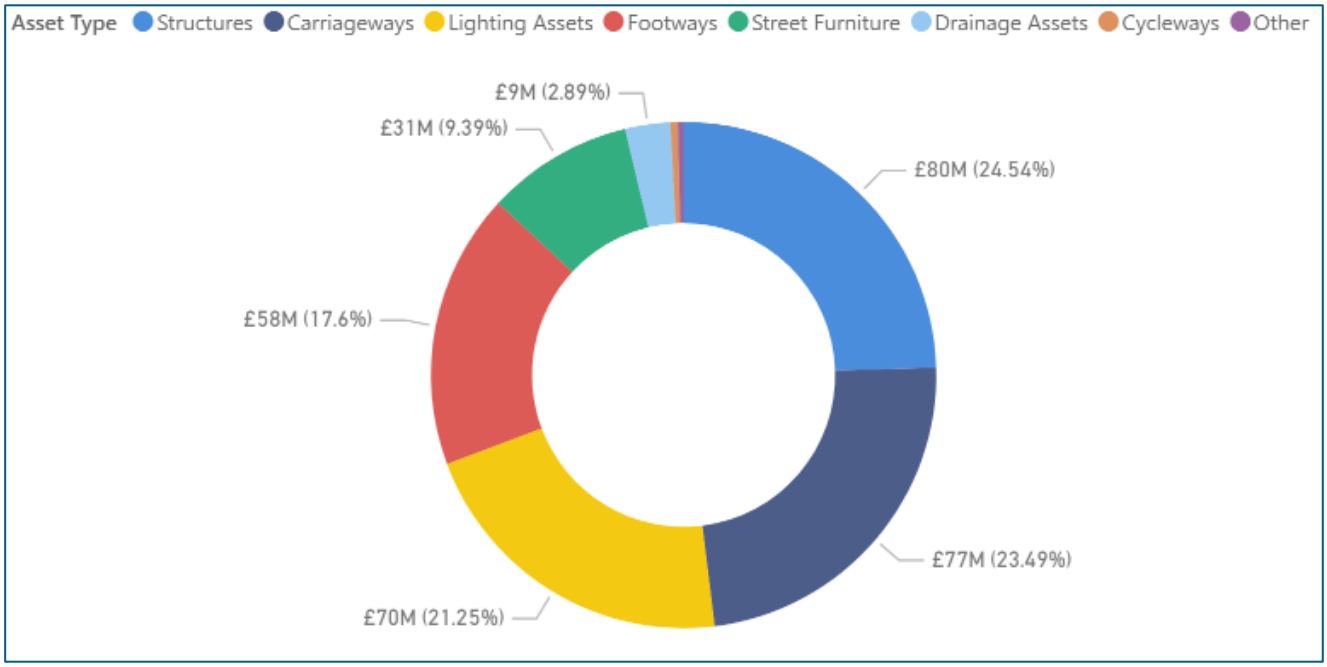

Figure 4-19 - Total Spend by Asset Group

Structures received the biggest allocation in 2020-2021 (£80m), followed by carriageways (£77m), lighting (£70m) and footways (£58m). Street Furniture (£31m) was the next biggest allocation, followed by Drainage (£9m) and other categories (£4m) – corresponding to minor maintenance across all asset types.

4.3.3. Carriageways

The carriageways maintenance backlog is estimated this year to be **c. £309m.**

Across London's B, C & U roads, backlog sums up to **£230m** with Principal Roads' backlog being significantly lower across the capital (**c. £79m**). In terms of backlog per lane-km B, C & U roads present an average figure of **c. £17,757** whereas average backlog per lane-km for principal roads is estimated to be **c. £41,470.** Figure 4-20 exhibits the split of the amount of carriageways backlog between the London Boroughs.

The overall backlog figure for 2019-2020 is reported to be c. **£248m** (compared to the **£309m** figure calculated for 2020-2021). This suggests that the carriageways backlog using the latest available data across all authorities for the last 2 years is estimated to be increasing by c. £61m in the past year.

Figure 4-21 presents the historical backlog trends and Figure 4-22 illustrates the split between Principal and B, C & U roads backlog by authority.

