Cumulative Impact Assessment 2020

October 2020

City of Westminster

This research was undertaken by analysts within the Council's Corporate Intelligence Function, working in collaboration with internal and external data and service experts between January and June 2020.

Acknowledgments

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Background

Cumulative impact has been used as a term to describe the stress that a large number of licensed premises can have on crime and disorder, nuisance and the demand on local services. The guidance describes cumulative impact as "...the potential impact on the promotion of the licensing objectives of a number of licensed premises concentrated in one area." It is often not that licensed premises on their own are operating in a way that is detrimental to the licensing objectives, but it is the cumulation of the premises and the people attending them that creates the increased problems and demands on services.

Cumulative impact can occur either in the area where the premises are located or some distance away from them, for example at public transport locations or fast food premises. The issue of cumulative impact occurs due to the number of people in the area frequenting the licensed premises. The cumulation of licensed premises has a disproportionate demand on local services such as transport, public lavatories, waste collection and street cleaning. There is also a higher level of crime and disorder, often associated with alcohol related violence that can take place which will draw in additional demands on the police as well as the ambulance service. It is also likely that criminal activity is attracted to areas where there are higher concentrations of people and who may be vulnerable to theft or other crimes due to the level on intoxication.

The problems associated with cumulative impact could not be attributed to individual premises, and not to mismanagement by individual licensees, and so collective restraint was called for. Westminster City Council was the first local authority to establish a stress area (cumulative impact) policy under the public entertainment and night café licensing regimes which pre-dated the Licensing Act 2003 (the Act). Under the Licensing Act 2003 the council established its cumulative impact areas and approach for determining applications within these areas within its policy statement. The council has continued to review the cumulative impact of licensed premises for every revision of its policy statement.

The cumulative impact policy placed a presumption that any new licensed premises within the defined stress areas (cumulative impact) areas would have a presumption against the grant of the licence or the variation of the licence to increase the capacity or hours of the premises. The policy did allow for an exception if the applicant could demonstrate that the premises operation would not adversely impact the intention of the policy and add to the cumulative stress in the area. If the Sub-Committee were satisfied that exceptional circumstances were demonstrated the it could grant the application on exception circumstances.

Until 6th April 2018 "cumulative impact" and cumulative impact policies were not a statutory construct under the Act. Prior to this date "cumulative impact" was only referred to within the statutory guidance issued by the Home Office.

The government amended the Licensing Act 2003 via the Policing and Crime Act 2017. This amendment made it a requirement that the Licensing Authority must produce a cumulative impact assessment (CIA) if the authority can evidence that there is cumulative impact within its area. The Licensing Authority must consult on its intention to publish the CIA. The aim of the CIA is to limit the growth of licensed premises where the promotion of the Licensing objectives is being compromised. The Council will classify these areas of cumulative stress as Cumulative Impact Areas or Zones and have a Cumulative Impact Policy that will set out its approach to determining applications that are located within these areas or zones. The government at the time described this change as "providing greater clarity and legal certainty about their [cumulative impact policies] use".

In cumulative impact areas, there is a presumption that the licensing authority will refuse or impose limitations on applications which are likely to add to the cumulative impact unless the applicant can demonstrate that there will be no negative cumulative impact on the licensing objectives.

The publication of a CIA does not change how licensing decisions are made; the Licensing Authority will always consider each application on its merits. However, a CIA is a strong statement of intent about an authority's approach to licence applications.

Analytical Approach

In order to identify and assess potential areas of cumulative impact across the whole borough, incidents indicative of negatively impacting the promotion of the licensing objectives were spatially situated and analysed across the whole of the borough, using data-driven approaches.

A wide variety of evidence was used, in line with government guidance[1], including local crime and disorder statistics, prevalence of ambulance attendances, environmental health complaints, as well as resident perceptions.

A careful review of literature and guidance was undertaken, as well as engagement with stakeholders to identify, vet and obtain key data for the CIA. Potential sources were screened to ensure that they were:

- indicative of a negative impact on the promotion of the licensing objectives
- reliable
- situated in time and space
- dated back 3 years (2017 – 2019), to ensure potential area definitions were based on consistent patterns

Licensed premises in the UK tend to operate later than other businesses and alcohol is typically consumed more in the evening and at night. For this reason, concentrations of incidents recorded between 18:00 and 06:00 in proximity to licensed premises were considered wherever possible to inform boundary definition.

This data-led assessment has ensured that areas burdened by cumulative impact were identified consistently and transparently across the borough, while considering different patterns of potential cumulative impact.

Methods Employed

The methods that the Licensing Authority employed in carrying out the CIA were:

1. Spatial-temporal descriptive analysis of all incidents indicative of cumulative impact to understand borough-wide patterns
2. Area based regression analysis explored the relationship between the prevalence of incidents and licensed premises
3. Space-time pattern mining (hot spot analysis) to discern whether, where and when incidents significantly clustered (within circa. 5000 m^2, average size of a city block) over 12 consecutive quarters, results were key to boundary definition
4. Area comparison to contextualise cumulative impact in the West End and explore pressures in other areas previously of concern or with higher concentration of licensed premises

Impact of COVID-19 on Cumulative Impact Assessment

Due to the uncertain short, medium and long-term effects of COVID-19 on the City and shortage of data to describe its impact at the time of this analysis, the patterns observed in this research may not accurately describe the fabric and dynamics of the City at the time this assessment was published.

As an indication of the immediate change, Mayor's Office for Policing And Crime (MOPAC) found that in April 2020 the total notifiable criminal offences recorded in Westminster fell by 76% compared to April 2019, compared to a 31% reduction within the rest of the Metropolitan Police Service. During this month, in which all but essential functions were shut down, St James's and West End wards saw a 90% decline in crime upon the same time last year, which accounted for 15% of all crime reduction across London in this month.

1 Woodhouse, John. "Alcohol Licensing: Cumulative Impact Assessments." Commons Research Briefing CBP-7269, House of Commons Library, 16 Apr. 2019, commonslibrary.parliament.uk/research-briefings/cbp-7269/

COVID-19 also impeded some of the information exchanges relevant to the CIA. Although the intelligence reviewed in this assessment was broad, alcohol-related ambulance call outs to specific locations and at specific times could not be included. A data sharing agreement was under discussion with the London Ambulance Service (LAS) as this information would have offered more granular, highly relevant insights. Due to the tremendous pressure on the LAS in response to COVID-19, this could not progress in time.

However, alcohol-related ambulance attendances in the borough at the output area level[2] were considered, as were ambulance call outs of all kinds to the coordinates of licences premises.

Furthermore, due to the circumstances of COVID-19, which emerged midway through this assessment, engagement with stakeholders was limited. In addition, intended observational research of behaviours and dynamics between licensed premises and crime, nuisance and disorder within identified areas could not be carried out. These components of the research were aimed at validating and contextualising patterns observed in the data. This is a constraint on this assessment, future iterations of the CIA should aim to situate and critically interpret patterns observed in quantitative information with qualitative evidence.

Cumulative Impact Assessment Findings

The principle of cumulative impact is to identify which areas are saturated with a significant number, type or composition of licensed premises, causing the benefits provided by alcohol outlets to be outweighed by public nuisance, crime, disorder and other costs of excessive alcohol consumption.

An analysis of the temporal and spatial patterns of incidents in the borough – across years, months, weekdays and times of day was undertaken. Public realm crimes (serious violence, robberies, theft and drug offences), alcohol-related call out incidents, anti-social behaviour and demands on services were prevalent in Westminster between 2017 and 2019, among the highest in London and the country. However, these pressures varied significantly both in space and time. Data description found that all incidents observed concentrated in the West End, many occurring in the evening and at night, as well as on weekends.

Two regression models were employed to ascertain the relationship between incidents indicative of cumulative impact and licensed premises. Both models found that, on average, for every additional unique licence location (proxy for premises) in an area (20,000m^2 in size), reported incidents were likely to increase by a factor of 1.06 – 1.17, depending on the premises type, incident type and time of day. Furthermore, for every additional licensed premises the odds of there being at least one reported incident in the vicinity grew by 20% – 471%, depending on the premises type, incident type and time of day.

Among specific premises types assessed, pubs and wine bars, restaurants, shops and stores, and hotels and hostels were most significantly aligned with incidents in their proximity. While this analysis controlled for area size, it did not control for other factors such as population density, the composition of premises types, operating hours or other land use characteristics. Such confounding factors likely cause deviations away from model predictions.

A hotspot analysis was undertaken to identify and characterise areas which experienced persistent concentrations of incidents in time and over time. A space-time pattern mining model was used to assess whether statistically significant patterns of incidents emerged over the last three years, on a quarterly basis, in both space (within approximate size of a city block) and time (day, night and 24-hour average).

The results conclusively characterised two parts of the West End as burdened by cumulative impact between 2017 and 2019, to varying degrees. These emerged as statistically significant areas of concern in the borough across numerous dimensions. Based on the strength of the hotspots of incidents recorded between 6pm – 6am over the twelve consecutive quarters (2017-2019), and their proximity to significant concentrations of licensed premises. Two areas were outlined: West End Zone 1 and West End Zone 2.

2 "Output Areas." Office for National Statistics, ons.gov.uk/census/2001censusandearlier/dataandproducts/outputgeography/outputareas

West End Zone 1, 0.68 km^2 in size, presented acute levels of cumulative impact based on crime, disorder and nuisance incident patterns between 2017 and 2019. West End Zone 2 (0.86 km^2), which surrounds this area also demonstrated significant patterns, however to a less severe and uniform degree.

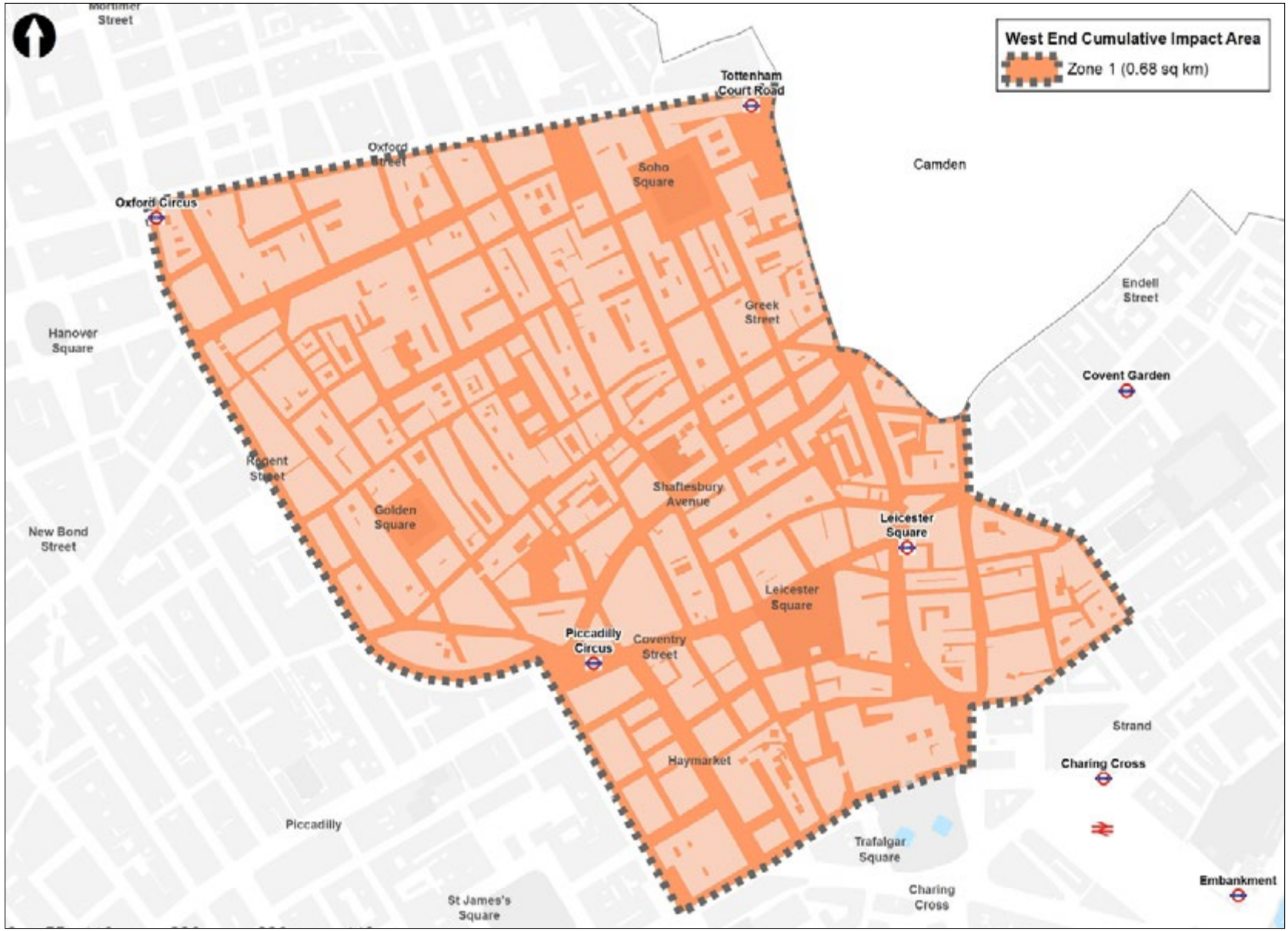
The West End Stress Area previously subject to the terms of cumulative impact in the prevision Statement of Licensing Policy published in 2016, sat within Zones 1 and 2, except for its eastern wing in Covent Garden. Although licensed premises were concentrated outside of these zones, particularly east of Zone 2 in Covent Garden, incidents indicative of cumulative impact did not, and this area was therefore excluded.

West End Zone 1

West End Zone 1 sits on just 3% of the borough's footprint yet held 25% of all unique licence locations as of February 2020, 943 unique licences were issued to 766 unique locations. Over 3200 residential households were also situated here, 3% of the borough's total according to council tax records in February 2020. Four underground stations fall within this zone, among the busiest in London in the evening and night.

The rate of incidents per square kilometre observed here, as well as the rate of licensed premises per square kilometre was approximately 9 times than the borough's average rate. For crimes in particular, the rate was 10–13 times higher between 6pm – 6am compared to the borough average. Approximately one third of serious violent crimes (795), robberies (2237) and thefts (24407) recorded in the borough between 6pm and 6am occurred in Zone 1 alone between 2017–2019. On average, 40% of drug offences (1529) at night were reported in this area.

Incident Type Night = 6pm–6am	**Total, 2017–19**	**Proportion of Borough's Incidents**
Serious violent crimes Night	795	31%
Robberies Night	2237	33%
Theft and Handling Night	24407	33%
Drug Offences Night	1529	40%
Noise Complaints Night	1389	16%
Reactive Waste Management	6630	10%
Ambulance Call Outs to locations of licensed premises	5353	22%
Anti-social behaviour on Transport Night	592	13%
Anti-Social Behaviour MPS	9662	16%

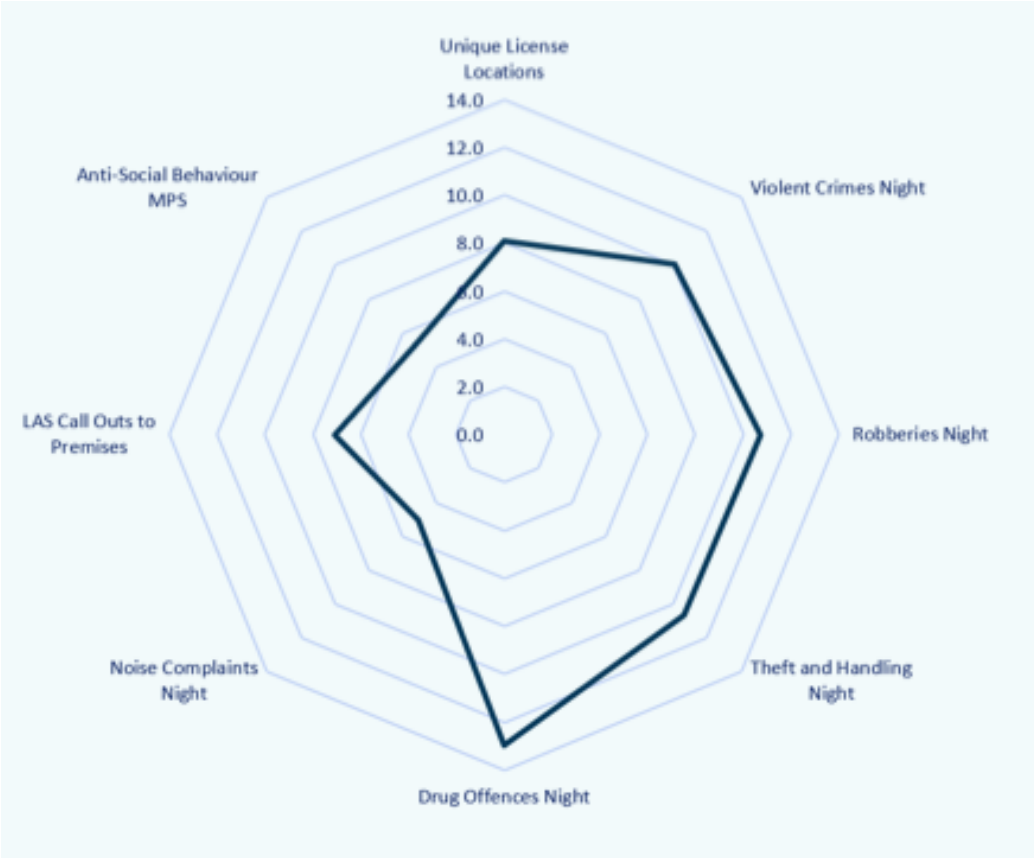

West End Cumulative Impact Area
Zone 1 (0.68 sq km)
Mortimer Street
Tottenham Court Road
Oxford Street
Soho Square
Camden
Oxford Circus
Endell Street
Greek Street
Hanover Square
Covent Garden
Regent Street
Shaftesbury Avenue
Golden Square
Leicester Square
New Bond Street
Leicester Square
Piccadilly Circus
Coventry Street
Strand
Haymarket
Charing Cross
Piccadilly
Trafalgar Square
Embankment
Charing Cross
St James's Square

The Zone 1 Radial Chart below displays the rate of public realm crimes, noise nuisance and disorder incidents per km^2 relative to the borough's average concentration. For example, serious violent crimes in 2017-2019 which occurred between 6pm and 6am in Zone 1 per square kilometre were approximately 10 times the borough's average concentration.

All of Zone 1 falls into the pre-existing West End Stress Area boundaries with the exception of the area south of Haymarket and north of Trafalgar Square. In this area patterns of theft and robberies between 6pm and 6am had been characterised as persistent over the last three years and intensified in the final months of 2019. Persistent patterns of serious violent crimes in the evening and night emerged here, as well as sporadic trends in the volume of drug offences recorded.

Serious violent crimes and drug offences rose significantly between 21:00 and midnight with an hour to hour average % change of 40% for serious violent crime and 47% for drug offences. There was also a peak in serious violent crime at 03:00 before dropping off. Drugs have a significant drop off after midnight in terms of recorded crimes. It is important to note that patters of drug offence records are significantly influenced by policing practices.

In Zone 1 Crimes (excluding thefts) built up from 21:00 to a primarily concentrated between 23:00 and 3am. Crimes recorded at 9pm were not substantially higher than those at 6pm with the exception of serious violence (difference of 16 crimes). Thefts in Zone 1 fell, but more gradually compared to the rest of the borough.



West End Zone 2

West End Zone 2 is a larger area (0.86 square kilometres) surrounding Zone 1, it occupies 3.9% of the borough's footprint and held 13% of all unique licence locations in February 2020. Over 2300 residential households were situated here, 1.8% of the borough's total.

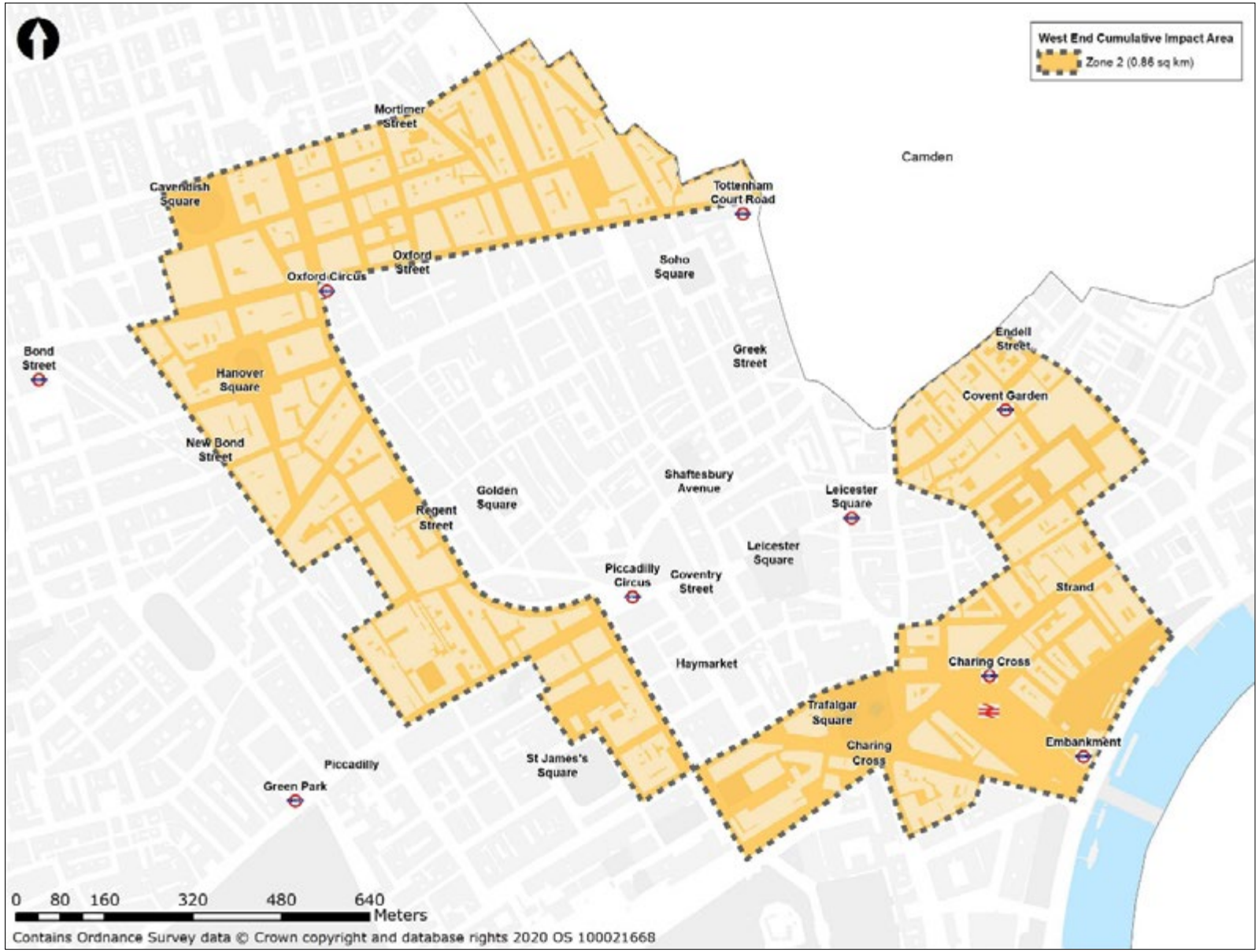
Statistically significant and persistent hotspots emerged within this boundary as well, across incident categories assessed. The rate of incidents per square kilometre observed here was nearly 4 times greater and rate of licensed premises per square kilometre was 3.4 times greater than the borough's average concentration.

Cumulative impact in Zone 2 is likely significantly shaped not just by the premises that sit within it, but also dispersal from the acutely affected Zone 1 and hosting key transport hubs Charing Cross, Embankment and Covent Garden, in close proximity to Oxford Circus and Tottenham Court Road stations.

Interpreting the results of the hotspot analysis, incident types did not cluster as uniformly in Zone 2 as in Zone 1. The area around Charing Cross station, towards Embankment demonstrated particularly persistent patterns of serious violent crime in the evening and night, as well as high rates of ambulance call outs to the location of licences. Consecutive patterns of robberies in the evening and night were observed in 2019. Daily averages of antisocial behaviour were also persistent, and sporadic patterns of drug offences between 6pm and 6am were also recorded over the last three years.

In the northern part of Zone 2, along Oxford Street, hotspots of thefts and robberies at night were characterised as intensifying, historical (persistent over the last 3 years but did not cluster significantly in the last quarter of 2019) and consecutive (they were significant for the majority of 2019 but not previously).

Incident Type Night = 6pm – 6am	**Total 2017 – 2019**	**Proportion of Borough's Incidents**
Serious violent crimes Night	388	15%
Robberies Night	1384	21%
Theft and Handling Night	12964	21%
Drug Offences Night	487	13%
Noise Complaints Night	887	10%
Reactive Waste Management	6602	10%
Ambulance Call Outs to locations of licensed premises	5330	22%
Anti-social behaviour on Transport Night	1266	27%
Anti-Social Behaviour MPS	6276	11%


West End Cumulative Impact Area
Zone 2 (0.86 sq km)
Mortimer Street
Cavendish Square
Tottenham Court Road
Camden
Oxford Circus
Oxford Street
Soho Square
Bond Street
Hanover Square
Greek Street
Endell Street
Covent Garden
New Bond Street
Golden Square
Shaftesbury Avenue
Leicester Square
Regent Street
Leicester Square
Piccadilly Circus
Coventry Street
Strand
Haymarket
Charing Cross
Trafalgar Square
Embankment
Charing Cross
Piccadilly
St James's Square
Green Park
0 80 160 320 480 640
Meters
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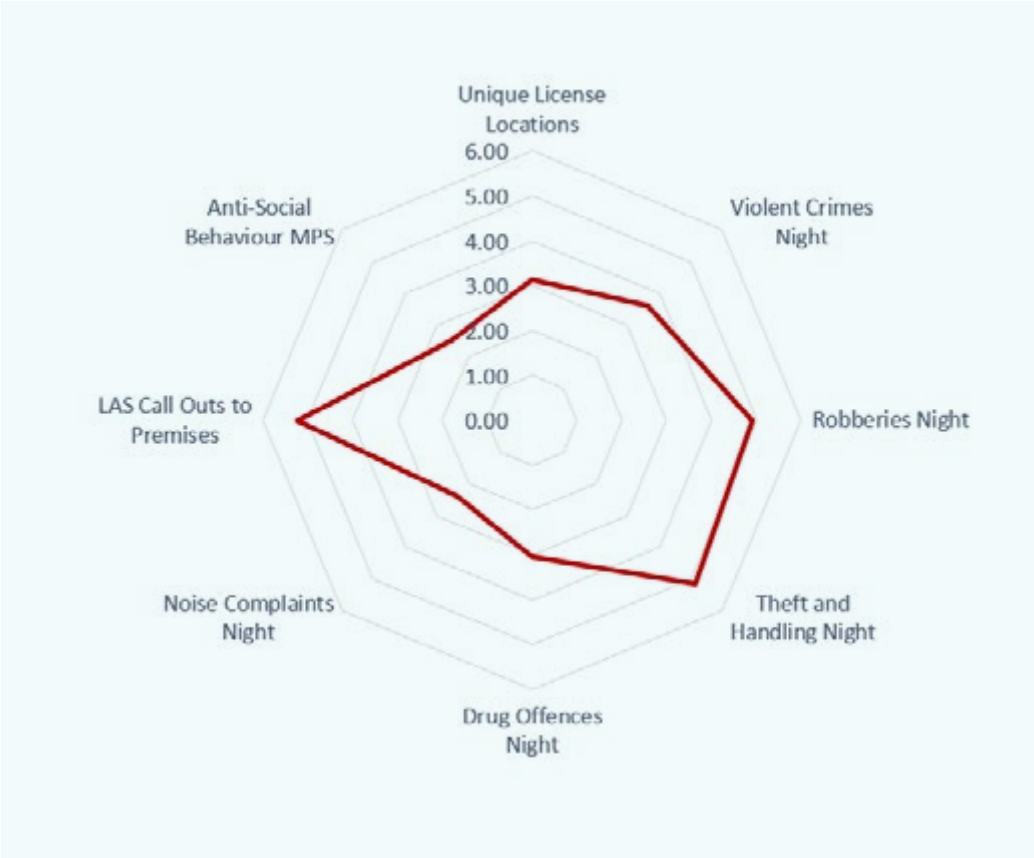
Noise complaints at night were also more concentrated in the northern part of Zone 2, however there were consecutive hotspots of drug offences at night in all parts of Zone 2.

The Zone 2 Radial Chart below displays the rate of public realm crimes, noise nuisance and disorder incidents in 2017-2019 per km^2 relative to the borough's average concentration. Robberies and theft and handling crimes between 6pm and 6am, as well as ambulance call outs to the locations of licensed premises per square kilometre were approximately 5.5 times the borough's average.

Statistical analysis comparing crime in these areas to the borough more widely, indicated that public realm crimes recorded in these areas between 2017 – 2019 were more likely occur in the evening and night and on weekends. This coincides with higher volumes of street population, deduced from peaks of entries and exits to the underground.

Public realm crimes combined (excluding theft) made up nearly 10% of all crime incidents in Zone 2 over the last three years. 1/5 of these occurred between midnight and 3am and nearly 1/3 between 21:00 and midnight. In Zone 2, across all crime types figures fall on average between 20:00 and 22:00, apart from serious crime which shows little variation between these hours.

Serious violent crimes in Zone 2 rose between 23:00 and 01:00 with an average % change of 56% upon the previous hour and more steadily between 01:00 and 03:00 (11% each hour on average). Crimes on average across the three years and weekdays, were highest between midnight – 03:00, after which they dropped off. Robberies in Zone 2 on average demonstrated two peaks between 17:00 and 20:00 and 02:00 – 04:00. Between midnight and 03:00 robberies rose steadily upon the previous hour, dropping off steeply after 04:00.

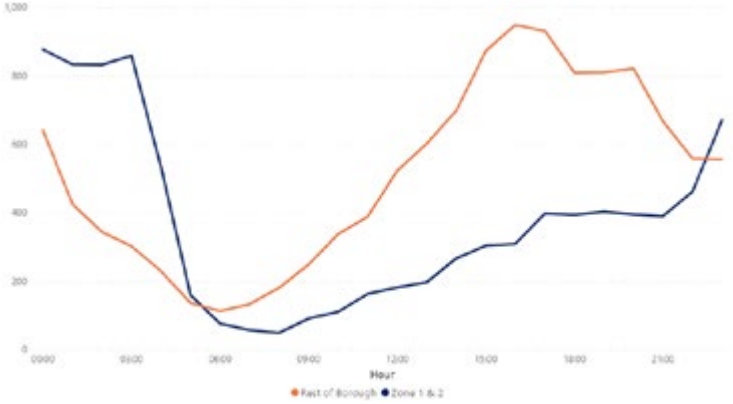


Drug offence records in Zone 2 demonstrated peak at midnight. Between 23:00 and 01:00 the average hour to hour average increase was 72%, dropped steadily until 07:00 with the exception of a 03:00 jump. It is important to note that patterns of drug offence records are significantly influenced by policing practices.

West End Zones 1 and 2

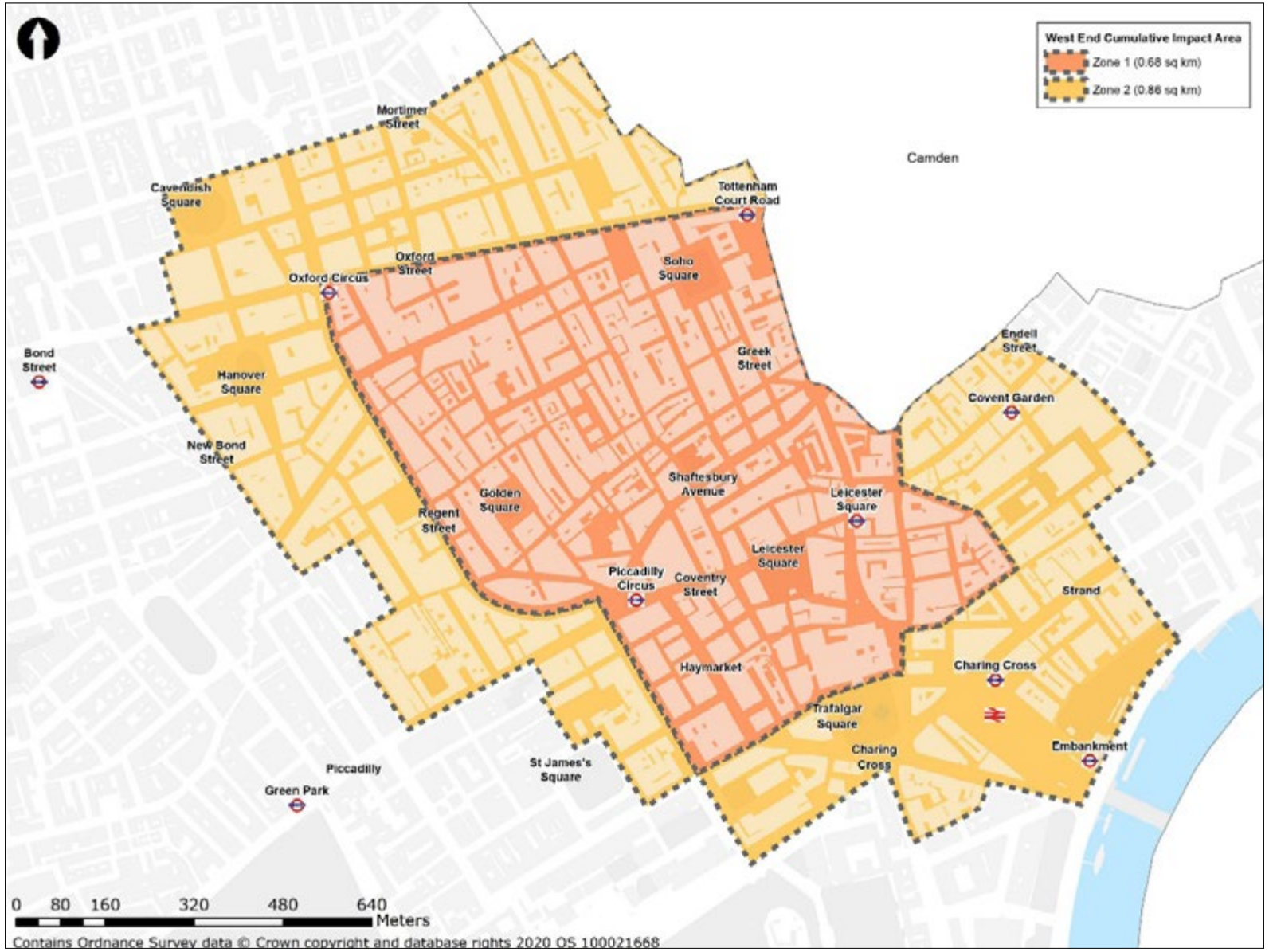
Zones 1 and 2 combined there were 1486 licences issued to 1169 unique licence locations. This represents 38% of unique licence locations in the borough on just 7% (1.54 km^2) of its footprint. This combined area is 57% larger than the previous West End Stress Area.

Public realm crimes between 6pm – 6am in the borough were disproportionately concentrated here. Over the last three calendar years, 46% of serious violent crimes, as well as over half of robberies, thefts and drug offences in the borough were recorded here. Additionally, 44% of ambulance call outs 2017 – 2019 to the locations of licensed premises fell within these zones.



Graph of all crimes excluding thefts Zones 1 & 2 combined compared to rest of the borough by Hour and Type, 2017 – 2019 Totals

Incident Type Night = 6pm – 6am	**Total, 2017 – 2019**	**Proportion of Borough's Incidents**
Serious violent crimes Night	1183	46%
Robberies Night	3621	54%
Theft and Handling Night	32810	54%
Drug Offences Night	2016	53%
Noise Complaints Night	2276	26%
Reactive Waste Management	13232	20%
Ambulance Call Outs to locations of licensed premises	10683	44%
Anti-social behaviour on Transport Night	1858	39%
Anti-Social Behaviour MPS	15938	27%


West End Cumulative Impact Area
Zone 1 (0.68 sq km)
Zone 2 (0.86 sq km)
Camden
Mortimer Street
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Tottenham Court Road
Oxford Street
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New Bond Street
Golden Square
Shaftesbury Avenue
Leicester Square
Regent Street
Leicester Square
Piccadilly Circus
Coventry Street
Strand
Haymarket
Charing Cross
Trafalgar Square
Embankment
Charing Cross
St James's Square
Piccadilly
Green Park
0 80 160 320 480 640
Meters
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Other areas of the City

Evidence of cumulative impact taking place elsewhere in the borough was less conclusive. The borough-wide hotspot analysis by design set a higher threshold for cumulative impact. Further analysis focused on offering insight into whether there was evidence of less acute and persistent patterns of incidents as those seen in the West End, which could nonetheless be characterised as cumulative impact.

Seven areas outside West End Zones 1 and 2 were explored if they were previously characterised as:

a. previously classified as a cumulative impact area (Queensway & Bayswater and Edgware Road),

b. of concern, as identified via previous studies (Mayfair), or

c. had high concentrations of licensed premises within a confined area (Victoria, Paddington, Fitzrovia North and corridor between Marylebone Road and Oxford Street).

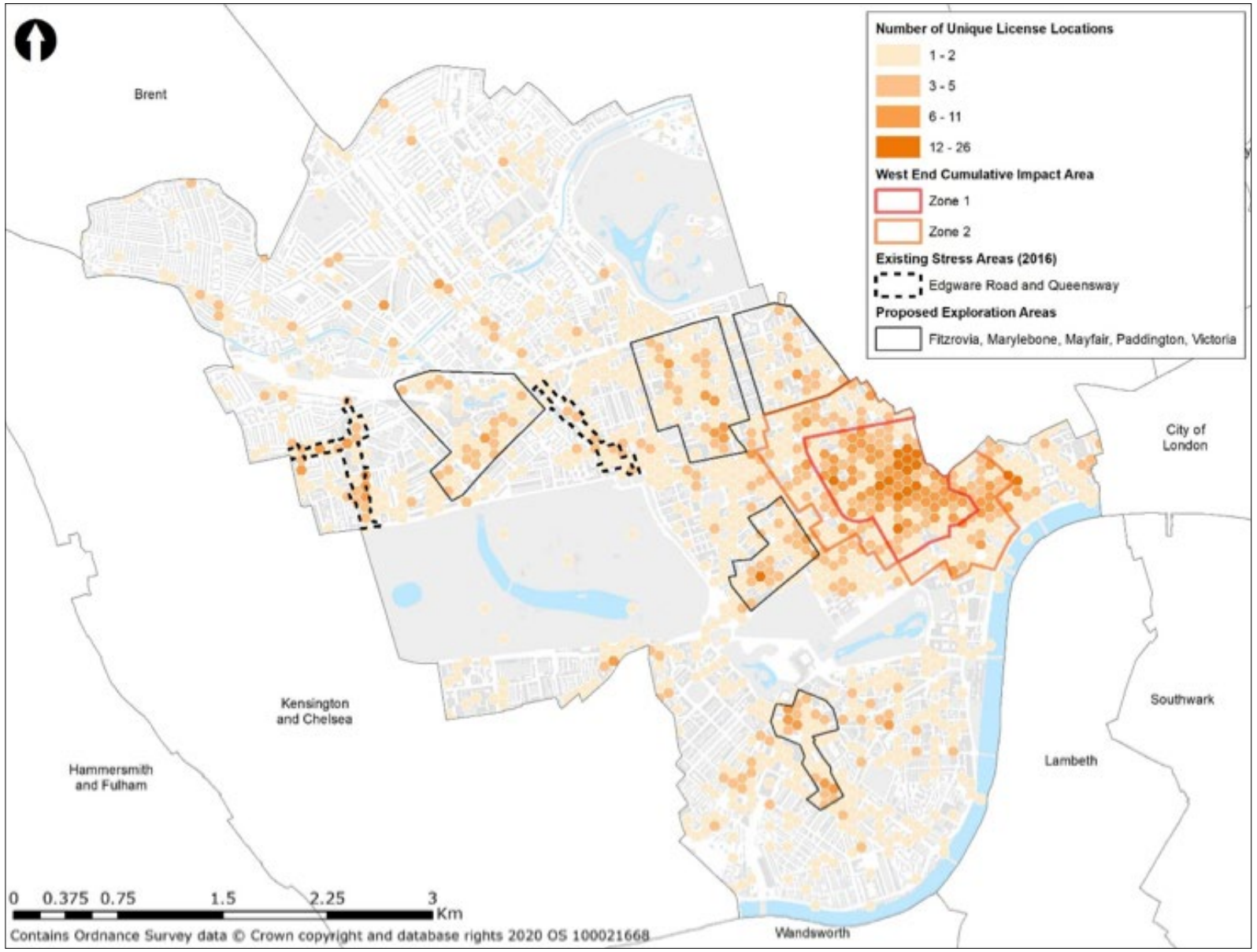
Within each area, the total prevalence of incidents between 2017 and 2019 were compared by type, per square kilometre. As a benchmark, these were compared to the overall borough average of incident concentrations. The average of these incident rates in each area was calculated and found to be comparable to the borough's mean concentration in Paddington (x1), Fitzrovia North (x1) and the corridor between Marylebone Road and Oxford Street showed (x1.3). These areas were therefore not investigated further.

The rate of incidents per square kilometre observed in the West End Zone 1, as well as the rate of licensed premises per square kilometre was approximately 9 times than the borough's average rate. The average concentration of incidents was nearly 4 times greater than those seen in the borough overall.

Victoria and Mayfair areas demonstrated somewhat elevated relative rates compared to the borough average of incidents per square kilometre, 1.9 and 1.7 respectively. While the previous Cumulative Impact Areas in Queensway/Bayswater and Edgware Road demonstrated higher mean incident concentrations (3.7 and 3.9 times the borough average respectively).

A detailed review of incidents types, supplementary evidence where available (enforcement visits and residents survey responses), as well as detailed assessment of the volume and composition of licensed premises in Victoria, Mayfair, Queensway/ Bayswater and Edgware Road was conducted.

In the absence of a behavioural audit to situate the incidents observed, the evidence that these areas could confidently be characterised as burdened by cumulative impact between 2017 – 2019, attributable to a saturation in volume or type of licensed premises, was not conclusive. However, data insights indicate there are patterns of concern in all four areas to varying degrees, the nature of which should be further explored and closely monitored to ensure these do not become characterised by cumulative impact in the future.


Number of Unique License Locations
1 - 2
3 - 5
6 - 11
12 - 26
West End Cumulative Impact Area
Zone 1
Zone 2
Existing Stress Areas (2016)
Edgware Road and Queensway
Proposed Exploration Areas
Fitzrovia, Marylebone, Mayfair, Paddington, Victoria
Brent
City of London
Kensington and Chelsea
Hammersmith and Fulham
Southwark
Lambeth
Wandsworth
0 0.375 0.75 1.5 2.25 3
Km
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Licensing Authority Conclusion and Intention to Publish

After consideration of the cumulative impact assessment it is the Licensing Authority's view that the number of premises licences in the West End[3], are such that it is likely granting further types of licences or varying existing licences would be inconsistent with the authority's duty to promote the licensing objectives. The granting of licences for certain types of operation that are likely to add to Cumulative Impact within these areas would not be consistent with the Licensing Authority's duty under the Licensing Act 2003.

In accordance with section 5A(6) of the Licensing Act 2003 the Licensing Authority will consult on its intention to publish this cumulative impact assessment prior to its publication. Comments received during the consultation process will be considered and if necessary, amendments can be made to this document to provide further clarity or make any corrections that are required.

In publishing a cumulative impact assessment, the Licensing Authority is setting out its continuing approach in upholding its duty to promote the Licensing Objectives. The Licensing Authority must have regard to the assessment and place the appropriate weight it should ascribe to any particular evidence when revising its Statement of Licensing Policy. The Licensing Authority must have regard to its Statement of Licensing Policy and the Home Office Guidance issued under section 182 of the Licensing Act 2003 when determining applications under the Act.

The cumulative impact assessment does not change the fundamental way in which licensing decisions are made. The Licensing Authority will consider and determine application based on their merits. If an applicant can demonstrate through the operating schedule that they would not add to the cumulative impact, then an exception to the Licensing Authority's policy to refuse applications within this area may be made.

Applicants for new licences or to vary existing premises licences within the West End Cumulative Impact Zone that has been designated within the Licensing Authority's Statement of Licensing Policy must therefore give consideration to potential cumulative impact issues when setting out the steps that will be taken to promote the licensing objectives.

The Licensing Authority is required to undertake a review of the Cumulative Impact Assessment every three years. However, due to the impact of the COVID-19 the Licensing Authority will likely undertake a review of this Cumulative Impact Assessment earlier than the statutory three year period.

3 Based on estimates of licensed premises examined in February 2020 (WCC Licensing Data)

Introduction

Introduction

Cumulative Impact Assessment

Under the Licensing Act 2003 the Licensing Authority (the council) is required to publish a statement on licensing policy every 5 years. The Act has four licensing objectives:

- Prevention of Crime & Disorder
- Promotion of Public Safety
- Prevention of Nuisance
- Protection of Children from Harm

A policy must take into account any Cumulative Impact Assessment (CIA) published under section 5A of the Act. If adopted, a licensing authority must review its CIA every 3 years. In the Act, cumulative impact is described as "the **potential impact** on the promotion of licensing objectives of a **significant number** of licensed premises **concentrated in one area**".

A licensing authority can publish a CIA to help it limit the number or types of licence applications granted in areas where there is evidence demonstrating the number or density of licensed premises is having cumulative impact, circumstances which undermine the licensing objectives.

In cumulative impact areas, there is a presumption that the licensing authority will refuse or impose limitations on applications which are likely to add to the cumulative impact unless the applicant can demonstrate that there will be no negative cumulative impact on the licensing objectives.

The publication of a CIA does not change how licensing decisions are made; the Licensing Authority will always consider each application on its merits. However, a CIA is a strong statement of intent about an authority's approach to licence applications.

CIAs relate to applications for new premises licences and 'club premises certificates, as well as applications to vary existing premises licences and club premises certificates in a specified area. Westminster City Council's Cumulative Impact Assessment (CIA) was undertaken in the first half of 2020 (January – June) and led by the council's internal intelligence team.

Objectives

- To describe patterns indicative of cumulative impact across the borough, and how these varied in both space and time.
- To describe the distribution and composition of licences in the borough.
- To examine the relationship between incidents indicative of cumulative impact and licences
- To identify areas which experienced persistent patterns of incidents indicative of cumulative impact in time and space, and over time.
- To compare areas of potential concern against the borough's average concentration of incidents per square kilometre.
- Based on evidence obtained and assessed, recommend where and why the licensing authority should consider implementing a cumulative impact policy to ensure its duty to promote the licensing objectives are not negatively impacted.

Research Approach

Research Approach

The aim of this assessment is to identify whether, where and when patterns of cumulative impact across the whole borough have emerged and are likely to negatively impact the promotion of the licensing objectives. A data-led approach was elected to offer a transparent, consistent and replicable approach to evaluating the prevalence and degree of cumulative impact.

Despite these advantages, the authors of this assessment recognise that a primarily data-led approach can carry considerable limitation, such as:

- Intelligence requirements cannot be met by existing data sets (due to lack of access, availability or suitability)
- Data sets offer limited insights (lacking spatial, temporal or descriptive granularity)
- Data may be collected for other purposes, such as operational service delivery, and is not always amenable to more strategic analysis (e.g. offers only a partial view of service demand or capturing limited categories)

To address some of these challenges, the initial research programme aimed to validate, contextualise and nuance areas characterised by cumulative impact by key data sets with observational research and behavioural audits. Gaining a more detailed understanding of the dynamics and fabric of the City and licensed premises within it was unfortunately not feasible due to the circumstances imposed by the COVID-19 in Spring of 2020.

However, a breadth of high quality and detailed data has been obtained and interrogated using statistical methods to offer comprehensive insights into where cumulative impact has occurred in the borough. Government guidance, academic literature and assessments conducted elsewhere were carefully reviewed to inform this data selection, as did conversations with council services and key external stakeholders.

Stakeholder Engagement

Between January and June, the authors engaged with a range of internal and external stakeholders to ensure the objectives of the Cumulative Impact Assessment could be met with appropriate intelligence and a considered approach.

Service and data experts with the London Ambulance Service, as well as Metropolitan Police provided guidance, as well as data for the CIA. Advice was also offered from the council's Safer Westminster Partnership lead, as well as public health policy leads and researchers from within the council. These discussions afforded analysts access to the SafeStats data platform, managed by the GLA Intelligence Unit.

Westminster City Council's business intelligence, data system, as well service experts in the council's Public Protection and Licensing and City Management teams were consulted throughout the analysis to ensure data was suitably employed and interpreted.

To further support interpretation and validation of data, in the absence of observational research, initial results were discussed with Westminster service leads and City Inspectors.

Throughout the research programme, guidance was offered from the council's Head of Licensing Policy, as well as public protection and licensing service leads. Questions were also raised, and feedback offered by the cabinet member for Public Protection and Licensing and Licensing Committee at various stages of the CIA's development.

