

OFFICIAL  
31 August 2021  
CRMP

## **Assessment of Risk (DRAFT)**

# 1 Summary

London Fire Brigade's (LFB) Assessment of Risk (AoR) is designed to help increase the understanding of how risk from fire and non-fire emergencies in London has changed over time and how the different elements combine to give a London-wide picture of risk.

The AoR is not the only process LFB uses to determine and provide its services, but it does give a high-level overview which can be used to understand the basic concepts of fire cover and the steps that LFB is taking to make people safe. The AoR is updated annually or as significant new data becomes available. This enables the Brigade to adapt its operations to London's changing environment.

The Brigade's approach to assessing risk is founded on risk management principles and the definitions set out in the National Fire Chiefs Council's 'Definition of Risk Project'.

In this Assessment of Risk, risk is defined as a combination of the likelihood and consequences of hazardous events. This allows the risk of incidents that may have happened only rarely, or never, to be assessed alongside risks that are common. This next section outlines the Brigade's understanding of risk and its approach to assessing risk in London.

This AoR has identified several high-risk areas relevant for London which will inform the development of the next Community Risk Management Plan (CRMP). The Brigade attends a wide range of emergencies that result in casualties and fatalities. These often occur in buildings but often occur in other locations as well. The highest identified fire risks are generally where most people live and the highest risk property types are:

- Fires in purpose-built flats
- Fires in houses and bungalows
- Fires in converted flats and houses of multiple occupancy (HMOs)
- Fires in care homes and specialised housing
- Fires in warehouses and bulk storage
- Fires in landfill and wasteland
- Fires in rural land (urban/rural interface)
- Fires in manufacturing and processing plants

The highest risks from incidents other than fires are:

- Non-fire incidents involving road vehicles – particularly road traffic collisions
- Non-fire incidents involving trains – particularly persons under train
- Non-fire incidents involving outdoor water – particularly persons in the water

The UK Government and the London Resilience Forum (a partnership of organisations with responsibility for emergency preparedness in London) each produce a risk register of worst-case risks. This is updated annually and is used by them to prepare their response should these risks occur. This risk assessment uses a broader definition of risk and includes impacts on human welfare, behaviour, economic, infrastructure, environment, and security. The major worst-case risks on these registers which the Brigade must prepare for are:

- Terror related incidents – particularly marauding terrorist attacks
- Major fires – particularly fires in high-rise buildings, other large public or commercial buildings, landfill and waste processing and wildfires near areas of dense population.

- Flooding – particularly surface water flooding and pluvial flooding (that arises from excessive rainfall)
- Pandemic type influenza – particularly the continuing threat from Covid-19 and its variants

Finally, the Brigade has identified emerging risks that may arise and risks that could change over the term of the CRMP which may require the Brigade to adapt the services it provides to meet London's changing needs, wants and expectations:

- Changing built environment – particularly the impact of modern methods of construction, legacy building stock and changing use of commercial spaces
- Health and well-being – particularly changes in inequalities of access to quality health care
- Equalities and fairness – particularly the impact of poverty on people's health, living and working circumstances
- Sustainability and climate change – particularly in increasing high-impact weather-related events
- Security and resilience – particularly the continuing threat from marauding terrorist attacks
- Population change – particularly the increasing population of older people given the risk factors associated with this community

Overall, the risk of being a fatality or casualty of a fire is relatively low when compared to other risks in London. However, fire still presents a broad risk to the public, especially if control measures which are intended to prevent or reduce harm are not in place/fail and/or when the wider impacts of fire are considered.

## 2 Our approach

Our Assessment of Risk looks at all foreseeable risks, both fire and non-fire, for which the London Fire Brigade may be expected to put in place appropriate controls.

In doing so, it is mindful of the requirements that are put on all fire and rescue services by the Fire and Rescue Services Act 2004, the 2018 Fire and Rescue Service National Framework for England, the Civil Contingencies Act 2004 and the Human Rights Act 1998.

To do this the Brigade is taking a layered approach to assessing risks in London (see figure 1.). This enables the Brigade to consider all risks independently of each other and take a fully integrated assessment of risk and the factors that influence vulnerability. It considers risk through a number of sources, including our internal reviews of each fire that results in a fatality.

Our Community Risk Management Plan will set out how we intend to help London reduce, manage, and respond to these risks.

### **People's concerns and vulnerabilities**

This layer takes a people-centred and community-centred view of concerns in London which aims to identify the risks that Londoners are most concerned about in relation to fire and rescue service incidents. These concerns reflect what Londoners, including those who commute into or visit London, have told us. These concerns are associated with risk perception, mental health and wellbeing, economic loss, and loss of local infrastructure. The scale of some of these perceived risks may not match the reality that each risk poses, however it is important that the Brigade understands both the scale of actual risk and the perception of risk held by the public to allow it to engage in the most appropriate way to make people safer and feel safe in London.

The Brigade aims to eliminate or reduce these risks by understanding how people use and live in their spaces. We use our last five years of data on fatalities and injuries arising from fire and non-fire incidents to understand peoples' vulnerability to becoming a casualty of an incident we may attend. This allows us to identify those people who are most vulnerable to fire and non-fire incidents.

### **Fire and Non-fire incidents risk**

This is a data-led risk assessment for individual life risks in different property types or locations that the Brigade attends, and which give rise to the highest number of casualties or fatalities per incident. This allows the Brigade to know which property types are locations for most life-risk incidents and which property types have the potential for the greatest wider impacts and consequences.

### **Worst case risk scenarios**

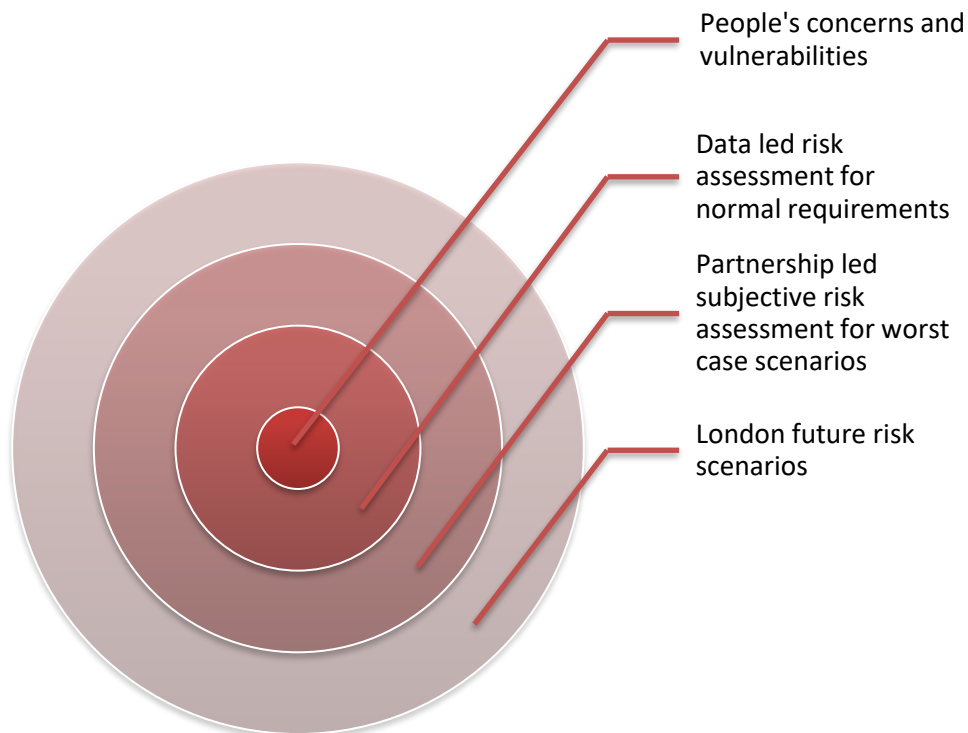
This is a subjective risk assessment for the worst-case scenarios based on the London and national risk registers. These worst-case risks are assessed against a broad range of impacts: human welfare, behavioural impact, economic, infrastructure, environmental and security and are made up of three categories: accidents, threats, and natural hazards. This gives the Brigade a wider partner perspective on risks faced in London and the UK.

### **Future risk scenarios**

This seeks to identify foreseeable risks which the Brigade may need to adapt to over the next three to five years and allows for longer term planning to be undertaken. These risks have been taken from the Centre for London's 2020 work on future London scenarios.

## Summary

The first three layers of this risk assessment, when considered independently of each other, give an integrated assessment of all foreseeable risks across London in terms of who is at most risk, the places where people are at most risk and the broader risks associated with fire and rescue service incidents which give rise to wider community impacts. By including the fourth layer of future risk scenarios LFB can identify if there are any emerging trends or gaps which may need additional or new capacity or capability in future.



**Figure 1.** The four independent risk layers

## 3 People's concerns and vulnerabilities

This is the first layer of our risk assessment. To understand people's concerns and vulnerabilities we begin with the concerns. We have then mapped where those concerns are located across London and analysed those concerns in relation to building and population density.

We then consider vulnerabilities by considering the different risk factors which influence people's vulnerabilities and how those risk factors make people more or less likely to need our services.

### 3.1 Concerns

The concerns identified below have been raised either by Londoners, through engagement and consultation, or are things that we have identified ourselves. These risks are associated with public risk perception, mental health and wellbeing, economic loss, and loss of infrastructure. This year, as a result of our analysis, we have added two new concerns: building density, including high-rise buildings with cladding and population density. The list of concerns is below, and we have provided maps showing the location of these concerns at Appendix 1.

#### People

- A. Population density (a concern that the more people there are living in an area, the greater the risk that an incident will spread)<sup>i</sup>
- B. Deprivation (a concern that people whose income does not meet their basic needs are more exposed to risk)<sup>ii</sup>
- C. Deprivation change (a concern that risk rises in an area when relative poverty rises)<sup>iii</sup>
- D. Health deprivation and disability (a concern that the quality of people's health and access to healthcare affects their risk)<sup>iv</sup>
- E. Older people (a concern that people aged 65 and over may be more at risk)<sup>v</sup>
- F. School age population (a concern that school-age children may be more at risk)<sup>vi</sup>
- G. Employment (a concern that an area which attracts high numbers of employees is more likely to experience an incident with wide impacts)<sup>vii</sup>
- H. Crime (a concern that areas which experience high rates of anti-social behaviour, damage, and arson are more exposed to risk)<sup>viii</sup>

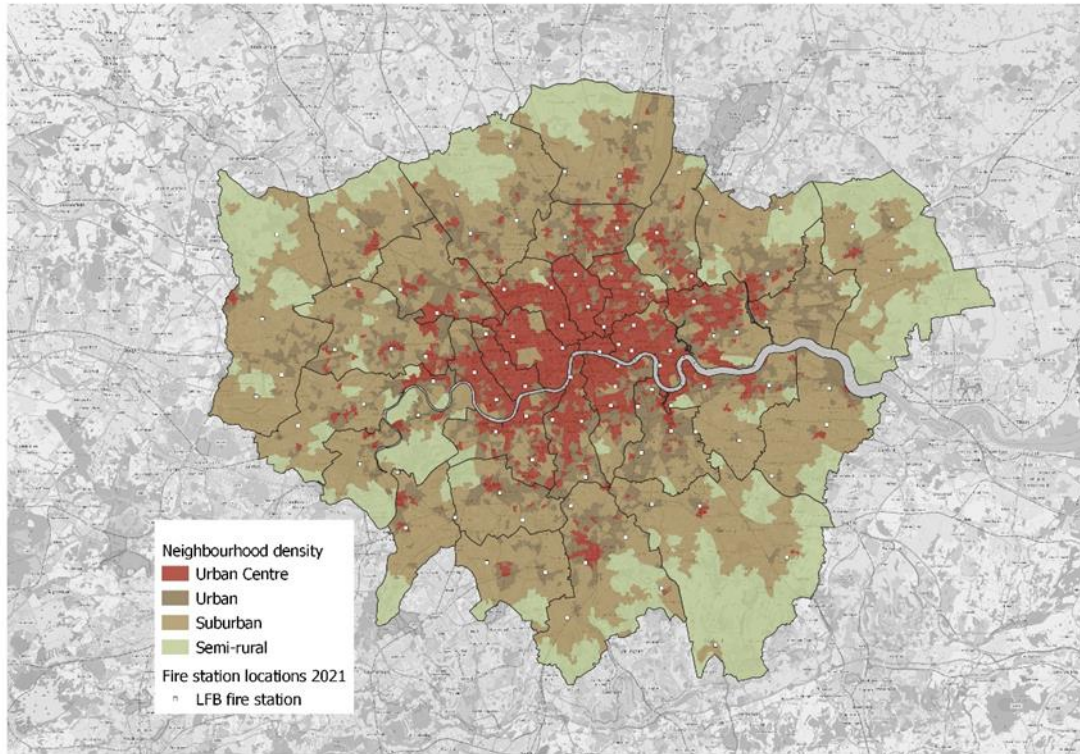
#### Place

- I. Density of buildings (a concern that the closer buildings are to each other, the greater the likelihood that an incident will spread)<sup>ix</sup>
- J. Volume of high-rise buildings (a concern that a concentration of buildings of 6 floors and above, or 18m and above, places an area at greater risk)<sup>x</sup>
  - o Residential high-rise with Aluminium Composite Material (ACM) cladding risks (a concern that such buildings are at even greater risk if they have ACM cladding)
- K. Number of Heritage sites (a concern that Grade I or Grade II listed buildings, or buildings of significant importance are more likely to be damaged in an incident)<sup>xi</sup>
- L. Open water sources (a concern that rivers, lakes, and other inland waters increase risk in an area)<sup>xii</sup>
- M. Industrial land (a concern that incidents on land with large commercial buildings, factories, and warehouses are more likely to be significant)
- N. Open land (a concern that fires on grass land, parks and rural land are increasing which can spread to nearby properties or have a wider environmental impacts)<sup>xiii</sup>

### 3.2 Neighbourhood density zones

There are too many concerns to show them clearly on a combined map. However, there is a strong relationship between where concerns are concentrated and the combined density of buildings and population. We have used a map of the combined density of buildings and population to create neighbourhood density zones and then analysed the concerns by these zones. Appendix 1 contains maps showing the geographical location of each concern across London.

