ATKINS

Member of the SNC-Lavalin Group

State of the City Report

Year 2: 2019-20

LoTAG

07 May 2021

Notice

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This document has 48 pages including the cover.

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 1.0	State of the City – detailed report	SC	TS	TS	JP	07/05/2021
Rev 2.0	Updates to data submitted by subset of authorities.	TS				24/05/2021

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 and 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

2020 has been a challenging year for all local Highways Authorities. The impact of the Covid pandemic extends to infrastructure management with a large number of 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 SoC 2018-2019 and capitalises 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:

- **Evolution of Questionnaire and online solution –** Atkins worked collaboratively with input from LoTAG and Local Authorities to evolve the 2018 questionnaire, which was circulated to the London Highway Authorities for completion in 2018-2019. For the 2019-2020 analysis the state of city online solution was developed to host collate and process the submitted data.
- **Stakeholder engagement –** the Local Authorities were invited to attend engagement workshops providing a forum for the aims of the report, data requested and queries to be discussed. A series of workshops were held, these included training and guidance. Additional 1-2-1's with a sub-set of authorities were undertaken. To this extent, condition data and submissions were discussed and assessed, and data inputs validated.
- **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 2019-2020 State of the City' analysis:

- Carriageway
- Footway
- Cycleways
- Structures
- Lighting
- 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 Authorities, 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

The online solution was first presented and shared with LoTAG; stakeholders were invited to participate in mock-up data submissions. Issues, bugs, and feedback were collated and addressed. A follow up kick-off meeting with all London Authorities was then scheduled. The workshop presented and reiterated the aim of the SoC work, this year's data requests.

Four workshops were held with stakeholders from the local Authorities. In these workshops, Atkins presented the State of the City Questionnaire, its purpose, the information that was gathered from previous years and all changes that were introduced to the latest version. Open discussions were held where Authorities' 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.

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 2017-2018 and 2018-2019 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 LoTAG for the 2018-2019 report. Assumptions for the 2019-2020 submission are refined and aligned to previous outcomes. These represent maintenance backlog and annual maintenance need and are founded upon a series of engineered assumptions. Inconsistent reporting for specific sub-asset classes (structures) was identified and feedback from the chair of the relevant group was integrated in the analysis to generate the relevant figures for this year's analysis and outputs. All the relevant asset specific assumptions (service lives and relevant rates) are presented in Table 3-1 in a format similar to the 2018-2019 submission.

Table 3-1 - Backlog and Steady State Assumptions Comparison of 2018 & 2019

Asset Type	Asset Group	Service Life (Years)		Renewal Rate (Backlog)		Maintenance Rate (Steady State)		Width (m)	Target PI		OpEx Rate	
		2018	2019	2018	2019	2018	2019	All years	2018	2019	2018	2019
Carriageway **(rates per unit area)**	Principal Roads (A Roads)	15		£45		£40	£40	3.5	90%		30%	30%
	Local Roads (B, C, U Roads)	25		£22	£25	£22	£22	8	85%		30%	30%
Footways **(rates per unit area)**	Category 1 & 1a	30		£50	£90	£90	£90	2	90%		30%	30%
	Category 2, 3, 4	40		£40		£30	£30	2	85%		30%	30%
Street Lights **(rates per unit)**	Lighting columns	40	40	£4,000	£4,000	£4,000	£4,000	-	95%		10%	10%
	Feeder Pillars	20	20	£1,500	£1500	£1,500	£1,500	-	95%		10%	10%
	Illuminated Bollards	20	20	£460	£460	£460	£460	-	95%		10%	10%
	Illuminated Signs	20	20	£550	£550	£550	£550	-	95%		10%	10%
Drainage **(rates per unit)**	Gullies (structural life)	50	50	N/A	£1,000	£1,000	£1,000	-	95%		-	
	Gullies (serviceability)	0.5	0.5	N/A	£12	£12	£12	-	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%		-	

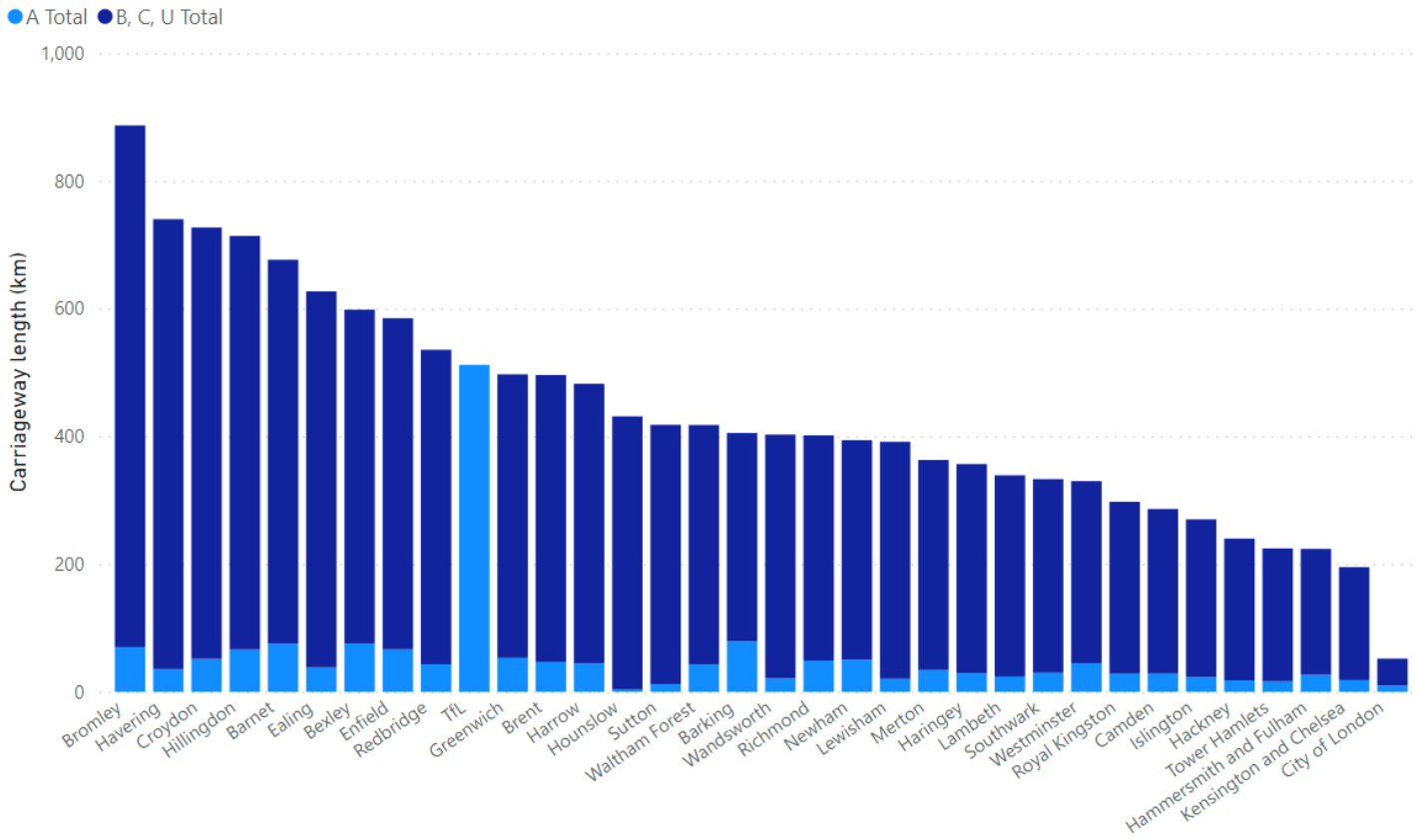
4. Results

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. **14,850km** with Principal Roads (A Total) to c. **1,278km** (excluding TfL's inventory); TfL's Principal Roads carriageway length is **c. 512km** long. These figures present little (negligible) variation from the 2019-2019 submission.

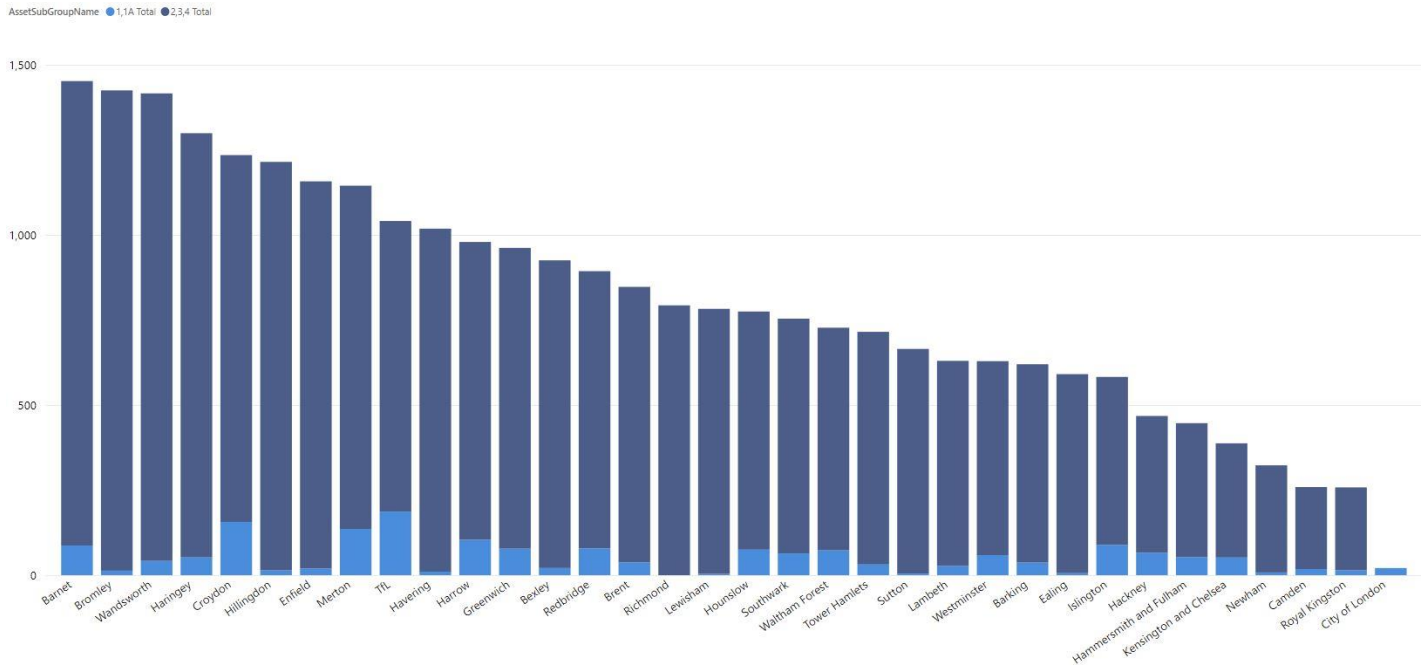
Figure 4-1 - Carriageway Length across London (split between Principal "A" and Local "B, C & U" Roads)



4.1.2. Footways

Collated footways inventory data indicates that across the capital there is a total of c. **28,770km** of footways. Hierarchies 1 and 1A amounts up to **3,920km**. The breakdown is displayed in Figure 4-2. TfL owns the largest length of footways (c. 2,368km) followed by Barnet (c. 1,452km) and Bromley (c. 1,425km).

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

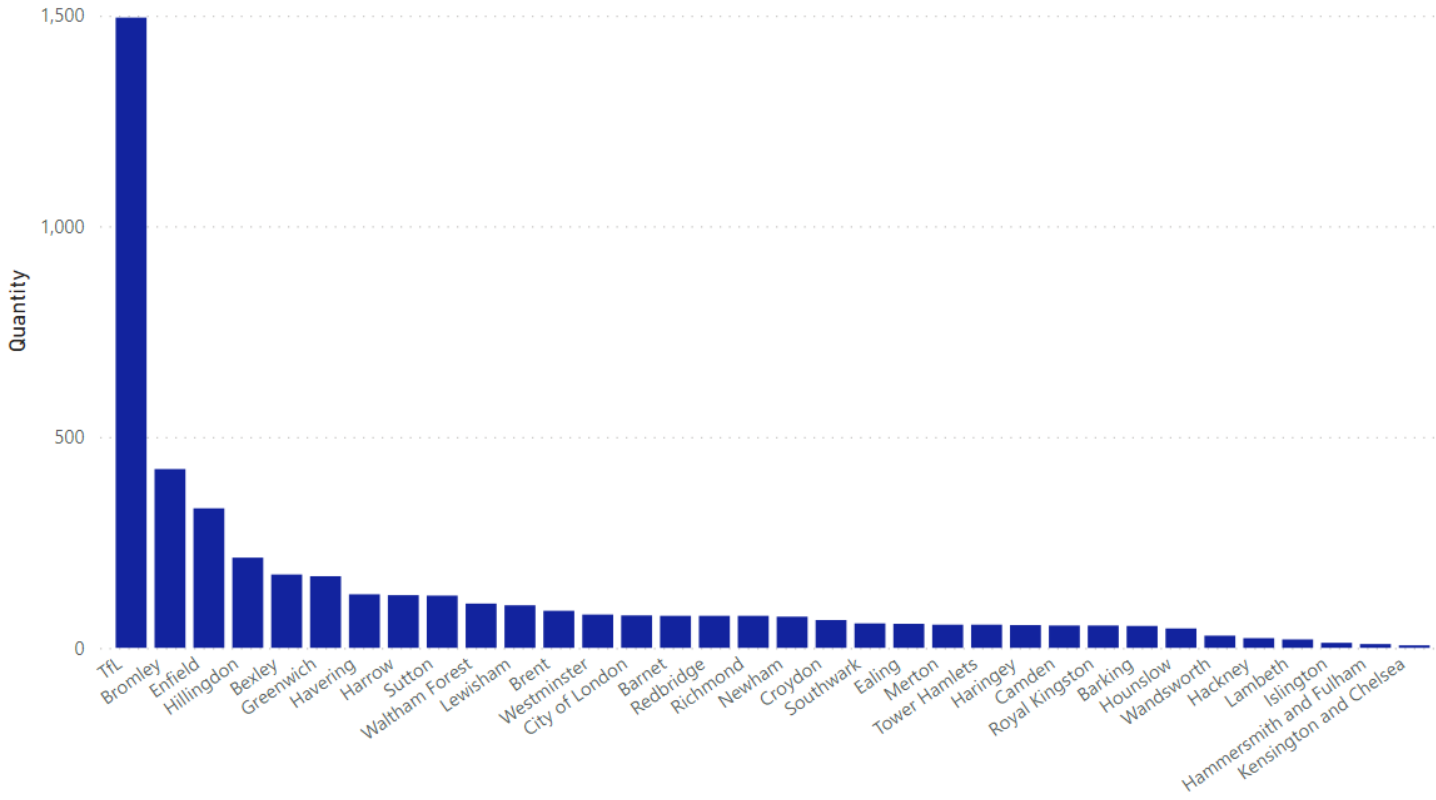


4.1.3. Structures

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 **1.08 million m²**.

It should be noted that the total 'equivalent area' figures exhibit some inconsistencies when compared with historic Bridgestation SoC report outputs. This could be attributed to overall inventory and inspection coverage. It is proposed that the standardised report should be reviewed in light of this to avoid 'noise' in the reported figures.