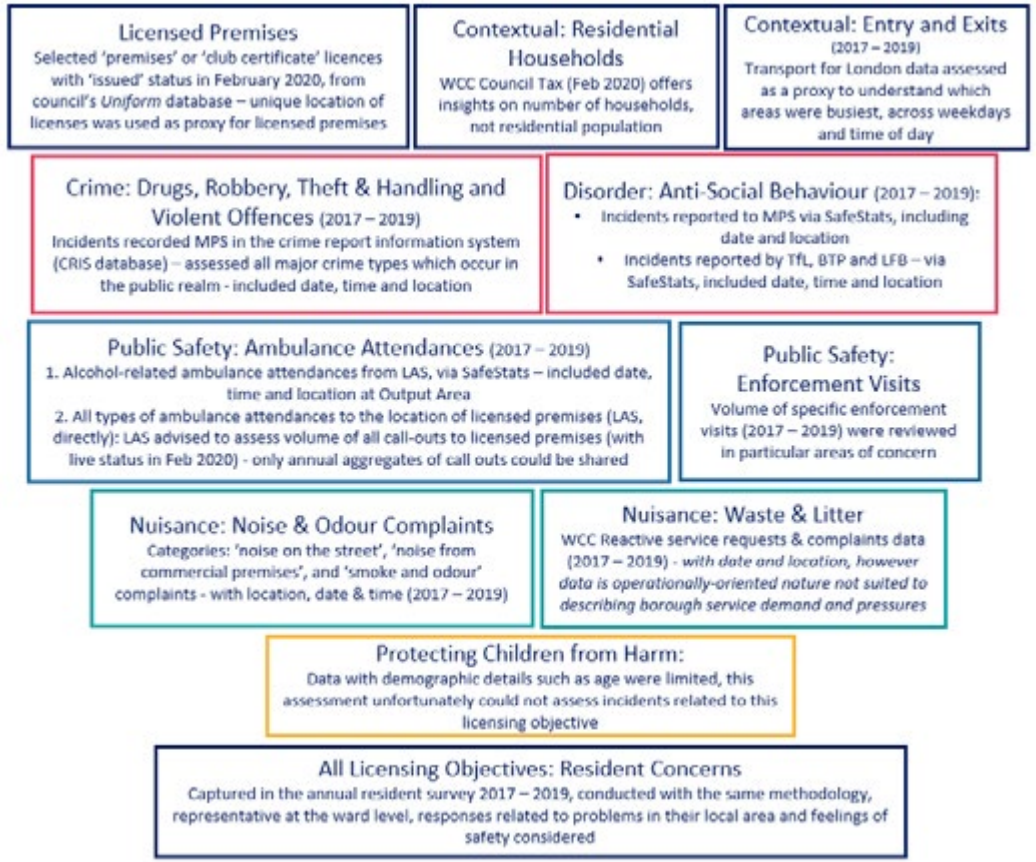
Data Selection

Following desk research and engagement with stakeholders, as well as careful review of government guidance[4] relevant data was sourced based on the following criteria:

- Data details incidents likely to be indicative of a negative impact on the promotion of the licensing objectives
- Data is reliably collected and stored
- Data is situated in time (ideally citing the date and hour of the reported incident)
- Data situated in space (ideally citing the coordinates of the reported incident)
- Data dates back 3 years (2017 – 2019), to ensure persistent patterns are considered

4 Woodhouse, John. "Alcohol Licensing: Cumulative Impact Assessments." Commons Research Briefing CBP-7269, House of Commons Library, 16 Apr. 2019, commonslibrary.parliament.uk/research-briefings/cbp-7269/.

Considered in this assessment was local crime and disorder statistics, prevalence of ambulance attendances, environmental health complaints, as well as resident perceptions:



For more details about the above-mentioned data sets and their limitations, please see Appendix 1.

Harm Against Children

Demographic information such as 'age' was not captured or accessible in most data sets here observed, meaning insights into harms against children, the prevention of which is among the four licensing objectives, could not be considered in this assessment.

Research Methods

The research was undertaken in the following stages:

1 Incident Patterns

Borough-wide profiling of incidents indicative of cumulative impact:

- Spatial and temporal descriptive analysis of all key data sets
- Segmentation analysis of resident concerns

2 Analysis of Licences

Examination of relationship between licences and incidents:

- Descriptive analysis of licences
- Regression analysis testing the prevalence of incidents and proximity of licences premises

3 Hotspot Analysis

Identification of areas characterised by statistically significant and persistent patterns:

- Space-time pattern mining model finds statistically and persistent patterns:
- Space-time pattern mining model finds statistically significant clusters in time and space
- Asses overlap with concentrateds of licenced premises
- Area definitions

4 Area comparison

Investigate thresholds of potential cumulative impact in other areas:

- with higher than average concentrations of licensed premises
- previously of concern
- previously characterised by as stressed

This approach was devised and undertaken by analysts within the council's corporate intelligence teams. Contributing analysts held expertise in spatial analysis, statistical analysis, crime analysis and manipulation of big data. The main analytical platforms employed were PowerBI, ArcGIS and R. As this is a relatively new area of evidence-based policy research, this approach aims to offer a point of departure which can be iteratively improved as intelligence sources and capabilities develop.

1 Incident Patterns

Patterns of incidents in the borough indicative of cumulative impact were assessed, each incident type was described in space and time to varying degrees of detail depending on the granularity of the data available.

Furthermore, resident views between 2017 and 2019 were examined gathered consistently through the council's annual City Survey. Resident perceptions of problems in their local areas in particular were assessed. Segmentation analysis grouped views according to the degree and character of concern among respondents.

2 Analysis of Licences

Working within the parameters of the council's licensing data, the distribution and composition of licenses in the borough were examined, including an approximate view on their opening hours.

To unearth whether the prevalence or types of licensed premises likely had a bearing on incidents indicative of cumulative impact observed, two types of regression models were employed. These tested whether the prevalence of selected incident types were significantly dependent on the number of licensed premises in the area in which they were recorded ($20{,}000m^2$). In particular, for every additional licensed premises, the objective was to establish:

i) the increased odds of a crime being reported (i.e. there being at least one reported crime

i) by how much does the number of reported crimes increase, on average

While these analyses controlled for area size, they did not control for other factors such as population density or other potential land use characteristics. Such confounding factors likely cause deviations away from model predictions. Any estimates should therefore be viewed as approximations and should not be interpreted as a relationship of cause and effect.

3 Hotspot Analysis
Having established the influence of licensed premises upon the likelihood of incidents indicative of cumulative impact to occur in their vicinity, hotspot analysis was undertaken to identify and characterise areas which experienced concentrations of incidents over time.

A space-time pattern mining model[5] produced by ESRI was used to assess whether statistically significant patterns of incidents emerged over the last three years, on a quarterly basis, in both space (within the size of a city block) and time (day, night and 24-hour average).

Based on i) the strength of the hotspots of incidents recorded between 6pm – 6am over the twelve consecutive quarters (2017-2019), and ii) their proximity to significant concentrations of licensed premises areas which presented acute or significant evidence of cumulative impact were outlined.

4 Area Comparison
The above-mentioned borough-wide hotspot analysis by design set a higher threshold for cumulative impact. Further analysis focused on offering insight into whether there was evidence of less acute and persistent concentrations of incidents in other areas, which could nonetheless be characterised as cumulative impact.

5 "An Overview of the Space Time Pattern Mining Toolbox." ArcGIS for Desktop, ESRI, 2020, desktop.arcgis.com/en/arcmap/10.3/tools/space-time-pattern-mining-toolbox/an-overview-of-the-space-time-pattern-mining-toolbox.htm

Seven areas, in addition to those identified in the hotspot analysis, were explored further if they were:

i) previously characterised as stressed (Queensway & Bayswater and Edgware Road)

ii) of concern (Mayfair)

iii) had higher concentrations of licensed premises (Victoria, Paddington, Fitzrovia North and corridor between Marylebone Road and Oxford Street)

These are mapped in Appendix 2, alongside concentrations of licences in the borough.

Within each area, the total prevalence of incidents between 2017 and 2019 were compared by type, per square kilometre. As a benchmark, these were compared to the overall borough average of incident concentrations. Also considered was the proportion of incidents in the borough these areas accounted for.

The areas which demonstrated higher levels of incidents per square kilometre relative to the borough average were nuanced further through using supplementary data, detailed assessment of licences, as well as discussions with service experts.

The methodological steps associated with the above listed stages are detailed further, where necessary, in each of the chapters citing findings.

Note on Temporal Focus: 6pm – 6am

Licensed premises in the UK tend to operate later than other businesses and alcohol is typically consumed more in the evening and at night. These patterns have been validated by previous observational research in the borough which additionally found that alcohol-led activities were particularly prevalent on the weekends.[6]

Concentrations of incidents recorded between 6pm and 6am in proximity to licensed premises were therefore considered wherever possible to inform recommendations of which areas experienced cumulative impact. Where such temporal granularity could not be obtained, the prevalence of relevant incidents across the day was considered.

For an overview of how the above-mentioned data sets were employed to identify areas experiencing cumulative impact between 2017 and 2019, please see Appendix 3.

6 Hadfield, P. (2017) Mayfair Evening and Night-time Economy Public Behaviour / Area Profiling Study: Project to Inform the City of Westminster Interim Licensing Policy Review 2017: Final Report. Hadfield, P., Sharples, S., Bevan, T. and Measham, F. (2015) Westminster Evening and Night-time Behaviour Audit 2013-14. Final Report to the West End Partnership Group and the City of Westminster. Bevan, T., License, A., Rowell, A., Hadfield, P. and Davies, P. (2015) Westminster Evening and Night-time Economy: A Cost v Benefit Study for the City of Westminster. London: TBR.

Findings

Incident Patterns

Findings
1. Incident Patterns

Overview

A series of nation-wide, longitudinal assessments carried out by public health researchers at Sheffield and Bristol investigated the relationship between alcohol and late-night refreshment licensing data and alcohol-related admissions, as well as crime rates. In areas where more restrictive policies and interventions had been implemented, a reduction in crime, disorder and alcohol-related call outs occurred with statistical significance, with the latter issue seeing the greatest reduction, followed by serious violent crimes.[7]

Public realm crimes (serious violence, robberies, theft and drug offences), alcohol-related call out incidents, anti-social behaviour and demands on services have been prevalent in Westminster, among the highest in London and the country.

Data description of incidents in 2017 – 2019 found that all incident categories observed varied both in space and time. Many occurred in the evening and at night and on weekends when alcohol-related activities typically peak. Incidents were primarily concentrated in the West End where licensed premises are disproportionately concentrated. These findings support that the data selected for this assessment are broadly indicative of cumulative impact.

Alcohol-related Incidents

In 2015 a team of researchers auditing behaviours in the West End Stress Area in evening and night found that positive social interactions diminish, and levels of anti-social drunkenness rises steeply. These patterns seem to be reflected in the temporal analysis of incidents recorded between 2017 and 2019 and consistent with results more widely in the UK which have assessed drinking patterns.

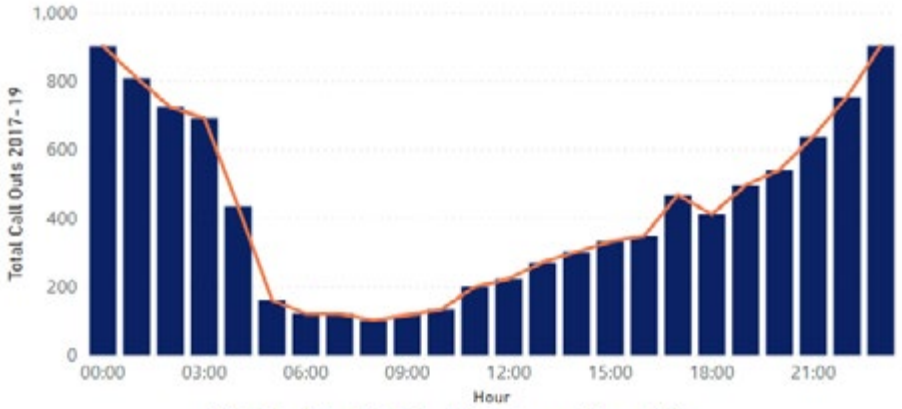
Westminster experienced the highest volume of alcohol-related incidents of any borough, accounting for 1/10 incidents in London. According to London Ambulance Service data published on SafeStats, there were over 10,000 alcohol-related ambulance call outs in the last three years, 73% of which occurred between 6PM and 6AM – peaking between 23:00 and midnight on Friday and Saturday nights.

The LAS data here described, retrieved from the SafeStats platform[8], was available at the Output Area (OA) level which is based on residential population, rather than equally sized areas. The irregular shape and size of OA's can distort the source and concentration of issues. These nonetheless offer an approximation of where within the borough incidents concentrate, significant concentrations can be found in and around the West End, with elevated volumes near Victoria Station and along Oxford Street.

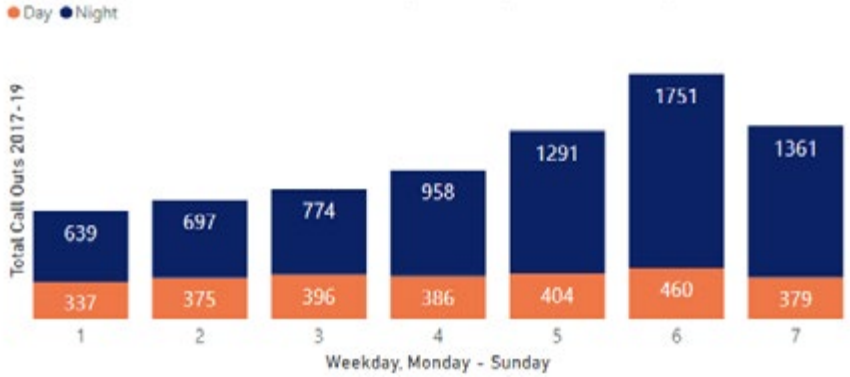
7 de Vocht F, Heron J, Angus C, et al Measurable effects of local alcohol licensing policies on population health in England J Epidemiol Community Health 2016;70:231-237.
de Vocht F, Heron J, Campbell R, et al Testing the impact of local alcohol licencing policies on reported crime rates in England J Epidemiol Community Health 2017;71:137-145.
de Vocht F, Tilling K, Pliakas T, et al The intervention effect of local alcohol licensing policies on hospital admission and crime: a natural experiment using a novel Bayesian synthetictime-series method J Epidemiol Community Health 2017;71:912-918.

8 London Assembly. "About SafeStats." London City Hall, 12 Mar. 2018, www.london.gov.uk/what-we-do/research-and-analysis/safestats/about-safestats.

Total Alcohol-related Call Outs by Hour

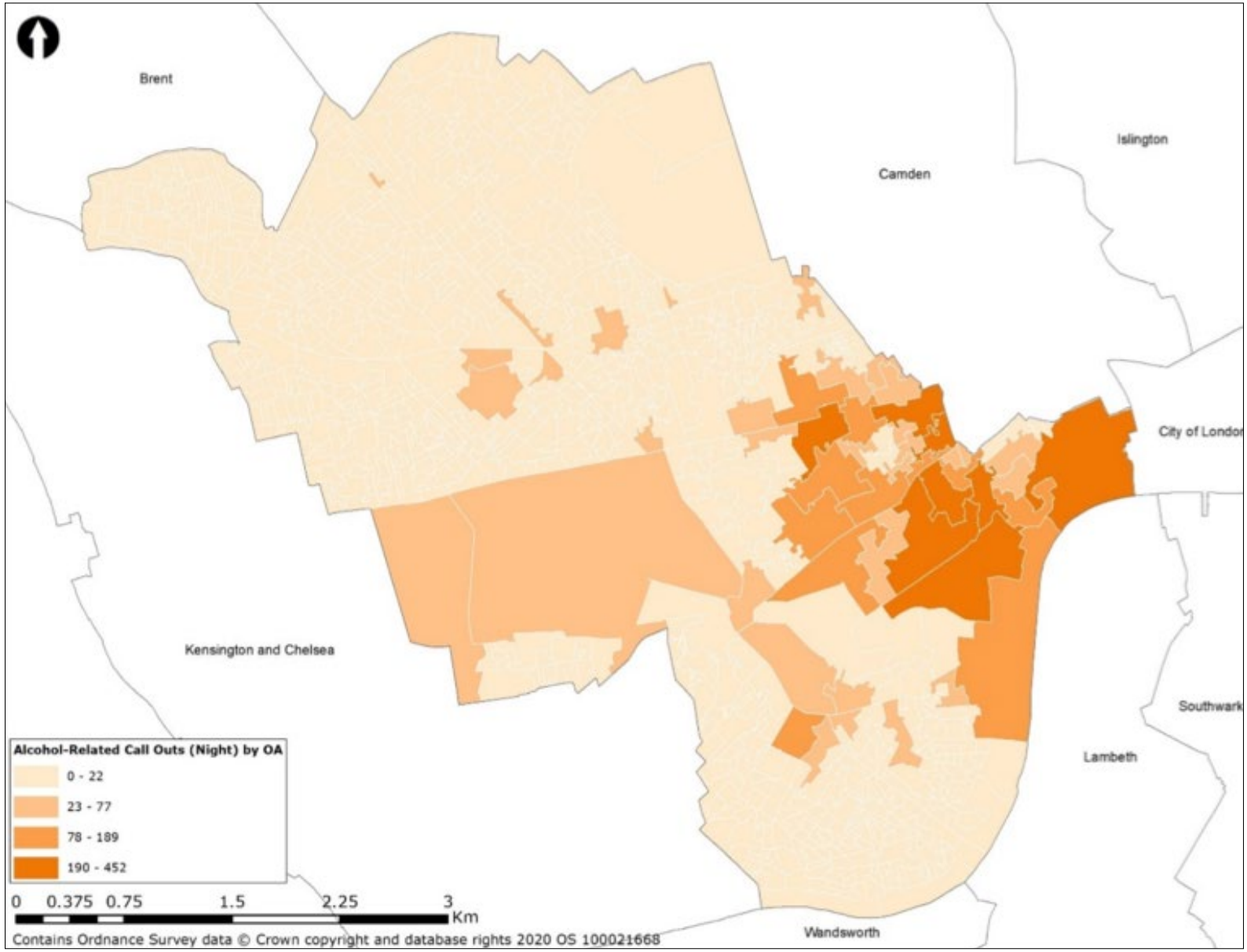


Total Alcohol-related by Weekday and Time of Day



Total Call Outs by Hour and Weekday (Monday – Sunday), LAS 2017-19

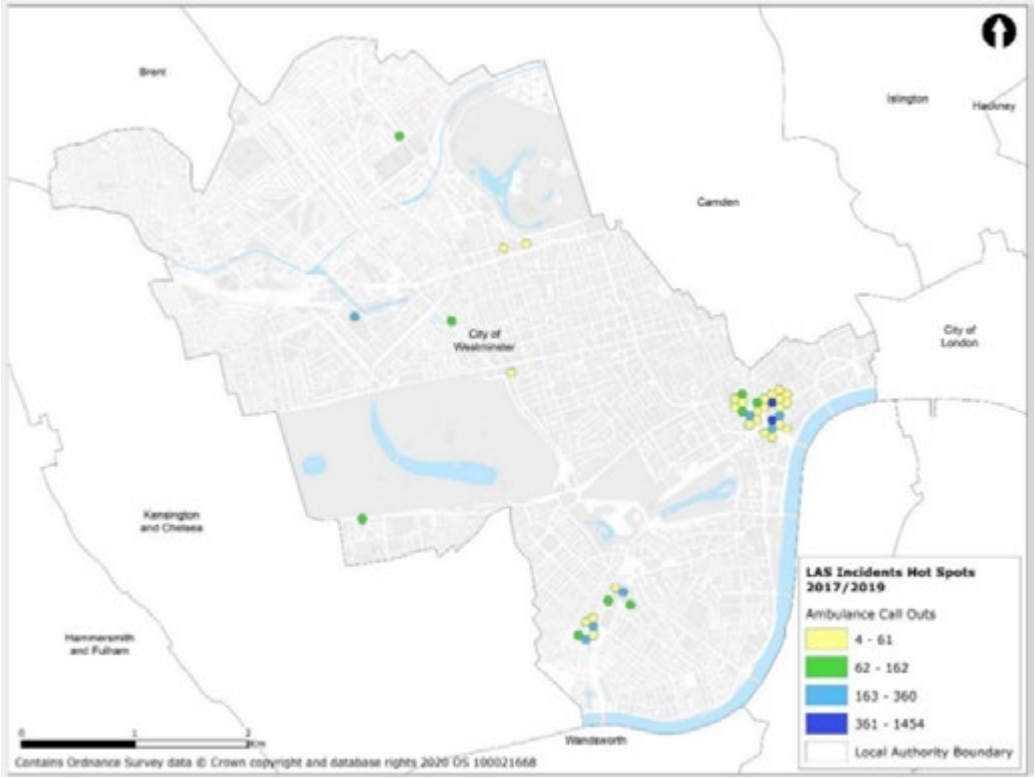
Hour	1	2	3	4	5	6	7	Total
00:00:00	85	77	55	90	161	231	204	**903**
01:00:00	54	72	78	89	99	212	206	**810**
02:00:00	40	49	59	75	77	220	204	**724**
03:00:00	40	41	51	67	86	222	186	**693**
04:00:00	31	32	30	28	53	120	140	**434**
05:00:00	8	12	13	17	22	48	41	**161**
06:00:00	8	11	19	17	13	25	28	**121**
07:00:00	14	19	19	17	18	20	14	**121**
08:00:00	12	15	14	13	16	17	15	**102**
09:00:00	10	14	13	22	22	16	20	**117**
10:00:00	14	16	18	16	26	28	15	**133**
11:00:00	23	23	46	29	25	30	24	**200**
12:00:00	29	27	29	37	34	36	31	**223**
13:00:00	31	42	38	46	40	35	39	**271**
14:00:00	40	35	38	40	46	53	49	**301**
15:00:00	41	53	49	42	41	66	40	**332**
16:00:00	42	58	51	49	50	54	44	**348**
17:00:00	73	62	62	58	73	80	60	**468**
18:00:00	41	55	57	52	76	86	44	**411**
19:00:00	65	61	58	72	94	90	56	**496**
20:00:00	65	64	74	65	103	108	62	**541**
21:00:00	80	66	82	113	136	98	64	**639**
22:00:00	67	82	97	121	171	139	78	**755**
23:00:00	63	86	120	169	213	177	76	**904**
Total	**976**	**1072**	**1170**	**1344**	**1695**	**2211**	**1740**	**10208**


Brent
Islington
Camden
City of London
Kensington and Chelsea
Southwark
Lambeth
Wandsworth
Alcohol-Related Call Outs (Night) by OA
0 - 22
23 - 77
78 - 189
190 - 452
0 0.375 0.75 1.5 2.25 3
Km
Contains Ordnance Survey data © Crown copyright and database rights 2020 OS 100021668

Ambulance Call Outs

Between 2017 and 2019, there were a total of 24,439 a call outs to 2,141 unique licence locations in Westminster, approximately two-thirds of the unique sites in the borough. The number of attendances to premises locations in Westminster rose by approximately 450 call outs each year between 2017 and 2019.

LAS call outs to the location of licences concentrated in and around Soho and Charing Cross Station, as well as Victoria Station.



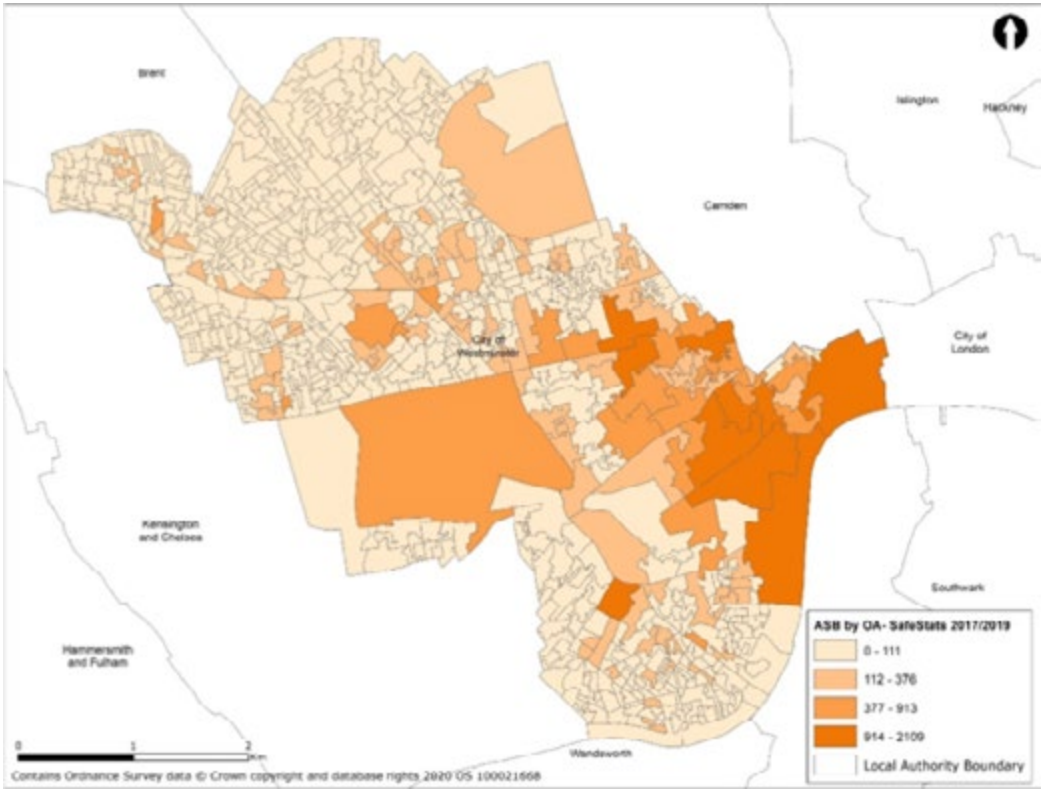
Concentrations of ambulance call outs to unique licence locations (Feb 2020), LAS 2017-19

Anti-Social Behaviour

Between 2017 and 2019, there were 67,000 anti-social behaviour (ASB) incidents in the borough recorded by the Metropolitan Police Service (59,290, 88%), Transport for London[9] (4,160, 53%), British Transport Police[10](3,530, 45%) and London Fire Brigade (114, less than 2%).

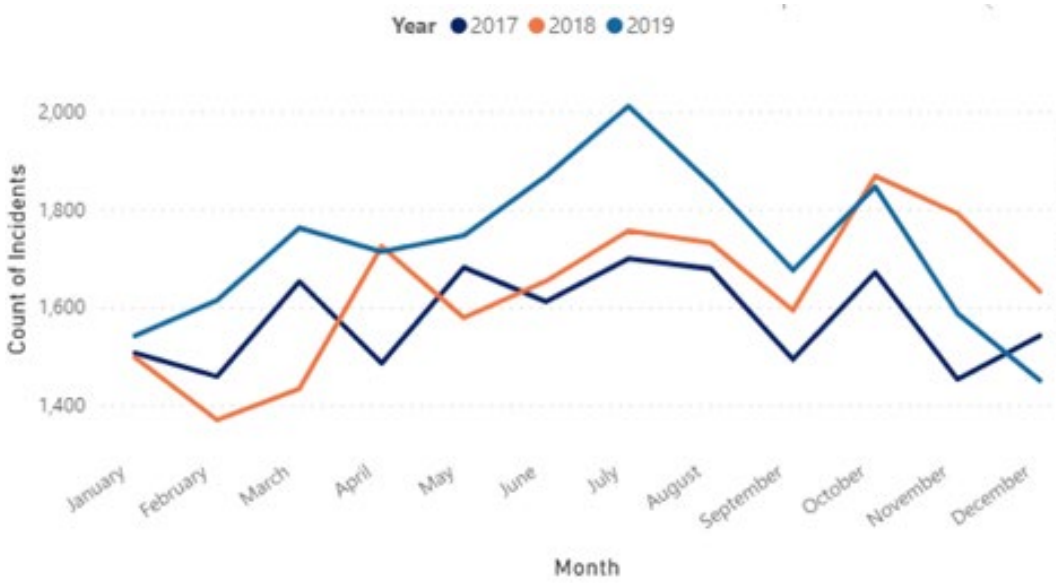
The total number of offences recorded by the Metropolitan Police Service in Westminster has risen year on year over the last three. Offences peaked in the summer months and spiked again in October. Hourly data was not available for this data set, therefore variations between offences at night and the day could not be assessed.

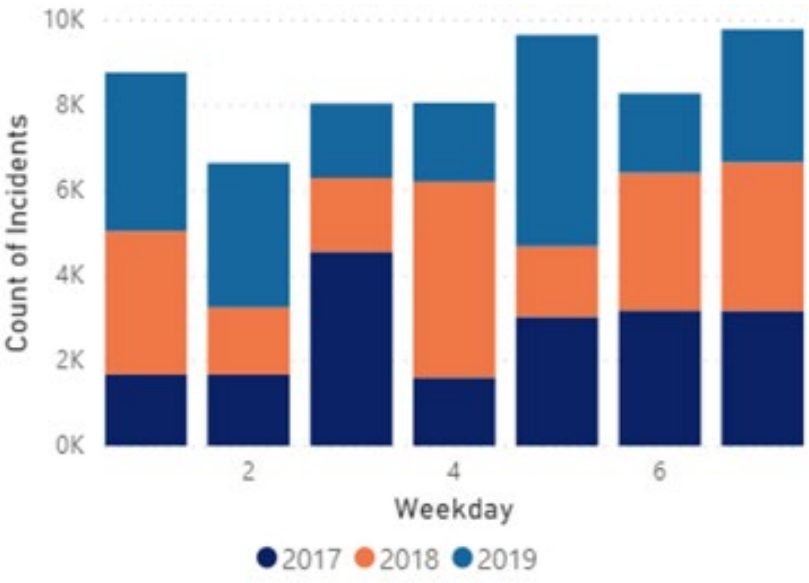
Spatially, incidents concentrated in the West End, the Eastern end of Oxford Circus, Victoria Station and parts of Mayfair.



9 TfL data reports 'Code Red' incidents recorded by employees on London Buses (a part of TfL) through a dedicate radio channel

10 BTP data reports offences recorded at all stations and estates operated by London Underground, Network Rail and Train Operators


Year 2017 2018 2019
Count of Incidents
2,000
1,800
1,600
1,400
January
February
March
April
May
June
July
August
September
October
November
December
Month


Count of Incidents
10K
8K
6K
4K
2K
0K
2
4
6
Weekday
2017 2018 2019

Transport-related Anti-Social Behaviour

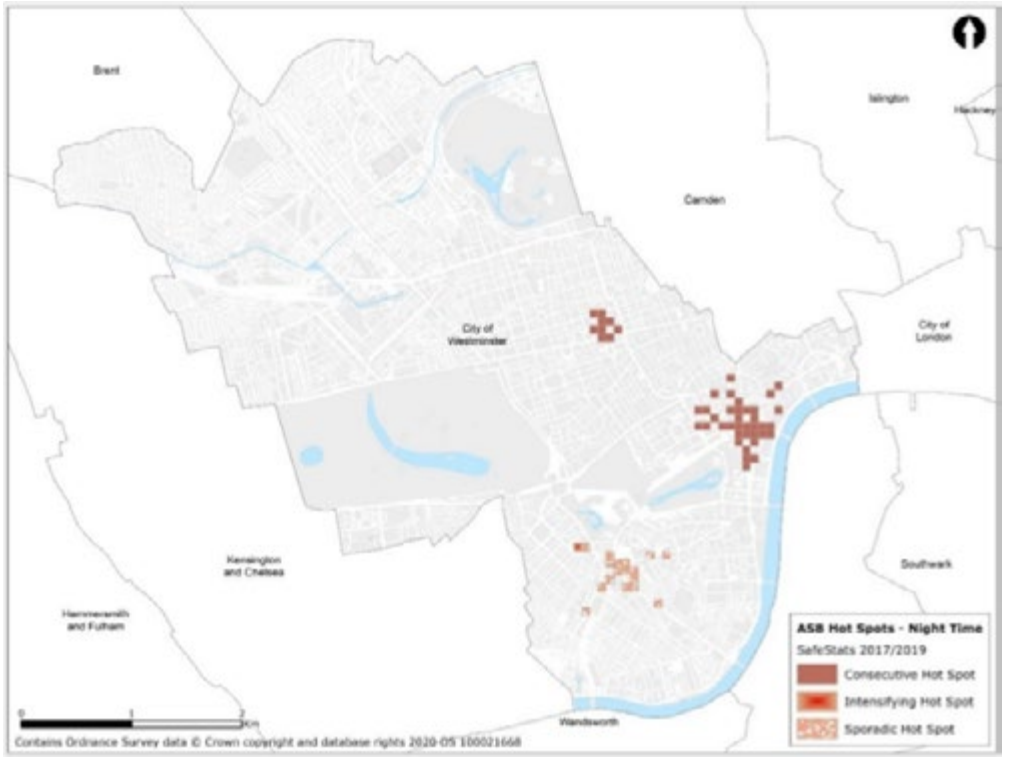
Nearly 2,600 ASB incidents a year related to transport services operating in the borough, two-thirds (62%) of which occurred between 6pm and 6am with peaks on Friday and Saturday nights.

Transport-related ASB in the evening and night concentrated near the West End and Charing Cross, Oxford Circus and to a lesser extent Victoria Station.

Analysis of TfL data at night indicates that underground stations in these areas were among the busiest in the borough at night.

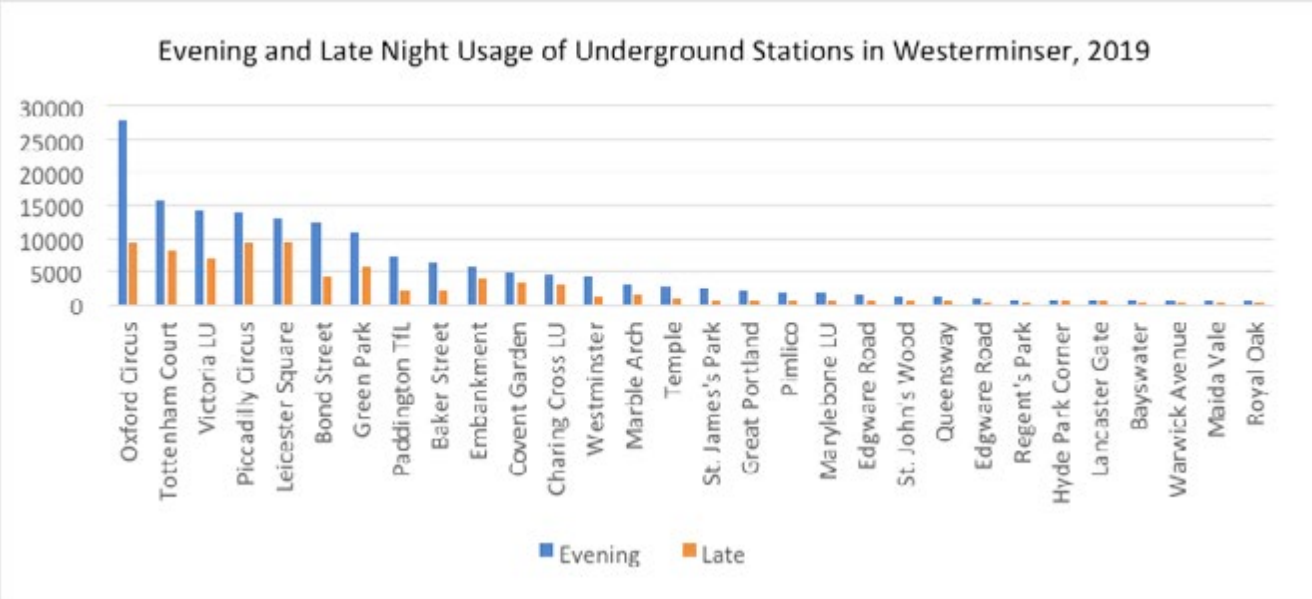
From 9pm – 3am in particular, with the exception of Victoria, the most frequently used stations are all in the West end.

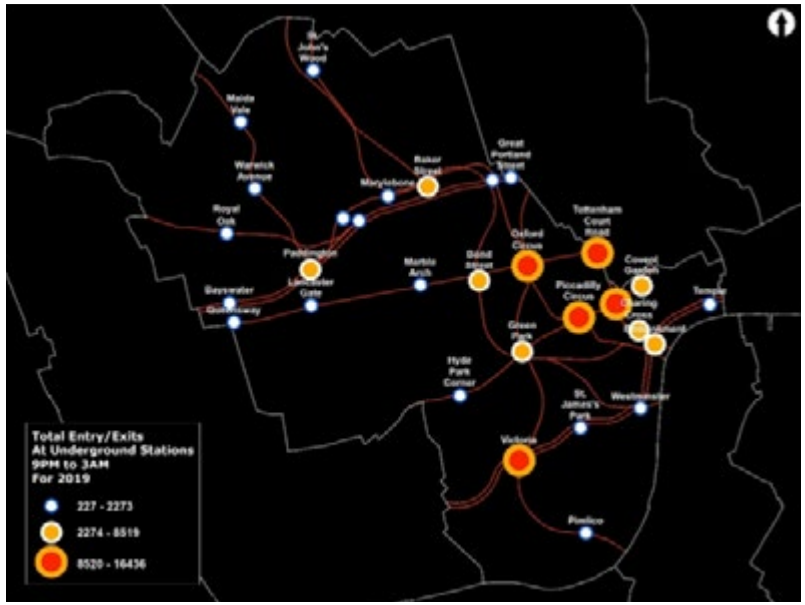
Between 2018 and 2019, on weekdays, the busiest transport hubs were Victoria and Oxford Street. On weekends Victoria and Oxford Street remain the most frequently used, however Paddington, Leicester Square, Piccadilly Circus and Tottenham Court Road also experienced high volumes of traffic. The difference between an average weekday and weekend traffic is particularly stark in Leicester Square and Piccadilly Circus.

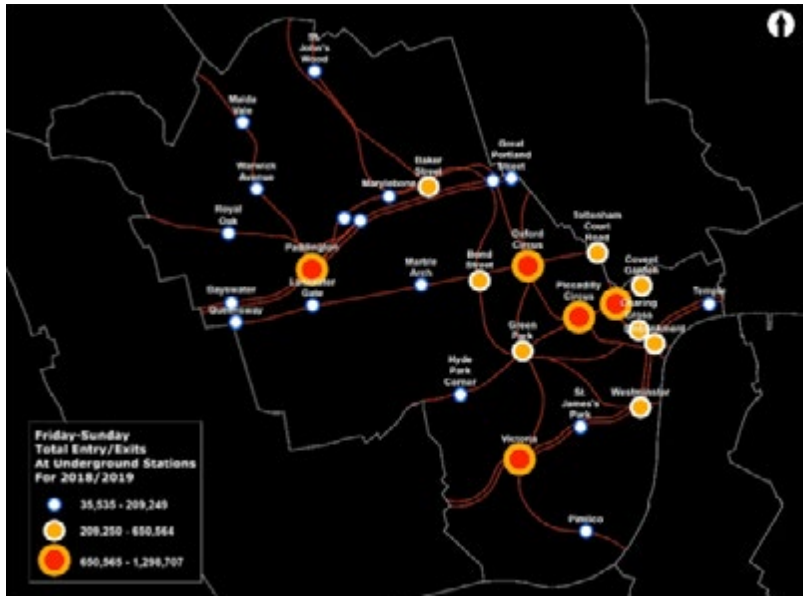


Hotspots of Anti-Social Behaviour Offences on Transport Services between 6pm – 6am

Total Entry and Exits on a typical day weekend 9PM and 3AM in 2019





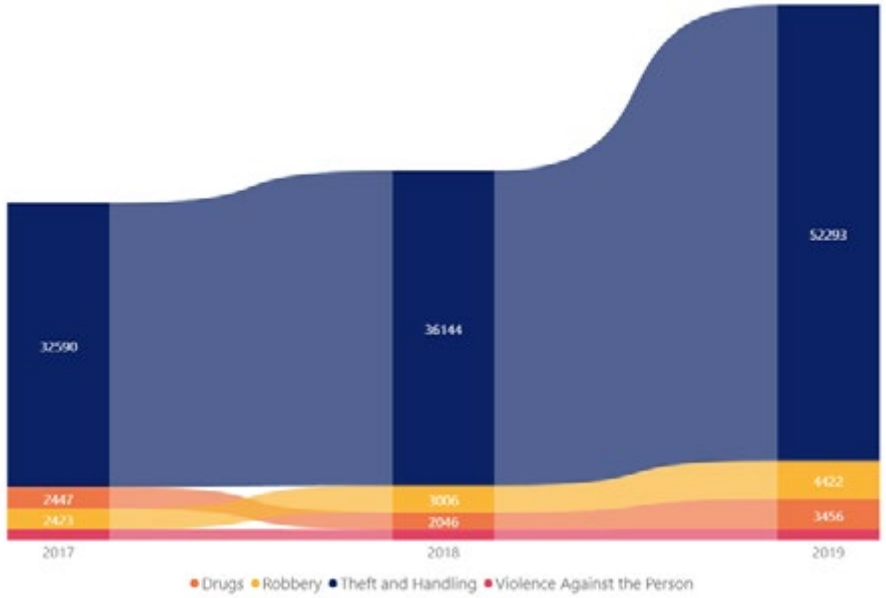


Public-Realm Crimes

Observed in this chapter are major crime types related to the public realm captured in the Crime Report Information System between (CRIS) 2017 and 2019. Analysts based the Metropolitan Police Service in Charing Cross advised the assessment to consider the following Major Crime Class:

- Thefts & Handling (121,000 crimes, 85%)
- Robberies (9,850 crimes, 7%)
- Drug Offences (7,950, 5.5%)
- Serious Violence Against the Person (3,540, 2.5%) (Minor Class: Grievous Bodily Harm and above)

In the last three years, all of these public realm crimes have increased. Furthermore, across all four types, Westminster recorded more crime than any other local authority in London.



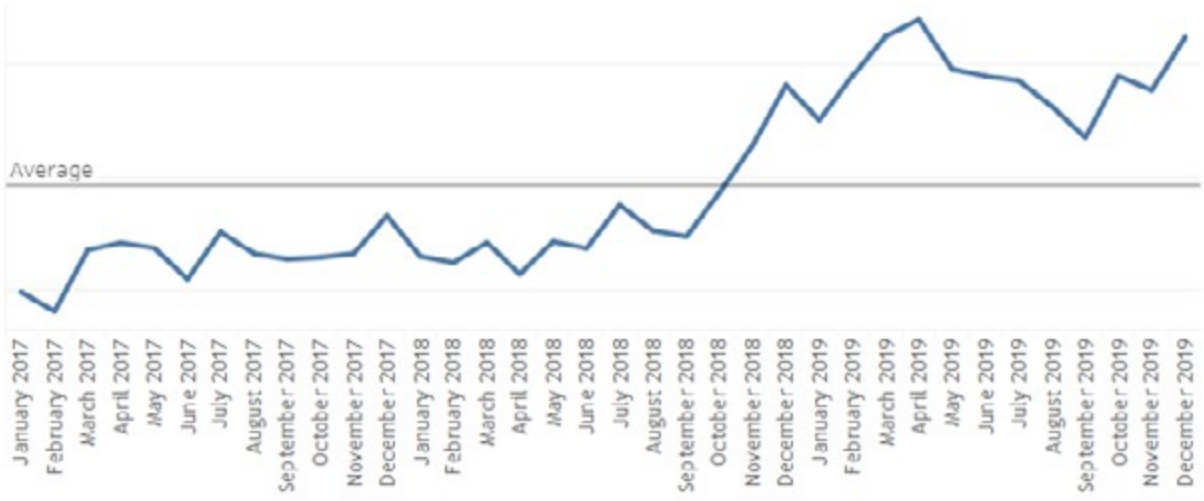
Theft and Handling

Theft and handling crimes describe thefts from a person, motor vehicle, bike, residential or non-residential property and more. Approximately 4 in 10 thefts in London occurred in Westminster between 2017 – 2019.

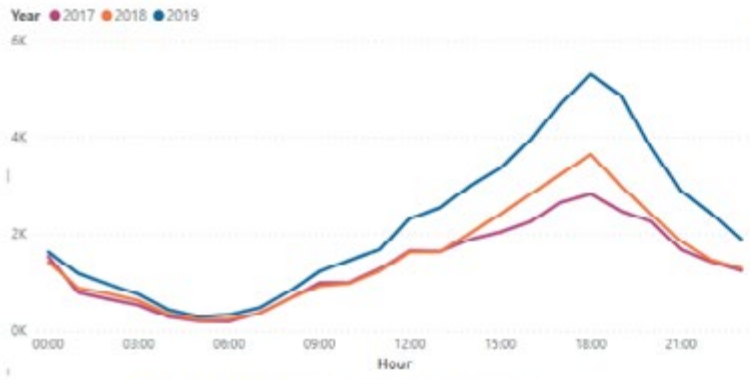
In the borough these rose year on year, 11% between 2017 and 2018 (32,590 to 36,144) and a further 45% between 2018 and 2019 (to 52,293) – totalling over 120,000 crimes.

Across all days of the week, thefts peaked at 18:00. They tended to be lowest on Sunday, rising throughout the week with the greatest volumes being recorded on Friday and Saturday.

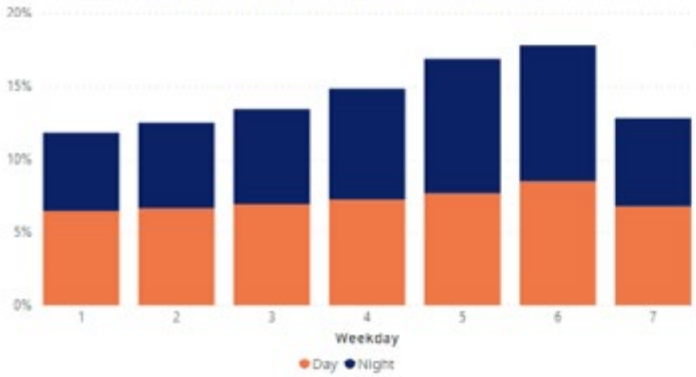
Thefts are the most common crime type in the borough and are reported across all parts of the borough to varying degrees. In the evening and night they are particularly concentrated in the West End and along Oxford Circus.



