UNDERSTANDING RISK IN LINCOLNSHIRE

2020 - 2023

LINCOLNSHIRE FIRE & RESCUE

COMMUNITY RISK PROFILE

Lincolnshire
COUNTY COUNCIL
Working for a better future

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" Making our communities safer, healthier and more resilient. "

Foreword

The Fire and Rescue National Framework for England outlines the requirement for every fire and rescue authority to assess all foreseeable fire and rescue related risks that could affect their communities. It is essential that we have an understanding of both current and future risks and the consequences of those risks for the people, who live, work and visit Lincolnshire.

We will use this understanding to develop strategies and plans to prevent and mitigate risk to our communities. It is essentially about ensuring we have the right resources in the right place, at the right time to keep our communities safe.

This Community Risk Profile underpins our Integrated Risk Management Plan and provides the foundation on which to develop further detailed plans, as we work towards our mission 'to make our communities safer, healthier and more resilient'.

As a Fire and Rescue Service we have had to change the way we work in order to respond to new and emerging risks and against a background of reduced central funding during this period of austerity. Developing an understanding of risk is essential to ensuring our resources and capabilities remain well placed to meet the needs of our communities. As part of Lincolnshire County Council we will also consider the needs of our partners within wider public protection delivery.

There will undoubtedly be challenges ahead but our values place improvement, diversity, service to the community and our people at the heart of what we do. It is our commitment to these values that will ensure we remain focused on delivering a professional, risk-led and innovative service to the communities of Lincolnshire.

Les Britzman,
Chief Fire Officer

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Introduction

This Community Risk Profile provides the context and background analysis of risk which will inform Lincolnshire Fire and Rescue's Integrated Risk Management Plan (IRMP) which is a statutory requirement for all FRS. It provides a comprehensive review of current risks and a forward-looking assessment of future risks to our communities and will help shape service delivery over the next three years.

This document is underpinned by detailed performance data and analytics, which together are used to support our understanding of community risk and help target activities, both strategically and on a day-to-day basis. It enables us to better understand the diverse nature of our communities and to identify, prioritise and plan for both current and foreseeable risks, in accordance with the requirements of the Fire and Rescue National Framework 2018, which states;

"Every Fire and Rescue Authority must assesses all foreseeable fire and rescue related risks that could affect their communities, whether they are local, cross-border, multi-authority and/or national in nature from fires to terrorist attacks. Regard must be had to Community Risk Registers produced by Local Resilience Forums and any other local risk analyses as appropriate".

The Community Risk Profile also takes account of information supplied by partners and external influences on our Service at a local and national level. It does not replicate the statutory, multi-agency Community Risk Register managed by the Lincolnshire Local Resilience Forum (LRF).

Executive risk summary

Having analysed all available data on both current and foreseeable future risks, we have produced the following priority community risks for the period 2020–2023;

Risk Number	Risk Type	Risk Rating
1	Dwelling Fires	20
2	Road Traffic Collisions	20
3	Health and Wellbeing	20
4	Flooding and Severe Weather	20
5	Non-Domestic Fires	12
6	Residential High Rise	10
7	Malicious Acts	10
8	Heritage	9
9	Deliberate Fires	9

These risks will inform and drive Lincolnshire Fire and Rescue's Integrated Risk Management Plan (IRMP) and will help shape service delivery over the next three years, ensuring our resources and the strategies we use to mitigate risk are targeted at the areas where they can make the most difference.

Dwelling Fires
Lincolnshire has a total of 338,700 households across the county (VOA, 2017) with over 52,000 of those privately rented. District councils produce their own strategies to address housing needs within the local authority area. As an example, the Central Lincolnshire Local Plan sets out how Central Lincolnshire alone will grow by 36,960 new homes between 2012 and 2036. We have a strategy to promote fire safety in the home and link in with District housing officers through a service level agreement.

This, alongside our historic demand, which shows a gradual increase in fires over the last five years, has resulted in this being assessed as one of our highest risks for 2020-23. Domestic fires make up 35% of our fire incidents, with almost half (48%) of those caused by cooking over the last five years. 84% (21) of fire fatalities over the same period occurred in dwelling fires.

Road Traffic Collisions
The numbers of road traffic collisions (RTCs) where people were killed or seriously injured on Lincolnshire's roads has increased from 375 in 2013 to 507 in 2017 (Lincolnshire Road Safety Partnership).

5% of Lincolnshire Fire and Rescue (LFR) calls during this period were to RTCs. Our analysis shows that most of these collisions happen during the daytime and at peak travelling times.

Several major projects are underway to improve Lincolnshire's road network, including the Lincoln Eastern Bypass, which will be part of a wider concept to create a ring road around Lincoln city and is set for completion in May 2020.

As a result RTCs are assessed as one of our highest risks.

Flooding and Severe Weather
The 2013 tidal surge in Boston and the Wainfleet floods of 2019 were significant flooding events requiring a multi-agency response and national FRS assistance.

Flooding and severe weather is considered a risk in the LRF community risk register. As a result this is assessed as a high risk for 2020-23.

Non-Domestic Fires

Non-domestic fires include all business, commercial, industrial, schools and hospitals. Non-residential fires made up 17% of our fire incidents over the last five years with the majority caused by electrical appliances (31%) and deliberate ignition (21%).

The Greater Lincolnshire Local Enterprise Partnership (LEP) sets out a number of development objectives including improvements to Lincolnshire's infrastructure and economy, which will see an increase in non-domestic premises in the future.

This is assessed as a high risk for 2020-23.

Health and Wellbeing

Over recent years additional stations have taken up co-responding duties which is linked to an increase in calls to medical emergencies. However, changes to mobilising protocols within the NHS, along with the availability of LFR crews, saw the number of attended calls decrease in 2018/19.

Health and Wellbeing remains a high risk for the county and LFR will play a key role through our co-responding scheme and through our safe and well check programme in mitigating this risk. Almost half of our calls are to co-responder incidents, with 92% of those resulting in some form of medical intervention by our crews.
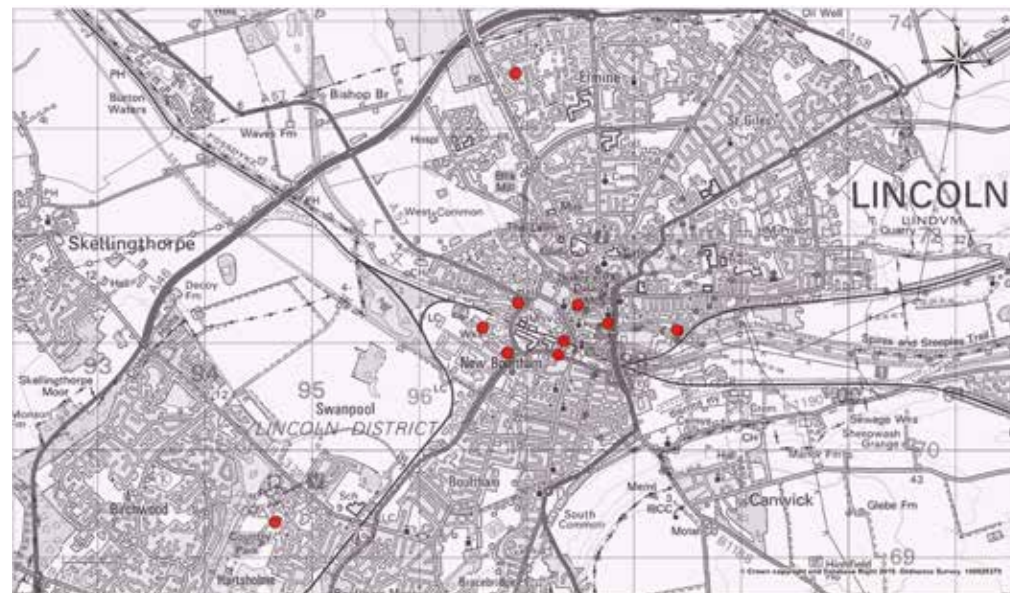
This is assessed as a high risk for 2020-23.

Residential High Rise

The 2017 Grenfell Tower tragedy in London involved a 24 storey residential high-rise building. The fire caused 72 deaths and 70 injuries. The subsequent Grenfell Tower Inquiry (Phase 1 report) was published in October 2019 and identified significant learning for fire and rescue services. LFR will analyse this report to ensure all learning is captured and, where appropriate, actioned upon in order to ensure our planning and response to high rise incidents remains effective.

Fires in high-rise buildings present a significant risk to firefighters and the public. High-rise buildings are defined as those over 18 metres (5 storeys) of

which Lincolnshire has forty one, including hospitals and commercial premises. In total there are twenty residential high-rise buildings in Lincolnshire, most of which are located in the City of Lincoln. Over the last five years, there were twelve recorded fire incidents in six of the residential high rise buildings within Lincoln.

The tallest high-rise buildings in Lincolnshire are Shuttleworth House (17 floors), Jarvis House (15 floors), and Trent View (15 floors).

The consequences of such an incident remain high. As a result this has been assessed as a high risk for 2020-23.

Malicious Acts

The UK faces a serious and sustained threat from terrorism, including from international groups, domestic extremists and Northern Ireland related groups. As of May 2019 the current UK threat level for international terrorism is 'severe' which means an attack is highly likely.

Whilst there is no direct and specific threat to Lincolnshire, we continue to work with partner agencies to tackle extremism and provide resources, at both local and national level to respond to malicious acts.

Due to the continued national threat, this has been assessed as a high risk for 2020-23.

Heritage

The 2019 fire at the medieval cathedral of Notre-Dame in Paris destroyed most of the historic building's roof and took with it many irreplaceable artworks. This devastating incident underlined the importance of protecting our heritage buildings.

Lincolnshire is a county rich in cultural and physical heritage with many historic sites across the county, including the magnificent Lincoln Cathedral, Lincoln Castle, St Boltophs Church ('Boston stump'), Gainsborough Old Hall, one of the best preserved medieval manor houses in England, Tattershall Castle and Harlaxton Manor to name a few. Lincolnshire boasts many Grade I listed buildings and is home to several windmills.

Whilst the risk to life is relatively low, heritage buildings, due to their age are often constructed of combustible materials; their original features and contents often irreplaceable. It is therefore important that these historic properties are protected and as a result this has been assessed as a medium risk for 2020-23.

Heritage buildings are located across the county as shown opposite.

Deliberate Fires

We have experienced an average of around 450 deliberate fires per year over the last 5 years. Most of these occur in vehicles or non-residential premises, with a peak during the dry summer months.