The neighbourhood density map shows the population and building density across London. We have divided this into four zones. Those with the highest population and building density (more than 15,000 people per sq. km) are shown in red, those with above average population and building density (between 9,000 and 15,000 people per sq. km) are shown in amber, those with below average population and building density (between 2,000 and 9,000 people per sq. km) are shown in grey and the lowest population and building density (below 2,000 people per km) are shown in green.



### Neighbourhood density zones

The table below shows that the largest proportion of concerns are in the most urban areas of London with 73 per cent of the most deprived areas and 83 per cent of the most health and disability inequality are located in just 30 per cent of London's area.

The same goes for the built environment with 87 per cent of London's high-rise buildings and 59 per cent of historical buildings located in its urban centres which make up just 14 per cent of London's area.

However, when it comes to vulnerabilities to fire these are much more evenly distributed with 46 per cent of people over the age of 65 living in suburban areas and 49 per cent living in urban areas.

London does have large areas of lower population and building density levels. These are home to just 3 per cent of its population but cover 24 per cent of the land area. These do contain some risks though, such as open water and rural land.

Overall, risks are more concentrated in areas of more dense population and buildings, however vulnerabilities to fire are more evenly distributed throughout London's diverse neighbourhoods and communities.

In the table and in the maps at Appendix 1, there is reference to LSOAs. These are Lower Super Output Areas which are small geographic areas used for the publication of the census. Across England, LSOAs have an average population of 1,500 people or about 650 households.

Neighbourhood concern	Urban Centre	Urban	Suburban	Semi-rural
Area covered (SqKm)	14%	16%	47%	24%
Population	35%	25%	37%	3%
Volume of buildings	41%	22%	33%	4%
Volume of buildings over 18m	87%	7%	6%	0%
Employees	65%	14%	19%	2%
Over 65's	26%	23%	46%	5%
Students (5-18)	32%	26%	39%	3%
Most deprived LSOA's	48%	25%	26%	2%
Changes in deprivation	42%	24%	31%	3%
Most health and disability inequality	58%	25%	16%	1%
Number of listed buildings (GI, II, II*)	59%	14%	20%	7%
Police recorded arson and criminal damage	39%	26%	32%	3%
Area of open water	17%	9%	33%	41%
Area of open land	4%	6%	53%	36%
Area of Industrial land	13%	33%	50%	5%

**Table 1.** Showing the percentage of area covered by each risk zone in relation to the percentage of concerns within each risk zone

### 3.3 Individual risk factors and vulnerabilities

Some people are more likely to have a fire, and some are more likely to become a casualty if they have a fire. Understanding what increases someone's vulnerability to fire enables the Brigade to target its services where they can best reduce risk.

#### Fatalities and risk factors

In the last five years, there were 1,191 fatalities from incidents we attended. From these incidents fire was responsible for the death of 259 people, of which 197 were from accidental fires in the home. A further 4,693 people were injured at fire incidents during this same period, of which 2,767 were considered serious and required hospital treatment. Over the same five-year period there were 932 fatalities and 13,652 casualties at the non-fire incidents we attended.

Our data shows that the two most important risk factors which contribute to someone becoming a fatality in a fire are if they smoke or have conditions more often associated with older people, such as visual, cognitive, or physical impairments. The last five years of data shows that 35 per cent of fatalities from fire were smokers and 65 per cent of fatalities from fire were over 65. Although the differential has reduced over time, men are still 16 per cent more likely than women to die as a result of a fire. Additionally, proportionate to the size of population, there are more fire deaths in inner London than outer London (46 per cent of fire deaths compared to 40 per cent of population in inner London and 54 per cent of fire deaths compared to 59 per cent of population in outer London). This is likely to be related to increased risk factors such as the higher levels of deprivation in inner London compared to outer London.

Individuals who are most at risk from fire, are those who:

- carry out high-risk fire behaviours
- are less able to react to a fire/alarm, and/or
- are less able to escape from a fire



## 4 Data-led risk assessment for normal requirements

This is the second layer of our risk assessment. It sets out the risk of fire and non-fire events against where they happen. To decide which type of incident to include in this layer we have applied the requirement of the Fire and Rescue Services Act 2004 which states that the Brigade must *secure the provision of the personnel, services and equipment necessary efficiently to meet all normal requirements*.

We have analysed the last five years' worth of our incident data<sup>xiv</sup> and compared the rate of incidents, given their nature and location and the rate of casualties from these incidents.

We have displayed this information on a risk matrix below. This shows where we attend the most fire or non-fire incidents and which give rise to the highest number of injuries and fatalities. We have also provided more information on the highest risks for both fire and non-fire events.

We have considered an incident to be a 'normal requirement' if that type of incident occurs at least once a month. Incidents get a higher incident score the more frequently they occur and incidents that occur less than once a month are outside of normal requirements and are dealt with in our third layer. The following table sets out the likelihood scores we use in the risk matrix:

### Likelihood

Score	Descriptor
1	Between one a month and one a week
2	Between one a week and one a day
3	Between one and five a day
4	Between five and twenty a day
5	Twenty or more a day

To rate the consequence of each incident, we have used our data to assess the 'life consequence' of an incident and the 'wider consequences' of an incident separately. We have then taken the higher of these two scores to determine the consequence score for the incident.

To calculate life consequence, we have calculated a consequence scale by dividing the number of fires or non-fire incidents by the number of fire injuries or casualties. By using this scale, we can identify incidents which are relatively rare but produce a high number of casualties in relation to the number of incidents. The following table sets out the life consequence scores we have used:

### Life Consequence scores

Score	Life consequence
1	One casualty occurs per 100 or more incidents
2	One casualty occurs per 25 - 100 incidents
3	One casualty occurs per 10 - 25 incidents or a fatality occurs in 300 or more incidents
4	One casualty occurs per 5 – 10 incidents or a fatality occurs per 100 – 300 incidents
5	One casualty occurs per 5 or fewer incidents or a fatality occurs per 100 or fewer incidents

To calculate wider consequence we have used the size of the Brigade's response to an incident (the number of fire appliances used) as a proxy for the wider impacts that an incident has, such as wider human welfare impacts, behaviour changes, economic impacts, environmental impacts and impacts on essential services. The table below sets out the scores we have used:

### Wider Impact Consequence scores

Score	Wider impact consequence
1	One or more incidents of this type have needed over 4 pumps in the last five years
2	One or more incidents of this type have needed over 20 pumps in last five years
3	One or more incidents of this type have needed over 50 pumps in last five years
4	One or more incidents of this type have needed over 80 pumps in last five years
5	One or more incidents of this type have needed over 100 pumps in last five years

## 4.1 Fire and Non-fire incidents risk matrix

Combined Consequence	5	Fires in warehouses and bulk storage	Non-fire incidents involving outdoor water and boats   Fires on landfill or wasteland   Fires in manufacturing and processing plants	Non-fire incidents involving trains and transport buildings	Fires in purpose-built flats   Non-fire incidents involving road vehicles and urban infrastructure   Fires on rural land (urban rural interface)	
	4	Fires on boats   Non-fire incidents involving camping tent, shelter, or marquee   Non-fire incidents in static caravans, houseboats, and towing caravans   Non-fire incidents in other residential property	Fires in offices and call centres   Fires in short stay accommodation   Fires in retail outlets   Fires in food and drink outlets	Fires in converted flats or HMOs   Fires in care homes and specialised living	Fires in houses and bungalows	
	3	Fires on trains   Fires in camping tent, shelter, or marquees   Fires in places of worship   Fires in communal living	Fires in hospitals and medical care facilities   Fires in other non-residential property   Fires in public administration, utilities, and amenities	Fires in private garages and sheds	Fires involving road vehicles	
	2	Fires involving BBQs   Fires in entertainment and cultural venues	Fires in sports and leisure facilities   Fires on education sites   Non-fire incidents in carparks and transport   Non-fire incidents in places of worship	Fires involving urban furnishings   Non-fire incidents in short stay accommodation   Non-fire incidents in non-residential property   Other incident in public administration, utilities, and amenities   Non-fire incidents in vegetation by infrastructure network   Non-fire incidents in hospitals and medical care	Non-fire incidents in converted flats and HMOs   Non-fire incidents involving urban furnishings   Non-fire incidents in food and drink outlets   Non-fire incidents on rural land   Non-fire incidents involving BBQs   Non-fire incidents in retail outlets   Non-fire incidents in care and specialised living	Non-fire incidents in purpose-built flats   Non-fire incidents in houses or bungalows
	1	Fires involving outdoor water   Fires involving carpark and transport   Non-fire incidents involving animals and agriculture   Non-fire incidents on aircraft	Fires in farms, agriculture   Fires in transport buildings   Fire in vegetation by infrastructure network	Fires in urban infrastructure   Non-fire incidents in manufacturing and processing plants   Non-fire incidents at sports and leisure facilities   Non-fire incidents in communal living   Non-fire incidents in entertainment and cultural venues   Non-fire incidents in warehouses and bulk storage   Non-fire incidents on education sites   Non-fire incidents in offices and call centres   Non-fire incidents on landfill and wasteland	Fires in refuse, rubbish, or recycling   Non-fire incidents in private garage or sheds   Non-fire incidents in farming and agriculture	False alarms in any property type   Non-fire incidents involving refuse, rubbish, or recycling,
		1	2	3	4	5
<b>Likelihood</b>						

## 4.2 Major individual life risks from fires

Rating	Risk	Likelihood	Life Consequence	Outcome description	Examples of significant incidents in last five years
Very High	Fires in purpose-built flats	4	5	LFB responded to an average of 2,637 fires in purpose-built flats a year over the past five years or roughly seven a day. This resulted in an average of 378 fire injuries a year at a rate of one injury every seven incidents attended or with an average of one fatality for every 300 incidents attended. The most likely location in a purpose built flat for a fire to start which results in a fatality is the living room or bedroom. There are over 8000 high-rise buildings in London with over 500 buildings of over 20 floors planned. In June 2021 there were 901 buildings in London with a temporary suspension of 'stay put' where an interim simultaneous evacuation strategy has been put in place which have an increased risk of fire spread outside the flat of origin to other properties within the same building.	<ul style="list-style-type: none"> <li>• Chartham Court - 2016 – 10 pump fire in a 16-floor residential block of flats, 3 people injured, 60 people evacuated, internal fire spread from ground to 3<sup>rd</sup> floor and external fire spread from ground to 9<sup>th</sup> floor.</li> <li>• Shepherd's Court – 2016 – 20 pump fire with fire spread to five floors, 50 people evacuated from 18 floor residential high-rise block. A total of 32 appliances were required to resolve the incident.</li> <li>• Grenfell Tower, Major Incident – 2017 – 72 people died because of a fire which started on the 4<sup>th</sup> floor and spread to the 23<sup>rd</sup> floor, 40 pumps, requiring 319 pumps to resolve over the course of the incident.</li> <li>• Worcester Park – 2019 – 20 pump fire in a residential block of flats of four floors. 23 flats were destroyed, and 150 people evacuated because of a fire which spread outside of its compartment of origin, requiring 142 pumps to resolve over the course of the incident.</li> <li>• Barking Riverside – 2019 – 20 flats destroyed because of a fire which spread outside of its compartment of origin, requiring 36 pumps to resolve over the course of the incidents.</li> <li>• The Cube Bolton – 2019 – 221 people evacuated because of a fire which spread outside of its compartment of origin.</li> <li>• New Providence Wharf, Major Incident – 2021 – 20 pump fire, 35 people rescued, 22 in fire escape hoods and a full evacuation of the building. This incident required 46 pumps to resolve over the course of the incident.</li> </ul>