Figure 4-2 - Structures Stock - Quantities

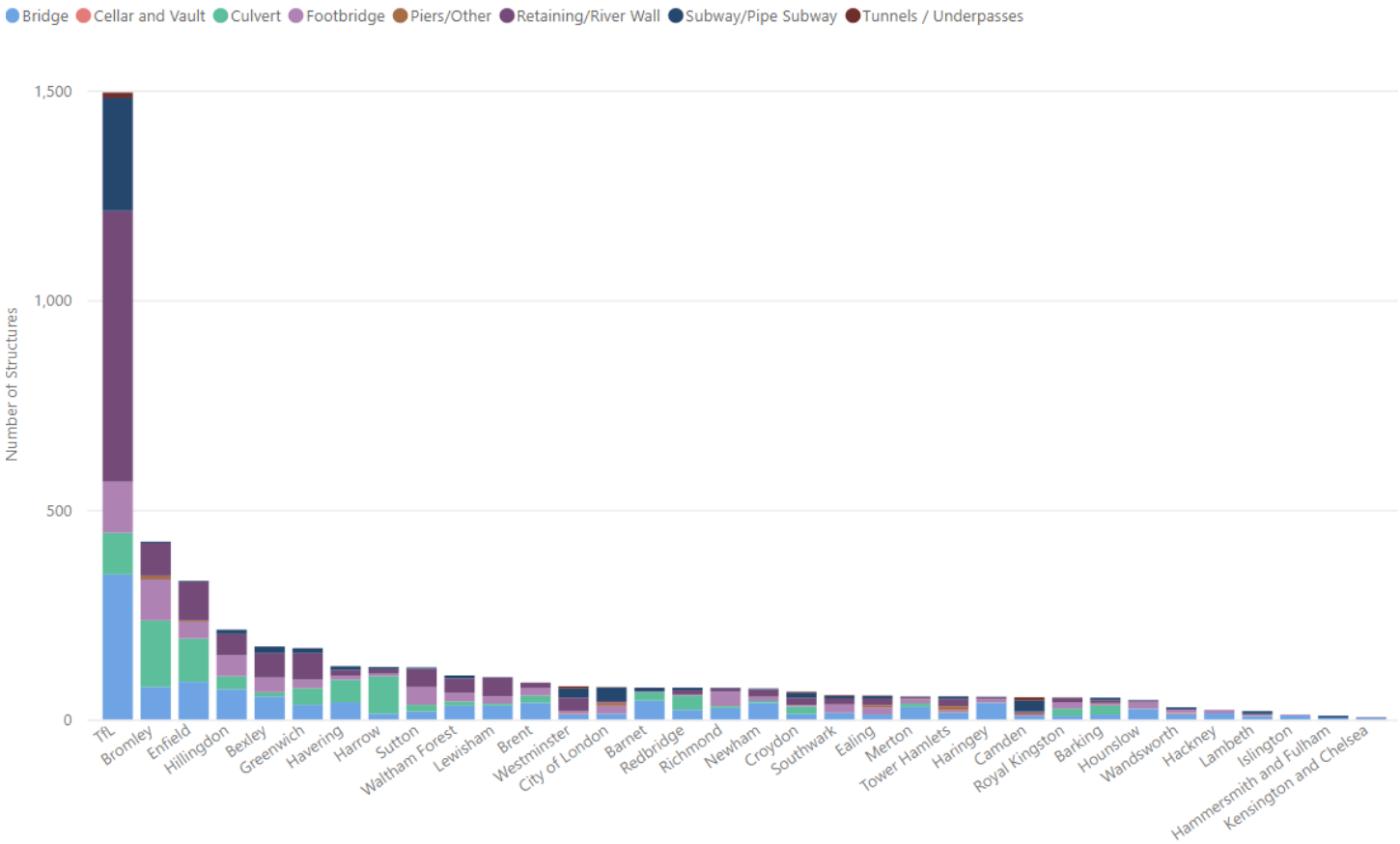


A breakdown of the asset types held within Bridgestation inventory is presented in Figure 4-4. Across London there are a total of:

- 762 Culverts
- 678 Footbridges
- 1,318 Retaining / River Walls
- 1,254 Bridges
- 494 Subway / Pipe Stations
- 33 Tunnels / Underpasses

Within the inventory, some Local Authorities are found to be more 'structures' rich' (Bromley, Hillingdon, Enfield) than others (Islington, Hammersmith and Fulham and Kensington and Chelsea). On average, the inventory suggests that c. 91 structures are managed per Authority across the Capital (excluding TfL). Including TfL, the total number of structures reported equals to **4,584**.

Figure 4-3 - Structures Inventory Breakdown and Asset Types across London



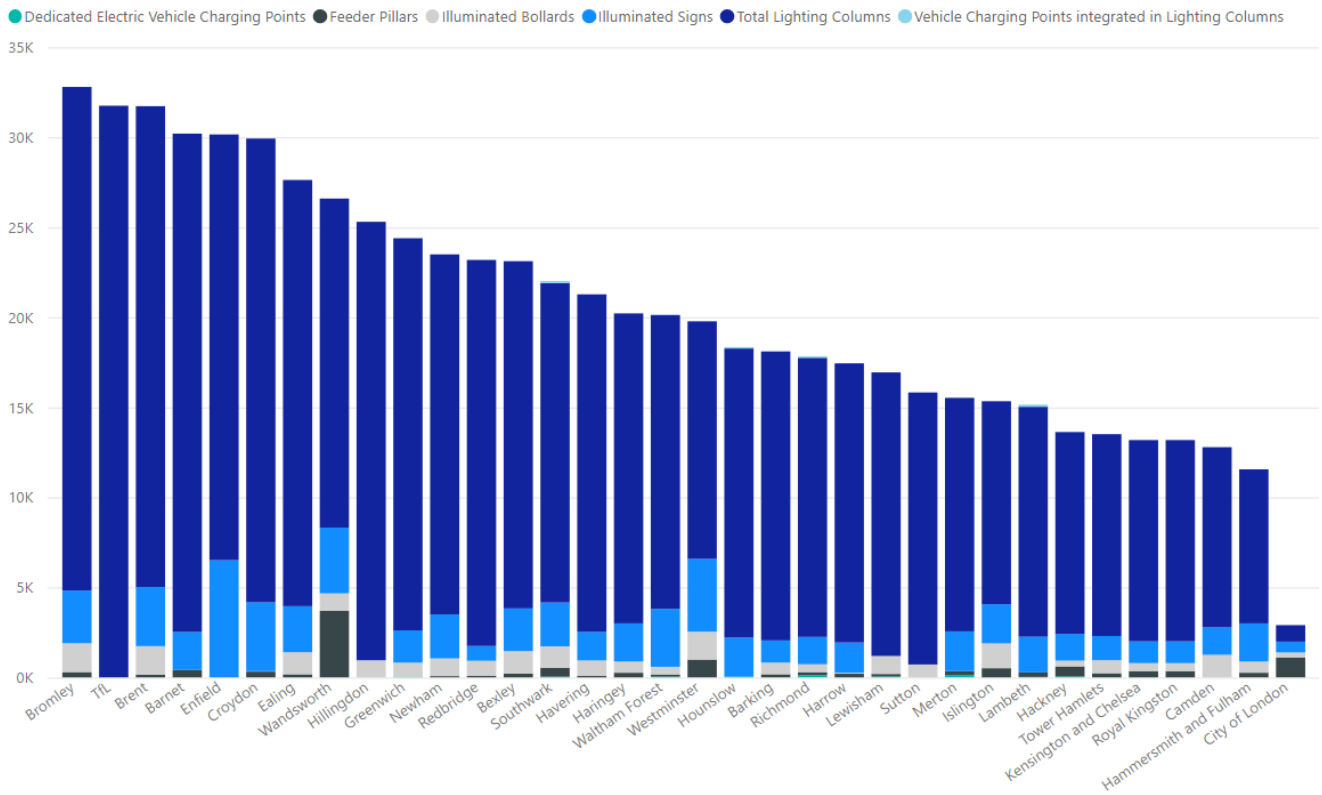
4.1.4. Lighting

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. 695k** individual lighting assets can be found in London and managed by local authorities. Figure 4-5 presents the overall Lighting assets breakdown across Local Authorities.

Figure 4-4 - 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. While this year's submission aimed at better capturing the lighting column inventory (using a format similar to valuation reporting and quantities as a function of column length) a large number of data gaps limited our capability to report such findings. The total numbers reported remain largely the same as the ones reported in the 2018-2019 output.

Table 4-1 - Lighting Assets as a function of Asset Type (overall and aggregated – includes TfL)

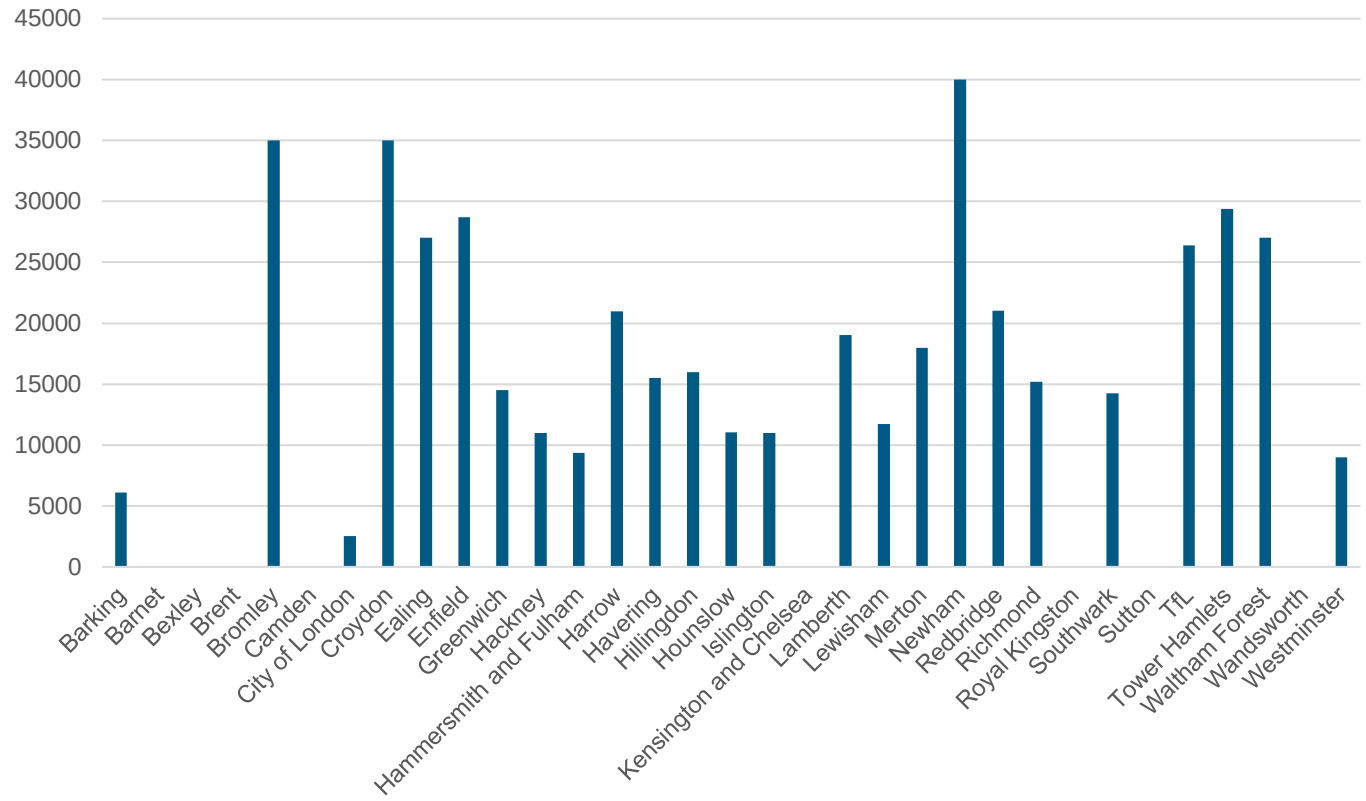
Asset Type	Quantity
Feeder Pillars	11,868
Illuminated Bollards	23,197
Illuminated Signs	68,100
Lighting Columns	590,828
Vehicle Charging Points (dedicated)	535
Vehicle Charging Points (integrated)	409
Total Lighting Assets	**694,937**

4.1.5. Other Assets

Participating authorities submitted inventory data regarding trees across London. To collate the inventory information the latest available data from each authority was used to represent totals across the capital. The dataset thus presented in Figure 4-7 collates submissions from 2017 to 2020. The average number of trees across the capital (with no additional processing and including TfL) is c. 24k trees per Authority.

Havering reported 275000 trees in their portfolio in 2018-2019 SoC. This outlier was removed, and the average quantity across all authorities was calculated to be c. 15.5k trees. This figure was also assigned to Havering. A small sub-set of authorities has still no inventory of Trees but a more holistic picture across the capital can be generated compared to last year's submission.

Figure 4-6 – 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 2018-2019 and 2019-2020 without retrospective post-processing; this is only applied at backlog calculation sections.

4.2.1. Carriageways

Figure 4-7 presents the reported condition for carriageways by authority and asset type. The predefined Performance Target for A roads is 90% and the one for B,C,U 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.

A limited subset of parcitipating authorities have reported network performance higher than the predefined Performance Target either for Principal or Secondary Roads. **Hounslow** (97%), **Bexley**, **Southwark** and **Kensington and Chelsea** (93%) are the authorities meeting the predefined 90% Target SoGR for Principal Roads. For Local Roads, 12 Authorities have reported overall network performance higher than the Target SoGR. Tower Hamlets roads have the lowest reported Local Roads SOGR at 54% while local roads in Wandsworth are presented with the highest measured performance with 96.2%. For Principal Roads, the range of Levels of Service reported is larger extending between 47% at Wandsworth to 97% at Hounslow. The overall average SoGR across all authorities for A roads is estimated to be 80.15% (81.94% in 2018-2019), whereas the figure for Local Roads 80.31% (80.00% in 2018-2019)

Table 4-2 illustrates the average SoGR (mean between Local and Principal roads), per participating Authority in each year of analysis. Authorities Southwark, Enfield and Lewisham reported the highest positive change in SoGR for carriageways (22.7%, 13.8% and 9.3% respectively) suggesting an overall improvement of road conditions, whereas a significant number (the vast majority) of authorities report an overall drop in network condition. City of London is reporting the highest carriageways deterioration (-26.2%) followed by Wandsworth (-18.6%), and Camden (-10.8%).

The overall positive swing of reported condition from Southwark was validated and the council queried on the reported figures; in this case an error in previous years' submissions was reported and gap filling that might have not aligned with actual network conditions. This is considered in backlog calculations.

In addition, historic data from Lambeth Borough were reviewed and the historic and current backlog was further validated in a workshop delivered prior to submitting Version 2 of the 2019-2020 report. The available historic condition data (2017-2018) pointed to a £20m+ carriageways backlog, attributed to low reported performance across the B, C, U Roads asset class. The Local Authority has now identified and provided new data sources that have been factorised in the 2019-2020 analysis and the historic and current backlog have been amended to exhibit this.