Total Theft by Hour and Year

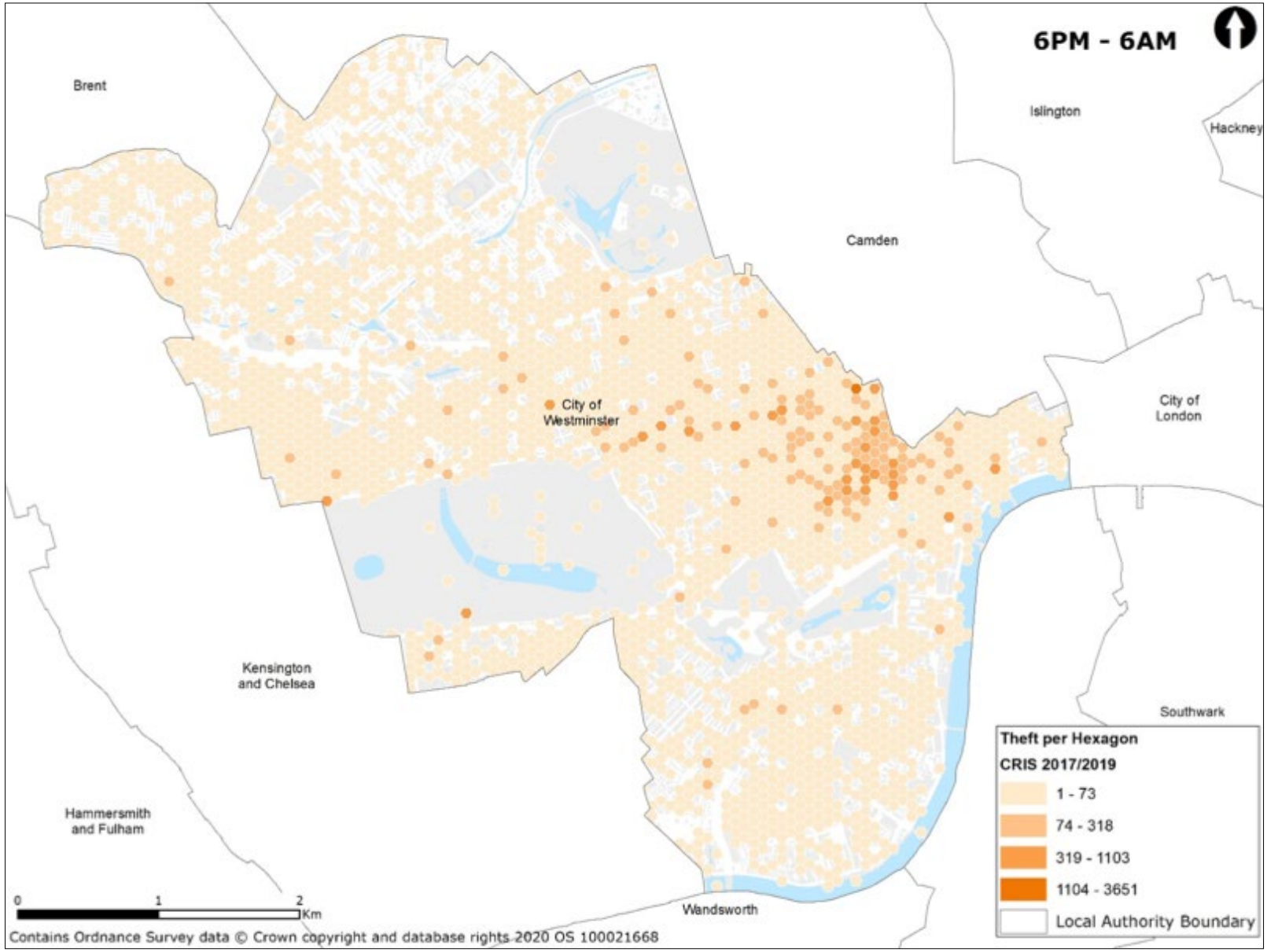


Total Theft by Time Bracket and Weekday



Total Theft by Hour and Weekday, CRIS 2017-19

Hour	1	2	3	4	5	6	7	Total
00:00:00	508	460	488	612	721	923	876	**4588**
01:00:00	193	227	225	377	446	693	699	**2860**
02:00:00	164	190	201	283	345	586	625	**2394**
03:00:00	144	152	178	233	280	436	492	**1915**
04:00:00	83	92	87	117	164	266	275	**1084**
05:00:00	72	76	68	79	106	160	170	**731**
06:00:00	98	116	119	106	101	122	116	**778**
07:00:00	189	209	179	193	201	125	125	**1221**
08:00:00	343	371	346	346	350	228	168	**2152**
09:00:00	468	516	477	489	539	370	291	**3150**
10:00:00	465	506	502	518	555	508	400	**3454**
11:00:00	577	541	621	592	685	656	526	**4198**
12:00:00	728	747	852	780	835	912	751	**5605**
13:00:00	794	818	778	877	821	986	747	**5821**
14:00:00	894	850	905	1002	978	1264	1015	**6908**
15:00:00	934	958	1022	1039	1086	1513	1259	**7811**
16:00:00	1097	1142	1147	1252	1336	1682	1369	**9025**
17:00:00	1265	1282	1433	1520	1715	1912	1446	**10573**
18:00:00	1412	1560	1696	1880	2038	1980	1201	**11767**
19:00:00	1244	1412	1547	1695	1961	1623	866	**10348**
20:00:00	1036	1049	1281	1345	1627	1402	725	**8465**
21:00:00	676	759	893	1069	1338	1181	501	**6417**
22:00:00	554	640	675	882	1167	1000	409	**5327**
23:00:00	380	411	561	713	1050	953	367	**4435**
Total	**14318**	**15084**	**16281**	**17999**	**20445**	**21481**	**15419**	**121027**


6PM - 6AM
Brent
Islington
Hackney
Camden
City of Westminster
City of London
Kensington and Chelsea
Southwark
Hammersmith and Fulham
Wandsworth
0
1
2
Km
Theft per Hexagon
CRIS 2017/2019
1 - 73
74 - 318
319 - 1103
1104 - 3651
Local Authority Boundary
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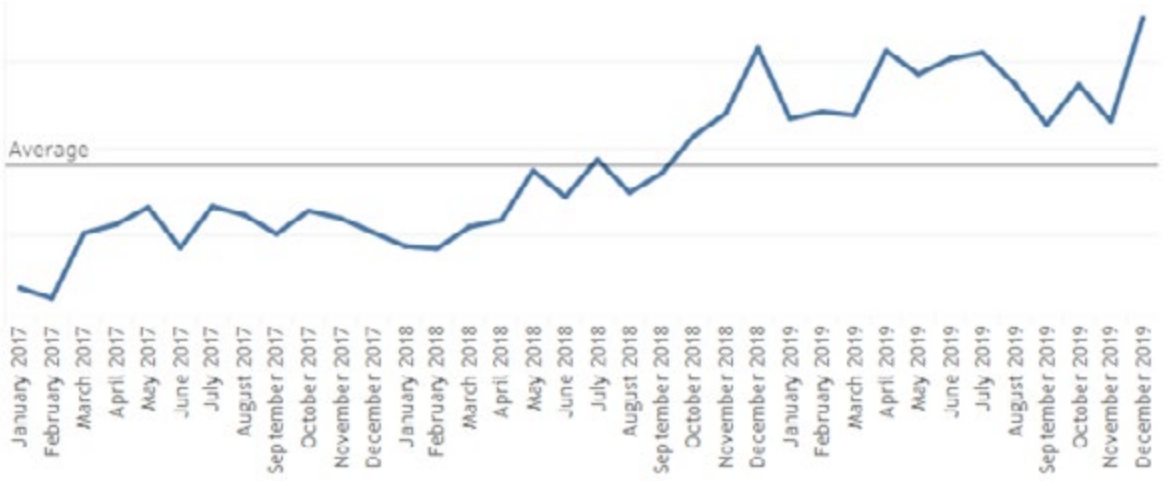
Robberies

Robberies describe thefts with the use of force or a threat of force. Both personal (circa 95%) and commercial robbery (5%) are included in this class, however snatch theft is not. Robberies in London more widely are four times that of the rest of England and Wales, accounting for 40% of crimes[11]. This is likely attributable to the large numbers of people travelling in and out of the city, leading to a greater supply of potential victims and possessions.

Robberies reported in Westminster are significantly higher than in other London boroughs, accounting for approximately 10% in the whole city over the last three years. The prevalence of robberies in the borough rose year on year, by 24% in 2017 – 18 and 47% between 2018 – 19, totalling 9850 across all years. On average, there were over 270 robberies a month over this period, however nearly half (45%) of occurred in 2019.

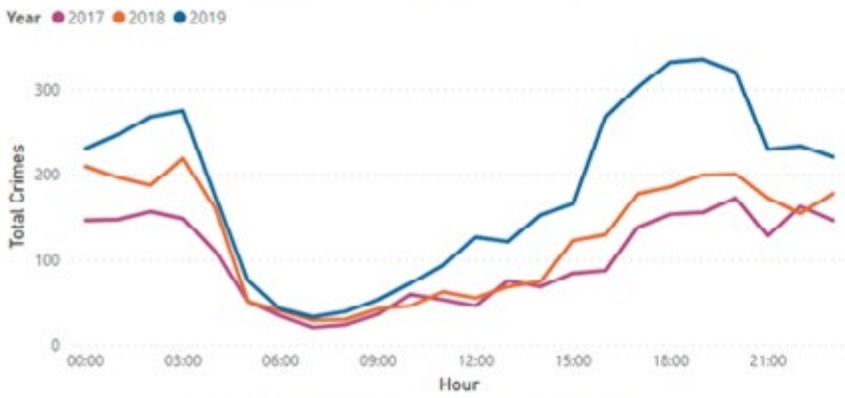
Over two-thirds (69%) occurred in the evening and night, peaking between 18:00 and 20:00, midnight and again at 3:00 – particularly on weekends.

Spatially, robberies clustered around Oxford Street during the day and within the West End, Charing Cross and along Oxford Circus in the evening and night.

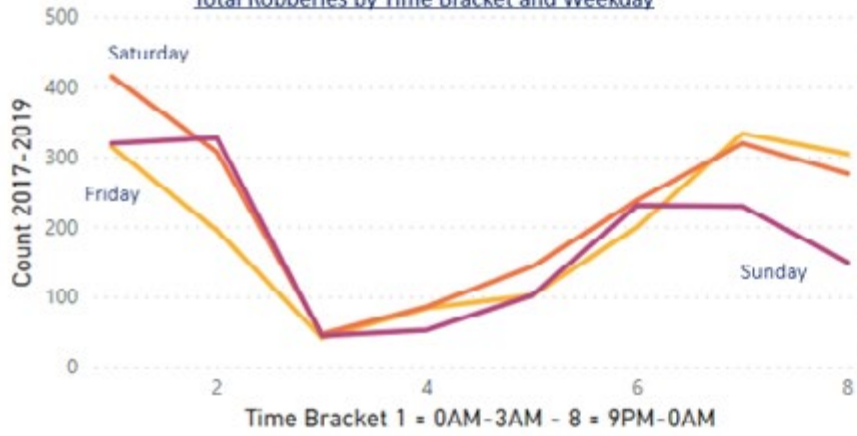


11 Wieshmann, Handan, et al. "Violence in London: What We Know and How to Respond." Publications, The Behavioural Insights Team, 30 Jan. 2020, bi.team/publications/violence-in-london-what-we-know-and-how-to-respond

Total Robberies by Hour and Year

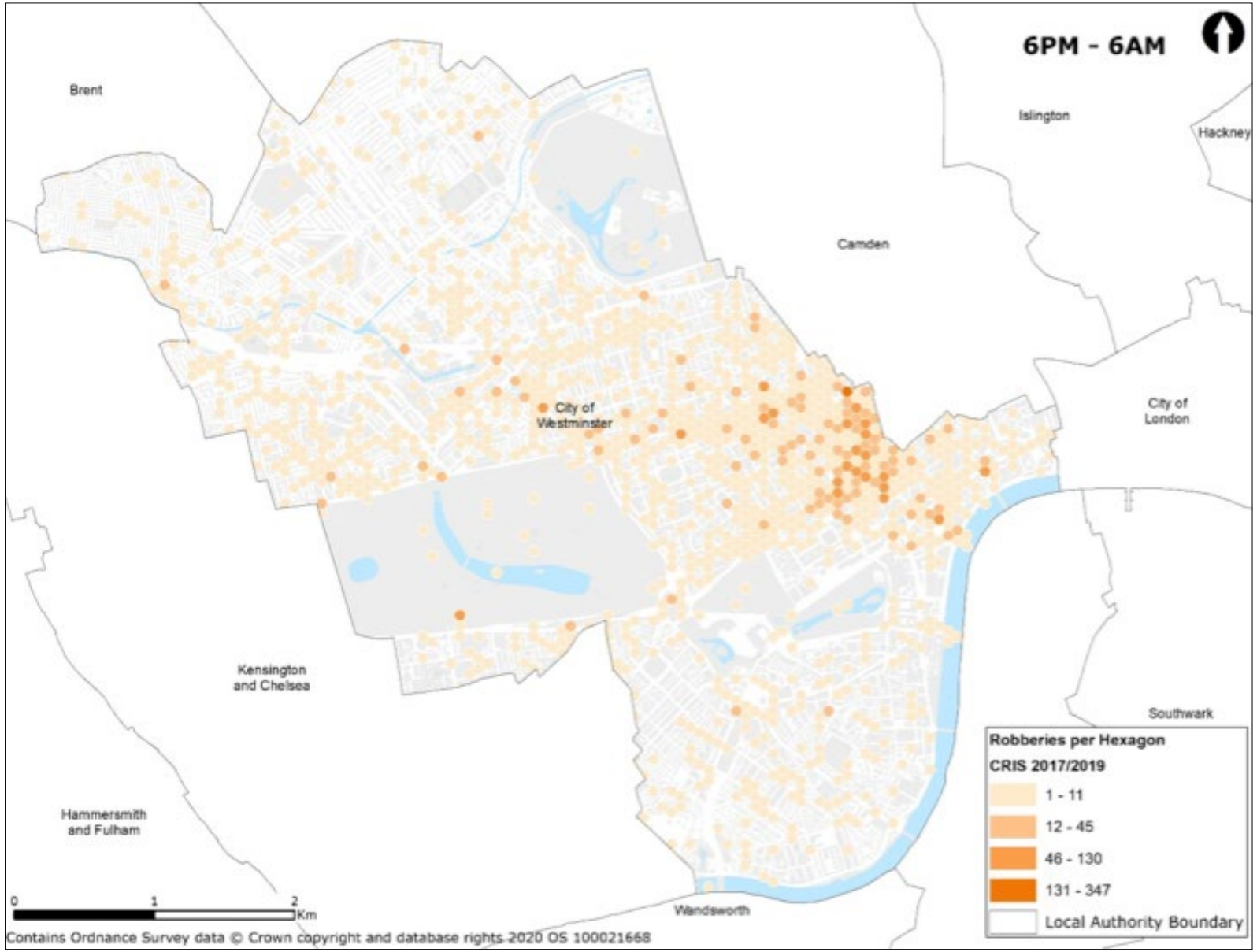


Total Robberies by Time Bracket and Weekday



Total Robberies by Hour and Weekday, CRIS 2017-19

Hour	1	2	3	4	5	6	7	Total
00:00:00	63	47	72	76	113	127	90	**588**
01:00:00	42	54	57	84	91	146	118	**592**
02:00:00	44	61	47	95	111	143	112	**613**
03:00:00	41	78	44	69	107	155	149	**643**
04:00:00	27	39	46	38	68	114	115	**447**
05:00:00	10	17	14	15	21	39	64	**180**
06:00:00	20	14	11	9	19	20	26	**119**
07:00:00	14	17	8	13	11	15	8	**86**
08:00:00	14	15	12	17	13	13	12	**96**
09:00:00	21	23	16	15	26	23	10	**134**
10:00:00	27	34	16	33	21	27	22	**180**
11:00:00	22	29	27	36	38	37	22	**211**
12:00:00	33	34	34	27	37	40	25	**230**
13:00:00	38	39	36	35	30	54	35	**267**
14:00:00	37	36	45	50	36	50	43	**297**
15:00:00	66	51	50	48	44	60	55	**374**
16:00:00	69	60	67	59	65	96	70	**486**
17:00:00	92	75	78	93	92	83	107	**620**
18:00:00	88	83	95	116	104	108	78	**672**
19:00:00	79	106	96	110	112	105	83	**691**
20:00:00	107	76	105	113	118	107	69	**695**
21:00:00	52	76	83	67	110	91	53	**532**
22:00:00	87	64	78	95	87	93	48	**552**
23:00:00	75	66	80	75	108	93	49	**546**
Total	**1168**	**1194**	**1217**	**1388**	**1582**	**1839**	**1463**	**9851**


6PM - 6AM
Brent
Islington
Hackney
Camden
City of Westminster
City of London
Kensington and Chelsea
Southwark
Hammersmith and Fulham
Wandsworth
0
1
2
Km
Robberies per Hexagon
CRIS 2017/2019
1 - 11
12 - 45
46 - 130
131 - 347
Local Authority Boundary
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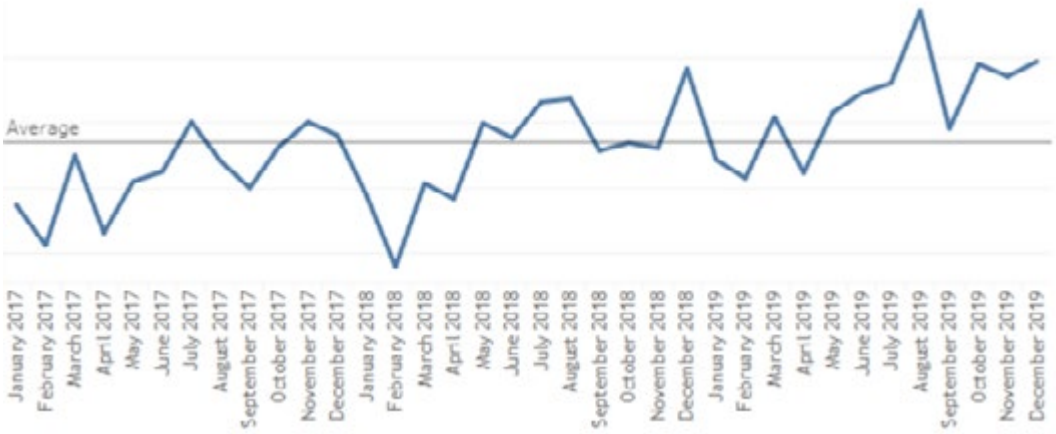
Violence Against the Person

The impact of alcohol consumption in large quantities on violent crime has been well documented[12], intoxication increases levels of aggression, influences potentially harmful social expectations, as well as acts as a depressant. it simultaneously increases vulnerability of potential victims. Higher concentrations of alcohol availability within neighbourhoods is strongly associated with the likelihood of violence[13].

Public violence is especially likely to be driven by alcohol consumption, in England and Wales nearly two thirds of violent incidents occurred over the weekend and at night[14].

Between 2017 and 2019, the highest volume of violence against the person within any London borough was recorded in Westminster. Over 30,000 offences were recorded, accounting for approximately 5% of all violent offences in London and nearly a third of all crime in Westminster.

Over the last three years, there were over 850 serious violent crimes in Westminster a month. Volumes were on the rise in late 2019 (increasing a total of 8.35% between December 2018 and 2019)[15].



12 Wieshmann, Handan, et al. "Violence in London: What We Know and How to Respond." Publications, The Behavioural Insights Team, 30 Jan. 2020, bi.team/publications/violence-in-london-what-we-know-and-how-to-respond

13 Gmel, G., Holmes, J., & Studer, J. (2016). Are alcohol outlet densities strongly associated with alcohol related outcomes? A critical review of recent evidence. Drug and Alcohol Review, 35(1), 40-5

14 ONS (2019) The nature of violent crime in England and Wales: year ending March 2018.

15 https://www.met.police.uk/sd/stats-and-data/met/crime-type-definitions/

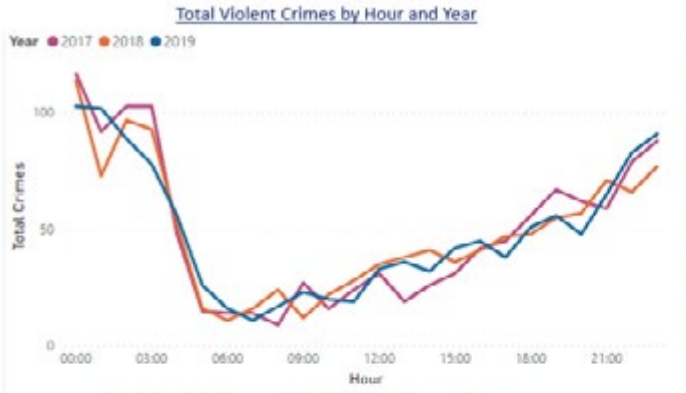
Serious Violent Crime

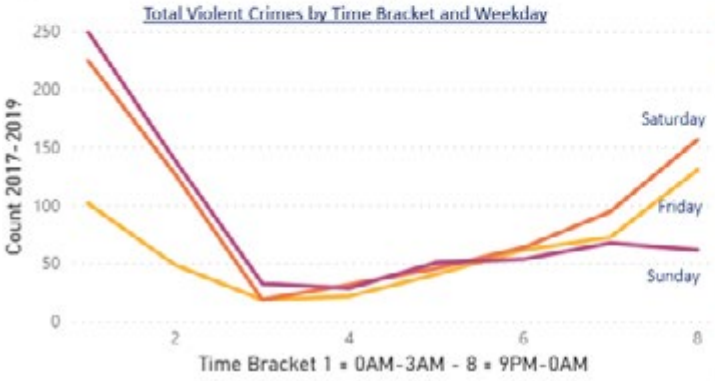
For this assessment, crimes categorised within the major class of 'Violence Against the Person' related to serious violent offences[16] were assessed. The minor class categories shared by the Metropolitan Police Service (MET) related specifically to crimes involving grievous bodily harm, homicide and 'other' violence. These offer only a partial view of all violent crime in the borough, excluding other minor class categories, including harassment and common assault which make up the majority of Violence Against the Person incidents. Data related to these offences unfortunately could not be obtained for this study but should be assessed in future iterations.

Summary of findings

In total there were 5000 unique serious violence crimes recorded in Westminster between 2017 – 2019, of those 70% (3540) could be retained after further data cleaning (for example removing those without a specific location). Based on these figures, there were 1,180 serious serious violent crimes recorded annually on average by the MET, exceeding 3500 over the last 3 years. Nearly three-quarters of these occurred between 6pm and 6am, most on Friday, Saturday or Sunday, peaking at 23:00, 00:00 and 3:00 respectively.

Serious serious violent crimes recorded between 6pm and 6am concentrated overwhelmingly in the West End, with isolated elevated rates in the north-west, centre and south of the borough.

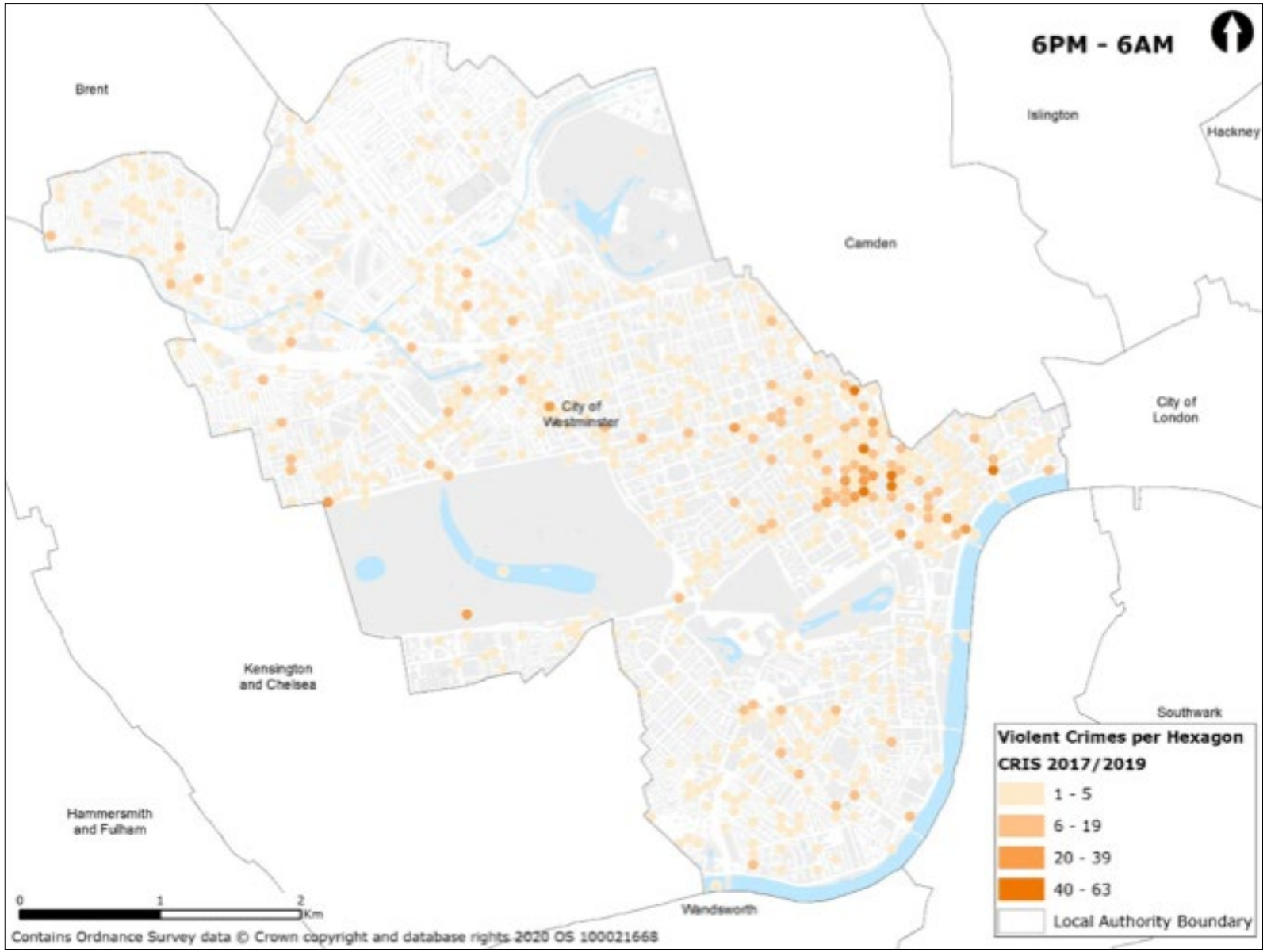




Total Violent Crimes by Hour and Weekday, CRIS 2017-19

Hour	1	2	3	4	5	6	7	Total
00:00:00	40	34	34	29	39	83	75	**334**
01:00:00	19	23	17	26	36	67	79	**267**
02:00:00	19	25	18	29	27	75	96	**289**
03:00:00	21	23	25	26	26	75	78	**274**
04:00:00	16	20	9	11	17	40	43	**156**
05:00:00	2	12	3	4	6	12	18	**57**
06:00:00	4	5	4	2	4	5	17	**41**
07:00:00	8	6	4	5	6	5	7	**41**
08:00:00	7	5	8	3	9	9	9	**50**
09:00:00	6	8	7	11	8	10	12	**62**
10:00:00	6	7	9	10	8	11	7	**58**
11:00:00	12	11	6	15	6	11	10	**71**
12:00:00	10	17	14	10	13	19	16	**99**
13:00:00	13	12	13	13	10	12	20	**93**
14:00:00	9	14	13	15	18	15	15	**99**
15:00:00	13	12	12	14	25	15	18	**109**
16:00:00	13	16	15	22	20	25	17	**128**
17:00:00	25	9	16	20	17	24	19	**130**
18:00:00	24	22	18	25	19	23	24	**155**
19:00:00	22	22	23	25	21	41	24	**178**
20:00:00	20	22	18	23	33	31	20	**167**
21:00:00	22	20	26	27	37	43	20	**195**
22:00:00	25	24	17	41	43	50	28	**228**
23:00:00	39	24	36	28	51	64	14	**256**
Total	**395**	**393**	**365**	**434**	**499**	**765**	**686**	**3537**

16 https://www.met.police.uk/sd/stats-and-data/met/crime-type-definitions/


6PM - 6AM
Brent
Islington
Hackney
Camden
City of Westminster
City of London
Kensington and Chelsea
Southwark
Hammersmith and Fulham
Wandsworth
0
1
2
Km
Violent Crimes per Hexagon
CRIS 2017/2019
1 - 5
6 - 19
20 - 39
40 - 63
Local Authority Boundary
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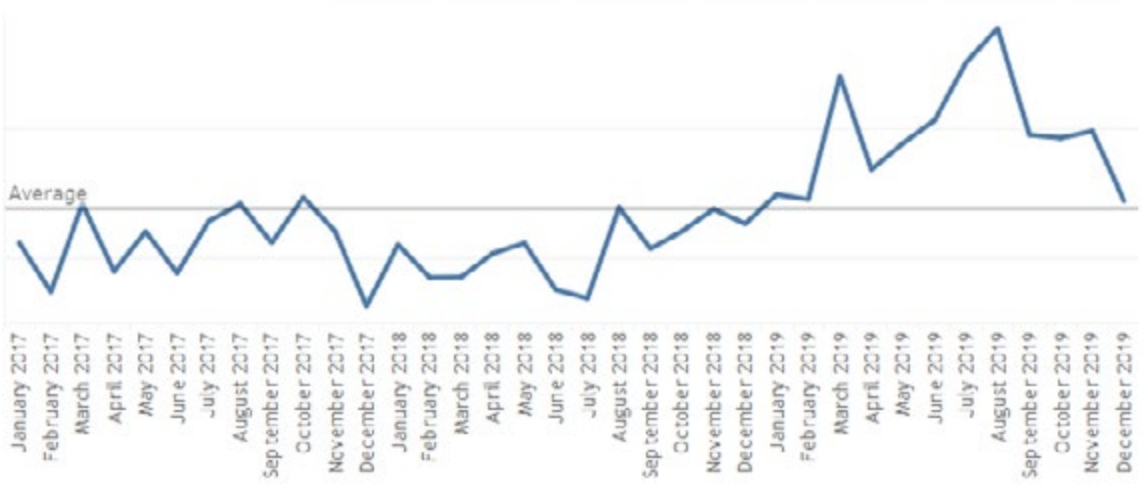
Drug-related Crimes

Crimes that fall under the major class 'drugs' relate to the possession, consumption, supply of or intent to supply illegal drugs. Levels of reported drug-related crimes, more than other types of crime here observed, reflect the police's targeting and policies.

Westminster recorded the highest volume of drug offences of any borough between 2017 and 2019. The prevalence of offences rose steeply between 2018 and 2019, from 2056 to 3456, following a fall between in 2018. Across the three years observed, there were 7949 drug offences reported in the borough, 43% of which occurred in 2019.

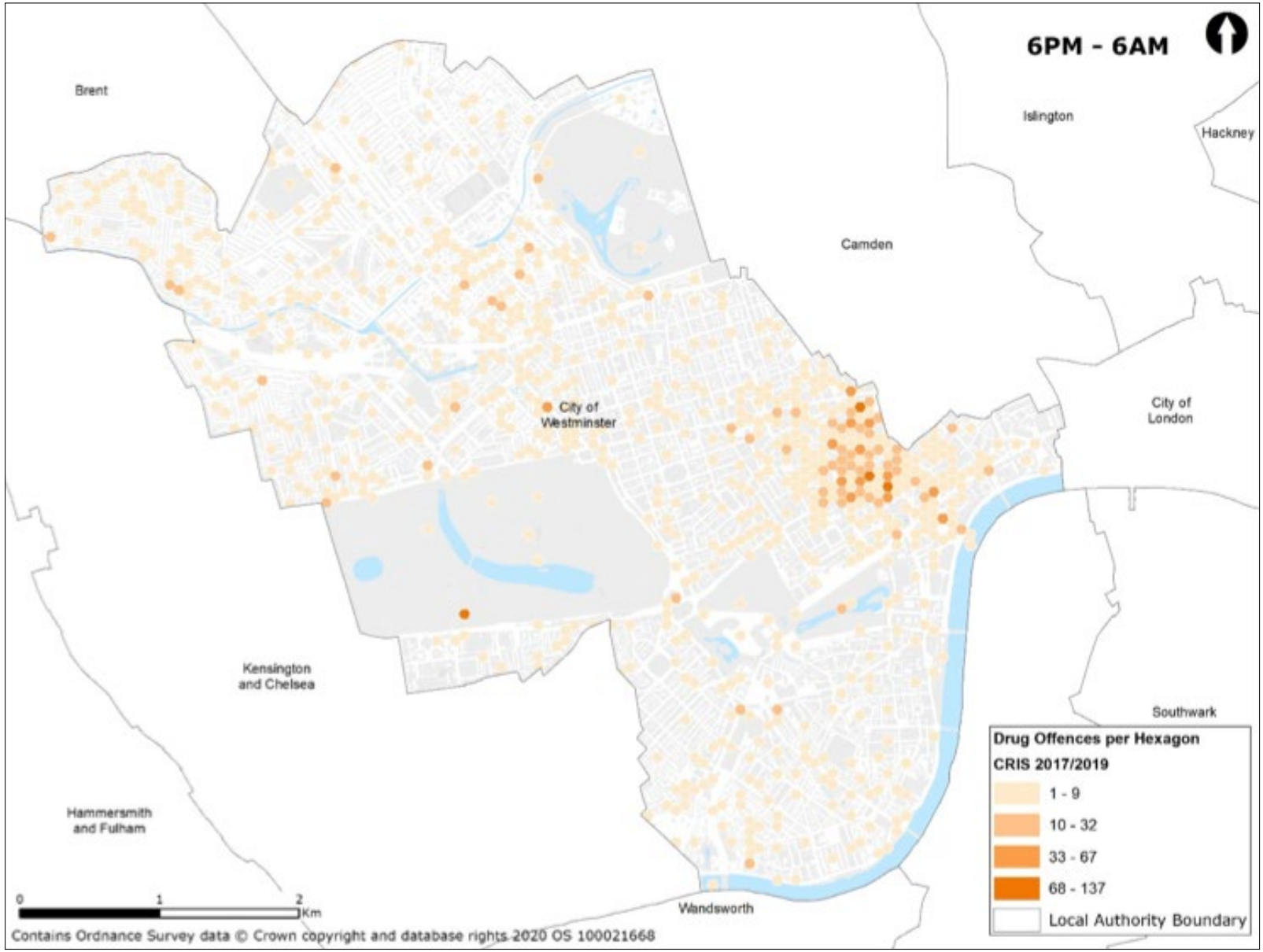
Half of crimes were reported (48%) in the evening and night over this period. Reports of drug-related crimes peaked in August in all three years and remained high in autumn of 2019. Overall, reported drug offences peaked in the late afternoon between 14:00 and 17:00 and to a lesser degree at night between 23:00 – 01:00.

Over this period, drug-related crimes reported between 6pm – 6am were significantly clustered in and around the West End to varying degrees, with a particular high concentration localised in Hyde Park.



Total Drug-related Crimes by Hour and Weekday, CRIS 2017-19

Hour	1	2	3	4	5	6	7	Total
00:00:00	65	71	73	75	100	111	103	598
01:00:00	36	49	33	52	75	96	60	401
02:00:00	20	34	31	29	44	70	48	276
03:00:00	16	24	19	30	49	65	43	246
04:00:00	18	15	12	20	23	37	36	161
05:00:00	6	8	4	10	8	8	16	60
06:00:00	3	5	4	4	1	4	10	31
07:00:00	4	15	7	14	9	9	7	65
08:00:00	22	10	10	18	14	5	7	86
09:00:00	21	26	25	24	23	13	14	146
10:00:00	29	45	30	43	35	14	17	213
11:00:00	28	46	56	49	47	23	23	272
12:00:00	54	58	49	75	66	44	32	378
13:00:00	114	64	50	83	55	34	41	441
14:00:00	133	79	75	80	73	62	69	571
15:00:00	156	90	94	110	81	73	92	696
16:00:00	148	59	86	114	81	71	87	646
17:00:00	102	92	73	80	70	68	96	581
18:00:00	55	40	52	60	66	48	57	378
19:00:00	52	42	47	62	48	47	48	346
20:00:00	61	40	53	49	54	51	48	356
21:00:00	41	39	43	50	72	52	35	332
22:00:00	29	28	28	42	55	33	27	242
23:00:00	41	53	65	59	71	82	56	427
Total	**1254**	**1032**	**1019**	**1232**	**1220**	**1120**	**1072**	**7949**


6PM - 6AM
Brent
Islington
Hackney
Camden
City of Westminster
City of London
Kensington and Chelsea
Southwark
Hammersmith and Fulham
Wandsworth
0
1
2
Km
Drug Offences per Hexagon
CRIS 2017/2019
1 - 9
10 - 32
33 - 67
68 - 137
Local Authority Boundary
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Noise and Odour Complaints

Note about the data

Noise and odour complaints recorded between 2017 – 2019, including the date, time and coordinates here observed were retrieved from the council's Uniform platform which collates complaints recorded through numerous sources including: ReportIt, FixMyStreet and the Call Centre.

Relevant fields were selected with the council's noise management expert in March 2020. Several categories of noise were advised to be considered by the service as these were more likely to be related to licensed premises:

- Noise in the Street
- Noise from Commercial Premises
- Odours and Smoke

A 'complaint' is recorded when a member of the public raises a concern through one of the council's contact portals. As noise is a subjective experience of sound, complaints depict the prevalence of nuisance individuals are willing to report, not the prevalence of negative experiences of sound.

The fields observed here are fairly broad classifications and therefore cannot confidently be attributed to the activities of licensed premises. Complaints relating to noise in the street may be associated with other issues such as pedi-cabs, buskers or construction. Likewise, there is no field which captures noise complaints from a licensed premises specifically, as most complainants would not be aware of the distinction. However, these broader descriptions, combined with the time and location of incidents in proximity to where and when licensed premises operate offers an indication of nuisance.

It should however be noted that whether noise complaints are sourced from a serial complainant or multiple concerned residents is not captured. Furthermore, depending on the channel by which complaints are reported, error can occur in locating the source of the noise. This may be due to the complainant's description, recipients lack of clarity about area described or the nature of how sound moved through space.

Patterns

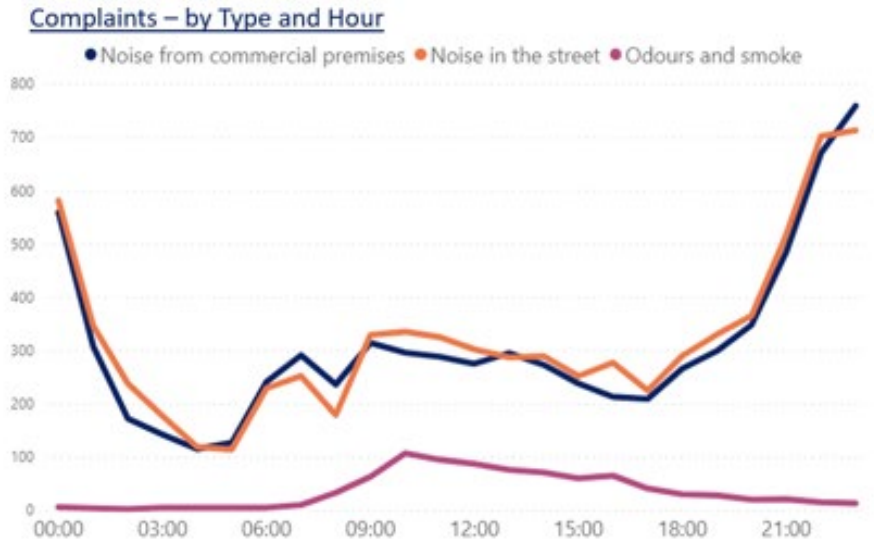
Over 15,000 noise complaints were recorded in Westminster between 2017 and 2019 related to 'commercial premises' and 'noise in the street'. Across the three years, recorded noise complaints peaked in 2019 at 5,800, a 27% rise (1,240 complaints) upon the previous year.

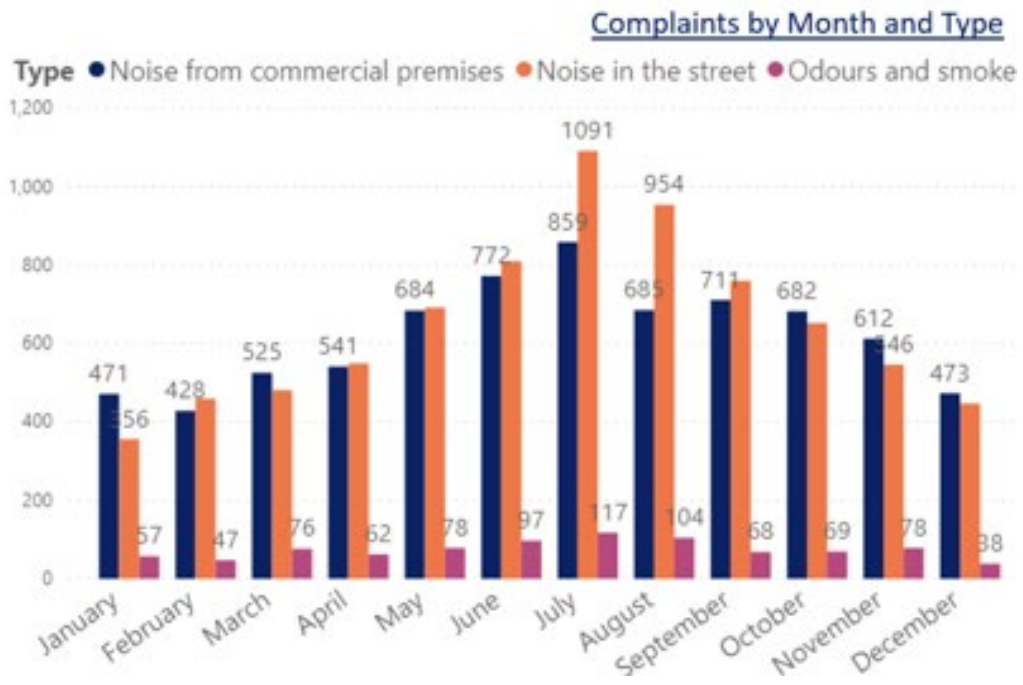
Noise complaints demonstrate seasonal patterns, with the highest volume of complaints in the summer months peaking in July and at their lowest in January.

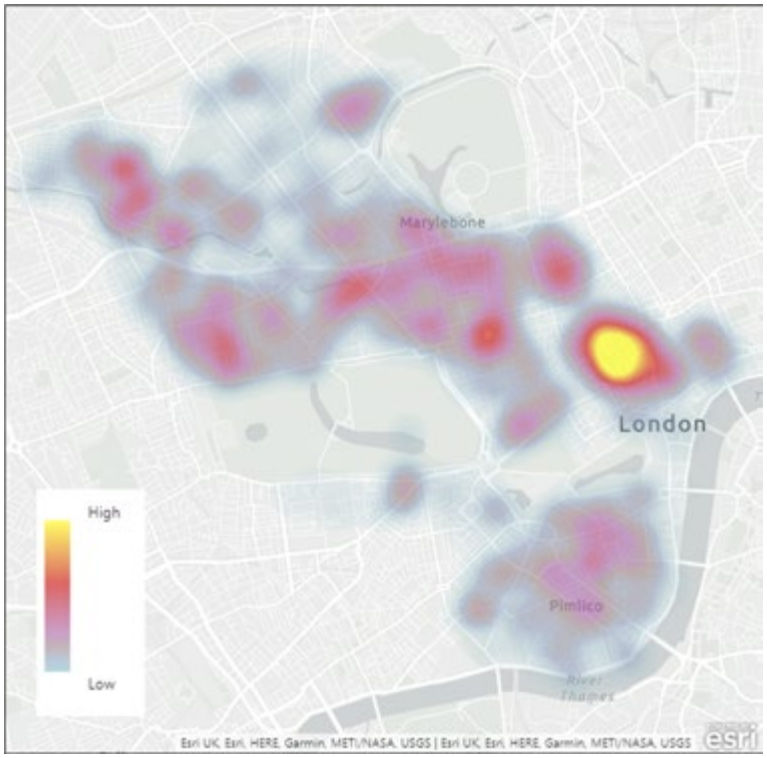
Across the three years, complaints were highest on Thursday nights and remained elevated on Friday and Saturday nights. Over half (58%) of complaints were reported at night, peaking between 22:00 and midnight on average.

On average, only 300 complaints related to odour were recorded annually, also peaking in summer months and typically reported during the day. These are excluded from further analysis.

Noise complaints between in the evening and night (6pm – 6am) were primarily concentrated in the West End, as can be seen below.




Complaints by Month and Type
Type
Noise from commercial premises
Noise in the street
Odours and smoke
1,200
1,000
800
600
400
200
0
471
428
525
541
684
772
859
685
711
682
612
473
January
February
March
April
May
June
July
August
September
October
November
December


Marylebone
London
Pimlico
River Thames
High
Low
Esri UK, Esri, HERE, Garmin, METI/NASA, USGS | Esri UK, Esri, HERE, Garmin, METI/NASA, USGS
esri

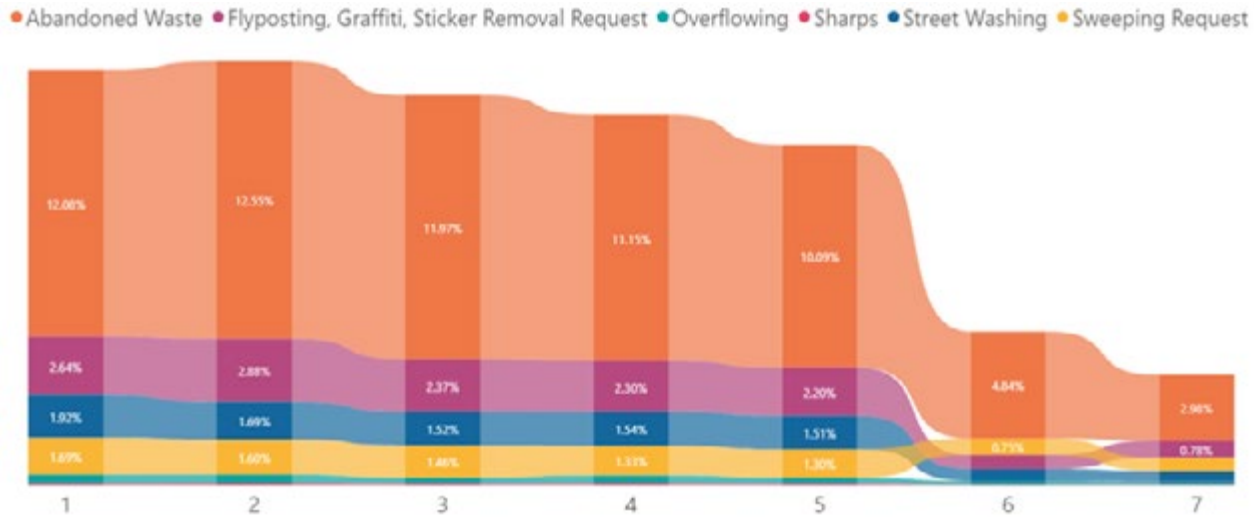
Demand for Waste Services

Note about reactive-waste data

A waste-related 'complaint' may arise when an expected service was not met by the council's service provider (Veolia) and a 'service request' is made reactively when an additional demand needs to be met. Although all reactive cleansing requests are reported, they provide an incomplete picture of the overall cleansing tasks completed.

Waste is almost wholly collected pro-actively through scheduled collections (more than 90%), which reflect levels of demand in the city (for example the West End receives three sweeps a day). Insights on scheduled service tasks completed as part of day-to-day operations could not be obtained as this data has been characterised as commercially sensitive.

Westminster's waste service have advised that only rarely are reactive requests or complaints made and these are mediated through a number of factors. The data here observed describes the where, what and when of the reactive cleansing however only offers a partial view of the greatest demands for waste services in Westminster. It is therefore considered but not taken into account for potential boundary definitions of cumulative impact zones.



Source of waste service demand as percentage of the total, by Weekday (Mon – Sun)

Patterns

Requests for waste services, as well as complaints rose year on year, from 20,475 in 2017 to 22,340 in 2018 (9%), and a further 5.5% to 23,565 in 2019 – averaging a growth rate of 7.25%**.** 67,270 service requests and complaints were recorded in total.

65% related to abandoned waste on the street and a fifth (18%) to street washing and sweeping. Removing flyposting and graffiti accounted for 14% of requests and complaints made. The remaining requests related to a range of issues, including overflowing bins and sharp objects.

On average, the greatest volume of reactive service requests were recorded on Tuesdays, records more than halved on the weekend.

Resident Concerns

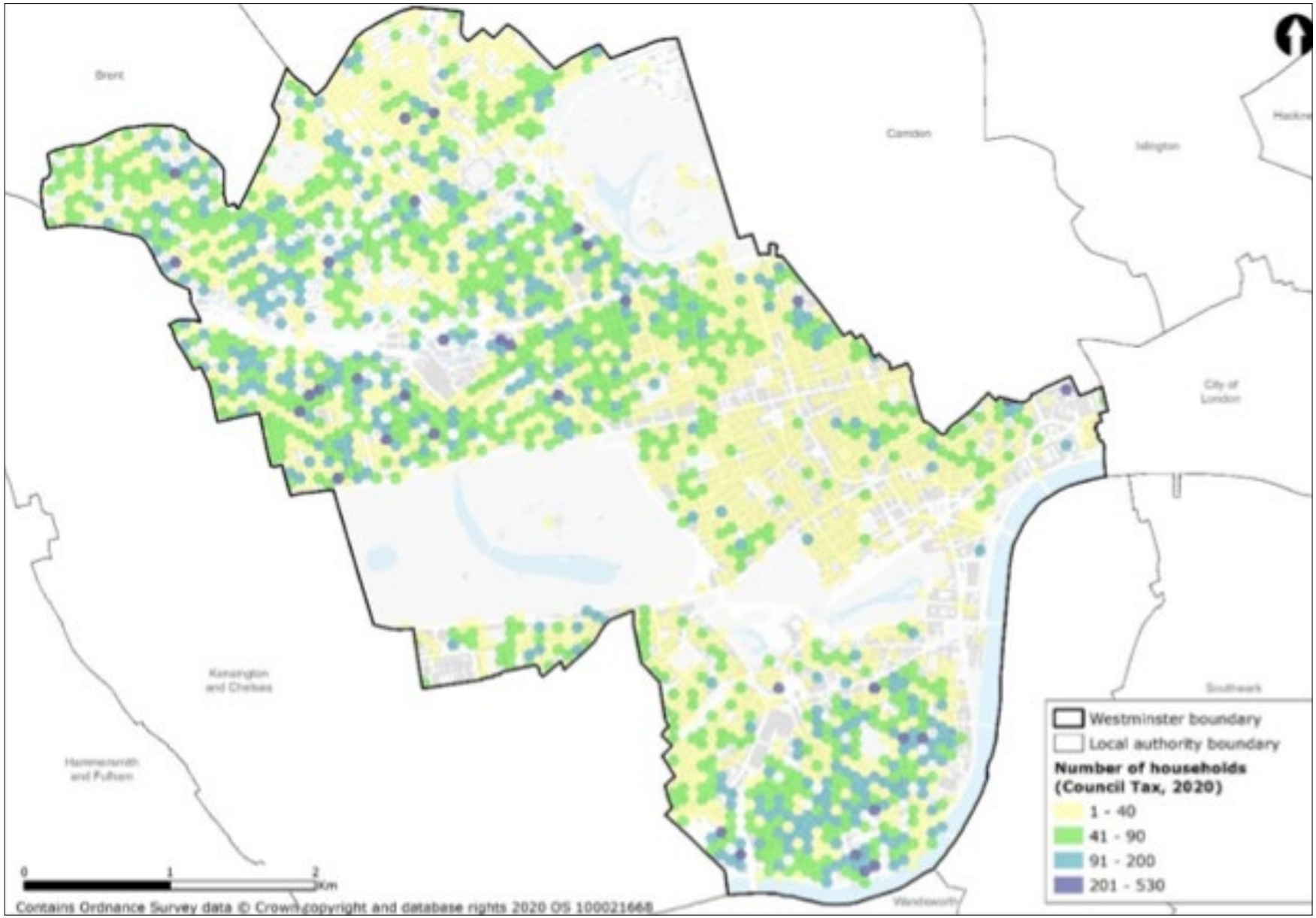
A resident survey is undertaken annually by an independent research company for Westminster City Council, selected responses collected between 2017 – 2019 are here assessed.

