LONDON FIRE BRIGADE

Report title

Draft Assessment of Risk

Report to	Date
Commissioner's Board London Fire Commissioner	14 July 2021
Report by	**Report number**
Assistant Director Strategy and Risk	LFC-0551

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I agree the recommended decision below.

Andy Roe
London Fire Commissioner

Date This decision was remotely signed on 15 September 2021

Executive Summary

This report presents a new draft Assessment of Risk in London for approval by the London Fire Commissioner. It has been produced to meet the requirements of the Fire and Rescue National Framework and will inform the development of the Commissioner's next Community Risk Management Plan. The draft will be subject to formal public consultation in the summer and in the light of responses received, will be finalised later this year.

Recommended decisions

For the London Fire Commissioner

The London Fire Commissioner approves the draft Assessment of Risk for public consultation.

Introduction and Background

1. The Fire and Rescue Framework requires fire and rescue services in England to assess all foreseeable fire and rescue related risks that could affect its communities, whether, local, cross border, multi-authority and/or national in nature.

2. The National Framework also requires the London Fire Commissioner to produce an integrated risk management plan[1] which must reflect up to date risk analyses including an assessment of all foreseeable fire and rescue related risks that could affect the area of the authority.

3. The Draft Assessment of Risk attached at Appendix 1 has been produced in accordance with the first of these requirements and will inform the development of the Brigade's next Community Risk Management Plan in accordance with the second requirement.

Objectives and Expected Outcomes

4. The methodology used for the current assessment of risk was developed with the intention of improving the transparency of our risk assessment process for the public and enabling them to understand how we take their concerns into account in our plans.

5. The Brigade undertook internal and external community engagement about the new approach to that assessment of risk in 2016 and while this dialogue was useful, there was little feedback. Where responders did suggest additional concerns, they were added if the supporting data was available at ward level.

6. In February 2020, the Commissioner published his Transformation Delivery Plan, which established the Brigade's vision to be *a dynamic, forward looking organisation of fully-engaged people at the centre of the communities we serve, adapting to the changing needs of London*.

7. In the context of this vision, officers consider it to be more important than ever to involve communities in our assessment of risk, to ensure we understand their concerns, can take account of them in our planning and demonstrate to them how we have responded.

8. Officers have developed a new approach to the assessment of risk that it is hoped is more transparent than previous assessments and that recognises and takes account of all local concerns. To test this, officers recommend that the assessment be subject to formal consultation for the first time.

9. The draft assessment has been developed using previous community feedback and the input of colleagues across all relevant departments. Formally seeking community input to the new draft at this stage will allow sufficient time to undertake any further work and analysis in response to the public's views. Following any necessary revisions, the final draft will be used to inform the next Community Risk Management Plan and be approved alongside it.

Equality Impact

10. The London Fire Commissioner and decision takers are required to have due regard to the Public Sector Equality Duty (s149 of the Equality Act 2010) when exercising our functions and taking decisions.

[1] Now referred to as a Community Risk Management Plan, in line with guidance from the National Fire Chief's Council.

11. It is important to note that consideration of the Public Sector Equality Duty is not a one-off task. The duty must be fulfilled before taking a decision, at the time of taking a decision, and after the decision has been taken.

12. The protected characteristics are: Age, Disability, Gender reassignment, Pregnancy and maternity, Marriage and civil partnership (but only in respect of the requirements to have due regard to the need to eliminate discrimination), Race (ethnic or national origins, colour or nationality), Religion or belief (including lack of belief), Sex, and Sexual orientation.

13. The Public Sector Equality Duty requires us, in the exercise of all LFC functions (i.e. everything the LFC does), to have due regard to the need to:

    a. Eliminate discrimination, harassment and victimisation and other prohibited conduct.

    b. Advance equality of opportunity between people who share a relevant protected characteristic and persons who do not share it.

    c. Foster good relations between people who share a relevant protected characteristic and persons who do not share it.

14. Having due regard to the need to advance equality of opportunity between persons who share a relevant protected characteristic and persons who do not share it involves having due regard, in particular, to the need to:

    a. remove or minimise disadvantages suffered by persons who share a relevant protected characteristic where those disadvantages are connected to that characteristic;

    b. take steps to meet the needs of persons who share a relevant protected characteristic that are different from the needs of persons who do not share it;

    c. encourage persons who share a relevant protected characteristic to participate in public life or in any other activity in which participation by such persons is disproportionately low.

15. The steps involved in meeting the needs of disabled persons that are different from the needs of persons who are not disabled include, in particular, steps to take account of disabled persons' disabilities.

16. Having due regard to the need to foster good relations between persons who share a relevant protected characteristic and persons who do not share it involves having due regard, in particular, to the need to—

    a. tackle prejudice, and

    b. promote understanding.

17. An equality impact assessment has been undertaken as part of the development of the assessment and is included within it at section 8.

Finance comments

18. This report recommends that the draft Assessment of Risk is approved for public consultation. Any costs identified as part of the consultation will be considered and a funding source identified before any costs are incurred, in line with governance requirements.

Legal comments

19. Under section 9 of the Policing and Crime Act 2017, the London Fire Commissioner (the "Commissioner") is established as a corporation sole with the Mayor appointing the occupant of that office. Section 1 of the Fire and Rescue Services Act 2004 states that the Commissioner is the fire and rescue authority for Greater London.

20. The production of a London Safety Plan (Plan) is a requirement of the Fire and Rescue National Framework for England (the "Framework") issued by the Secretary of State under section 21 of the Fire and Rescue Services Act 2004. Section 21(7) of the 2004 Act requires fire and rescue authorities to have regard to the Framework in carrying out their functions. The Framework requires the London Fire Commissioner to have integrated risk management plans, known as the Community Risk Management Plan ("CRMP"), which are to be the subject of formal consultation.

21. The Framework sets out in relation to the CRMP that:

> 4.6 ... Each plan must:
>
> - reflect effective consultation throughout its development and at all review stages with the community, its workforce and representative bodies and partners
>
> 7.12 In demonstrating their accountability to communities for the service they provide, fire and rescue authorities need to:
>
> ...provide the opportunity for communities to help to plan their local service through effective consultation and involvement.

22. When considering the general law on consultation, the essential questions for the court will be of adequacy and fairness in all the circumstances of the case (see *R (Coughlan and others) v North & East Devon Health Authority* [1999] EWCA Civ 1871).

23. The Government has issued guidance on consultations which should act as our first point of reference when considering the fairness of our proposed processes: https://www.gov.uk/government/publications/consultation-principles-guidance

24. However, when looking at the precise circumstances of a case, the court will have in mind certain guiding principles that must be followed if consultation is to be fair. The formulation most commonly adopted is set out in *R v London Borough of Brent, ex p Gunning* [1985] LGR 168 and frequently referred to as "the *Gunning* principles":

    - The consultation must be at a time when proposals are still at a formative stage.
    - The proposer must give sufficient reasons for any proposal to permit of intelligent consideration and response. Those consulted should be aware of the criteria that will

be applied when considering proposals and which factors will be considered decisive or of substantial importance at the end of the problem.

- Adequate time must be given for consideration and response.

- The product of consultation must be conscientiously taken into account in finalising any statutory proposals.

25. The attached draft Assessment of Risk forms a central part of the documents which should be consulted on and, as noted above, our consultation will be undertaken in line with the requirements of the Framework and the general law on consultation, including but not limited to the *Gunning* principles.

26. Furthermore, under section 327D of the Greater London Authority Act 1999, as amended by the Policing and Crime Act 2017, the Mayor may issue to the Commissioner specific or general directions as to the manner in which the holder of that office is to exercise his or her functions.

27. By direction dated 1 April 2018, the Mayor set out those matters for which the Commissioner would require the prior approval of either the Mayor or the Deputy Mayor for Fire and Resilience (the "Deputy Mayor"). Paragraph (b) of Part 1 of the said direction requires the Commissioner to seek the prior approval of the Mayor before "[b] Approval of the final proposed text of the draft London Safety Plan (or any revision of it) for the purposes of sending it to the Assembly under section 327G(2) of the GLA Act 1999".

28. In line with the requirements set out above, this report provides the Commissioner and Deputy Mayor with a draft Assessment of Risk for approval prior to formal public consultation.

List of Appendices

Appendix	Title	Protective Marking
1.	Draft Assessment of Risk	None

LONDON FIRE BRIGADE

OFFICIAL
15 June 2021
CRMP

Assessment of Risk (DRAFT)

1 Summary

The LFB's Assessment of Risks (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 the 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 the LFB are 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 Chief's Council's 'Definition of Risk Project'.

In this Assessment of Risk, risk is defined as combination of the likelihood and consequences of hazardous events. A risk-based approach uses techniques of risk assessment that allow consideration of possible incidents that have not been revealed by the demand. 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, the highest risk dwelling 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 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 as far as they can be prepared. This risk assessment considerers 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 and other large public buildings
- Flooding – particularly surface water flooding a pluvial flooding
- 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 reducing emissions from Brigade vehicles
- 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 broader impacts of fire are considered.