This has been assessed as a medium risk for 2020-23

Number of Heritage Buildings
- 1
- 2
- 3
- 4
- 6
- 13
- 35

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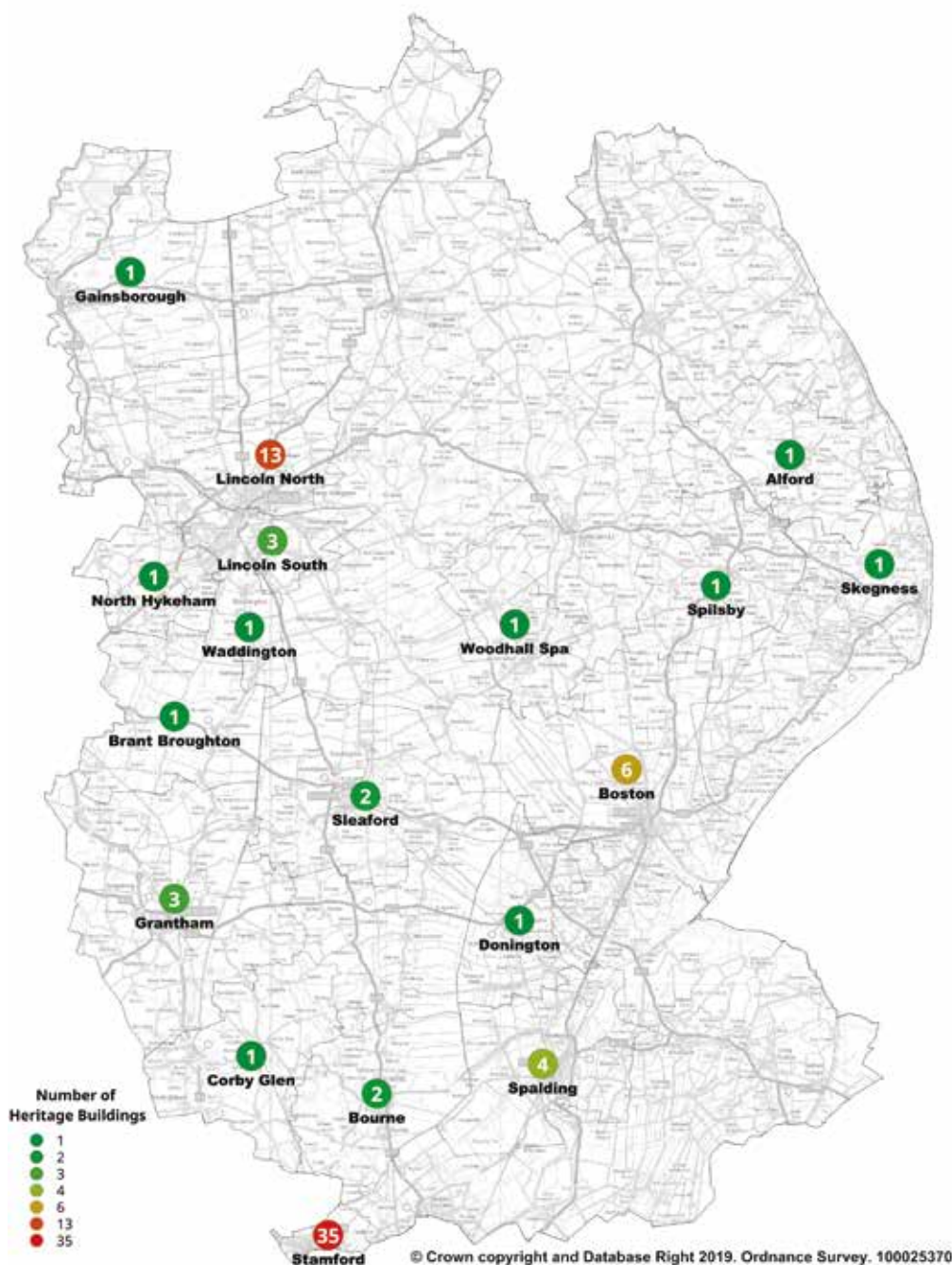
Risk assessment methodology

Defining Risk

Before we begin profiling risk it is important to understand what we mean by risk, and how we define it. The ISO International Standard 31000:2018 (Risk Management - Guidelines) defines risk as:

"The effect of uncertainty on objectives".

This definition is clarified by a note, stating:

"Risk is usually expressed in terms of risk sources, potential events, their consequences and their likelihood".

Risk and Demand

When thinking about the likelihood of fire and other incidents, it is important to note that 'risk' and 'demand' are not the same thing;

Risk is defined by the geographical locations of high-risk communities, people and premises and is connected with social factors in the population, including poverty/deprivation, age, health and lifestyle. Individuals at risk of harm from fire and other accidents are often also at risk of other types of harm. We know both from our routine local analysis and national research that incidents are more likely to happen to some individuals and in some areas, than others.

We routinely make use of data systems including the Lincolnshire Research Observatory, and demographic profiling tools (e.g. MOSAIC), both of which provide information to household/business level.

Demand is defined by historic, activity-based data, for example the number/location of incidents attended, the number/location of 'Safe and Well' checks carried out and the number/location of fire safety inspections completed.

This helps us to make the connections between community risk and incident activity and to target the available resources at the areas considered at greatest risk. Our approach to how we mitigate these risks is set out in the IRMP and is delivered through our annual service plan.

Integrated Risk Management Cycle

Risk will continually move with changes to the environment, population and demographics. With it, the demand for our resources and services will change.

Our risk management cycle ensures all foreseeable risks are identified, their likelihood and consequences analysed and effective risk treatment measures are applied to prevent and mitigate their impact on our communities.

IDENTIFY RISKS

ANALYSE RISKS

EVALUATION

IRMP CYCLE
Risk management planning is a continuous cycle, which ensures all foreseeable risks are identified, their likelihood and consequences analysed and effective risk treatment measures applied to prevent and mitigate their impact on our communities.

IDENTIFY CONTROLS

ENGAGEMENT & CONSULTATION

RISK TREATMENT
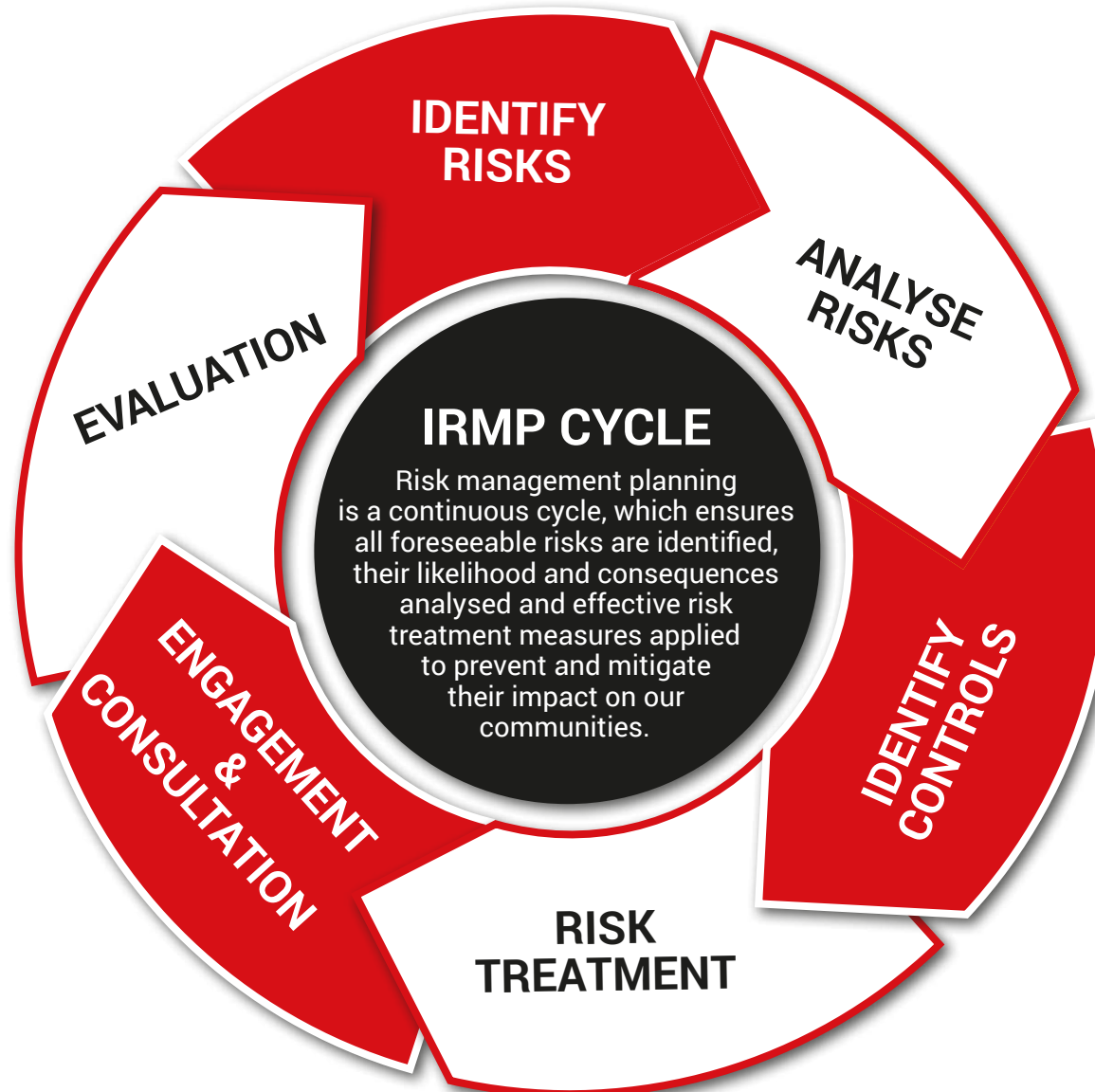
SUPPORTING FRAMEWORKS

- PREVENTION & PROTECTION
- RESPONSE
- PEOPLE
- RESOURCING
- EVALUATION

Identifying Risk

Lincolnshire's Local Resilience Forum (LRF) Community Risk Register sets out the key community risks for Lincolnshire together with an assessment of how likely they are to happen and the impacts across the county if they do. This process sets the direction for community risks in Lincolnshire and will drive our assessment of the highest risks within our IRMP.

The risks identified by the Lincolnshire community risk register are:

- Pandemic flu
- East coast flooding
- Inland flooding
- Impacts from disease / contamination
- Severe weather
- Loss of critical infrastructure
- Fuel shortages
- Malicious acts

We also use a range of datasets to support risk identification, intelligence and the effective targeting of resources. Whilst these datasets will evolve with time (as new information, research and systems are introduced) our broad categories of data are defined below:

Geographic Data	Identifying places within communities that are more at risk and the nature of those risks.
Social Data	Identifying types of people that are more at risk, through the use of marketing and other social data, then identifying the best way to reach those people.
Partnership Data	Working with other services, including Health, Police and Social Services to jointly identify common groups, individuals and geographical areas where joint or shared interventions will be most effective.
Historic Demand Data	Identifying historic incident data using the Incident Recording System (IRS) to support analysis of activity and demand.
Business Data	Identifying high-risk businesses and commercial premises through our Experian dataset to drive our Fire Safety and Operational Risk-based inspection programmes.

Horizon Scanning

Horizon scanning is the process of exploring what the future might look like to gain an understanding of foreseeable uncertainties and risk. The process assists us to analyse whether we are adequately prepared for potential opportunities and threats.