Summary: Of the 7600 resident survey respondents in the last 3 years, three-quarters were not concerned about problems in their local area related to issues with licensed premises, ASB, drug use, drunken behaviour, rubbish, public smoking, vandalism and violence. While nearly one-fifth (18%) felt drug use and dealing specifically was a fairly big problem. However, nearly 1 in 10 (9%) of all respondents were significantly concerned about all the above-mentioned issues.

For context, the hexagon **map below** displays the concentration of residential households in the borough:

Selected survey question: the methodology of the annual City Survey remained consistent across all three years to ensure results were comparable across years:

- Face to face survey, 25 minutes long
- Sample size: 2500+ residents, geographically spread to ensure results are representative at the ward level
- Demographic quotas were set to be representative of the borough population according to: age, gender and working status
- Independent social research company carried out all fieldwork and processed all primary data, relaying anonymised data to council officers


Brent
Camden
Islington
City of London
Kensington and Chelsea
Hammersmith and Fulham
Southwark
Wandsworth
Westminster boundary
Local authority boundary
Number of households (Council Tax, 2020)
1 - 40
41 - 90
91 - 200
201 - 530
0
1
2
Km
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The following question offered insight on resident concerns in their local area, which may be directly or indirectly affected by cumulative impact:

"Thinking about this local area, to what extent if at all do you think these issues are a problem..."

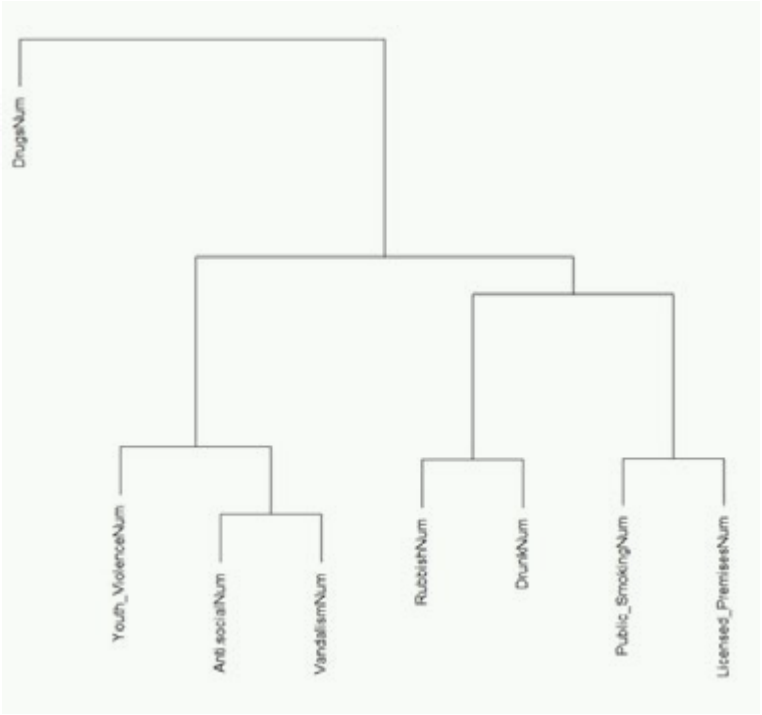
- rubbish and litter lying around
- people being drunk or rowdy
- anti-social behaviour
- vandalism, graffiti and other deliberate damage
- people using or dealing drugs
- violence among young people
- smoking in public places
- issues related to licensed premises (e.g. people drinking/ smoking outside, blocked pavements, deliveries, etc.)

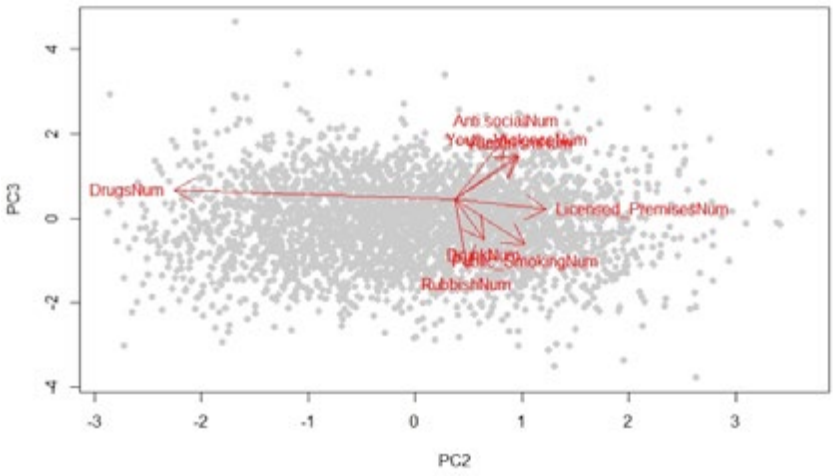
Response options ranged between 'A Very Big Problem' – 'Not A Problem At All', including a 'Don't Know / No Opinion' response.

Method: To better understand variation in concern amongst residents, we used a form of unsupervised machine learning (neural gas cluster analysis) to group survey respondents into naturally existing segments. The analysis was conducted using the free statistical software package "R", and segments were derived based on how concerned residents were about 8 issues/problems (see above). Similarly, we also used principal component analysis (PCA) to establish how closely opinions on particular issues were clustered together. These outcomes are presented below.

Results: A cluster dendogram and PCA plot show that resident opinions about particular issues tend to cluster together in the following groups:

- Those primarily concerned about drug use and dealing.
- Those primarily concerned about youth violence, anti-social behaviour and vandalism.
- Those primarily concerned about rubbish/littering, drunken behaviour, smoking in public places and licensed premises.





Segmentation analysis revealed 5 distinct segments, each of which can be categorised based on varying levels of concern about 8 local issues/problems.

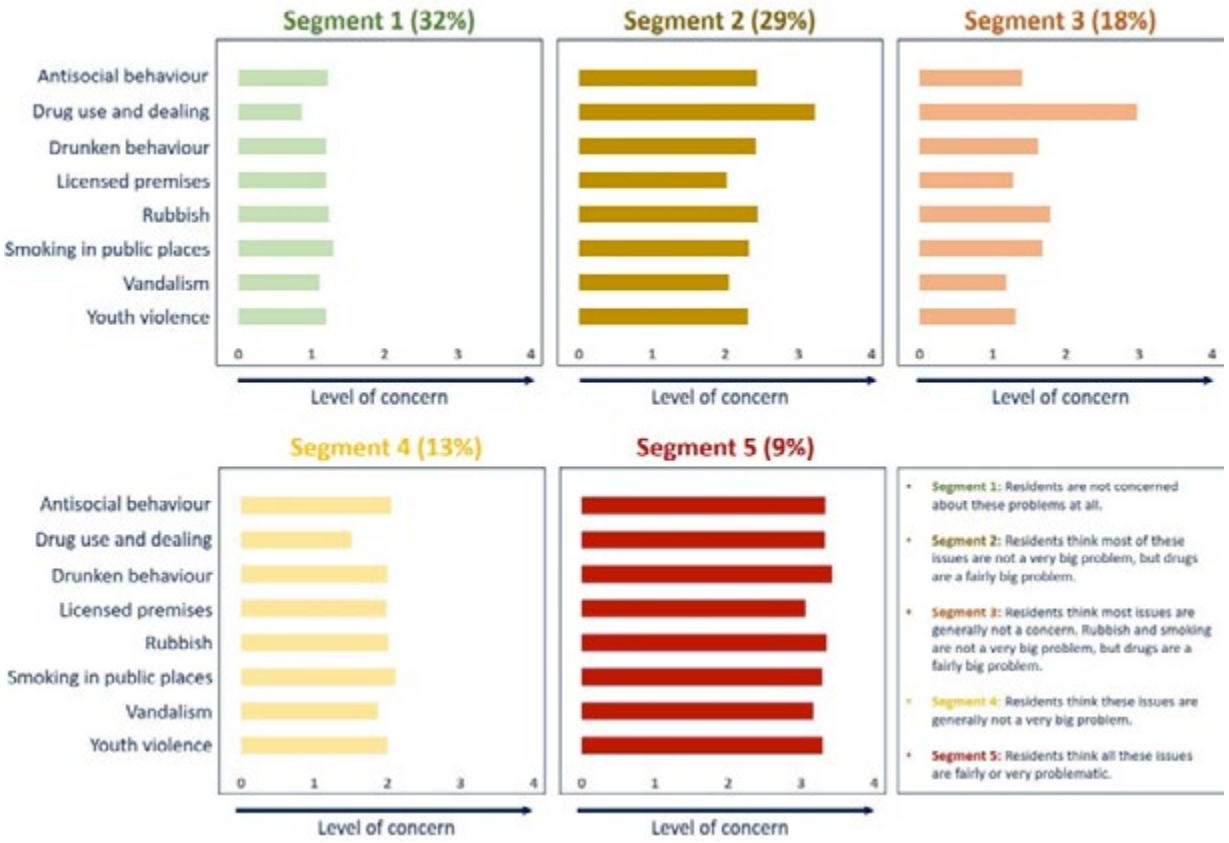
Worth noting is segment 5 (9% respondents across the three years), in which respondents were **fairly or very concerned** about all the issues, on average.

We also examined how respondents from each segment felt about their safety walking alone in the area they live after dark. Response options ranged from 'Very Safe' to 'Very Unsafe', with a 'Don't Know' option.

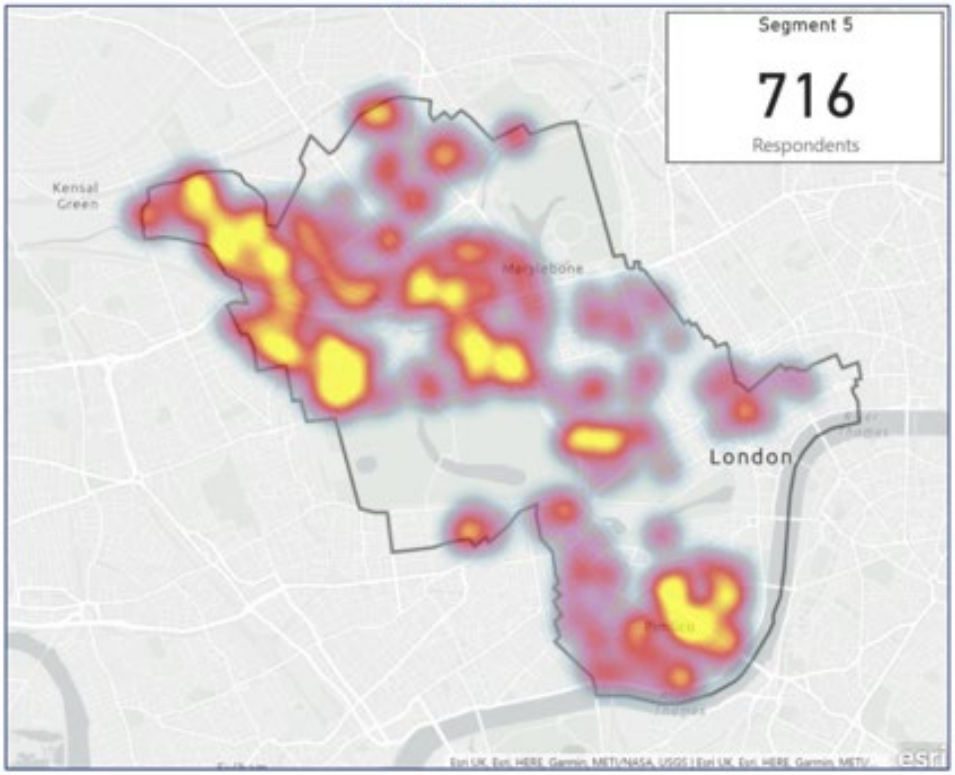
Despite containing only 9% of respondents, the chart below indicates that segment 5 accounted for more than a third (36%) of residents who felt 'very unsafe', and almost a quarter (23%) of residents who felt a 'bit unsafe'.

Respondents in segment 5 (n=716) were unevenly spatially distributed, clustering in particular parts of the borough over the 3 years sampled. The maps below display where respondents belonging to segment 5 live.

Note that, although the heatmap offers an indication of where concerned residents concentrate spatially, the city survey is not representative of resident views below the ward level.

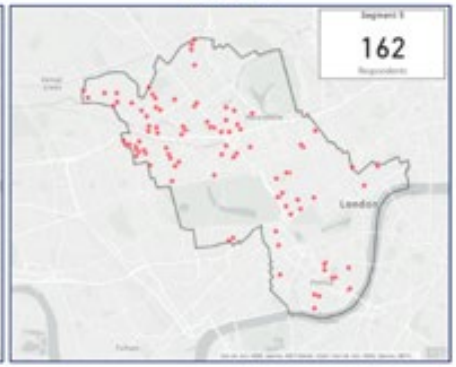


2017-2019

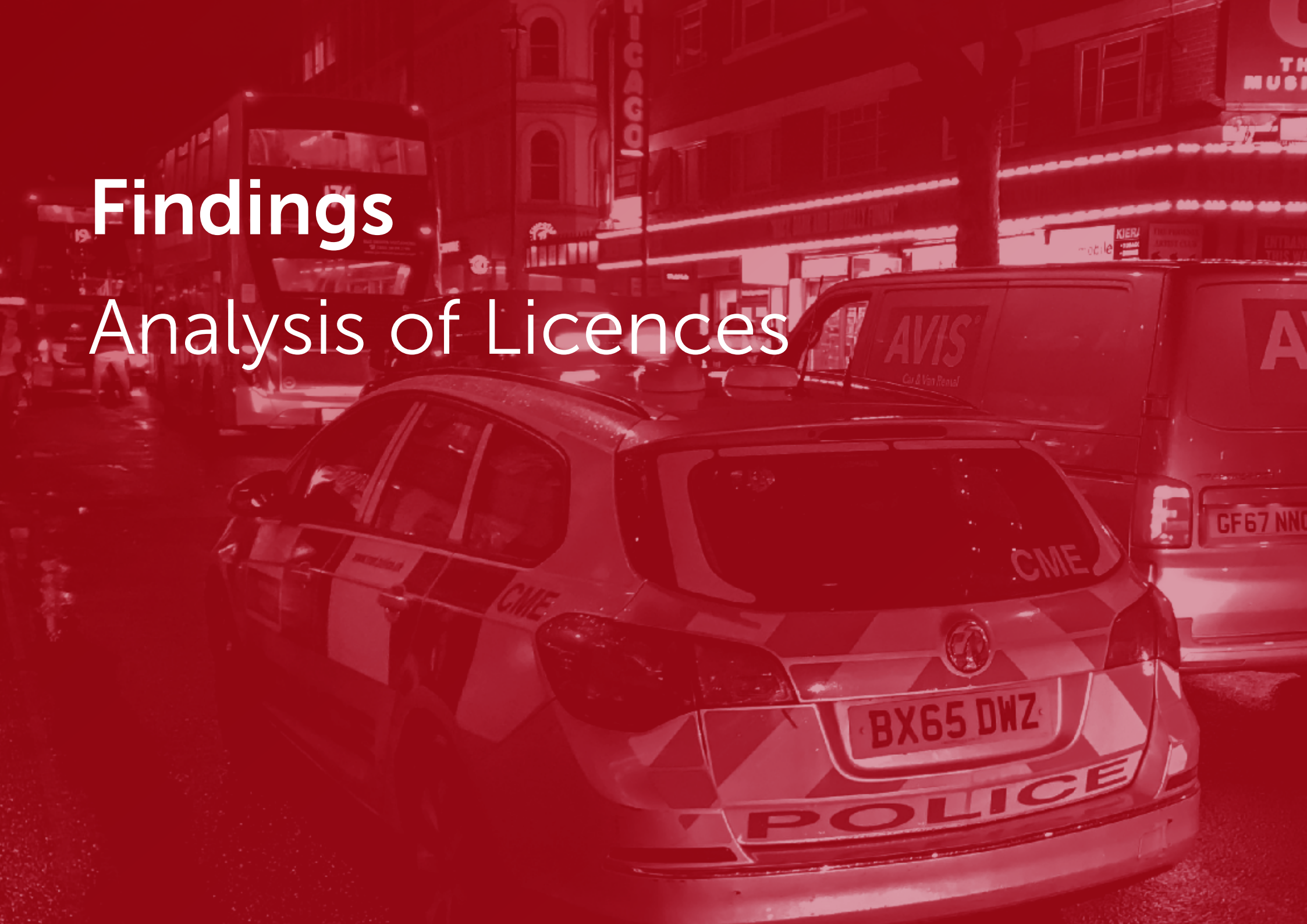


2017

2018



2019



Findings

Analysis of Licences

Findings
2. Analysis of Licences

The following analyses examines the relationship between licences, by type and location, and incidents indicative of cumulative impact which occurred between 2017 and 2019 described above. As not all data sets were sufficiently granular for the model (required coordinates), the regression analysis focuses on:

- all major crime categories (daily average and 6pm – 6am)
- noise complaints (daily average and 6pm – 6am)
- anti-social behaviour (daily average)

Before delving into the approach and the results of the regressions analysis, the borough's composition of licences are first described in more detail.

Profile of Licencing Data

Important Note on Interpreting Licensing Data

The council's licensing data is primarily collected for operational purposes in a system called Uniform. Extracted for analysis were licences with an 'issued' status in February 2020 under the Licensing Act 2003. Exclusively assessed were licences with a 'premises' or 'club certificate' licence.

Among the fields queried were the unique licence reference number, business' trading name, address, UPRN, premises type, the time period(s) a licence is are permitted to operate, and the coordinates of the premises to which the licence was issued.

Depending on the nature of a premises, multiple licences may be issued to the same business. Although licences hold unique reference numbers in the system, specific premises do not. Trading names, addresses and UPRN's are also not unique for a variety of reasons. Therefore, only **approximations** of premises could be made by using the distinct locations (concatenating the XY coordinates) of licences as a proxy these are referred to as **unique licence locations**.

It should also be noted that a licence issued does not necessarily mean it is in use, instances of this have been identified in the data. Similarly, permitted trading hours outlined in a licence may not reflect a business' opening hours in practice.

A complex string listing multiple combinations of time periods and hours a premises is permitted to trade (e.g. Monday to Thursday 11:00-23:00, Friday – Saturday 11:00 – 1:00, Sunday 12:00 – 22:00), required extensive cleaning and data manipulation to glean broad insights about operating hours. Assessed in the analysis of operating hours are **approximations**, not accurate reflections of the number and type of premises in the borough and their associated operating hours.

Lastly there were numerous types of premises to which licences were issued. To facilitate data analysis and visualisation, these were categorised into larger premises type groups, to see how these were grouped please see Appendix 4.

Limitations

In addition to the above-mentioned limitations of the licensing data, the following should be noted:

- Classification of premises types can be misleading (e.g. a 'restaurant' can refer to a fine dining establishment, a venue which also hosts a late-night bar and club or a McDonalds)
- Nearly 5% of licences have a 'not recorded' premises type

Although the majority of licensing data was accurate, the following was identified in the data:

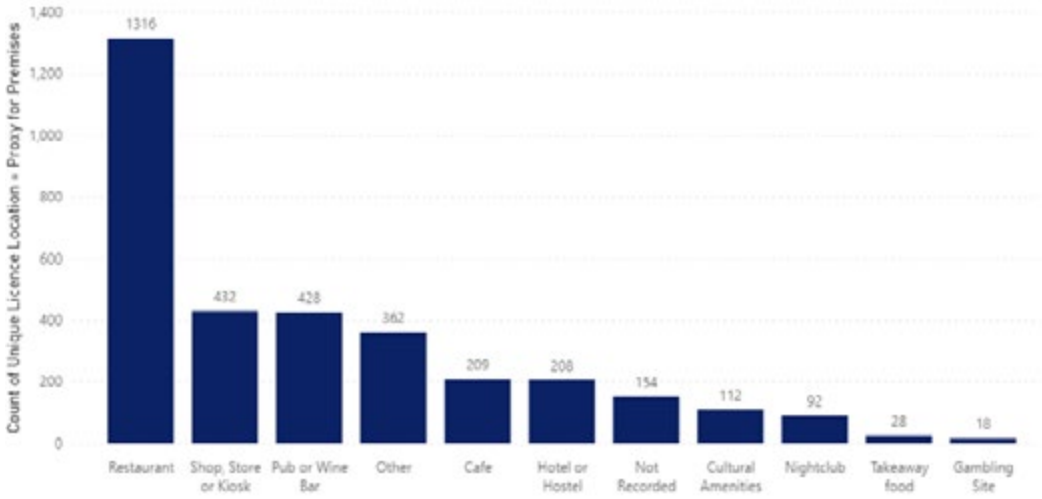
- If a premises with multiple licences is described differently (e.g. in one of its licences it is a hotel and in another a bar), it will be counted twice when the unique licence location by premises type is observed
- In some instances XY coordinates for the same premises differed marginally, leading to separate unique licence locations (used as a proxy for premises)

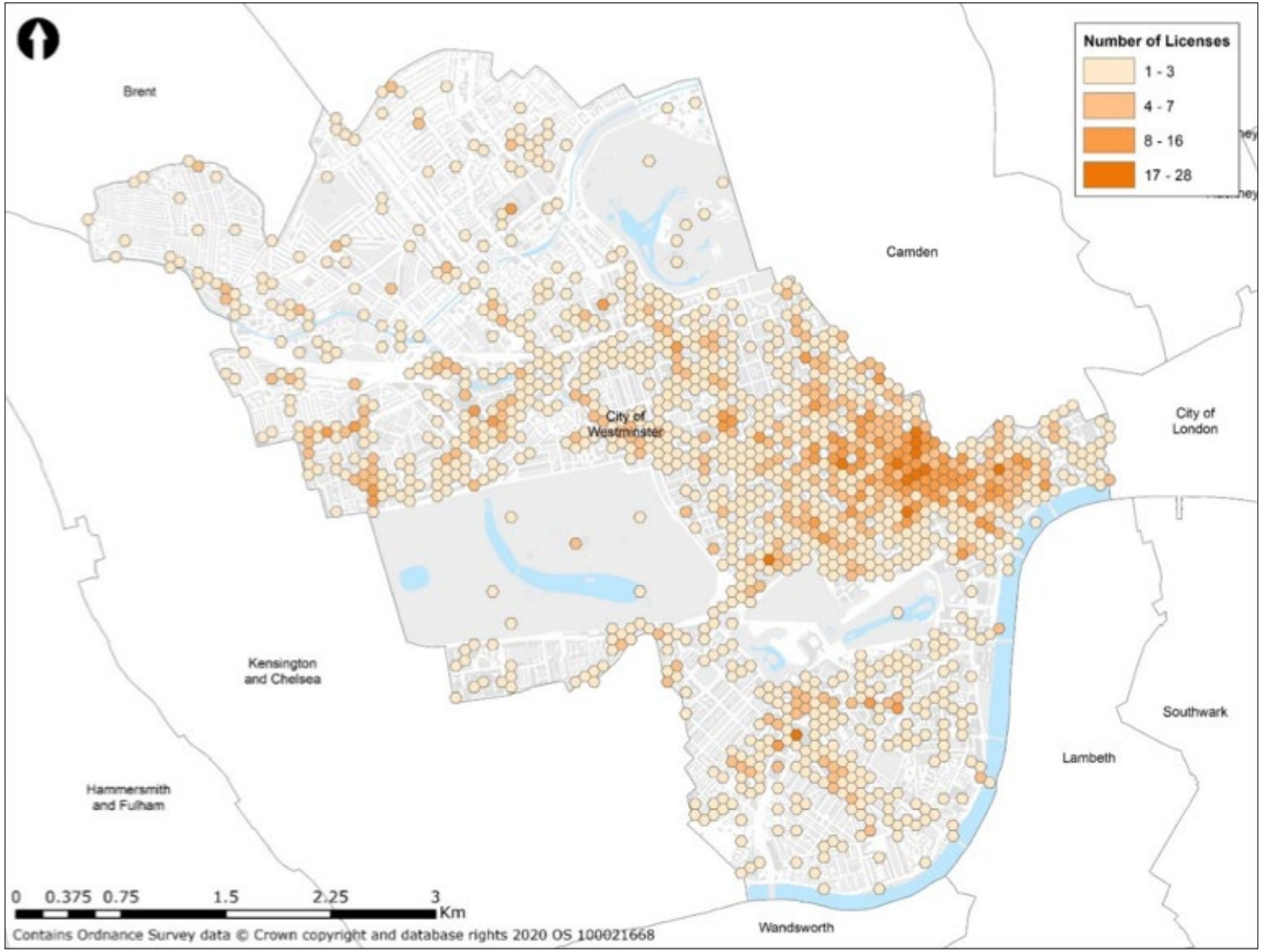
LA03 Licences in Westminster

As of February 2020, there were 3769 unique 'premises' and 'club certificate' licenses issued under the Licensing Act 2003 in 3076 unique locations in the City of Westminster. Unique licence locations grouped by premises types (see Appendix 4) are displayed in the bar chart below.

39% of all unique licence locations are characterised as restaurants, 13% as a shop, store or kiosk and 13% as a pub. Cafés and hotels each account for 6% of licence locations, while Nightclubs and a range of cultural amenities such as theatres and cinemas, each represent 3% of licensed locations.

The concentration of unique licence locations in the borough are displayed in the figure below.




Number of Licenses
1 - 3
4 - 7
8 - 16
17 - 28
Brent
Camden
City of Westminster
City of London
Kensington and Chelsea
Southwark
Lambeth
Hammersmith and Fulham
Wandsworth
0 0.375 0.75 1.5 2.25 3
Km
Contains Ordnance Survey data © Crown copyright and database rights 2020 OS 100021668

Trading Hours

Data Note

Of the 3769 licences under LA03 issued in February 2020, 2778 held details on permitted trading hours that could be analysed further. 979 licences (26%) have therefore been excluded, 88% of which did not have a premises type recorded either. Also, among this excluded data are 54 licences (2% of total) which held opening hour details could not be transformed.

Of the remaining **three-quarters of licences**, the hours analysed refer to the times a premises is permitted to operate under its licence, business trading hours may differ in practice. Trading hours vary across days of the week and days of the year, in total there are 1080 distinct combinations of trading hours.

Described in this section are the latest possible closing times of all time period combinations. It is crucial to note for interpretation that most licences have multiple time period specifications for when trading can take place (e.g. Sunday – Thursday, Friday to Saturday, Bank Holidays) with specific hours associated with each time period. Due to the structure of the licensing data, it was not possible to observe core hours independent of these time periods. This causes **licences with variations of operating hours across weekdays to be counted multiple times.** In other words, the charts below may display 3 licences which refer to the same licence and premises. Furthermore, the dates listed on the x-axis below (30th and 31st of December) are arbitrary but are included to mark the transition of days.

Despite these limitations, the broad patterns of permitted operating hours by premises type can be deduced but the number of premises types in the borough should not be inferred.

Opening Hours by Premises Type

The below bar chart displays the volume of licences and the associated trading hours permitted in the borough by grouped premises type. Shown are the start of each hour the licences are permitted, without taking weekday into account.

Displayed below are the permitted operating hours of all licences, grouped by the premises type to which they have been issued.

For a more detailed view on the overall closing times of licensed trading hours according to individual premises types, see Appendix 5.

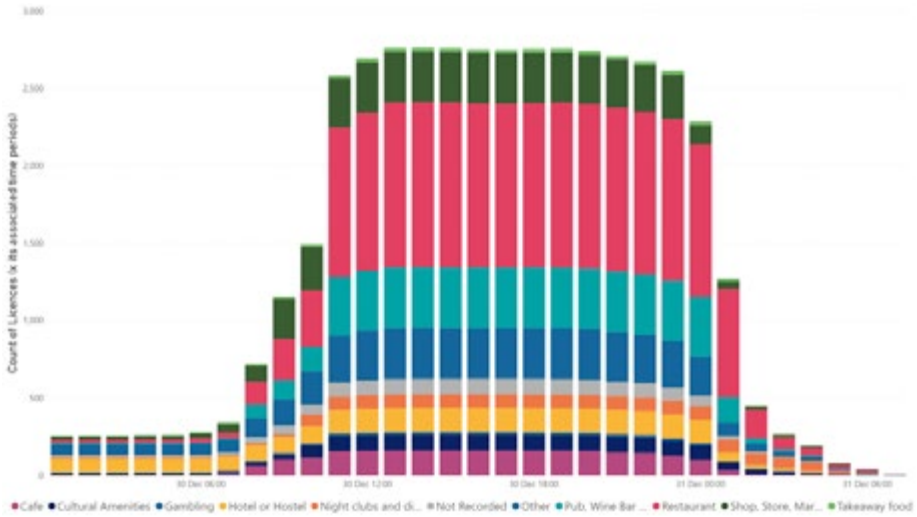
Across premises types, most premises and club certificate licences permit trading between 11:00 – 23:00, permissions dramatically drop off at 00:00 and 01:00.

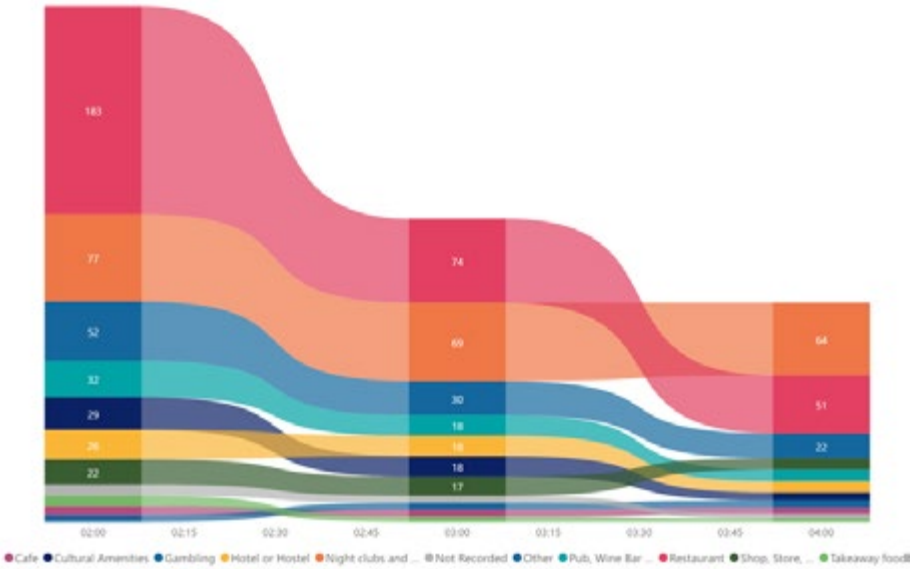
- The majority of licences issued to pubs and wine bars do not permit trading past 1:00, indicating that most patrons leave premises before or by this time.

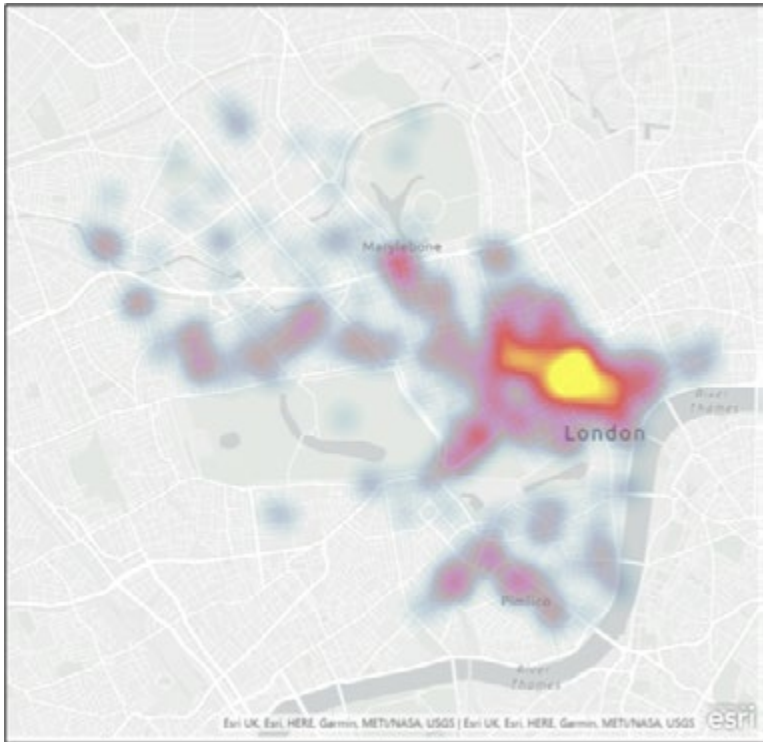
The **ribbon chart** below displays the volume of licences of all time periods issues to premises types permitting trade until 2:00, 3:00 and 4:00.

- The number of licences issued to premises characterised as restaurants and nightclubs permitting operation until 3:00 and 4:00 are comparable in number, indicating that there are a substantial number of late-night venues characterised as restaurants trading alcohol.
- Few licenses permit trading past 4:00, among those are night clubs including karaoke bars, casinos, sexual entertainment venues, 24-hour stores, restaurants with bars and restaurants serving late night refreshments like McDonald's.
- A third of licences permitting trade until 4:00 are primarily issued to nightclubs, while over a quarter are issued to restaurants.

Concentration of licensed locations with trading hours ending between 2:00 – 4:00 are mapped by premises type in the figure below.







Regression Analysis

Rationale

Tobler's first law of geography tells us that everything is related to everything else but near things are more related than distant things. Operating on this principle, which underpins the cumulative impact assessment, incidents in proximity to premises are more likely to be related.

The descriptive analysis outlined in the above situated a range of incidents indicative of cumulative impact in the borough in both space and time. Although unique licence locations appear to be similarly distributed in space, the relationship between incidents and licensed premises has not yet been explicitly established. Therefore, whether the prevalence of different types of crime, noise and anti-social behaviour was significantly correlated with the number or type of licensed premises in their proximity was tested.

Approach

Research questions:

1. For every additional licensed premises, what are the increased odds of a crime being reported (i.e. the likelihood of there being at least one reported crime)?
2. For every additional licensed premises, by how much does the number of reported crimes increase, on average?

Dependent variables: incidents which negatively impact the promotion of the licensing objectives were selected that were sufficiently granular (point-data) and captured consistently across the borough:

- Serious violent crimes (Night & 24-hour Average)
- Robberies (Night & 24-hour Average)
- Theft & Handling crimes (Night & 24-hour Average)
- Drug-related crimes (Night & 24-hour Average)
- WCC Noise complaints (in the street & from commercial premises) (Night & 24-hour Average)
- Anti-social behaviour offences (MPS) (24-hour Average)

Independent variables potential explanatory variables of dependent variables:

- All unique licensed locations
- Unique licensed locations by premises type group:
  - Café
  - Cultural Amenity
  - Gambling sites
  - Hotels & Hostels
  - Nightclubs
  - Pubs or Wine Bars
  - Restaurants
  - Shop, Store, Market or Kiosk
  - Takeaways

Area size: in the absence of statistics which offer guidance on the relationship between the proximity of incidents of crime directly connected with licensed premises, hexagons[17] 20,000m^2 in size were selected, as these captured a few average sized city blocks and could account for a degree of dispersal.

17 "Why Hexagons?" ArcGIS Pro | Documentation, pro.arcgis.com/en/pro-app/tool-reference/spatial-statistics/h-whyhexagons.htm.

Method

To address the research questions, two types of regression models were employed:

c. Odds-Model (Binary Logistic Regression)

In the first instance a binary logistic regression was used to model the absence/presence of crime (binary response variable) against the number of licensed premises (explanatory variable). Where this relationship was significant (Wald Test, $p<0.05$), we used the model coefficient to estimate the odds ratio, i.e. the proportional change in odds of there being at least one reported crime per additional licensed premises. In other words, for a given area, what is the increased likelihood of at least one crime being reported when an extra licensed premises is present.

Interpretation: An odds ratio greater than 1 indicates that a crime is more likely to occur, whereas an odds ratio less than 1 indicates a decrease in likelihood. We report these significant outcomes and their 95% confidence intervals as percentages; for example, given an odds ratio of 1.5, for every additional licensed premises the likelihood of there being at least one reported crime increases by 50%. Crime types or premises types which are more populous are more likely to be picked up by this model, for example thefts are the most common crime category and restaurants the most prevalent licensed premises in the borough.

d. Relationship-Model (Zero-truncated Negative Binomial Regression)

While the Odds-Model offers insight into whether one or more crimes is likely to have occurred in a locale in which a licensed premises is located, we also wanted to quantify by how much the number of reported crimes increases for ever additional licensed premises. Therefore, we modelled the relationship between positive crime counts (response variable) and the number of licensed premises (explanatory variable) using a zero-truncated negative binomial regression. As above, where this relationship was significant (Wald Test, $p<0.05$), the model coefficient (i.e. the slope value) was extracted to estimate the relative change in the number of reported crimes per additional licenses premises.

Interpretation: A coefficient greater than 1 indicates an increase in the number of reported crimes, whereas a coefficient less than 1 indicates a decrease. These coefficients are reported along with their 95% confidence intervals. Each of these approaches (A and B) were repeated for different crime types and for different classes of licensed premises.

Limitations

While these models control for area size, they do not control for other factors which are likely to significantly shape the likelihood and prevalence of crime. The following confounding factors would likely cause deviations away from model predictions:

- Street population density is among the most significant drivers of crime, disorder and nuisance, which could not be accounted for in this study.
- Operating hours of premises types: whilst a certain number of licensed premises may operate in a given area, their operating hours may not always coincide with the occurrence of particular crime types and this is not captured by the model.
- Prevalence and distribution of premises types or incident categories: 85% of recorded public realm crimes in Westminster were categorised as thefts, while 40% of licensed premises were described as restaurants. If less prevalent premises types, as well as crime types, are situated in close proximity to more populous groups, their impact could be obscured.
- Land use characteristics: it is possible that certain premises types concentrate near other land use characteristics which drive crime, disorder and nuisance that are not accounted for in this model, for example transport hubs.
- Dispersal: the location at which incidents are recorded may not be where they have originated, potentially leading to missed correlations.
- Temporal dimensions: although this model takes broad times of day into account, it does not regard the impact of weekdays or season on crime rates.

For the above stated reasons, the model's estimates should be interpreted as approximations of correlations between the prevalence of licensed premises (types) and crimes in their vicinity, not as a relationship of cause and effect.

Results Summary

Both models found that incidents of all types were more likely to be reported in the vicinity of licensed premises between 2017 and 2019 and significantly increased with every additional premises within a given area (20,000m^2).

The odds regression model indicated that for every additional licensed premises (of any type), the likelihood of there being at least one reported incident at night in the vicinity increased by 20% – 471%, depending on the type of crime. Of all public realm crimes, the addition of licensed premises influenced the likelihood of theft reports the most (471% increase in odds per additional licensed premises) and drugs the least (20%). These results are in part a reflection of how many crime incidents were recorded in each category.

The relationship regression model found that for every additional licensed premises within a given area (20,000m^2), incidents of crime were likely to increase by a factor of 1.06 – 1.17 (6-17%), depending on the premises type, incident type and time of day.

The table below summarises the results of the impact of licensed premises types overall for different crime types.

Note: 95% confidence intervals given in brackets	**Drugs**		**Robbery**		**Theft**		**Violent Crime**		**Noise**		**Anti-social Behaviour**	
	Licences OVERALL											
	All day	Night	All day	Night	All day	Night	All day	Night	All day	Night	All day	Night
Odds Model: For every additional licensed premises, the odds of there being at least one reported crime increase by:	**28%** (22-35%)	**20%** (16-25%)	**76%** (59-96%)	**56%** (45-69%)	**972%** (422-2099%)	**471%** (274-773%)	**31%** (25-37%)	**26%** (21-31%)	**111%** (81-146%)	**74%** (57-94%)	**62%** (47-77%)	N/A
Relationship Model: For every additional licensed premises, reported crime increases by a factor of:	**1.08** (1.05-1.10)	**1.10** (1.07-1.13)	**1.12** (1.10-1.15)	**1.14** (1.10-1.18)	**1.16** (1.14-1.19)	**1.17** (1.14-1.19)	**1.09** (1.07 – 1.12)	**1.11** (1.08-1.14)	**1.10** (1.08-1.11)	**1.09** (1.07-1.11)	**1.06** (1.05-1.07)	N/A

However, the strength of these dependencies varied considerably when looking at specific premises and incident types. Calculated in the below table is the **likelihood** of at least one crime, noise complaint or ASB offence being recorded for every additional licensed premises in its vicinity based on 2017 – 2019 figures:

All results by incident type and premises types assessed are detailed in Appendix 6.

According to the Odds Model's estimations, shops and stores selling alcohol were significantly associated with a greater likelihood of reported crime, disorder and nuisance, followed by pubs and wine Bars, restaurants, and Hotels. Takeaways were significantly associated with a higher likelihood of drugs offences being recorded at night but did not significantly influence the odds of any other types of crimes. The model also found the presence of cafés significantly affected the odds of robberies and noise complaints being reported nearby over a 24-hour period.

The table below displays the model's significant coefficient's (i.e. the slope value) which estimate the relative change in the number of reported incident types per additional licenses premises, by type. Overall, for every additional licensed premises the number of reported crimes increased by 13%, noise complaints by 9% and disorder at all times of day by 6%. On average, crime incidents in the evening and at night increased by 27% for every additional restaurant in the area, and 37% for every shop or store. For every additional pub, noise complaints increased by 24%.

For every additional licensed premises, reported incidents increased by a factor of: Note: 95% confidence intervals given in brackets & NS = Not significant	OVERALL	Pub / Wine Bar	Restaurant	Shop / Store
Drugs (at night)	**1.10** (1.07-1.13)	NS	**1.15** (1.01-1.30)	**1.53** (1.12-2.09)
Robbery (at night)	**1.14** (1.10-1.18)	NS	**1.30** (1.17-1.45)	NS
Theft (at night)	**1.17** (1.14-1.19)	NS	**1.38** (1.27-1.50)	**1.19** (1.01-1.40)
Serious Violence (at night)	**1.11** (1.08-1.14)	NS	**1.23** (1.10-1.37)	**1.39** (1.08-1.79)
Average for all crimes at night, weighted equally	**1.13**	N/A	**1.27**	**1.37**
Noise	**1.09** (1.07-1.11)	**1.24** (1.09-1.41)	**1.16** (1.09-1.24)	**1.17** (1.02-1.35)
Antisocial behaviour (all times of day)	**1.06** (1.05-1.07)	NS	**1.14** (1.08-1.19)	**1.15** (1.03-1.28)

Conclusion

The models did not find the other premises types observed to be significantly associated (within a 95% confidence interval) with incidents indicative of cumulative impacts. As outlined by the limitations of this analysis, one should not conclude that these premises types (nightclubs, gambling sites or cultural amenities) do not in practice influence the likelihood of incidents or correlate with increased crime, noise and ASB prevalence.

The results relating to nightclubs in particular illustrate some of the limitations of this model as previous behavioural audits, as well as practitioner and academic research have discerned that such late-night venues are frequently associated with cumulative impact[18]. Analysis of trading hours found that night clubs are typically among the last to close their doors, while incidents of cumulative impact tend to concentrate late at night. Due to the structure of the licensing data, late-night premises could not be tested in the regression model, however sensitivity to trading hours as well as incidents times, would offer valuable insights into risk.

The relationship of nightclubs to crimes, nuisance and disorder may also have been obscured in the regression model due to their location among many other more populous premises types also assessed here. For example, in the West End Zone 1, there are approximately 47 nightclubs situated in close proximity to 404 restaurants. Furthermore, the premises type classifications in the licensing data do not always ideally capture the nature of the business. As mentioned, a fine dining establishment, a venue which also hosts a late-night bar and club, as well as a late-night fast-food restaurant all fall under the umbrella of 'restaurant'.

18 Hadfield, P. (2017) Mayfair Evening and Night-time Economy Public Behaviour / Area Profiling Study: Project to Inform the City of Westminster Interim Licensing Policy Review 2017: Final Report. Hadfield, P., Sharples, S., Bevan, T. and Measham, F. (2015) Westminster Evening and Night-time Behaviour Audit 2013-14. Final Report to the West End Partnership Group and the City of Westminster. Bevan, T., License, A., Rowell, A., Hadfield, P. and Davies, P. (2015) Westminster Evening and Night-time Economy: A Cost v Benefit Study for the City of Westminster. London: TBR.

Findings

Space-Time Pattern Mining

Findings
3. Space-Time Pattern Mining

Rationale of analysis

Seasons, weather conditions, bank holidays and weekdays all have a bearing on the levels of crime, disorder and nuisance. In light of this, the following analysis sought to identify areas in the City which presented problems associated with cumulative impact persistently. Areas which present overall higher levels of incident volumes, including instances of irregularly high levels of activity, are however also considered in the next section.

Approach

Statistically significant trends of cumulative impact across dimensions over the last three years were identified and characterised to inform areas of where cumulative impact was experienced over the last three years.

Employed was ArcGISPro's Space-Time Pattern Mining toolbox and the emerging hot spot analysis tool[19] in particular. This tool is identifies trends in data, characterising patterns in hotspots such as 'persistent', 'new' 'diminishing' or 'sporadic'. In total, 16 types of hot and cold spot categories can be identified.

Data sets which captured point data (coordinates of incident), the incidents date and in most cases the incident time could be assessed by this tool. A variety of incidents from 2017 – 2019 were assessed by type, across seasons (12 quarters) within areas approximately the size of a city block (73 x 73m). Where possible, the model additionally analysed at each incident type by time of day as well i) 6am– 6pm, ii) 6pm – 6am and iii) the daily average.

From these results statistically significant time-sensitive hotspots of incidents indicative of cumulative impact were identified borough-wide. Patterns of concern identified were layered and interrogated alongside concentrations of licensed premises in proximity to them. Observed spatial and temporal patterns identified were then discussed with area experts to further situate and interpret cumulative impact.

Additionally assessed was where licensed premises significantly clustered in space using Getis-Ord GI*[20] hot spot analysis, as well as assessing the exact location, composition and volume of licensed premises in the most affected areas.

Based on the strength of the hotspots, their classification, proximity of concentrated licensed premises and feedback from service experts, boundaries of zones presented evidence of cumulative impact were drawn.

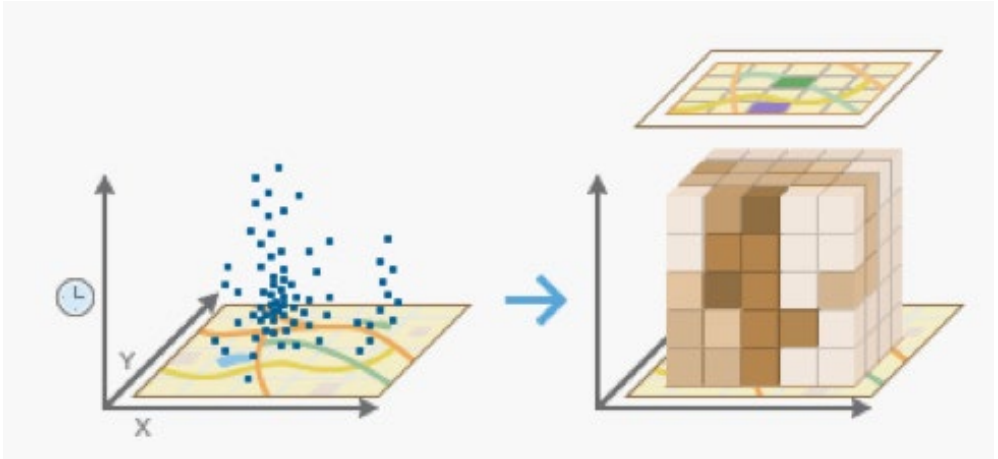
19 "How Emerging Hot Spot Analysis Works." How Emerging Hot Spot Analysis Works-ArcGIS Help | Documentation, ESRI, pro.arcgis.com/en/pro-app/tool-reference/space-time-pattern-mining/learnmoreemerging.htm.

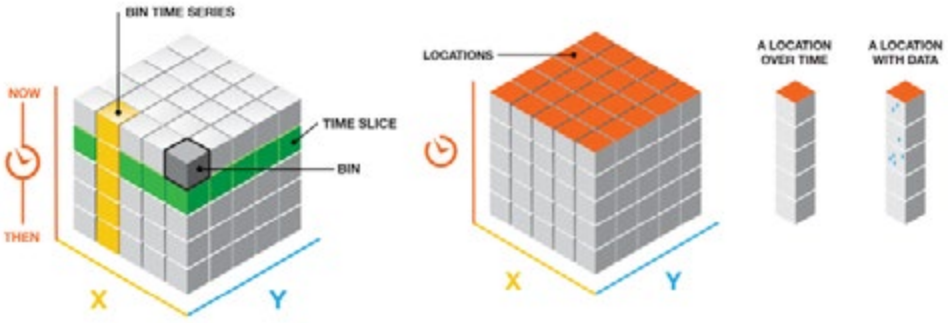
20 "How Hot Spot Analysis (Getis-Ord Gi*) Works." How Hot Spot Analysis (Getis-Ord Gi*) Works-ArcGIS Pro | Documentation, ESRI, pro.arcgis.com/en/pro-app/tool-reference/spatial-statistics/h-how-hot-spot-analysis-getis-ord-gi-spatial-stati.htm#GUID-AF3205B7-D9AE-4C14-AFE9-E672092200BE.