Very High	Fires in houses and bungalows	4	4	LFB responded to an average of 1,942 fires in houses or bungalows a year over the past five years or roughly five a day. This resulted in an average of 267 fire related injuries a year or one injury for every seven incidents attended or one fatality for every 300 incidents attended. The most likely location in a house or bungalow for a fire to start which results in a fatality is the living room or bedroom.	<ul style="list-style-type: none"> <li>• Antrim Grove – 2016 – 10 pump persons reported fire requiring a total of 51 pumps over a period of 10 hours.</li> </ul>
Very High	Fires in care homes and specialised living	3	4	LFB responded to an average of 368 fires in care homes and supported living a year over the past five years or roughly one a day. This resulted in an average of 48 fire injuries a year or one injury for every eight incidents attended by LFB or one fatality for every 300 incidents attended. The most likely location in a care home or supported living for a fire to start which results in a fatality is the living room or bedroom. This risk also has possible broader impacts including fire spread outside the flat of origin to other properties within the same building.	<ul style="list-style-type: none"> <li>• Chingford care home fire - 2018 – one person died at a 10-pump fire in a care home for people with learning difficulties. In total 24 appliances were used to resolve the incident.</li> </ul>
Very High	Fires in converted flats and HMOs	3	4	LFB responded to an average of 947 fires in converted flats and HMOs a year over the past five years or roughly three a day or one fatality for every 300 incidents attended. This resulted in an average of 139 fire related injuries or one injury for every seven incidents attended. The most likely location in a converted flat or HMO for a fire to start which results in a fatality is the living room or bedroom. This risk also has possible broader impacts including fire spread outside the flat of origin to other properties within the same building.	<ul style="list-style-type: none"> <li>• Daleham Garden, Camden – 2017 – 8 pump, persons reported fire, 1 person died, 20 people evacuated requiring alternative accommodation requiring a total of 27 pumps to resolve over the course of the incident.</li> </ul>
Very - High	Fires on rural land (urban rural interface)	4	5	LFB responds to an average of 1,480 fires on rural land a year which resulted in one fatality in the last five years. Though most of these incidents are low level and dealt with by one or two fire engines they can require on rare occasions require significant resource commitment with a maximum of 209 pumps involved at a single incident in the last five years. These incidents have the potential to cause significant environmental damage.	<ul style="list-style-type: none"> <li>• Wanstead flats, Redbridge – 2018 – 40 pump grass fire in the urban/rural interface meaning that the fire had a significant impact on public safety. It required a total of 209 pumps to resolve over the course of the incident. Involving 100 hectares of rural grass land. Depending on their duration grass fires can cause localised increases in air pollution whilst active.</li> </ul>

High	Fires on landfill and wasteland	2	5	LFB responds to an average of 105 fires in landfill and wasteland a year. These incidents can require significant resource commitment with a maximum 250 pumps over six days involved in a single incident in the last five years. These incidents have the potential to cause significant environmental damage.	<ul style="list-style-type: none"> <li>•Launders Lane landfill site, Havering – 2019 – 10 pump fire requiring 250 pumps over 6 days. Though all fires result in significant amounts of smoke in the short term, the consequence of incidents in landfill sites which can burn intermittently for weeks and months can impact on local air quality affecting public health and well-being in that area.</li> </ul>
High	Fires in warehouses and bulk storage	1	5	LFB responds to an average of 37 fires in warehouses and bulk storage a year which resulted in one fatality in the last five years. Though these numbers are relatively low they can require significant resource commitment with a maximum of 202 pumps involved over 18 hours at a single incident in the last five years. These incidents have the potential to cause significant environmental damage.	<ul style="list-style-type: none"> <li>•East Lane Business Park, Brent – 2017 – 20 pump fire requiring 202 pumps over 18 hours.</li> <li>•Aladdin Works, Ealing – 2018 – 20 pump fire requiring 198 pumps over 33 hours.</li> <li>•White Hart Lane, Haringey – 2017 – 25 pump fire requiring 198 pumps over 25 hours.</li> </ul>
High	Fires in manufacturing and processing plants	2	4	LFB responds to an average of 115 fires in manufacturing and processing plants a year. These incidents can require significant resource commitment with a maximum 110 pumps involved in a single incident in the last five years. These incidents have the potential to cause significant environmental damage.	<ul style="list-style-type: none"> <li>•Rustlins Ltd, Brent – 2018 – 15 pump fire requiring 110 pumps in total.</li> <li>•A&amp;R Paper converters, Redbridge – 15 pump fire requiring 108 pumps in total</li> </ul>
High	Fires in retail outlets	2	4	LFB responds to an average of 341 fires in retail outlets a year. These incidents can require significant resource commitment with a maximum 102 pumps involved over 10 hours at a single incident in the last five years. These incidents have the potential for fire spread to residential property with many mixed-use buildings in London.	<ul style="list-style-type: none"> <li>•The Mall, Walthamstow – 2019 – 25 pump fire requiring 102 pumps over 10 hours to resolve.</li> </ul>
High	Fires in short stay accommodation	2	4	LFB responds to an average of 117 fires in short stay accommodation a year or roughly two a week which resulted in 7 fire injuries a year or one every 17 incidents attended. These incidents can require significant resource commitment with a maximum 86 pumps over 17 hours involved in a single incident in the last five years.	<ul style="list-style-type: none"> <li>•Mandarin Hotel, Westminster – 2018 – 20 pump fire requiring 58 pumps over 18 hours to resolve.</li> <li>•Harbour Hotel, Richmond – 2019 – 15 pump fire requiring 86 pumps over 17 hours, with 300 people evacuated.</li> </ul>
High	Fires in offices and call centres	2	4	LFB responds to an average of 154 fires in offices and call centres a year or roughly three a week which resulted in 4 fire injuries a year or one every 36 incidents attended. These incidents can require significant resource	<ul style="list-style-type: none"> <li>•Chancery Lane, Westminster – 2020 – 25 pump fire requiring 98 pumps over 12 hours, with 39 people evacuated.</li> </ul>

				commitment with a maximum 98 pumps over 12 hours involved in a single incident in the last five years.	
High	Fires in food and drink outlets	2	4	LFB responds to an average of 325 fires in food and drink outlets a year or roughly one a day which resulted in 26 fire injuries a year or one every 12 incidents attended. These incidents can require significant resource commitment with a maximum 82 pumps over 13 hours involved in a single incident in the last five years.	<ul style="list-style-type: none"> <li>•Tiroler Hut Restaurant, Westminster – 2019 – 15 pump fire in restaurant and residential property, requiring 82 pumps over 13 hours to resolve.</li> </ul>

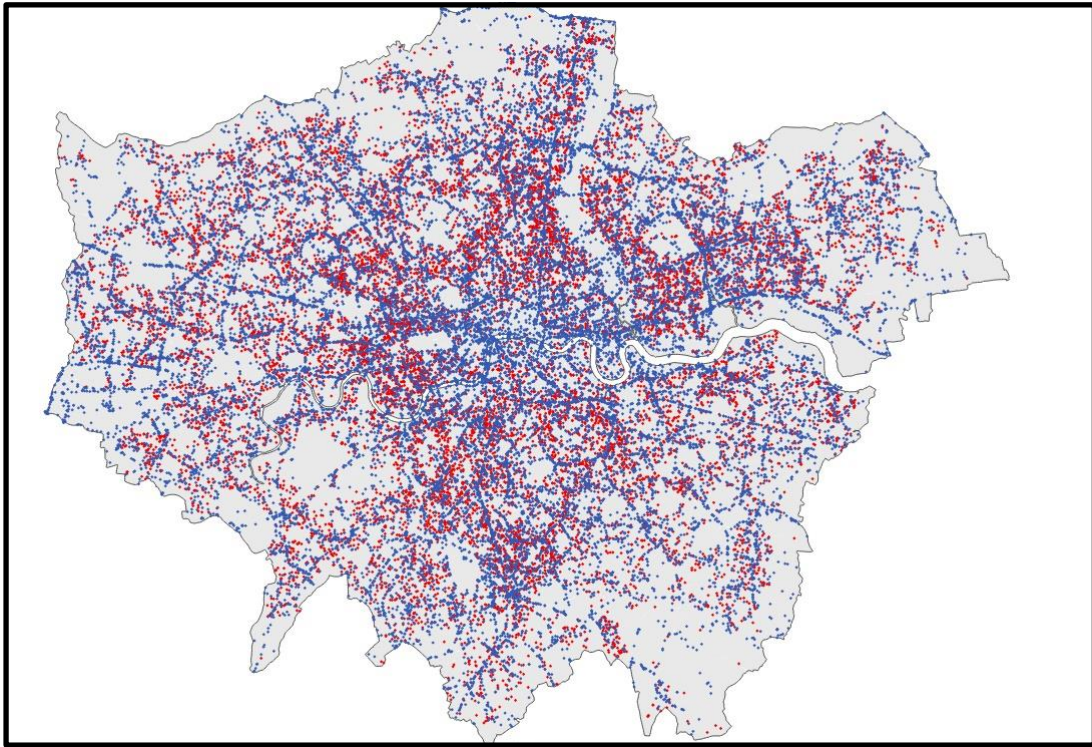
#### 4.4 Major individual life risks from non-fire incidents

Rating	Risk	Likelihood	Life Consequence	Outcome description	Examples of significant incidents
Very High	Non-fire incidents involving road vehicles and urban infrastructure	4	5	LFB responded to an average of 5,546 Non-fire incidents a year involving road vehicles over the last five years or 15 a day. This resulted in an average of 1,666 casualties a year resulting from these incidents, or one injury for every three incidents attended. The most common incident involving road vehicles or urban infrastructure is road traffic collisions and associated risks on roads.	<ul style="list-style-type: none"> <li>Orpington bus crash – 2019 – 2 pumps and 2 FRUs special service. Two buses in collision with a motor vehicle, one person killed and 14 injured.</li> </ul>
Very High	Non-fire incidents involving trains and transport buildings	3	5	LFB responded to an average of 243 Non-fire incidents involving trains a year over the last five years or one every day and half. This resulted in an average of 95 casualties a year, or one casualty every other incident attended. The most common incident type involving trains and transport buildings is persons under a train. The largest incident was the tram crash at Sandilands, where 7 people lost their lives and 50 people were injured.	<ul style="list-style-type: none"> <li>Sandilands, tram crash, Major Incident, Croydon – 2016 – 8 pumps, 4 FRUs, USAR modules, 7 persons died, 50 persons injured and removed to hospital, this incident required a total of 20 pumps to resolve.</li> </ul>
Very High	Non-fire incidents involving outdoor water and boats	2	5	LFB responded to an average of 179 All incidents a year involving outdoor water over or boats over the last five years, or one every other day. This resulted in an average of 31 casualties a year resulting from these incidents, or one casualty for every five incidents attended. The most common incident type in or near outdoor water or boats is person in the water in need of rescue.	<ul style="list-style-type: none"> <li>Princess Crescent, Hackney – 2019 – 12 pump, 6 FRUs, 1 HVP special service, burst watermain, 250 properties flooded to depth of 1 meter, 1 person rescued, 100 people displaced.</li> <li>Pan-London surface water flooding, major incidents – 2021 - 68 and 63 pumps were deployed across London to deal with widespread flooding on 12<sup>th</sup> and 25<sup>th</sup> July 2021 which were both declared as a major incident. Several rescues were carried out by the Brigade from people in cars with several underground stations and hospitals flooding.</li> </ul>



## 4.5 Other significant property risks with wider impacts

Risk	Outcome description	Examples of recent significant incidents that have occurred in London or in other countries
Fires in heritage buildings	LFB responds to an average of 33 fires in grade I and II* buildings a year and 303 fires within 15m of a listed building a year in London. In particular cases this can give rise to significant loss of heritage to London and the UK and potential significant economic loss and media and political attention associated with the buildings.	<ul style="list-style-type: none"> <li>• Notre-Dame de Paris fire – 2019 – Major fire in a historical cathedral in Paris requiring over 400 firefighters to extinguish costing in excess of €1 billion to restore.</li> </ul>
Fires in essential services	LFB responds to an average of 165 fires involving public utilities, utilities and amenities a year over the last five years or three a week. This resulted in an average of 10 fire related injuries a year, or one casualty every 17 incidents attended.	<ul style="list-style-type: none"> <li>• Holborn tunnels fire – 2015 - A fire in electrical tunnels in the Holborn area closed the centre of London for 36 hours and resulted in 5,000 people being evacuated.</li> </ul>
Fires in transport buildings	LFB responds to an average of 71 fires involving transport buildings a year over the last five years or just over one a week. This resulted in an average of 5 fire related injuries a year, or one casualty every 118 incidents attended.	<ul style="list-style-type: none"> <li>• Elephant and Castle fire – 2021 – 15 pump, FRUs 4 fire and explosion in railway tunnel under Elephant and Castle railway station resulting in six casualties and over 600 people evacuated.</li> </ul>
Fires in hospitals and medical care facilities	LFB responds to an average of 92 fires involving hospitals and medical care facilities a year over the last five years or nearly two a week. This resulted in an average of 7 fire related injuries a year, or one casualty every 14 fires attended.	<ul style="list-style-type: none"> <li>• Royal Marsden Hospital, Kensington and Chelsea – 2008 – 20 pump fire, 800 staff and 29 patients evacuated.</li> <li>• University College Hospital, Westminster – 2008 – 20 pump basement fire, 20 staff and 83 patients evacuated.</li> </ul>



**Figure 3.** Map of all incidents in high risk property/locations

- Fire incident
- Other incident types

## 5 Reasonable worst-case risk scenarios

This is the third layer of our risk assessment. The reasonable worst-case risk matrix is a subjective risk assessment based on the London and National Risk Registers. This, together with the risk assessment of "normal" risk in layer two, allows us to address the requirement in the Fire and Rescue National Framework to assess all foreseeable fire and rescue related risks that could affect its communities.

The National Risk Register is produced by Government and the London Risk Register is produced by the London Resilience Forum (LRF). In both cases, they take a subjective approach to assess the reasonable worst-case scenario for each risk identified. This is because the consequences of risk can vary enormously; a train crash could result in the death and injury of many people but could also result in only a small number of minor injuries. There is very little data available to inform these risk assessments because of the rarity of these events.