Horizon scanning is an ongoing process, which examines all main external influences upon the county.

Whilst internal performance is monitored and acted upon regularly, there are also a number of issues that influence the decisions and actions of Lincolnshire County Council as the fire authority. LFR will consider a range of external issues covering political, economic, socio-cultural, technological, environmental, legal and organisational (PESTELO) themes at a local, regional and national level:

2020 – 2023 PESTLO THEMES

Theme	Details	
Political	Potential impact of Brexit Change of Government, Council political affiliation, Devolution and Boundary changes	
Economic	Impact of changes to LFR budget and the likely impact on resources, both internally and externally	
Socio-cultural	Impact of predicted increase in population Impact of ageing population Impact of migration, particularly in Boston Impact of deprivation	Impact of predicted increase in health issues; obesity, dementia, falls Impact of Pandemic Flu virus
Technological	Impact of IT outage/cyber attack Impact of power outage Opportunities presented by technology to improve service delivery	
Environmental	Impact of climate change Impact of East Coast flooding/inland flooding and improvements to flood defences Impact of severe weather	Impact of changes to the built environment, e.g. housing developments, industrial developments and changes to the road network (GLEP)
Legal	Impact of potential changes in legislation arising from Grenfell enquiry Joint Health and Wellbeing Strategy for Lincolnshire 2013 – 2018 Impact of changes to FRS National Framework	
Organisational WHERE HOW WHAT WHEN WHY	Impact of key business continuity risks on critical services Impact/opportunities of collaboration Impact of workforce change	Impact of RDS review Impact of Wellbeing Strategy Impact of HMICFRS inspection Impact of review of LFR values

Risk Analysis

Our risks are analysed using risk and workload modelling software. This allows us to build a layered picture of risk and drives planning by supporting the effective targeting of resources at those communities, businesses and individuals most at risk.

We analyse the level of community risk using a methodology called 'FRAM' (Fire Risk Assessment Methodology). FRAM blends five years of incident data and indices of multiple deprivation to generate an independent risk score within a defined lower super output area (LSOA).

Applying this model to Lincolnshire generates a countywide geographical map of risk, consisting of high (red), medium (yellow) and low (green) risk areas, shown opposite.

FRAM is our base methodology for all LFR predictive risk analysis, against which additional layers are added, including high-risk businesses, response drivetimes and demand maps to build up a comprehensive picture of risk.

We use an interactive mapping tool to share our risk analysis both internally and with other agencies. By sharing this information, managers are able to view, analyse and manipulate layers of risk within their areas, supporting multi-agency and local level risk-led decision-making.

Where relevant, we will use academic research to help improve understanding of risk and vulnerabilities, using relevant studies to make connections between national trends and local analysis of risk.

FRAM Risk Level
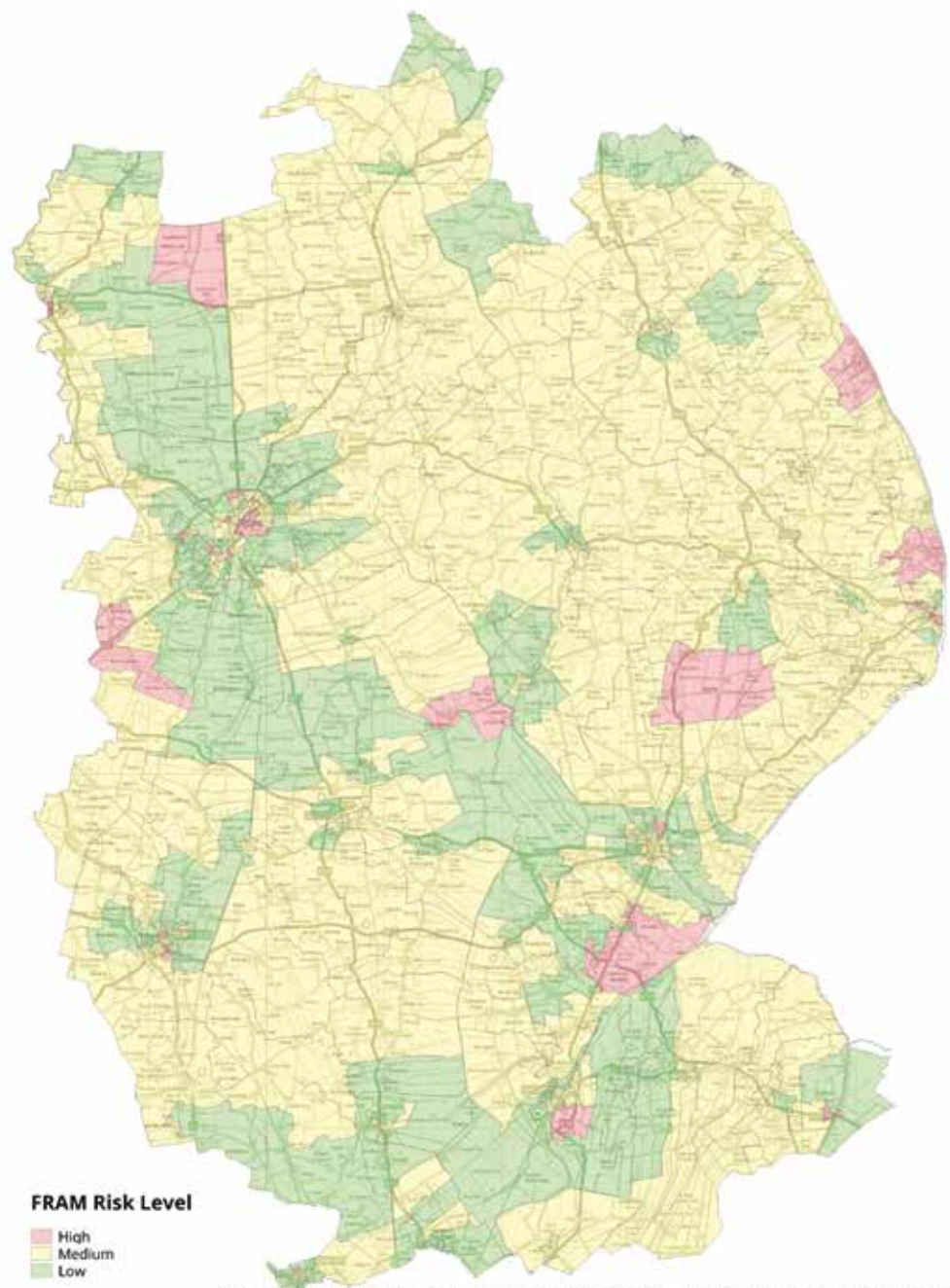
- High
- Medium
- Low

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Case Study – Hemswell Cliff Area

Our analysis of risk, using FRAM indicates a high-risk (red) area to the north of the county near Hemswell Cliff. This area ranks 35th in our high risk areas and (unlike many of the others) cannot be reached within our normal 10 minute response times:

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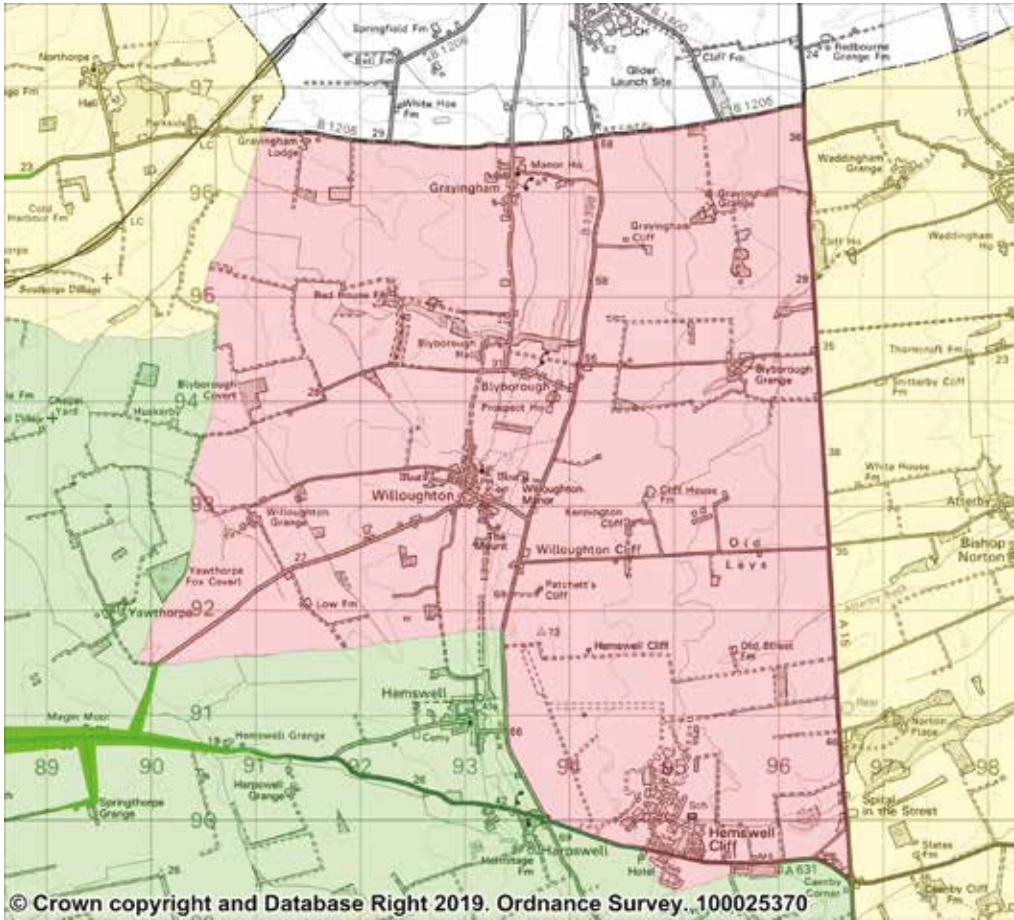
Further analysis of this area indicates that it is a relatively small geographical area and is very rural.

The reason for the high-risk rating is a combination of deprivation score and incident history. In the last 5 years, the area has had:

- 1 x Deliberate non-domestic fire
- 5 x Dwelling fires
- 0 x Fatalities
- 2 x Injuries
- 10 x Injuries at Special Service incidents

This information was passed on to our Prevention and Protection department to ensure appropriate and targeted risk control measures are applied though prevention activity.

This approach to community risk management ensures resources are matched to risk and demand, and individuals to interventions.