2 Our approach

Our Assessment of Risk looks at all foreseeable risks, both fire and non-fire, 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 takes a layered approach to assessing risks in London (see figure 1.). This enables the Brigade to consider all risks alongside 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 fatal fire reviews.

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 citizen 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 have told us and include the tourists, visitors, migrants and commuters. These risks are associated with public risk perception, mental health and well-being, economic loss and loss of local infrastructure. These will be consulted on an updated as part of the consultation for this Assessment of Risk.

The Brigade takes a balanced approach to person and place to try to eliminate or reduce these risks by understanding how people use / live in their spaces. We use our data on fire fatalities and injuries and all incident casualties and fatalities, to understand peoples' vulnerability to becoming a casualty of an incident attended by the fire and rescue service. This allows the Brigade to identify those people who are most vulnerable to fire and non-fire incidents.

Fire and Non-fire incidents risk

This layer is a data led risk assessment for individual life risks in different property types or locations which the Brigade attends, and which give rise to the highest number of casualties or fatalities per incident. The result of this allows the Brigade to know which properties are locations for most life risk incidents.

Worst case risk scenarios

The next layer 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.

Future risk scenarios

The final layer seeks to identify foreseeable risks which the Brigade may need to be able to adapt to over the next 3-5 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

These first three layers when considered alongside 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 final 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.

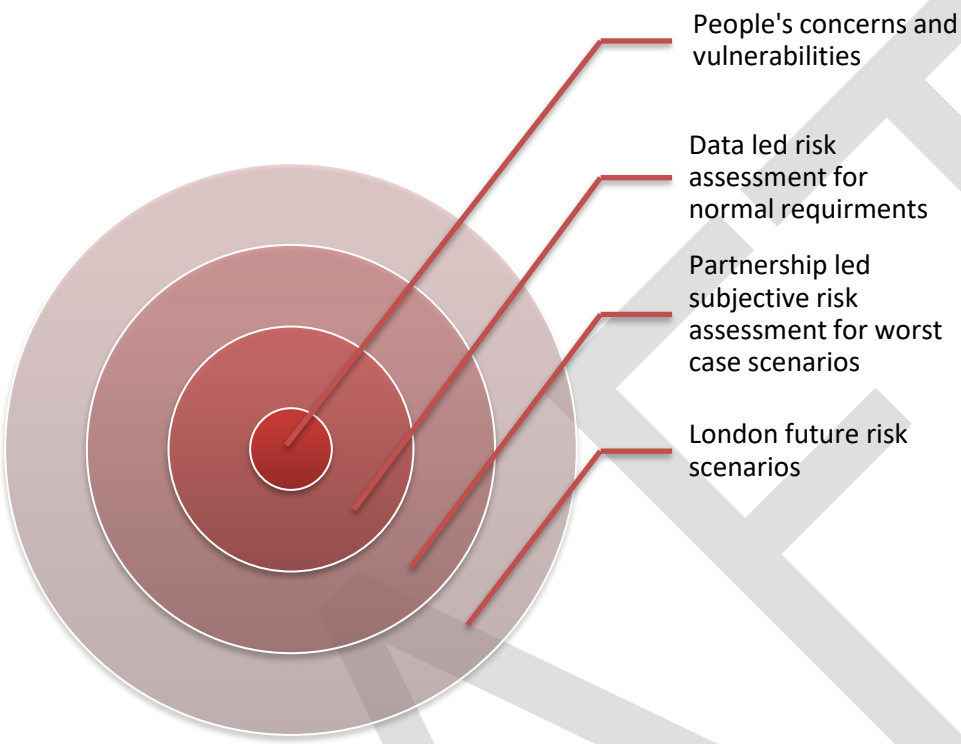


Figure 1. The four layers

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

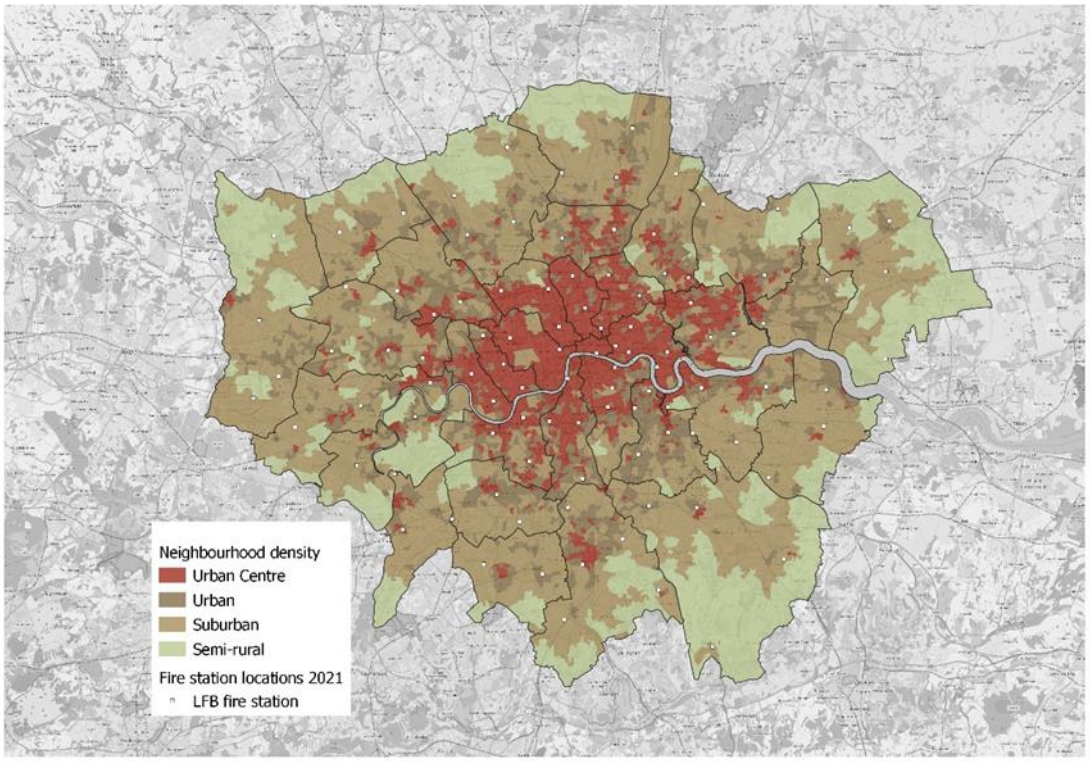
Concerns have been raised either by citizens, through engagement and consultation, or are things that we have identified ourselves. These risks are associated with public risk perception, mental health and well-being, economic loss and loss of infrastructure. This year, as a result of our analysis, we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

- Population density 2019
- Building density
- Density of high-rise buildings (over 18m)
- Employment 2019
- Older people (65+) 2019
- Student age population (5-18) 2019
- Deprivation IMD 2019
- Deprivation change 2015-2019
- Health deprivation and disability IMD 2019
- Number of heritage sites 2020
- Crime (Anti-social behaviour, damage and arson) 2020
- Open water sources
- Open land
- Industrial land

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 the zones.

The neighbourhood density map overleaf 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 percent of the most deprived areas and 83 percent of the most health and disability inequality located in just 30 percent of London's area.

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

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

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

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

LFB attended 1451 fatal incidents, including the tragic Grenfell Tower Fire which resulted in the tragic death of 72 people, in the last five years. 285 of these fatalities happened at fires, of which 215 were at accidental dwelling fires, and the remaining 1,236 happened at non-fire incidents. There have also been 4,867 casualties from fires in the last five years of which resulted in 2,766 attending hospital. 3,546 of the casualties were from accidental dwelling fires of which 1,982 resulted in a hospital attendance and 1,321 casualties from other property types, of which of which 784 resulted in a hospital attendance.

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 conditions associated with older people, such as visual, cognitive or physical impairments. The last five years of data shows that 35 percent of fatalities from fire were smokers and 65 percent of fatalities from fire were over 65. Although the differential has reduced over time, men are still 16 percent more likely than women to die as a result of a than to becoming fire. Additionally, proportionate to the size of population there are more fire deaths in inner London than outer London (46% of fire deaths compared to 40% of population in inner London and 54% of fire deaths compared to 59% of population in outer London). This is likely linked 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, given the nature of the incidents we attend and where they happen. To decide which type of incidents should be included in this layer 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 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 considered to be 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

In order 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 taker 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, 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	Non-fire incidents involving trains and transport buildings	Fires in purpose-built flats | Non-fire incidents involving road vehicles and urban infrastructure	
	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 manufacturing and processing plants | Fires on landfill or wasteland | 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 | Fires on rural land	
	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
		Likelihood				

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. Currently there are in excess of 400 buildings with waking watches in London which have a increased risk of fire spread outside the flat of origin to other properties within the same building.	• Grenfell Tower, Major Incident – 2017 – 72 people died as a result of a fire which started on the 4th floor and spread to the 23rd floor, 40 pumps, requiring 319 pumps to resolve. • Worcester Park – 2019 – 23 flats destroyed and 150 people evacuated as a result of a fire which spread outside of its compartment of origin, requiring 142 pumps to resolve • Barking Riverside – 2019 – 20 flats destroyed as a result of a fire which spread outside of its compartment of origin, requiring 36 pumps to resolve. • The Cube Bolton – 2019 – 221 people evacuated as a result of a fire which spread outside of its compartment of origin • New Providence Wharf, Major Incident – 2021 – 35 people rescued, 22 in fire escape hoods and a full evacuation of the building. This incident required 46 pumps to resolve.
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.	• Antrim Grove – 2016 – 10 pump persons reported fire requiring a total of 51 pumps over a period of 10 hours.
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	• Cheshunt – 2017 – 2 people died and 33 people rescued as a result of a fire in care home in Hertfordshire.