The ratings for the fire-related risks on the London Risk Register are based on our recommendations. In producing this risk assessment, we have reviewed the ratings that we have provided to the LRF and are considering revisions to some of our recommended ratings. For the purposes of this risk assessment, we have used the original risk ratings agreed by the LRF but have used professional judgement to identify those which are considered high-risk for LFB.

Below the risk matrix, we have included two further tables. The first highlights the major risks from the matrix and provides examples of real incidents. The second highlights the significant risks from the matrix and again, provides examples of real incidents. Professional judgement has been used to delineate between these two categories.

### Risk ratings

These risk ratings are taken directly from the London Risk Register.

#### Likelihood

Score	Likelihood Descriptor	Probability of the Reasonable Worst-case Scenario occurring within a 12-month period
1	Low	Less than 0.2% chance of occurring
2	Medium Low	Between 0.2% and 1%
3	Medium	Between 1% and 5%
4	Medium High	Between 5% and 25%
5	High	More than 25%

#### Consequence

Impact Category	Explanation
Human Welfare	Includes numbers of fatalities and casualties resulting from the reasonable worst- case scenario, needs for mass evacuation, and short and long-term accommodation.
Behavioural Impacts	Psychological impacts of the risk, including how people's perception and behaviour might change as a result of the risk.

<b>Economic</b>	An approximate net economic cost, including both direct (e.g. loss of goods, buildings, infrastructure) and indirect (e.g. loss of business, increased demand for public services) costs.
<b>Essential Services</b>	How the reasonable worst-case scenario might impact the emergency services, critical infrastructure, transport, education and other service and infrastructure providers.
<b>Environment</b>	Encompassing long-term impact of contamination or pollution of land, water or air with harmful biological / chemical / radioactive matter or oil, flooding, or disruption or destruction of plant or animal life.
<b>Security</b>	Includes impacts to law enforcement and intelligence services, and disruptions to criminal justice and border security.

## Worst-case risk matrix

Consequence	5	Large toxic chemical Release   Nuclear Reactor Accident   Radioactive storage facility/transport accident	Nuclear attack unenclosed urban area	Conventional attack on chemicals infrastructure   Biological attack – unenclosed urban area	Influenza type pandemic	
	4	Aircraft collision   Fire or explosion at a fuel distribution site   Explosion at a high-pressure gas pipeline   Reservoir/Dam collapse   Fire and explosion at onshore fuel pipeline	Complex Built Environments   Attack on UK gas infrastructure   Attack on UK electricity infrastructure   Malicious aviation incident   Large Aircraft Incident#   High consequence dangerous goods   Malicious aviation incident	Surface Water Flooding   Fluvial flooding   Severe drought   Chemical attack – enclosed urban area   Radiological attack – unenclosed urban area		Marauding terrorist attack
	3	Building collapse   Bridge Collapse   Water supply infrastructure	Industrial explosion and major fire   Malicious maritime incident	Major fire#   Tidal flooding   Ground Water flooding   Rail incident   Attack with building collapse   Chemical attack unenclosed urban area	Person Bourn IED	Public disorder
	2	Maritime pollution   Accidental Release of Biological Pathogen	Wildfire#   Railway accident	Storms and gales   Land movement   Localised industrial accident involving small toxic release   Anthrax letter	Local Accident on Motorways/ Major Trunk Roads,	Industrial action by firefighters#
	1	Small Aircraft Incident#   Earthquake				
		1	2	3	4	5
<b>Likelihood</b>						

# The rating of these are subject to review and change

## Examples of major worst-case risks

Rating	Risk	Likelihood	Consequence	Outcome description	Examples of significant incidents
Very High	Terror related incidents	5	4	Marauding, simultaneous or near simultaneous marauding firearms attacks in a crowded urban area. Up to 200 fatalities (predominantly from gunshots but also from blast) and 650 casualties with gunshot, blast, and other injuries.	<ul style="list-style-type: none"> <li>• July 7<sup>th</sup> London bombings – 2005 – 56 people killed and 784 injured when four bombers set off near simultaneous bombs in London.</li> <li>• November 13<sup>th</sup> Paris attacks – 2015 – 137 people killed and 416 injured in a multi sited terror attack in Paris.</li> <li>• Westminster Bridge attack – 2017 – 6 people killed, including the perpetrator, and 49 injured when a car was driven at speed at pedestrians on Westminster Bridge.</li> <li>• London Bridge attack – 2017 – 11 people killed, including the perpetrators, and 48 injured when a van was deliberately driven at pedestrians near London Bridge.</li> <li>• Parsons Green bomb – 2017 – 30 people injured when a bomb exploded on the District Line near Parsons Green station.</li> <li>• Fishmongers hall attack – 2019 - 3 people killed, including the perpetrator, and 3 people injured in a stabbing attack.</li> </ul>
High	Major fire	3	3	A major fire in a building resulting in up to 140 fatalities and 300 casualties, significant damage to the building affected and disruption to local transport services for up to a week. This risk also includes a major fire in a very tall building, large buildings which have a footprint of over one hectare, buildings of national significance or in a building/location which forms or is related to part of the UK national infrastructure.	<ul style="list-style-type: none"> <li>• Kings Cross Underground fire – 1987 – 31 people killed and 100 injuries from a fire in an underground station.</li> <li>• Hampton Court fire – 1986 – large fire at a Royal Palace in West London</li> <li>• Windsor Castle fire – 1992 – large fire at the Royal Palace destroyed 115 rooms and other priceless artifacts.</li> <li>• Buckingham Palace fire – 2002 – Fire in Buckingham Palace.</li> <li>• Rosepark Nursing Home, Uddingston, Lanarkshire – 2004 – Fire in care home resulting in 14 deaths of elderly residence</li> </ul>

					<ul style="list-style-type: none"> <li>• Hunts recycling fire – August 2012 – 40 pump fire at Hunts recycling, Dagenham next to an Upper Tier COMAH site during the closing ceremony of the London Olympics.</li> <li>• Holborn tunnels fire – 2015 - A fire in electrical tunnels in the Holborn area closed the centre of London for 36 hours and resulted in 5,000 people being evacuated.</li> <li>• Grenfell Tower – 2017 – 72 people died because of a fire which started on the 4<sup>th</sup> floor and spread to the 23<sup>rd</sup> floor</li> <li>• Notre-Dame de Paris Cathedral fire – 2019 – Major fire in a cathedral in Paris costing over £500 million to restore</li> </ul>
Very High	Flooding	3	4	<p>Surface water flooding in a large metropolitan area caused by a warm unstable atmosphere, most likely to occur in summer due to the warmer atmosphere having a greater water holding capacity, causes a pattern of convective rainfall events.</p> <p>Successive bands of frontal rainfall saturate river catchments (soil moisture deficit is at zero) and fill river channels to full capacity. High intensity heavy rainfall causes fluvial rivers in London (tributaries to the Thames) to exceed channel capacity. Flooding happens very quickly with little warning and time for evacuations.</p>	<ul style="list-style-type: none"> <li>• Floods in South East England – 2014 – Widespread flooding across the South East of England affecting Hampton and ground water flooding in Kenley requiring the rescue and evacuation of many residence.</li> <li>• Flooding in Belgium and Germany – 2021 – over 180 people killed in widespread surface water and pluvial flooding in Europe. Similar floods occurred in China and India within a week.</li> <li>• Pan-London surface water flooding – 2021 - 68 and 63 pumps were deployed across London to deal with widespread flooding on 12<sup>th</sup> and 25<sup>th</sup> July 2021. Several rescues were carried out by the Brigade from people in cars and Pudding Land TFL station was flooded. A major incident was declared by LFB on 12<sup>th</sup> July.</li> </ul>
Very High	Pandemic	4	5	<p>A worldwide outbreak of influenza occurs when a novel flu virus emerges with sustained human-to-human transmission. Up to 50 per cent of the population may experience symptoms, which could lead to up to 750,000 fatalities in total in the UK. Absenteeism would be significant and could reach 20 per cent for 2-3 weeks at the height of the pandemic, either because people</p>	<ul style="list-style-type: none"> <li>• Covid-19 Global Pandemic – 2020/2021 – Worldwide pandemic which saw LFB respond alongside the London Ambulance Service and the Metropolitan Police Service to increase London's emergency health care capacity.</li> </ul>

			are personally ill or caring for someone who is ill, causing significant impact on business continuity.	
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## Examples of significant worst-case risks

Rating	Risk	Likelihood	Consequence	Outcome description	Examples of significant incidents
High	Public disorder	5	3	Large scale public disorder at site(s) in a single city, or in multiple cities, occurring concurrently over several days resulting multiple large fires across London.	<ul style="list-style-type: none"> <li>London riots – 2011 – London experienced its biggest time of civil unrest in recent history, resulting in multiple large fires across the city over a three day period, with LFB having 97 frontline fire appliances committed to incidents all across London at its height.</li> </ul>
High	Complex built environment	2	4	Consequences of a major incident affecting large buildings or a complex built environment. Incidents in these facilities/areas have the potential to trigger a complex chain of events that lead to serious consequences for public safety.	<ul style="list-style-type: none"> <li>London is a complex built environment, from London underground stations, to the largest shopping centre in Europe, home to six Premier league football clubs, the national football and rugby stadiums, the world's most prestigious tennis tournament, the UK Parliament and Royal Family, the centre of the UK financial system, embassies and a number of world famous museums, art galleries, libraries, hotels, universities and theatres as well as three top tier COMAH (Control of Major Accident Hazards Regulations) sites, two international airports, two central London heliports and a military air base.</li> </ul>
High	Large aircraft incident in proximity to airport	2	4	An aircraft incident within 1000m of the airport boundary during the take-off or landing phase. Aircraft are large commercial aircraft that can range in size from an Airbus A380 (550 people) to smaller commercial jets (50 people). Fatalities or serious injury may occur on the aircraft or within a localised area caused by the direct impact of the aircraft. There may also be local structural collapse, or road closers and HAZMAT material contamination. It will have a joint response from LFB and Airport FRS.	<ul style="list-style-type: none"> <li>Air France flight 4590 – 2000 – A Concorde flight takes off from Paris Charles de Gaulle Airport crashing two minutes after take-off into a nearby hotel resulting in 113 deaths and 6 injuries.</li> </ul>
High	Large hazardous materials incident	1	5	Large toxic chemical release caused by release of chlorine or several other chemicals. This incident arises from possible mechanical equipment/process failure or corrosion, and not necessarily involving fire or explosion.	<ul style="list-style-type: none"> <li>Gas leak in Bhopal, India – 1984 - Thousands of people died from the effects of toxic gases which leaked from a chemical factory near the central Indian city of Bhopal. Methyl isocyanate gas (MIC) had escaped when a valve in the</li> </ul>

				A road or rail tanker containing dangerous goods and/or "high consequence" dangerous goods are involved in an accident leading to fire and an explosion. Up to 200 fatalities and up to 500 people requiring medical treatment. The explosion will cause varying degrees of damage to property and infrastructure depending on their distance from the incident. This risk would result in a toxic plume/gas cloud which would be harmful to the population, resulting in evacuation	plant's underground storage tank broke under pressure. This caused a deadly cloud of lethal gas to float from the factory over Bhopal, with more than 20,000 people required hospital treatment
Medium	Railway Accident	2	2	Up to 30 fatalities and up to 100 casualties, (fractures, internal injuries - burns less likely). Possible loss of freight. Major disruption to rail line including possible closure of rail tunnel.	<ul style="list-style-type: none"> <li>• Sandilands, tram crash, Major Incident, Croydon – 2016 – 8 pumps, 4 FRUs, USAR modules, 7 persons died, 50 persons injured and removed to hospital, this incident required a total of 20 pumps to resolve.</li> <li>• Hoboken train crash, New York – 2016 – 1 death, 114 injured when a train crashed through the rail concourse during rush hour at one of New York's busiest rail terminals</li> <li>• Bad Aibling rail accident, Germany – 2016 – 12 people killed and 85 injured when two train collided head on in south eastern Germany.</li> </ul>
Medium	Building/ Bridge Collapse	1	3	<p>Collapse of a large building (high-rise block, shopping mall etc). Up to 100 fatalities depending on the size and construction of building, and occupation rates, and 350 casualties. Potential for several persons to be trapped or missing. Localised loss of power and other essential services. Local access routes affected due to road closures.</p> <p>Roads, access routes and transport infrastructure impassable for considerable length of time. Severe congestion over wide geographical area. Emergency access into/out of large populated areas severely restricted. Potential for several persons to be trapped or missing.</p>	<ul style="list-style-type: none"> <li>• Genoa Bridge Collapse – 2018 – Ponte Morandi Bridge collapse 2018 in Genoa Italy. 43 people died and 16 were injured in the bridge collapse which occurred during a period of torrential rain in the region.</li> <li>• Miami beach building collapse – 2021 – A wing of a 13-floor residential block of flats containing 55 flats collapsed. 98 confirmed fatalities from the incident taking over a month to resolve.</li> <li>• King Street Southall – 2020 – 6 pump fire, explosion, and collapse, 2 FRUS, USAR modules, 2 people died, 5 people rescued, 50 people evacuated, total 37 pumps required over 36 hours to resolve the incident.</li> </ul>