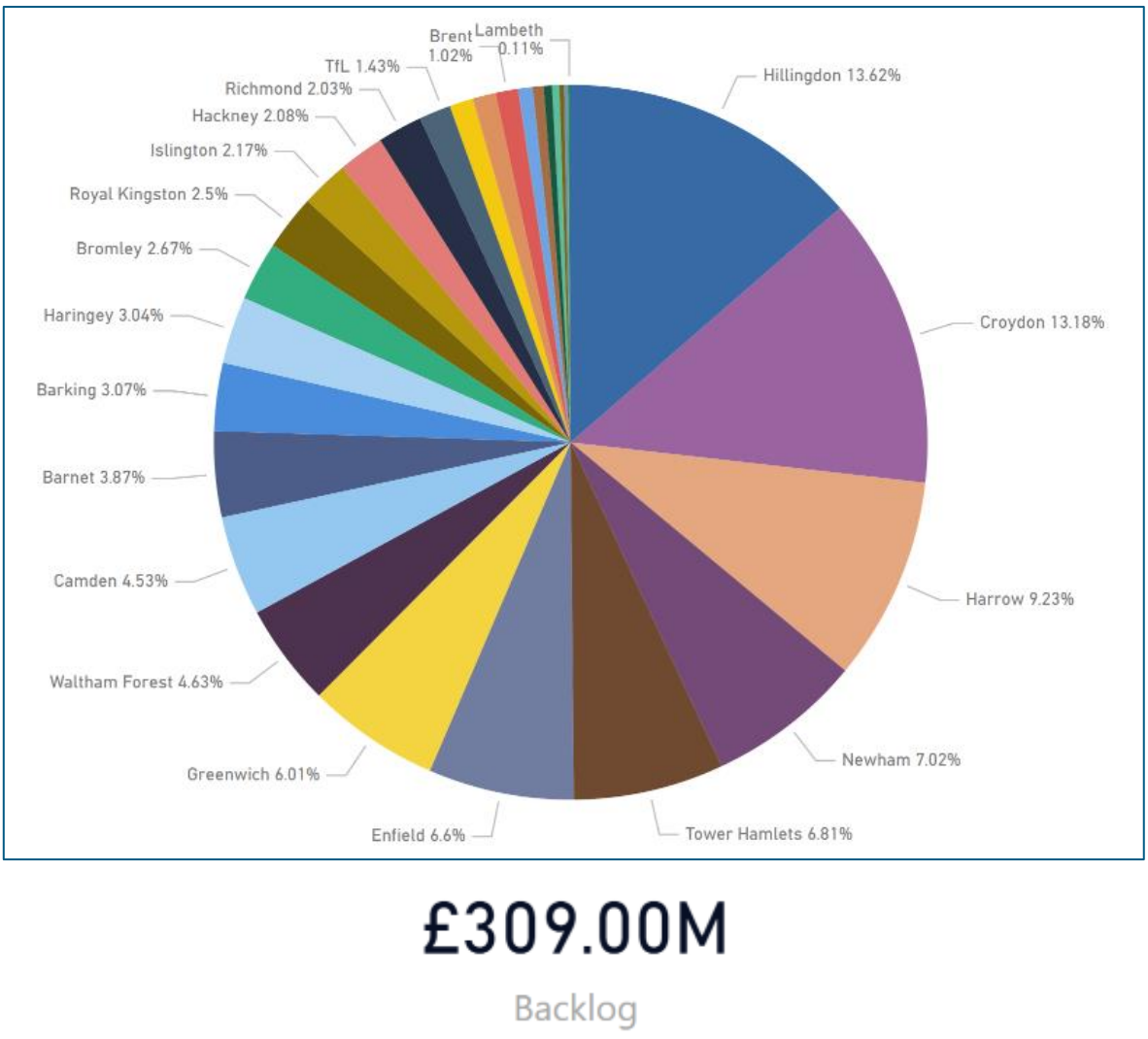

Figure 4-20 – Backlog for carriageways by Authority

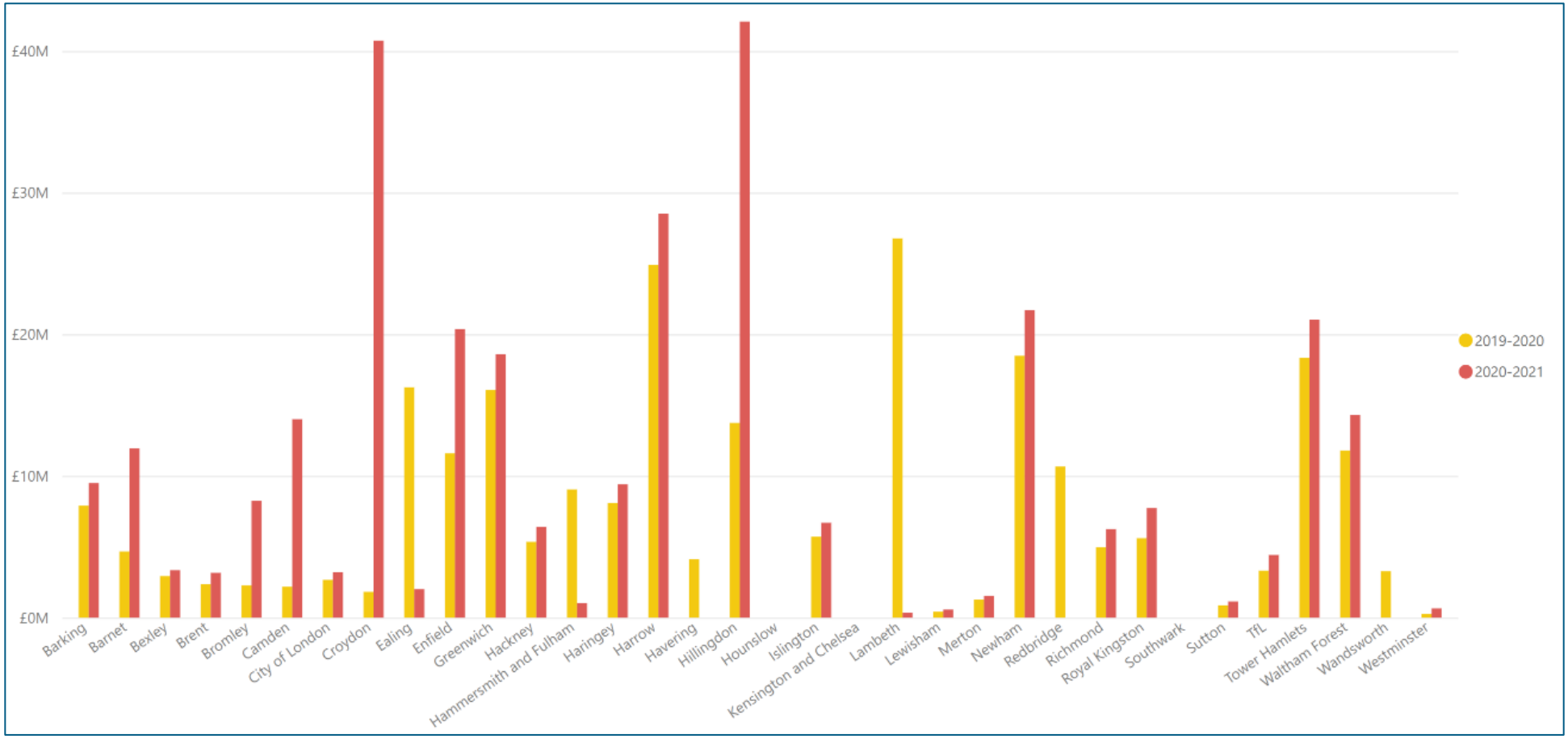

Figure 4-21 – Backlog trends for carriageways by Authority (2019-2021)

Figure 4-16 presents the updated (historic) and most recently estimated backlog figures across London Authorities. Figure 4-17 below illustrates the backlog split by the A and B, C, U roads.

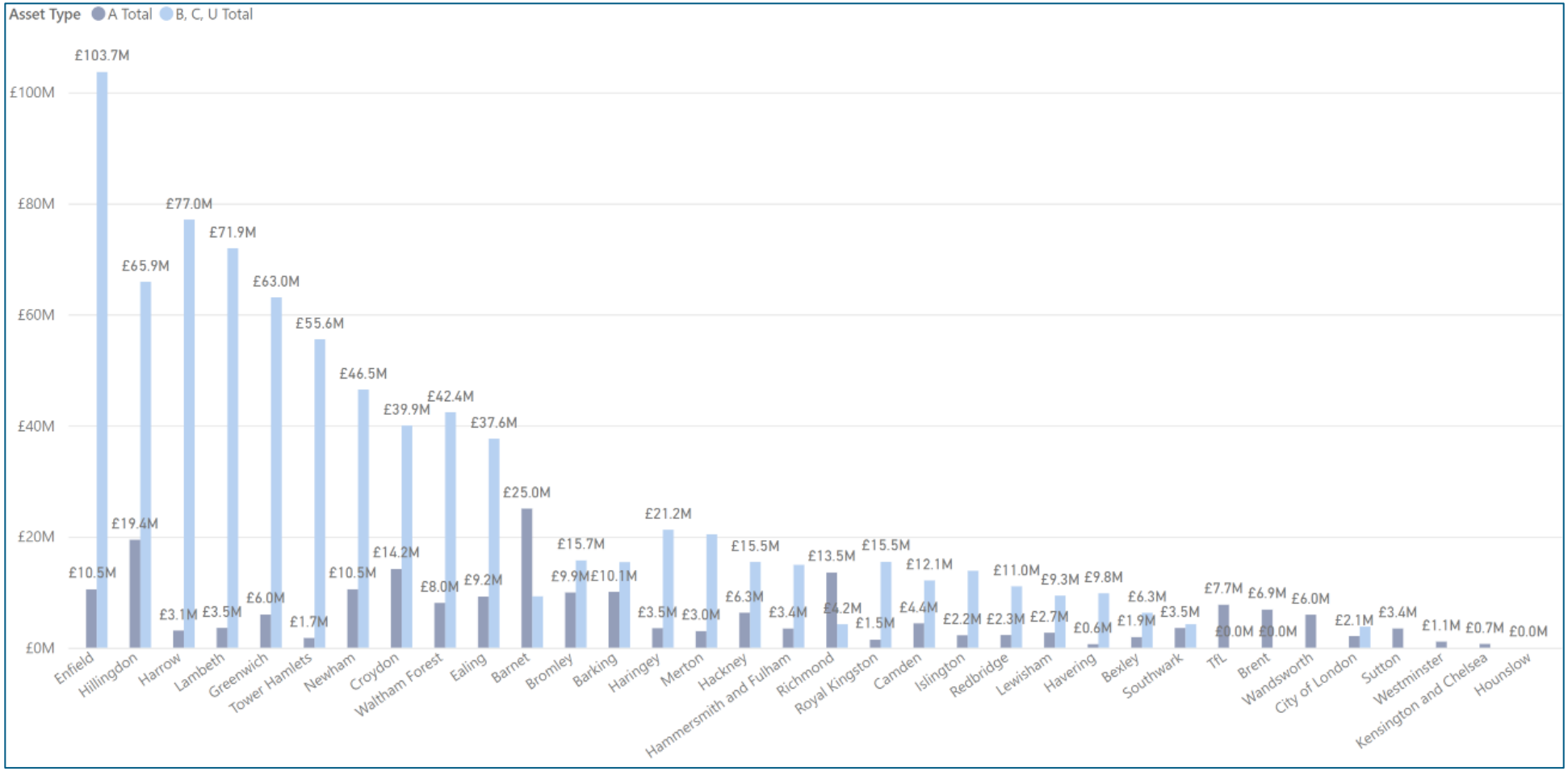

Figure 4-22 - Backlog by Authority and Asset Type

4.3.4. Footways

This year's footways backlog total is estimated to be **£375m**.

Circa £354m corresponds to backlog on Categories 2, 3 and 4 footways (94% of total backlog)**, whereas backlog which corresponds to 1 and 1A roads is significantly lower at c. £21m.** Figure 4-24 illustrates the backlog trends by authority and Figure 4-25 presents the footways backlog per borough and footway category type.

The overall backlog figure for 2019-2020 is reported to be c. £237m (compared to the £375m figure calculated for 2020-2021).