				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.	
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.	•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.
Very - High	Fires on rural land	4	4	LFB responds to an average of 1480 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.	•Wanstead flats, Redbridge – 2018 – 40 pump fire, requiring a total of 209 pumps. Involving 50 hectares of rural grass land.
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.	•East Lane Business Park, Brent – 2017 – 20 pump fire requiring 202 pumps over 18 hours. •Aladdin Works, Ealing – 2018 – 20 pump fire requiring 198 pumps over 33 hours. •White Hart Lane, Harringay – 2017 – 25 pump fire requiring 198 pumps over 25 hours.
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.	•Rustlins Ltd, Brent – 2018 – 15 pump fire requiring 110 pumps in total. •A&R Paper converters, Redbridge – 15 pump fire requiring 108 pumps in total

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.	•The Mall, Walthamstow – 2019 – 25 pump fire requiring 102 pumps over 10 hours to resolve. •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.
High	Fires on landfill and wasteland	2	4	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.	•Launder Lane landfill site, Havering – 2019 – 10 pump fire requiring 250 pumps over 6 days.
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.	•Harbour Hotel, Richmond – 2019 – 15 pump fire requiring 86 pumps over 17 hours, with 300 people evacuated.
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 commitment with a maximum 98 pumps over 12 hours involved in a single incident in the last five years.	•Chancery Lane, Westminster – 2020 – 25 pump fire requiring 98 pumps over 12 hours, with 39 people evacuated.
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.	•Tiroler Hut Restaurant, Westminster – 2019 – 15 pump fire in restaurant and residential property, requiring 82 pumps over 13 hours to resolve.

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.	
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.	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.
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.	Prince's 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.

4.5 Other significant property risks with wider impacts

Risk	Outcome description	Examples of significant incidents that have occurred outside of the last 5 years 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 in all listed buildings 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.	• Notra dame fire – 2019 – Major fire in a cathedral in Paris causing over £500 million to restore.
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.	• 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.
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.	• Kings Cross Underground fire – 1987 – 31 people killed and 100 injuries from a fire in an underground station.
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.	• Royal Marsden Hospital, Kensington and Chelsea – 2008 – 20 pump fire, 800 staff and 29 patients evacuated. • University College Hospital, Westminster – 2008 – 20 pump basement fire, 20 staff and 83 patients evacuated.
Non-fire incidents in purpose-built flats	LFB responds to an average of 14,244 non-fire incidents in purpose-built flats a year. Most of these are shut in lift and other low risk incidents, however, there are some larger risks that exist within this category, such as building collapse which have significant life risks and wider impacts associated with them.	• Miami beach building collapse – 2021 – A wing of a 13-floor residential block of flats containing 55 flats collapsed. At time of writing there were 11 confirmed fatalities and 150 people unaccounted for.

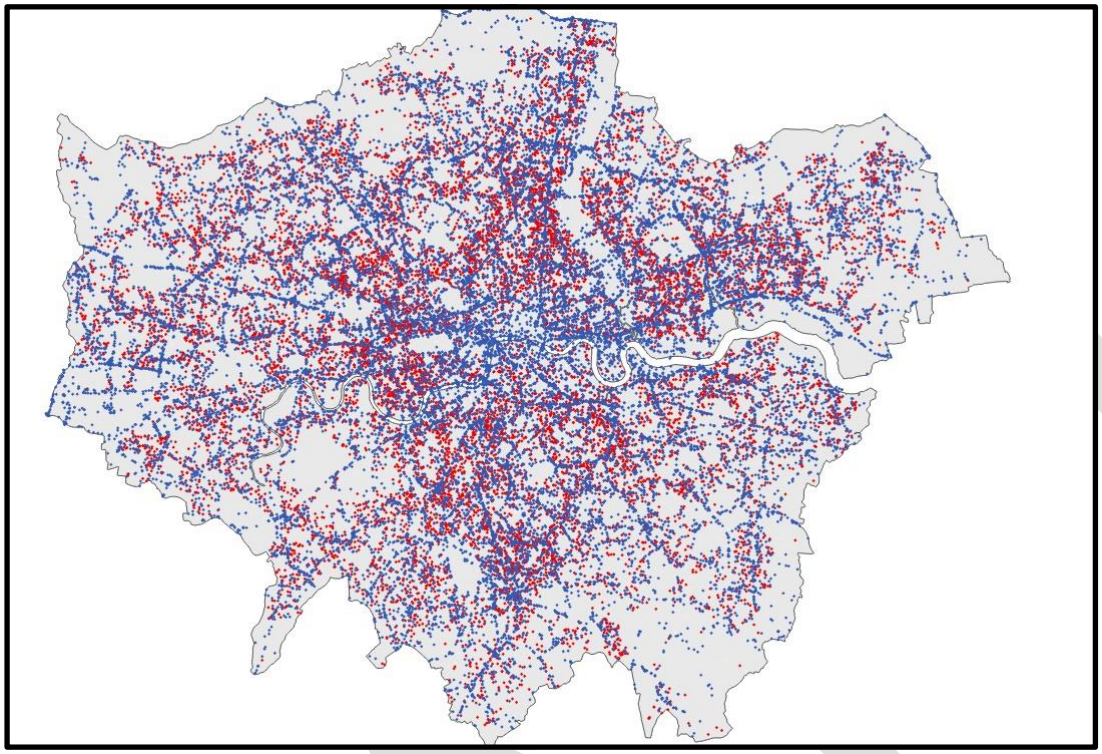


Figure 3. Map of all incidents in high risk property/locations

- 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.

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.
Economic	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.

Essential Services	How the reasonable worst case scenario might impact the emergency services, critical infrastructure, transport, education and other service and infrastructure providers.
Environment	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.
Security	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 | 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
		Likelihood				

The rating of these are subject to review

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.	• July 7th London bombings – 2005 – 56 people killed and 784 injured when four bombers set off near simultaneous bombs in London. • November 15th Paris attacks – 2015 – 137 people killed and 416 injured in a multi sited terror attack in Paris. • Westminster Bridge attack – 2017 – 6 people killed and 49 injured when a car was driven at speed at pedestrians on Westminster Bridge. • London Bridge attack – 2017 – 11 people killed and 48 injured when a van was deliberately driven at pedestrians near London Bridge. • Parsons Green bomb – 2017 – 30 people injured when a bomb exploded on the District Line near Parsons Green station. • Fishmongers hall attack – 2019 3 people killed and 3 people injured in a stabbing attack
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.	• Kings Cross Underground fire – 1987 – 31 people killed and 100 injuries from a fire in an underground station. • 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. • Grenfell Tower – 2017 – 72 people died as a result of a fire which started on the 4th floor and spread to the 23rd floor • Notra dame de Paris Cathedral fire – 2019 – Major fire in a cathedral in Paris costing over £500 million to restore
Very High	Flooding	3	4	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	• Floods in South East England – 2014 – Widespread flooding across the South East of England affecting Hampton and ground water

				a greater water holding capacity, causes a pattern of convective rainfall events. 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.	flooding in Kenley requiring the rescue and evacuation of many residence.
Very High	Pandemic	4	*5*	A worldwide outbreak of influenza occurs when a novel flu virus emerges with sustained human to human transmission. Up to 50 percent 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 percent for 2-3 weeks at the height of the pandemic, either because people are personally ill or caring for someone who is ill, causing significant impact on business continuity.	• 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.