Medium	Local Accident on Motorways/ Major Trunk Roads,	4	2	Multiple vehicle incident causing up to 10 fatalities and up to 20 casualties (internal injuries, fractures, possible burns); closure of lanes or carriageway causing major disruption and delay.	<ul style="list-style-type: none"> <li>• California – 2016 – Tour bus crash killing 13 and injuring 30 when a bus crashed into the back of a lorry.</li> <li>• Germany bus crash – 2017 – Tour bus collided with a lorry killing 18 people, 30 people injured.</li> </ul>
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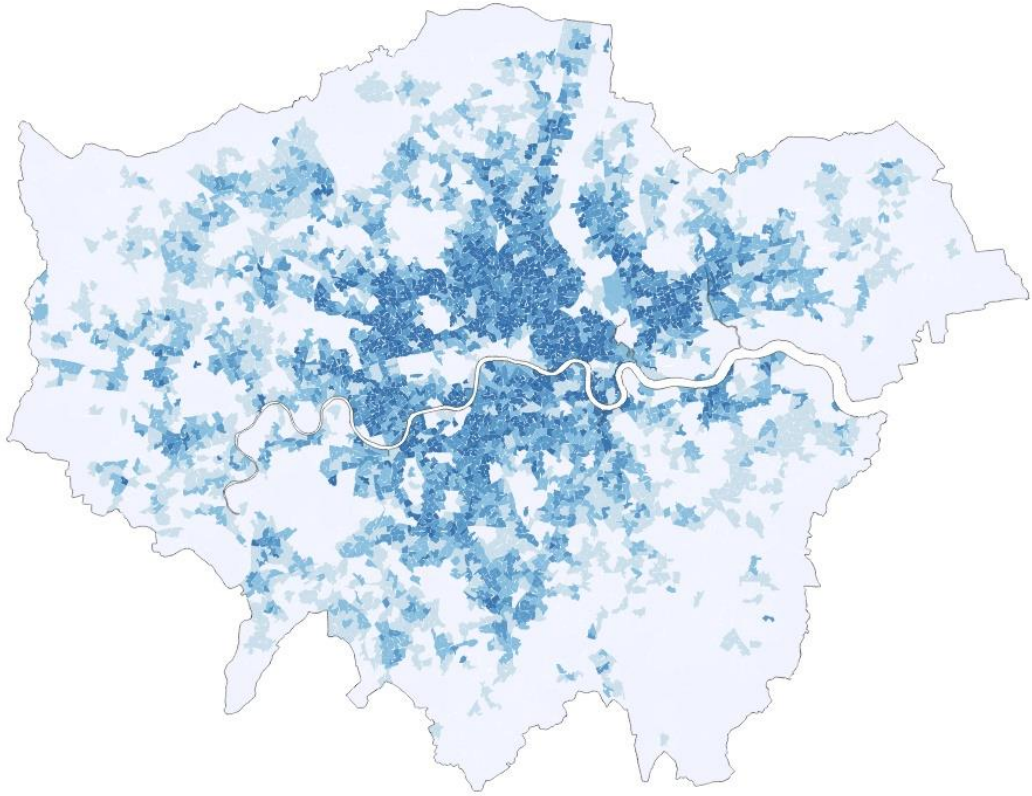
## 6 Future risk scenarios

This is the fourth layer of our risk assessment, which looks at future foreseeable risks to London. There is insufficient data or information currently to enable us to rate these risks for likelihood and impact. Our professional view is that all of them should be considered as high risks.

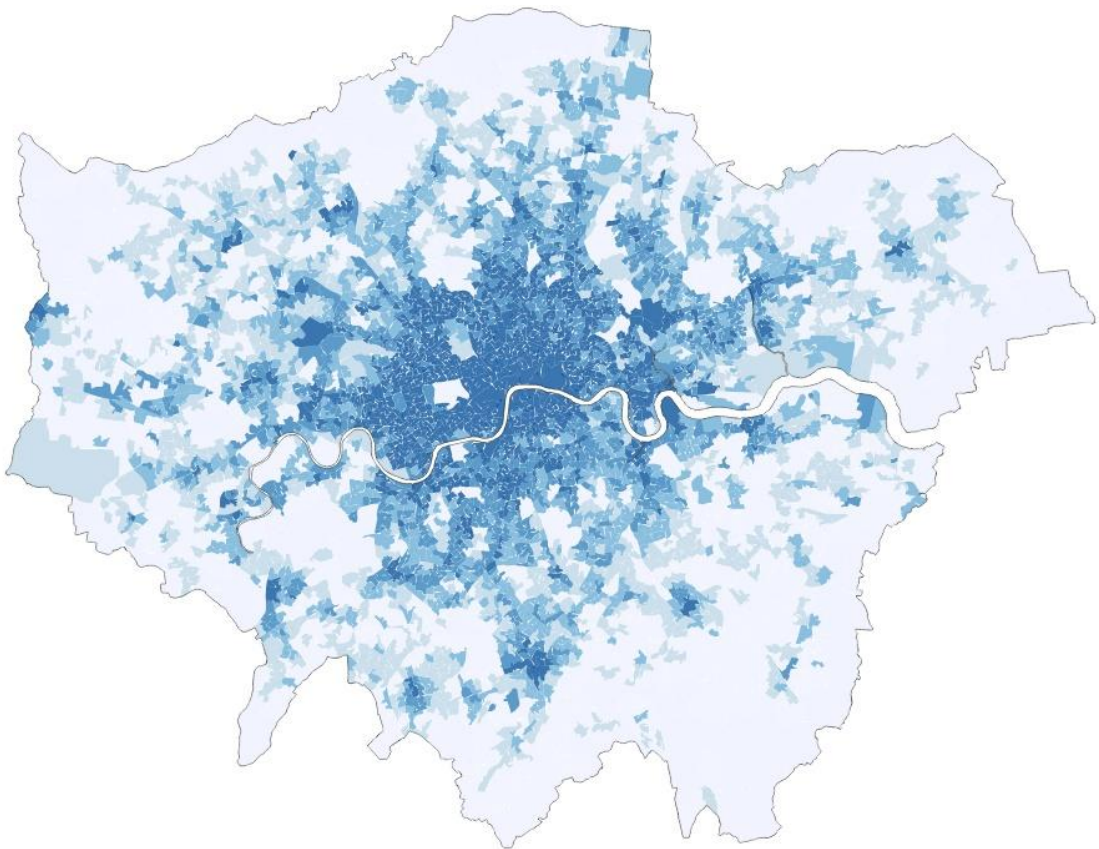
We will keep these risks under review on an annual basis.

Impact	Risk	Outcome description
High	Changing built environment	<p>Adapting the built environment whilst raising design and management standards resulting in continued issues with legacy building stock and modern methods of construction. Changes to the use of premises due to Covid-19 or other societal issues resulting in poorly adapted buildings resulting in potential for increased fire spread.</p> <p>The move to online retail could mean declining town centres and spaces especially in outer London resulting in the loss of retail space. Future of offices meaning that buildings which only presented a day-time life risk may be converted into residential property bringing an increased night-time life risk. Uncertainty about the future of central London meaning that property may change use. Increased use of low traffic zones meaning main transport routes may be more congested, though this will not affect LFB's pan-London response times it may impact attendance times for specific incidents in the vicinity to low traffic zones.</p>
High	Health and well-being	<p>Long term Covid-19 health impacts (direct and indirect) leading to greater mental health issues, poor mobility, and reliance on prescription drugs. Growing health issues, inequalities between those with private health care and those that rely on state provision. High level of obesity and inactivity increasing mobility issues. Unaffordable and overstretched care provision meaning fewer people are getting the help they require to enable them to live independently. Poorly trained and poorly regulated care providers, meaning lack of identification and reporting of risks.</p>
High	Equalities and fairness	<p>In-work poverty leading to higher levels of deprivation. Economic inequalities creating greater disparity between rich and poor within the same areas. Overcrowding of housing due to lack of social housing. Racism and associated movements leading to social unrest and public disorder.</p>
High	Sustainability and climate change	<p>A significant increase in the frequency of events or their impact, along with the possibility of new extreme weather events. Warming climate giving rise to more extreme weather events and hot dry summers like 2018, flooding of 2021 and the 2013 St Jude's day gales and storms. These incidents all put significant strain on the Brigade's resources and it is therefore foreseeable that if the scale and intensity of these extreme weather events increase with climate change the Brigade's capacity to deal with these incidents whilst maintaining normal business may be exceeded in the future. Other emerging risks which are associated with climate change include changing fuels for road vehicles, alternate power supplies for domestic and commercial premises.</p>
High	Security and resilience	<p>Continued risk of terrorism and the need to be able to respond with other emergency responders in a coordinated way mean that the Brigade will need to continue to delivery its high treat capability and enhance its response in light of the recommendations made by the Manchester Arena Inquiry.</p>
High	Population change	<p>Most scenarios predict a continuation of the current trend for population growth, with some estimating population increases of up to 15 million people by 2050. This would be at a rate of 200,000 people a year, which is four times the current rate of population increase. However, at the other extreme there are predictions of population decrease. Additionally, the elderly population of London is predicted to increase in proportion as people live longer, with an increase of 1.3 million people over the age of 50 by 2050 or an increase of 45,000 a year. This could bring an increase in risk factors associated with an aging population and in particular an increase in people with dementia meaning more high-risk individuals.</p>

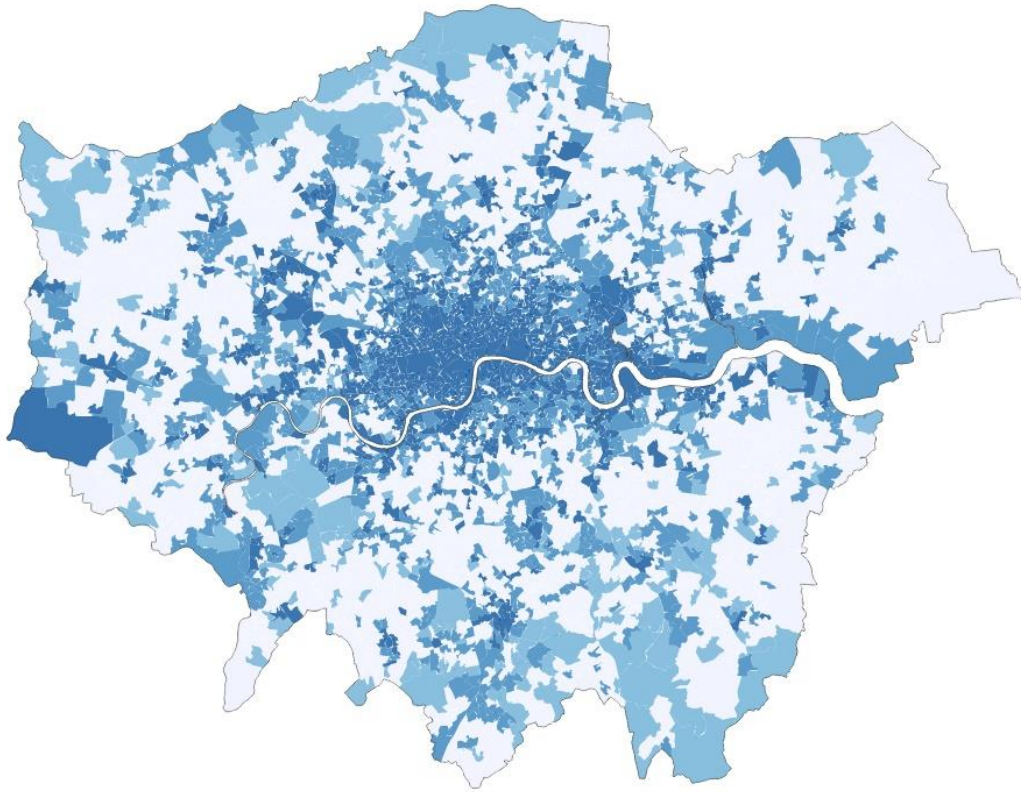
## Appendix 1: Mapped Concerns



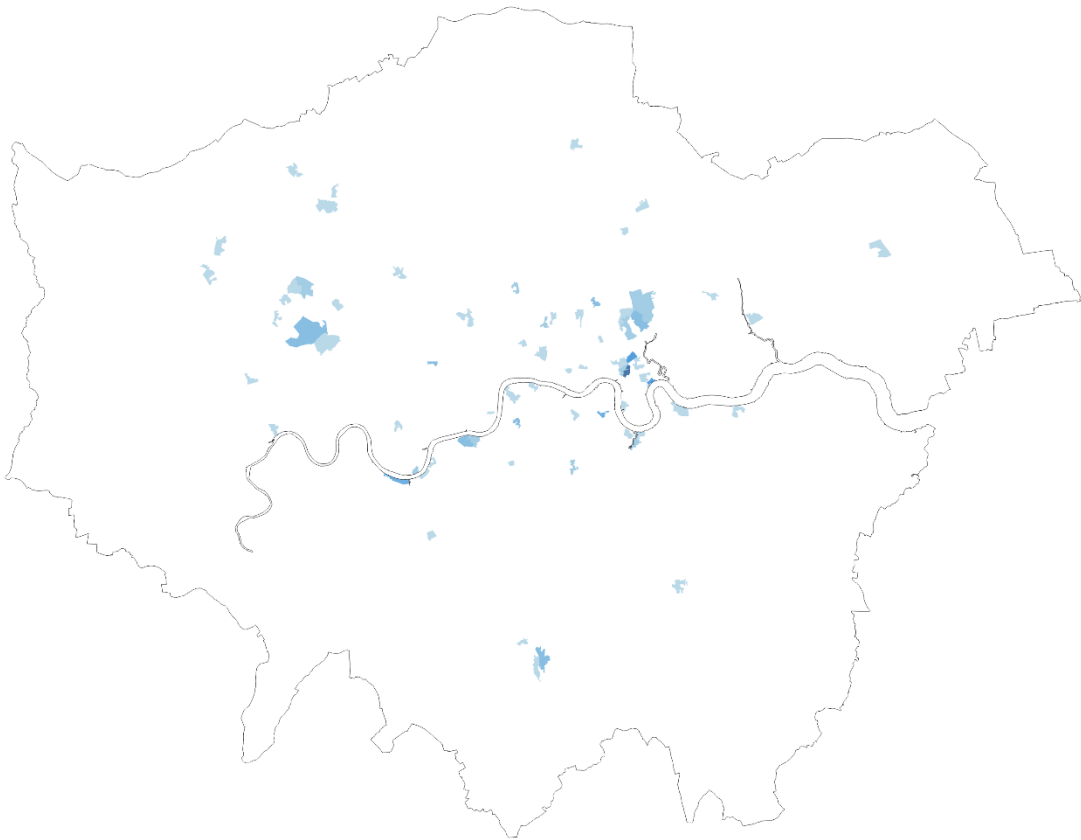
**Map 1** Ranking population density (2019) by LSOA (Dark high – light low)