Once our risks have been identified and analysed we use a risk assessment matrix to determine the level of risk. This is based on:

Likelihood (Demand)
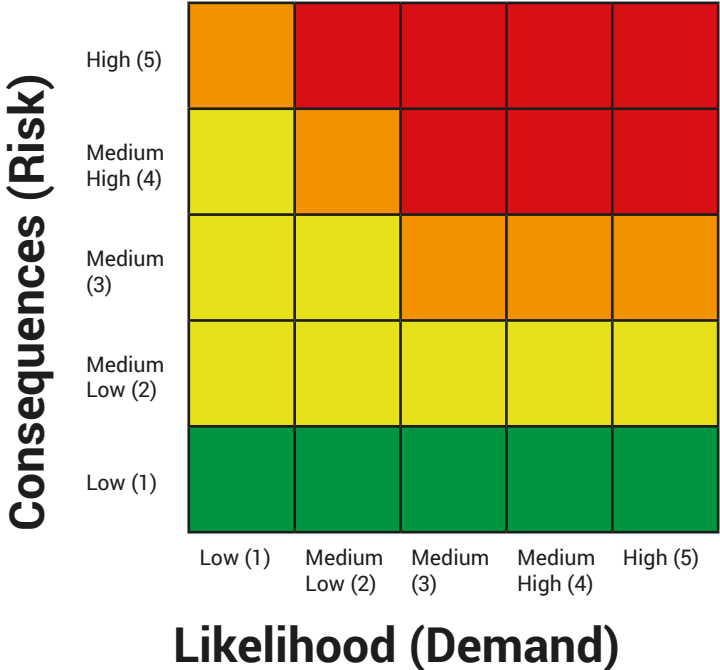
Each identified risk is scored using available intelligence and professional judgement. These risks are then categorised as follows:

VERY HIGH RISK – May have a medium – low likelihood but their potential consequences meanLFR will treat as a priority and allocate resources according to the threat.

HIGH RISK – Will be given careful consideration during LFR's strategic planning process.

MEDIUM RISK – Will be monitored to ensure Response, Prevention and Protection resources are in place to mitigate the risk.

LOW RISK – Will be managed during normal planning and response arrangements.

The outcomes of this process are summarised in Section 3 (page 5) and are then used to drive our IRMP.

Risk Treatment

The IRMP document is our long-term plan which outlines LFR's assessment of key risks and the strategies we will adopt to mitigate those risks over a 3 year period. The IRMP enables us to target our resources and develop further detailed plans, such as the annual service plan effectively, ensuring we can fulfil our mission of 'making our communities safer, healthier and more resilient'.

The IRMP will assess key community and corporate risks and drive the strategies for how these risks are treated. These strategies cover the core business of the service. Maintaining the right balance between these strategies and ensuring our approach to risk reduction is fully integrated is key to the delivery of an effective service.

Evaluation

Our assessment of risk is recorded on corporate and community risk registers. These registers provide assurance that risks are being prioritised and monitored effectively and resources allocated appropriately. Both risk registers are reviewed on a monthly basis at our Service Management Board.

We are committed to the continual improvement of the services we provide to our communities. It is important that all integrated risk activities are evaluated to allow the Service to continually monitor risks, ensure compliance with legal responsibilities, measure the impact and benefits of the work being carried out and evaluate the effectiveness of any changes made as a result of IRMP planning.

Quality assurance of IRMP activities will be delivered through:

- HMICFRS inspections
- Internal department and policy audits
- Continual team monitoring, team development and sharing of best practice
- Staff appraisals

We know Lincolnshire

We collect lots of data about incidents we attend and about risks in our county. We know a lot about Lincolnshire and the risks within the area. This section explains those risks in more detail.

Context

Lincolnshire is the fourth largest county in England covering 5,921 square kilometres. The county is classified as one the most rural in England by the Department for Environment, Food and Rural Affairs (DEFRA).

Lincolnshire's population is around 750,000 and is growing, ageing and changing, the impact of this is covered in more detail later. The county comprises seven districts; East Lindsey, West Lindsey, North Kesteven, South Kesteven, South Holland, the Borough of Boston and the City of Lincoln.

Lincolnshire has over 50 miles of coastline stretching from The Humber in the north to The Wash in the south with many of its beaches awarded blue flag status.

The Lincolnshire Wolds is a range of hills designated as an area of outstanding natural beauty and covering an area of 560 square kilometres.

There are 18 rivers running through the county, the two largest being the Witham and the Trent. It is also home to the Foss Dyke canal, one of England's oldest canal systems still in use today.

The western edge of Lincolnshire is connected to the UK's strategic road network by the A1 and also has part of the East Coast Main Line running through it, providing excellent rail links to London and Scotland.
Lincolnshire has no commercial airports however it does have a number of active RAF bases, a number of small local airfields and Humberside airport is just across the border in North Lincolnshire.

The port of Boston has regular container services operating to and from Norway, Sweden and Spain with overall some 750 vessels and 1.5 million tonnes of cargo being handled through the port each year. Imports include animal feeds, paper, steel and timber. In addition up to half a million tonnes of grain is exported from the port of Boston every year.

Lincolnshire is an agricultural area, growing large amounts of wheat, barley, sugar beet and oilseed rape. Workers from the European Union comprise a large component of the seasonal agricultural workforce, particularly in the south of the county.
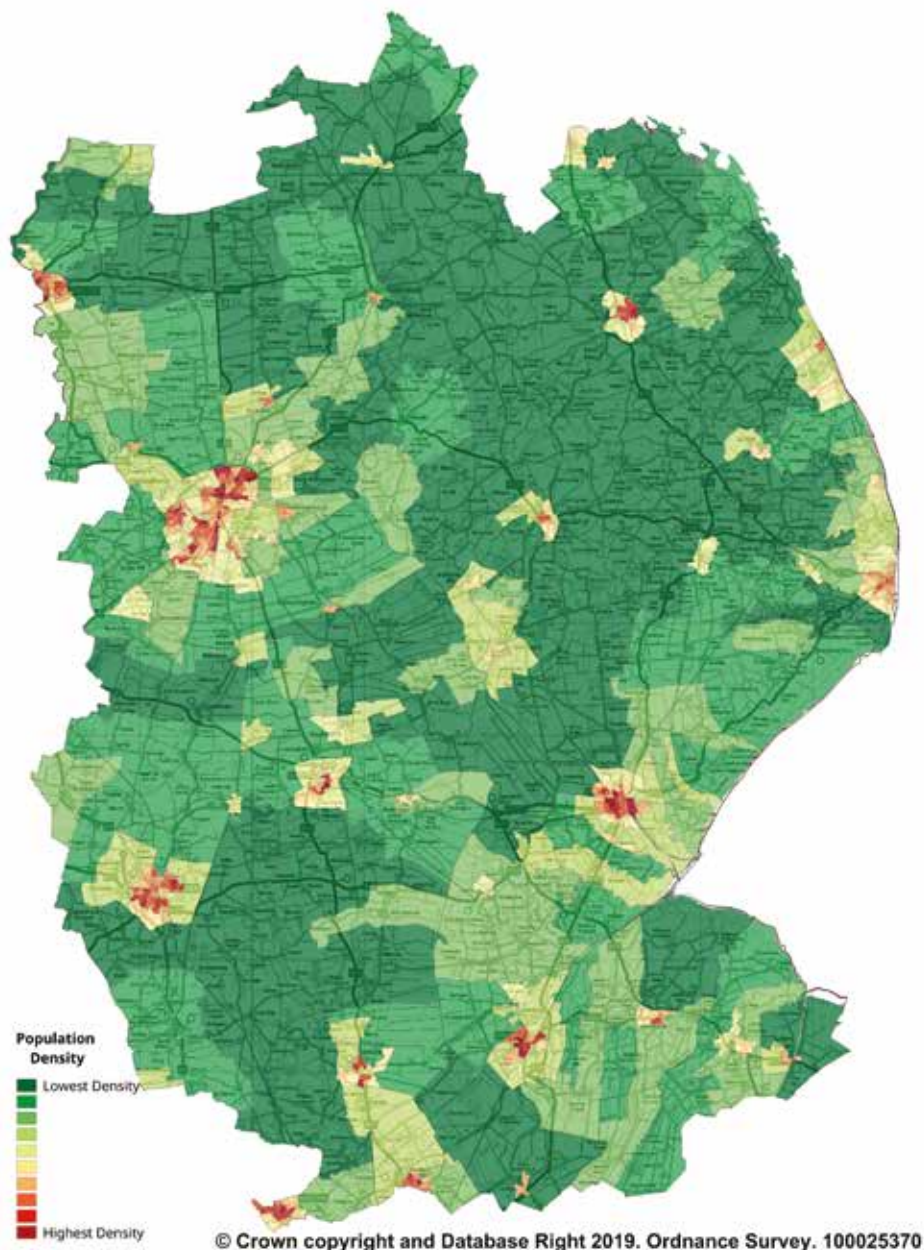
Population

Knowing both the population size and demography of an area, and understanding how it is changing, are both important factors for understanding our communities and the risks within them.

Lincolnshire's current population is estimated at 751,200. This is expected to rise to 802,000 by 2031, an overall increase of 8% in line with the national prediction over this period. (Source; Lincolnshire Research Observatory)

	2016	2021	2031	2041	Change (%) 2016-2021	Change (%) 2016-2031	Change (%) 2016-2041
Lincolnshire	744,800	766,300	802,000	824,400	3	8	11
Boston	67,700	69,600	71,800	73,300	3	6	8
East Lindsey	138,700	140,700	144,900	147,700	1	4	6
Lincoln	97,400	98,500	102,400	104,200	1	5	7
North Kesteven	113,600	117,400	123,200	126,900	3	8	12
South Holland	92,500	95,900	101,200	105,200	4	9	14
South Kesteven	140,900	146,500	155,500	161,400	4	10	15
West Lindsey	93,900	97,600	103,000	105,700	4	10	13
East Midlands	4,725,400	4,874,100	5,127,100	5,311,400	3	9	12
England	55,268,100	57,030,500	59,789,800	61,952,100	3	8	12

The map demonstrates Lincolnshire's more densely populated areas, highlighted in red through to lowest density in dark green.

Population Density
- Lowest Density
- Highest Density

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Migration Levels

Net migration (the balance between immigration – those entering the UK for a year or more, and emigration – those leaving the UK for a year or more) affects some areas of Lincolnshire more than others.

The Office for National Statistics data (2016)* estimates Lincolnshire as having a 7.3% proportion of non-British population, compared with a National proportion of 9.3%.

However, the proportion of non-British nationals in Boston Borough (27%) and South Holland (13%) is significantly higher, as demonstrated in the map below;

(Source; Office for national statistics)

Boston Borough has the highest proportion of non-British nationals outside of London. Immigrant workers, mainly from the European Union, comprise a large component of the seasonal agricultural workforce, particularly in both Boston and South Holland.

Of the 25 fire related fatalities during the last five financial years, four were recorded as being 'Other White' ethnicity group. This equates to 16% of fire related fatalities. There were four fire related fatalities in the South Holland area, 75% (three fatalities) recorded as 'Other White' and in the Boston area, five fire related fatalities with one of the individuals being 'Other White', therefore relating to 20% of the fatalities in this area. This data indicates that a higher percentage of the population of South Holland were fatally injured by fire than the resident population of the area.

Age, Gender and Ethnicity

Lincolnshire has a declining younger population and a growing older population with many people moving to the county in order to retire. Lincoln as a city has a higher percentage of people aged 20-64 compared with other districts, due to the influence of universities and higher education.

The trend towards an ageing population profile will continue, with the proportion of people over 75 years projected to increase by 88% between 2016 and 2041.