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.	• London riots – 2011 – London experienced its biggest time of civil unrest in recent history, resulting in multiple large fires across the city and LFB having over 90 frontline fire appliances committed to incidents at its height.
High	Complex built environment	2	4	Consequences of a major incident affecting large buildings or a complex built environments. Incidents in these facilities/areas have the potential to trigger a complex chain of events that lead to serious consequences for public safety.	• 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 sites, two international airports, two central London heliports and a military air base.
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.	• Air France flight 4590 – 2000 – A Concord flight takes off from Paris Charles de Gaulle Airport crashing two minutes after take off into a nearby hotel resulting in 133 deaths and 6 injuries.
High	Large hazardous materials incident	1	5	Large toxic chemical release caused by release of chlorine or a number of other chemicals. This incident arises from possible mechanical equipment/process failure or corrosion, and not necessarily involving fire or explosion.	• 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 plant's underground storage tank broke under pressure. This caused a deadly cloud of lethal

				A road or rail tanker containing dangerous goods and/or "high consequence" dangerous goods is 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	gas to float from the factory over Bhopal, with more than 20,000 people required hospital treatment

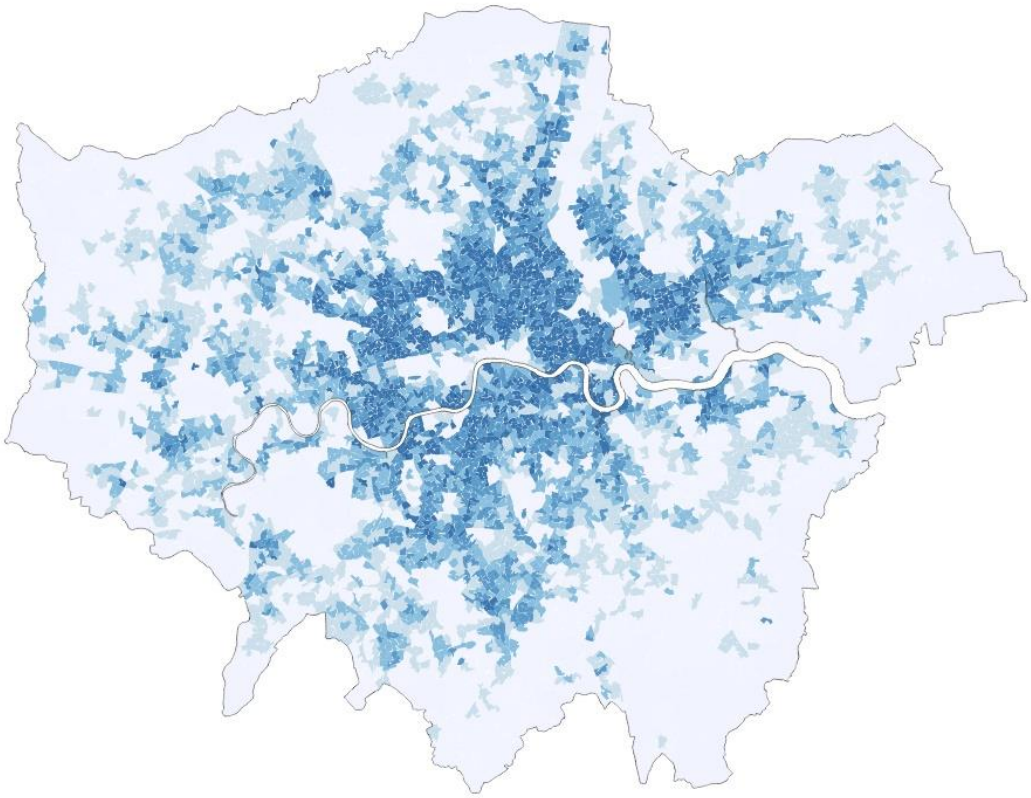
6 Future risk scenarios

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.

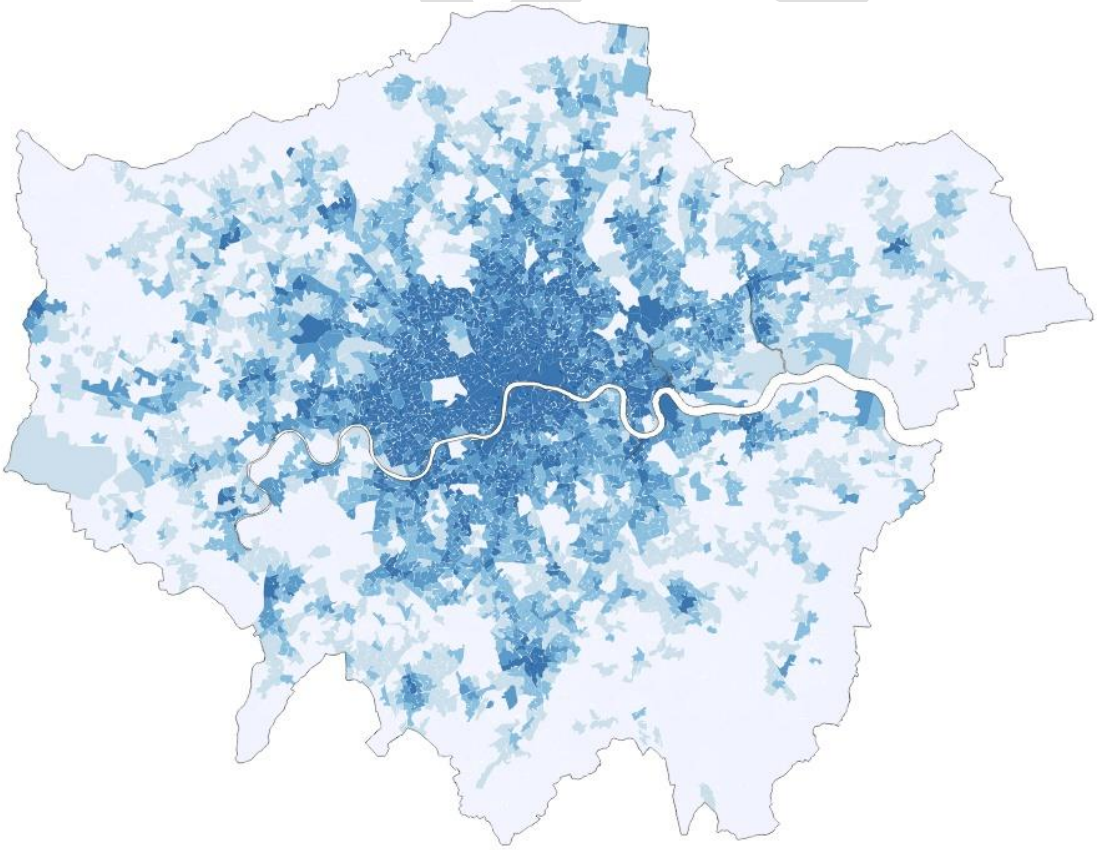
We will keep these risks under review on an annual basis.

Rating	Risk	Outcome description
High	Changing built environment	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 or other societal issues resulting in poorly adapted buildings resulting in potential for increased fire spread. 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, with potential for an increase in attendance times.
High	Health and well-being	Long term COVID 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.
High	Equalities and fairness	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.
High	Sustainability and climate change	A significant increase in the frequency of events or their impact, along with the possibility of new events. Warming climate giving rise to more extreme weather events and hot dry summers like 2018, flooding and gales and storms.
High	Security and resilience	Continued risk of terrorism and the need to be able to respond with other emergency responders.
High	Population change	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.