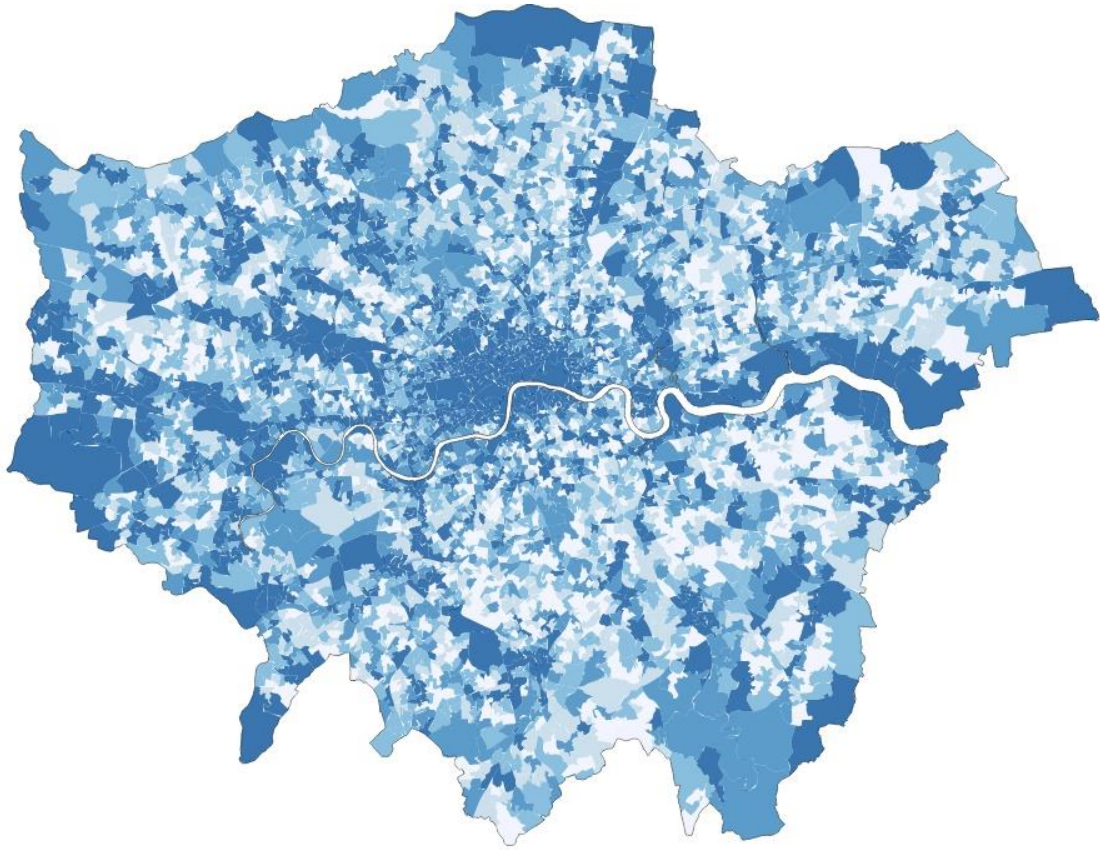
**Map 2** Ranking of all building density by LSOA (Dark high – light low)



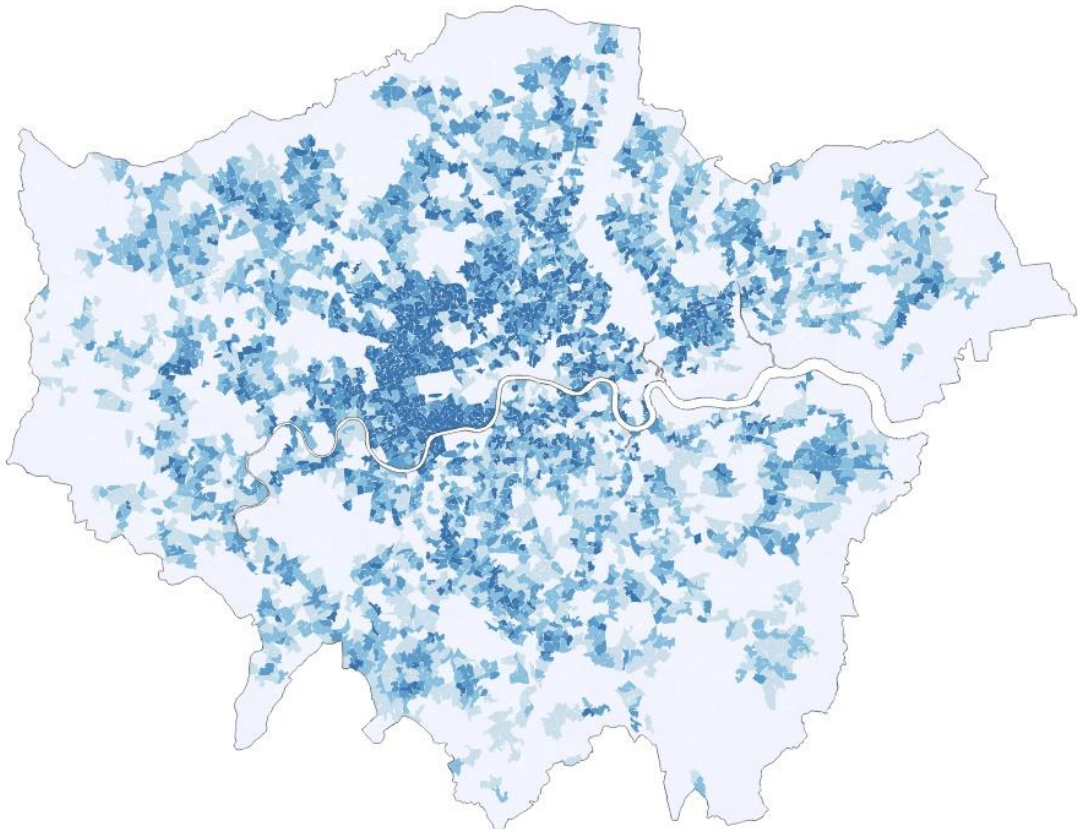
**Map 3** Ranking density of buildings over 18m by LSOA (dark high – light low)



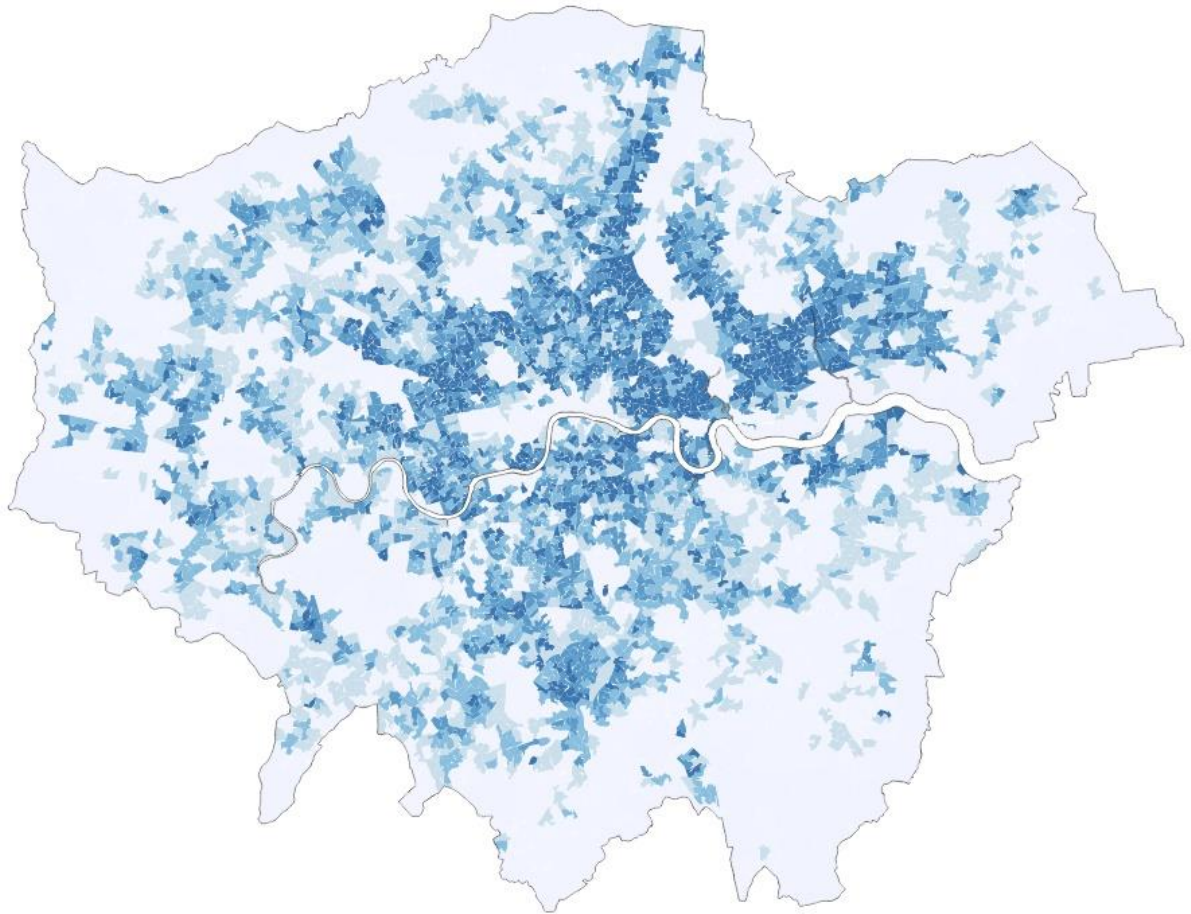
**Map 3a** Residential high-rise with ACM cladding risks (dark more – light fewer)



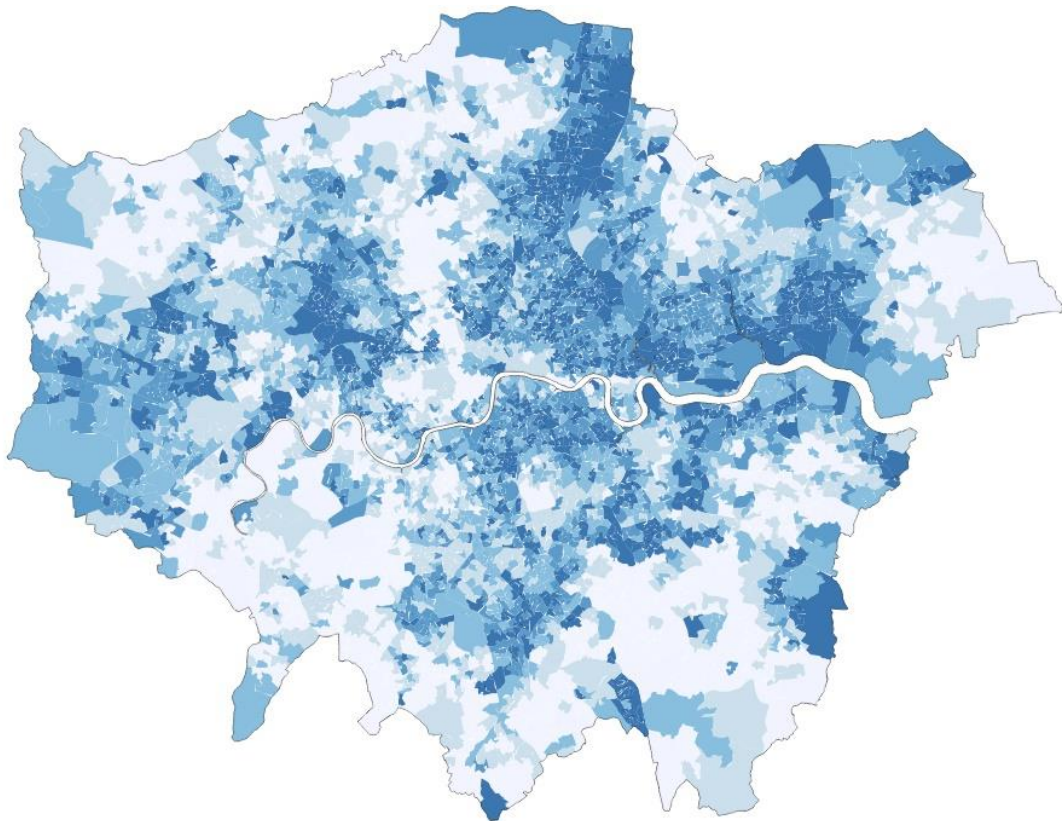
**Map 4** Ranking of registered employment locations by LSOA (Dark high – light low)