The proportion of young people in Lincolnshire (aged 0-19) fell from approximately 23% of the total population in 2007 to 22% in 2017. In the same period the population of those aged 65+ has increased by 3% to approximately 23% . The two factors together highlight a declining younger population and a growing older population in the county. (Source; Lincolnshire Research Observatory)

The table shows changes in population by broad age group.

	0-19 (%)		20-64 (%)		65+ (%)	
	2007	2017	2007	2017	2007	2017
Lincolnshire	23	22	58	55	20	23
Boston	23	23	58	56	19	21
East Lindsey	21	19	56	52	24	29
Lincoln	24	23	62	61	14	15
North Kesteven	23	22	58	55	19	23
South Holland	22	21	56	55	22	24
South Kesteven	24	23	58	55	18	22
West Lindsey	23	21	57	54	19	24
East Midlands	24	23	60	58	16	19
England	24	24	60	58	16	18

Deprivation

In the Index of Multiple Deprivation (IMD) showing overall deprivation, the 2015 data shows Lincolnshire ranked 90th out of 152 upper tier local authorities in England, where 1st is the most deprived. The map demonstrates Lincolnshire's more densely populated areas, with those most deprived highlighted in red through to the lowest deprived in dark green.

Index of Multiple Deprivation

1
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10

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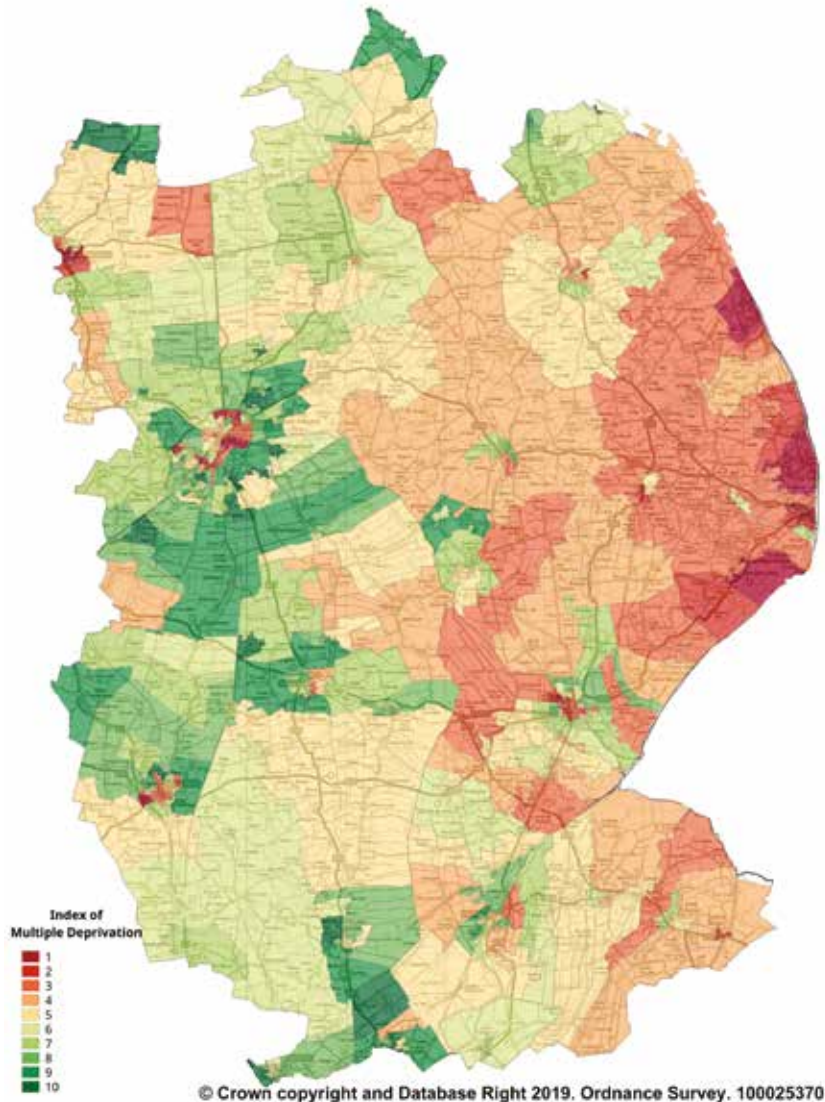
Health

Understanding ill health and its distribution is the first step to planning effective interventions to improve health and to prevent ill health.

Life expectancy from birth for Lincolnshire residents is comparable to national estimates and has remained static since 2010. Healthy life expectancy from birth in Lincolnshire is slightly lower than national estimates and has decreased since 2010.

70% of adults in the county are overweight or obese. National estimates of levels of morbid obesity suggest that there may be 11,500 adults with a BMI over 40 and nearly 800 with a BMI over 50 in Lincolnshire.

It was estimated that 11,688 people aged 65 and over were living with dementia in Lincolnshire in 2017. This accounted for 6.7% of all adults aged 65 and over. It is estimated that more than 15,000 individuals in Lincolnshire have a learning disability.

The number of people aged 65+ admitted to hospital as a result of falls is projected to increase from 3,309 in 2014 to 5,188 in 2030.

Lincolnshire's Joint Strategic Needs Assessment provides further evidence and analysis around health in the county.

The Joint Health and Wellbeing Strategy for Lincolnshire sets out the following Health priorities for the county:

- Mental Health and Emotional Wellbeing (Children and Young people)
- Mental Health (Adults)
- Carers
- Physical Activity
- Housing and Health
- Obesity
- Dementia

Delivery of the objectives identified for each of these priorities will be through Lincolnshire's Health and Wellbeing Board.

Environment

Lincolnshire is a largely rural county with a coastline of more than 50 miles, hosting seaside resorts that attract thousands of visitors each year. It is also home to a diverse range of wildlife including the grey seal. Large areas of land along the coastline are below sea level and are protected from flooding by sea walls and defences.

There are a number of internationally and nationally important nature conservation sites along the coast, including the Wash, which is classified as a Site of Special Scientific Interest.

There are 18 rivers running through the county, the two largest being the Witham and the Trent. It is also home to the Foss Dyke canal, one of England's oldest canal systems still in use today.

Understanding flood risk is an important factor in understanding the level and weight of resources required to respond to flood events, be it inland flooding, east coast flooding or surface water flooding following a severe weather event.

In 2013 Boston experienced a devastating tidal surge affecting approximately 600 homes and businesses in the town. It was the worst flooding seen in Lincolnshire in 60 years. The 'Boston Barrier' is a partnership between the Environment Agency, Lincolnshire County Council, Boston Borough Council and Black Sluice Internal Drainage Board, who are all working together to reduce the risk of tidal flooding in Boston. This tidal flood defence system is set to be operational by December 2019 and will provide protection for 14,300 properties in the area. When the barrier is built and the banks immediately downstream are raised, Boston will be protected from a tidal surge with a 0.3% annual probability (or 1 in 300 chance of happening in any one year).

Artists impression of the Boston Barrier

Access to the Environment Agency's flood risk maps allows us to analyse the risk and ensure we are adequately prepared:
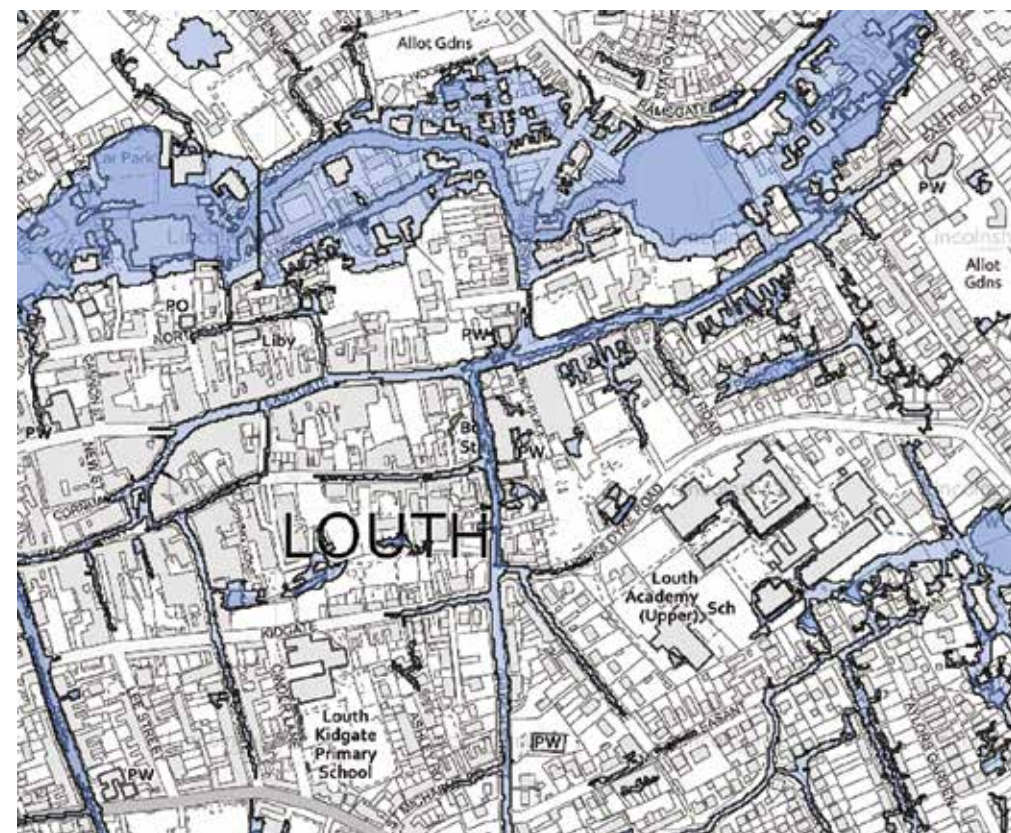
Economy

Agriculture, commercial, industrial, finance, transport, energy, public services and leisure and tourism make up the county's economy.

The county's coastal resorts attract around 20 million visitors per year, many during the summer months.

Lincoln City has the fourth highest proportion of students in the East Midlands with around 10,000 students at the University of Lincoln. Lincolnshire's long-standing reliance on traditional industries such as agriculture remains high.

The Greater Lincolnshire Local Enterprise Partnership (LEP) has developed a number of priorities and plans to meet economic development objectives. These plans provide a window into what Lincolnshire might look like in the future and allow us to predict and prepare for associated risk.

The main priority growth areas are:

- Agri-food
- Visitor economy
- Manufacturing and engineering
- Low carbon
- Health and care
- Ports and logistics

Further details on the LEP strategies and plans can be found here.

Business

We use Experian's Incident Risk Score model (IRS) to identify high-risk business premises for both fire safety and operational risk inspection.

Experian's analysis of historic fire incidents reveals that 80% of fires occur in the top 20% of highest risk businesses and identified three common areas of risk in commercial premises:

- The presence of a large number of people
- The presence of material or stock which could be flammable
- Places where food is being cooked

Experian's IRS data is blended with a number of other sources of empirical and dynamic data to drive our fire safety and operational risk-based inspection programmes.