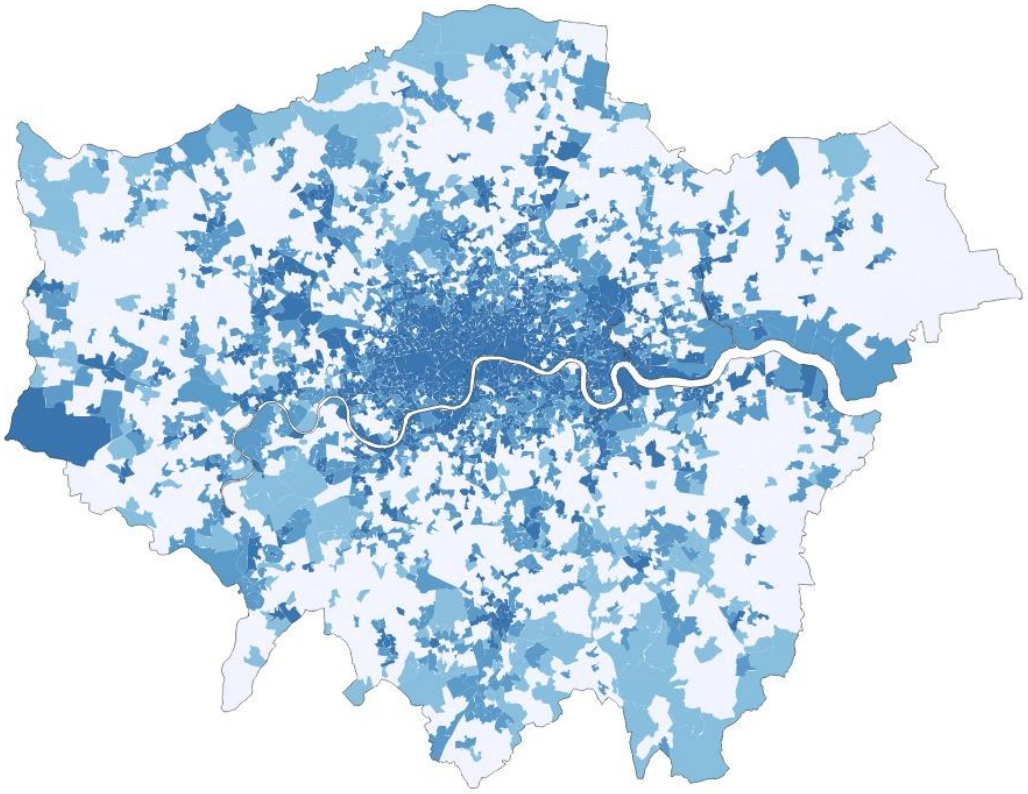
Appendix 1: Mapped Concerns



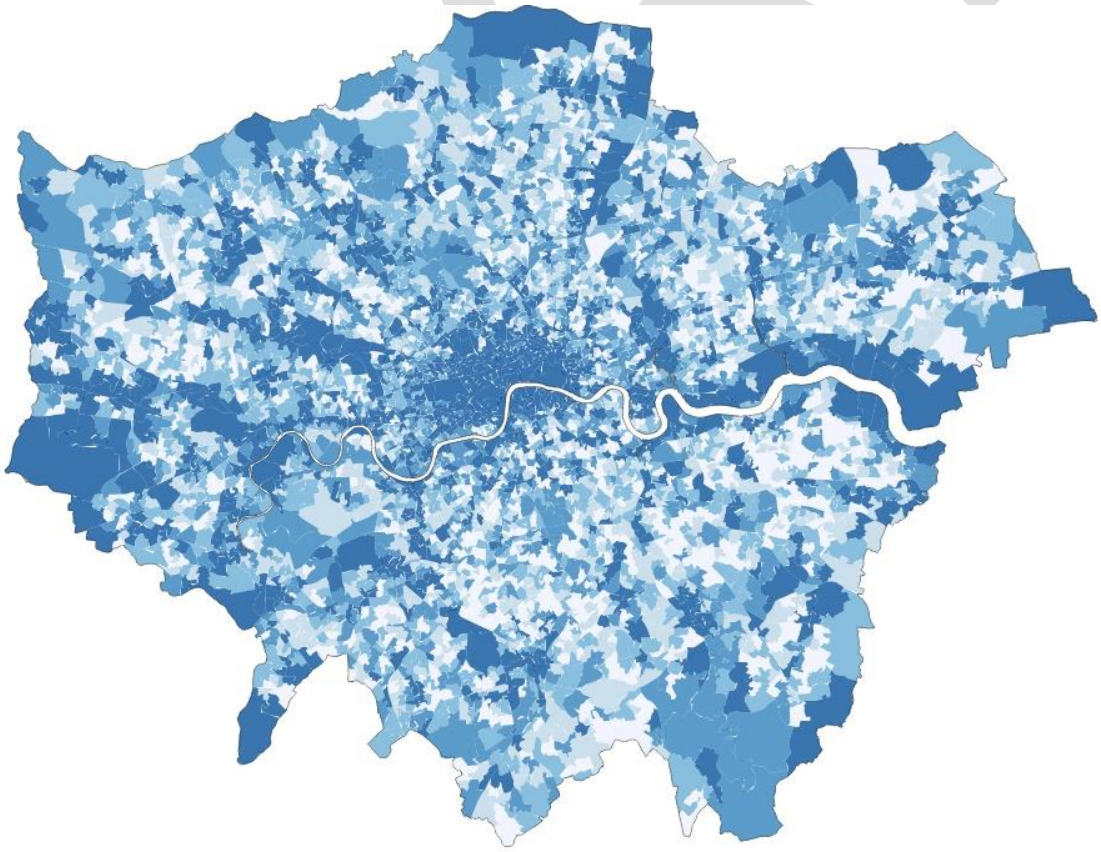
Map 1 Ranking population density (2019) by LSOA (Dark high – light low)



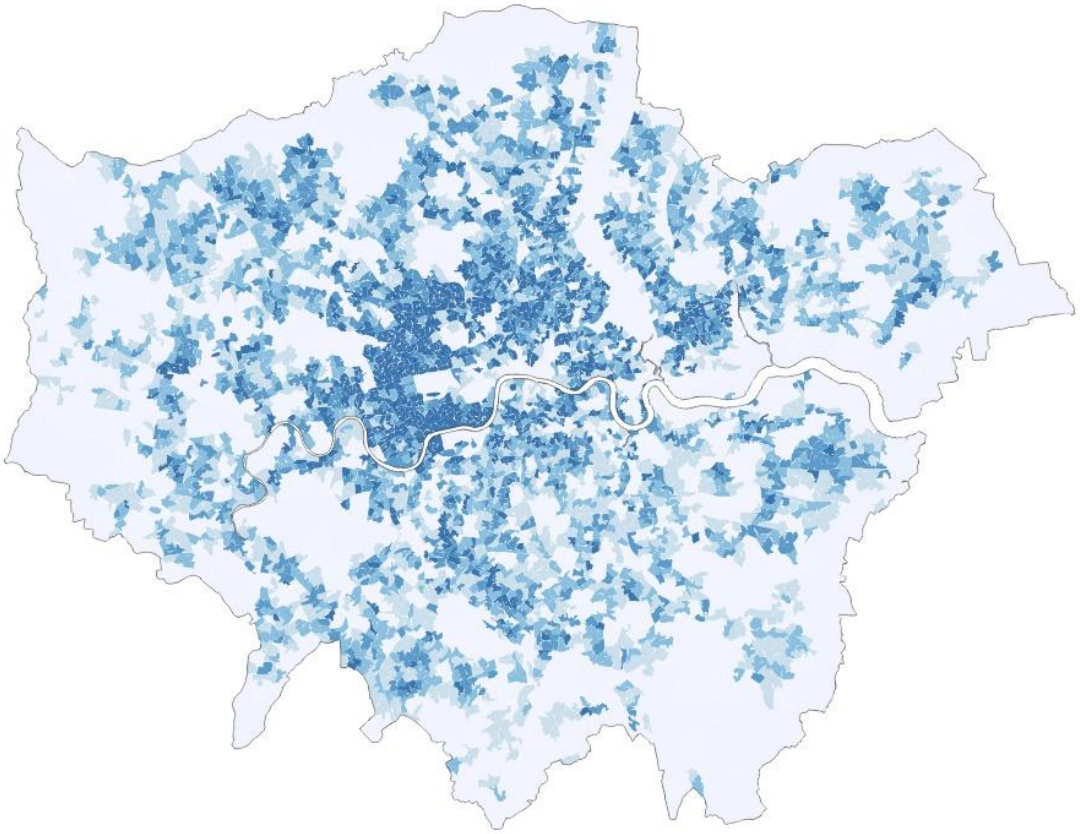
Map 2 Ranking of all building density by LSOA (Dark high – light low)



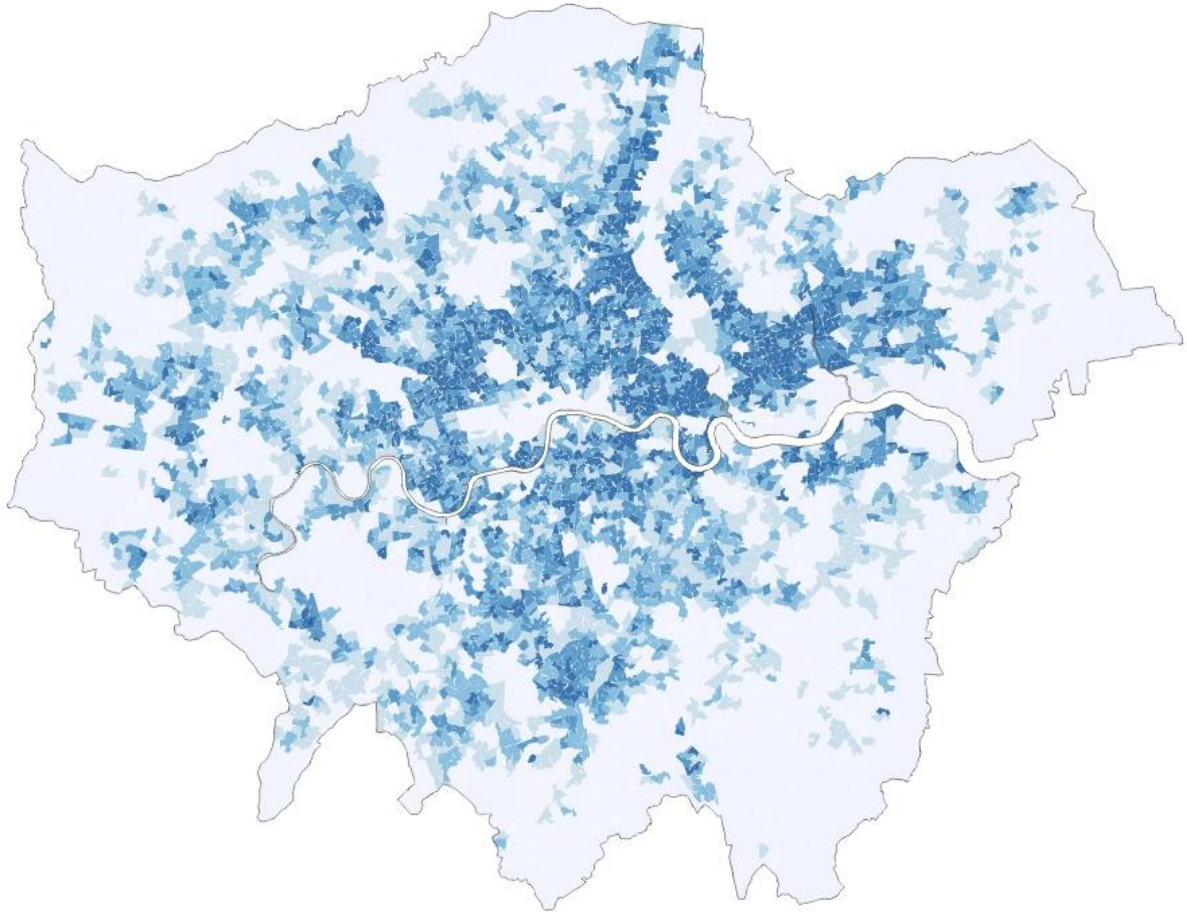
Map 3 Ranking density of buildings over 18m by LSOA (dark high – light low)