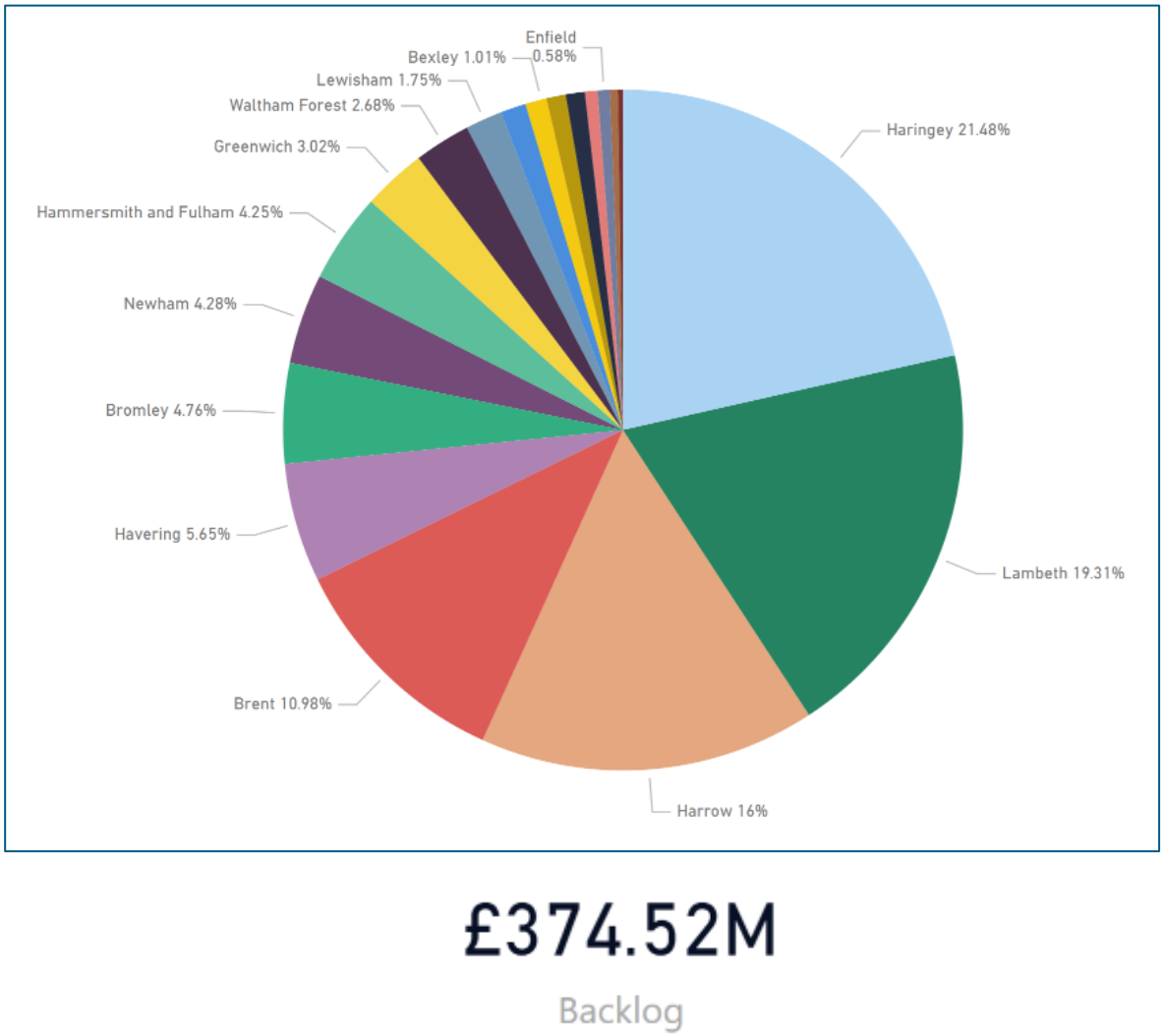

Figure 4-23 - Backlog for footways by Authority

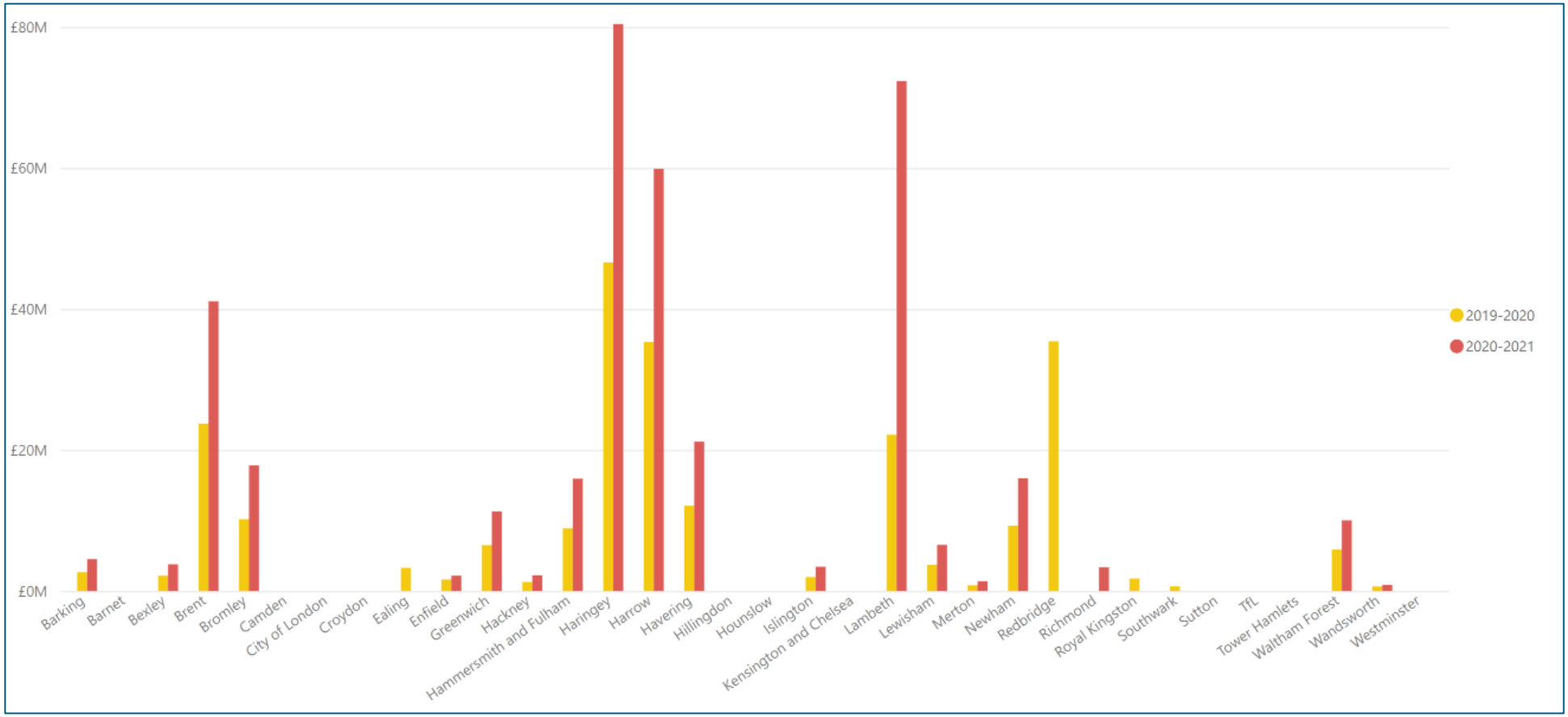

Figure 4-24 - Backlog trends for footways by Authority (2019-2021)