Method

In order to identify and characterise spatial trends, while considering the temporal dimensions of incidents the tool take the following steps:

- Data is input in a space-time NetCDF cube[21], which summarizes a set of points into a data structure by aggregating them into space-time bins (within each bin, the points are counted).
- The data structure is akin to a three-dimensional cube made up of space-time bins with the x and y dimensions representing space and the t dimension representing time, as depicted in the illustration below produced by ESRI.
- Using the values conceptualising the spatial relationship, the Getis-Ord Gi* statistic (a hotspot analysis approach) was then calculated.
- Once run, each bin in the NetCDF cube is associated with a z-score, p-valuem and hotspot bin classification.
- Any hot or cold spot trends are evaluated using the Mann-Kendall trend test, resulting in a z-score and p-value for each location with data and with the hot spot z-score and p-value for each bin.
- Finally, the emerging hot spot analysis tool categorizes each study area within one 16 possible patterns, these can be found in Appendix 7
- Of particular concern to the cumulative impact assessment were hotspot trends categorised as 'persistent hotspots', 'intensifying hot spots', 'historical hot spot', 'diminishing hot spots' and to a lesser degree 'consecutive hotspots', the definition of these are listed below.





21 "Create Space Time Cube By Aggregating Points (Space Time Pattern Mining)." Create Space Time Cube By Aggregating Points-ArcGIS Help | Documentation, ESRI, pro.arcgis.com/en/pro-app/tool-reference/space-time-pattern-mining/create-space-time-cube.htm.

Model Inputs

The following inputs were defined in the space-time pattern mining:

Data sets assessed (selected based on spatial and temporal granularity suitable for the model):

- Public realm major crime categories were individually assessed: drug-related, robberies, serious violence against the person and theft and handling offences
- Noise complaints: 'noise in the street' and 'noise from commercial premises' categories were
- Anti-social behaviour offences: reported by the Metropolitan police service, for which only the daily average was available. The potential relationship of these incidents to licensed premises is more tenuous.

Incident times observed: i) Night: 6pm - 6am average ii) Day: 6am - 6pm iii) 24-hour period

Time Bins set: Calendar year quarters over 3 years (2017 – 2019), totalling 12 bins

Location / hotspot size: the average size of a city block was calculated and used (73m x 73m or 5,329 metres squared) as this in theory allowed for sufficient space to account for dispersal from premises while still being able to identify individual problematic streets

Definition of hot spot categories considered for identification of areas affected by cumulative impact:

Persistent Hot Spot	A location that has been a statistically significant hot spot for ninety percent of the time-step intervals with no discernible trend indicating an increase or decrease in the intensity of clustering over time.
Intensifying Hot Spot	A location that has been a statistically significant hot spot for ninety percent of the time-step intervals, including the final time step. In addition, the intensity of clustering of high counts in each time step is increasing overall and that increase is statistically significant.
Consecutive Hot Spot	A location with a single uninterrupted run of statistically significant hot spot bins in the final time-step intervals. The location has never been a statistically significant hot spot prior to the final hot spot run and less than ninety percent of all bins are statistically significant hot spots.
Diminishing Hot Spot	A location that has been a statistically significant hot spot for ninety percent of the time-step intervals, including the final time step. In addition, the intensity of clustering in each time step is decreasing overall and that decrease is statistically significant.
Historical Hot Spot	The most recent time period is not hot, but at least ninety percent of the time-step intervals have been statistically significant hot spots.

Results: Space Time Pattern Mining Outputs

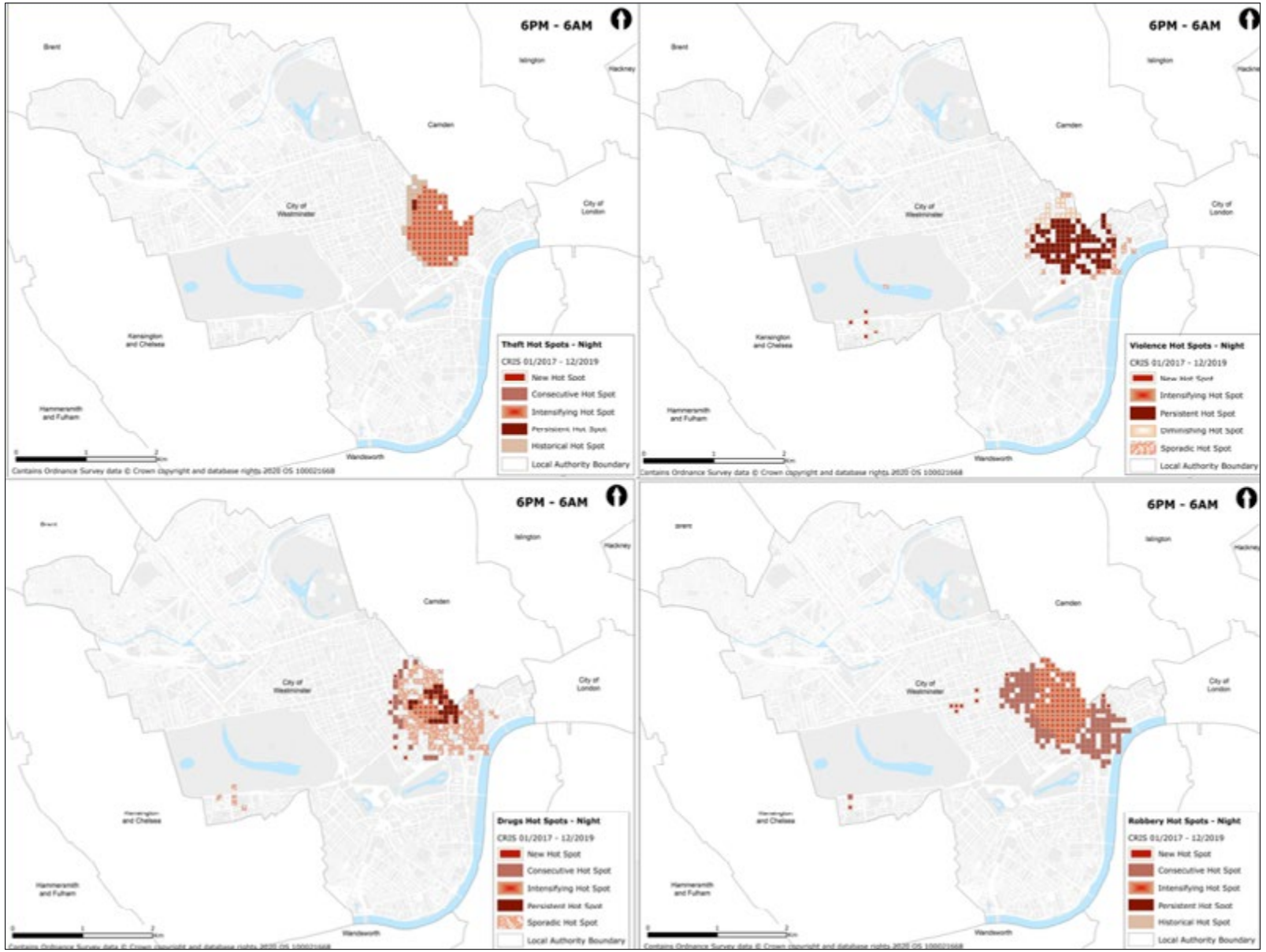
Where possible, hotspots of incidents which occurred between 6pm and 6am were considered for boundary definition of areas impacted by cumulative impact between 2017 – 2019, as these were more likely to be associated with licensed premises based on previous research and outputs of the regression analysis.

The model's outputs characterised two parts of the West End as burdened by cumulative impact, to varying degrees. These emerged as the only statistically significant areas of concern in the evening and night borough across multiple dimensions.

Public Realm Crimes at Night

Below are the results related to all public realm crimes categories between 6pm – 6am, from left to right: theft & handling crimes, violent offences, drug-related crimes and robbery. Hotpots characterised as 'historical', 'persistent' or 'intensifying' were identified, indicating that the concentration of crimes was statistically significant in 90% of the time steps. From left to right: thefts & handling, serious violence against the person, drug-related crimes and robberies.

All key hot spot categories for crime concentrated significantly in and around the West End, with incidents related to robbery most widespread. 'New hotspots', incidents in the last 3 months of 2019, related to serious violence were identified near Knightsbridge, there were also 'sporadic' hotspots and isolated hotspots related to robberies in this area. As these hotspots were scarce and less acute categories, this area was not assessed further.


6PM - 6AM
Brent
Islington
Hackney
Camden
City of Westminster
City of London
Kensington and Chelsea
Hammersmith and Fulham
Wandsworth
Theft Hot Spots - Night
CRIS 01/2017 - 12/2019
New Hot Spot
Consecutive Hot Spot
Intensifying Hot Spot
Persistent Hot Spot
Historical Hot Spot
Local Authority Boundary
Contains Ordnance Survey data © Crown copyright and database rights 2020 OS 100021668
6PM - 6AM
Violence Hot Spots - Night
CRIS 01/2017 - 12/2019
Intensifying Hot Spot
Persistent Hot Spot
Diminishing Hot Spot
Sporadic Hot Spot
Local Authority Boundary
6PM - 6AM
Drugs Hot Spots - Night
CRIS 01/2017 - 12/2019
New Hot Spot
Consecutive Hot Spot
Intensifying Hot Spot
Persistent Hot Spot
Sporadic Hot Spot
Local Authority Boundary
6PM - 6AM
Robbery Hot Spots - Night
CRIS 01/2017 - 12/2019
New Hot Spot
Consecutive Hot Spot
Intensifying Hot Spot
Persistent Hot Spot
Historical Hot Spot
Local Authority Boundary

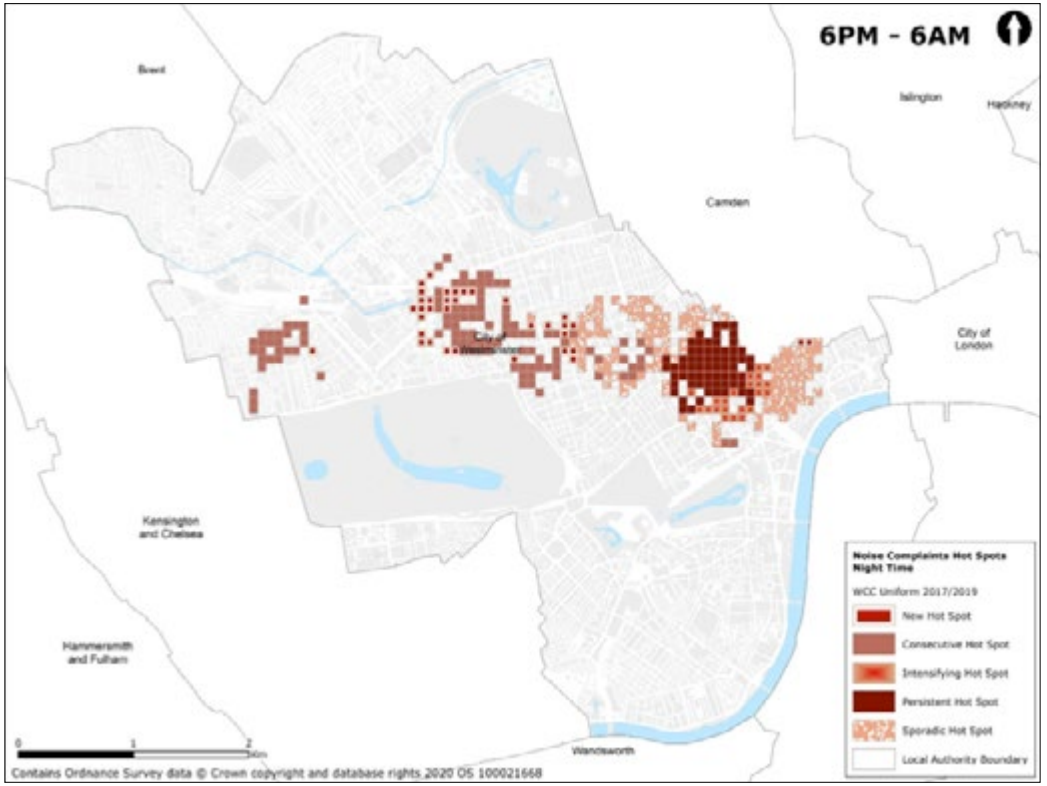
Noise Complaints at Night

Predominantly 'consecutive' hotspots (where incidents clustered for less than a year within the 3-year period) and sporadic hotspots (significant concentrations varied over the last 3 years) emerged outside of the West End in relation to noise complaints reported between 6pm and 6am.

A cluster of persistent and intensifying hotspots of noise complaints at night concentrated in and around the West End, with sporadic patterns shrouding Covent Garden area and parts of Oxford Street. Consecutive and new hot spots (significant concentrations emerged in the last 3 months of 2019) were identified along Marylebone Road, Marylebone, in northern Mayfair and along Edgware Road (Area B below). Another cluster of consecutive hotspots emerged near Westbourne Grove and surrounding areas (Area A).

These outputs were interrogated in detail in a workshop with the council's noise management service and experienced city inspectors, with a view on licensed premises in the area to ascertain whether the concentration of licensed premises may be a contributing factor.

Service experts advised that it was unlikely given the location of the noise hotspots that they were significantly related to the activities of licensed premises.



Area A

Area B

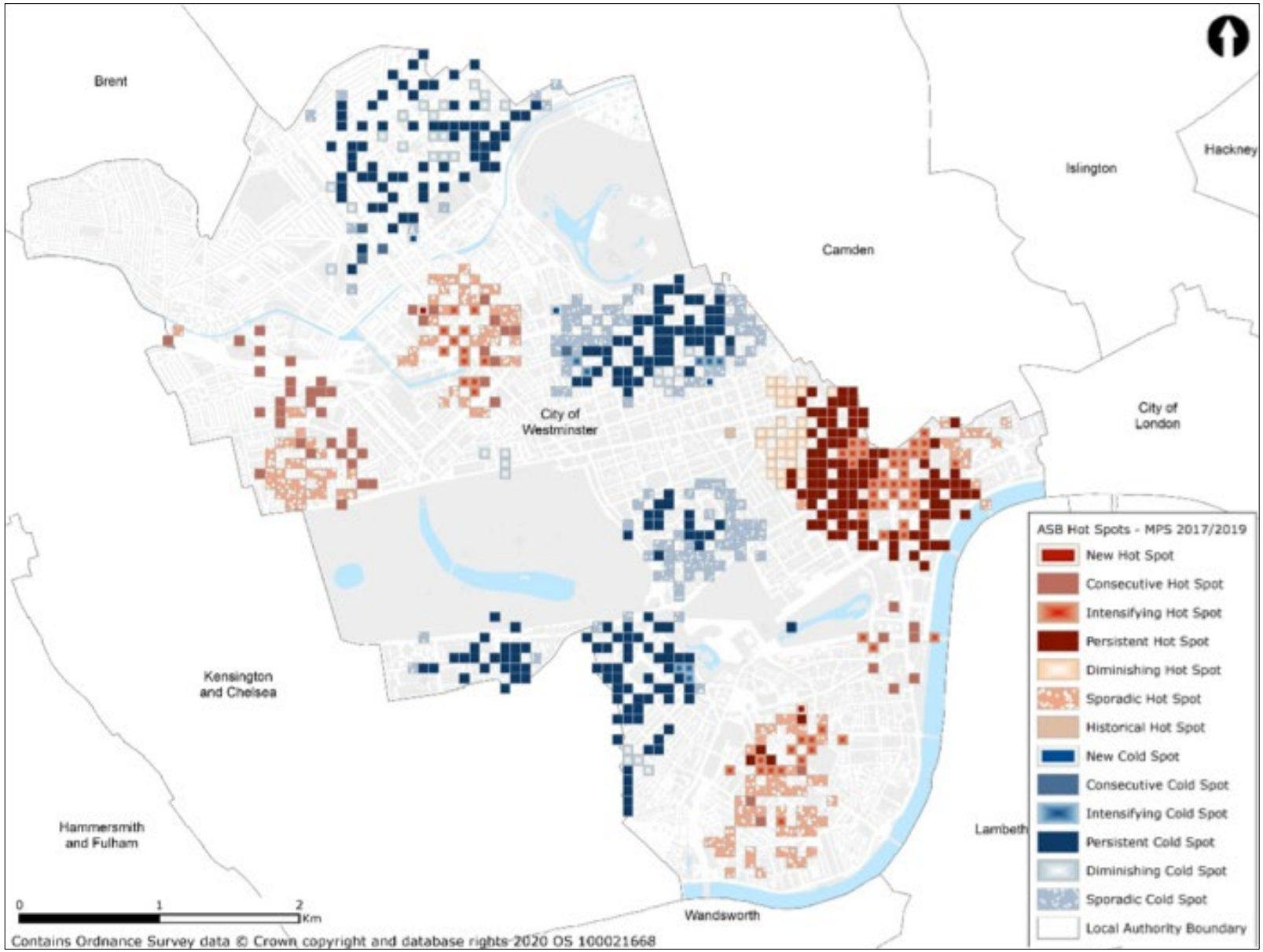
This was in part due to the nature of noise complaints (detailed in Appendix 1), as well as the nature of the areas in which they were situated. Regarding the latter, St Petersburg Place, Porchester Square and Bishops Bridge Road in Area A are all residential in character with very few licensed premises. Noise complaints likely concentrated here over consecutive quarters in 2019 for reasons other than cumulative impact. In Area B with the exception of Wigmore Street and Edgware Road, licensed premises are also relatively scarce and therefore unlikely to be the source of complaint.

The consecutive hotspots in Westbourne Grove within Area A fall within the Queensway & Bayswater Stress Area where there were elevated numbers of licensed premises as of February 2020. The rates of noise complaints, as well as all other incident types are investigated further in the next section. Edgware Road is also assessed further, as is Wigmore Street which is assessed within a broader corridor of licensed premises between Oxford Street and Marylebone Road.

Anti-social Behaviour, Daily Averages

The above output indicates that although persistent and intensifying hotspots of anti-social behaviour incidents at all times of day concentrated in and around the West End and eastern Oxford Street. Other areas were also affected by more dispersed patterns of sporadic hotspots, as well as consecutive hot spots. These emerged in and around Victoria, near Paddington, as well as parts of Lisson Grove and parts of Maida Vale. Several hotspots also arose near Parliament Square, which may be attributable to the political protests the area attracts. Sparsely concentrated consecutive hotspots reached additionally reached from Lancaster Gate to Westbourne areas, with sporadic hotspots concentrating near Queensway and Bayswater. Cold spots were not considered in this analysis.

As anti-social behaviour encompasses a raft of issues which could not be isolated at particular times, these hotspots are informative but cannot be confidently associated with licences premises, particularly as many of the afore-mentioned clusters do not arise in proximity to concentrations of licensed premises with the exception of Victoria, home to a national train station and Queensway and Bayswater in which the trends were weaker. Furthermore, although the regression analysis found a relationship between ASB incidents at all times of day in proximity to licensed premises, it was among the weaker significant relationships identified. For these reasons, these hotspots have not informed cumulative impact boundary definitions.


Brent
Hackney
Islington
Camden
City of Westminster
City of London
Kensington and Chelsea
Hammersmith and Fulham
Lambeth
Wandsworth
0
1
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Km
ASB Hot Spots - MPS 2017/2019
New Hot Spot
Consecutive Hot Spot
Intensifying Hot Spot
Persistent Hot Spot
Diminishing Hot Spot
Sporadic Hot Spot
Historical Hot Spot
New Cold Spot
Consecutive Cold Spot
Intensifying Cold Spot
Persistent Cold Spot
Diminishing Cold Spot
Sporadic Cold Spot
Local Authority Boundary
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Boundary Definitions

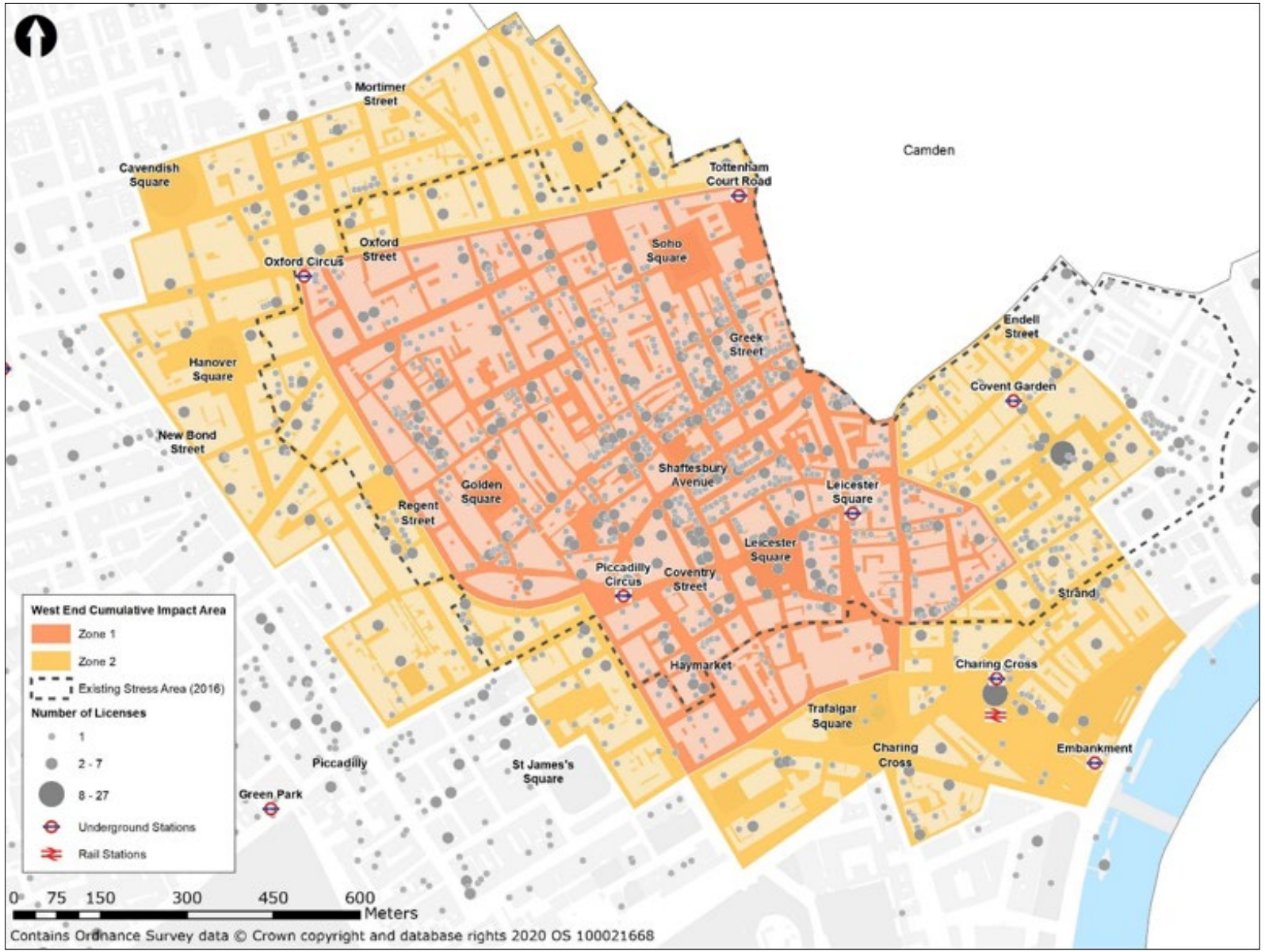
In the Time-Space Pattern Mining model evidence of persistent patterns emerged across incident categories in the West End. These trends were individually and jointly critically interpreted with service experts, along-side the results of concentrations of call outs to the locations of licences, as well as concentrations of unique licence locations.

Unfortunately, alcohol-related ambulance call outs were only accessible at the output area level, which could not be adapted for this model. Broadly speaking however, the spatial description previously undertaken found these too concentrated in the West End of the borough.

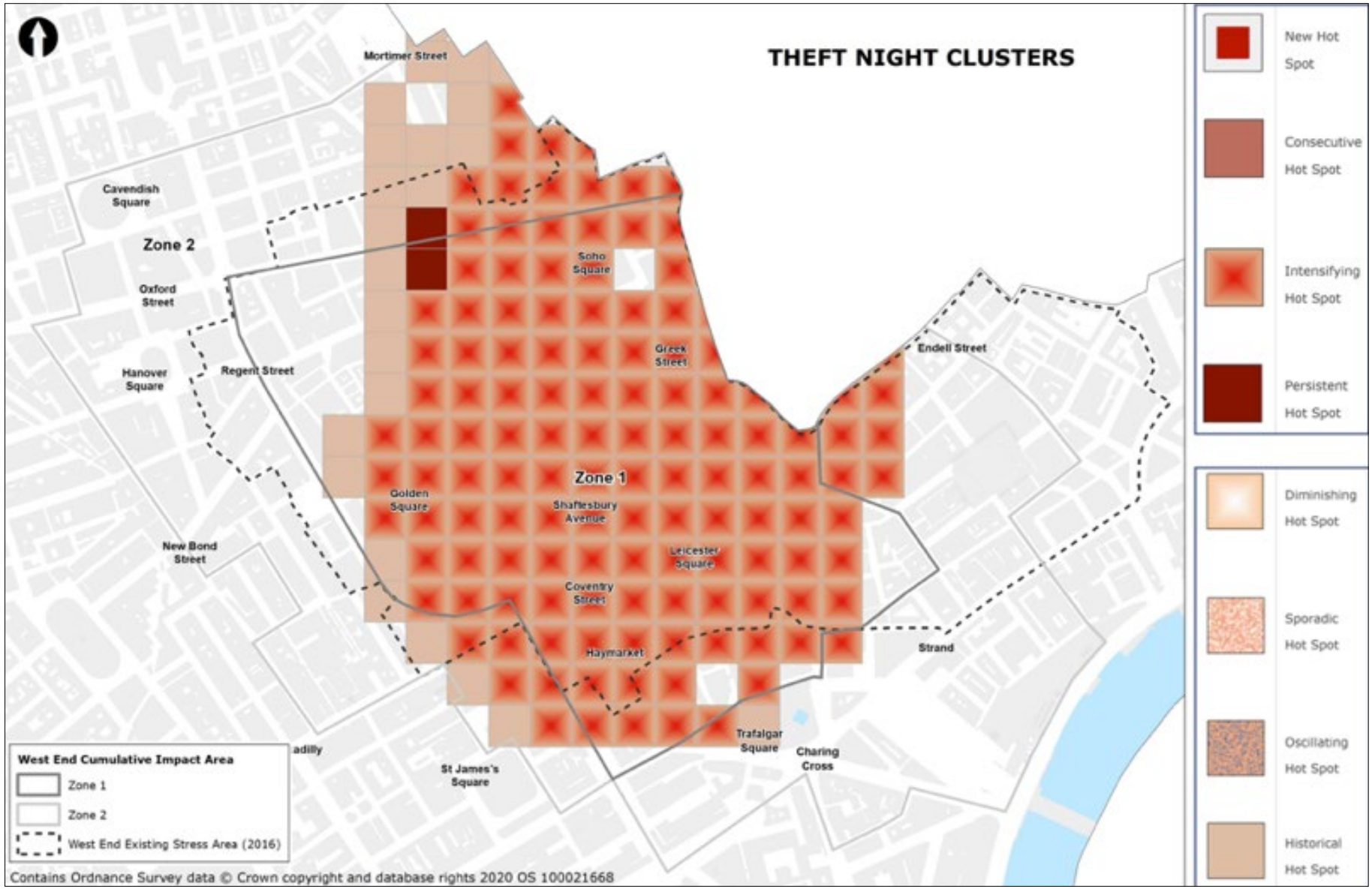
Figures on the following pages, depict all crime hotspots, as well as noise complaint hotspots in the West End. Based on the strength of these trends, their proximity to significant concentrations of licensed premises (see Appendix 8), ambulance call outs to licence locations and feedback from service experts, boundaries Cumulative Impact Areas Zones 1 and 2 were drawn.

Although licensed premises were found to significantly cluster outside of Zone 2 (eastwards, previously included in the 2016 West End Stress Area), incidents indicative of cumulative impact did not, and this area was therefore excluded. However, this area does suffer from sporadic noise and anti-social behaviour and therefore should be monitored as an area of concern due to its proximity to the West End Cumulative Impact Zone, concentration of licensed premises and potential increases in noise and antisocial behaviour in the future.

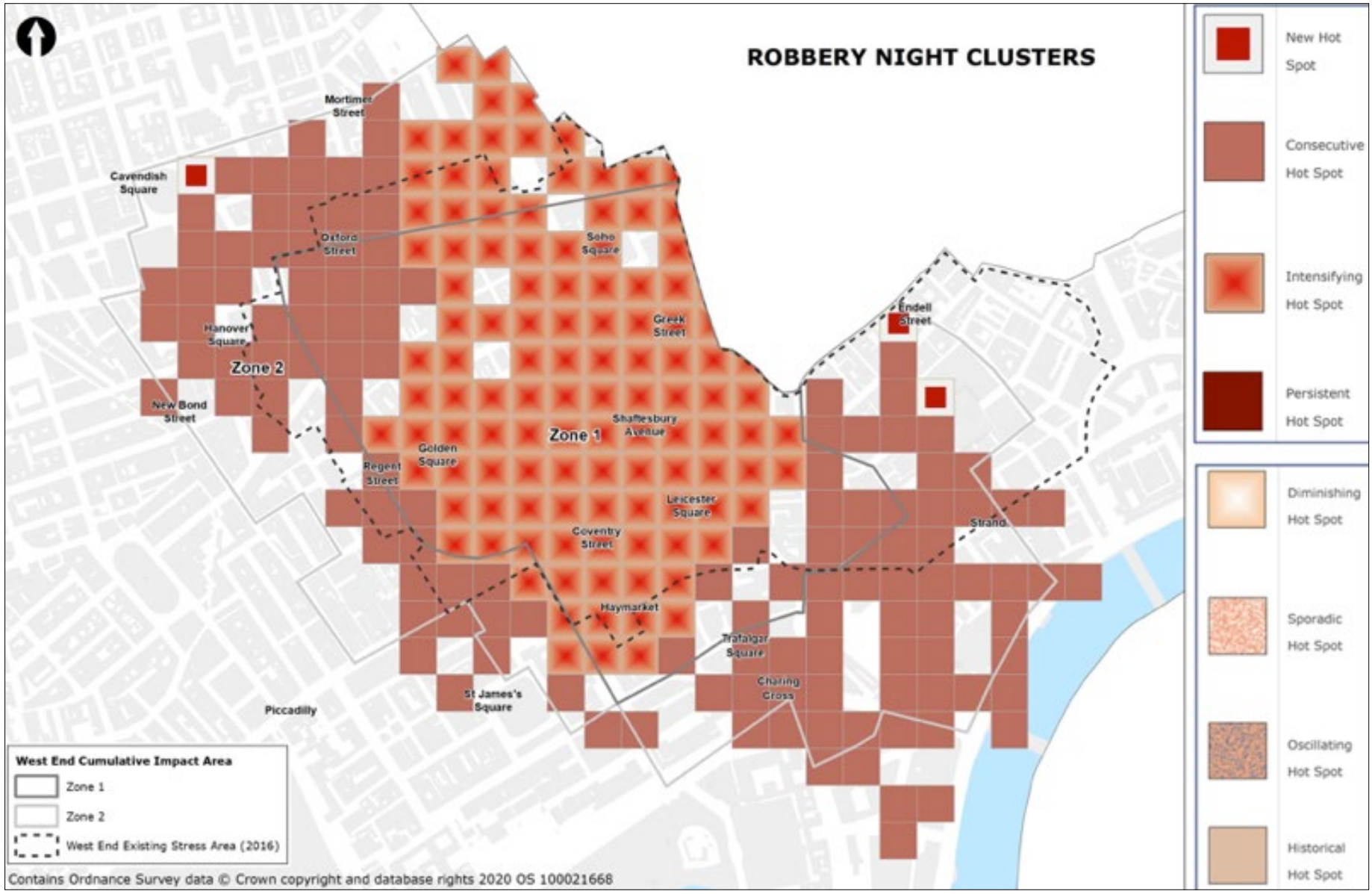
Unique Licence Locations within West End Zones 1 and 2, West End Stress Area for reference



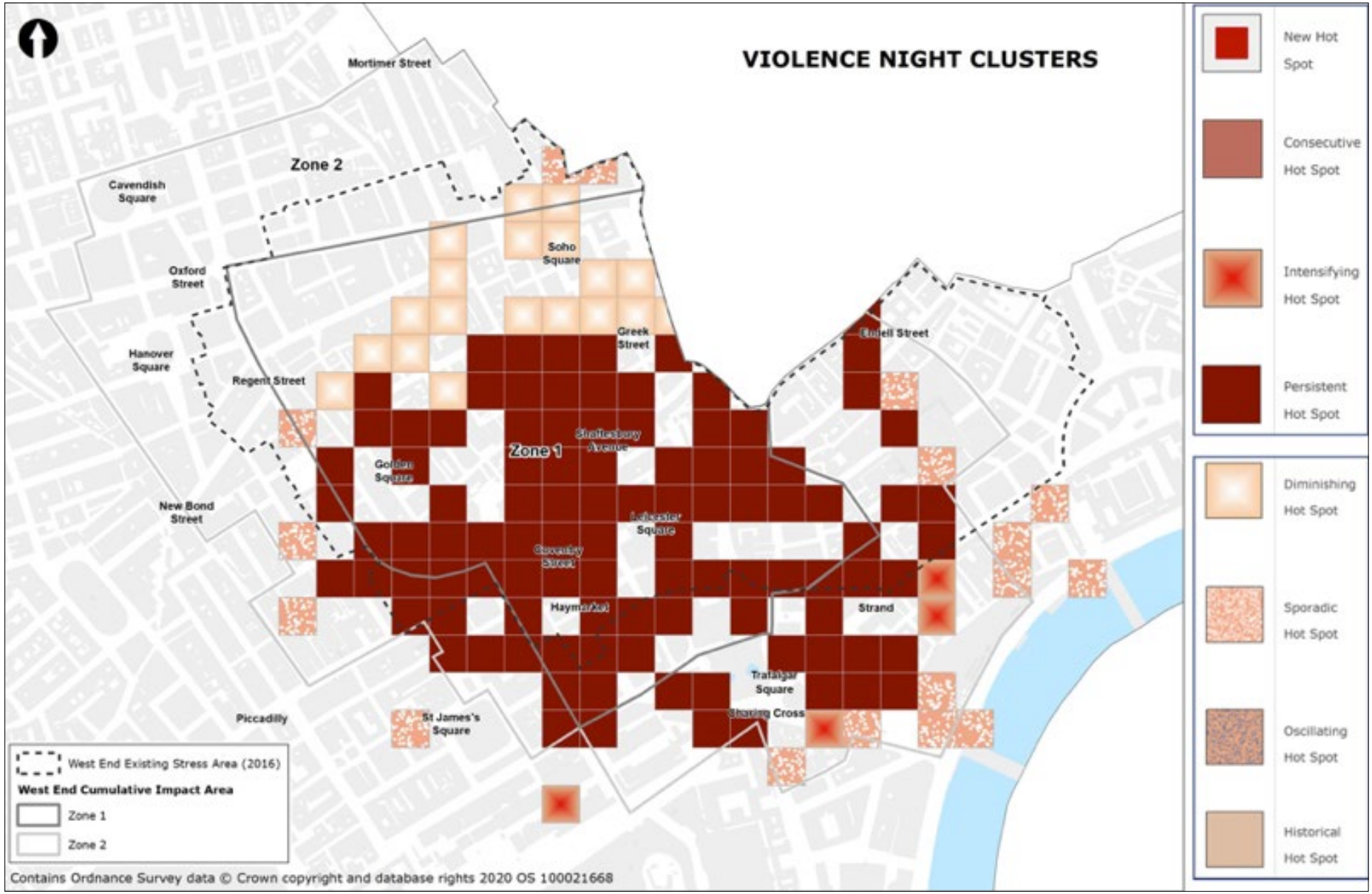
Hotspots of Theft and Handling Crimes between 6pm – 6am in the West End, 2017-19



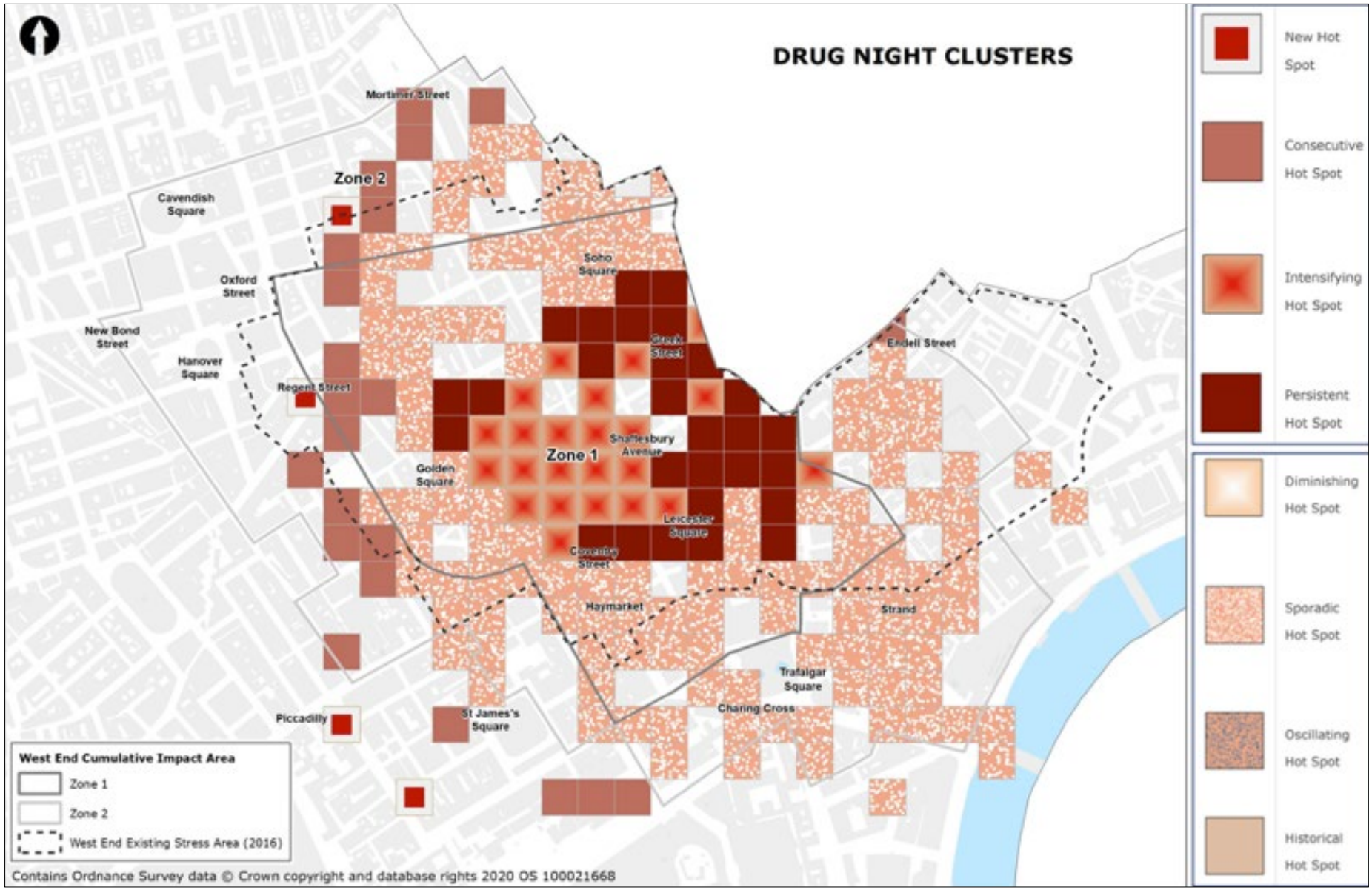
Hotspots of Robberies between 6pm – 6am in the West End, 2017-19



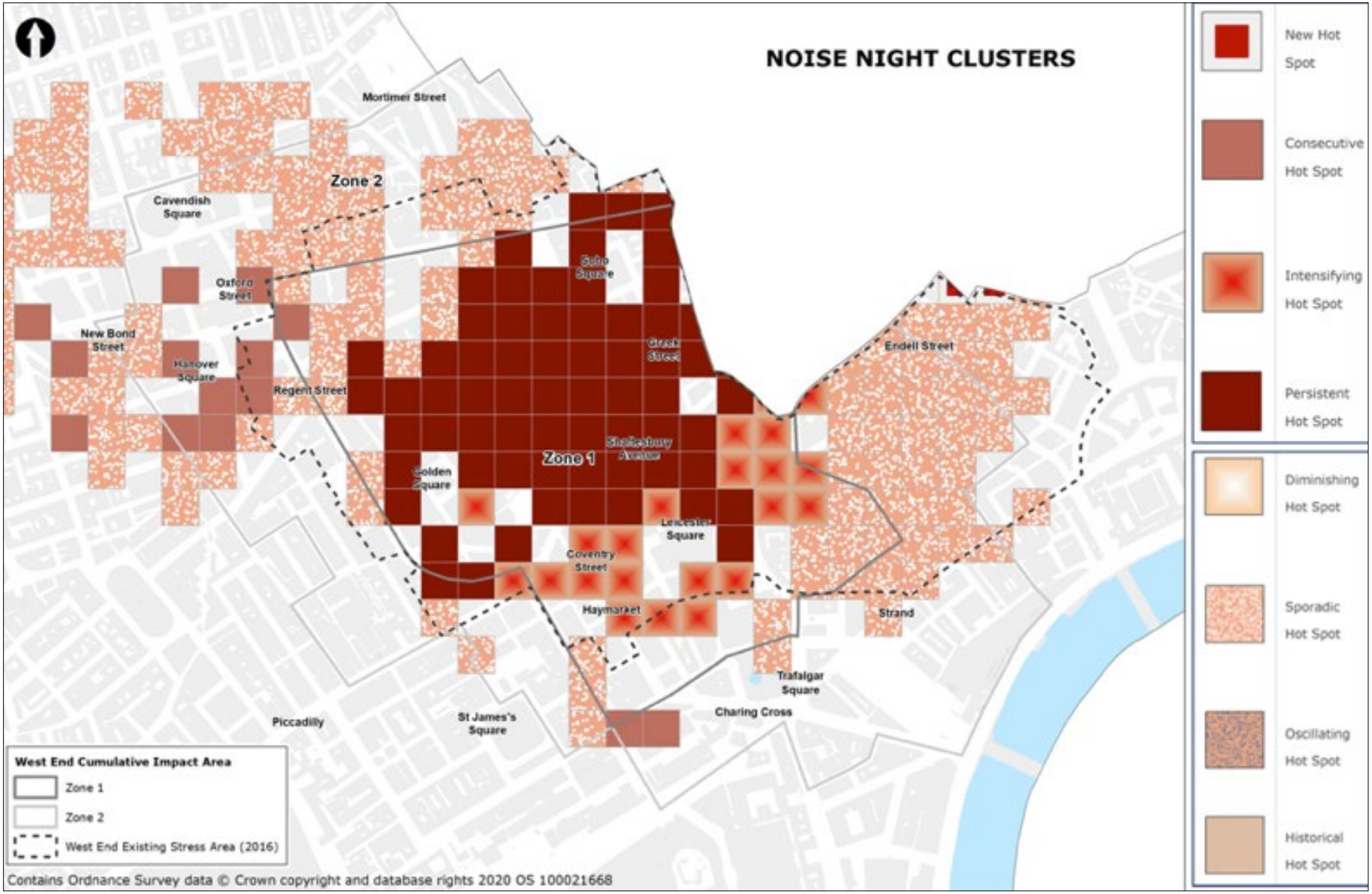
Hotspots of Serious Violence Against the Person between 6pm – 6am in the West End, 2017-19



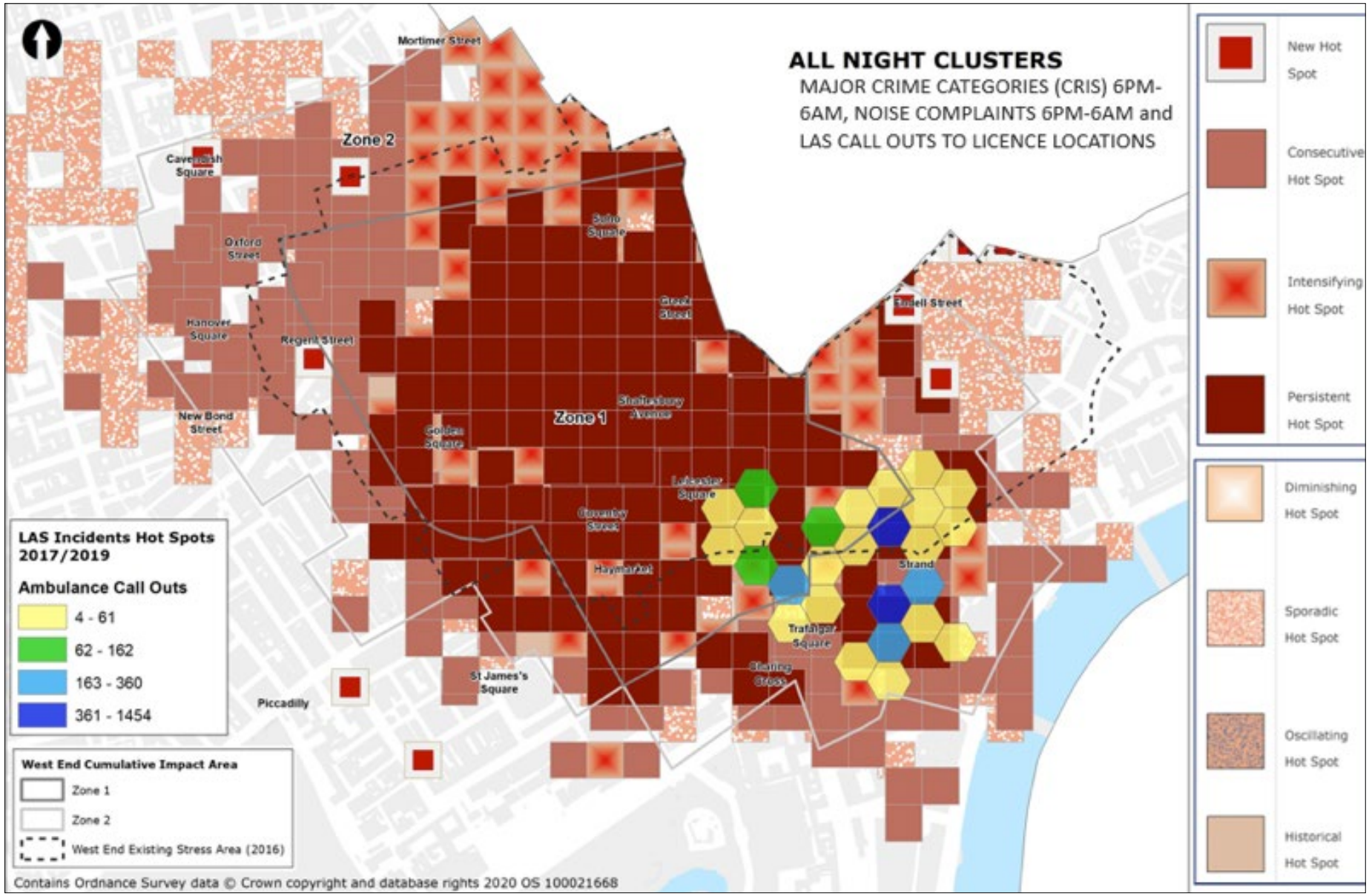
Hotspots of Drug Offences between 6pm – 6am in the West End, 2017-19



Hotspots of Noise Complaints between 6pm – 6am in the West End, 2017-19



Hotspots of All Crime Types and Noise Complaints between 6pm – 6am in the West End, including concentrations of LAS call outs to the location of licensed premises 2017-19



All of Zone 1 falls into the pre-existing West End Stress Area boundaries with the exception of the area **south of Haymarket and north of Trafalgar Square**. In this area patterns of theft and robberies between 6pm and 6am had been characterised as persistent over the last three years and intensified in the final months of 2019. Persistent patterns of serious serious violent crimes in the evening and night emerged here, as well as sporadic trends in the volume of drug offences recorded.

Interpreting the results of the hotspot analysis, incident types did not cluster as uniformly in Zone 2 as in Zone 1. The area around **Charing Cross station, towards Embankment** demonstrated particularly persistent patterns of serious violent crime in the evening and night, as well as high rates of ambulance call outs to the location of licences. Consecutive patterns of robberies in the evening and night were observed in 2019. Daily averages of antisocial behaviour were also persistent, and sporadic patterns of drug offences between 6pm and 6am were also recorded over the last three years.

In the northern part of Zone 2, along Oxford Street, hotspots of thefts and robberies at night were characterised as intensifying, historical (persistent over the last 3 years but did not cluster significantly in the last quarter of 2019) and consecutive (they were significant for the majority of 2019 but not previously). Noise complaints at night were also more concentrated in the northern part of Zone 2, however there were consecutive hotspots of drug offences at night in all parts of Zone 2.