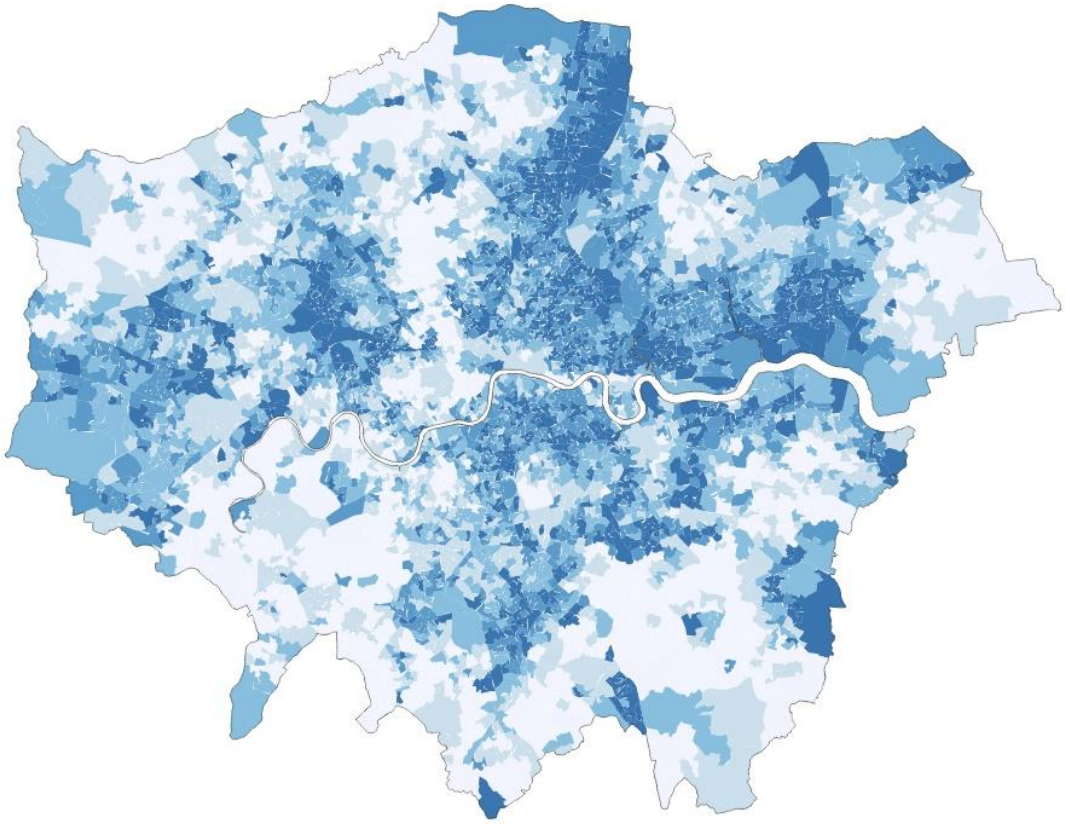
Map 4 Ranking of registered employment locations by LSOA (Dark high – light low)



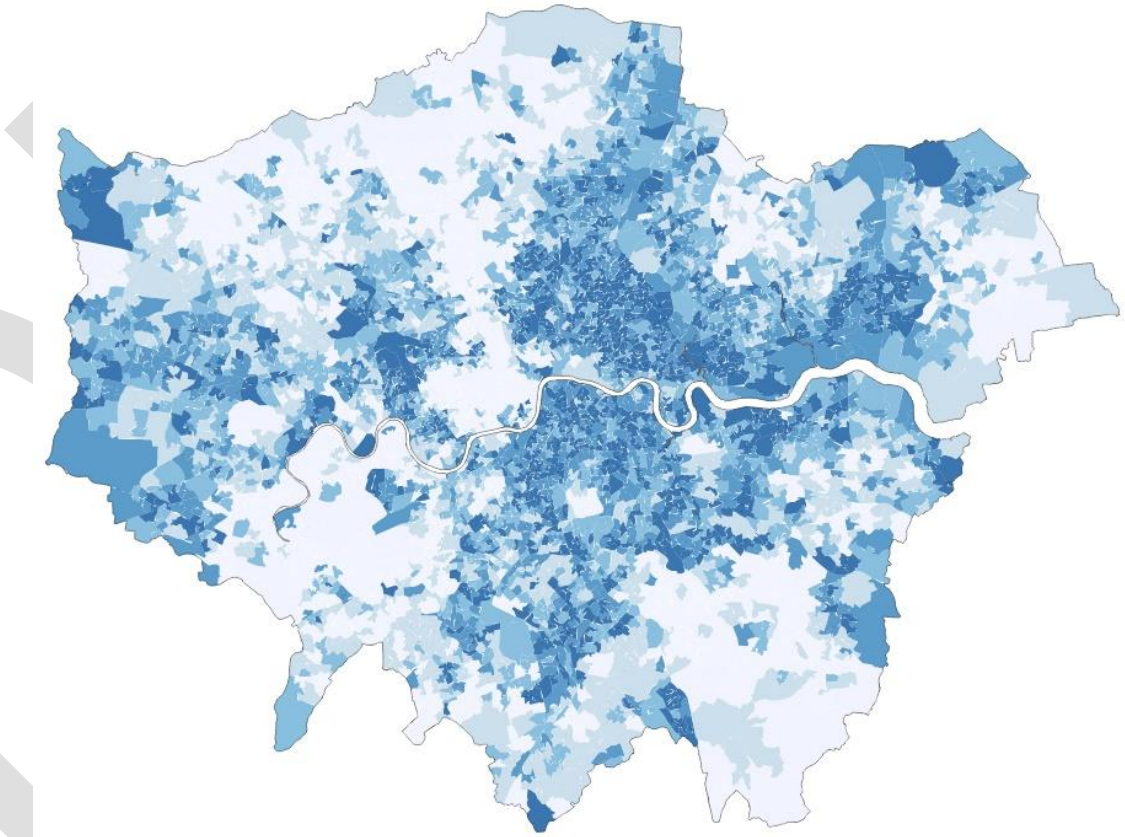
Map 5 Ranking population density Age 65+ (2019) by LSOA (Dark high – light low)



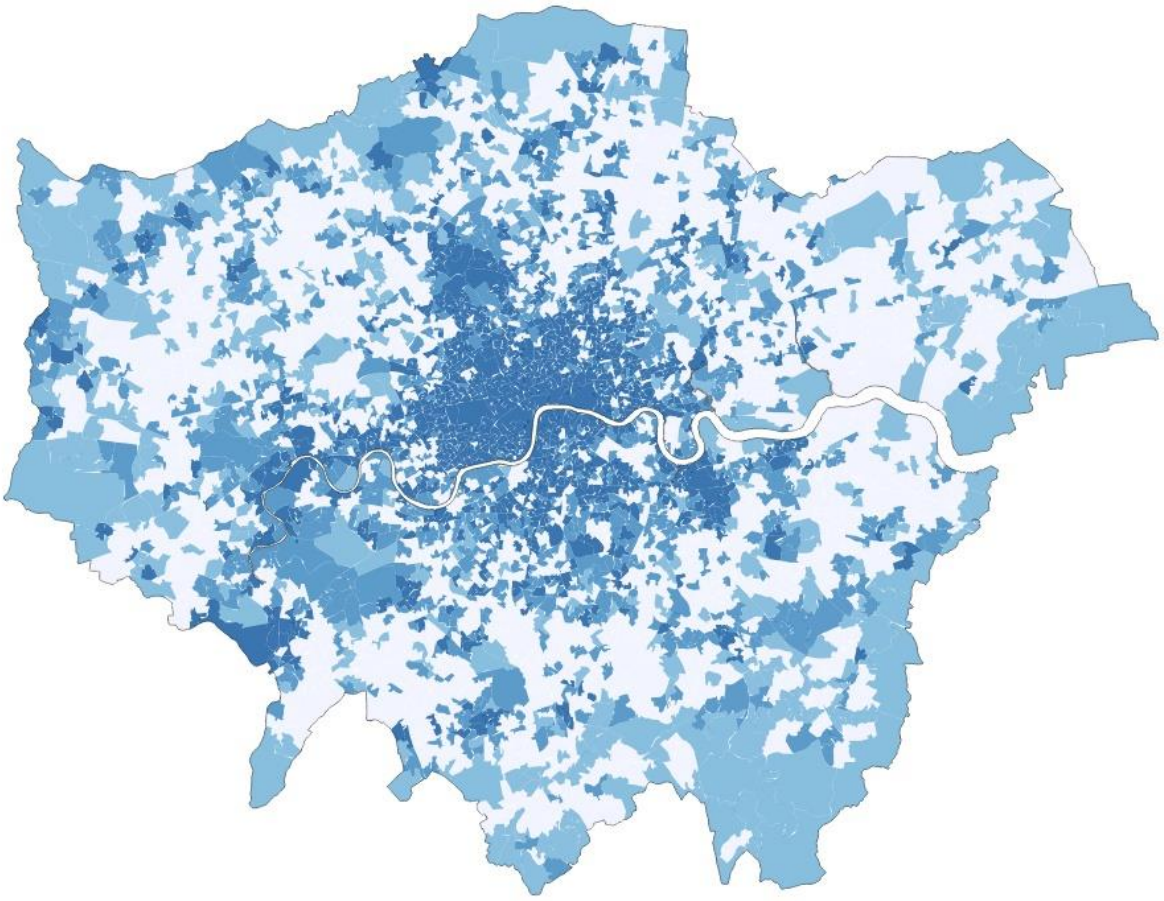
Map 6 Ranking population density Age 5-18yrs (2019) by LSOA (Dark high – light low)