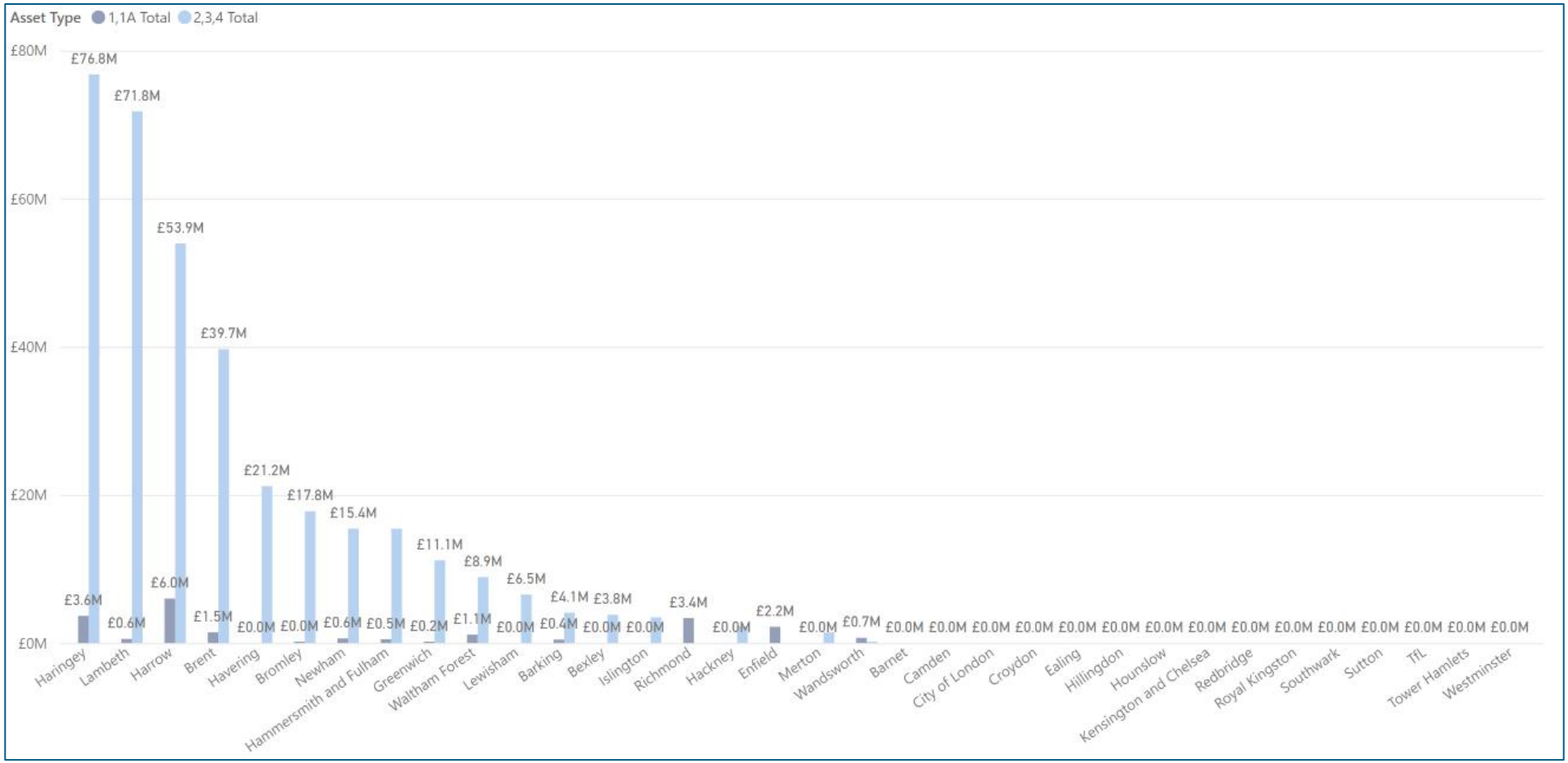

Figure 4-25 - Backlog for footways by Borough and footway hierarchy

4.3.5. Structures

The structures maintenance backlog has been increasing since the first State of City report, published in 2017, where it was estimated to be **c. £216m**. Using the latest data (from Bridgestation) and reviewed assumptions, the figure is now calculated to stand at **c. £672m.** Figure 4-26 presents the structures backlog per authority as estimated using the latest data input.

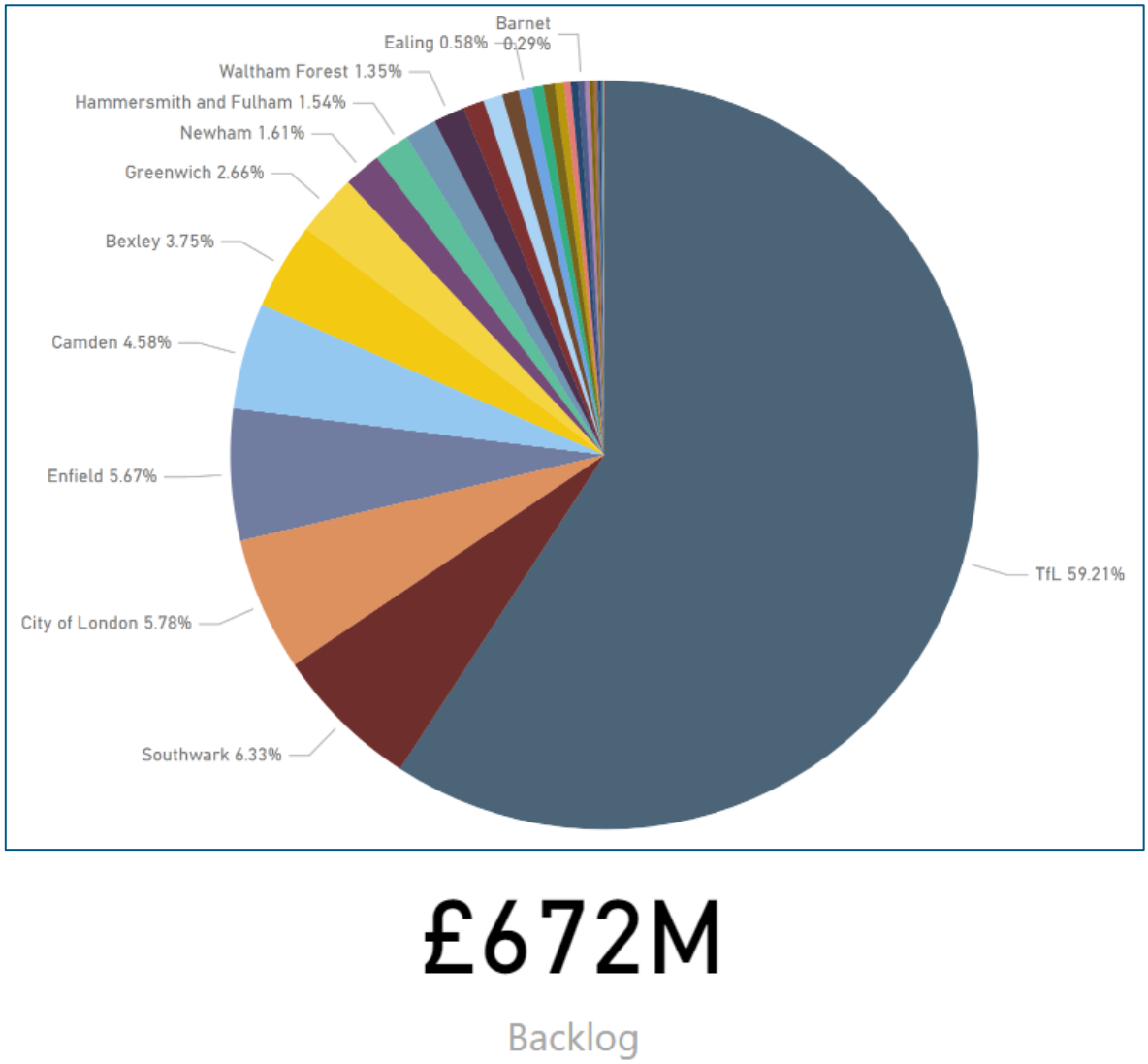

Figure 4-26 - Structures Backlog by Authority

Figure 4-27 breaks down the structures backlog per asset class (Footbridge, Roadbridge, Retaining Walls, Tunnels, Culvers, Piers, Cellar and Vaults) across London.

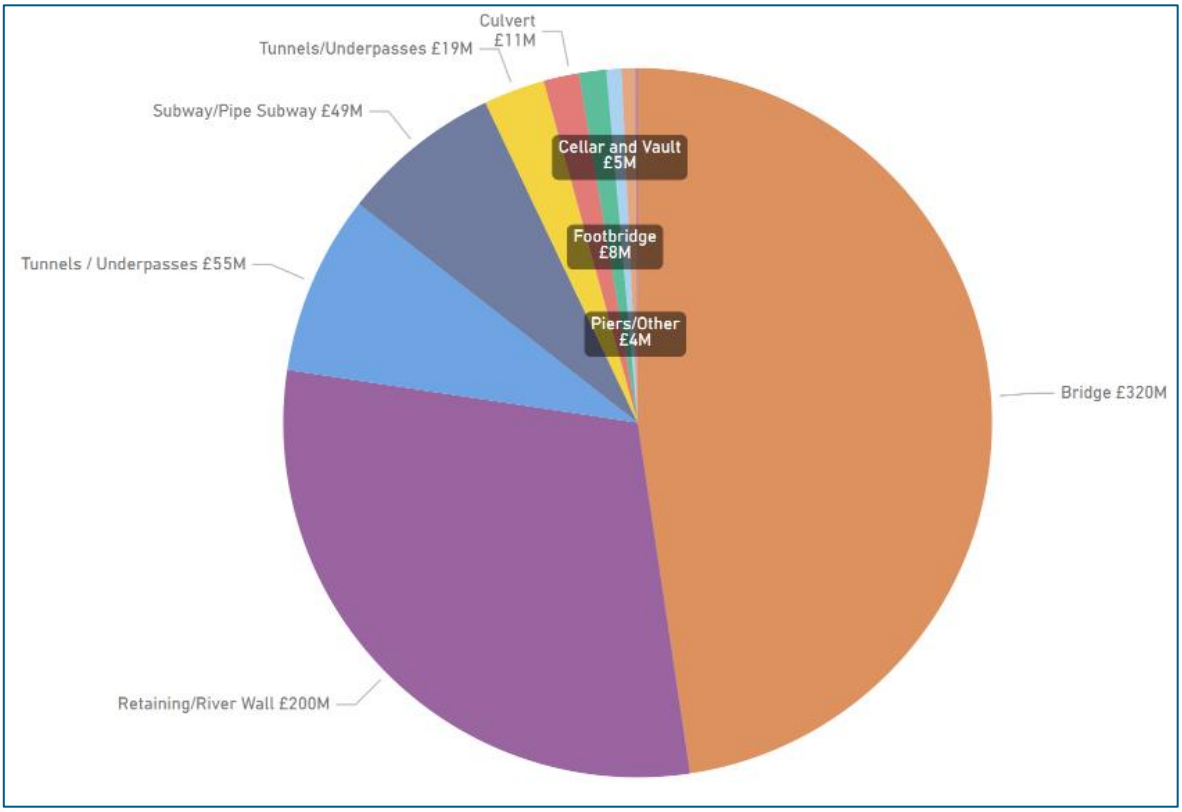

Figure 4-27 - Structures Backlog per asset type

4.3.6. Lighting

The estimation for this year's total backlog for Lighting is **£234m.** This breakdown is presented in Figure 4-28 which represents the allocation / split between authorities and total backlog.