Findings

Area Comparison

Findings
4. Area Comparison

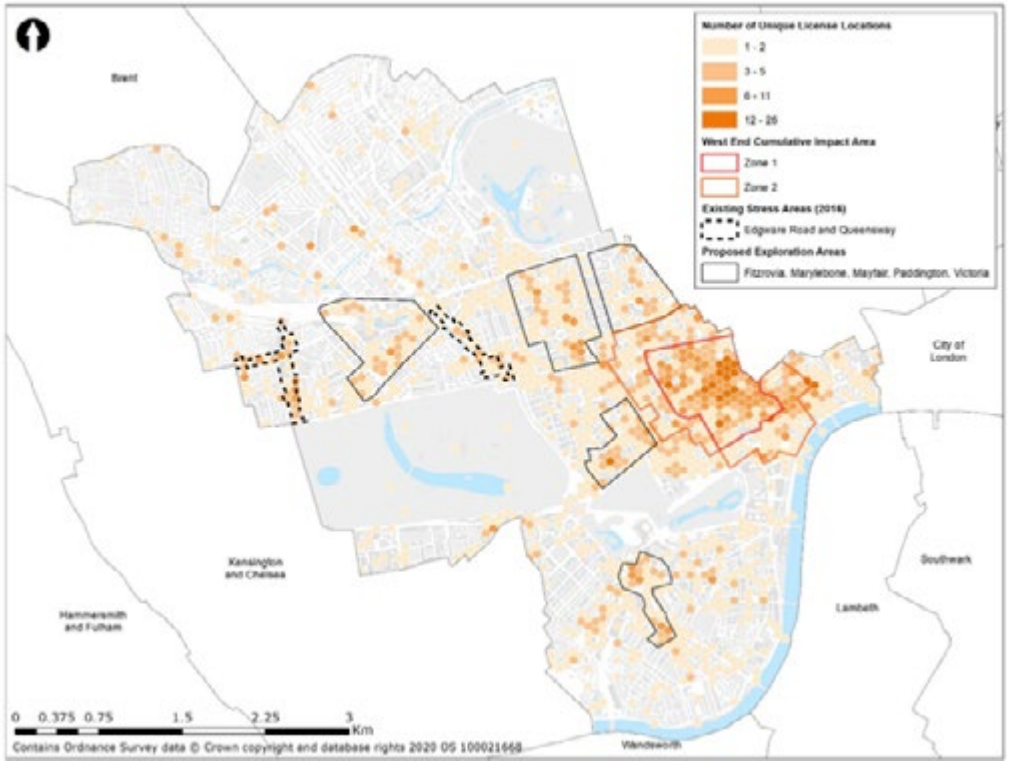
Rationale

The space-time pattern mining tool offered rich insights how incidents indicative of cumulative impact clustered over time and in space. By design it set a higher threshold for characterising cumulative impact and not all datasets were sufficiently granular to meet the input requirements of this tool.

To further describe the concentration of incidents indicative of cumulative impact in Zone 1 and Zone 2 and contextualize these against areas which did not present statistically significant hotspots but may nonetheless be burdened by a degree of cumulative impact, a comparative area study was undertaken looking at total incident volumes over the last three years.

Approach

Analysis in this section sought to offer a view on areas i) previously identified as stressed or ii) of concern relative to the West End, as well as gauge the rate of incidents in iii) licence-rich areas.



Areas of exploration:

1. West End Zone 1
2. West End Zone 2
3. West End Stress Area 2016
4. Queensway & Bayswater Stress Area 2016
5. Edgware Road Stress Area 2016
6. Mayfair Area, researched in 2017[22]
7. Paddington Station & Area
8. Victoria Station & Area
9. Corridor between Marylebone Road & Oxford Street
10. Fitzrovia (northern half)

22 Hadfield, P. (2017) Mayfair Evening and Night-time Economy Public Behaviour / Area Profiling Study: Project to Inform the City of Westminster Interim Licensing Policy Review 2017: Final Report.

Method

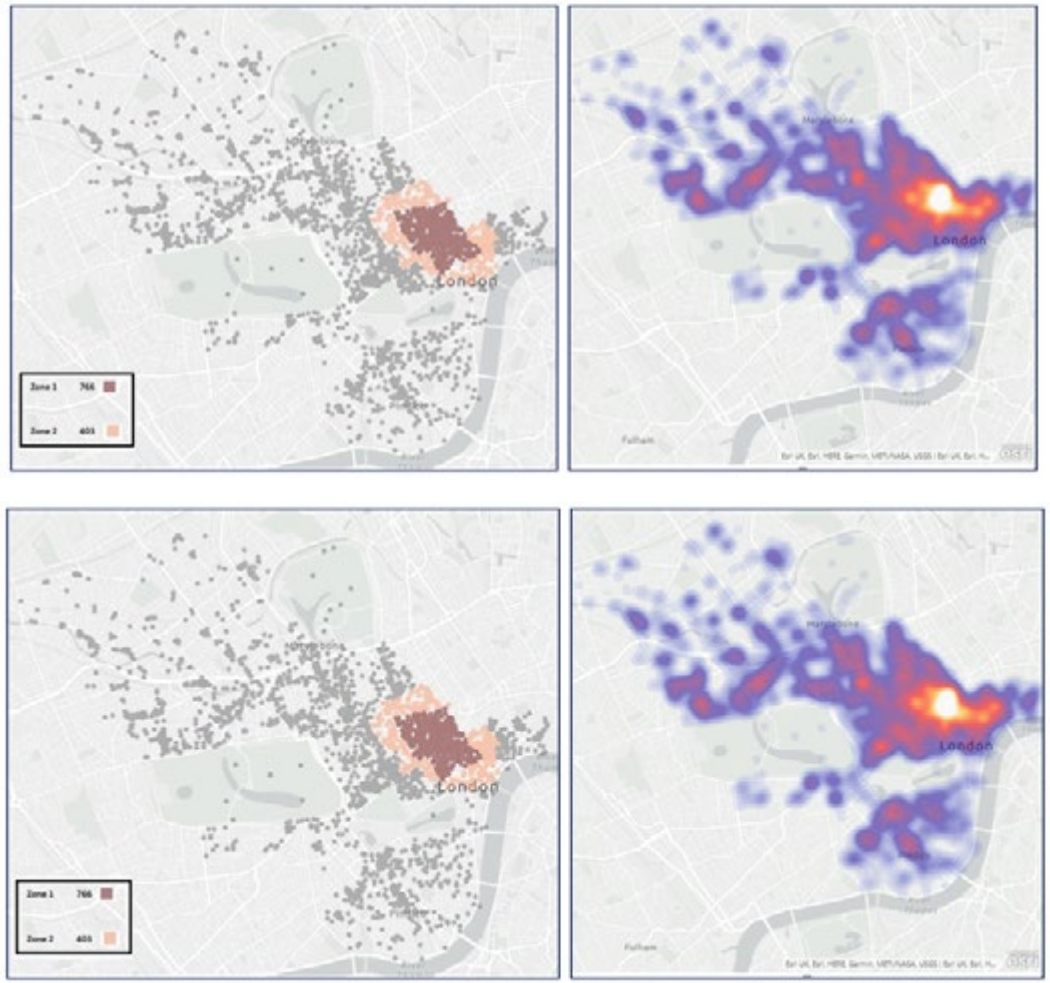
Within each area, the total prevalence of incidents between 2017 and 2019 were compared by type, per square kilometre. As a benchmark, these were compared to the overall borough average of incident concentrations per square kilometre. Also considered was the proportion of incidents in the borough these areas accounted for.

The areas which demonstrated elevated incidents per square kilometre relative to the borough average were investigated further using supplementary data, detailed assessment of licences within them, as well as discussions with service experts.

Findings

West End Zones

The maps below display the unique location of licences with an 'Issued' as of Feb, 2020. On the left are licences within Zone 1 (red) and 2 (orange) and on the right is a heatmap of licence locations in the borough overall.



West End Zone 1

Of all the areas observed, West End Zone 1 recorded the highest average rate of incidents per square kilometre, as well as the highest ratio of footprint to unique licence locations in the borough, further evidence cumulative impact characterised this area between 2017-2019.

The West End Zone 1 recorded a mean rate of incidents / km^2 nearly **9 times** higher the borough's average. For public realm crimes in particular, the rate was **10-13 times** higher between 6pm – 6am compared to the borough average.

On an area 0.68 km^2 in size, **3%** of the borough's footprint, approximately **one third** of serious violent crimes (795), robberies (2237) and thefts (24407) recorded in the borough between 6pm and 6am were recorded. On average, 40% of drug offences (1529) reported at night were in this area.

Incident Type Night = 6pm – 6am	**Total, 2017 – 2019**	**Proportion of Borough's Incidents**
Serious violent crimes Night	795	31%
Robberies Night	2237	33%
Theft and Handling Night	24407	33%
Drug Offences Night	1529	40%
Noise Complaints Night	1389	16%
Reactive Waste Management	6630	10%
Ambulance Call Outs to locations of licensed premises	5353	22%
Anti-social behaviour on Transport Night	592	13%
Anti-Social Behaviour MPS	9662	16%

The **Zone 1 Radial Chart** below displays the rate of public realm crimes, noise nuisance and disorder incidents per km^2 relative to the borough's average concentration. For example, serious violent crimes in 2017-2019 which occurred between 6pm and 6am in Zone 1 per square kilometre were approximately 10 times the borough average of serious violence incidents per square kilometre.

Situated in Zone 1, alongside 3240 residential households (3% in the borough), were over 750 unique licences locations (25% in the borough). The table below summarises the unique licensed premises by premises type group, used as a proxy for premises count.

Crimes (excluding theft) in Zone 1 primarily concentrated between 23:00 and 3am. These patterns are particularly pronounced on Friday night to early Sunday morning.

Table showing total 2017-2019 crimes (excl. Thefts) in Zone 1 by Hour

Hour	Drugs	Robbery	Violence Against the Person	Total
00:00:00	292	237	107	636
01:00:00	223	286	112	621
02:00:00	159	322	129	610
03:00:00	129	329	138	596
04:00:00	78	182	57	317
05:00:00	20	57	16	93
06:00:00	3	29	9	41
07:00:00	11	16	5	32
08:00:00	19	9	4	32
09:00:00	19	15	6	40
10:00:00	34	16	6	56
11:00:00	47	24	11	82
12:00:00	54	17	11	82
13:00:00	54	31	7	92
14:00:00	84	33	10	127
15:00:00	82	36	6	124
16:00:00	96	54	10	160
17:00:00	89	88	15	192
18:00:00	75	101	22	198
19:00:00	62	126	24	212
20:00:00	65	125	25	215
21:00:00	92	104	38	234
22:00:00	120	159	55	334
23:00:00	214	209	72	495
Total	**2121**	**2605**	**895**	**5621**

Table showing total 2017-2019 crimes (excl. Thefts) in Zone 1 by Hour and Weekday (1=Monday, 7 = Sunday)

Hour	1	2	3	4	5	6	7	Total
00:00:00	60	59	65	75	111	134	132	636
01:00:00	43	50	55	87	94	164	128	621
02:00:00	32	52	56	94	103	151	122	610
03:00:00	35	56	43	76	111	136	139	596
04:00:00	30	22	30	34	43	81	77	317
05:00:00	8	5	6	8	16	13	37	93
06:00:00	3	5	4	2	7	9	11	41
07:00:00	5	4	2	9	3	9		32
08:00:00	8	4	4	4	5	3	4	32
09:00:00	6	4	4	11	4	7	4	40
10:00:00	5	12	8	10	6	9	6	56
11:00:00	6	17	9	13	15	13	9	82
12:00:00	7	13	14	10	15	12	11	82
13:00:00	15	8	9	16	12	16	16	92
14:00:00	14	12	17	20	20	26	18	127
15:00:00	11	17	22	28	18	16	12	124
16:00:00	19	16	21	22	25	33	24	160
17:00:00	17	21	26	33	33	34	28	192
18:00:00	16	22	27	36	37	43	17	198
19:00:00	21	29	22	45	34	37	24	212
20:00:00	25	21	37	27	41	43	21	215
21:00:00	15	22	31	33	65	48	20	234
22:00:00	39	23	39	70	62	68	33	334
23:00:00	64	48	70	65	100	106	42	495
Total	**504**	**542**	**621**	**828**	**980**	**1211**	**935**	**5621**

Robberies in Zone 1 on average rose steadily from 4pm onwards, dipping at 9pm and rising more again between 10pm and 2pm (with an hour to hour average % change of 26%), peaking at 3am, after which they dropped off steeply.

Serious violent crimes in Zone 1 rose most pronounced between 9pm – 00am, with an hour to hour average % change of 40%, and likewise peaked at 3am before dropping off.

Robberies in Zone 1

Hour	Total 3 Years	% of Zone 1 Robberies	% Change from previous hour
8PM	125	5%	-1%
9PM	104	4%	-17%
10PM	159	6%	53%
11PM	209	8%	31%
12AM	237	9%	13%
1AM	286	11%	21%
2AM	322	12%	13%
3AM	329	13%	2%

Serious Violent Crime in Zone 1

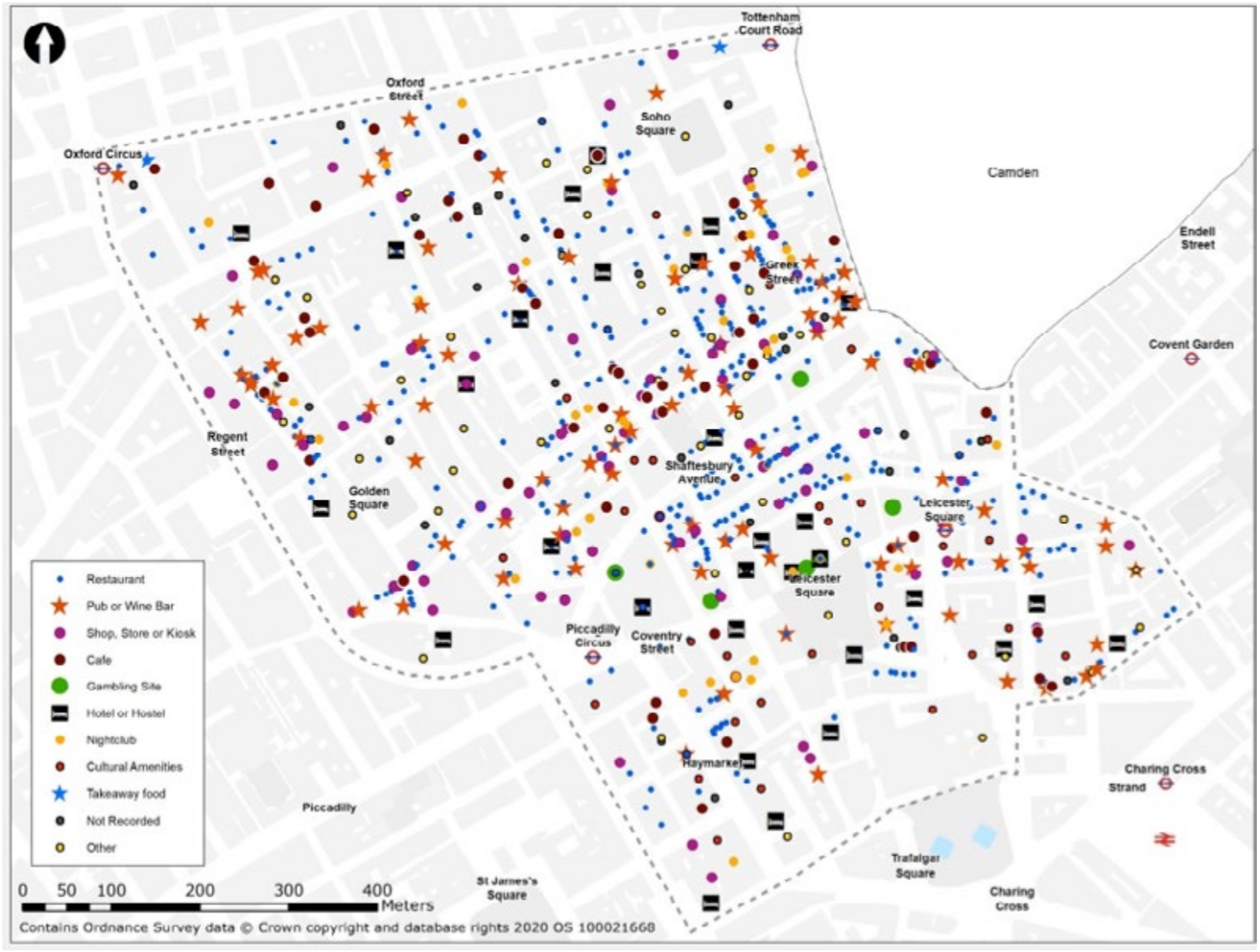
Hour	Total 3 Years	% of Zone 1 Violent Crimes	% Change from previous hour
8PM	25	3%	4%
9PM	38	4%	52%
10PM	55	6%	45%
11PM	72	8%	31%
12AM	107	12%	33%
1AM	112	13%	5%
2AM	129	14%	15%
3AM	138	15%	7%

Drug offence records in Zone 1 rose most steeply on average from 9PM to midnight, with an hour to hour average % change of 47%, after which they dropped off dramatically. It is important to note that patterns of drug offence records are significantly influenced by policing practices.

	Count of Unique Licence Locations = Proxy for Licensed Premises[1]		
Premises Type Group	**Total**	**Zone 1**	**Proportion**
Restaurant	1316	404	31%
Shop, Store or Kiosk	432	93	22%
Pub or Wine Bar	428	74	17%
Other	362	59	16%
Cafe	209	54	26%
Hotel or Hostel	208	30	14%
Not Recorded	154	35	23%
Cultural Amenities	112	37	33%
Nightclub	92	47	51%
Takeaway food	28	2	7%
Gambling Site	18	6	33%

1 Due to the licensing data structure, the exact number of premises cannot be discerned. Unique locations of license locations have been used as a proxy. The sum of unique license locations differs from the sum of unique license locations by premises type due to instances in which: i) multiple licences have been issued to the same premises categorising it with different type or ii) a unique licence location (based on coordinates) hosts multiple premises of different types.

Map of West End Zone 1 Unique Licence Locations by Premises Type



West End Zone 2

West End Zone 2 is a larger area (0.86 square kilometres) surrounding Zone 1, it occupies 3.9% of the borough's footprint and held 13% of all unique licence locations in February 2020. According to council tax records (Feb, 2020), 2310 residential households were situated here, 1.8% of the borough's total.

Statistically significant and persistent hotspots emerged within this boundary as well, across incident categories assessed. The rate of incidents per square kilometre observed here was nearly **4 times** greater and rate of licensed premises per square kilometre was **3.4 times** greater than the borough's average concentration.

Cumulative impact in Zone 2 was likely significantly shaped not just by the premises that sit within it, but also dispersal from the acutely affected Zone 1 and hosting key transport hubs Charing Cross, Embankment and Covent Garden, in close proximity to Oxford Circus and Tottenham Court Road stations.

Incident Type Night = 6pm – 6am	**Total, 2017 – 2019**	**Proportion of Borough's Incidents**
Serious violent crimes Night	388	15%
Robberies Night	1384	21%
Theft and Handling Night	12964	21%
Drug Offences Night	487	13%
Noise Complaints Night	887	10%
Reactive Waste Management	6602	10%
Ambulance Call Outs to locations of licensed premises	5330	22%
Anti-social behaviour on Transport Night	1266	27%
Anti-Social Behaviour MPS	6276	11%

The **Zone 2 Radial Chart** below displays the rate of public realm crimes, noise nuisance and disorder incidents in 2017-2019 per km^2 relative to the borough's average concentration. Robberies and theft and handling crimes between 6pm and 6am, as well as ambulance call outs to the locations of licences per square kilometre were approximately 5.5 times the borough's average.

Public realm crimes combined (excluding theft) made up nearly 10% of all crime incidents in Zone 2 over the last three years. 1/5 of these occurred between midnight and 3am and nearly 1/3 between 9pm and midnight. In Zone 2, across all crime types figures fall on average between 8pm and 10pm, apart from serious crime which shows little variation between these hours.

As can be seen from the tables below, crimes (excluding theft) in Zone 2 primarily concentrated between 00:00 and 3am. These patterns are particularly pronounced on Friday night to early Sunday morning.

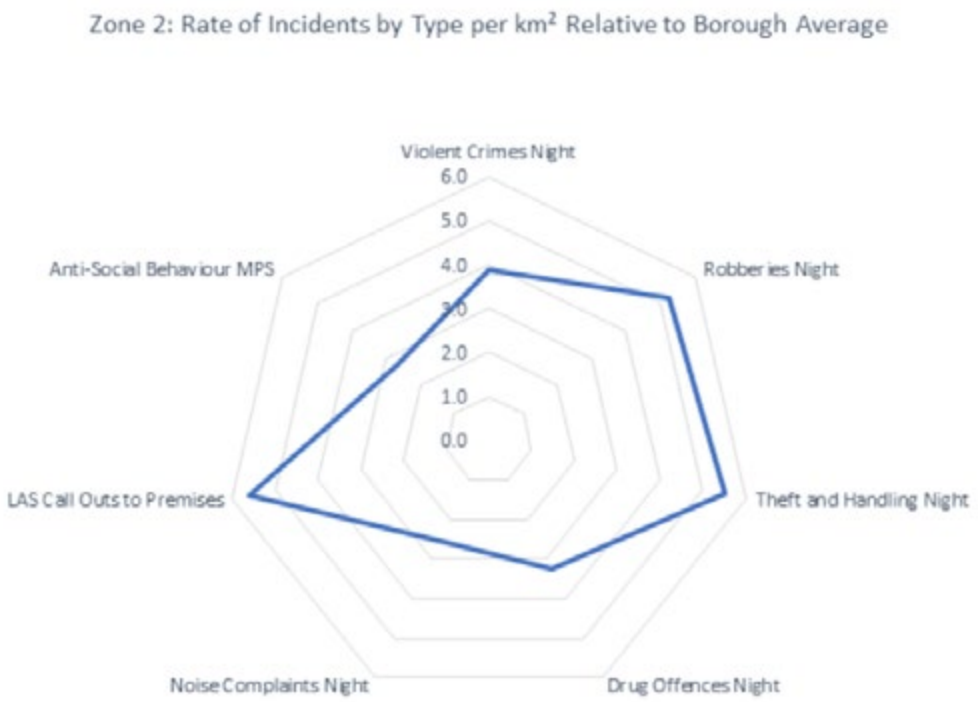


Table showing total 2017-2019 crimes (excl. Thefts) in Zone 2 by Hour

Hour	Drugs	Robbery	Violence Against the Person	Total
00:00:00	77	118	47	**242**
01:00:00	43	117	53	**213**
02:00:00	34	136	53	**223**
03:00:00	48	153	63	**264**
04:00:00	37	143	37	**217**
05:00:00	14	48	5	**67**
06:00:00	8	25	3	**36**
07:00:00	8	12	6	**26**
08:00:00	4	12	2	**18**
09:00:00	19	27	6	**52**
10:00:00	28	21	7	**56**
11:00:00	42	33	7	**82**
12:00:00	55	34	12	**101**
13:00:00	44	51	11	**106**
14:00:00	62	66	13	**141**
15:00:00	79	93	9	**181**
16:00:00	49	90	11	**150**
17:00:00	55	138	14	**207**
18:00:00	35	150	12	**197**
19:00:00	42	129	21	**192**
20:00:00	38	123	20	**181**
21:00:00	44	83	30	**157**
22:00:00	26	86	17	**129**
23:00:00	49	98	30	**177**
Total	**940**	**1986**	**489**	**3415**

Table showing total 2017-2019 crimes (excl. Thefts) in Zone 2 by Hour and Weekday (1=Monday, 7 = Sunday)

Hour	1	2	3	4	5	6	7	Total
00:00:00	27	28	18	34	41	57	37	**242**
01:00:00	10	30	11	27	40	43	52	**213**
02:00:00	21	25	17	30	31	53	46	**223**
03:00:00	23	34	18	28	28	72	61	**264**
04:00:00	10	26	13	13	28	63	64	**217**
05:00:00	6	9	2	5	13	12	20	**67**
06:00:00	6	5	3	2	3	4	13	**36**
07:00:00	4	3	2	10	1	3	3	**26**
08:00:00	3	2	1	6	1	4	1	**18**
09:00:00	6	8	14	4	11	5	4	**52**
10:00:00	7	12	9	10	8	4	6	**56**
11:00:00	9	13	15	13	14	11	7	**82**
12:00:00	7	9	14	24	13	21	13	**101**
13:00:00	14	11	20	16	12	21	12	**106**
14:00:00	19	18	19	18	23	27	17	**141**
15:00:00	25	22	23	23	22	35	31	**181**
16:00:00	17	11	18	27	22	33	22	**150**
17:00:00	21	26	28	34	25	34	39	**207**
18:00:00	28	20	29	32	32	31	25	**197**
19:00:00	20	33	27	25	35	28	24	**192**
20:00:00	33	22	25	36	36	18	11	**181**
21:00:00	13	24	24	18	29	37	12	**157**
22:00:00	13	19	20	17	29	18	13	**129**
23:00:00	14	20	29	19	43	36	16	**177**
Total	**356**	**430**	**399**	**471**	**540**	**670**	**549**	**3415**

Robberies in Zone 2 on average demonstrated two peaks between 17:00 and 20:00 and 2am – 4pm. Between midnight and 3am robberies rose steadily by x% upon the previous hour, dropping off steeply after 4am.

Serious violent crimes in Zone 2 rose between 11pm and 1am with an average % change of 56% upon the previous hour and more steadily between 1am and 3am (11% each hour on average). Crimes on average across the three years and weekdays, were highest between midnight – 3am, after which they dropped off.

Robberies in Zone 2

Hour	Total 3 Years	% of Zone 2 Robberies	% Change from previous hour
8PM	123	6%	-5%
9PM	83	4%	-33%
10PM	86	4%	4%
11PM	98	5%	14%
12AM	118	6%	20%
1AM	117	6%	-1%
2AM	136	7%	16%
3AM	153	8%	13%

Serious Violent Crime in Zone 2

Hour	Total 3 Years	% of Zone 2 S. Violent Crimes	% Change from previous hour
8PM	20	4%	-5%
9PM	30	6%	50%
10PM	17	3%	-43%
11PM	30	6%	76%
12AM	47	10%	36%
1AM	53	11%	13%
2AM	53	11%	0%
3AM	63	13%	19%

Drug offence records in Zone 2 demonstrated two peaks, one in the afternoon and a second at night peaking at midnight. Between 11pm and 1am the average hour to hour average increase was 72%, dropped steadily until 7am with the exception of a 3am jump. It is important to note that patterns of drug offence records are significantly influenced by policing practices.

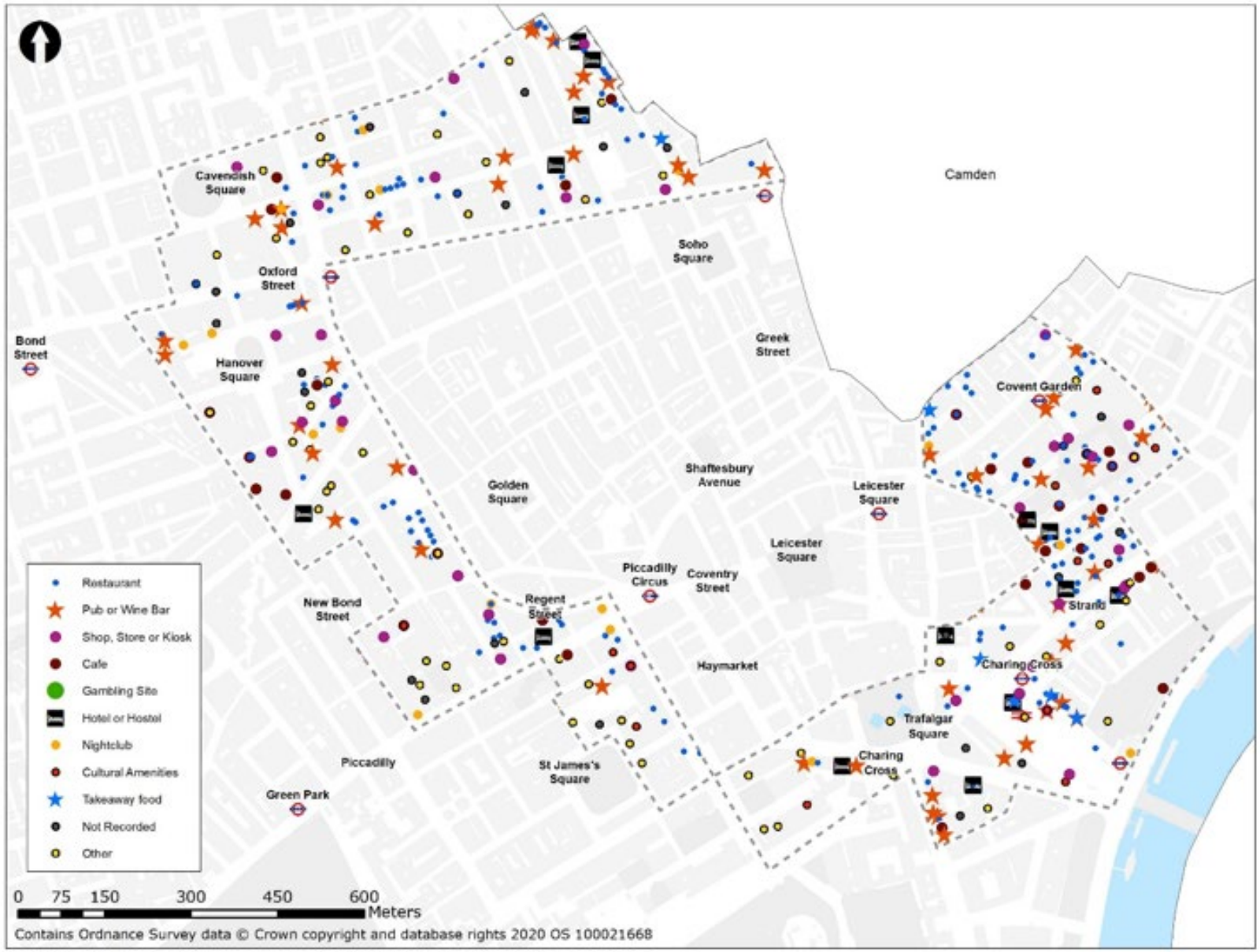
Drug Offences in Zone 2			
Hour	Total 3 Years	% of Zone 2 Drug O.	% change from previous hour
8PM	38	4%	-10%
9PM	44	5%	16%
10PM	26	3%	-41%
11PM	49	5%	88%
12AM	77	8%	57%
1AM	43	5%	-44
2AM	34	4%	-21
3AM	48	5%	41%

Despite holding a larger footprint, the total number of incidents recorded in this area was lower compared to Zone 1, as were the total number of licensed locations (approximately 13% of the borough total).

	Count of Unique Licence Locations = Proxy for Licensed Premises[23]		
Premises Type Group	Total	Zone 2	Proportion
Restaurant	1316	197	15%
Shop, Store or Kiosk	432	38	9%
Pub or Wine Bar	428	53	12%
Other	362	58	16%
Cafe	209	30	14%
Hotel or Hostel	208	14	7%
Not Recorded	154	29	19%
Cultural Amenities	112	13	12%
Nightclub	92	22	24%
Takeaway food	28	6	21%

23 Due to the licensing data structure, the exact number of premises cannot be discerned. Unique locations of license locations have been used as a proxy. The sum of unique license locations differs from the sum of unique license locations by premises type due to instances in which: i) multiple licences have been issued to the same premises categorising it with different type or ii) a unique licence location (based on coordinates) hosts multiple premises of different types.

Map of West End Zone 2 Unique Licence Locations by Premises Type



Zones 1 & 2

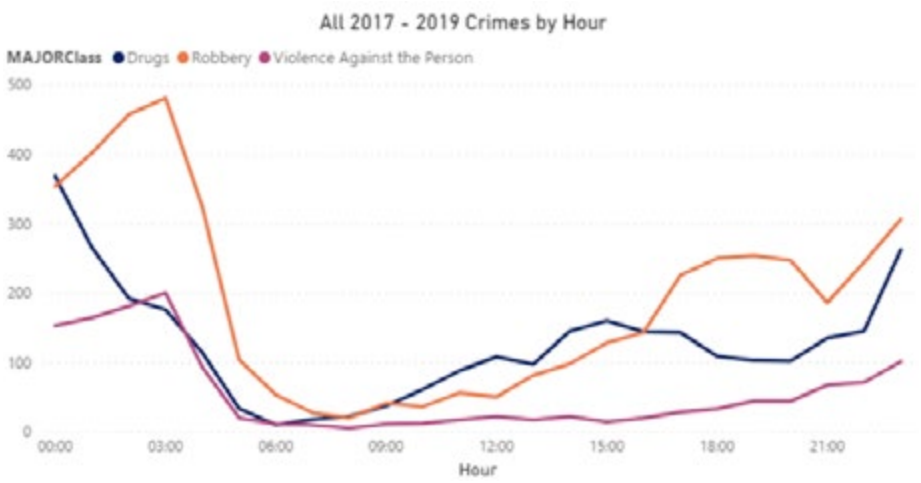
Public realm crimes between 6pm – 6am in the borough were disproportionately concentrated here. Further statistical analysis comparing crime in these areas to the borough more widely, indicated that public realm crimes recorded in these areas between 2017 – 2019 were more likely occur in the evening and night and on weekends. This coincides with higher volumes of street population, deduced from peaks of entries and exits to the underground.

Over the last three calendar years, 46% of serious violent crimes, as well as over half of robberies, thefts and drug offences in the borough were recorded here. Additionally, 44% of ambulance call outs 2017 – 2019 to the locations of licensed premises fell within these zones.

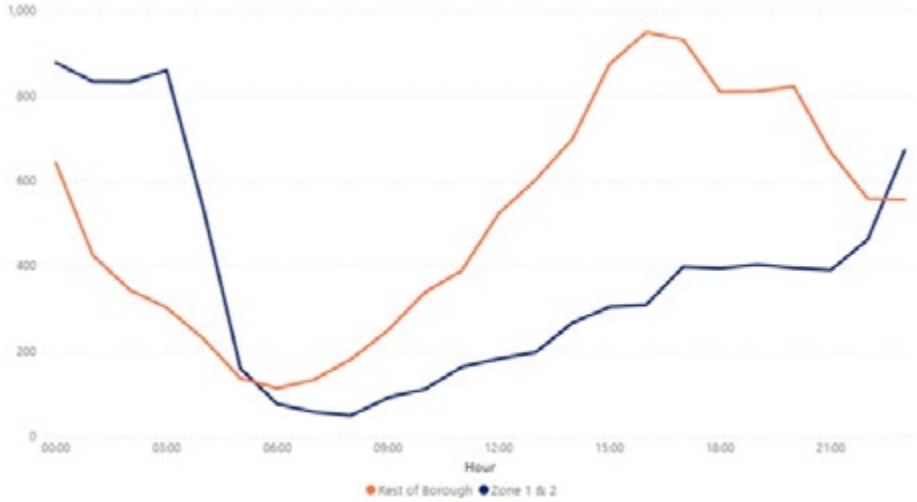
These zones occupy 7% (1.54 km^2) of the borough footprint, this combined area is therefore 57% larger in footprint compared to the previous West End Stress Area.

Incident Type Night = 6pm – 6am	**Total, 2017 – 2019**	**Proportion of Borough's Incidents**
Serious violent crimes Night	1183	46%
Robberies Night	3621	54%
Theft and Handling Night	32810	54%
Drug Offences Night	2016	53%
Noise Complaints Night	2276	26%
Reactive Waste Management	13232	20%
Ambulance Call Outs to locations of licensed premises	10683	44%
Anti-social behaviour on Transport Night	1858	39%
Anti-Social Behaviour MPS	15938	27%

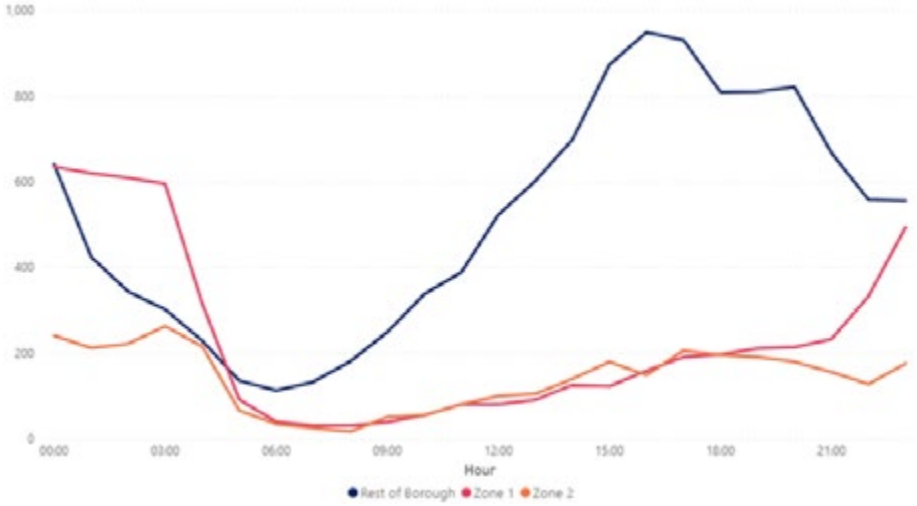
Graph of all crimes excluding thefts Zones 1 & 2 combined by Hour and Type, 2017 – 2019 Totals



Graph of all crimes excluding thefts Zones 1 & 2 combined compared to rest of the borough by Hour and Type, 2017 – 2019 Totals



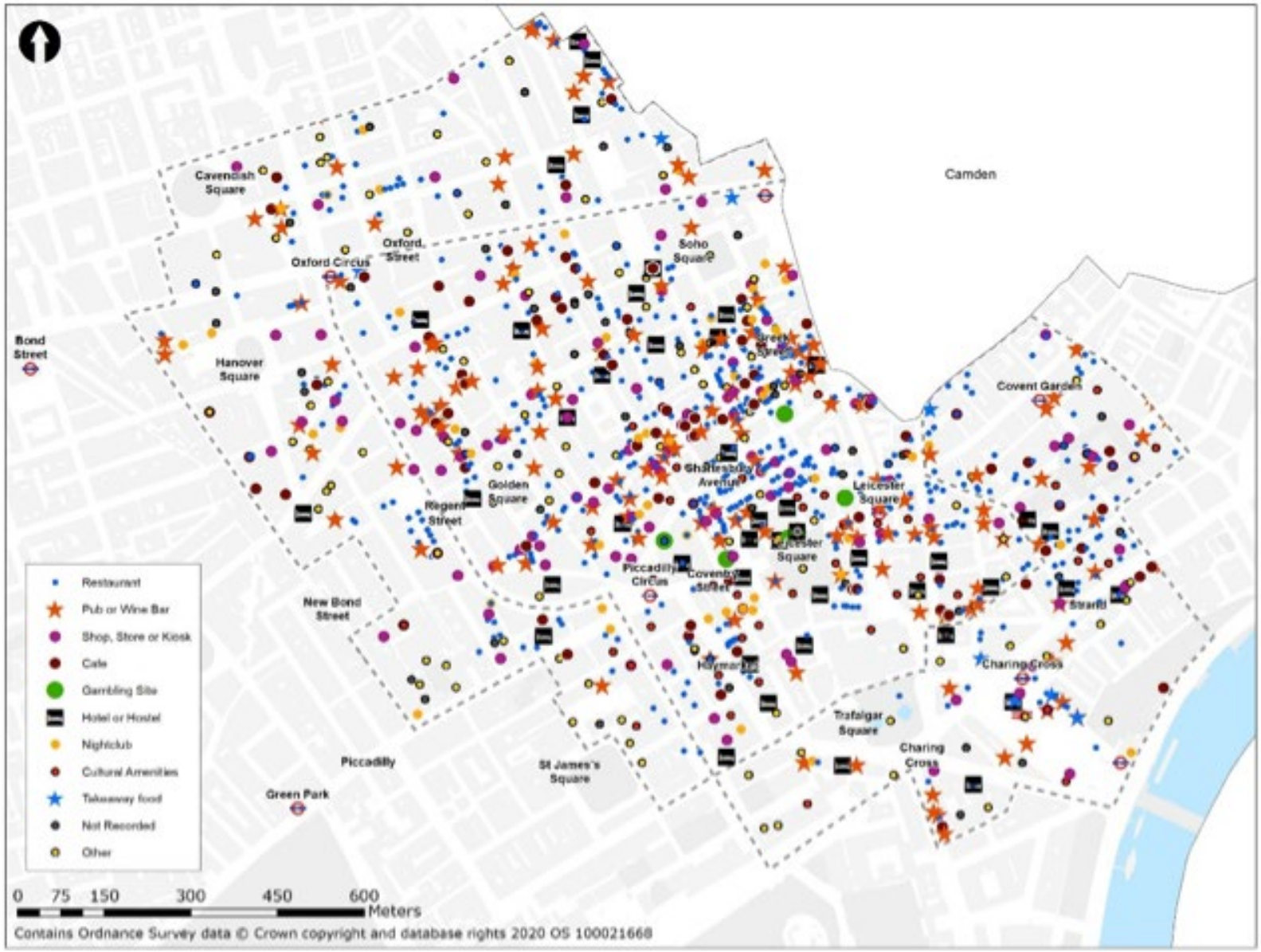
Graph of all crimes excluding thefts in Zones 1 & 2 compared individually to rest of the borough by Hour and Type, 2017 – 2019 Totals



In Zones 1 & 2 combined there were 1486 licences issued to 1169 unique licence locations. This represents 38% of unique licence locations in the borough on just 7% (1.54 sq km) of its footprint.

	Count of Unique Licence Locations by Premises Type = Proxy for Licensed Premises[24]		
Premises Type Group	**Total**	**Zone 1 + 2**	**Proportion**
Restaurant	1316	601	46%
Shop, Store or Kiosk	432	112	26%
Pub or Wine Bar	428	146	34%
Other	362	117	32%
Cafe	209	84	40%
Hotel or Hostel	208	44	21%
Not Recorded	154	64	42%
Cultural Amenities	112	50	45%
Nightclub	92	69	75%
Takeaway food	28	8	29%
Gambling Site	18	6	33%

24 Due to the licensing data structure, the exact number of premises cannot be discerned. Unique locations of license locations have been used as a proxy. The sum of unique license locations differs from the sum of unique license locations by premises type due to instances in which: i) multiple licences have been issued to the same premises categorising it with different type or ii) a unique licence location (based on coordinates) hosts multiple premises of different types.


Camden
Cavendish Square
Oxford Circus
Oxford Street
Soho Square
Bond Street
Hanover Square
Covent Garden
Golden Square
Regent Street
Leicester Square
New Bond Street
Piccadilly Circus
Strand
Charing Cross
Trafalgar Square
Piccadilly
St James's Square
Green Park
Restaurant
Pub or Wine Bar
Shop, Store or Kiosk
Cafe
Gambling Site
Hotel or Hostel
Nightclub
Cultural Amenities
Takeaway food
Not Recorded
Other
0 75 150 300 450 600
Meters
Contains Ordnance Survey data © Crown copyright and database rights 2020 OS 100021668

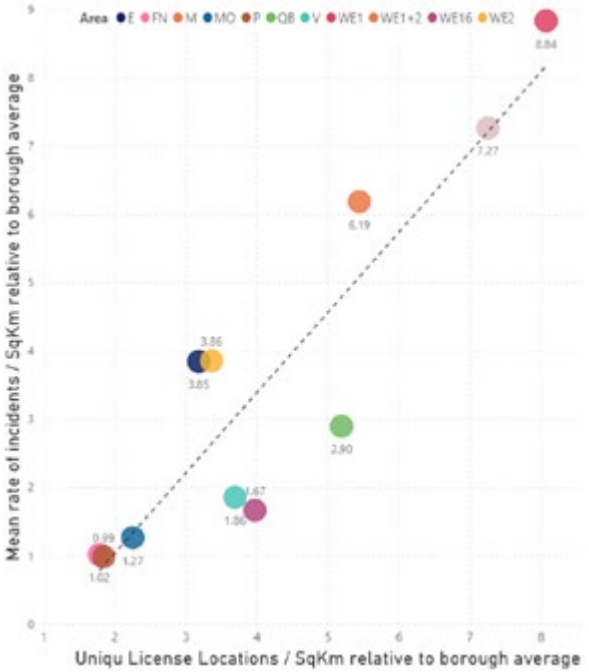
Areas of Exploration

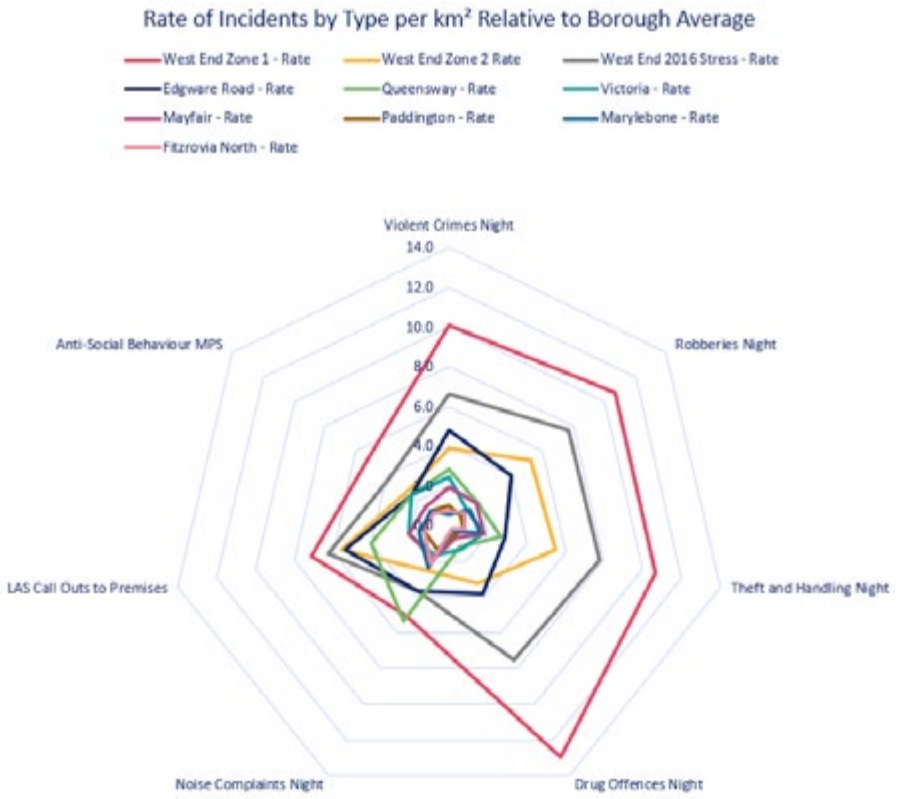
The radial chart below charts the rate of 2017-2019 incidents per km² by type, relative to the borough's average concentration (see Appendix 9).

The radial chart demonstrates which type of incidents concentrated particularly high in comparison to the borough's average by area. To summarise these patterns, the average rate of all incidents per km² depicted above was calculated and compared to the borough average.

Mean incident density rate relative to borough average

These average incident concentrations, relative to the borough average rate were plotted against the concentration of licence locations per km² in each area, also relative to the borough average. This can be seen in the figure below, the trend line supports the findings of the regression analysis, showing a positive correlation between prevalence of licensed premises and incidents indicative of cumulative impact.





Summary of Relative Concentrations by Area

Based on these calculations, Fitzrovia North (FN), Paddington (P) and the corridor between Marylebone Road and Oxford Street (MO) showed rates broadly comparable to the borough's average rate of incidents / km^2. These areas are therefore not explored further in this assessment. More detailed maps of these areas can be found in Appendix 10.

Victoria (V) and Mayfair (M) areas demonstrated somewhat elevated relative rates compared to the borough average, averaging 1.86 and 1.67 times the Westminster's mean rate of incidents per square kilometre respectively.

The West End Zone 2 (WE2) recorded a concentration of incidents on average 3.86 times greater than the average borough rates. Similarly, high concentrations (incidents per square kilometre compared to borough average) were observed in the 2016 Stress Areas in Edgware Road (E = 3.85) and to a lesser degree Queensway and Bayswater (QB = 2.9 times). These rates may be somewhat inflated relative to the other areas observed here as their boundaries are more narrowly defined.

To investigate the character of these areas and the volume of incidents within them further, Victoria, Mayfair, Edgware Road and Queensway and Bayswater are explored further in next section, Areas of Concern.

Proportion of Westminster's Incidents of Cumulative Impact, by Area

The proportion of incidents recorded over the last three years in Westminster are summaries below by area.