This information is not shared publically because of GDPR regulations.

Infrastructure

The rural nature of the county means that many people have to travel greater distances to work compared to the national average, with people in the west of the county generally making longer journeys than those in the east.

The western edge of Lincolnshire is connected to the UK's strategic road network by the A1 and also has part of the East Coast Main Line running through it, providing excellent rail links to London and Scotland.

Several major projects are underway to improve Lincolnshire's road network, including the Lincoln Eastern Bypass, which will be part of a wider concept to create a ring road around Lincoln city and is set for completion in May 2020. LFR is engaged with this project and others to understand potential impacts on road traffic collisions and FRS response times.

Lincolnshire has no commercial airports however it does have a number of active RAF bases, a number of small local airfields and Humberside airport is just across the border in North Lincolnshire.

The port of Boston has regular container services operating to and from Norway, Sweden and Spain with overall some 750 vessels per year being handled through the port. Imports include animal feeds, paper, steel and timber. In addition up to half a million tons of grain is exported from the port of Boston every year. The port handles approximately 1.5 million tons of cargo per year.

Port Sutton Bridge is a modern dry cargo port and warehouse complex that has grown over recent years.

Many communities within Lincolnshire are on the periphery of the supply networks for utilities such as water, gas and electricity, which means they are more exposed to single points of failure within the supply chain. Due to the sparse nature of the population, there are many homes within the county that are not on the main supply route for basic utilities. These homes rely on septic tanks, and oil and gas storage for hot water and heating. These homes are more resilient in times of widespread utilities disruption, but are more vulnerable to shortages or disruptions within their own system.

Industrial (COMAH)

Lincolnshire has a relatively low number of sites registered under the Control of Major Accident Hazards (COMAH) regulations 1999. However, by their nature they pose more significant risk to the local community than other industrial sites.

LRF's Community Risk Register indicates mitigating actions for risk related to COMAH sites, including on and off site emergency plans for top tier sites and onsite procedures for other sites. These sites are not detailed in this document for reasons of security.

Regular multi agency exercising of plans is carried out with full participation from LFR. Familiarisation with these sites is also part of firefighter training.

Historical incident demand 2014/15 – 2018/19

Historical Incident Demand - All Incidents

Incident demand over time is largely on the increase, mainly attributable to the increase in medical response. Over recent years additional stations have taken up co-responding duties which is linked to the increase in calls. However, changes within mobilising protocols within the NHS along with the availability of LFR crews, saw the number of attended calls decrease in 2018/19.

The number of fires attended is slowly on the increase, but this is subject to increase during prolonged periods of hot and dry summer weather, which can be seen during the numbers of incidents in 2018/19. Conversely, the number of 'other special service' incidents, which would include flooding attendances, will increase during times of exceptional rainfall. This will be the case during the 2019/20 year due to the flooding event of June 2019.

All incidents attended by LFR 2009/10 - 2018/19
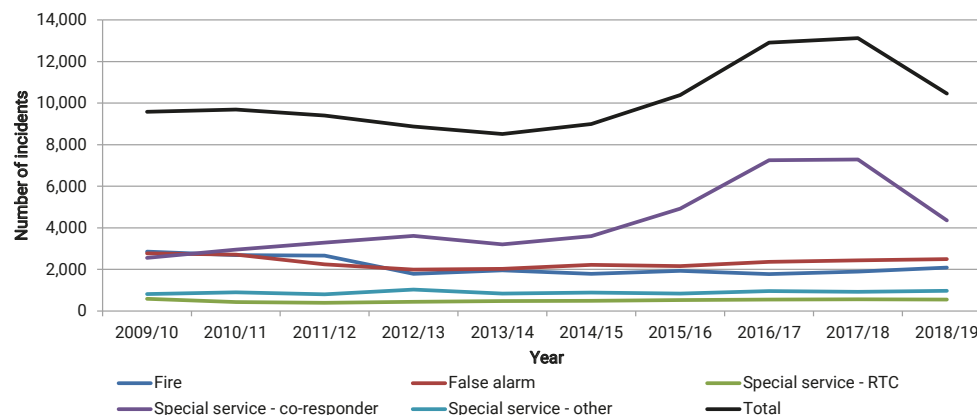
Number of incidents by type and hour of day 2014/15 - 2018/19

Legend: Fire | False alarm | Special service - RTC | Special service - co-responder | Special service - other
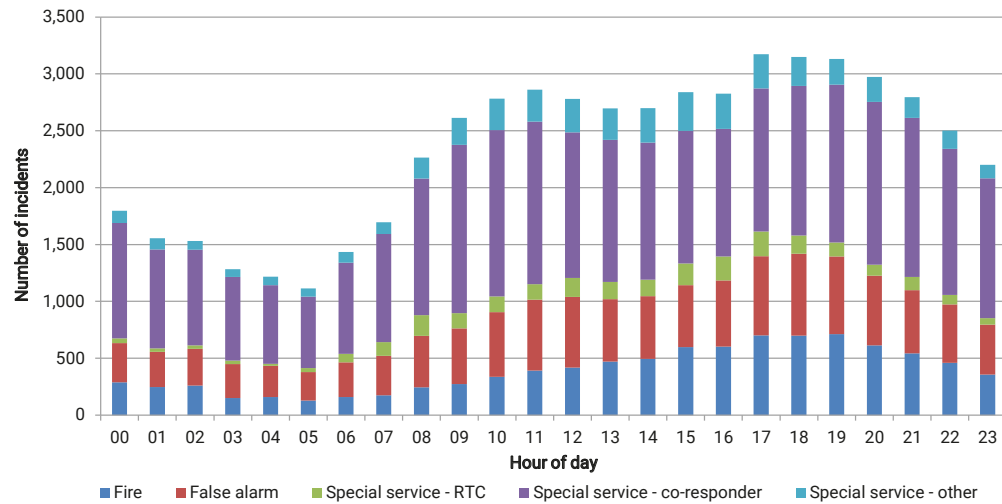
All incidents monthly breakdown by year 2014/15 - 2018/19

Legend: 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19
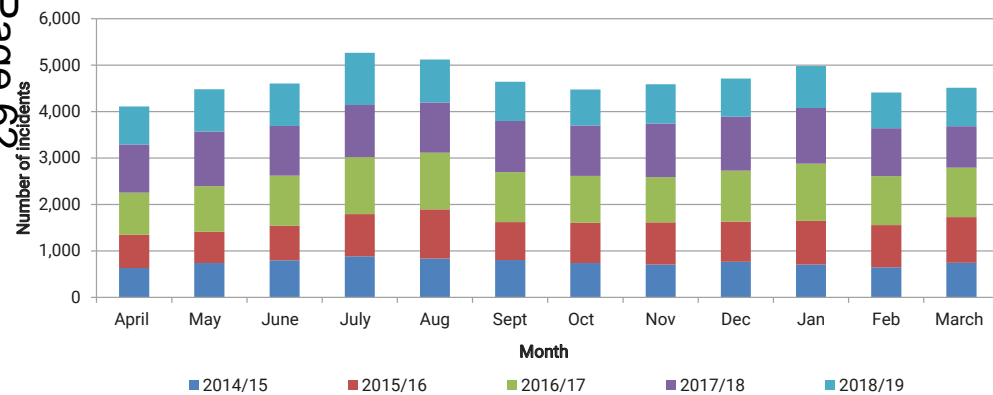
Heat map of All Attended Incidents

Hotspot Legend

Lowest Density

Highest Density

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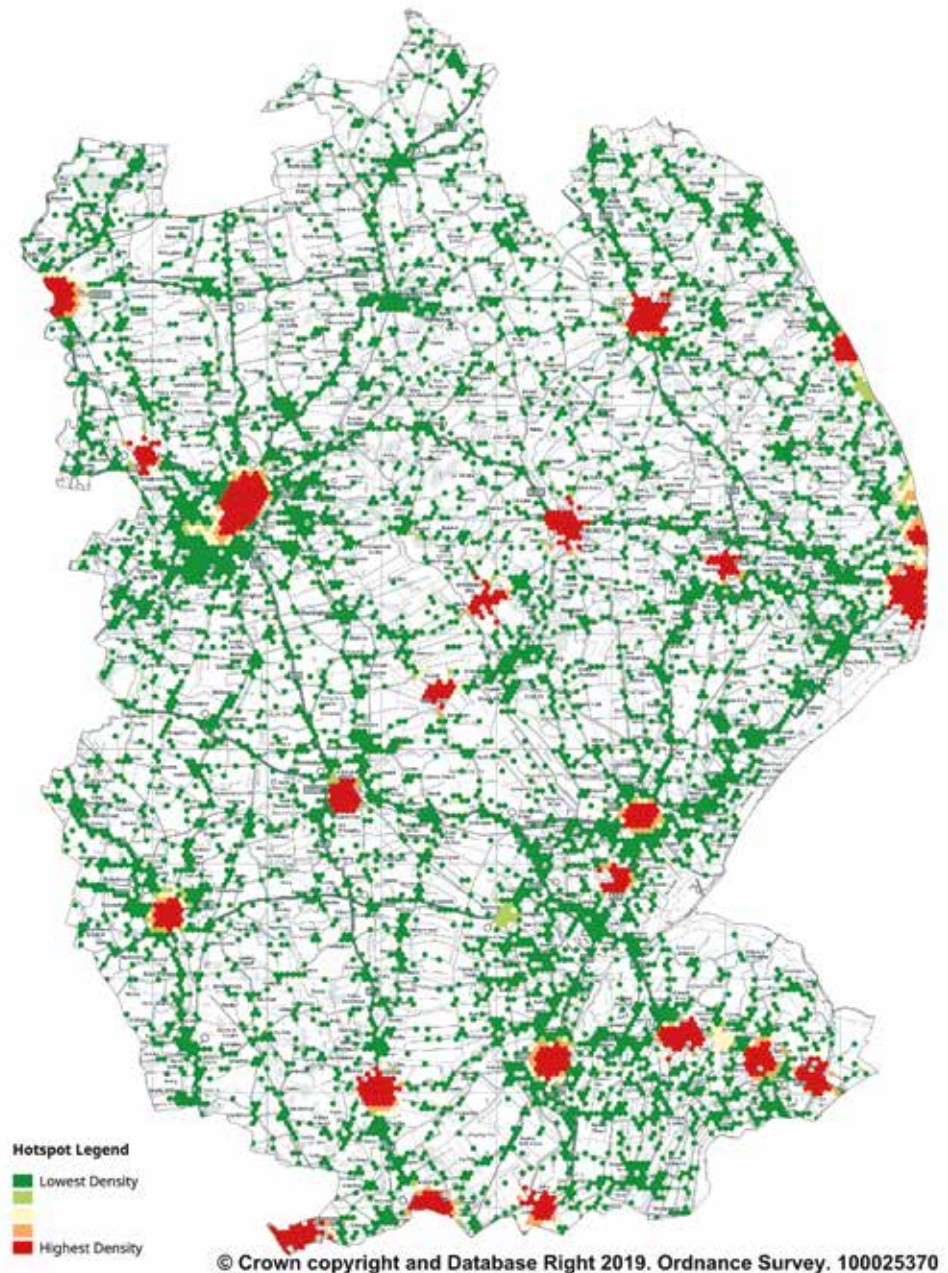
Incident breakdown by type 2014/15 - 2018/19