Figure 4-29 presents a breakdown of backlog across all authorities and Figure 4-30 includes a breakdown of asset types.

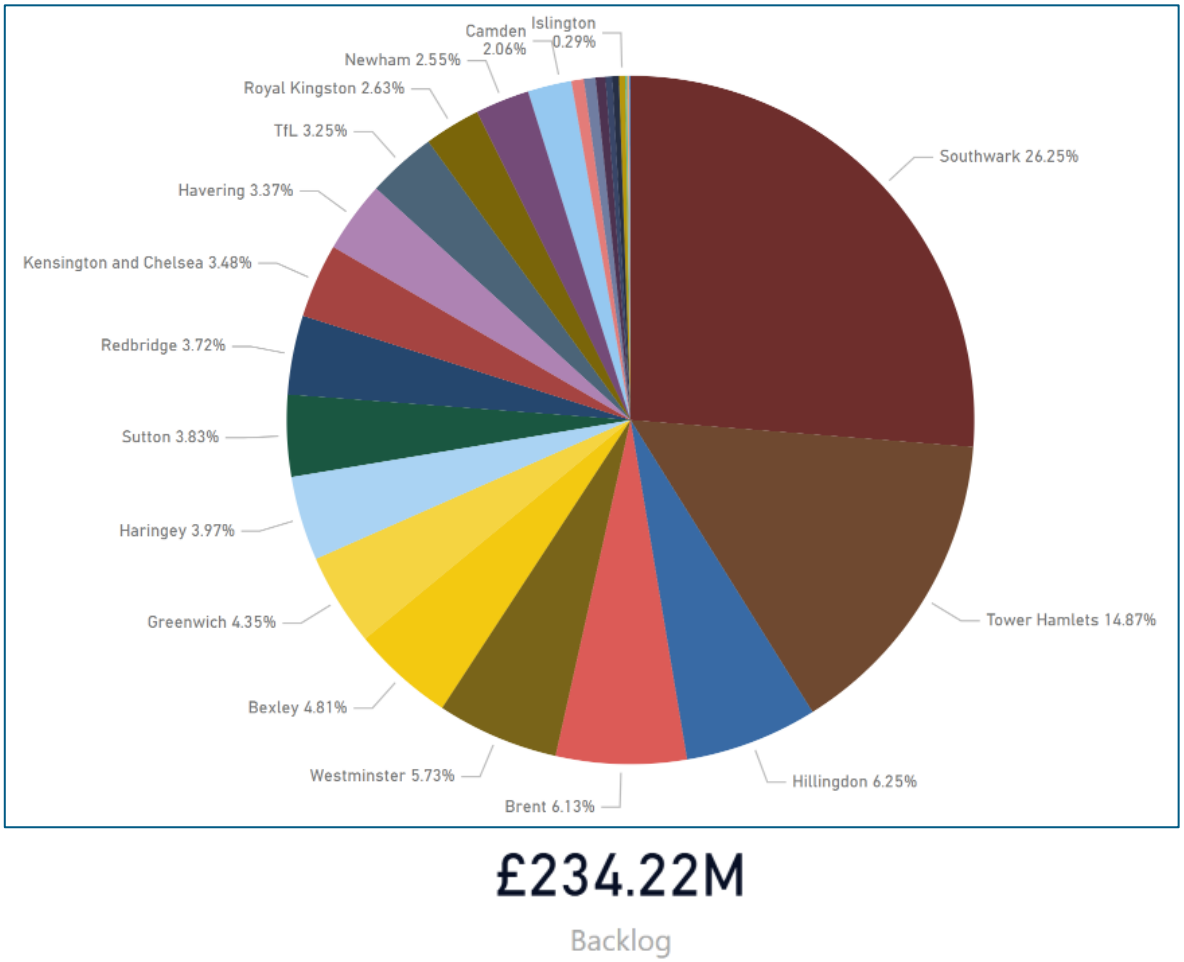

Figure 4-28 - Lighting backlog per Authority

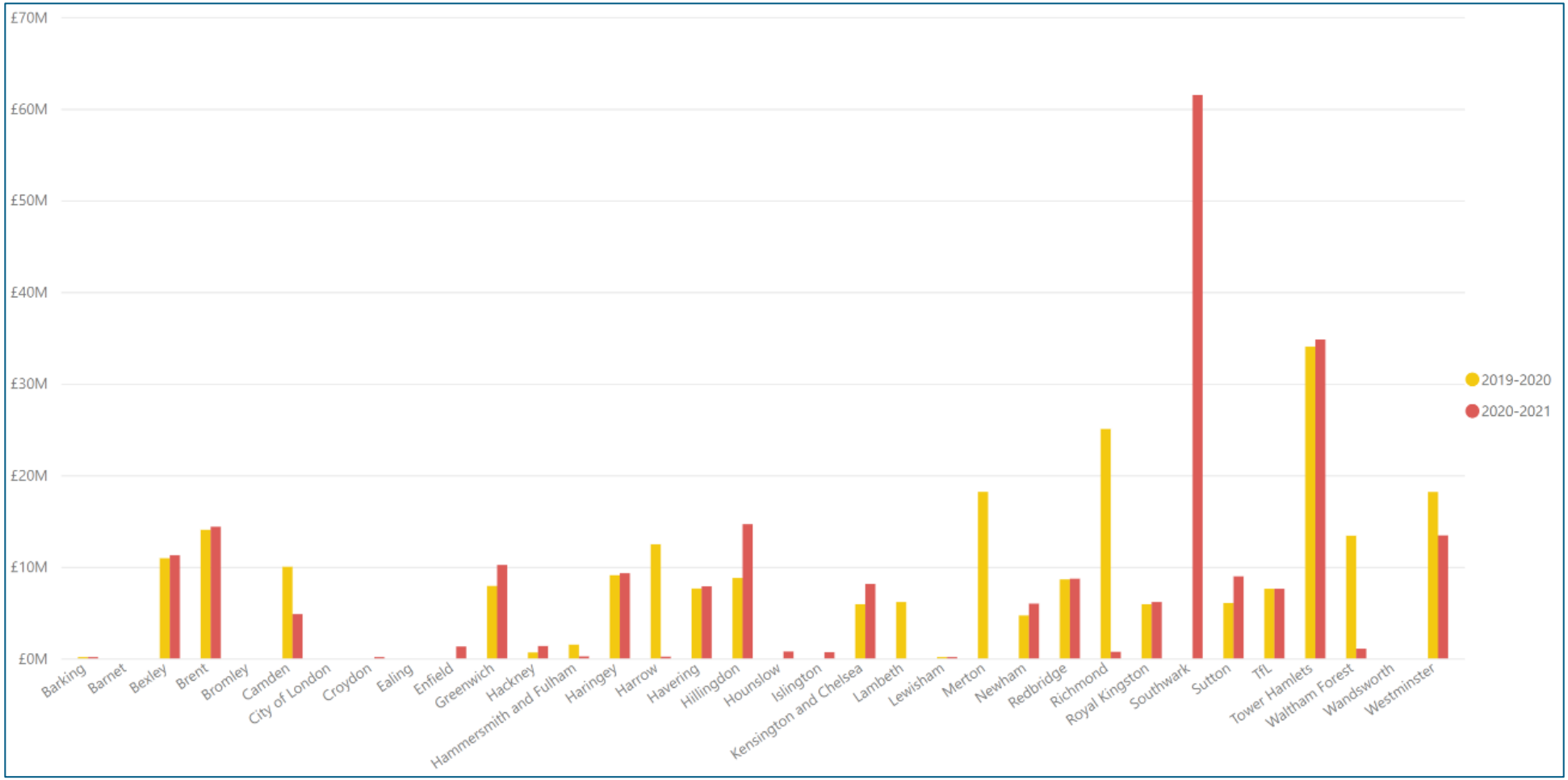

Figure 4-29 – Backlog trends for lighting by Authority (2019-2021)