Proportion of Borough's Public Realm Crimes 2017 – 2019, by Area

				Proportion of Borough Total between 2017 – 2019 by Area			
Area	**Unique License Locations**	**Footprint**	**Footprint Licenses Ratio**	**Serious Serious violent crimes – Night**	**Robberies – Night**	**Thefts – Night**	**Drug Offences – Night**
West End 1 + 2	38%	7%	5.2	46%	54%	54%	53%
West End Zone 1	25%	3%	8.1	38%	44%	47%	45%
West End Zone 2	13%	4%	3.1	15%	21%	21%	13%
West End Stress Area	32%	4%	7.2	14%	20%	21%	12%
Marylebone Corridor	6%	3%	2.3	1%	3%	4%	1%
Paddington	4%	2%	1.8	2%	2%	2%	1%
Mayfair	4%	1%	4.0	2%	2%	2%	1%
Victoria	3%	1%	3.7	2%	1%	2%	1%
Fitzrovia North	3%	2%	1.8	1%	2%	1%	0%
Queensway & Bayswater	3%	1%	5.2	2%	1%	1%	1%
Edgware Road	1%	0%	3.2	2%	2%	1%	2%

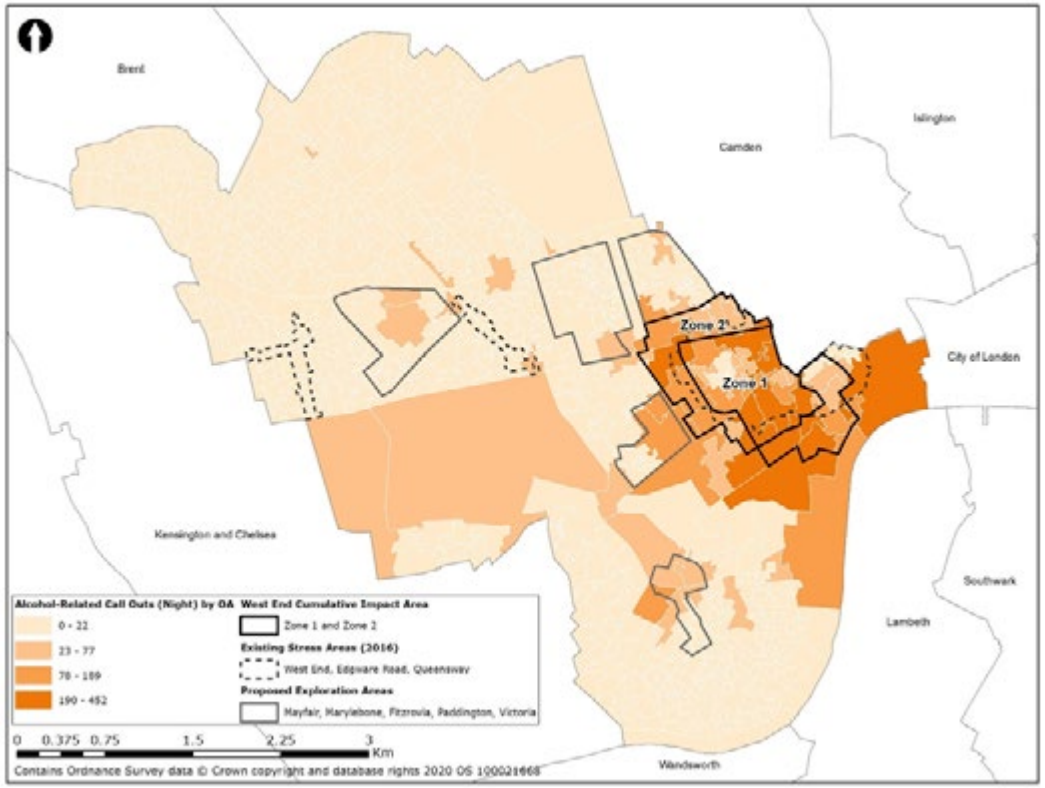
Proportion of Borough's Disorder and Nuisance 2017 – 2019, by Area

For a variety of reasons, the data portrayed on in the below table holds more caveats than that of the crime data, see Appendix 1 for details.

				Proportion of Borough Total between 2017 – 2019 by Area			
Area	**Unique License Locations**	**Footprint**	**Footprint Licenses Ratio**	**Noise Complaints Night**	**Reactive Waste Requests**	**ASB Day & Night**	**Ambulance Call Outs**
West End 1 + 2	38%	7%	5.2	26%	20%	27%	44%
West End Zone 1	25%	3%	8.1	16%	10%	16%	22%
West End Zone 2	13%	4%	3.1	13%	10%	11%	22%
West End Stress Area	32%	4%	7.2	20%	13%	20%	32%
Marylebone Corridor	6%	3%	2.3	6%	4%	3%	4%
Paddington	4%	2%	1.8	3%	3%	3%	3%
Mayfair	4%	1%	4.0	2%	1%	2%	2%
Victoria	3%	1%	3.7	1%	2%	2%	2%
Fitzrovia North	3%	2%	1.8	4%	3%	2%	2%
Queensway & Bayswater	3%	1%	5.2	3%	3%	1%	2%
Edgware Road	1%	0%	3.2	1%	1%	1%	2%

Areas of Concern

Plotted below are the total volumes of alcohol-related attendances between 6pm and 6am over the last three years at the Output Area (OA) level. OA's cross the delineated areas of exploration as they are based on population size and are irregular in size. Unfortunately, these are not sufficiently granular to identify problematic streets and derive relative concentrations based on uniform areas. However, broadly effected parts of the borough can be identified. Of the areas explored, OAs which intersect with Victoria, Paddington, parts of Mayfair, Fitzrovia North and either end of Edgware Road saw more alcohol-related call outs.



Victoria

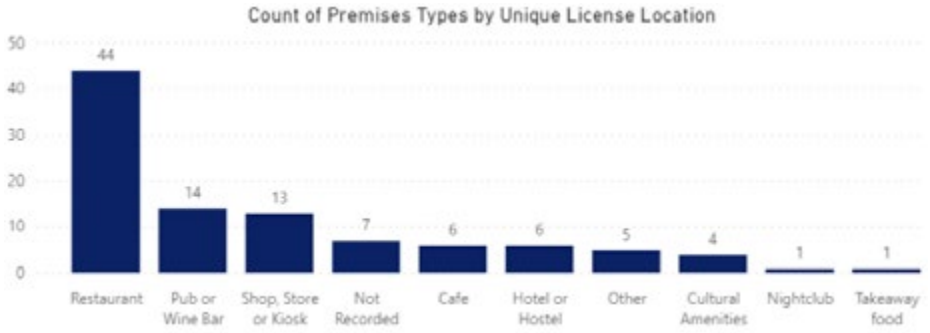
Victoria area is 0.19km^2 in size, accounting for nearly 1% of the borough's footprint. In this area numerous incidents indicative of cumulative impact were over twice as concentrated in space as the borough average: serious serious violent crimes at night (x2.5), anti-social behaviour at all times of day (x2.5), as well as ambulance call outs to the locations of licensed premises (x2). Both theft incidents at night (x1.8) and noise complaints at night (x1.6) were elevated as well. Looking across all incident types plotted in the radial chart, this area recorded 1.86 times the borough's average rate of incidents per square kilometre. Furthermore, Victoria station and its surrounding areas accounted for nearly one fifth of anti-social behaviour incidents recorded on transport networks in the borough between 2017 and 2019, averaging 24 incidents a month.

The table below highlights the total volume of all incident types in Victoria over the last three years, the average volume per year, per month, as well as the proportion of Westminster incidents this area accounts for.

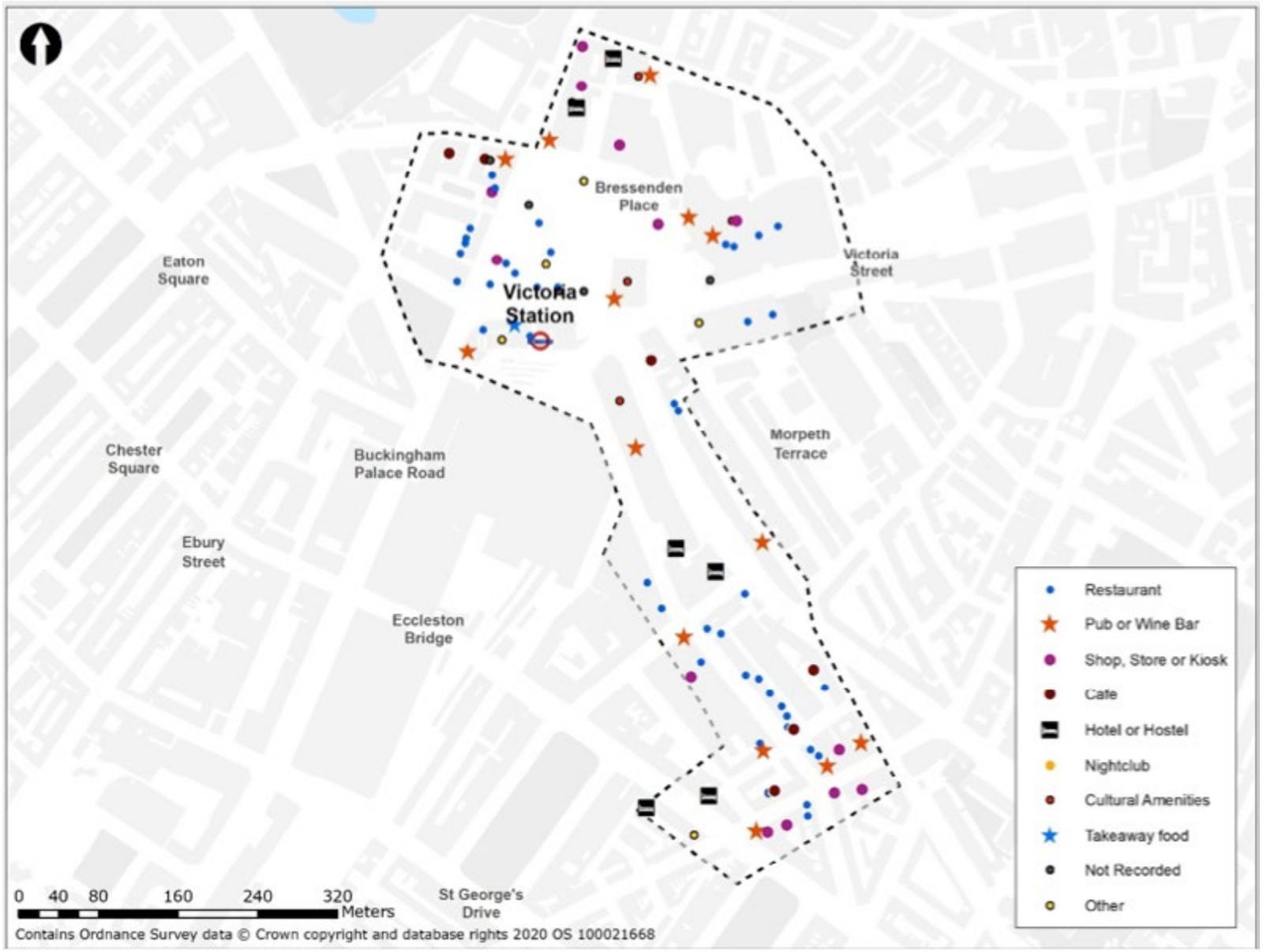
Incidents 2017 – 2019	Total	Mean incidents per year	Mean incidents per month	Proportion in Westminster
Footprint km²	0.19	–	–	0.9%
Licences	106	–	–	2.8%
Unique Licence Locations	98	–	–	3.2%
Residential Households	1092	–	–	0.9%
Serious Serious violent crimes Night	54	18	1.5	2%
Robberies Night	69	23	1.9	1%
Theft and Handling Night	940	313	26.1	1.5%
Drug Offences Night	46	15	1.3	1.2%
Noise Complaints Night	126	42	3.5	1.4%
Reactive Waste Requests	1019	340	28.3	1.5%
LAS Call Outs to Licence Locations	446	149	12.4	1.8%
ASB on Transport Night	862	287	23.9	18%
Anti-Social Behaviour MPS	1252	417	34.8	2%
Residents concerned about public realm (9%)	5	-	-	0.7%

The table below summarises the total number of unique licensed premises by premises type group, used as a proxy for premises count.[25]

	Count of Unique Licence Locations = Proxy for Licensed Premises		
Premises Type Group	**Total**	**Victoria**	**Proportion**
Restaurant	1316	44	3%
Shop, Store or Kiosk	432	13	3%
Pub or Wine Bar	428	14	3%
Other	362	5	1%
Cafe	209	6	3%
Hotel or Hostel	208	6	3%
Not Recorded	154	7	5%
Cultural Amenities	112	4	4%
Nightclub	92	1	1%
Takeaway food	28	1	4%
Gambling Site	18	0	0%



25 Depending on the licence application, some unique licence locations may be ascribed multiple premises groups and are therefore double counted.


Bressenden Place
Victoria Street
Eaton Square
Victoria Station
Chester Square
Buckingham Palace Road
Morpeth Terrace
Ebury Street
Eccleston Bridge
St George's Drive
0 40 80 160 240 320
Meters
Contains Ordnance Survey data © Crown copyright and database rights 2020 OS 100021668
Restaurant
Pub or Wine Bar
Shop, Store or Kiosk
Cafe
Hotel or Hostel
Nightclub
Cultural Amenities
Takeaway food
Not Recorded
Other

Interpretation

Victoria area hosts transport networks of significance to London, regionally and nationally. It is among the busiest stations in the evening and night, as well as on weekends. This presents a challenge to ascertain whether the concentration of licensed premises are key drivers of incidents recorded over the last three years, or whether other factors are of greater significance.

Although the number of licensed premises in the Victoria area has grown over the last several years, feedback from service experts and city inspectors suggest that much of these patterns are attributable to the travel of night-time revellers coming from elsewhere in the city.

Conclusion

Although statistically significant patterns of incidents at night in space and time were not identified in this area, concerning volumes of stress have been identified. However due to factors other than the prevalence of licence premises which likely drive crime, disorder and nuisance in the city, this area cannot be conclusively characterised by cumulative impact attributable to the concentration or types of licensed premises in the area.

Considering these elevated concentrations of incidents however, the volume and type of applications for licensed premises in this area should be carefully considered to ensure this area does not become characterised by cumulative impact in the future.

Mayfair

Mayfair area is 0.24km^2 in size, accounting for 1% of the borough's footprint. In this area numerous incidents indicative of cumulative impact were nearly twice as concentrated in space as the borough average: the rate of thefts at night (x1.83), noise complaints at night (x1.86), serious serious violent crimes at night (x1.90), as well as ambulance call outs to the locations of licensed premises (x2.07). Looking across all incident types plotted in the radial chart, this area recorded 1.67 times the borough's average rate of incidents per square kilometre.

The tables below highlight the total volume of all incident types in Mayfair over the last three years, the average per year, the average per month, as well as the proportion of Westminster incidents this area accounts for.

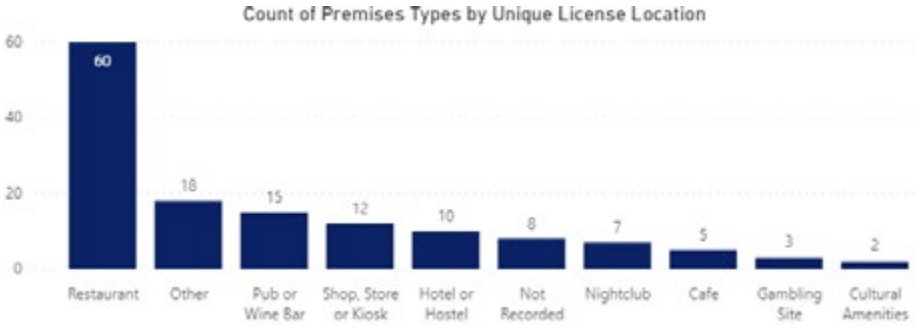
Mayfair – Overall Incidents

Situated in Mayfair, alongside over 1000 residential households, were over 130 unique licences locations (4% in the borough). Mayfair has a higher licence to footprint ratio than most of the other areas observed. The table below summarises the unique licensed locations by premises type group, used as a proxy for premises count.[26]

Incidents 2017 – 2019	Total	Mean incidents per year	Mean incidents per month	Proportion in Westminster
Footprint km^2	0.24	–	–	1%
Licences	153	–	–	4%
Unique Licence Locations	133	–	–	4.3%
Residential Households	1033	–	–	0.8%
Serious Serious violent crimes Night	53	18	1.5	2%
Robberies Night	131	44	3.6	2%
Theft and Handling Night	1203	401	33.4	2%
Drug Offences Night	30	10	0.8	0.7%
Noise Complaints Night	180	60	5.0	2%
Reactive Waste Requests	740	247	20.6	1%
LAS Call Outs to Licence Locations	550	183	15.3	2.3%
ASB on Transport Night	91	30	2.5	2%
Anti-Social Behaviour MPS	993	331	27.6	1.7%
Residents concerned about public realm (9%)	11	-	-	1.5%

26 Depending on the licence application, some unique licence locations may be ascribed multiple premises groups and are therefore double counted.

	Count of Unique Licence Locations = Proxy for Licensed Premises		
Premises Type Group	**Total**	**Mayfair**	**Proportion**
Restaurant	1316	60	5%
Shop, Store or Kiosk	432	12	3%
Pub or Wine Bar	428	15	4%
Other	362	18	5%
Cafe	209	5	2%
Hotel or Hostel	208	10	5%
Not Recorded	154	8	5%
Cultural Amenities	112	2	2%
Nightclub	92	7	8%
Takeaway food	28	0	0%
Gambling Site	18	3	17%



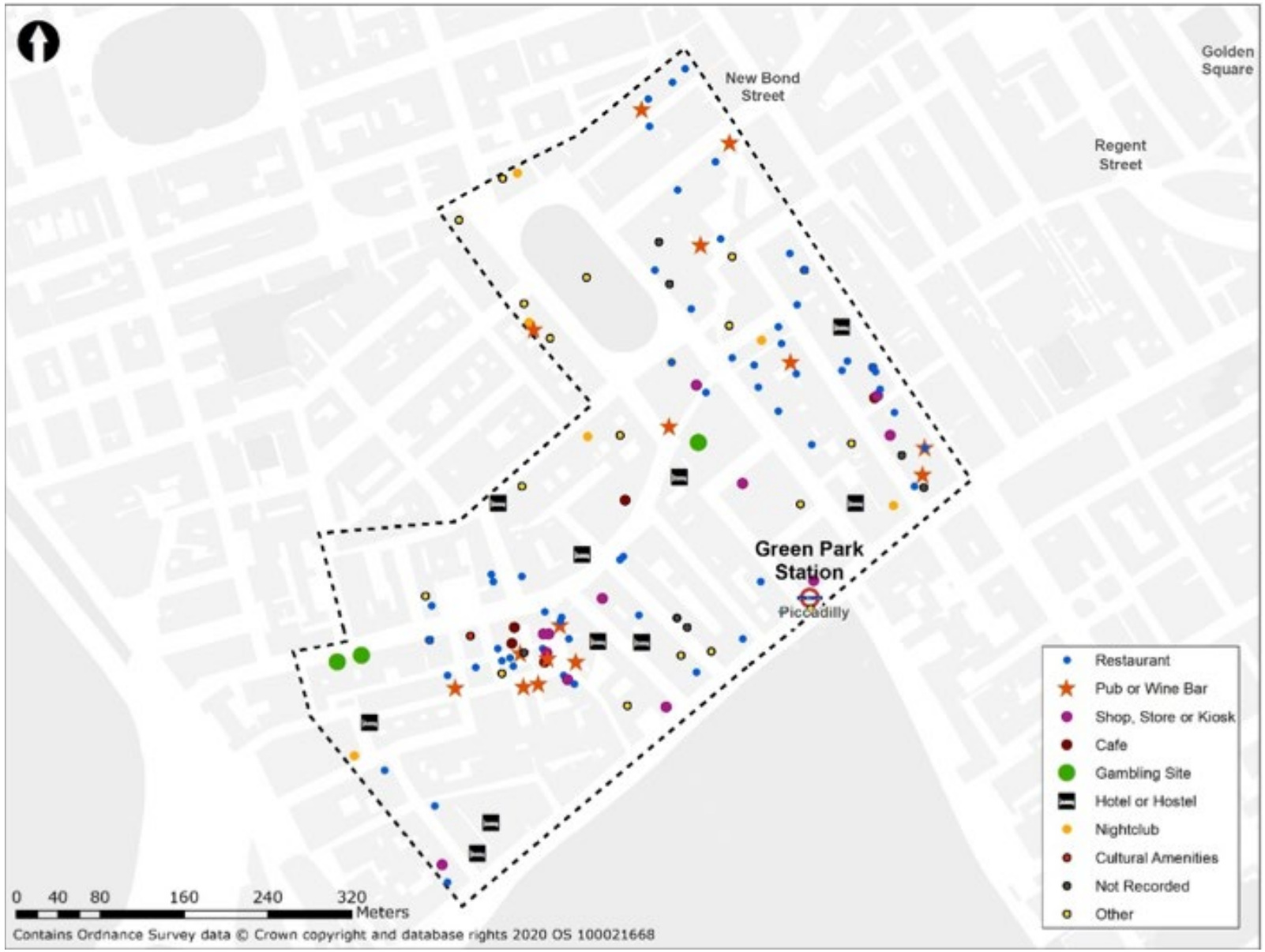
Conclusion

Based on these figures and taking the hotspot analysis results into account, this area does not currently present conclusive evidence of cumulate impact, the level of incidents observed over the last three years are higher than on average in the borough but were not found to concentrate in space, over time.

However, incidents observed in the last three years may be nuanced by observational research carried out over six months in the latter half of 2016[27] which found that the area around Berkeley Street, Berkeley Square and Dover Street in particular demonstrated negative impacts on the licensing objectives to be cumulative in character. This eastern area is primarily populated by bars, hotels and restaurants, with the latter giving rise to cumulative impact in this area. For these stated reasons, the volume and type of applications for licensed premises in this part of Mayfair in particular should be carefully considered to ensure it does not become characterised by persistent cumulative impact in the future.

Shepherd Market and surrounding areas, however, were found to have a more relaxed atmosphere, focused mostly on evening dining and after-work drinks on Thursdays and Fridays in restaurants and public houses, with relatively limited weekend activity. Despite the high concentration of licensed premises found in this part, little evidence of routine impacts on the Licensing Objectives was observed in 2016.

27 Hadfield, P. (2017) Mayfair Evening and Night-time Economy Public Behaviour / Area Profiling Study: Project to Inform the City of Westminster Interim Licensing Policy Review 2017: Final Report.


New Bond Street
Golden Square
Regent Street
Green Park Station
Piccadilly
Restaurant
Pub or Wine Bar
Shop, Store or Kiosk
Cafe
Gambling Site
Hotel or Hostel
Nightclub
Cultural Amenities
Not Recorded
Other
0 40 80 160 240 320
Meters
Contains Ordnance Survey data © Crown copyright and database rights 2020 OS 100021668

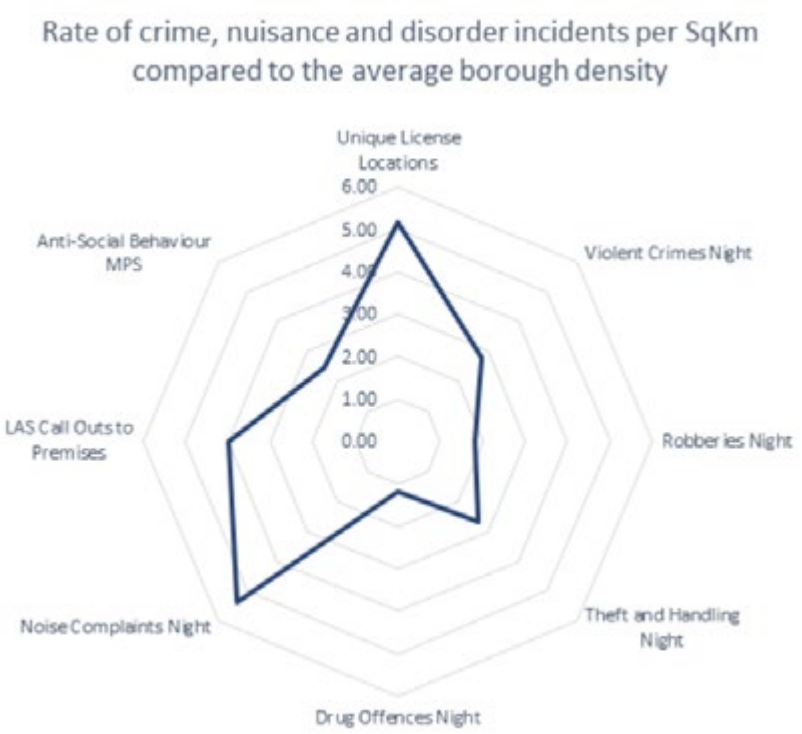
Queensway and Bayswater

Queensway and Bayswater area is 0.12km^2 in size, accounting for 0.5% of the borough's footprint. In this area numerous incidents indicative of cumulative impact were between two and five times as concentrated in space as the borough average. Particularly elevated were noise complaints at night (x5), ambulance call outs to the locations of licensed premises (x4), as well as serious violent crimes (x2.8) and, to a lesser degree, robberies (x1.8) at night. Looking across all incident types plotted in the radial chart, on average this area recorded nearly 3 times the borough's average rate of incidents per square kilometre between 2017 and 2019.

To assess how relative rates of incidents per square kilometre translate into total volumes, all incidents over the last three years, including the average per year, average per month, as well as the proportion of Westminster incidents this area accounts for were calculated in the below table. Assessed were also the number and composition of licensed premises in the area, displayed in the below bar chart.

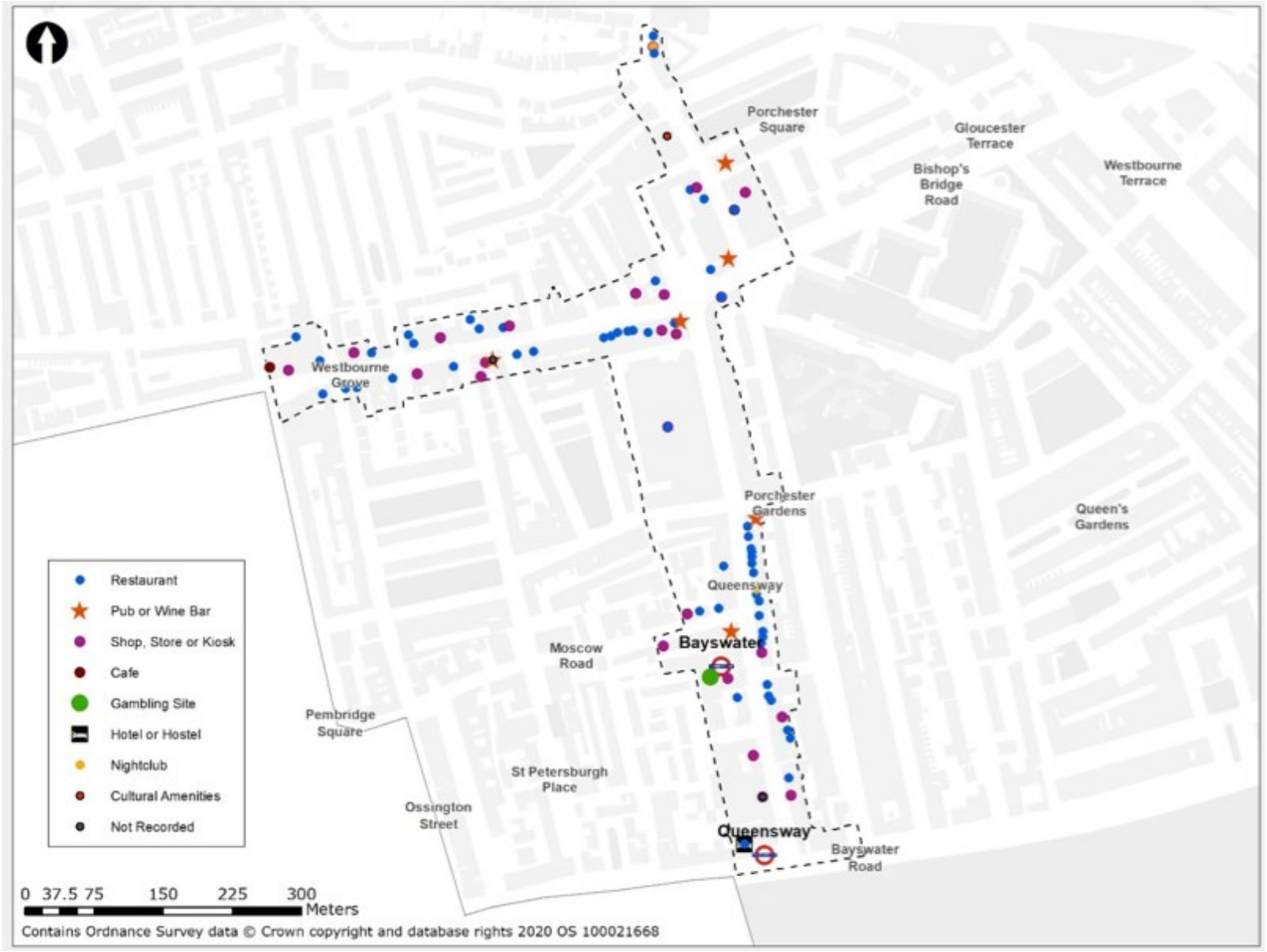
Queensway and Bayswater – Overall Incidents

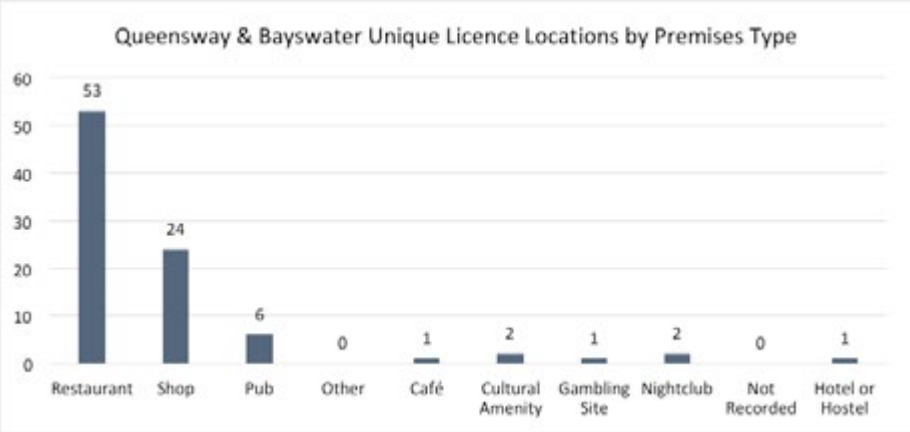
Issue	Total	Mean incidents per year	Mean incidents per month	Proportion of Westminster
Footprint km^2	0.12	–	–	0.50%
Licences	108	–	–	2.87%
Unique Licence Locations	87	–	–	2.83%
Residential Households	1443	–	–	1.13%
Serious Serious violent crimes Night	39	13	1.1	1.53%
Robberies Night	67	22	1.9	0.99%
Theft and Handling Night	876	292	24.3	1.45%
Drug Offences Night	25	8	0.7	0.65%
Noise Complaints Night	260	87	7.2	2.92%
Reactive Waste Requests	2185	728	60.7	3.28%
LAS Call Outs to Licence Locations	533	178	14.8	2.18%
ASB on Transport Night	26	9	0.7	0.55%
Anti-Social Behaviour MPS	790	263	21.9	1.33%
Residents concerned about public realm (9%)	32	11	0.9	4.47%



	Count of Unique Licence Locations = Proxy for Licensed Premises		
Premises Type Group	**Total**	**Queensway & Bayswater**	**Proportion**
Restaurant	1316	53	4.03%
Shop, Store or Kiosk	432	24	5.56%
Pub or Wine Bar	428	6	1.40%
Other	362	0	-
Cafe	209	1	0.48%
Hotel or Hostel	208	1	0.48%
Not Recorded	154	0	-
Cultural Amenities	112	2	1.79%
Nightclub	92	2	2.17%
Takeaway food	28	0	-
Gambling Site	18	1	5.56%

As of February 2020, there were nearly 90 unique locations in this area, the majority of which were restaurants and shops. There were also 6 are pubs, 2 are nightclubs, a hotel and a gambling business located here.


Porchester Square
Gloucester Terrace
Bishop's Bridge Road
Westbourne Terrace
Westbourne Grove
Porchester Gardens
Queen's Gardens
Queensway
Moscow Road
Bayswater
Pembridge Square
St Petersburgh Place
Ossington Street
Queensway
Bayswater Road
Restaurant
Pub or Wine Bar
Shop, Store or Kiosk
Cafe
Gambling Site
Hotel or Hostel
Nightclub
Cultural Amenities
Not Recorded
0 37.5 75 150 225 300
Meters
Contains Ordnance Survey data © Crown copyright and database rights 2020 OS 100021668



Interpretation

In Queensway and Bayswater, the rate of noise complaints were particularly high per square kilometre relative to the borough average. The space-time pattern mining analysis found that noise complaints related to noise in the street and from commercial premises clustered in consecutive hotspots (significant for most of 2019) along the eastern end of Westbourne Grove. This means for consecutive quarters in 2019, there were significant concentrations of noise nuisance reported in space and time. However due to the caveats associated with this data, it is difficult to ascertain to what extent these were a direct result of the activities and patrons of a saturation of licensed premises or types of licensed premises.

Over the last three years, this area recorded 15 ambulance call out to the location of licences on average a month. Although indicative, this evidence cannot be conclusively tied to licensed premises as they may have related to an issue nearby or in a residential property above. Furthermore, to what extent they are associated with the consumption of alcohol is not captured in the data obtained from the London Ambulance Service. These call outs were not particularly relative to other parts of the borough. Likewise, when assessing alcohol-related call outs at the Output Area level which intersected with Queensway and Bayswater, none were elevated.

On average over the last three years, 1 accusation of serious violent crime at night occurred a month, as well as 2 robberies at night. Although concerning, these volumes were not characterised as significant and persistent in both space and time in the hotspot analysis, indicating that their concentrations could be attributable to chance or irregularly high occurrences at a particular time in time rather than routine pressures attributable to the volume or type of licensed premises. Of the less than 1/10 of respondents who were characterised as concerned in the annual resident survey carried out between 2017 and 2019, 32 total resided in Queensway and Bayswater area. These results are concerning but unfortunately not representative at this geography.

Lastly, the boundary of Queensway and Bayswater was retained from its previous stress area definition. It should be noted that its delineation was more narrowly defined compared to the other areas here observed. This may have caused the relative rates of incidents per square kilometre to be somewhat inflated.

Conclusion

Based on these figures, results of the hotspot analysis result, as well as discussions with service experts the evidence here assessed Queensway and Bayswater is concerning, however cannot confidently be described as characterised by cumulative impact due to a high volume or type of licensed premises. However further exploration of licensed premises and their externalities in this area is advised to situate and nuance whether and how they negatively impact the promotion of the licensing objectives.

Edgware Road

Edgware Road area is 0.09km^2 in size, accounting for 0.4% of the borough's footprint. Numerous incidents indicative of cumulative impact were found to be over three, four and in some cases five times more concentrated in space compared to the borough average.

Particularly high was the concentration of serious serious violent crimes at night (x4.8), ambulance call outs to the locations of licensed premises (x5.5), drug offences recorded at night (x3.8) and robberies at night (x4). Both theft incidents at night (x1.8) and noise complaints at night (x1.6) were elevated here as well. Looking across all incident types plotted in the radial chart, this area recorded 3.85 times the borough's average rate of incidents per square kilometre.

The table below highlights the total volume of all incident types in Edgware Road over the last three years, citing the average volume per year, per month, as well as the proportion of Westminster incidents this area accounts for.

Edgware Road – Overall Incidents

Incidents 2017 – 2019	Total	Mean incidents per year	Mean incidents per month	Proportion in Westminster
Footprint km²	0.9	–	–	0.4%
Licences	60	–	–	1.6%
Unique Licence Locations	40	–	–	1.3%
Residential Households	864	–	–	0.7%
Serious Serious violent crimes Night	50	17	1.4	2.0%
Robberies Night	110	37	3.1	1.6%
Theft and Handling Night	701	234	19.5	1.2%
Drug Offences Night	60	20	1.7	1.6%
Noise Complaints Night	133	44	3.7	1.5%
Reactive Waste Requests	863	288	24.0	1.3%
LAS Call Outs to Premises Locations	538	179	14.9	2.2%
ASB on Transport Night	32	11	0.9	0.7%
Anti-Social Behaviour MPS	585	195	16.3	1.0%
Residents concerned about public realm (9%)	16	5	0.4	2.2%

The table below summarises the unique licence locations by premises type group, used as a proxy for premises count.[28]

	Count of Unique Licence Locations = Proxy for Licensed Premises		
Premises Type Group	Total	Edgware Road	Proportion
Restaurant	1316	19	1.4%
Shop, Store or Kiosk	432	11	2.5%
Pub or Wine Bar	428	5	1.2%
Other	362	1	0.3%
Cafe	209	1	0.5%
Hotel or Hostel	208	0	0.0%
Not Recorded	154	1	0.6%
Cultural Amenities	112	0	0.0%
Nightclub	92	1	1.1%
Takeaway food	28	1	3.6%
Gambling Site	18	1	5.6%

28 Depending on the licence application, some unique licence locations may be ascribed multiple premises groups and are therefore double counted.

Interpretation

The 2016 Edgware Road stress area is of a comparable size (0.4% footprint) to Queensway and Bayswater yet held less than half as many unique licence locations (41, 1.3% in the borough). Among these were 19 restaurants, 5 pubs or wine bar and 1 nightclub.

Despite holding significantly fewer licensed premises, Edgware Road recorded more public realm crimes between 2017 and 2019, accounting for 1.6% of those in the borough. This suggests that alcohol-consumption and licensed premises activities may not be the main driver of crime in this area. The southern end of Edgware Road lies next to March Arch and the western End of Oxford Street, some crime concentration may be attributable to the commercial activities in its neighbouring area.

Records of enforcement visits over the last three years indicate that there are numerous problematic businesses in the area known to the council. This suggests that issues in the area may not be attributable to a saturation or type of licensed premises in the borough but linked to specific businesses.

Furthermore, of the 1/10 residents who were characterised as concerned in the annual resident survey carried out between 2017 and 2019, 16 in total resided in Edgware Road. These results are unfortunately not representative at this geography.

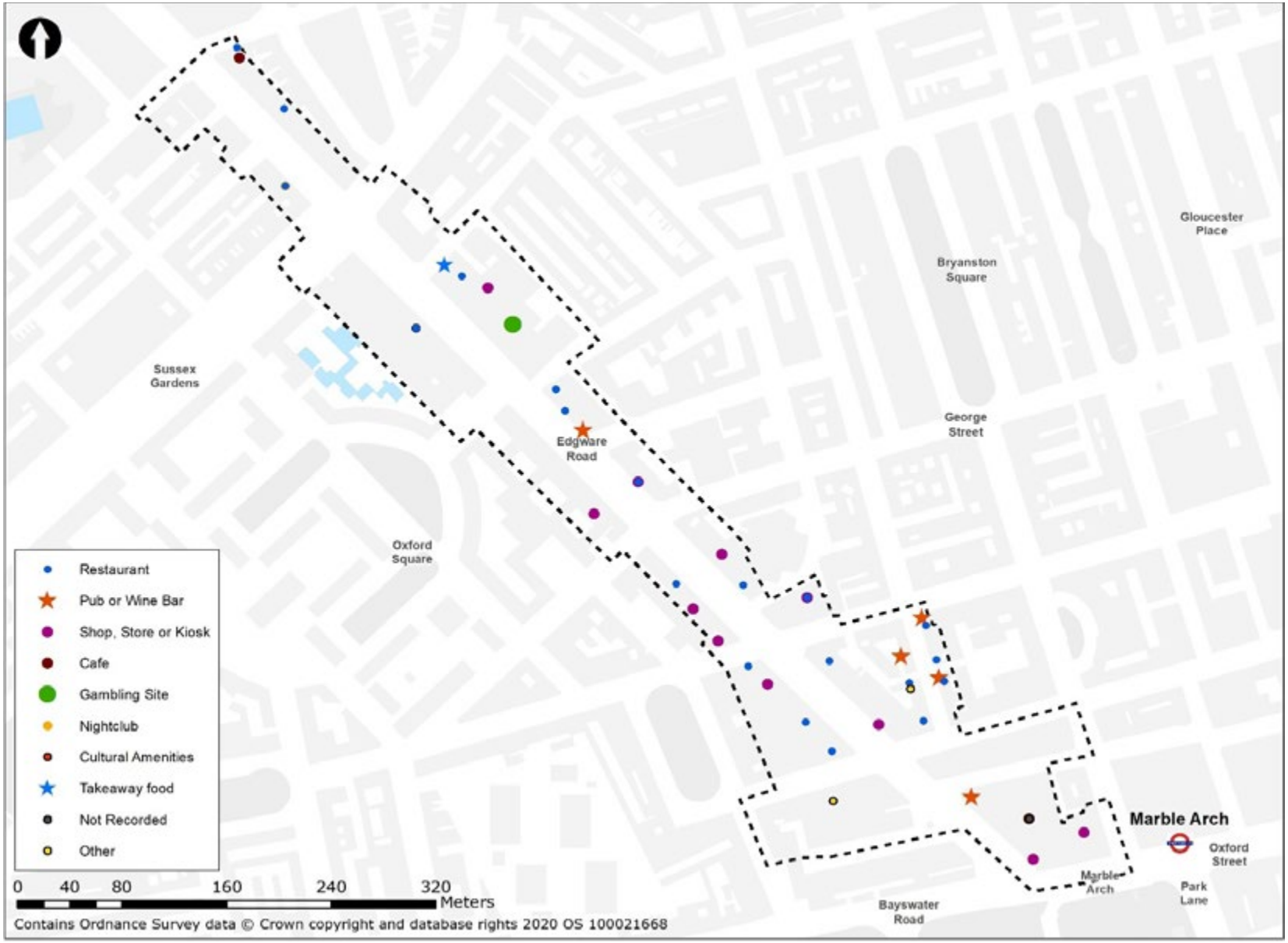
The Edgware Road Stress Area boundary was retained for this analysis. It should be noted that its delineation was more narrowly defined compared to the other areas here observed. This may contribute to its relatively high rates of incidents per square kilometre.

Finally, the space-time pattern mining tool did not find significant concentrations of incidents indicative of cumulative impact in space and time over the past 3 years in this area, suggesting patterns of stress were neither acute, nor persistent in character.

Conclusion

For the above stated reasons, and in the absence of behavioural audit insights, evidence characterising Edgware Road as burdened by cumulative impact as a result of a significant number or types of licensed premises cannot be described as conclusive.

However, patterns of concern were identified in this area the drivers of which should be further explored and nuanced. Furthermore, careful scrutiny of licence applications should be considered in this area to ensure it is not once more characterised by cumulative impact.


Gloucester Place
Bryanston Square
Sussex Gardens
George Street
Edgware Road
Oxford Square
Marble Arch
Oxford Street
Marble Arch
Park Lane
Bayswater Road
Restaurant
Pub or Wine Bar
Shop, Store or Kiosk
Cafe
Gambling Site
Nightclub
Cultural Amenities
Takeaway food
Not Recorded
Other
0 40 80 160 240 320
Meters
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Conclusion

Conclusion

This cumulative impact assessment has been carried out in accordance with Section 5A of the Licensing Act 2003. The principle of cumulative impact is to identify which, if any, areas are saturated with a significant number, type or composition of licensed premises, causing the benefits provided by alcohol outlets to be outweighed by public nuisance, crime, disorder and other costs of excessive alcohol consumption.

Key evidence indicative of cumulative impact dating back three years was assessed using numerous analytical approaches to identify and determine areas characterised by cumulative impact. This assessment relates to both premises licences and club premises certificates.

The outcome of the analysis of crime statistics, licensing data, ambulance statistics, alcohol-related call out incidents, anti-social behaviour, noise complaints, as well as engagement with internal and external service experts where possible has led to the following findings:

- Regression analysis established that the prevalence of licensed premises is significantly associated with incidents indicative of cumulative impact in the borough. Premises type, incident type and time of day have a bearing on these estimates.
- Hotspot analysis was used to assess whether statistically significant patterns of incidents emerged over the last three years, on a quarterly basis, in both space (within approximate size of a city block) and time (day, night and 24-hour average). The results characterised two parts of the West End as burdened by cumulative impact between 2017 and 2019, to varying degrees. These emerged as statistically significant areas of concern in the borough across numerous dimensions in the hotspot analysis. Based on i) the strength of the hotspots of incidents recorded between 6pm – 6am over the twelve consecutive quarters (2017-2019), and ii) their proximity to significant concentrations of licensed premises two areas were outlined: West End Zone 1 and West End Zone 2.
- West End Zone 1, 0.68 km^2 in size, experienced acute levels of cumulative impact across numerous dimensions between 2017 and 2019.
- West End Zone 2 (0.86 km^2), which surrounds this area also demonstrated significant patterns of incidents indicative of cumulative impact, however to a less severe degree.
- The West End Stress Area previously subject to the terms of cumulative impact in the council's Statement of Licensing Policy published in 2016, sits within Zones 1 and 2, except for its eastern wing in Covent Garden. Although licensed premises were found to significantly concentrate just outside of these zones, particularly east of Zone 2 in Covent Garden, incidents indicative of cumulative impact did not and this area was therefore excluded.
- Evidence of cumulative impact taking place elsewhere in the borough was less conclusive. Seven areas outside Zones 1 and 2 were explored if they were previously characterised as i) stressed (Queensway & Bayswater and Edgware Road), ii) of concern (Mayfair) or iii) had higher concentrations of licensed premises (Victoria, Paddington, Fitzrovia North and corridor between Marylebone Road and Oxford Street).
- Rates were comparable to the borough's average rate of incidents per square kilometre in Paddington (x1), Fitzrovia North (x1) and the corridor between Marylebone Road and Oxford Street showed (x1.3).
- Victoria and Mayfair areas demonstrated somewhat elevated relative rates compared to the borough average of incidents per square kilometre, 1.9 and 1.7 respectively.

- The 2016 Stress Areas in Queensway and Bayswater and Edgware Road demonstrated higher mean incident concentrations (3.7 and 3.9 times the borough average respectively). To nuance these rates further, a detailed review of incidents types, supplementary evidence (enforcement visits and residents survey responses), as well as detailed assessment of the volume and composition of licensed premises in both Queensway & Bayswater and Edgware Road was carried out.
- In the absence of a behavioural audit to situate the incidents observed, the evidence that either area could confidently be characterised as burdened by cumulative impact between 2017 – 2019, attributable to a saturation in volume or type of licensed premises, was not conclusive. However, data insights indicate there are patterns of concern in both areas, the nature of which should be further explored and closely monitored.

Appendix

Appendix

Appendix 1

Description of key data sets used

Crime data	**Description:** The Crime Report Information System (CRIS) is used by the Metropolitan Police Services to record all suspected crimes. Council analysts met with the MET's analytical team based at Charing Cross Police on several occasions to understand which crime types and what level of detail was most relevant for the CIA. With a data sharing agreement in place between the two institutions under the Safer Westminster Partnership, the following data was shared with council analysts in late February, 2020 to undertake analysis: Date, time and location of all accused public realm crimes which occurred between 2017 – 2019 in Westminster Incidents under the following major crime types: 'Violence Against the Person' (serious violence), 'Theft and Handling', 'Robberies' and 'Drug Offences' **Considerations for interpretation:** The nature of this data was discussed in detail with the MET analysts to ensure appropriate data cleaning. Among the steps taken: Each crime is assigned a crime ID within the CRIS database, if more than one individual was victimised or suspected or a crime, multiple records with a shared crime ID would be captured. To assess broader patterns of crime in the city, only distinct crime incidents were evaluated in this report. Small changes to CRIS records can take place after the initial record is made, these reflect the development of investigation. This may lead to marginal differences between published data and previously obtained data sets. However, as the data here assessed referred to crimes which took place 3 or more months previous to its extraction, changes are likely to be minimal. The CRIS dataset stores the time, day and date of a crime in different fields. In order for the Space Time Pattern Mining tool to work in ArcGIS, all that information needs to be stored in a specific format and within the same column. The MET provided the PAM tool that was used as an Add-Ins in Excel to convert the time field into a digital format.

A minority of records once plotted on the map fell outside of the boundary of Westminster. This might be due to a mistake in storing the x and y coordinates. These records were removed for the analysis. A further small portion of the records did not have the x and y coordinate information, so it was not possible to plot them and, for this reason, they were not considered for the CIA analysis.

Limitations:

Crime data reflects reported and recorded incidents, as there is significant under-reported crime. Furthermore, there are more Major and Minor Class crimes that may offer useful insights to the Cumulative Impact Assessment. Experts at the MET offered guidance on which to include, however a wider view of Violence Against the Person incidents would have been particularly beneficial.

SafeStats

SafeStats is a secure data platform hosted by the GLA Intelligence Unit which hosts a variety of crime and community safety datasets from key organisations. With authorisation data from the Metropolitan Police Service, Transport for London, London Fire Brigade, British Transport Police and London Ambulance Service were retrieved from this site. For more information about the platform visit **london.gov.uk/safestats**.

2017–2019 Anti-Social Behaviour Data retrieved:

- Metropolitan Police (MPS): date and location of ASB offences were retrieved from SafeStats. As the time of incidents could not be captured, more detailed temporal analysis was not possible.
- Transport for London (TfL: 'Code Red' incidents recorded by employees on London Buses (a part of TfL) through a dedicate radio channel
- British Transport Police (BTP): offences recorded at all stations and estates operated by London Underground, Network Rail and Train Operators
- London Fire Brigade (LFB): data was available at the XY coordinate and time of incident was captured. All first incident call outs attended were assessed.

2017 – 2019 Alcohol-related Incidents retrieved:

- London Ambulance Service: the time and output area of ambulance call outs related to alcohol were recorded. Lower geographical granularity was not available to protect the anonymity of patients. Multiple vehicles can be dispatched to the same incident, data assessed was de-duplicated in order to count total amount of incidents.

London Ambulance Service

Source and Description:

Without a Data Sharing Agreement in place and the pressures of COVID-19 placed on the London Ambulance Service, the information council analysts were able to obtain was limited. The LAS Business Intelligence team were however able to extract all of the call outs which took place to the coordinates of licensed locations (as of February 2020), aggregated by year – between 2017 – 2019.