**Map 5** Ranking population density Age 65+ (2019) by LSOA (Dark high – light low)

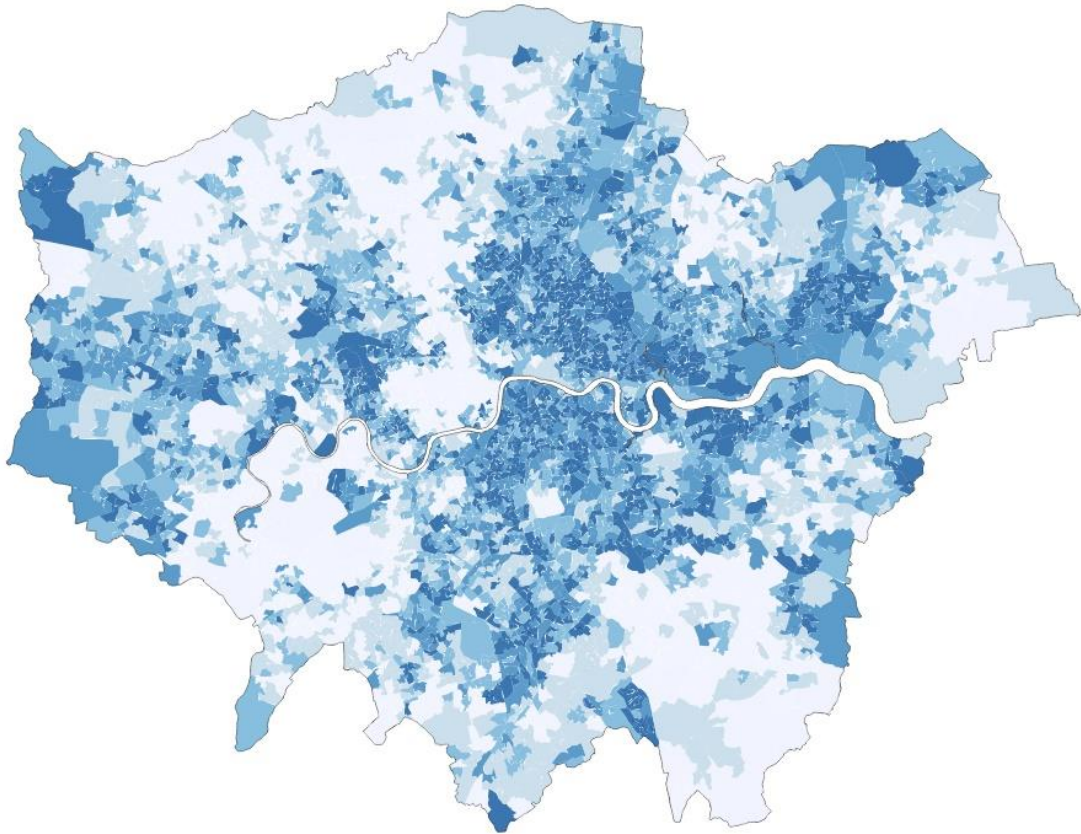


**Map 6** Ranking population density Age 5-18yrs (2019) by LSOA (Dark high – light low)

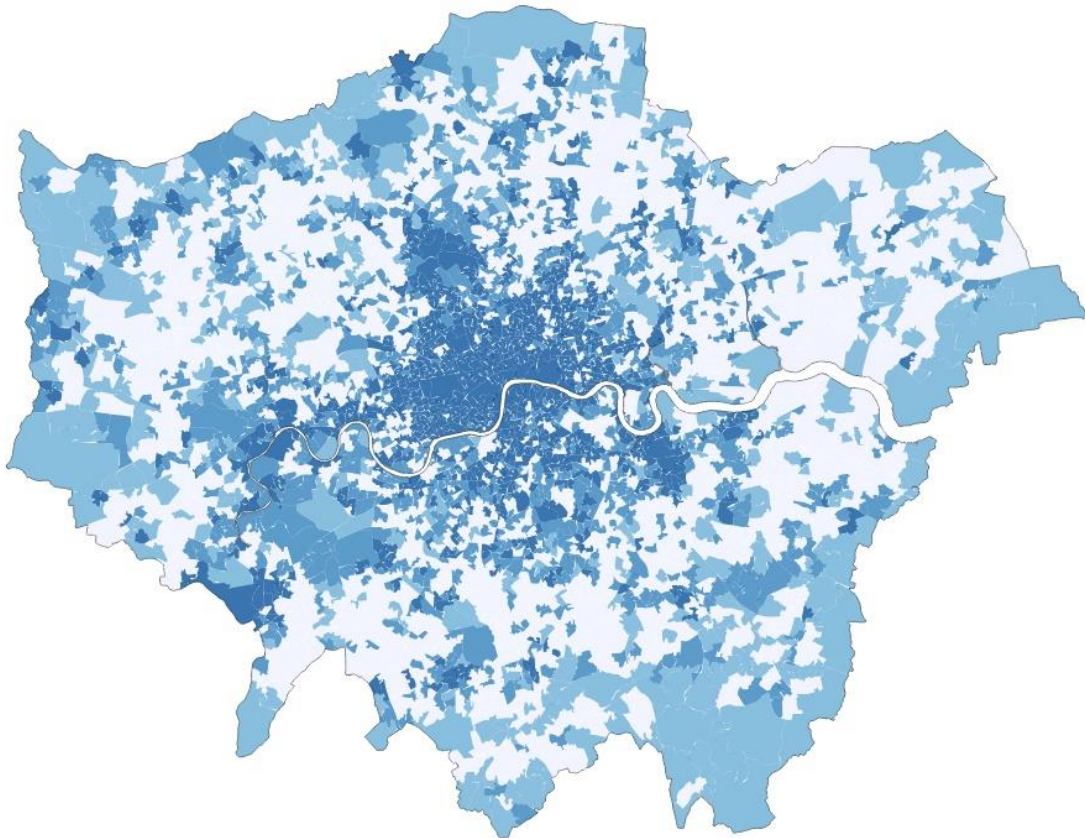




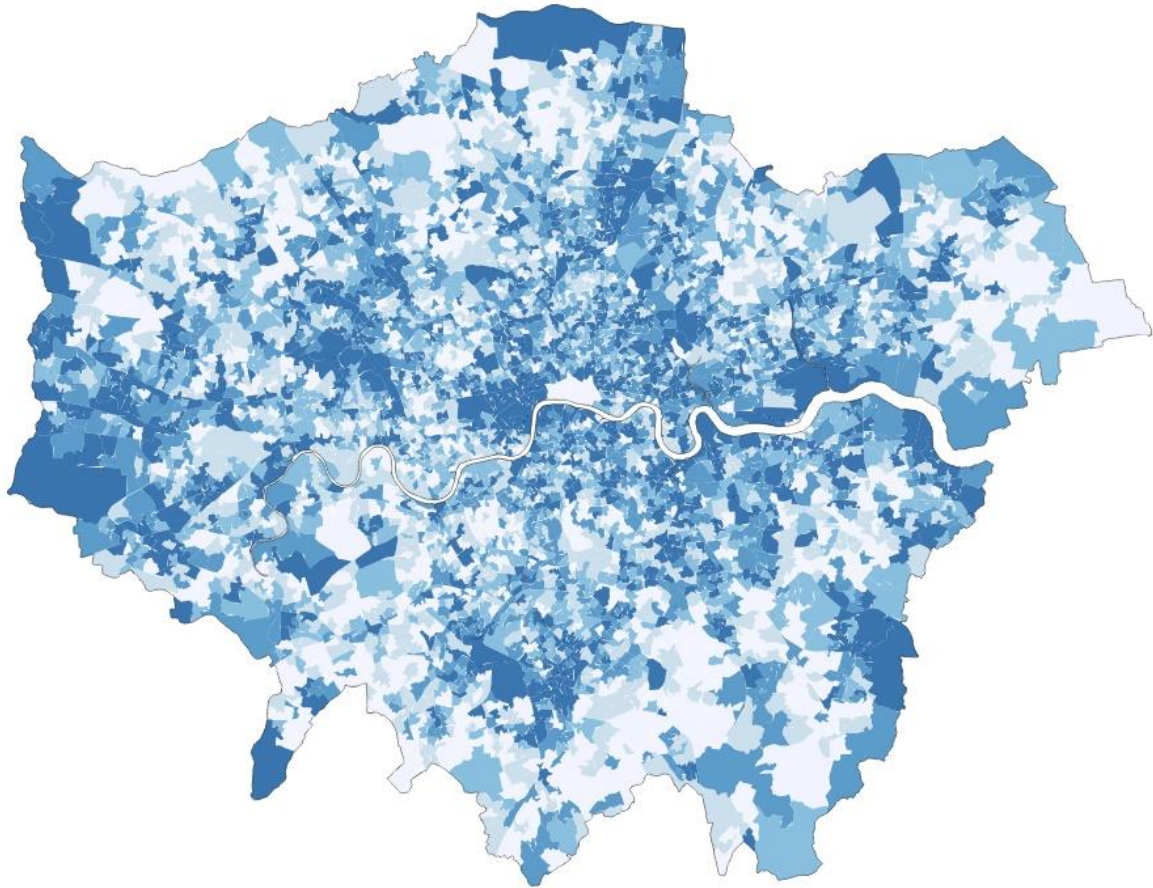
**Map 7** Ranking of IMD 2019 by LSOA (dark high – light low)



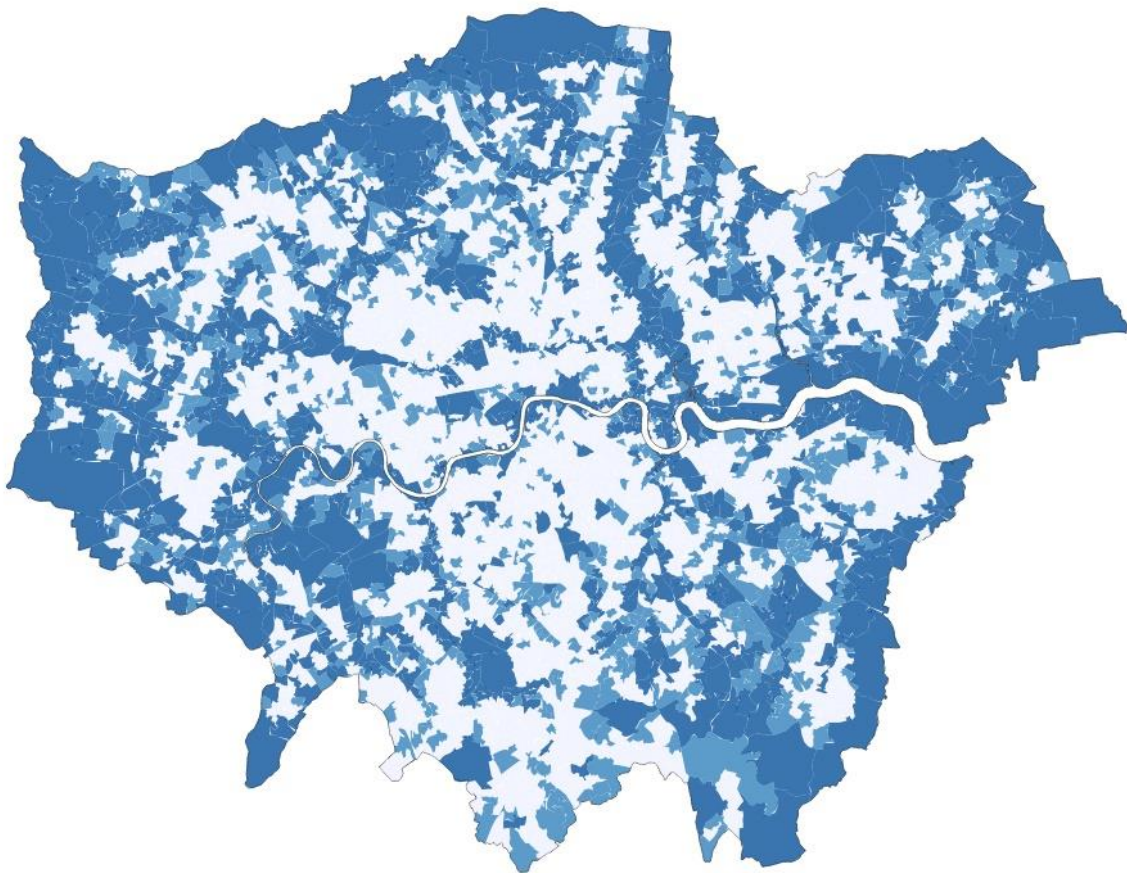
**Map 8.** Ranking IMD Health deprivation and disability by LSOA (Dark high – light low)