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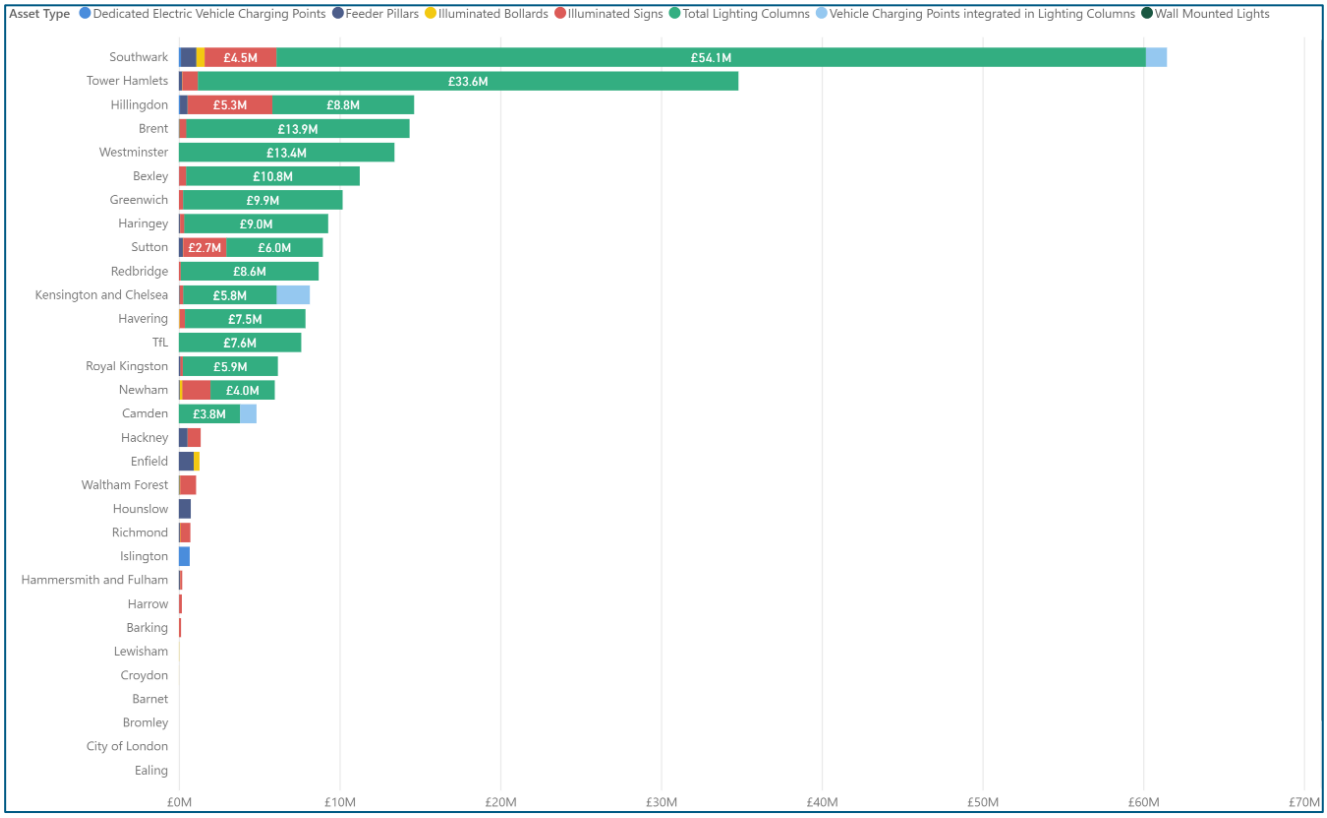

Figure 4-30 - Lighting backlog by Authority and Asset Type

4.4. Infrastructure Deterioration

Overall, asset health trends for the four major asset types can be seen in Figure 4-31.

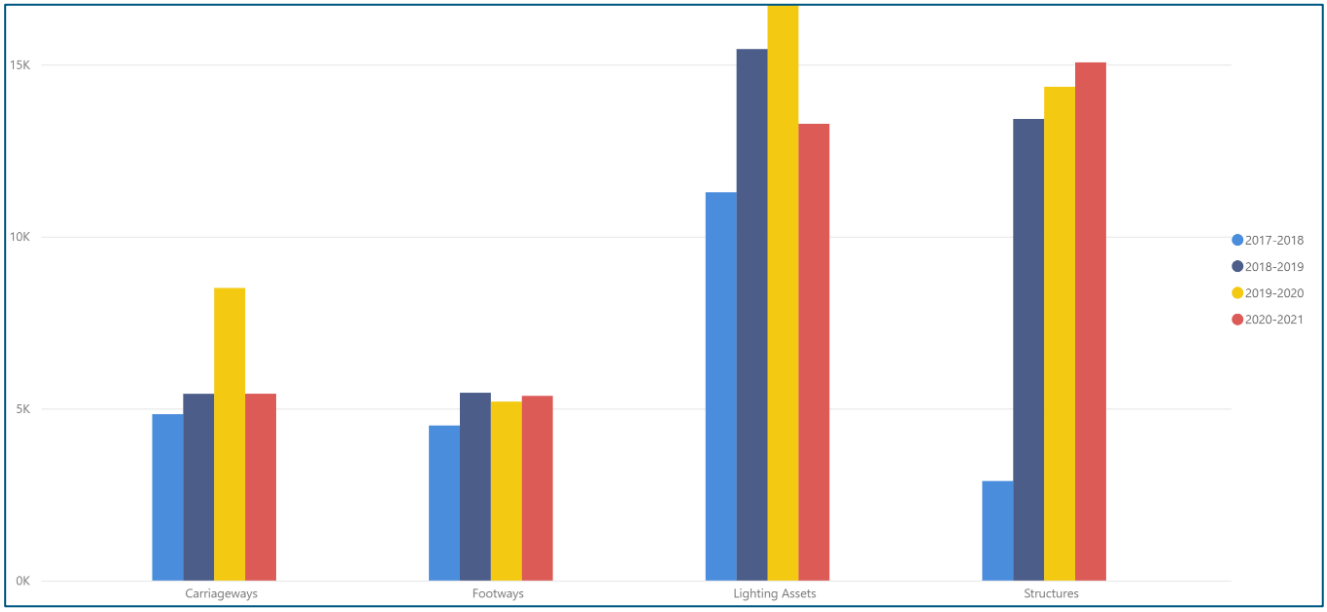

Figure 4-31 - Asset Health trends in London

In a similar way and with decreasing condition, the overall backlog is estimated to be increasing over the 4-year analysis span. This is displayed in Figure 4-30. In 2020-2021 the overall maintenance backlog has increased by £460m since 2019-2020 from £1.1bn to £1.6bn.

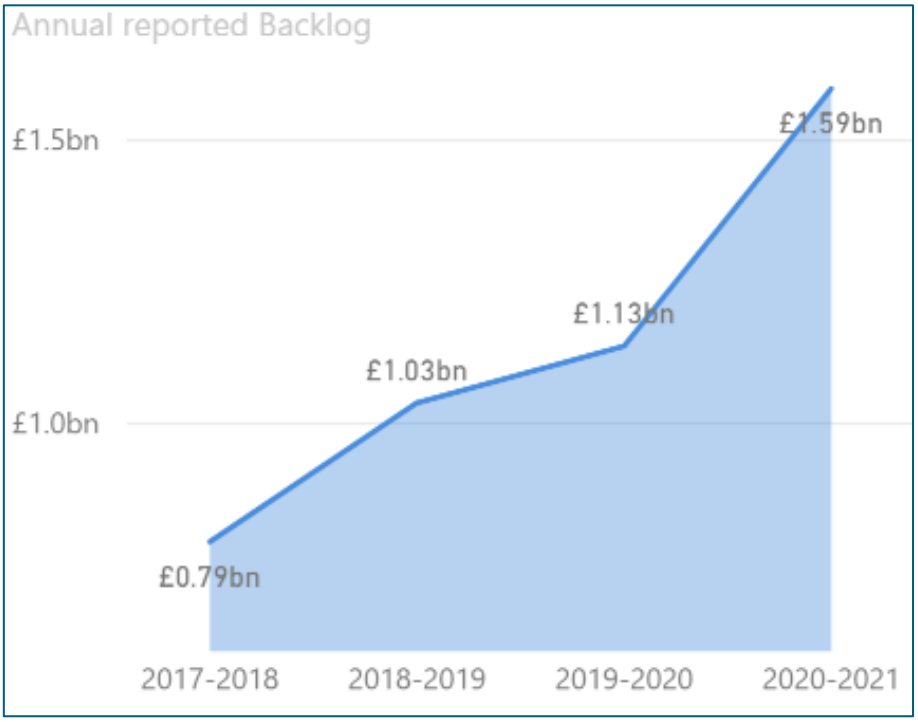

Figure 4-32 - Maintenance Backlog trends in London

4.5. Asset Management Maturity

The assessment of Asset Management maturity across London boroughs, provides a baseline and a representation of how far asset custodians in the capital have progressed with CoP recommendations and with developing the necessary skills, frameworks, technology and processes to support all decision making (maintenance & renewals).

Ten categories of Asset Management themes were presented as exhibited in Table 4-4.