Figure 4-7 - Average of measured condition for carriageways by authority and asset type

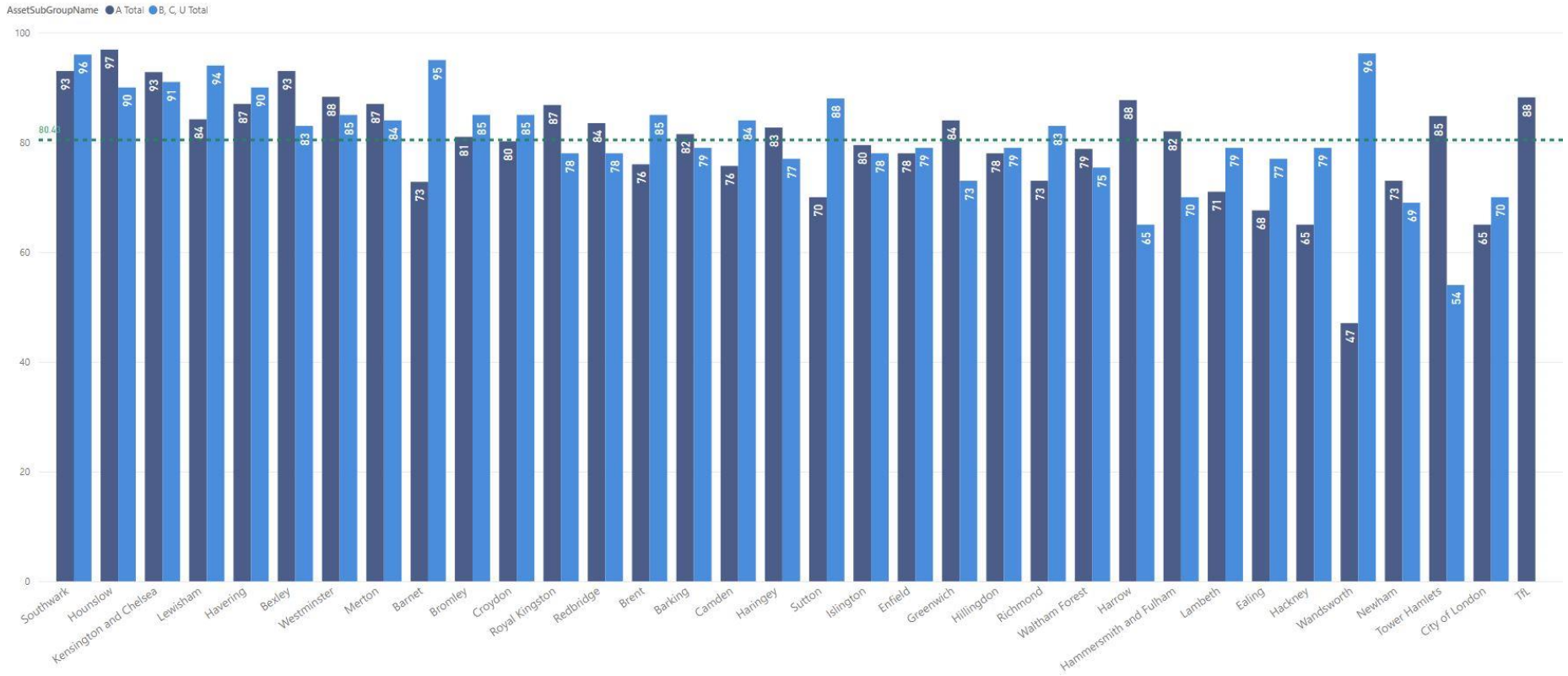


Table 4-2 – Change in SoGR for Authorities for carriageways (2018-2020)

Authority	2018-2019	2019-2020	% change in SoGR
Barking	79.0	80.3	1.6%
Barnet	80.5	83.9	4.2%
Bexley	84.0	88.0	4.8%
Brent	88.0	80.5	-8.5%
Bromley	80.5	83.0	3.1%
Camden	89.5	79.9	-10.8%
City of London	91.5	67.5	-26.2%
Croydon	84.0	82.6	-1.7%
Ealing	76.0	72.3	-4.9%
Enfield	*69.0*	*78.5*	*13.8%*
Greenwich	77.0	78.5	1.9%
Hackney	73.0	72.0	-1.4%
Hammersmith and Fulham	73.0	76.0	4.1%
Haringey	76.5	79.9	4.4%
Harrow	77.0	76.4	-0.8%
Havering	84.5	88.5	4.7%
Hillingdon	77.5	78.5	1.3%
Hounslow	93.0	93.5	0.5%
Islington	84.5	78.8	-6.8%
Kensington and Chelsea	93.0	91.9	-1.2%
Lambeth*	69.5	68.3	-1.7%
Lewisham	*81.5*	*89.1*	*9.3%*
Merton	81.5	85.5	4.9%
Newham	73.5	71.0	-3.4%
Redbridge	85.0	80.8	-5.0%
Richmond	78.0	78.0	0.0%
Royal Kingston	85.0	82.4	-3.1%
Southwark	*77.0*	*94.5*	*22.7%*
Sutton	83.5	79.0	-5.4%
TfL	90.0	88.2	-2.0%
Tower Hamlets	71.5	69.4	-2.9%
Waltham Forest	75.0	77.1	2.8%
Wandsworth	88.0	71.6	-18.6%
Westminster	88.0	86.7	-1.5%

4.2.2. Footways

Figure 4-8 presents overall network condition (reported SoGR) for footways across London. The collated data suggests that several authorities are struggling to meet the predefined target Performance (PI), particularly for Category 2, 3 and 4 Footways (PI: 90% for Category 1/1a, 85% for Categories 2, 3 and 4). In general terms authorities seem to be able to better prioritise work and serviceability of higher footway hierarchies and potentially struggle with the lower end; the exception to this rule is the Council of Enfield for which the reported (gap-filled) SoGR for Footway Categories 1,1a is c. 40% whereas the one for 2,3,4 categories 98%. These figures should be validated with the authority in the 2020-2021 SoC report.

The lowest SoGR figures are reported by Redbridge (35% for Cat 2-4), Enfield (39% Cat 1/1a), Haringey and Harrow both at (41% for Cat 2-4). It should be noted that Redbridge and Harrow's condition data are based on historic records. The average reported SoGR for Cat 1/1a footways is 82%, and for Cats 2-4 is 78%.

As illustrated in Table 4-3, over the period between 2018-2019, authorities such as Tower Hamlets, Richmond and Hillingdon reported the highest positive change in SOGR for footways (25.9%, 24.8% and 23.8%) respectively. This can be attributed to previously gap filled data or assumptions about network condition that may have been invalidated with the latest submission. Whilst the majority of authorities did not report any change in the SOGR between 2018 and 2019 there were a few authorities which reported a negative change. Brent (-33.1%) reported the largest decrease followed by Hammersmith and Fulham (-30.5%). In line with the assumptions deployed to rationalise the positive SoGR swing for a sub-set of authorities, this negative downturn of condition is attributed to participation and refreshed datasets rather than accelerated in year asset deterioration.

Figure 4-8 - Measured Network Condition (SoGR) for footways by Authority and Asset Type

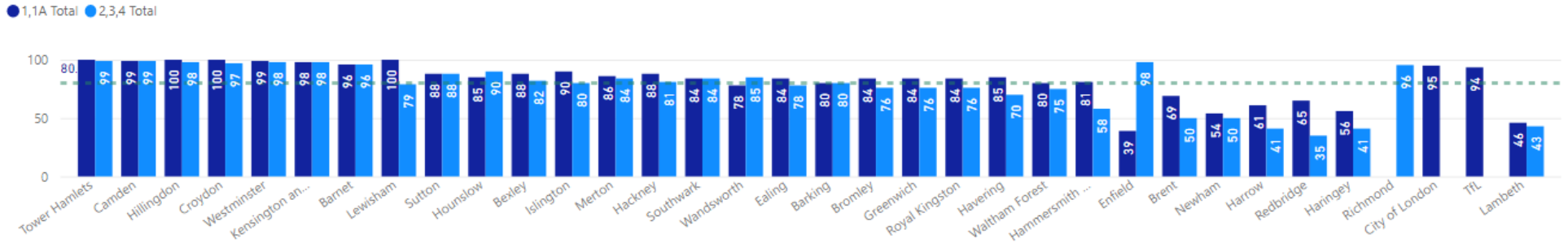


Table 4-3 – Change in SoGR for Authorities for footways (2018-2020)

Authority	2018-2019	2019-2020	% change in SoGR
Barking	80.0	80.0	0.0%
Barnet	96.0	96.0	0.0%
Bexley	85.0	85.0	0.0%
Brent	89.0	59.5	-33.1%
Bromley	80.0	80.0	0.0%
Camden	99.0	99.0	0.0%
City of London	98.0	95.0	-3.1%
Croydon	97.0	98.5	1.5%
Ealing	81.0	81.0	0.0%
Enfield	68.5	68.5	0.0%
Greenwich	80.0	80.0	0.0%
Hackney	84.5	84.5	0.0%
Hammersmith and Fulham	100.0	69.5	-30.5%
Haringey	48.5	48.5	0.0%
Harrow	48.0	51.0	6.3%
Havering	80.0	77.5	-3.1%
Hillingdon	80.0	99.0	23.8%
Hounslow	87.5	87.5	0.0%
Islington	85.0	85.0	0.0%
Kensington and Chelsea	98.0	98.0	0.0%
Lambeth	44.5	44.5	0.0%
Lewisham	89.5	89.5	0.0%
Merton	72.0	85.0	18.1%
Newham	52.0	52.0	0.0%
Redbridge	50.0	50.0	0.0%
Richmond	76.5	95.5	24.8%
Royal Kingston	80.0	80.0	0.0%
Southwark	84.0	84.0	0.0%
Sutton	88.0	88.0	0.0%
TfL	93.0	93.5	0.5%
Tower Hamlets	79.0	99.5	25.9%
Waltham Forest	77.5	77.5	0.0%
Wandsworth	84.0	81.5	-3.0%
Westminster	95.0	98.5	3.7%

4.2.3. Structures

Structural Levels of Service and SoGR %s across London are presented in Figures 4-9 through to 4-12. The figures reported from Bridgestation for the 2019-2020 review were validated with support from the chair of LoBEG.

For **Culverts**, the average reported condition, is calculated to be 95%. From all participating authorities the following fall below the target SoGR:

- Havering
- Enfield
- Barnett
- Newham
- Brent

For **Footbridges**, the average reported SoGR is 86%. Barnet (0%), Lambeth (11%) and Ealing (36%) are the authorities with the lowest reported SoGR. A number of authorities report 100% SoGR.

For **Retaining Walls**, the average reported SoGR is 89% across authorities. 14 of participating authorities fall below the predefined PI (95%) with the lowest SoGR reported in Ealing (28%) and City of London (51%).

For **Road Bridges**, average reported SOGR is 85%. A number of authorities are reporting a perfect score (Sutton, Camden, Hounslow, Lambeth, Newham etc), while the lowest figures are reported in Hammersmith and Fulham (18%) and Islington (47%). It should be noted that the H&F figure is potentially skewed by the latest developments that are a by-product of the Hammersmith Bridge closure.

In the **Subway / Pipe Subway** category, the average reported SoGR is 85%. 20 Authorities are reporting 100% PI, and the lowest figures are found in Harringey (0%), Richmond (0%) and Bromley (25%).

Lastly, for the **Tunnels and Underpasses** category, the average SoGR reported is 63%. 4 authorities are reporting a perfect score (Royal Kingston, Croydon, City of London and Westminster) but the overall average score is skewed by a 0% PI reported in both Ealing and Southwark.

Recommendation: In the 2019-2010 SoC cycle, some inconsistencies have been identified with Bridgestation structures SoGR reporting. These may be attributed to more ‘recent’ data been made available (condition or inventory) for a sub-set of Local Authorities. The efficacy of the repository and the standard reporting outputs should be reviewed.

Figure 4-9 - Culverts Condition breakdown across London

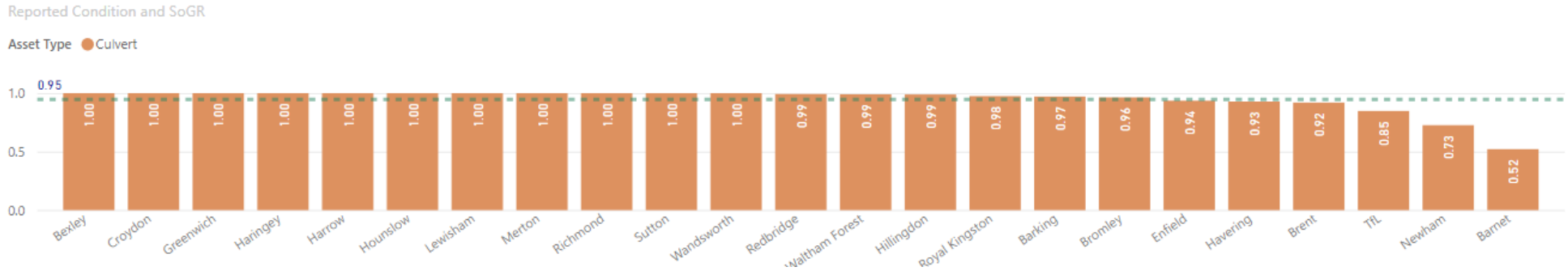


Figure 4-10 - Footbridge Condition breakdown across London

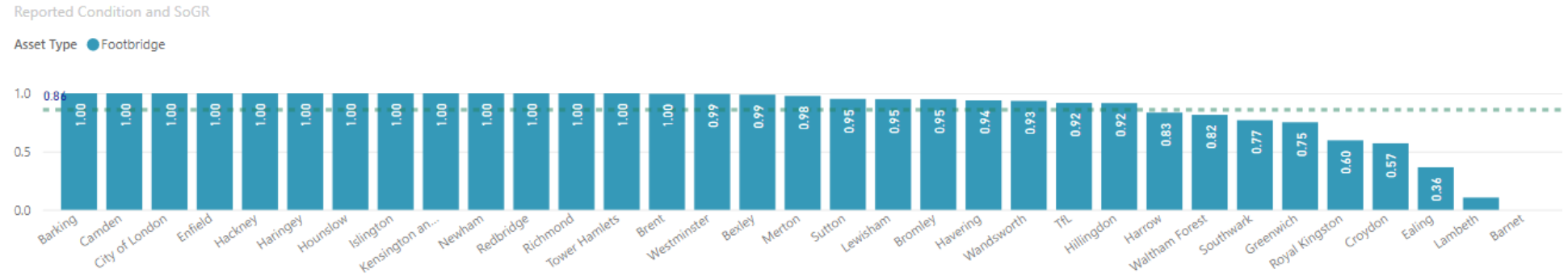


Figure 4-11 – Road Bridges Condition across London

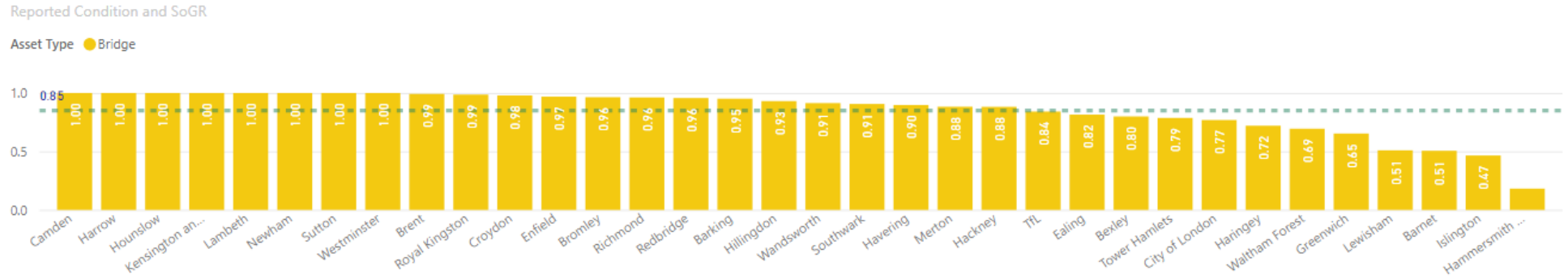
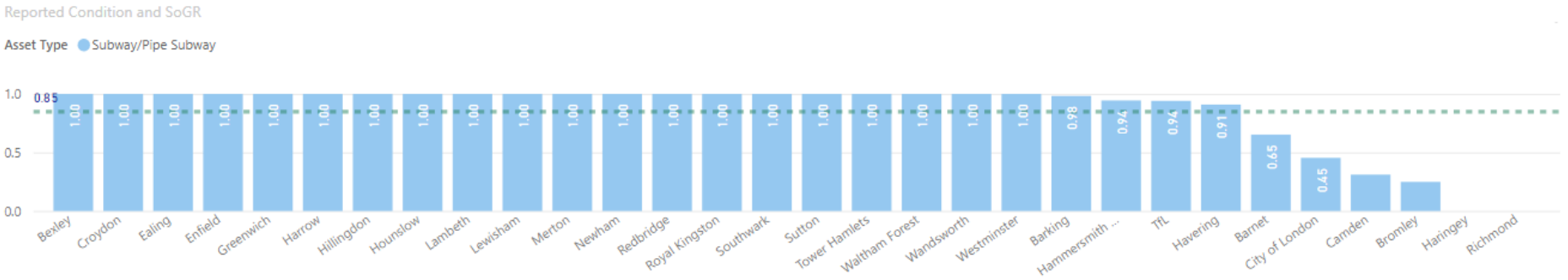


Figure 4-12 – Tunnels / Underpasses and Subway Condition across London



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 4-13 and 4-14.