Considerations for Interpretation:

This data offers some insight on the level of call outs which occurred to the sites of where licenced premises were located. However, these call out incidents were not necessarily alcohol or premises related; they could relate to an issue at the same location, for example a resident living above a pub falling ill.

When answering a call, the LAS capture details about the call out in the CAD system. A chief complaint is recorded, such as a 'Fall' or 'Poisoning', and in some cases further details about the incident such as whether alcohol had a bearing on the situation. However, these are not always included, therefore deducing which incidents are specifically alcohol related can be a challenge. We were therefore advised to consider all call outs which occurred to the sites of licensed premises.

Limitations:

There is room for error as some of these attendances may relate to a non-licensed premises issues at the same location. Likewise, call outs to the broader vicinity of a premises are not captured here. Furthermore, call outs to premises locations which have since closed or changed management are also included. For these reasons and others – there is noise in this dataset. We additionally do not have any temporal granularity beyond the calendar year of attendances, we therefore can't ascertain which attendances occurred at night and which during the day.

WCC Licensing Data

Description & Source:

This data is sourced from Uniform where operational data related to licensing is stored. Extracted for analysis were licences with an 'issued' status in February 2020 under the Licensing Act 2003. Exclusively assessed were licenses with a 'premises' or 'club certificate' licence.

Among the fields queried: unique licence number, trading name, address, UPRN, premises type, time periods licences are permitted to operate, coordinates of premises to which licence is issued.

Considerations for Interpretation:

Depending on the nature of a premises, multiple licences may be issued to the same business. Although licences hold unique reference numbers in the system, specific premises do not. Therefore, only approximations of premises could be made by using the distinct locations (concatenating the XY coordinates) of licences as a proxy. Furthermore, a licence issued does not necessarily mean it is in use, several instances of this were identified through interrogating all recorded licences in specific areas of concern. Similarly permitted trading hours may not reflect a business' opening hours in practice.

Limitations:

Classification of premises types can be misleading (e.g. a restaurant can relate to a fine dining establishment, a McDonalds or a venue which also hosts a late-night bar and club)

A significant proportion of licences have 'not recorded' and blanks in relation to the premises type and operating hours

Although the majority of licensing data was accurate, the following was identified in the data:

If a premises with multiple licences is described differently (e.g. in one of its licences it is a hotel and in another a bar), it will be counted twice when the unique licence location by premises type is observed

In some instances XY coordinates for the same premises differed marginally, leading to separate unique licence locations (used as a proxy for premises)

A complex string listing multiple time periods under which a premises is permitted to trade required extensive cleaning and data manipulation to glean broad insights about operating hours

WCC Noise & Odour Complaints

Source and description:

Noise and odour complaints data recorded between 2017 – 2019, including the date, time and coordinates here observed was retrieved from the Uniform system by WCC's Business Intelligence team with the permission of the council's Public Protection and Licensing (PP&L) manager. Uniform collates complaints recorded through numerous sources including: ReportIt, FixMyStreet and the Call Centre.

The fields were selected with the council's noise management expert in March 2020. Several categories of noise were advised to be considered by the service as these were more likely to be related to licensed premises:

- Noise in the street
- Noise from commercial premises
- Odours and smoke

Considerations for interpretation:

A 'complaint' is recorded when a member of the public raises a concern through one of the council's portals. As noise is a subjective experience of sound, complaints depict the prevalence of nuisance to certain individuals willing to report the incidents, not the prevalence of negative experiences of sound.

The fields observed here are fairly broad classifications and may therefore have no relation to licensed premises. Complaints relating to noise in the street may be associated with other issues such as pedi-cabs, buskers or construction. Likewise, there is no field which captures noise complaints from a licensed premises specifically, as most complainants would not be aware of the distinction.

However, these broader descriptions, combined with the time and location of incidents in proximity to where and when licensed premises operate offers an indication of nuisance.

Limitations:

Whether complaints are sourced from a serial complainant or multiple concerned residents is not recorded. Depending on the channel by which complaints are reported, error can occur in locating the source of the noise. This may be due to the complainants description, recipients lack of clarity about area described or the nature of how sound moved through space.

WCC Reactive Waste Complaints and Requests

Description: Reactive Waste data here observed was retrieved from the Echo system by WCC's BI team with the permission of the council's Waste Service. The field selection was discussed with Waste Manager Andrew Cook in March and April 2020. Among the guidance given for interpretation: a 'complaint' constitutes when an expected service was not met by our service provider (Veolia) and a 'service request' is made reactively when an additional demand needs to be met. Analysts consulted the waste team to advise which categories to consider for this analysis.

Considerations for Interpretation: All reactive cleansing requests are reported but provide an incomplete picture of the overall amount of cleansing tasks completed i.e. the majority of cleansing tasks are completed pro-actively as part of scheduled work. Waste is almost wholly collected pro-actively via scheduled collections and only rarely will reactive requests be made i.e. missed collections, overflowing bins, additional collections requests. This data will inform the where, what and on what days reactive cleansing/waste service requests were made but do not capture the pro-active scheduled service tasks completed as part of day-to-day operations which have been characterised as commercially sensitive.

Limitations: Waste team estimated the majority (>90%) of waste/cleansing tasks are carried out pro-actively so this is unfortunately a small proportion of operations and will be skewed by a number of factors including high footfall, active residents/businesses, BIDs resource and number of City Inspectors. BIDs also have some of their own reporting processes, this adds to the skewed picture which emerges - exacerbated by differing levels of enthusiasm and knowledge to report from WCC City Inspectors, as well as differentially scheduled routes due to varied demand across space int he borough (e.g. the West End is scheduled to receive 3 sweeps a day). Furthermore, these cleansing events are captured by day rather than by hour so when littering and other issues took place, is unknown. Pro-active cleansing events could not be obtained.

Data Reporting: Echo draws in data from multiple sources - directly by City Inspectors, but also through ReportIt (introduced in 2015/16) and more recently FixMyStreet (circa August, 2019) - in some cases the categories changed.

WCC Resident Survey

An annual resident survey undertaken by the council – the data here observed was collected between 2017 – 2019 with a consistent methodology to ensure the results were comparable:

- Face to face survey, 25 minutes long
- Sample size: 2500+ residents, geographically spread to ensure results are representative at the ward level
- Demographic quotas, representative of the borough population according to: age, gender and working status
- Independent social research company carried our all fieldwork and processed all primary data, council intelligence teams received anonymised data at the postcode level

Approximately two-thirds of the City Survey's questionnaire remain consistent across years to secure sound trend analysis.

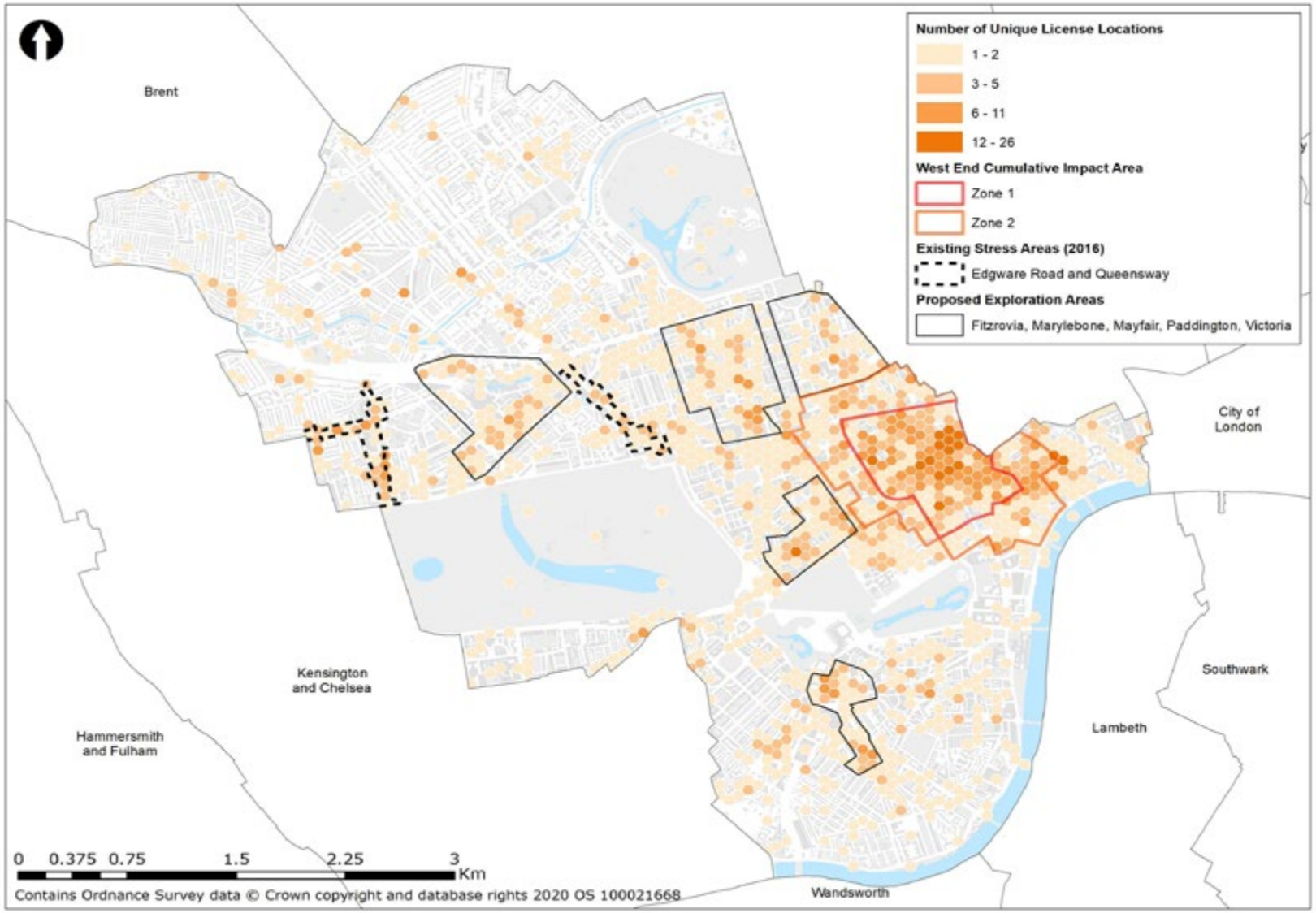
The question of interest here was stated as following, with a Likert scale response options ranging between 'a very big problem' – 'not a problem at all', including a 'don't know / no opinion' response:

"Thinking about this local area, to what extent if at all do you think these issues are a problem..."

- rubbish and litter lying around
- people being drunk or rowdy
- noisy neighbours or loud parties
- anti-social behaviour
- vandalism, graffiti and other deliberate damage
- people using or dealing drugs
- violence among young people
- smoking in public places
- issues related to licensed premises (e.g. people drinking/smoking outside, blocked pavements, deliveries, etc.)

Appendix 2

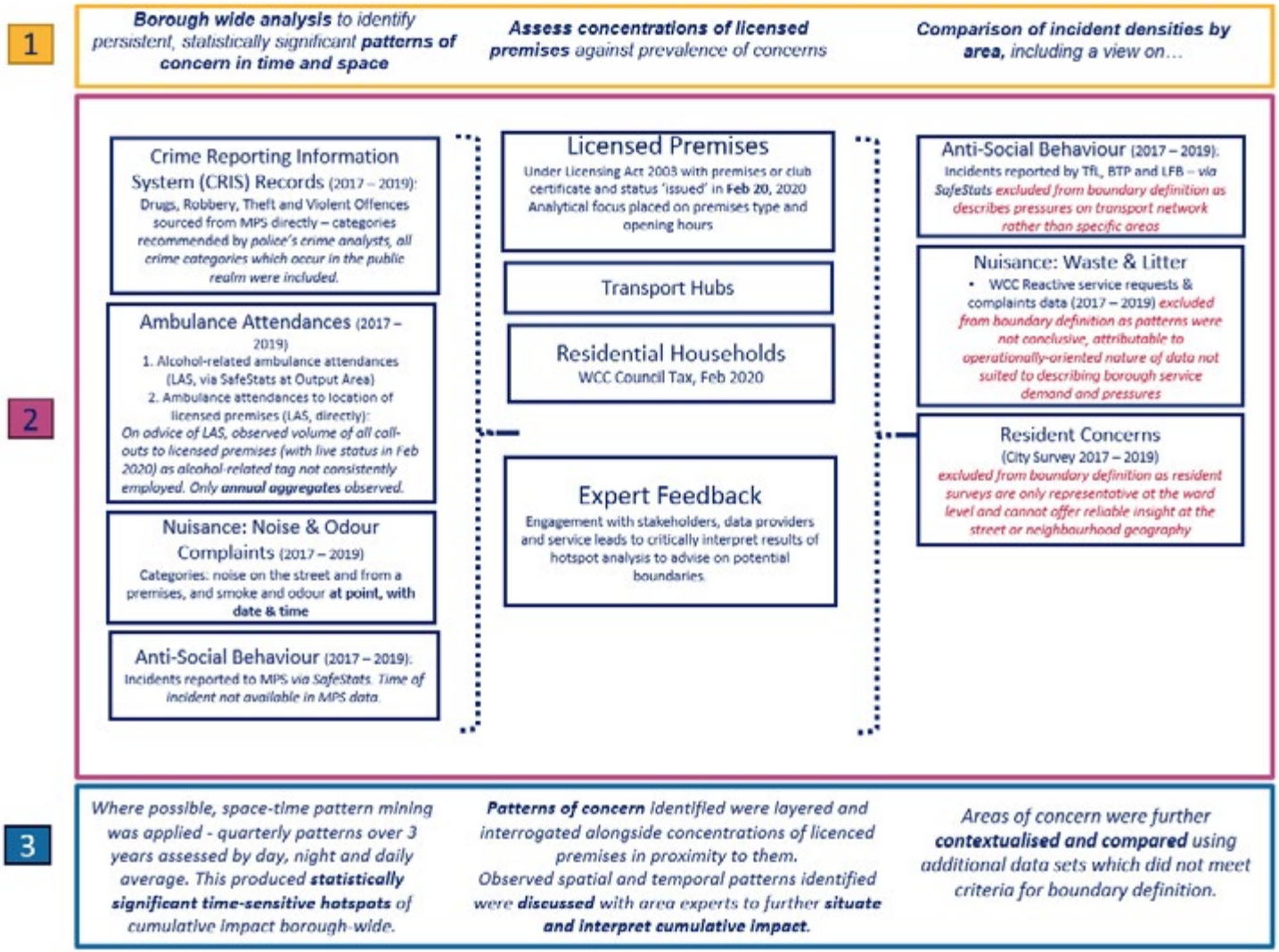
Boundaries of areas of exploration and hexagon map of unique licence locations



Appendix 3

Data used in Cumulative Impact Boundary Definition

Exploration of Cumulative Impact Boundaries = 1. Steps, 2. Data Sources and 3. Analytical Approach



Appendix 4

The following table outlines our premises were grouped by type recorded in the licensing data

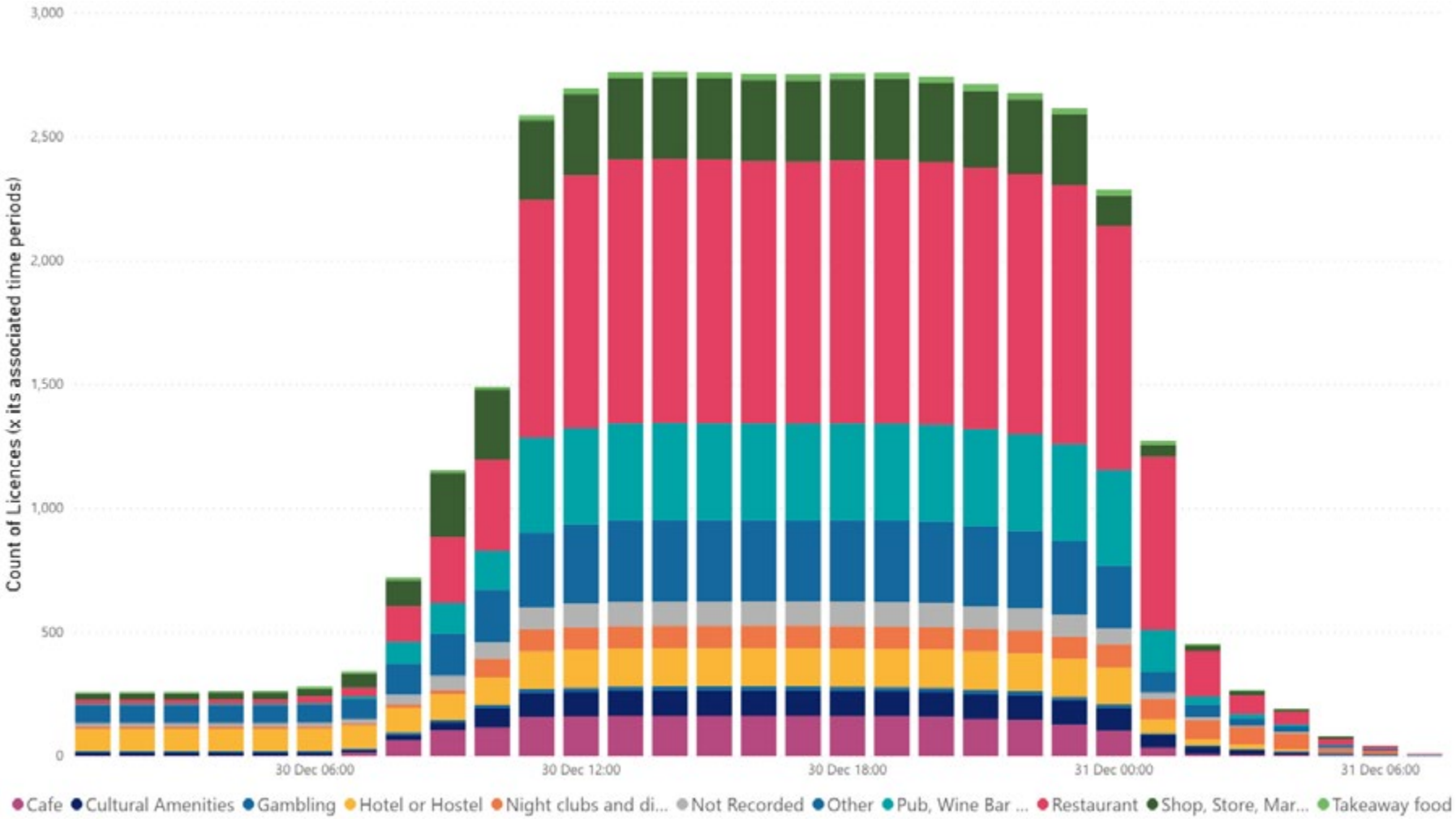
Premises Group	Recorded Premises Type
Cafe	Cafe Cafe within another property
Cultural Amenities	Amusement Arcade Cinema Concert Hall Conference centre (country house) Conference or exhibition centre Country cricket grounds Ice rink Indoor bowling centre Leisure (other) Museums & Art Galleries Public hall Snooker hall or club Theatre Tourist attraction or dark ride Village hall,scout hut or similar Zoo or safari park
Gambling Site	Casino or gambling club Large Casino
Hotel or Hostel	Hostel Hostel with on site management Hotel, 3 star or under Hotel, 4+ star or major chain Self catering holiday accom.
Nightclub	Night clubs and discos

Not Recorded	Not Recorded
Other	Auction Rooms Banks and Building Societies Barracks Brewery Civic amenity site Civic/public building Club or institution Clubhouse Coaching Inn College of Further Education Department store Educational Film and TV studio Food court Hairdresser or beauty salon HQs and Institutional Offices Markets (other than livestock) Miscellaneous Mooring Office Park / Open Space Petrol filling station Private Hospitals and Clinics Private sports centre (no pool) Private sports centre (pool) Recording Studio Salon in another property Sexual Entertainment Venue Showroom Special Treatment - Low risk premises Studio Surgeries or Health Centres University University land or building Vessel

Pub or Wine Bar	Pub or pub restaurant with lodge Public house or pub rest Wine bar
Restaurant	Restaurant
Shop, Store or Kiosk	Food store Food store (large) Hypermarket or superstore Kiosk within another property Sales kiosk Shop Shop (large) Shop (very large) Shop within another property Takeaway food outlet

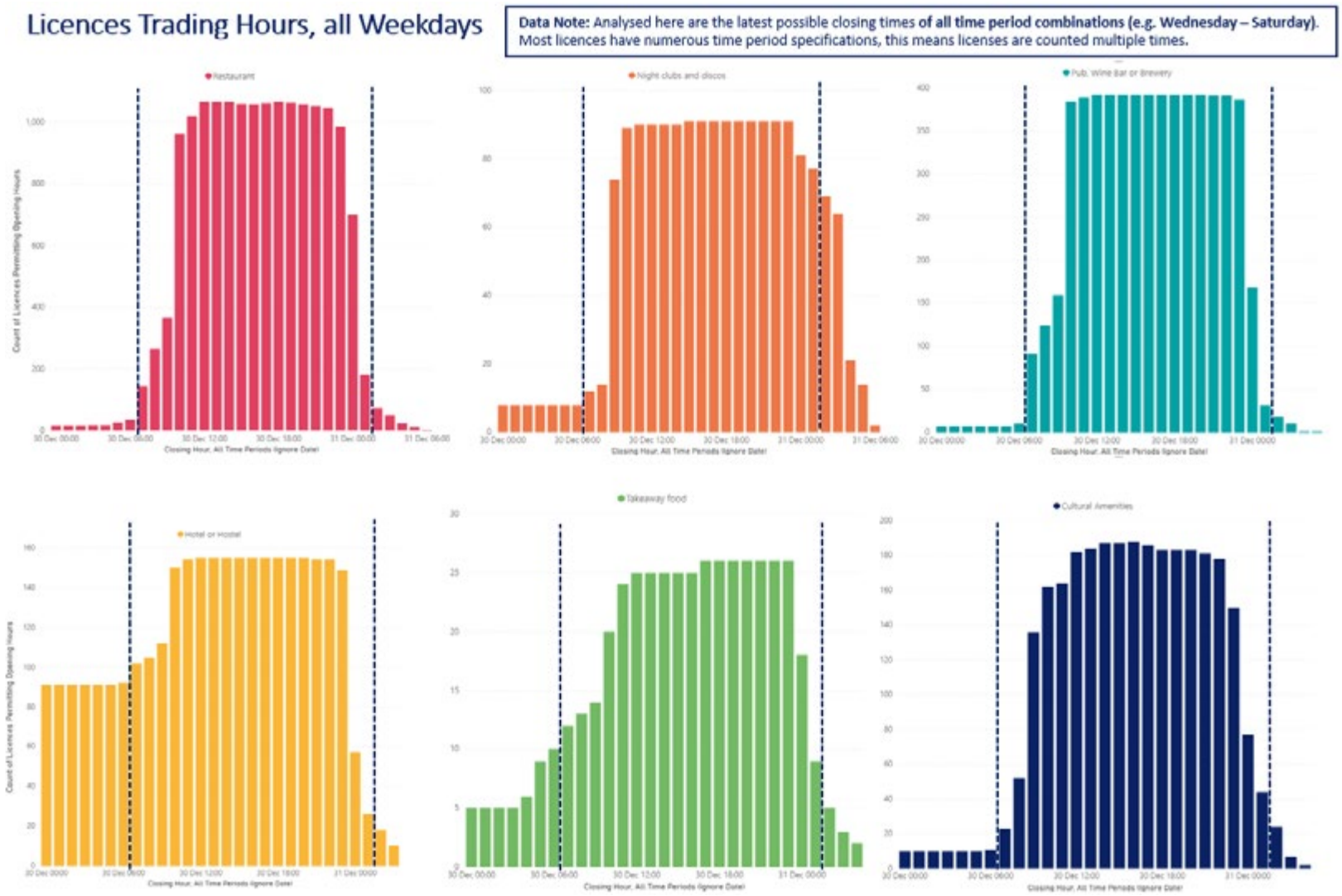
Appendix 5.1

Licensing trading hours by premises group type



Appendix 5.2

Licensing trading hours by premises group type



Appendix 6

Regression analysis results by incident type

Note: 95% confidence intervals given in brackets

NS = Not significant

Regression results: Drugs-related crime

	OVERALL		Café		Cultural Amenity		Gambling		Hotel / Hostel		Nightclubs		Pub / Wine Bar		Restaurant		Shop / Store		Takeaway	
	All day	Night	All day	Night	All day	Night	All day	Night	All day	Night	All day	Night	All day	Night	All day	Night	All day	Night	All day	Night
For every additional licensed premises, reported crime increases by a factor of:	1.08 (1.05-1.10)	1.10 (1.07-1.13)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1.15 (1.01-1.30)	1.58 (1.16-2.15)	1.53 (1.12-2.09)	NS	NS
For every additional licensed premises, the odds of there being at least one reported crime increase by:	28% (22-35%)	20% (16-25%)	NS	NS	NS	NS	NS	NS	69% (7-167%)	79% (21-165%)	NS	NS	44% (8-91%)	31% (3-67%)	52% (29-79%)	22% (8-39%)	37% (1-87%)	53% (17-101%)	NS	518% (41-2609%)

Note: 95% confidence intervals given in brackets

NS = Not significant

Regression results: robberies

	OVERALL		Café		Cultural Amenity		Gambling		Hotel / Hostel		Nightclubs		Pub / Wine Bar		Restaurant		Shop / Store		Takeaway	
	All day	Night	All day	Night	All day	Night	All day	Night	All day	Night	All day	Night	All day	Night	All day	Night	All day	Night	All day	Night
For every additional licensed premises, reported crime increases by a factor of:	1.12 (1.10-1.15)	1.14 (1.10-1.18)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1.25 (1.14-1.38)	1.30 (1.17-1.45)	NS	NS	NS	NS

For every additional licensed premises, the odds of there being at least one reported crime increase by:	76% (59-96%)	56% (45-69%)	128% (11-365%)	NS	NS	NS	NS	NS	338% (73-1107%)	106% (18-261%)	NS	NS	84% (20-180%)	98% (39-184%)	164% (97-254%)	104% (65-154%)	73% (8-178%)	75% (19-157%)	NS	NS

Note: 95% confidence intervals given in brackets

NS = Not significant

Regression results: Theft and handling

	OVERALL		Café		Cultural Amenity		Gambling		Hotel / Hostel		Nightclubs		Pub / Wine Bar		Restaurant		Shop / Store		Takeaway	
	All day	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**
For every additional licensed premises, reported crime increases by a factor of:	1.16 (1.14-1.19)	1.17 (1.14-1.19)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1.37 (1.26-1.49)	1.38 (1.27-1.50)	NS	1.19 (1.01-1.40)	NS	NS
For every additional licensed premises, the odds of there being at least one reported crime increase by:	972% (422-2099%)	471% (274-773%)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	712% (64-2602%)	964% (162-4225%)	3611% (510-26,367%)	927% (325-2384%)	640% (2-5250%)	1085% (62-8570%)	NS	NS

Note: 95% confidence intervals given in brackets

NS = Not significant

Regression results: Violent crime

	OVERALL		Café		Cultural Amenity		Gambling		Hotel / Hostel		Nightclubs		Pub / Wine Bar		Restaurant		Shop / Store		Takeaway	
	All day	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**
For every additional licensed premises, reported crime increases by a factor of:	1.09 (1.07 - 1.12)	1.11 (1.08-1.14)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1.23 (1.12-135	1.23 (1.10-1.37)	1.31 (1.05-1.65)	1.39 (1.08-1.79)	NS	NS
For every additional licensed premises, the odds of there being at least one reported crime increase by:	31% (25-37%)	26% (21-31%)	NS	NS	NS	NS	NS	NS	NS	84% (23-175%)	NS	NS	67% (26-121%)	56% (21-101%)	68% (43-97%)	46% (26-68%)	59% (17-116%)	62% (22-114%)	NS	NS

Note: 95% confidence intervals given in brackets

NS = Not significant

Regression results: Noise

	OVERALL		Café		Cultural Amenity		Gambling		Hotel / Hostel		Nightclubs		Pub / Wine Bar		Restaurant		Shop / Store		Takeaway	
	All day	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**
For every additional licensed premises, reported crime increases by a factor of:	1.10 (1.08-1.11)	1.09 (1.07-1.11)	NS	NS	NS	NS	NS	NS	1.21 (1.01-1.45)	NS	NS	NS	1.22 (1.09-1.37)	1.24 (1.09-1.41)	1.17 (1.11-1.24)	1.16 (1.09-1.24)	1.16 (1.02-1.32)	1.17 (1.02-1.35)	NS	NS

For every additional licensed premises, the odds of there being at least one reported crime increase by:	111% (81-146%)	74% (57-94%)	261% (30-900%)	NS	NS	NS	NS	NS	248% (24-874%)	203% (38-566%)	NS	NS	203% (64-460%)	118% (41-238%)	199% (107-333%)	135% (79-208%)	124% (18-324%)	86% (16-197%)	NS	NS

Note: 95% confidence intervals given in brackets

NS = Not significant

Regression results: Anti-social behaviour

	OVERALL		Café		Cultural Amenity		Gambling		Hotel / Hostel		Nightclubs		Pub / Wine Bar		Restaurant		Shop / Store		Takeaway	
	All day	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**	**All day**	**Night**
For every additional licensed premises, reported crime increases by a factor of:	1.06 (1.05-1.07)	N/A	NS	N/A	NS	N/A	NS	N/A	1.20 (1.02-1.41)	N/A	NS	N/A	NS	N/A	1.14 (1.08-1.19)	N/A	1.15 (1.03-1.28)	N/A	NS	N/A
For every additional licensed premises, the odds of there being at least one reported crime increase by:	62% (47-77%)	N/A	NS	N/A	NS	N/A	NS	N/A	NS	N/A	NS	N/A	105% (35-213%)	N/A	122% (71-188%)	N/A	105% (26-234%)	N/A	NS	N/A

Appendix 7

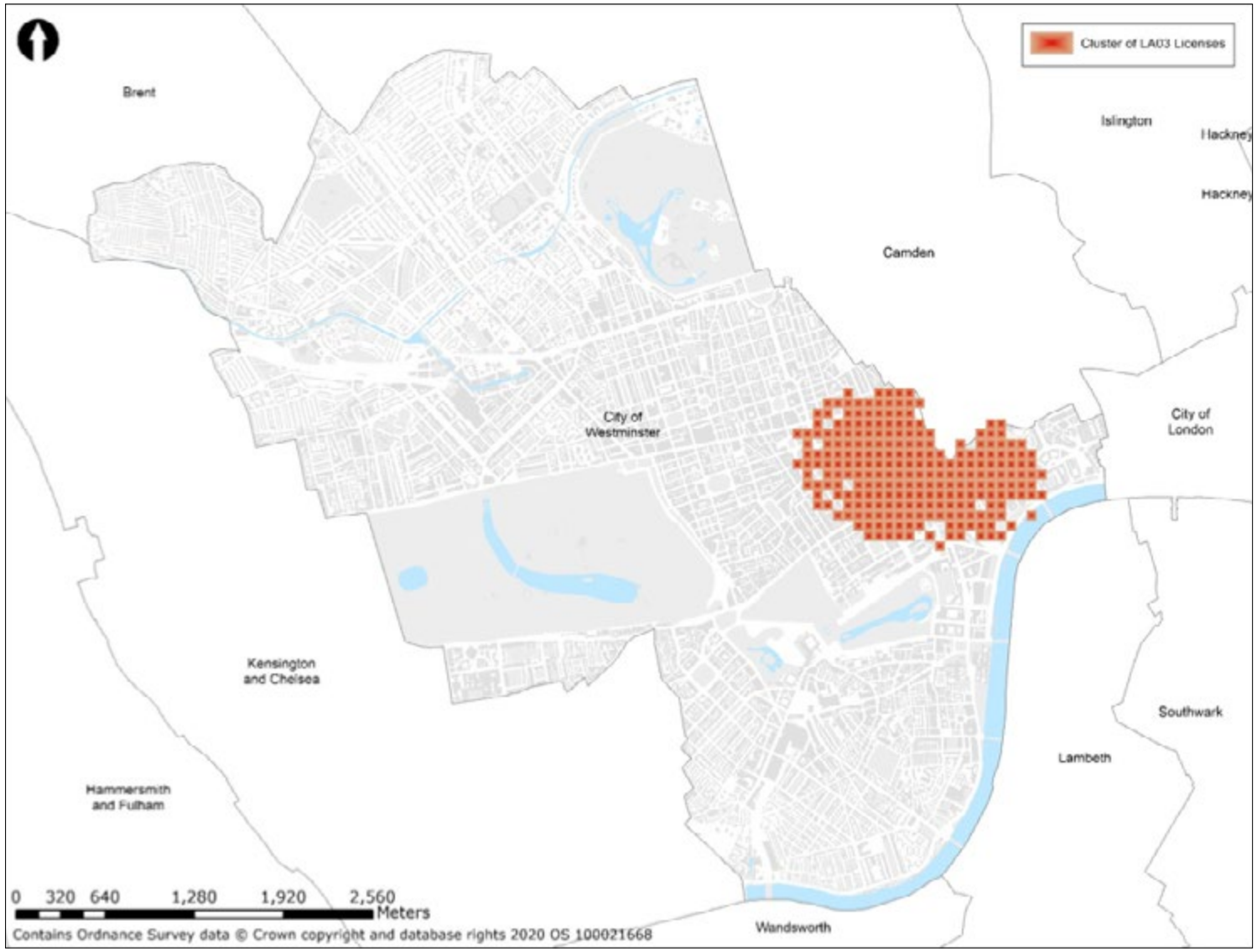
The emerging hot spot analysis tool categories areas in one of the following patterns

	Pattern name	Definition
	**No pattern detected**	Does not fall into any of the hot or cold spot patterns defined below.
	**New hot spot**	A location that is a statistically significant hot spot for the final time step and has never been a statistically significant hot spot before.
	**Consecutive hot spot**	A location with a single uninterrupted run of statistically significant hot spot bins in the final time-step intervals. The location has never been a statistically significant hot spot prior to the final hot spot run and less than ninety percent of all bins are statistically significant hot spots.
	**Intensifying hot spot**	A location that has been a statistically significant hot spot for ninety percent of the time-step intervals, including the final time step. In addition, the intensity of clustering of high counts in each time step is increasing overall and that increase is statistically significant.
	**Persistent hot spot**	A location that has been a statistically significant hot spot for ninety percent of the time-step intervals with no discernible trend indicating an increase or decrease in the intensity of clustering over time.
	**Diminishing hot spot**	A location that has been a statistically significant hot spot for ninety percent of the time-step intervals, including the final time step. In addition, the intensity of clustering in each time step is decreasing overall and that decrease is statistically significant.
	**Sporadic hot spot**	A location that is an on-again then off-again hot spot. Less than ninety percent of the time-step intervals have been statistically significant hot spots and none of the time-step intervals have been statistically significant cold spots.
	**Oscillating hot spot**	A statistically significant hot spot for the final time-step interval that has a history of also being a statistically significant cold spot during a prior time step. Less than ninety percent of the time-step intervals have been statistically significant hot spots.

	Pattern name	Definition
	**Historical hot spot**	The most recent time period is not hot, but at least ninety percent of the time-step intervals have been statistically significant hot spots.
	**New cold spot**	A location that is a statistically significant cold spot for the final time step and has never been a statistically significant cold spot before.
	**Consecutive cold spot**	A location with a single uninterrupted run of statistically significant cold spot bins in the final time-step intervals. The location has never been a statistically significant cold spot prior to the final cold spot run and less than ninety percent of all bins are statistically significant cold spots.
	**Intensifying cold spot**	A location that has been a statistically significant cold spot for ninety percent of the time-step intervals, including the final time step. In addition, the intensity of clustering of low counts in each time step is increasing overall and that increase is statistically significant.
	**Persistent cold spot**	A location that has been a statistically significant cold spot for ninety percent of the time-step intervals with no discernible trend, indicating an increase or decrease in the intensity of clustering of counts over time.
	**Diminishing cold spot**	A location that has been a statistically significant cold spot for ninety percent of the time-step intervals, including the final time step. In addition, the intensity of clustering of low counts in each time step is decreasing overall and that decrease is statistically significant.
	**Sporadic cold spot**	A location that is an on-again then off-again cold spot. Less than ninety percent of the time-step intervals have been statistically significant cold spots and none of the time-step intervals have been statistically significant hot spots.
	**Oscillating cold spot**	A statistically significant cold spot for the final time-step interval that has a history of also being a statistically significant hot spot during a prior time step. Less than ninety percent of the time-step intervals have been statistically significant cold spots.
	**Historical cold spot**	The most recent time period is not cold, but at least ninety percent of the time-step intervals have been statistically significant cold spots.

Appendix 8

Hotspot analysis of clusters of unique licence locations



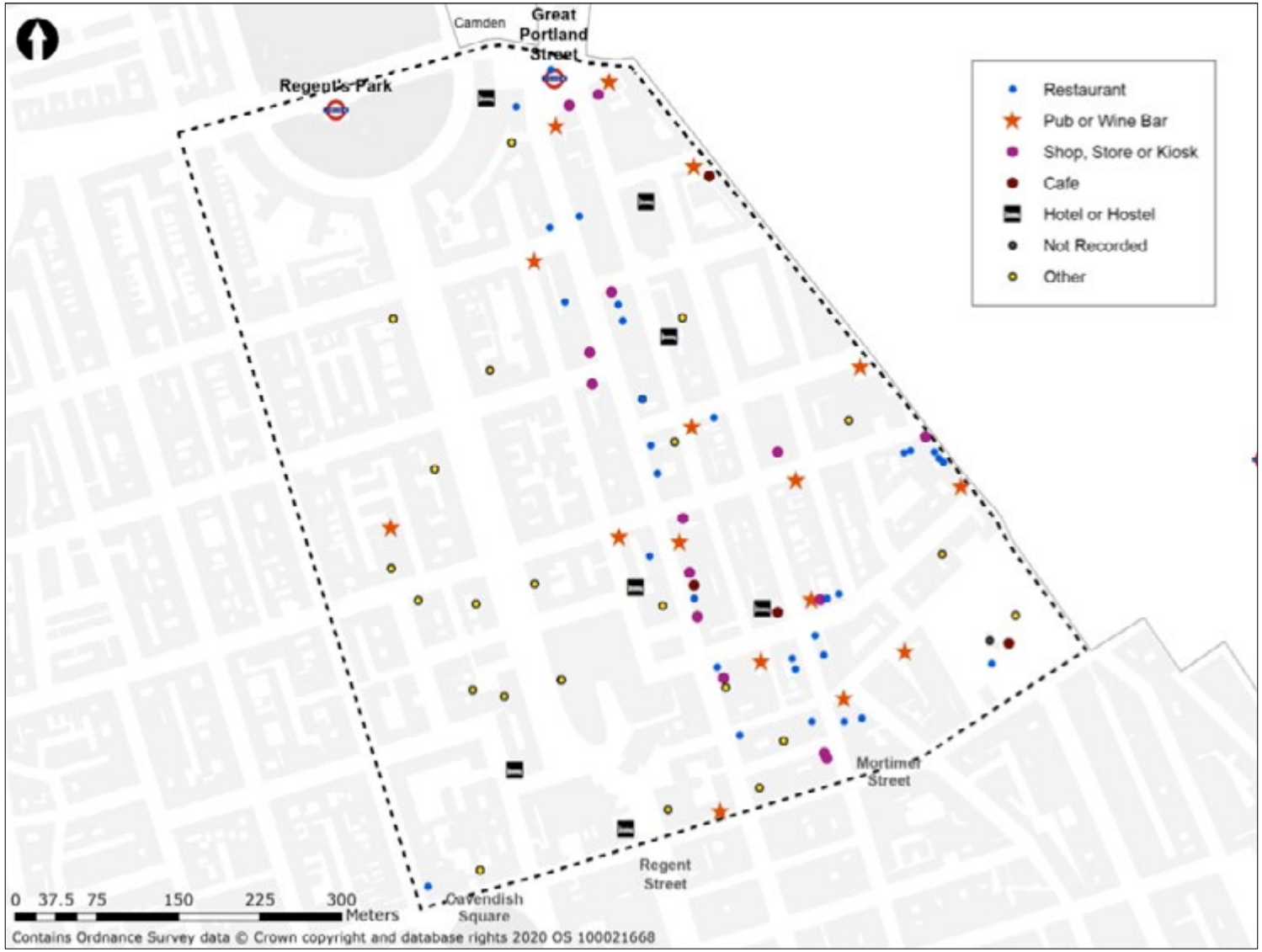
Appendix 9

Average concentrations of incidents indicative of cumulative impact in the City of Westminster 2017–2019

Category	Westminster total	Westminster count / km^2
Total area size	**22.03km^2**	
Licences	3769	171
Unique Licence Locations	3076	140
Residential Households	127541	5789
Alcohol Related Call Outs (Sum of Output Areas)	10208	463
Alcohol Related Call Outs 6pm - 6am (Sum of Output Areas)	7471	339
Serious Serious violent crimes	3537	161
Serious Serious violent crimes 6pm - 6am	2556	116
Robberies	9851	447
Robberies 6pm - 6am	6751	306
Theft and Handling	121027	5494
Theft and Handling 6pm - 6am	60331	2739
Drug Offences	7949	361
Drug Offences 6pm - 6am	3823	174
Noise Complaints	16065	729
Noise Complaints 6pm - 6am	8901	404
Reactive Waste Requests	66517	3019
LAS Call Outs to Premises	24,439	1109
ASB on Transport	7668	348
ASB on Transport 6pm - 6am	4728	215
Anti-Social Behaviour MPS	59,290	2691

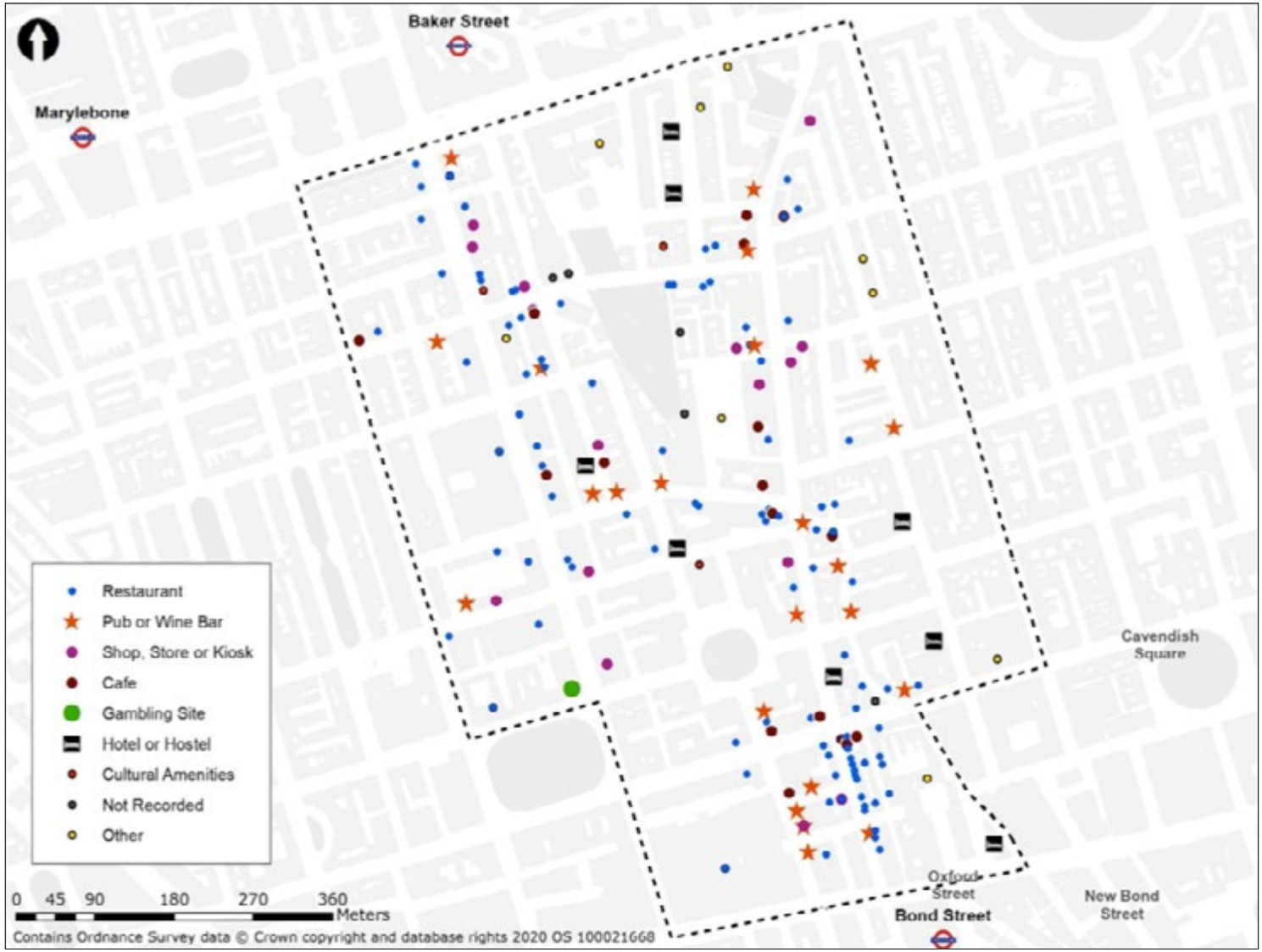
Appendix 10.1

Area of exploration: Fiztrovia North and unique licence locations by type



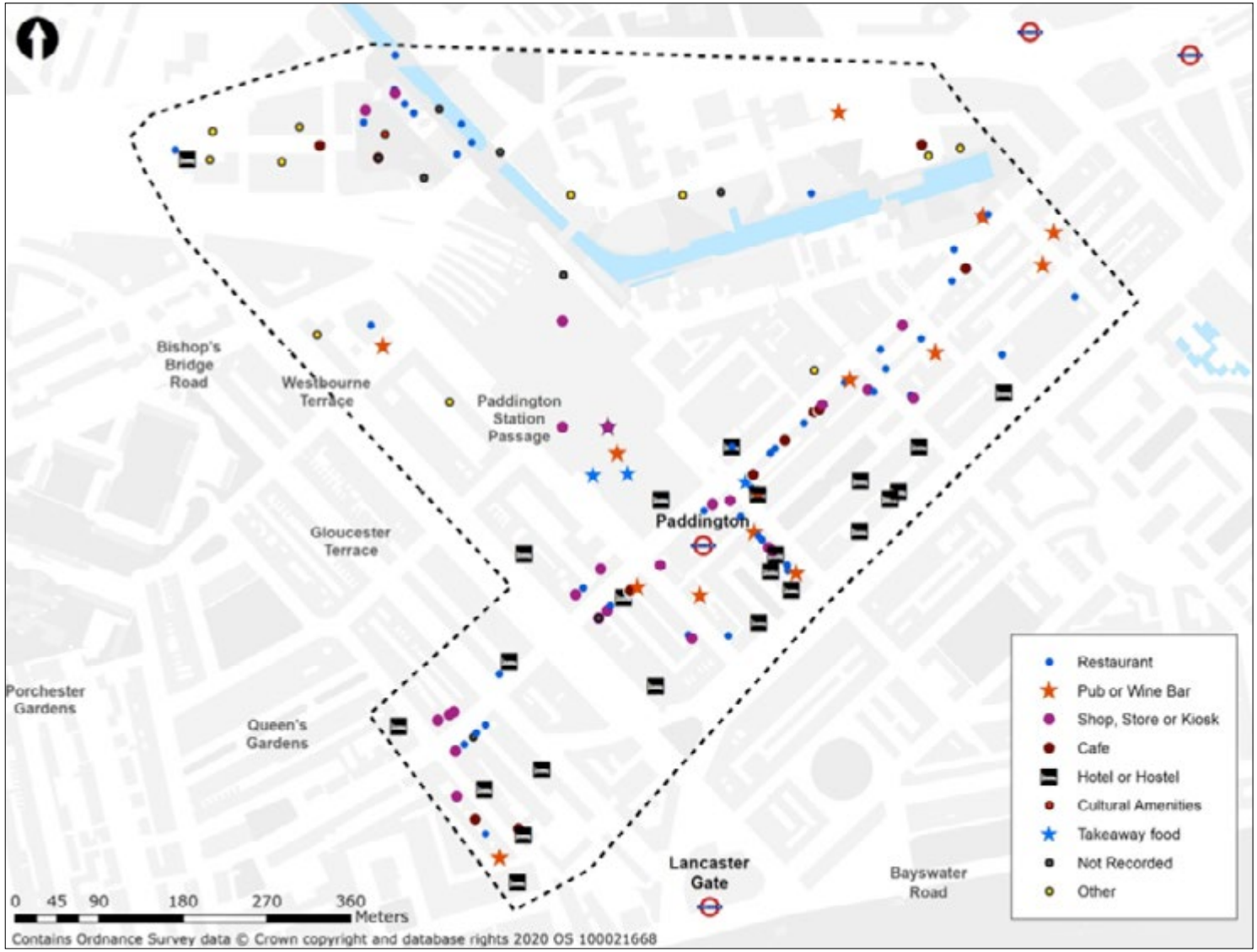
Appendix 10.2

Area of exploration: Mayrlebone – Oxford Street corridor and unique licence locations by type



Appendix 10.3

Area of exploration: Paddington and unique licence locations by type



City of Westminster