Table 4-4 - Asset Management Maturity Categories

ID	Asset Management Practice	Asset Management Practice Description
1	Policy and Strategy	The borough has a documented asset management policy and strategy that are consistent with strategic polices and strategies, and stakeholder requirements. The asset management policy
2	Communications	Asset management practices and activities are effectively communicated to relevant internal and external stakeholders including customers (HMEP 2 and 14; DfT Incentive Fund 2)
3	Stakeholders	Key asset management stakeholders, including customers and members, have been identified and are suitably engaged, and their requirements are used to inform practices, including capturing customer feedback (HMEP 12 and 13)
4	Performance Management	Operation, tactical and strategic performance measures and targets have been implemented which align with the borough's corporate objectives / outcomes, providing the senior management team, members and public with visibility of how highways contribute to the corporate objectives/outcomes. The Performance Measures are utilised by the borough to set levels of service, manage performance, assist in improving the service and utilised in communications with stakeholders.
5	Risk Management	The borough has well defined risk management processes that feed into and inform asset management decision making and activities (HMEP 8)
6	Lifecycle planning	Documented and auditable whole life and lifecycle planning principles and practices are used to assess short and long-term asset performance, costs and risks in order to inform business planning (HMEP 5; DfT Incentive Fund 5)
7	Prioritised work programmes	Documented and systematic practices, that take account of risks to objectives, safety and performance, are used to identify and prioritise cost effective programmes of works (HMEP 20)
8	Inspections and defect response	Documented and systematic practices are embedded and resourced for asset inspections and defect response – the practices are risk based where appropriate (no HMEP equivalent)
9	Competence and training	Competence requirements to deliver asset management are regularly reviewed and documented (e.g. job descriptions) and staff receive the necessary training and support to develop their asset management skills (HMEP 7)
10	Code of Practice Readiness	Adoption of all the recommendations from Well-managed Highway Infrastructure: A Code of Practice.

Table 4-5 provides the AM Maturity Assessment Criteria ranging from level 0 to 4.

Table 4-5 - AM Maturity Levels

Maturity Level	Generic Description
Level 0 – Innocence	Unaware of the requirement OR aware but there is no evidence of plans to address it
Level 1 – Aware	Aware of the requirement AND there is evidence of intent to progress it
Level 2 – Developing	The means of systematically and consistently achieving the requirement have been identified and are being progressed with credible and resourced plans in place
Level 3 – Competent	Robust, systematic and consistent practices are established for the requirement and there is evidence that they are working effectively
Level 4 – Integrated and Optimised	Practices are well established and seen as industry leading, delivery integrated and optimised asset management

The detailed survey responses are presented in Figure 4-31 and Figure 4-32 – 'AM Maturity Levels – Responses' that detail 2019-2020 and 2020-2021 responses.

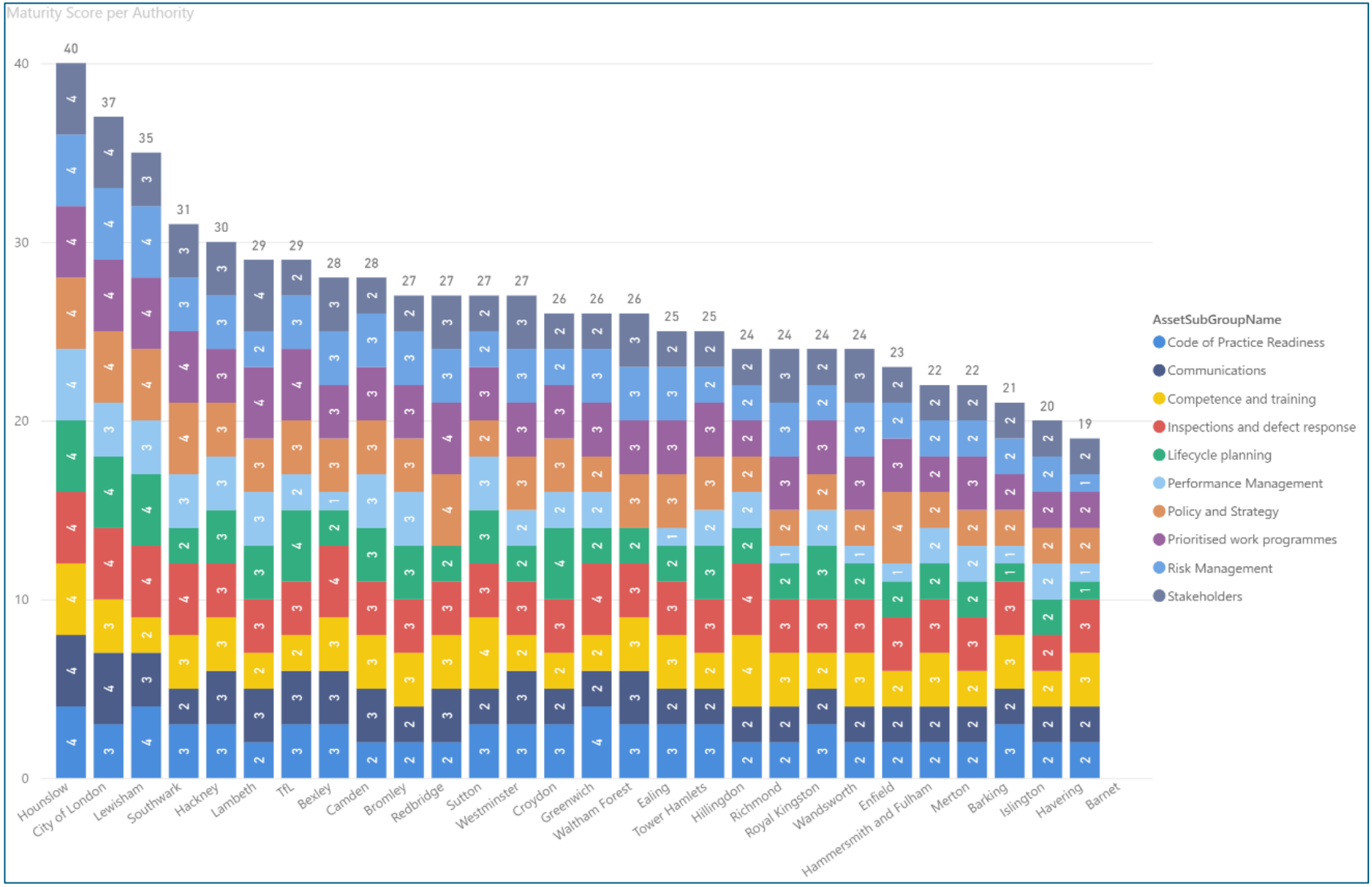

Figure 4-33 - AM Maturity Levels: 2019 - 2020 Responses

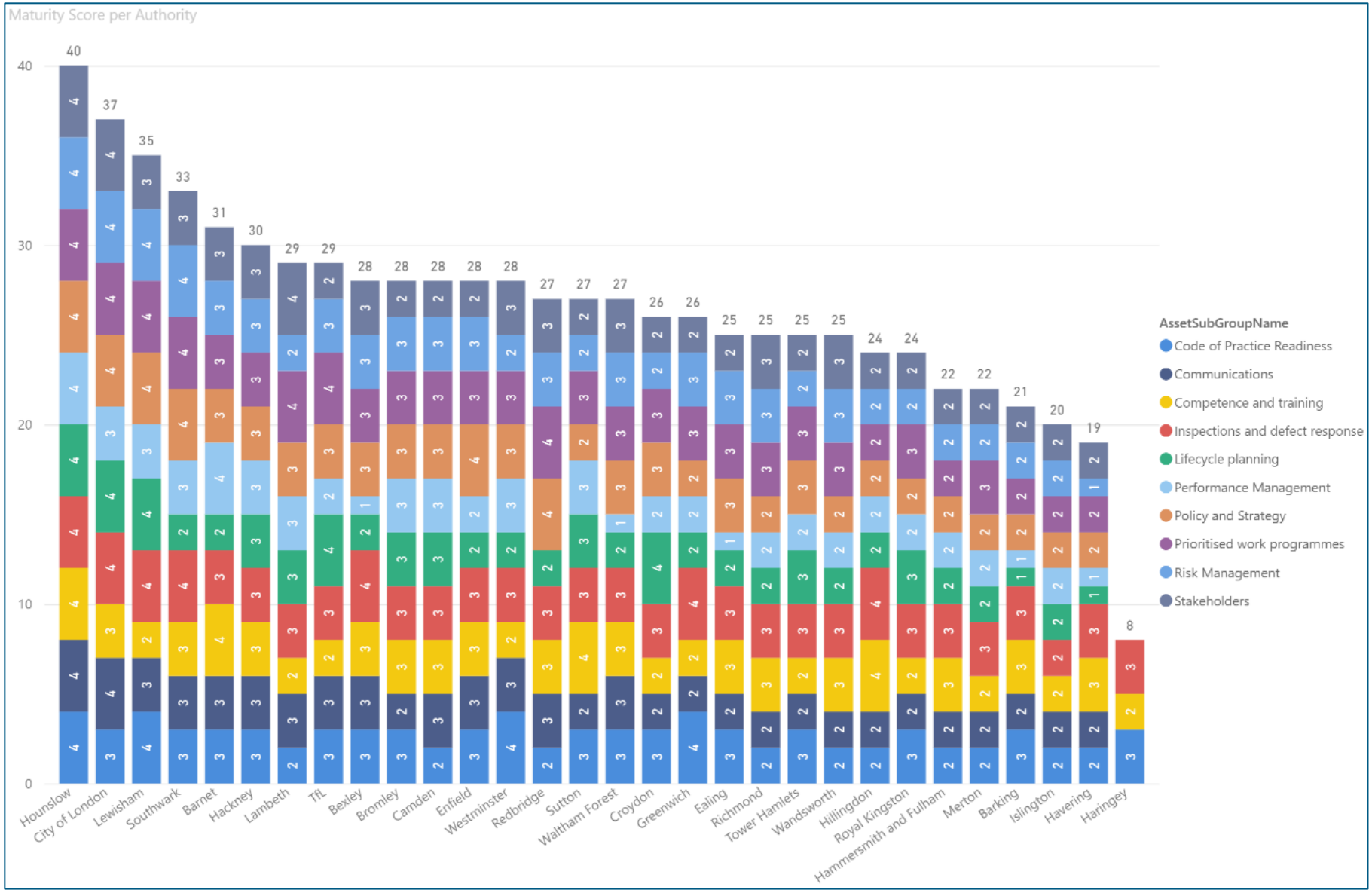

Figure 4-34 - AM Maturity Levels: 2020 - 2021 Responses

Figure 4-33 and Figure 4-34 aggregate the scoring for each authority with 0 being the lowest achievable and 40 the highest (10 categories with range 0 to 4).