The average reported condition for **Lighting Columns** is 85%; the figure is calculated after a number of data gaps were filled using historic records and assumptions (Tower Hamlets Newham, Kensington and Chelsea, and Brent). 14 authorities report SoGR above the predefined PI (95%) and the lowest performance is reported by Richmond, Merton and Tower Hamlets (55%, 60% and 20% respectively).

The average reported condition for **Feeder Pillars** is 85%. 12 authorities are above the predefined PI, with the lowest figures found in Hackney, Tower Hamlets and Newham (45%, 50% and 50% respectively).

The Illuminated signs SoGR London average is calculated at 89%, with 14 authorities achieving the PI. Lastly, the average SoGR for **Illuminated Bollards** is calculated to be 90% (the highest between all lighting assets in analysis). Ten authorities report network SoGR above the target PI with the lowest figure reported by Newham (60%).

It should be noted, that for this analysis several low-scoring SoGR are based on historic data. In addition to this, and since Version 1 of the SoC 2019-2010 report was issued to all authorities for consultation, a workshop to review Lambeth Borough data was set up. The reported SoGR for Total lighting Columns for the Authority was amended after the consultation and this is included in Version 2 of the SoC report.

Recommendation: In the 2019-2020 analysis, there are still cases of gap-filling and engineered assumptions revolving around the calculation of lighting assets SoGR for a sub-set of London Authorities; this should be addressed early on with support from the relevant LoTAG sub-group.

Figure 4-13 – Bollards and Signs Condition across London

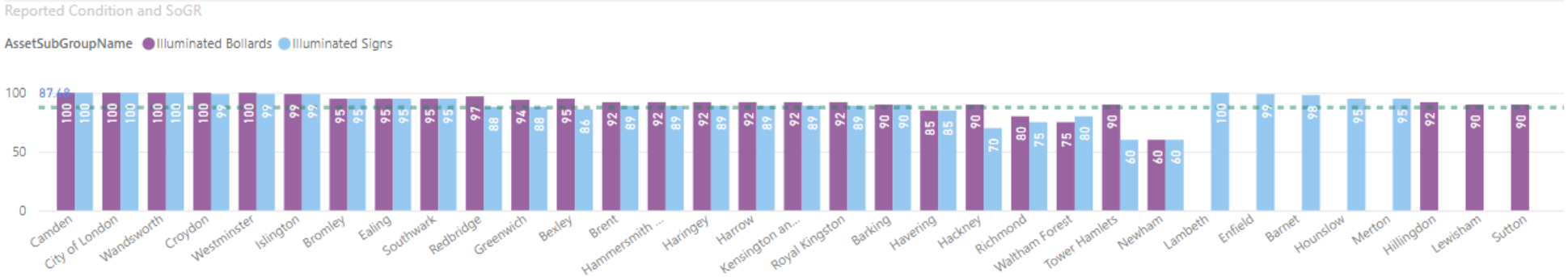


Figure 4-14 – Pillars and Columns Condition across London

4.3. Maintenance Backlog

4.3.1. Carriageways

The carriageways maintenance backlog is estimated for the 2019-2020 SoC to be **c. £225m.** It is seen to be decreasing compared to the figure reported in SoC 2018-2019, but the previously reported figure was further validated in this SoC cycle (and rationalised in this section).

Across London's B, C, & U roads, backlog sums up to **£175m** with Principal Roads' backlog being significantly lower across the capital (**c. £51m**). In terms of backlog per lane-km B, C, & U roads present an average figure of **c. £13k** whereas average backlog per lane-km for Principal roads is estimated to be **c. £24k.** The figures suggest that while the overall backlog for Principal roads is indeed lower, with overall carriageway backlog across London being driven primarily by B, C & U roads, a bigger investment per lane-km is needed to eliminate backlog on principal roads (due to higher works costs). Figure 4-15 exhibits the split of the amount of carriageways backlog between the London Authorities.

To rationalise the slight decrease in overall carriageways backlog (from £262M reported in the 2018-2019 Report to £226m), Atkins engaged with 4 Authorities that reported the highest positive carriageway SoGR upturns or have historically been represented with high SoGR figures (see Table 4-2). Data gaps and omissions or misreporting from previous years were highlighted, and the historic SoGR breakdowns were thus amended using feedback from relevant stakeholders. The historic (2018-2019) reported Backlog for carriageways was thus retrospectively amended for the following authorities:

- **Enfield** 2018 correction to carriageways backlog resulting in updated figure of c. £10.1m (was c. £46.4m)
- **Merton** 2018 correction to carriageways backlog resulting in updated figure of c. £5.1m (was c. £7m)
- **Lambeth** 2018 correction to carriageways backlog resulting in an updated figure of c. £3m (was c. £23.8m)

The overall backlog figure for 2018-2019 after this retrospective processing is thus reported to be c. **£202** (compared to the **£248m** figure calculated for 2019-2020). 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. £26m in the past year.

Circa 50% of the estimated backlog is accumulated across seven Authorities (Ealing, Harrow, Lambeth, Tower Hamlets, Hillingdon, Newham and Greenwich). Lambeth originally had the biggest portion of backlog, at **c. £26.02m; the updated data and the post-workshop validation has reduced this to c. £7.6m**. Figure 4-18 presents the historical backlog trends and Figure 4-19 illustrates the split between Principal and B, C, & U roads backlog by authority.

Figure 4-15 – Backlog for carriageways by Authority

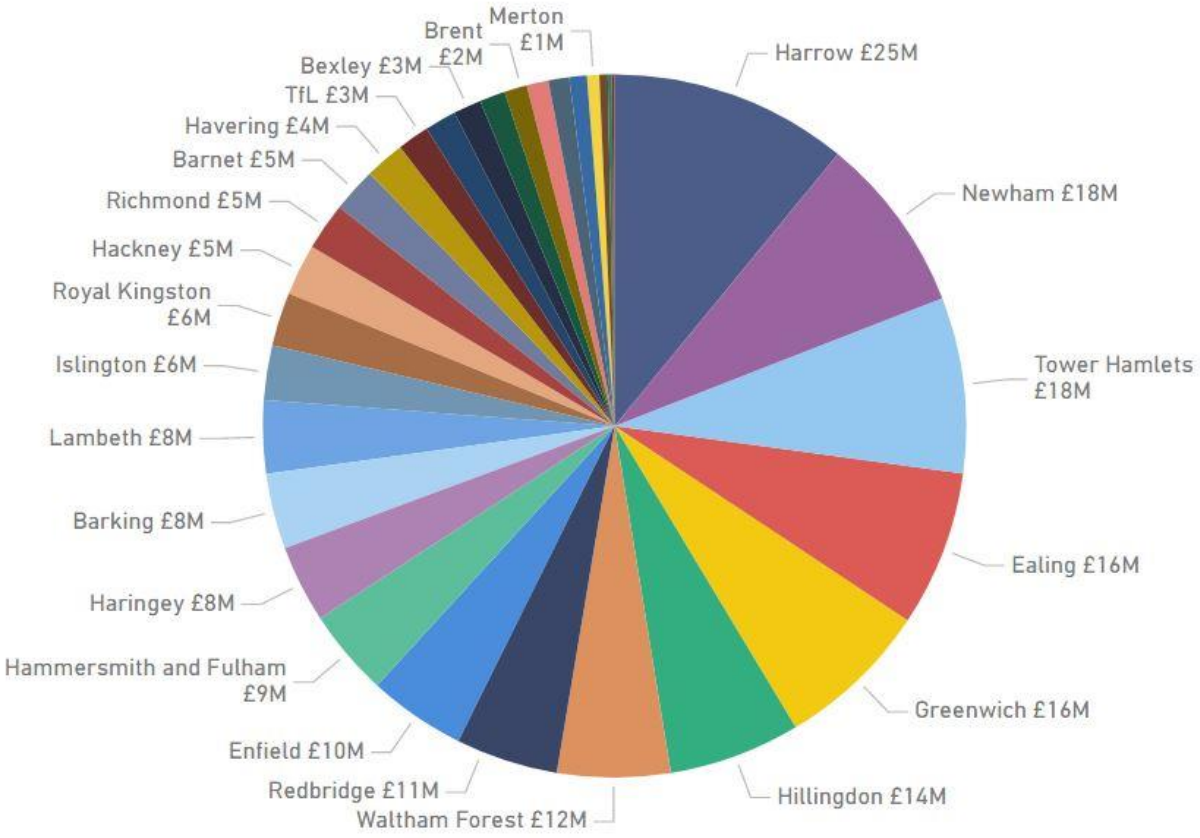


Figure 4-16 – Backlog trends for carriageways by Authority (2018-2020)

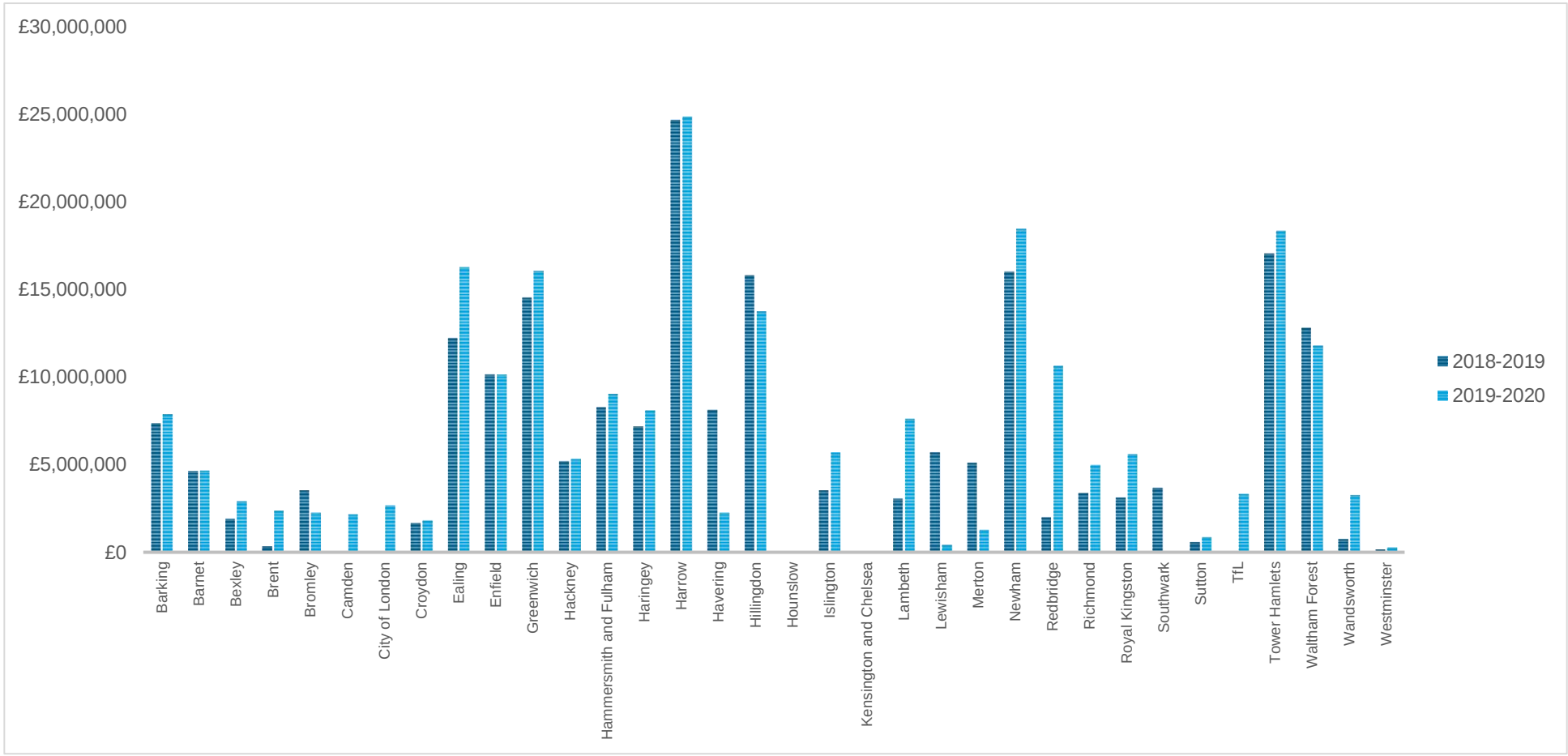
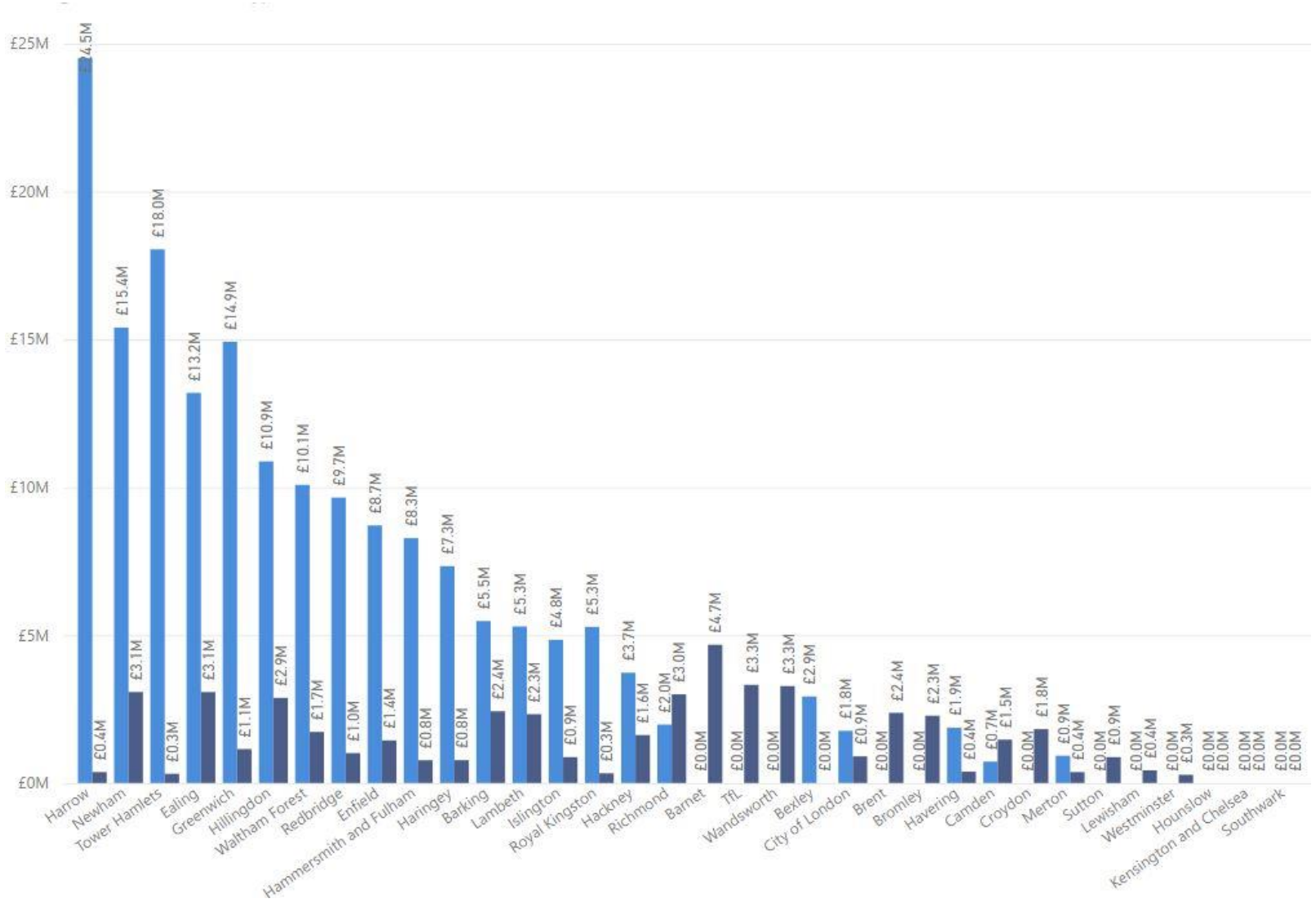


Figure 4-16 presents the updated (historic) and most recently estimated backlog figures across London Authorities. Lambeth had the highest backlog in relation to carriageways for 2019-20 at £26.8m, followed by Harrow at £24.9m. The sharpest increase in backlog was observed for Redbridge which had a backlog of £2m in 2018-2019 which increased to £8.7m in 2019-2020. This was attributed to more up to date carriageways condition data made available to Atkins. Figure 4-17 below illustrates the backlog split by the A and B, C, U roads. For the B, C, U roads, Lambeth had the highest backlog (c. £26m) followed by Harrow (c. £24.5m) and Newham (c. £15.4m).