Legend:
- Fire
- False alarm
- Special service - RTC
- Special service - co-responder
- Special service - other

Pie chart values: 8%, 17%, 21%, 5%, 49%
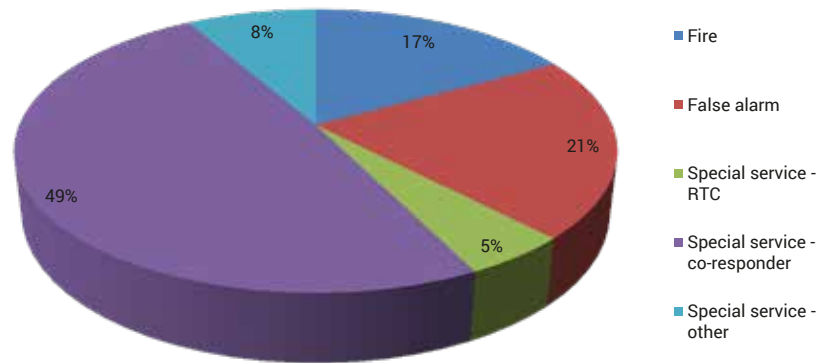
Fire Incidents Attended 2014/15 – 2018/19

Over the last 5 years the number of fires attended is slowly on the increase. In the most recent year this was largely due to the prolonged hot summer of 2018.

Types of fire are grouped into three categories:

1) Fire Primary, 2) Fire Secondary and 3) Fire Chimney.

Types of fire 2014/15 - 2018/19

Legend: Fire primary, Fire secondary, Fire chimney
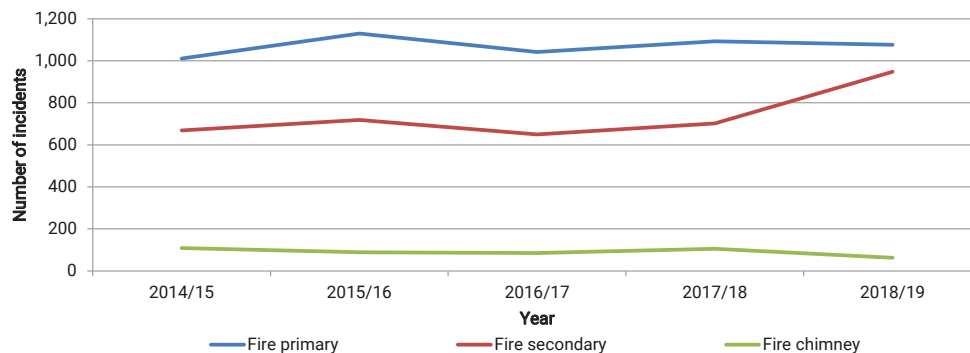
Primary Fire Incidents 2014/15 – 2018/19

Primary Fire incidents are categorised by property group and type, the main distinctions are: 1) Domestic 2) Non-Domestic and 3) Unspecified.

Primary fire property categories 2014/15 - 2018/19

Pie chart values: 35% Domestic, 17% Non-domestic, 48% Unspecified

Primary fires by property category 2014/15 - 2018/19

Legend: Domestic, Non-domestic, Unspecified
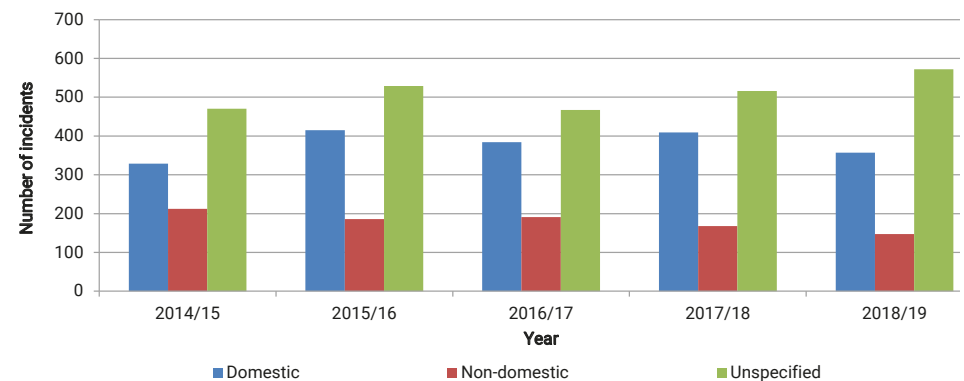
Over the last 5 years 35% of primary fires occurred in domestic (dwellings).

Dwelling Fires - When

Dwelling fires by month 2014/15 - 2018/19

Dwelling fires by day 2014/15 - 2018/19
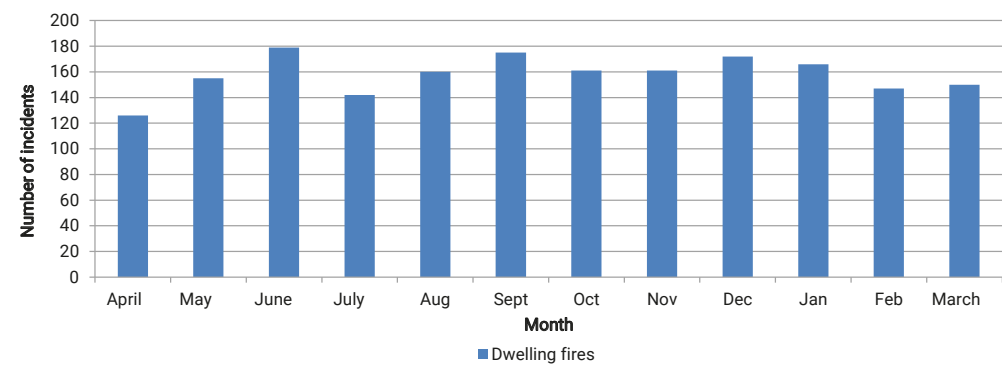
Dwelling fires by hour of day 2014/15 - 2018/19
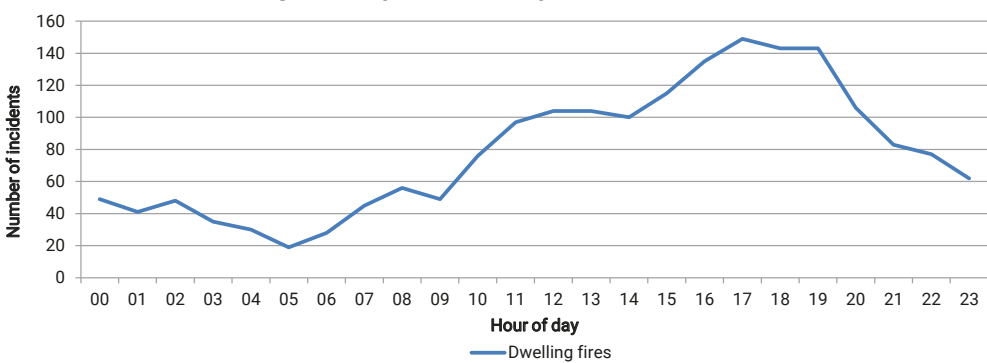
Dwelling Fires - Causes
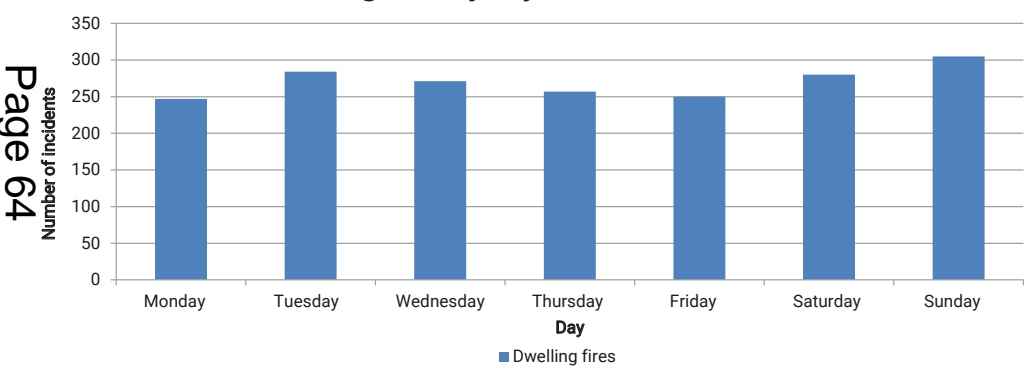
Dwelling fire causes 2014/15 - 2018/19

- Cooking appliances
- Other electric appliances
- Deliberate ignition
- Smokers materials
- Other known
- Mains electrics
- Unknown
- Naked light
- Space heating
- Other
- Other gas appliances
- Natural occurrences
- Spread from secondary fire
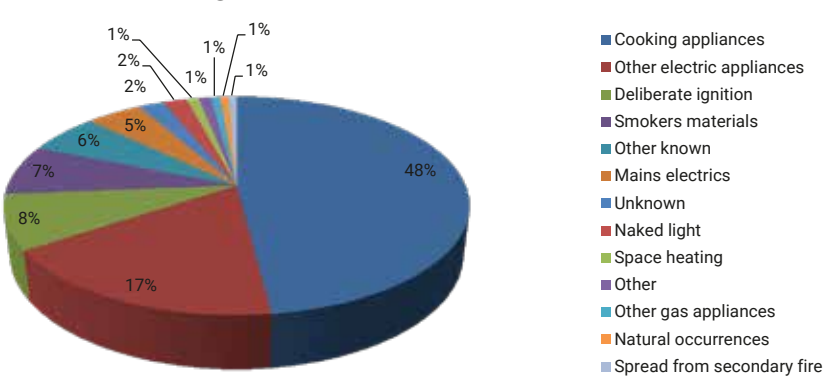
Dwelling Fires – Who

Dwelling fire household occupancy 2014/15 - 2018/19

- Lone person over pensionable age
- Couple with dependant children
- Lone person under pensionable age
- Not known
- Couple both under pensionable age with no children
- Lone parent with dependant children
- Couple one or more over pensionable age, no children
- 3 or more adults under pensionable age, no children
- Other
- 3 or more adults with dependant children
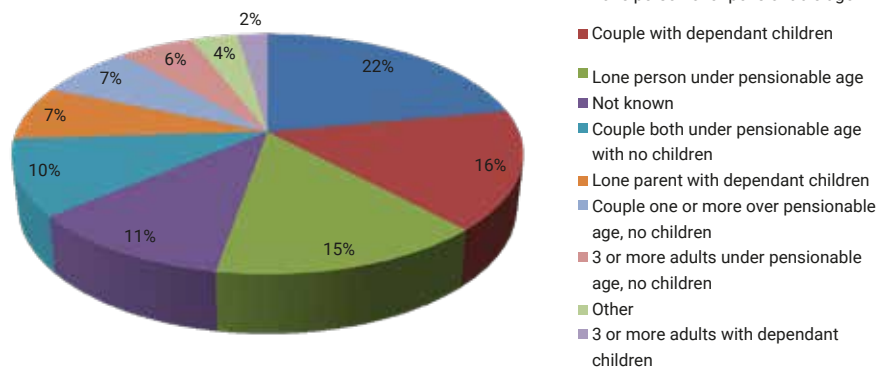
Dwelling fire human factors contributing to fire 2014/15 - 2018/19