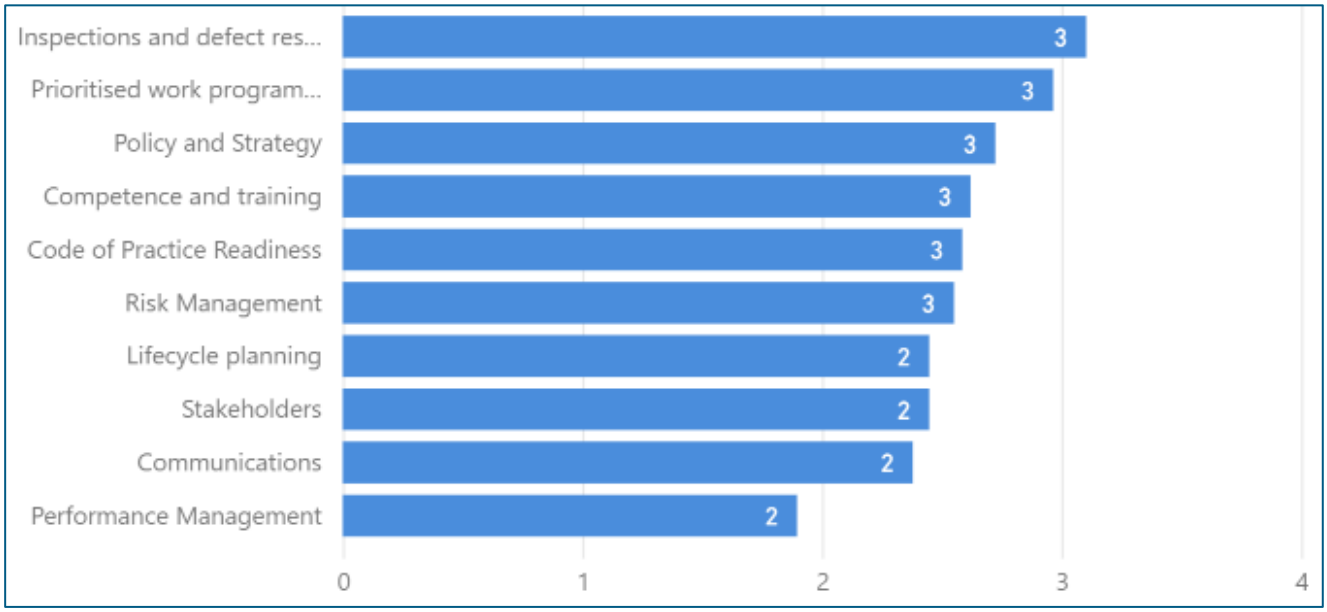

Figure 4-35 - AM Category Maturity data aggregation (2019-2020)

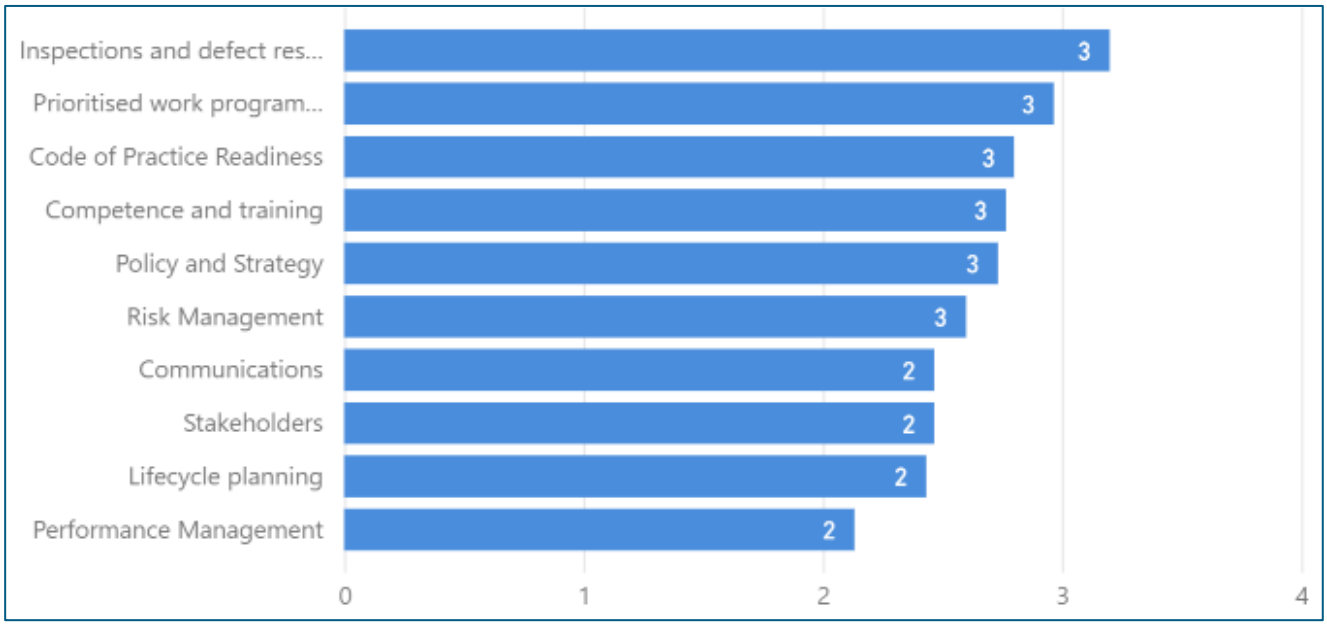

Figure 4-36 - AM Category Maturity data aggregation (2020-2021)

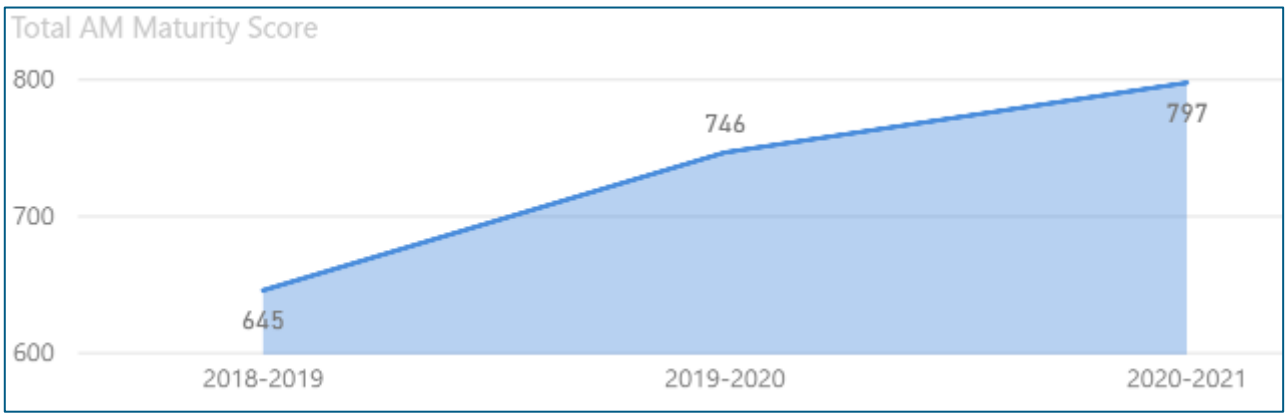

Figure 4-37 - Total AM Maturity Score (2018-2021)

It can be observed from Figures 4-33 and Figure 4-34 that across all participating authorities, the average aggregated maturity scores have improved, with many of the boroughs reporting an improvement in at least one AM Maturity Category. ‘Inspections and defect response’ has scored the highest in both years whereas ‘Performance Management’ has scored the lowest. The aggregate change in the score is further illustrated in Figure 4-37 as the total AM Maturity score has risen from 746 in 2019-2020 to 797 in 2020-2021. This indicates higher maturity levels across all authorities in London.