Figure 4-17 - Backlog by Authority and Asset Type



4.3.2. Footways

This year's footways backlog total is estimated to be **£237m**. Similarly, to the carriageways backlog, the footways sum presents large deviations across London Authorities. **Haringey** (£47m), **Redbridge** (£35m), **Harrow** (£35m), **Brent** (£24m) and **Lambeth** (£22m) are the 5 authorities with highest backlogs across the Capital (estimated to be c. **£162m**). Excluding these 5 Authorities, the average backlog across all remaining local authorities is estimated to be **c. £2.5m.** 18 Local Authorities report zero backlog for 2019-2020 (down from 17 Authorities in 2019-2020).

Circa £219m corresponds to backlog on Categories 2, 3 and 4 footways (92% of total backlog) Figure 4-19 illustrates the backlog trends by authority and Figure 4-20 presents the footways backlog per Authority and footway category type.

In line with the retrospective validation of submitted carriageways data, an analysis was completed to assess previous submissions (condition data) for authorities with large positive or negative SOGR swings in 2020 (baselined against 2019 data). The overall backlog for 2019 was estimated to be **£279m.** We have retrospectively amended the overall SoGR for Enfield to rectify gap filling from previous years and re-estimated the 2019-2020 backlog to be c**. £230m**. This is in line with the condition data the Authority has procured and shared for the 2019-2020 review and exhibits a gradual deterioration (from 2019 to 2020) in line with other London authorities.

The overall backlog figure for 2018-2019 after this retrospective processing is thus reported to be c. £230.5m (compared to the £236.7m figure calculated for 2019-2020). This suggests that the footways backlog using the latest available data across all authorities for the last 2 years is estimated to have increased by c. £6.3m in the past year. This is generally in line with the historic spending against maintenance need estimates carried out in the 2018-2019 analysis, that indicate that the overall backlog for footways was expected to grow slightly.

Figure 4-18 - Backlog for footways by Authority

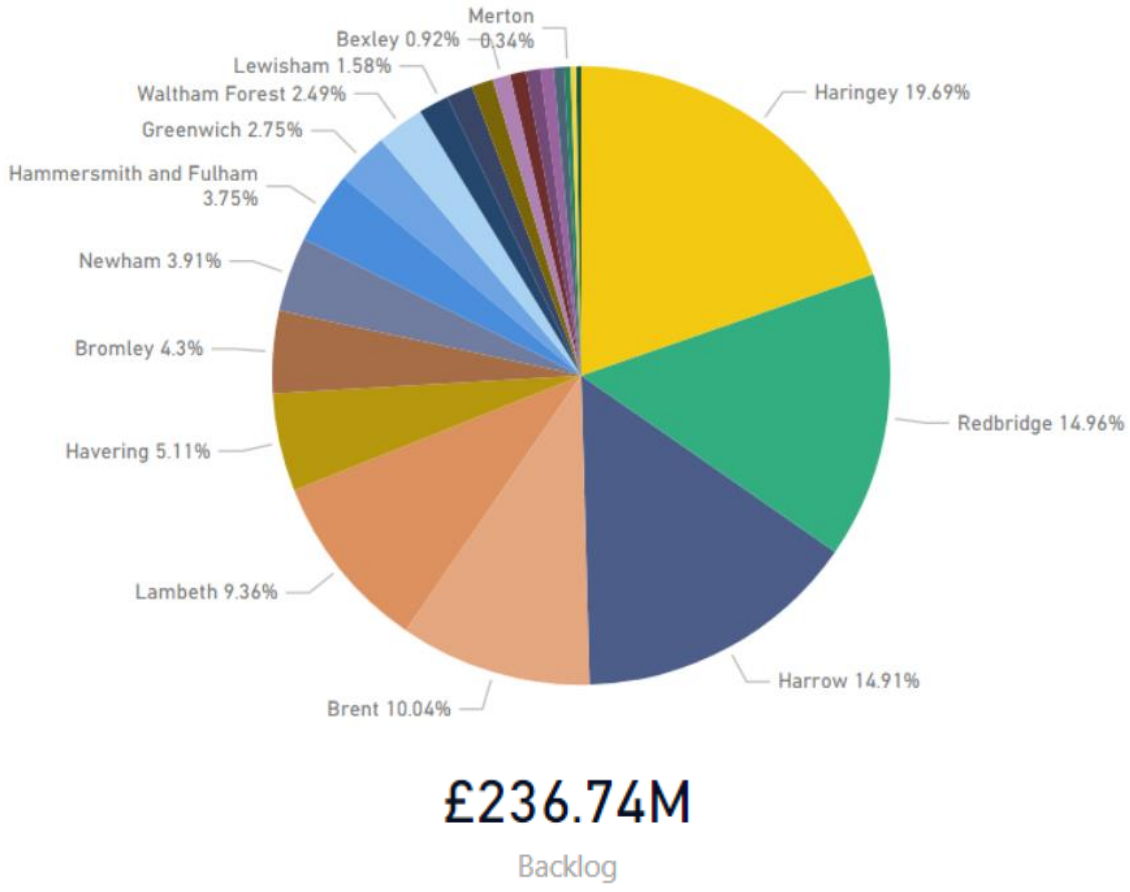


Figure 4-19 - Backlog trends for footways by Authority (2017-2020)

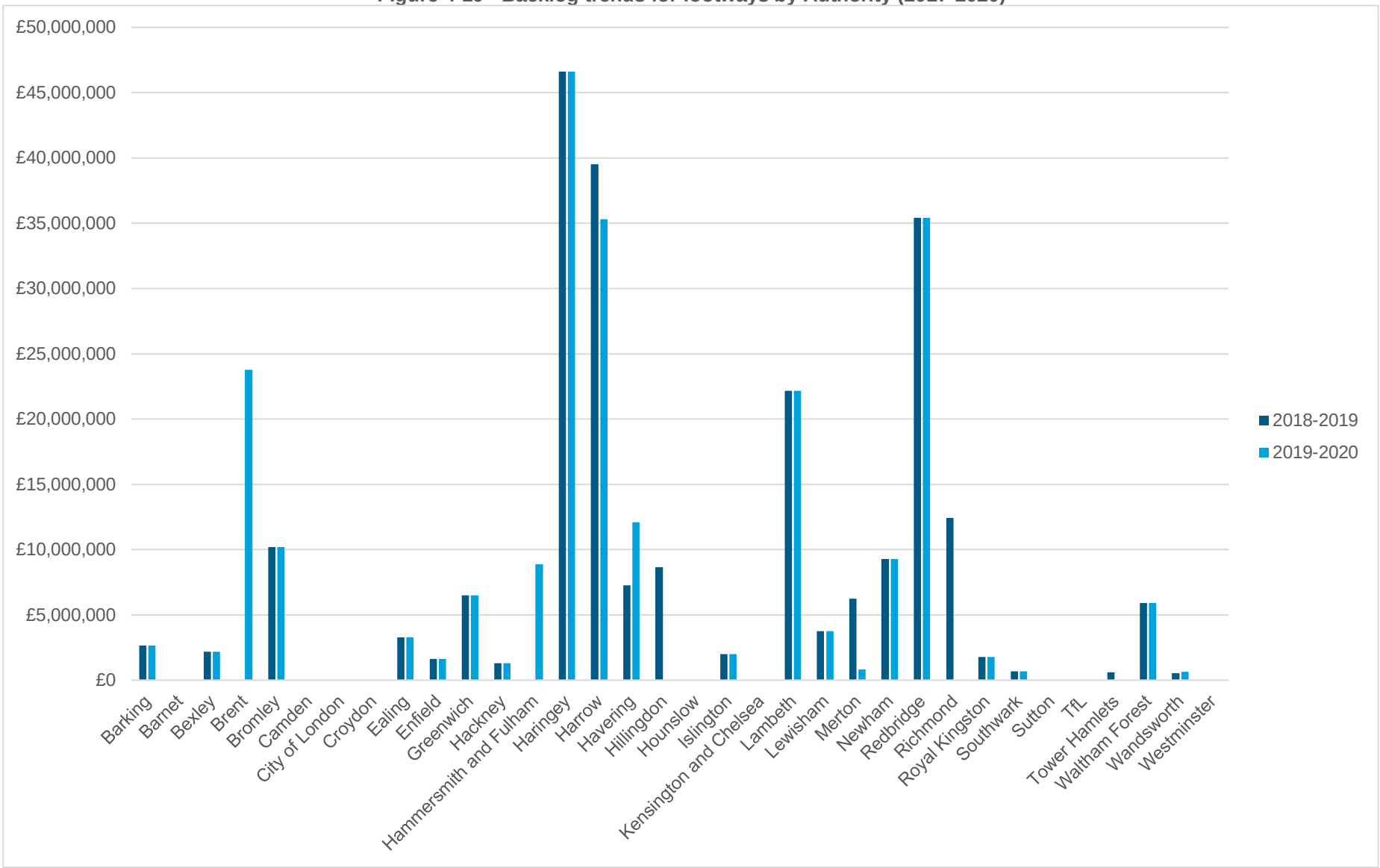
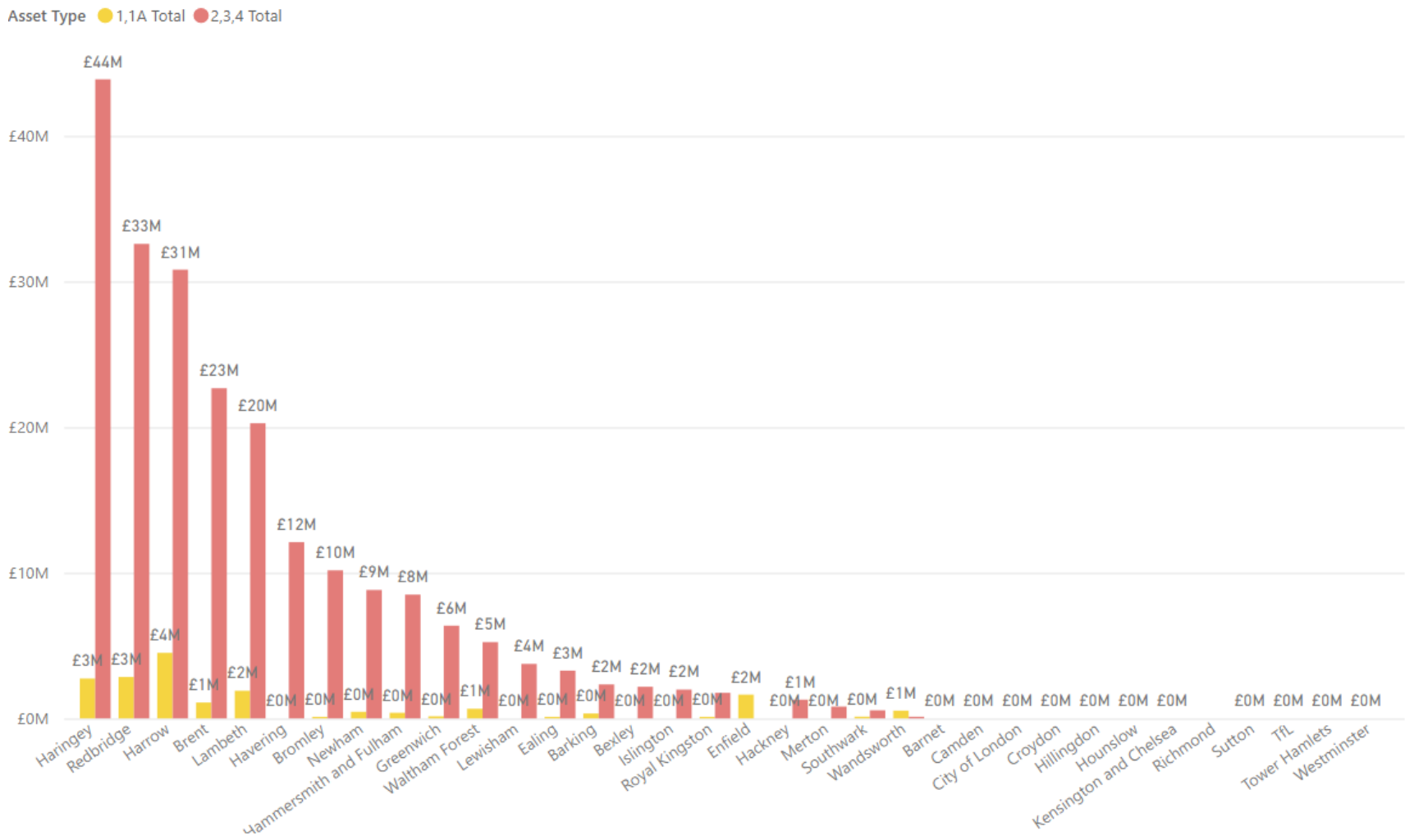


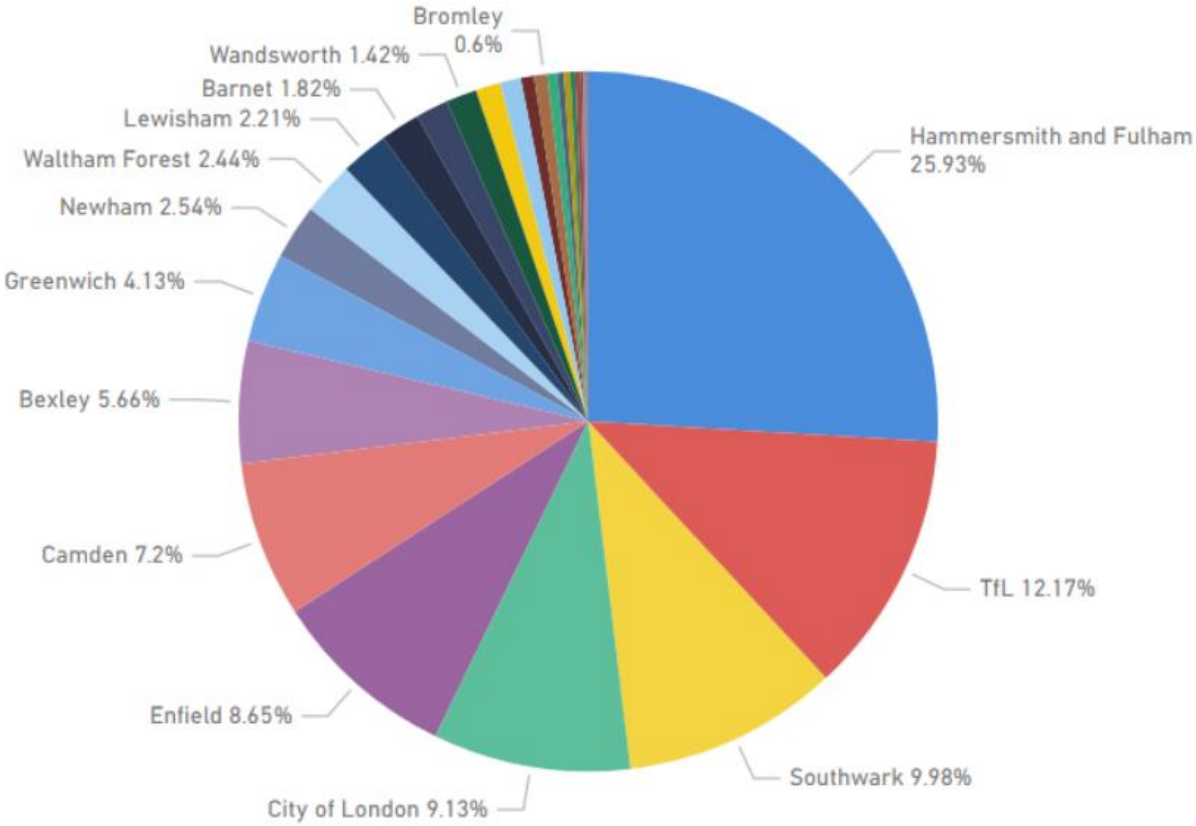
Figure 4-20 - Backlog for footways by Authority and footway hierarchy



4.3.3. 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. £413m.** Figure 4-21 presents the structures backlog per authority as estimated using the latest data input.