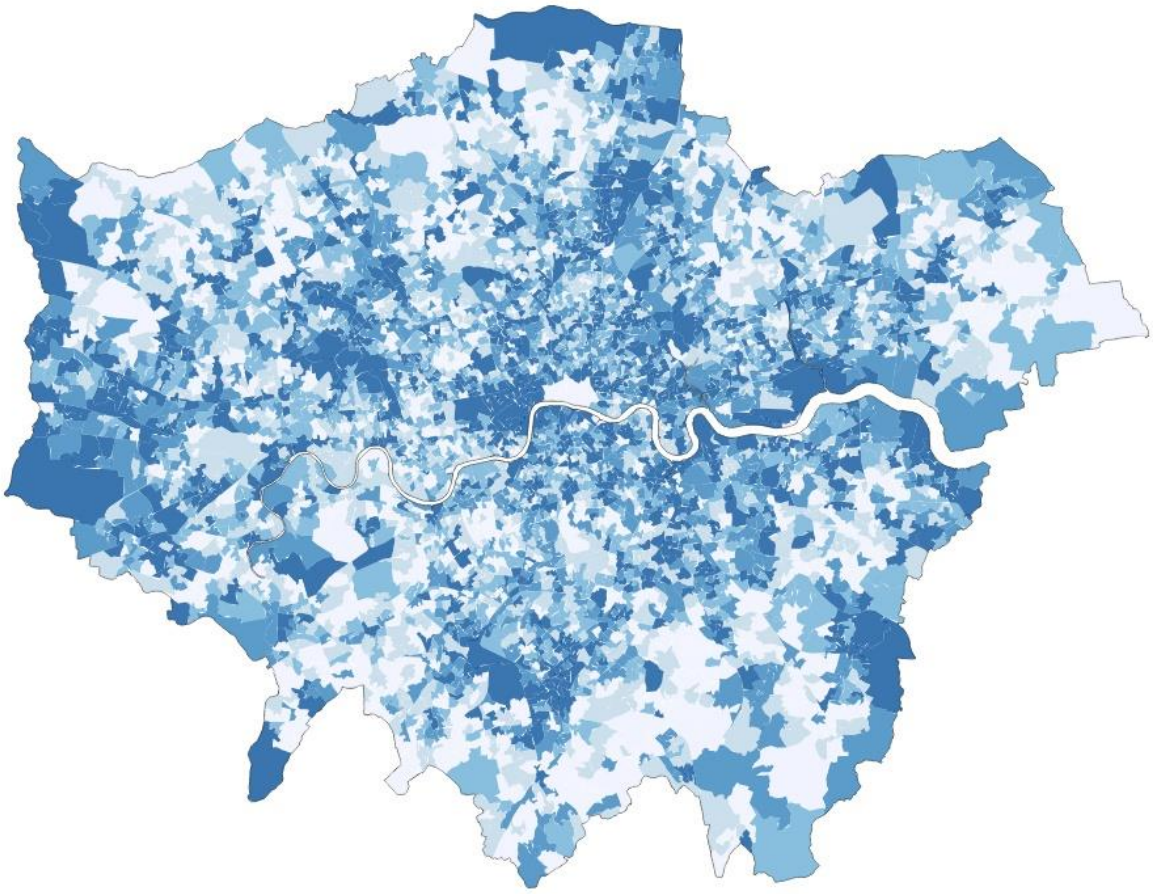
Map 7 Ranking of IMD 2019 by LSOA (dark high – light low)



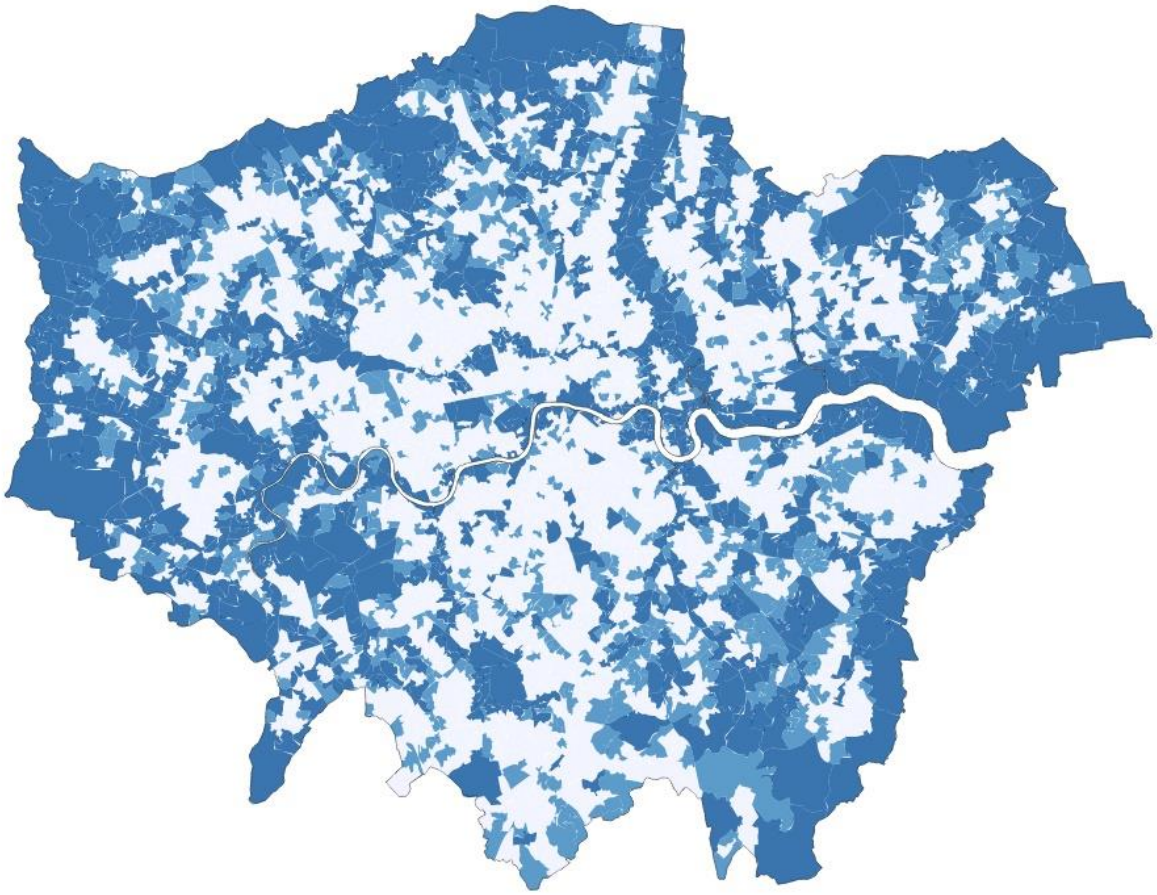
Map 8. Ranking IMD Health deprivation and disability by LSOA (Dark high – light low)