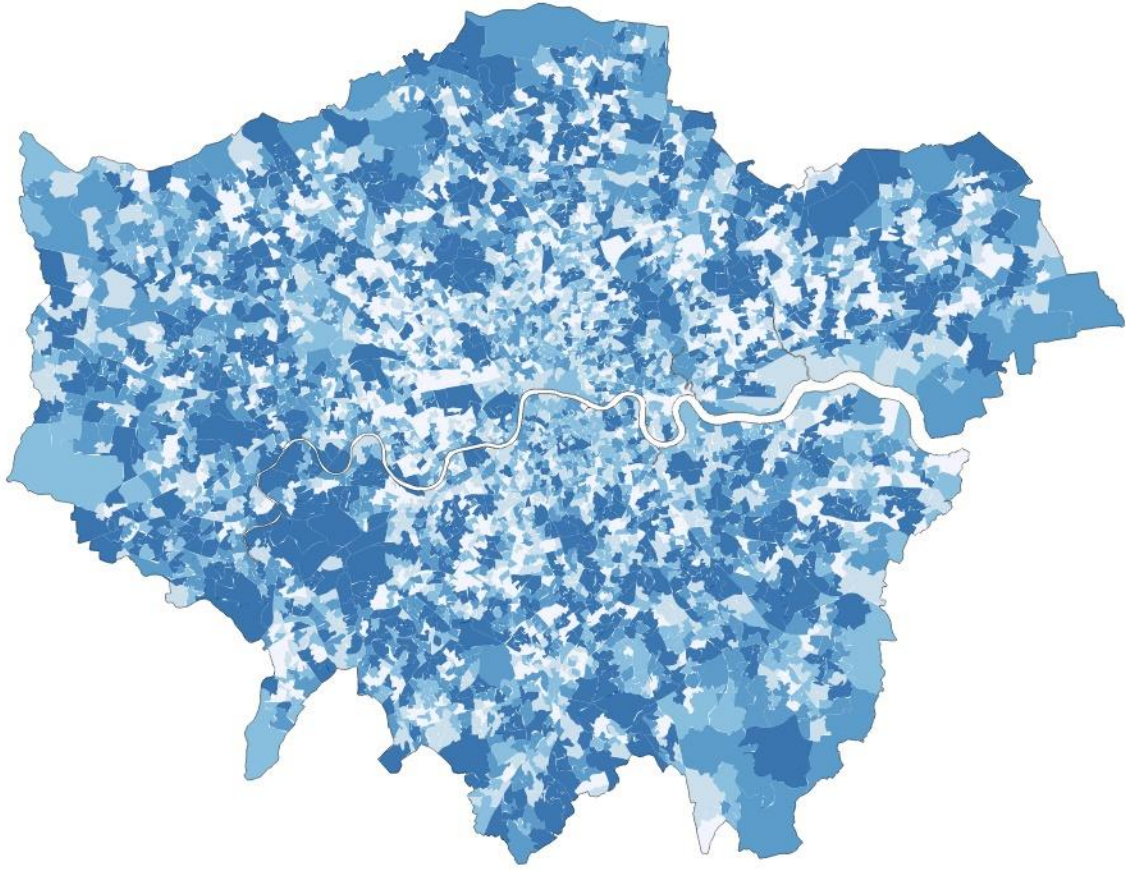
**Map 9** Ranking of heritage site density (Grade I, II and II\*) by LSOA (Dark high – light low)



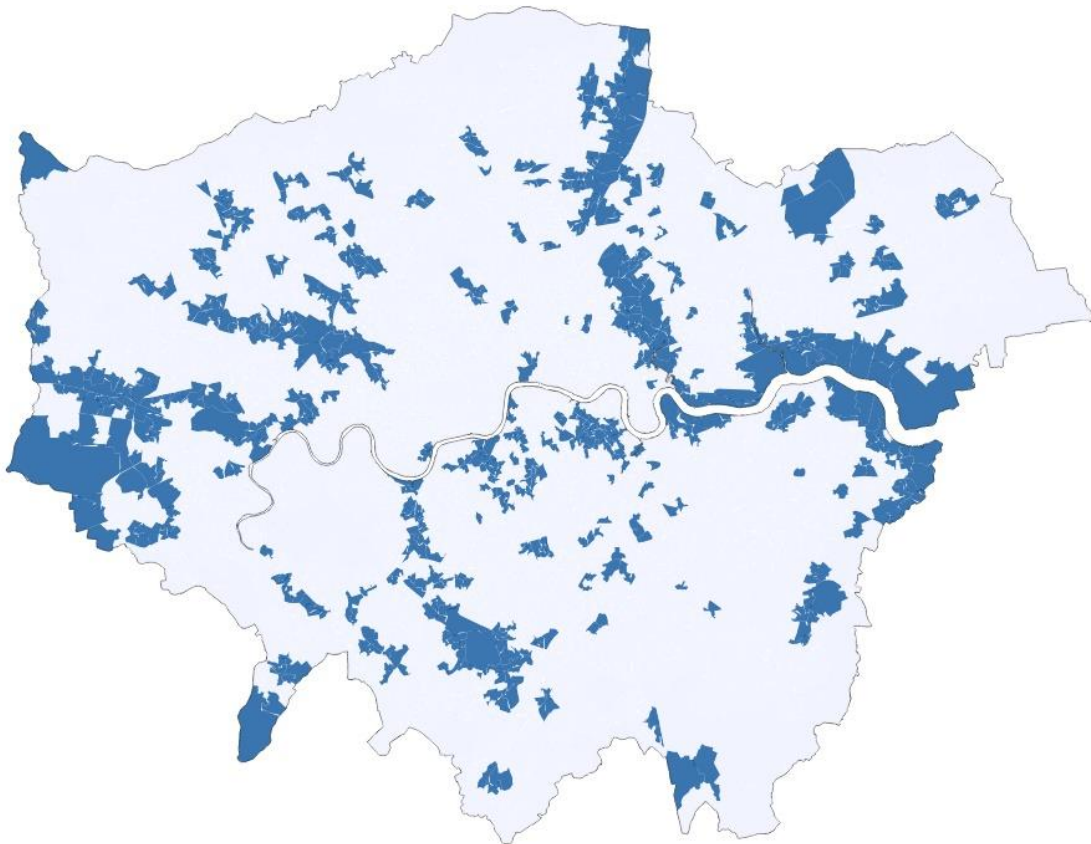
**Map 10** Ranking of MPS density of crime (Anti-social behaviour, damage, and arson) by LSOA (Dark high – light low)



**Map 11** Ranking of inland and tidal water density by LSOA (Dark high – light low)



**Map 12** Ranking of green space density by LSOA (Dark high – light low)



**Map 13** Industrial site locations (Dark high -light low)

## Appendix 2. Equalities impact assessment

Protected Characteristic	Impact: positive, neutral, or adverse	Reason for the impact	What information have you used to come to this conclusion?
<i>Example: Age</i>	<i>Adverse</i>	<i>Moving this service online will adversely affect older people, who are least likely to have access to a computer or smart phone and may not be able to use the new service.</i>	<i>GLA Datastore: X% of the London community are aged 70 or over. GLA data shows that only 10% of those over the age of 70 have regular access to a computer or smart phone.</i>
<b>Age</b> (younger, older, or age group)		<p>The AoR identifies that older people are more likely to have specific risk factors such as mobility issues, mental health issues, taking prescription drugs and living alone.</p> <p>The AoR identifies that that young people do not have any particular risk factors associated with them though some may live in lower quality accommodation, flats and live alone.</p>	<p>LFB data shows that older people are more likely to be victims of fire and rescue service incidents and are particularly vulnerable to fires, with 85 per cent of fatal fires involving someone over the age of 50 and 65 per cent of fatal fires involving someone over the age of 65. Figure 7. in appendix 1. shows that those aged over 65 are evenly distributed across London. Table 1. confirms this with 49 per cent of over 65s living in urban areas which make up 30 per cent of London's area and 46 per cent of over 65s living in suburban areas.</p> <p>London's population, the number of Londoners aged 65 or over is projected to increase by 86 per cent between 2019 and 2050, faster than younger age groups. Therefore, there will be a growing need for infrastructure that supports an ageing population, including accessible.</p>
<b>Disability</b> (physical, sensory, mental health, learning disability, long term illness, hidden)		<p>The AoR identifies that people with disability are more likely to have specific risk factors which increase their vulnerability to fire.</p>	<p>LFB's data shows that disability and poor mental health and mobility issues and taking prescription drugs increase your vulnerability to fire. Figure 4. in appendix 1. shows that disability is distributed across London with a great proportion in east London and the extreme west of London. Characteristics associated with disability are often found in older people who are found all over London and are proportional to the population density in each of the four neighbourhood impact</p>

			<p>zones. People with disability are also likely to be more economically deprived and as such have risk factors associated with deprivation. LFB's data shows that if you are poor you are more likely to have a fire. There are several related reasons for this. Figure 3. shows that there are patches of deprivation across London with a bias towards the eastern side of London as well as some areas in North West London.</p>
<p><b>Gender reassignment</b> (someone proposing to/undergoing/ undergone a transition from one gender to another)</p>		<p>People going through these processes can come up against some negative views when engaging with Establishment organisations, therefore they may be reluctant to invite them into their homes, for fear of being judged.</p>	<p>There is no detailed data held by the Brigade in relation to gender reassignment and their vulnerability to incidents which the fire and rescue service would be expected to attend and therefore no assessment has been made.</p> <p>Research carried out in 2012 on the acceptability of gender identity questions in surveys provided an indicative estimate that 1 per cent of the UK population identify as trans.</p>
<p><b>Marriage / Civil Partnership</b> (married as well as same-sex couples)</p>		<p>The AoR shows that single older men are more likely to be victims of fires.</p>	<p>LFB's data shows that being in a marriage or civil partnership generally decreases your risk from fire. As such those people who live alone and especially older people who live alone often have more risk factors making them more vulnerable to fire.</p>
<p><b>Pregnancy and Maternity</b></p>		<p>Mobility and prescription drugs</p>	<p>Though no LFB data specifically relates to pregnancy or maternity risk factors associated with pregnancy and maternity such as reduced mobility and prescription drugs are known to increase an individual's risk to fire.</p>
<p><b>Race</b> (including nationality, colour, national and/or ethnic origins)</p>		<p>The AoR cannot find any data that clearly shows that there any strong correlations between race and an increased vulnerability to fire or other emergencies.</p>	<p>57 per cent of Londoners are white British, white Irish or other white ethnicity, with the remaining 43 per cent having a black, Asian or minority ethnicity (BAME).</p> <p>LFB's data shows that race does not have an impact on an individual's vulnerability to fire. The proportion of each category of race is relative to the size of that category's population in London. Though other risk factors such as economic deprivation and employment may be present in specific ethnic groups.</p>

<p><b>Religion or Belief</b> (people of any religion, or no religion, or people who follow a particular belief (not political))</p>		<p>The AoR does not show any specific additional risks for any religion or belief.</p>	<p>However, it is known that the lighting of candles can increase someone's risk to fire.</p> <p>Additionally, though large gatherings can increase someone's risk to certain incident types the likelihood of such incidents is relatively low.</p> <p>The risk matrix shows that incidents in places of worship occur on average about once a month and result in one casualty every 10-25 incidents.</p> <p>It is noted that some areas of London hold higher numbers of a particular religious group, for example Barnet has the highest Jewish community numbers and New Malden the highest Korean population. The views of each person are equally valued and that for proportion of views purposes it may be necessary to direct engagement in highest populated areas, this is not to suggest that the views are of lesser or more value. Nearly half of London's residents, 48 per cent, give their religion as Christian.</p> <p>Muslims account for 14 per cent and all other religions total 12 per cent. People stating no religion make up the remaining 26 per cent. The proportion of Londoners who are Muslims or who have no religion has increased in recent years, while the proportion who are Christian has declined.</p>
<p><b>Sex</b> (men and women)</p>		<p>We will ensure language is inclusive throughout the project and run workshops to avoid excluding any groups, including the use of unnecessarily gendered language. Positive action opportunities to be explored in the future to facilitate a more balanced workforce and encourage participation from said groups.</p> <p>Gender specific groups to be contacted through engagement to seek views and opinions.</p>	<p>LFB's data shows that men are 16 per cent more likely to be victims of fire than women with men making up 58 per cent of fire victims over the last 20 years. Men and women are relatively evenly distributed across London.</p> <p>In 2019, the GLA projects that 4.55 million Londoners are female and 4.55 million are male. Women face particular issues around gender-based violence and low pay. As most lone parents (90 per cent) are women, recent reforms to welfare that have affected lone parents have had a disproportionate impact on women. Women sharing other characteristics women often face additional challenges, such as higher</p>

			<p>gender pay gaps among older and BAME women. Young women report issues around financial pressures and mental health issues.</p> <p>Men face issues around lower educational attainment and are at higher risk of suicide.</p>
<p><b>Sexual Orientation</b> (straight, bi, gay, and lesbian people)</p>		<p>People who are part of the LGBT community can come up against some negative views when engaging with Establishment organisations, therefore they may be reluctant to invite them into their home, for fear of being judged</p>	<p>Two per cent of adult Londoners identify as gay or lesbian, higher than the UK rate of 1.3 per cent. A further 0.6 per cent identify as bisexual and 0.6 per cent as other sexual identities.<sup>15</sup> A recent survey of the UK's LGBT population found that 40 per cent had experienced an incident such as verbal harassment or physical violence because they were LGBT, and that they had lower levels of life satisfaction than the general UK population.</p>

## Appendix 3 References

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i

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