Figure 4-21 - Structures Backlog by Authority

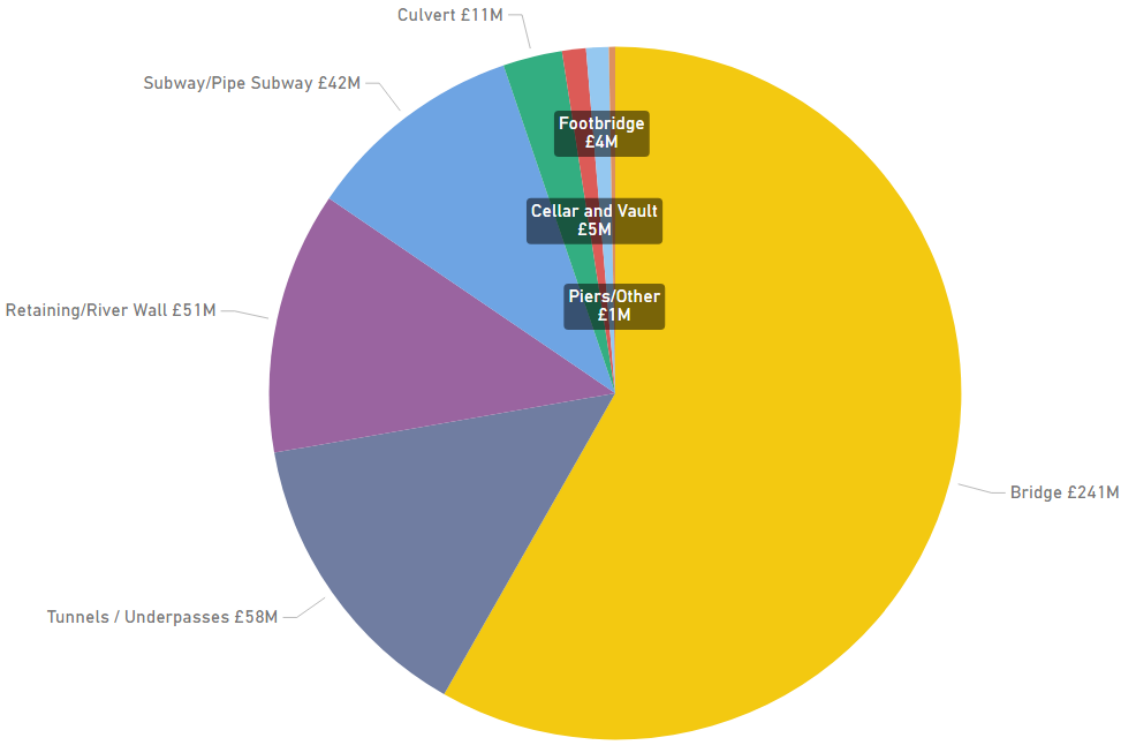


At **£413m** the structures backlog is calculated to be the highest between all asset groups in London. TfL, Southwark, City of London and Hammersmith and Fulham together make more than half of this sum. The average structures backlog per authority is calculated to be **c. £2.4m.** This figure is driven by the 6 Authorities with highest sum across London (H&F, TfL, Southwark, City of London, Camden, Greenwich) with an average figure of c. **£56m**. The large increase in H&F's total structures backlog is attributed to Hammersmith Bridge.

Figure 4-22 breaks down the structures backlog per asset class (Footbridge, Roadbridge, Retaining Walls, Tunnels, Culvers, Piers, Cellar and Vaults) across London. The vast majority (c. 58%) of the total sum (**£413m**) is attributed to Road Bridges.

Recommendation: The approach in calculating need and backlog for Structures is based on surface area and potentially prone to errors (gaps in inventory). A more engineered approach potentially drawing from available assumptions used in Bridgestation or by using a tool similar to the Structures toolkit could be utilised going forward to better understand and predict needs and backlog.

Figure 4-22 - Structures Backlog per asset type



4.3.4. Lighting

Following a trend similar to carriageways and structures, the lighting assets maintenance backlog estimated for 2019/20 has slightly increased in comparison to what was presented in earlier SoC reports. In line with Footways and Carriageways, a retrospective validation of condition data submissions from the 2018-2019 SoC was completed for Authorities exhibiting large positive or negative swings in reported SoGR. The backlog figure for 2018-2019 (£238.7m) is thus calculated to be **£226m** and the 2019-2020 backlog is estimated to be **£230**. This breakdown is presented in Figure 4-23 which represents the allocation / split between authorities and total backlog.

Figure 4-24 presents a breakdown of backlog across all authorities and Figure 4-25 includes a breakdown of asset types. Figure 4-24 captures the change in backlog between years 2019-2020 and 2020-2021 for participating authorities. This exhibits how the majority of authorities are represented by a 'steady state' or 'steady minor increase' in terms of backlog figures with a small subset of exceptions:

- **Westminster, Hillingdon**: New condition data provided suggesting a 'substantial' backlog that was not represented accurately in historic records; overall negative SoGR swing
- **Harrow**: New condition data provided suggesting a large backlog that was not represented accurately in historic records; overall positive SoGR swing

The authorities with the highest estimated backlog in 2019-2010 are:

- Tower Hamlets (£34m)
- Richmond (£25m)
- Merton and Westminster (£18m)
- Brent (£14m)

13 authorities are reporting zero backlog down from 14 authorities in the previous submission. It should be noted that the average maintenance need figure for Lighting assets across London has increased in this year's submission (£69m from £64m). This reflects amended inventories and quantities and the number will be validated in 2021-2022.

Figure 4-23 - Lighting backlog per Authority

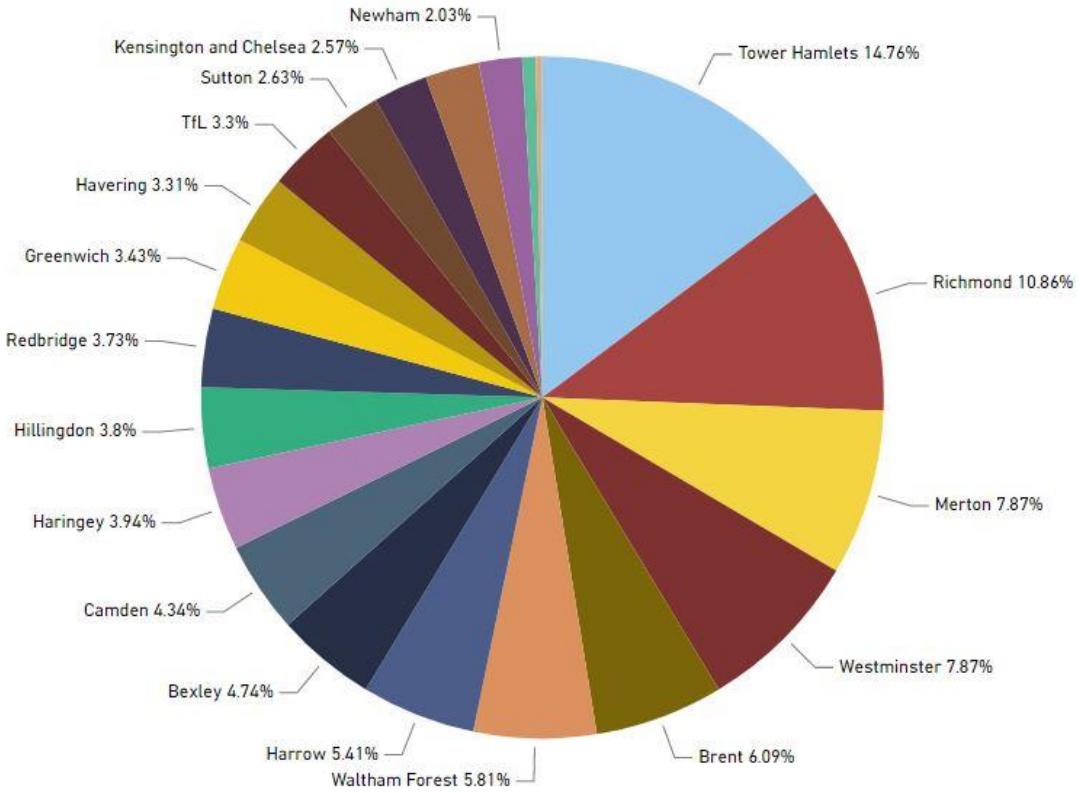


Figure 4-24 – Backlog trends for lighting by Authority (2017-2019)