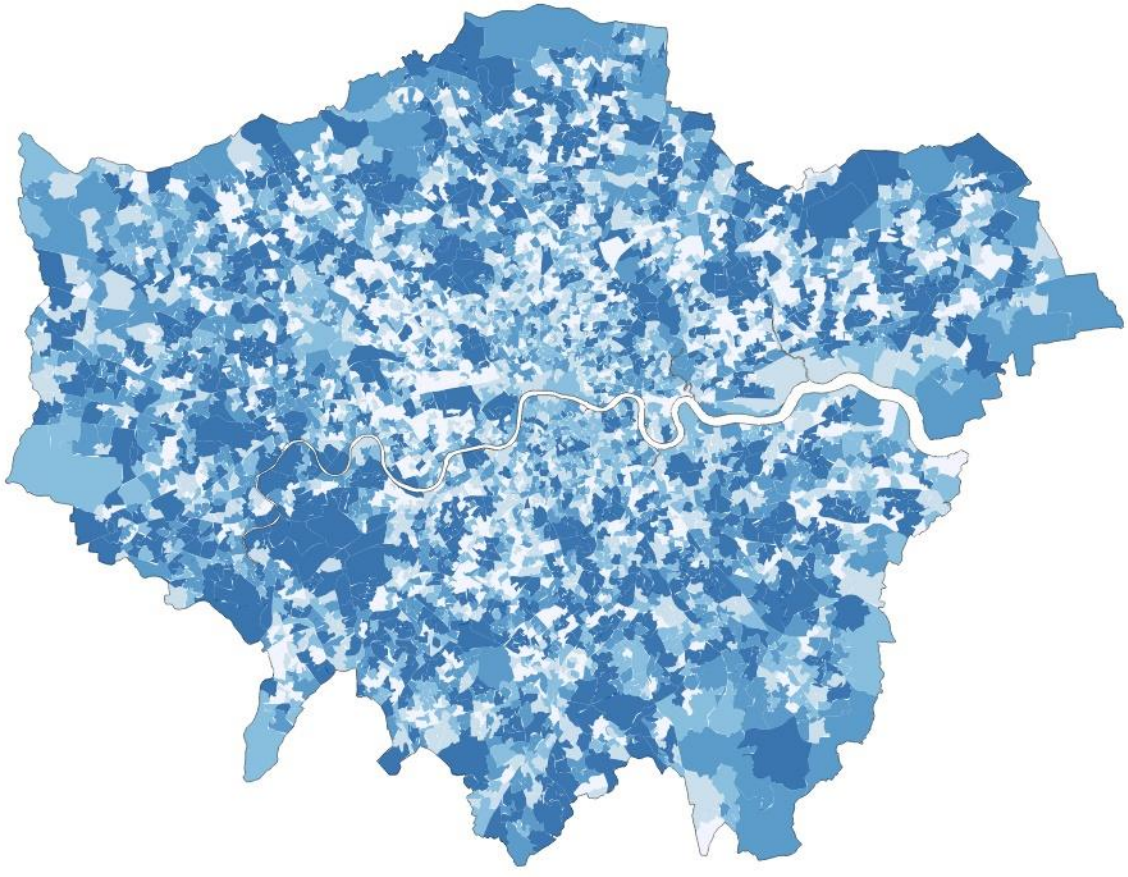
Map 9 Ranking of heritage site density (Grade I, II and II*) by LSOA (Dark high – light low)



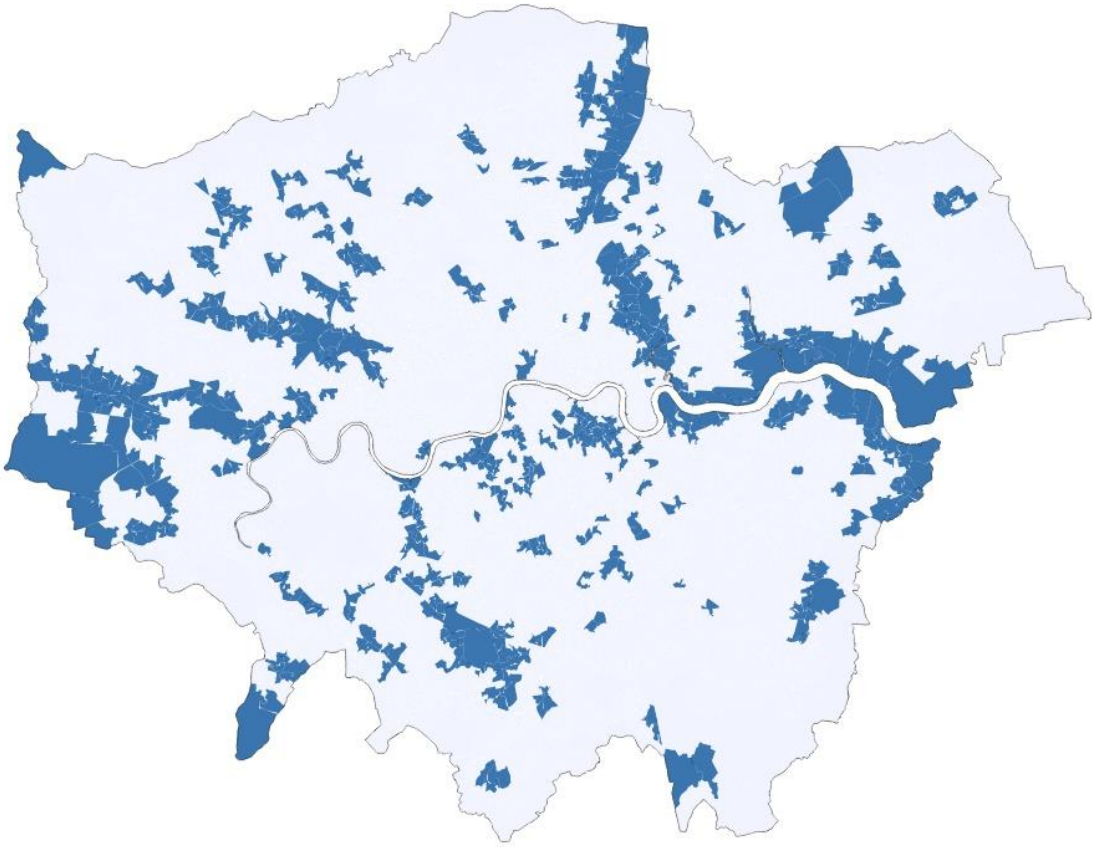
Map 10 Ranking of MPS density of crime (Anti-social behaviour, damage and arson) by LSOA (Dark high – light low)



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?
Example: Age	***Adverse***	***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.***	***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.***
Age (younger, older or particular age group)		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. 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.	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 percent of fatal fires involving someone over the age of 50 and 65 percent of fatal fires involving someone over the age of 65. Figure 7. in appendix 1. shows that those aged over 65 are fairly evenly distributed across London. Table 1. confirms this with 49 percent of over 65s living in urban areas which make up 30 percent of London's area and 46 percent of over 65s living in suburban areas. 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.
Disability (physical, sensory, mental health, learning disability, long term illness, hidden)		The AoR identifies that people with disability are more likely to have specific risk factors which increase their vulnerability to fire.	LFB's data shows that disability and in particular 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 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 a number of 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.
Gender reassignment (someone proposing to/undergoing/ undergone a transition from one gender to another)		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.	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. 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.
Marriage / Civil Partnership (married as well as same-sex couples)		The AoR shows that single older men are more likely to be victims of fires.	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.
Pregnancy and Maternity		Mobility and prescription drugs	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.
Race (including nationality, colour, national and/or ethnic origins)		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.	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). 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.

Religion or Belief (people of any religion, or no religion, or people who follow a particular belief (not political)		The AoR does not show any specific additional risks for any particular religion or belief.	However, it is known that the lighting of candles can increase someone's risk to fire. Additionally, though large gatherings can increase someone's risk to certain incident types the likelihood of such incidents is relatively low. 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. 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. 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.
Sex (men and women)		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. Gender specific groups to be contacted through	LFB's data shows that men are 16 percent more likely to be victims of fire than women with men making up 58 percent of fire victims over the last 20 years. Men and women are relatively evenly distributed across London. 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 the majority of 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

		engagement to seek views and opinions.	characteristics women often face additional challenges, such as higher gender pay gaps among older and BAME women. Young women report issues around financial pressures and mental health issues. Men face issues around lower educational attainment and are at higher risk of suicide.
Sexual Orientation (straight, bi, gay and lesbian people)		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 then into their home, for fear of being judged	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.15 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.

Appendix 3 References

6.1.1 Area

OS MasterMap® Topography 11/03/21

6.1.2 Building Volume

[Mastermap TOID Area * Rel Height] from OS MasterMap® Topography, CURRENCY DATE : 11/03/21

6.1.3 Crime

MPS Arson & Criminal Damage 2020 (Excludes City of London Police)

https://data.london.gov.uk/dataset/recorded_crime_summary

6.1.4 Deprivation

English indices of deprivation 2019

https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019 - 2015

https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015

Health Deprivation and Disability domain 2019

https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019

6.1.5 Employees

Business Register and Employment Survey 2019

https://www.nomisweb.co.uk/query/construct/summary.asp?mode=construct&version=0&dataset=189

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6.1.6 Fires and other incidents

LFB data 11/05/2021

https://app.powerbi.com/groups/me/apps/c846ad3c-94eb-4337-a0ef-99fce8ccbefe/reports/d5c8f605-f6a5-4cfb-bc3b-0f2f52d80708/ReportSection37011bc55f77f7721666?chromeless=true

6.1.7 Greenspace and Open land

OS Open Greenspace® v1.2 released 04/2021

6.1.8 Heritage buildings

Historic England, Listed Buildings, Grade I, II and II* features 2021
https://historicengland.org.uk/listing/the-list/data-downloads/**Open water**

OS MasterMap® Topography; Inland and Tidal Water 11/03/21

6.1.9 Population

ONS Lower layer Super Output Area population estimates

Mid year 2019 (Published September 2020)

https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/lowersuperoutputareamidyearpopulationestimates