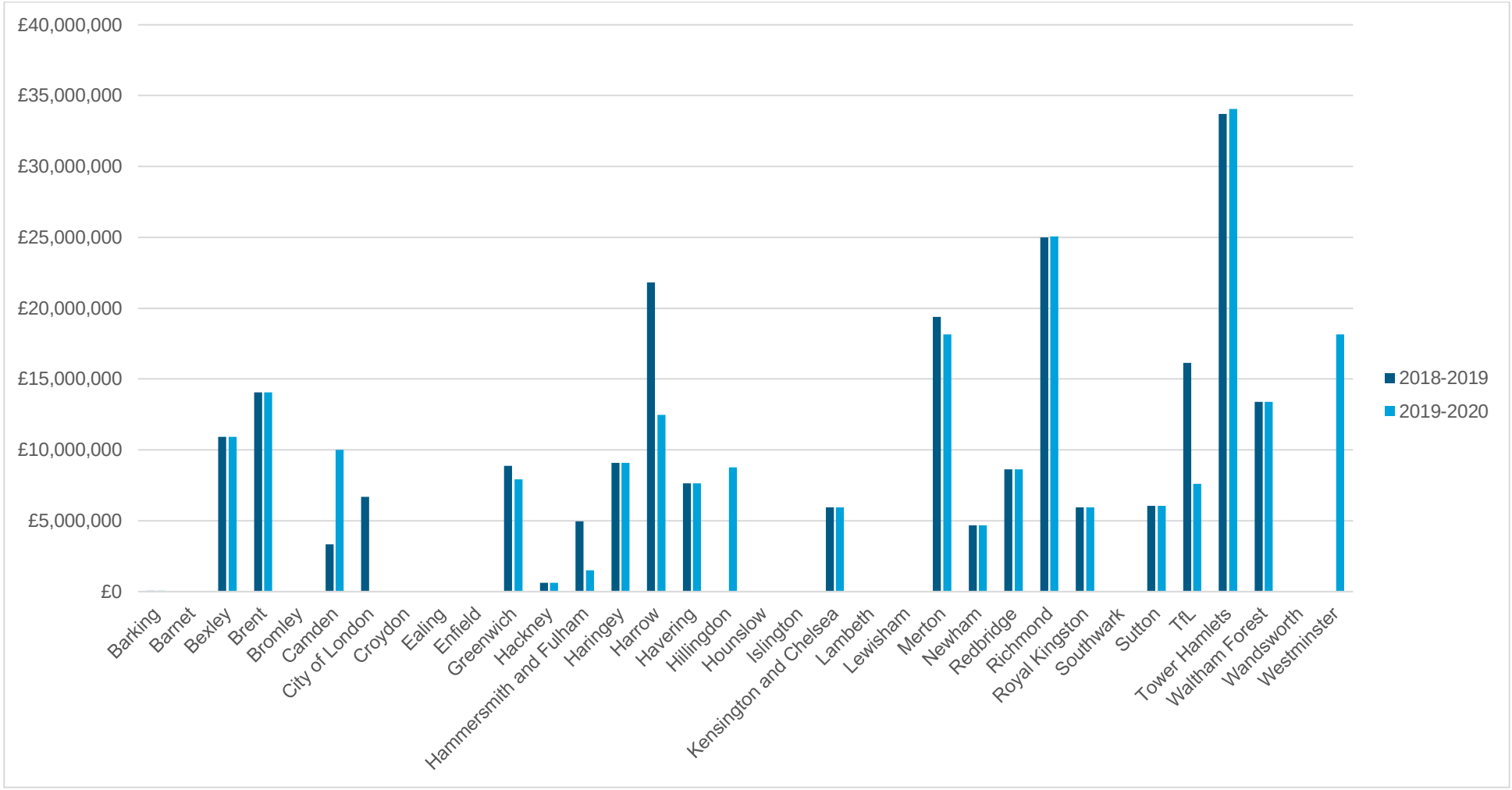


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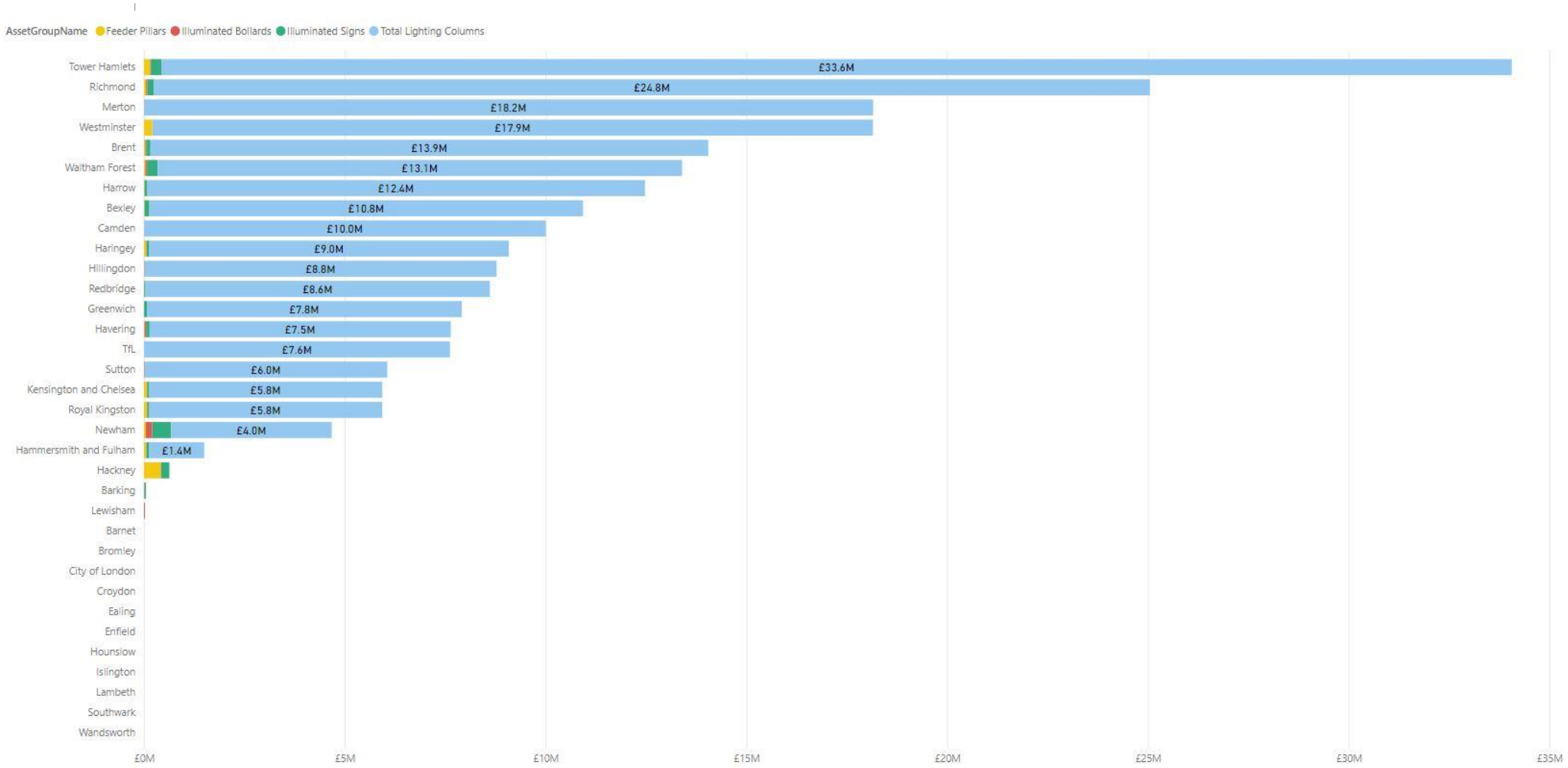
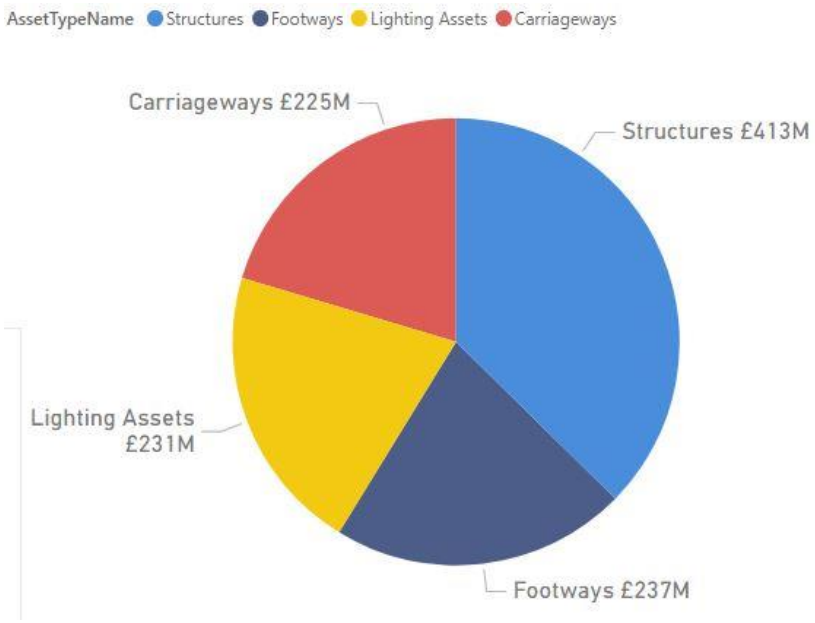
Figure 4-25 - Lighting backlog by Authority and Asset Type



4.3.5. Overall Backlog

The total backlog across all London authorities for 2019/20 is estimated to be **c. £1.11bn;** this figure does not include the maintenance backlog for drainage or trees. The split between Asset Groups can be seen in Figure 4-26. This reflects the overall increase in Structures Backlog in 2019-2010 as a result of the gradual deterioration of the asset stock (less available funding) and the closure of the Hammersmith Bridge.

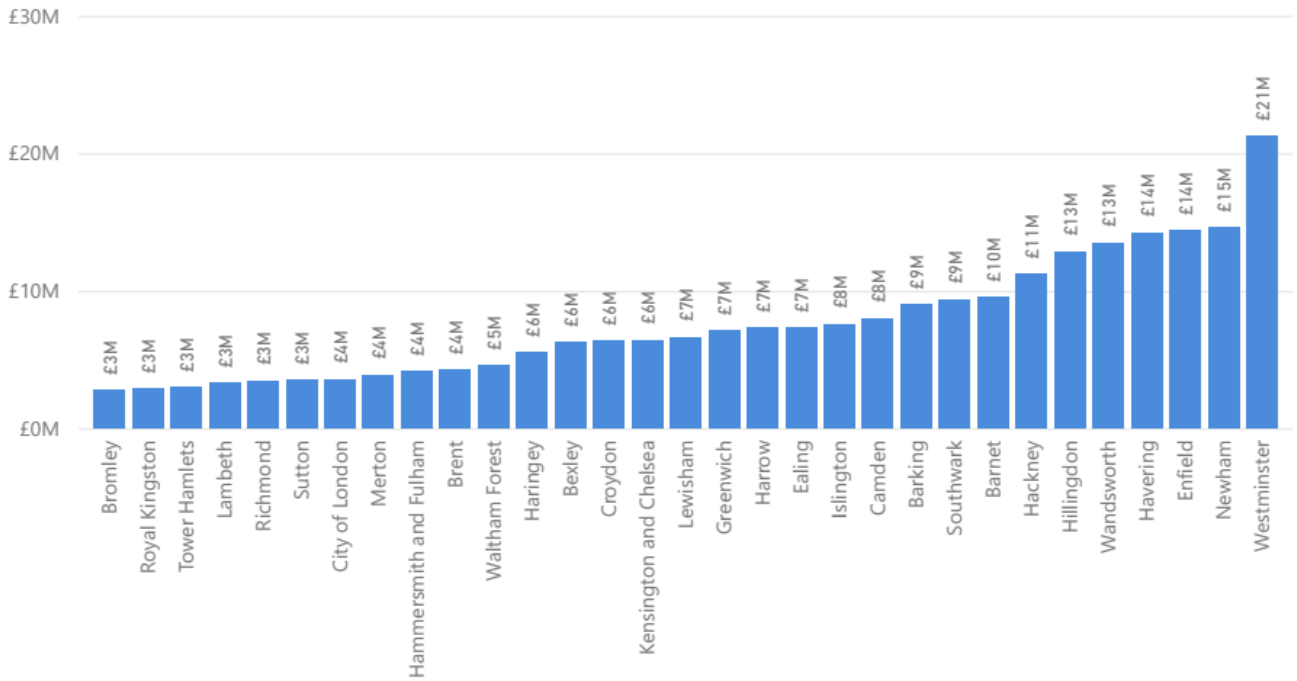
Figure 4-26 - Backlog by Asset Group



4.3.6. Maintenance spending

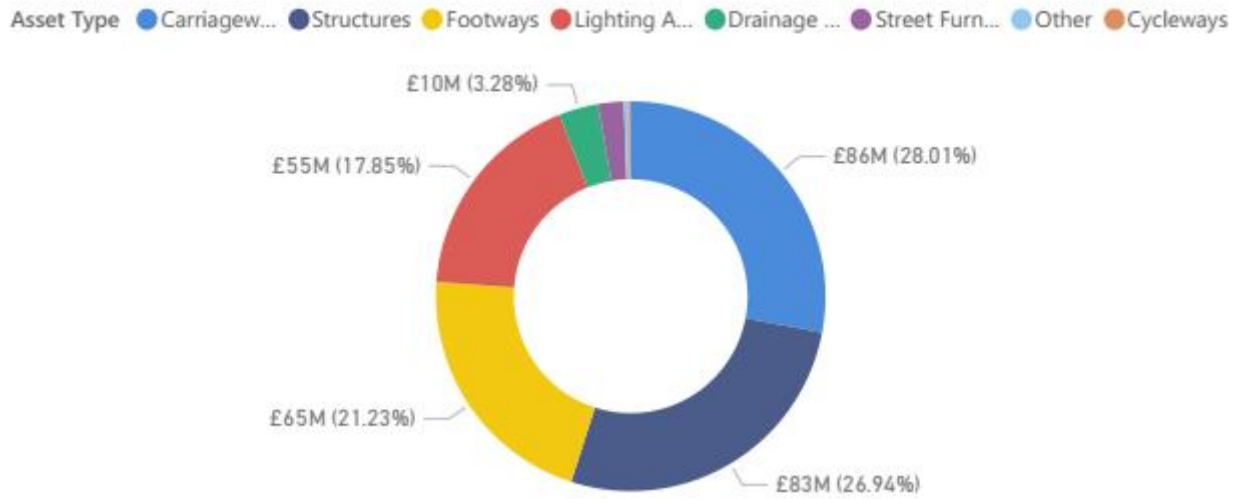
The overall maintenance expenditure in 2019/20 is estimated to be **c. £306m** across all authorities and asset groups**.** Figure 4-27 exhibits the annual maintenance spend by authority.

Figure 4-27 - Maintenance Total Spending by Authority



London Authorities spend between £3m and £21m in maintenance with the average figure calculated at **c. £10m (£8m excluding TfL)**.

Figure 4-28 - Total Spend by Asset Group

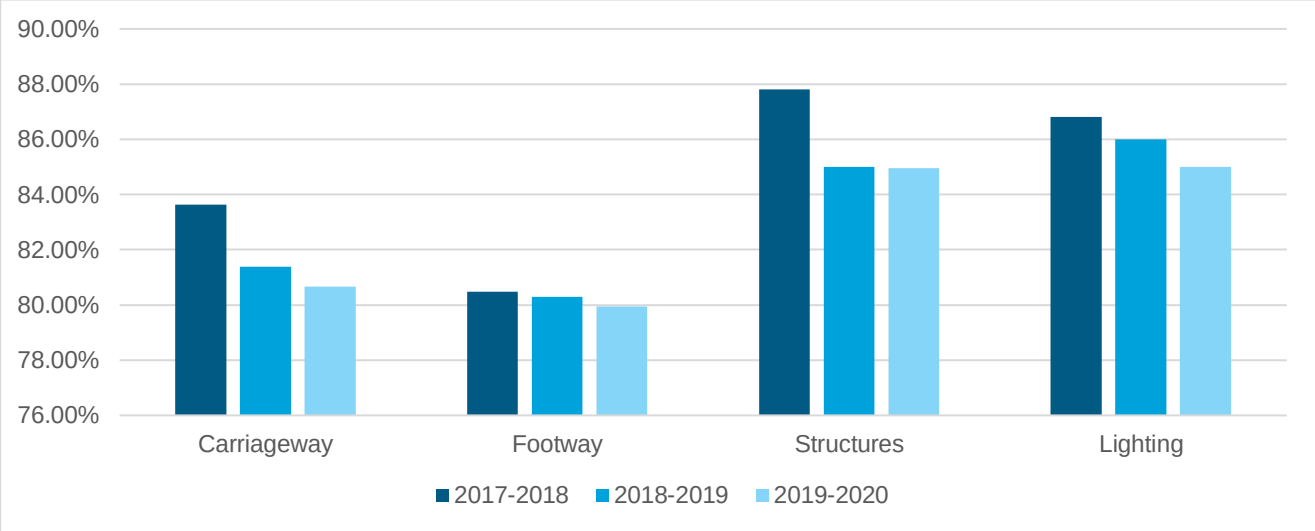


Carriageways received the biggest allocation in 2019-2020 (£96.74m), followed by structures (£86.2m), footways (£65m) and lighting (£54.68m). Drainage (£10.1m) and other categories (£1.19m) – corresponding to minor maintenance across all asset types, have significant lower maintenance spends.

4.4. Infrastructure Deterioration

Overall, asset health trends for the four major asset types can be seen in Figure 4-29. The data suggests that for all asset types, overall levels of service are reducing (or remaining quasi-steady). The biggest performance decline over the past 3 years can be seen in Structures (overall drop of c. 2.9%). Footways levels of service have declined the least (c. 0.5%).

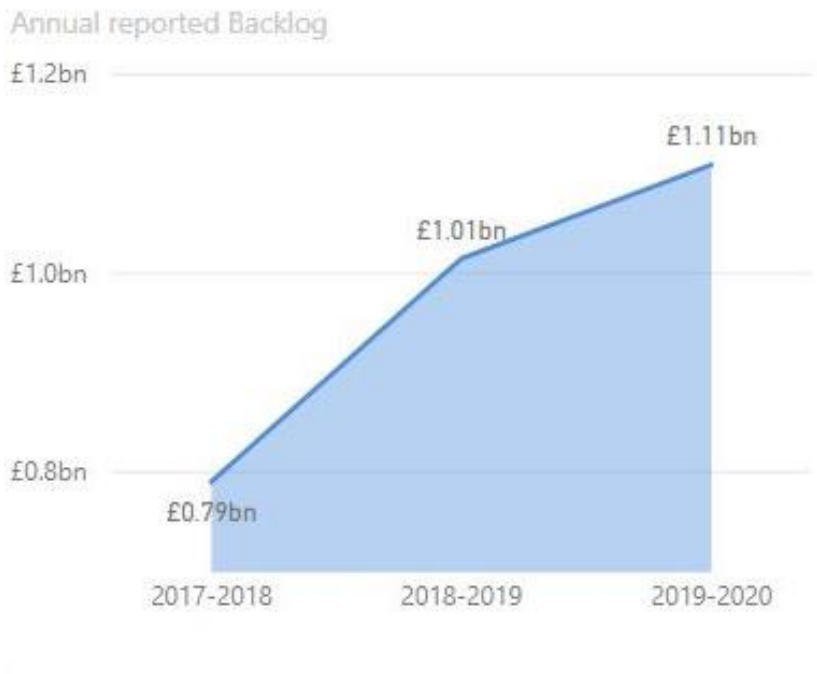
Figure 4-29 - Asset Health trends in London



In a similar way and with decreasing condition, the overall backlog is estimated to be increasing over the 3-year analysis span. This is displayed in Figure 4-30. In 2019-2020 the overall maintenance backlog has increased by £70m since 2017-2018 from £1.08bn to £1.13bn. It should be noted that latest figures include updated assumptions and unit rates, and this is reflected in the analysis (see assumptions table).

Recommendation: A study to review the 'cascade' of impacts of infrastructure deterioration (delays, safety and other social impacts) should be undertaken in line with the increasingly deteriorating Highways asset classes.

Figure 4-30 - Maintenance Backlog trend in London



4.5. Asset Management Maturity

The assessment of Asset Management maturity across London Authorities, 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.
2	Communications	Asset management practices and activities are effectively communicated to relevant internal and external stakeholders including customers.
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.

Each category (Asset Management Practice) is self-assessed with scores ranging from 0 to 4 as presented in Table 4-5.

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 2018-2019 and 2019-2020 responses.

Figure 4-31 - AM Maturity Levels: 2018 - 2019 Responses

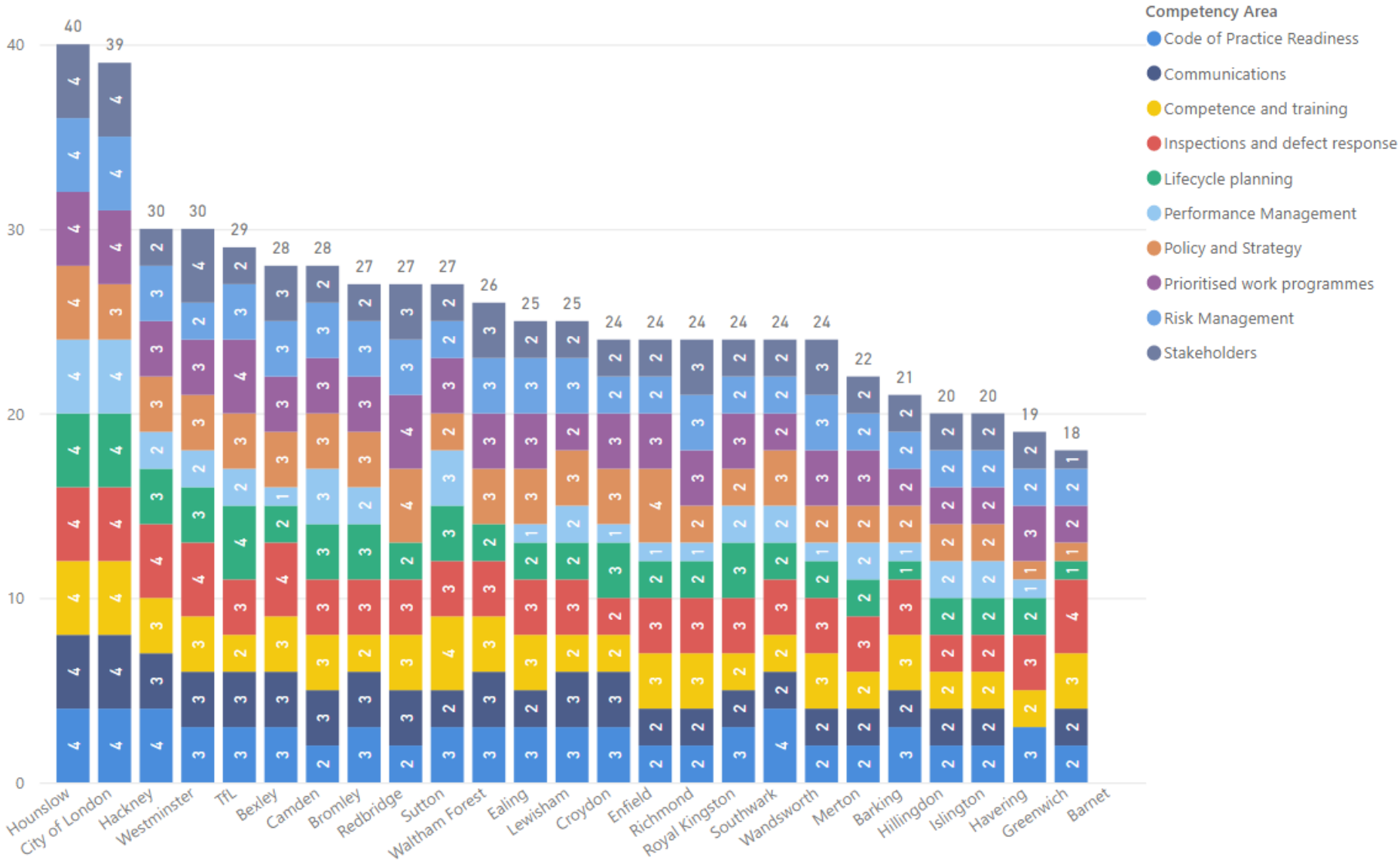
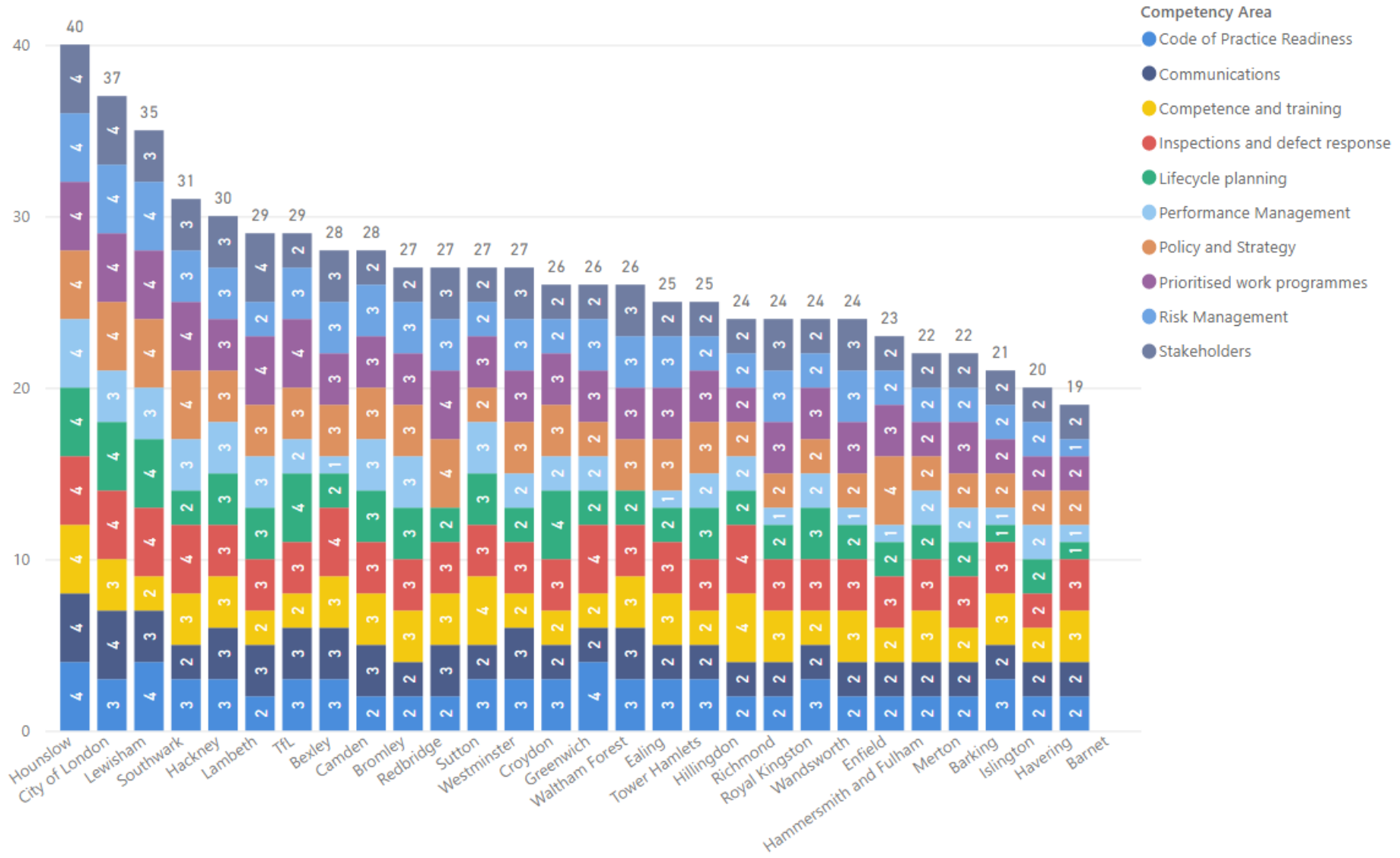


Figure 4-32 - AM Maturity Levels: 2019 - 2020 Responses



In general terms, authorities report having an all-around understanding of the 'Well Managed Highway Infrastructure – A Code of Practice' and seem to be prioritising specific elements and AM related activities, processes and techniques against others. 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). It can be observed that Hounslow has scored the highest (40) over both the years and Barnet has scored the worst for both periods (18 in 2018-2019 and 19 in 2019-2020). A subset of authorities is seen to be reporting an overall improvement over maturity scores (Greenwich, Havering, Lewisham, Southwark) and the majority is generally reporting steady maturity scores.

Recommendation: Self – assessment moderation should be considered for future maturity reviews. This will enable LoTAG to assess evidence against each AM category.

Figure 4-33 - AM Category Maturity data aggregation (2018-2019)

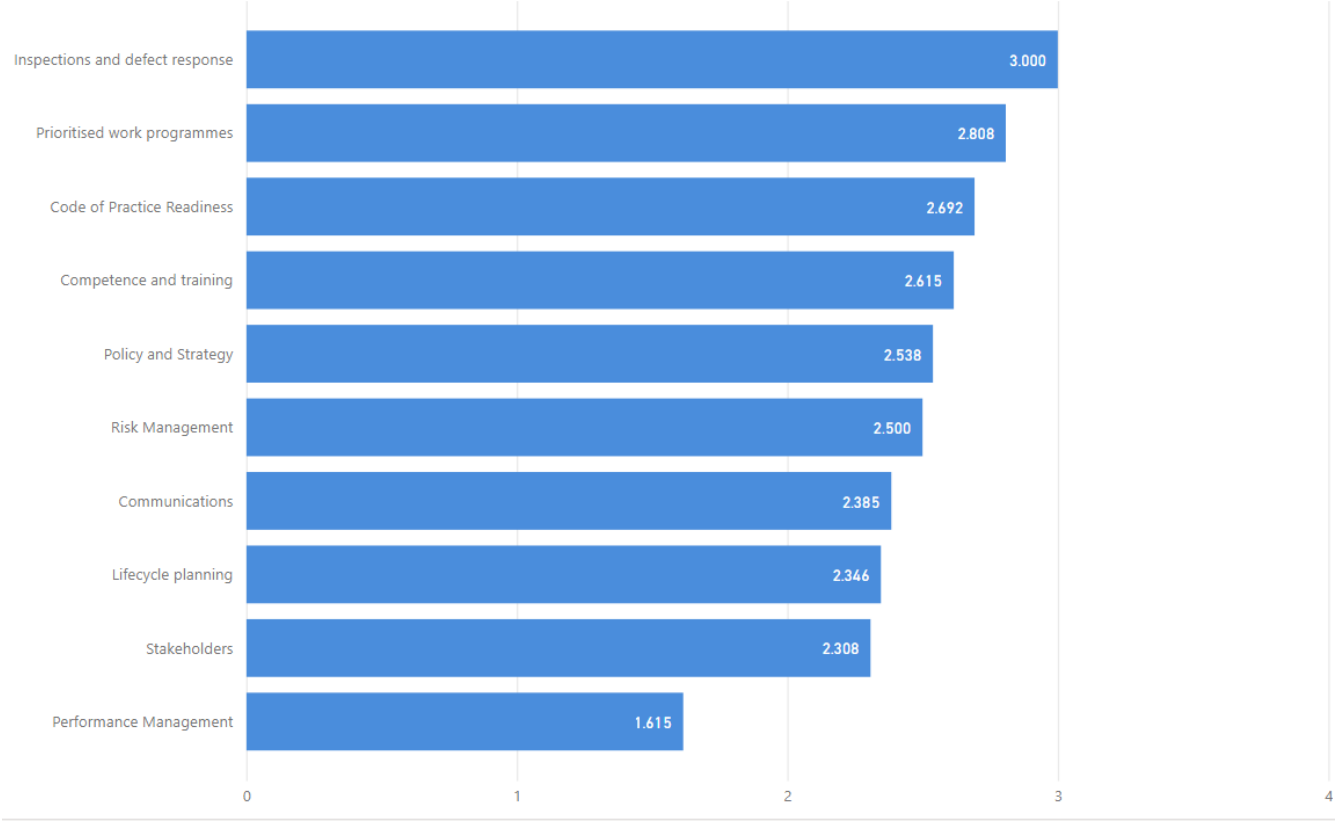


Figure 4-34 - AM Category Maturity data aggregation (2019-2020)

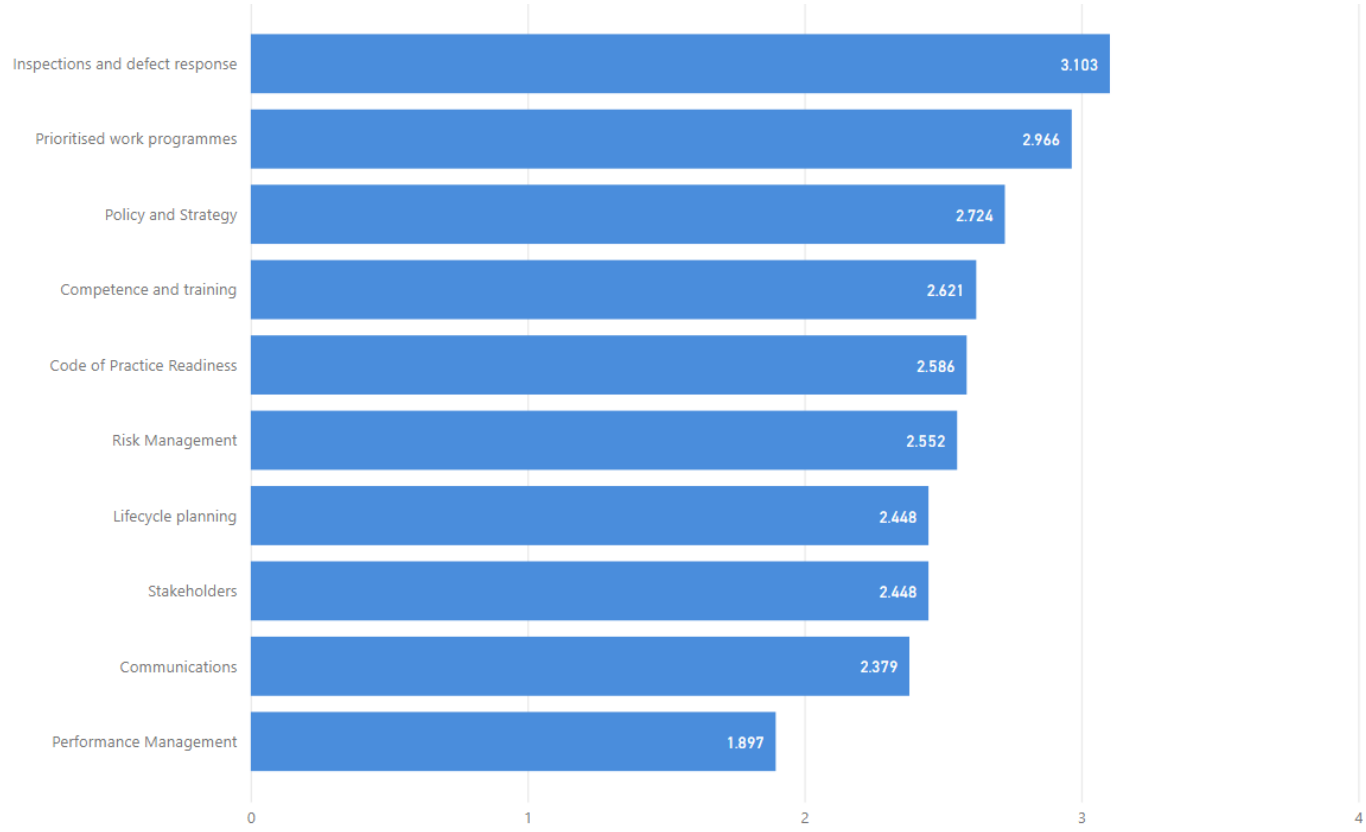


Figure 4-35 - Total AM Maturity Score (2018-2020)

The highest rated element across the 10 Asset Management maturity categories is the Code of Practice Readiness, which provides an insight into the progression made by the Authorities in adopting the Code of Practice recommendations. Similarly, the Inspections and Defect response category scores highly, indicating the Authorities are progressing with the implementation of fully documented inspection and response regimes that should embed risk assessment and evaluation.

It can be observed from Figures 4-33 and Figure 4-34 that across all participating authorities, the average aggregated maturity scores have increased. '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 4-35 as the total AM Maturity score has risen from 645 in 2018-2019 to 746 in 2019-2020. This indicates higher maturity levels across all authorities in London.

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