- None
- Not known
- Distraction
- Falling asleep/asleep
- Other medical condition/illness
- Other
- Disabled
- Excessive and dangerous storage
- Temporary lack of physical mobility

Dwelling Fires - Where

Hotspot Legend

Lowest Density

Highest Density

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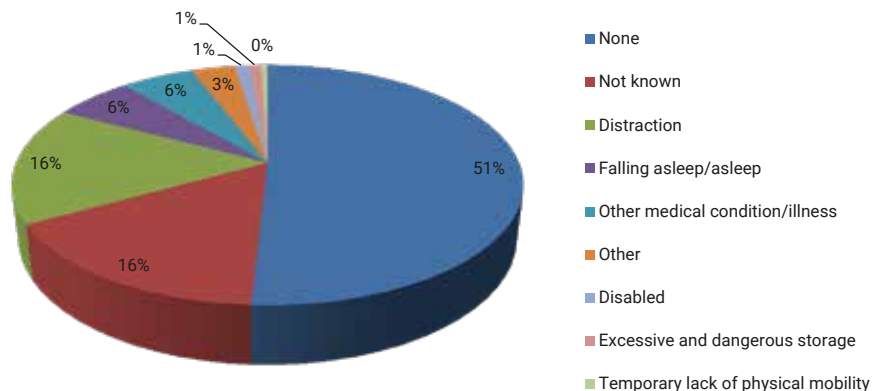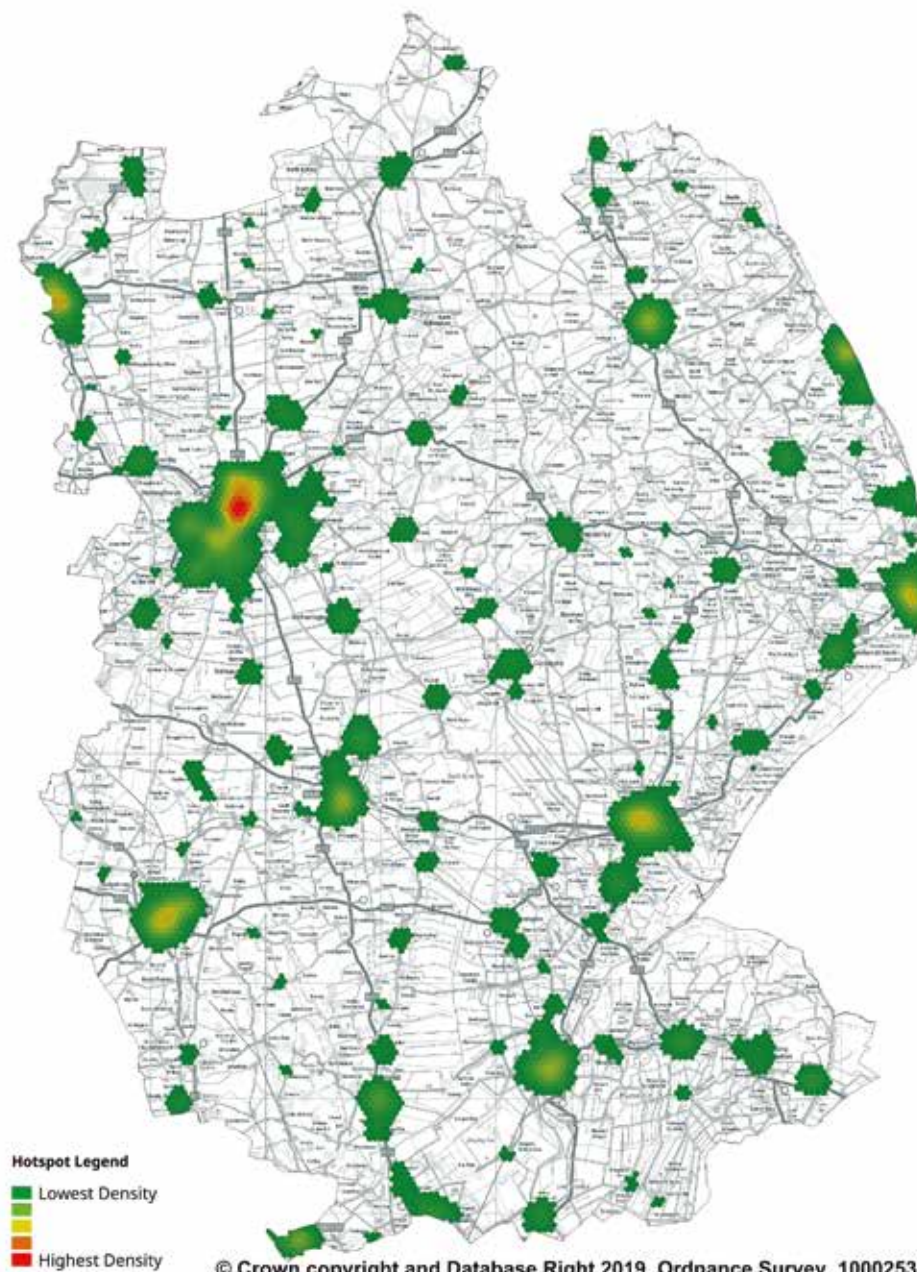
Dwelling Fires occurring in High Rise Buildings

Over the five year period, there has been 12 recorded fire incidents in six of the residential high rise buildings within Lincoln.

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Number of Fires Over 5 Years

- 0
- 1
- 2
- 3
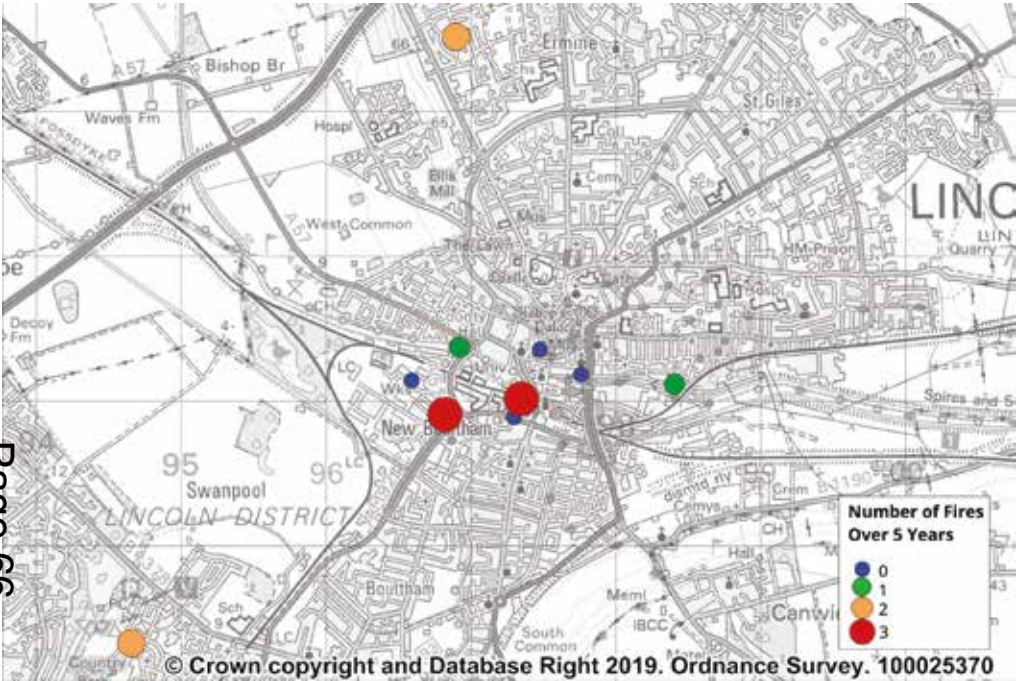
Non-Domestic Primary Fires - When

Non-domestic fires by month 2014/15 - 2018/19

Number of incidents (y-axis): 0 to 100

Month (x-axis): April, May, June, July, Aug, Sept, Oct, Nov, Dec, Jan, Feb, March
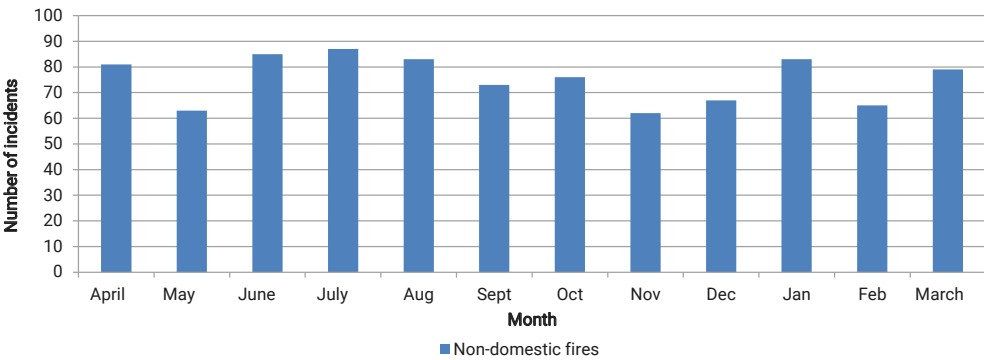
■ Non-domestic fires

Non-domestic fires by day 2014/15 - 2018/19

Number of incidents (y-axis): 0 to 180

Day (x-axis): Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday

■ Non-domestic fires

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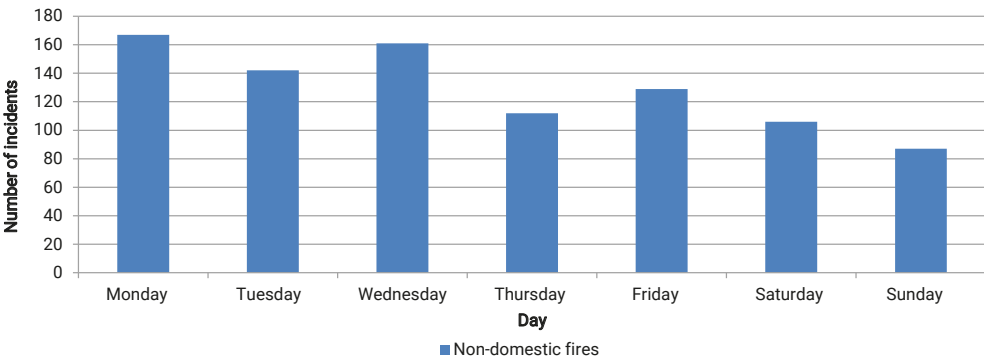
Non-domestic fires by hour of day 2014/15 - 2018/19
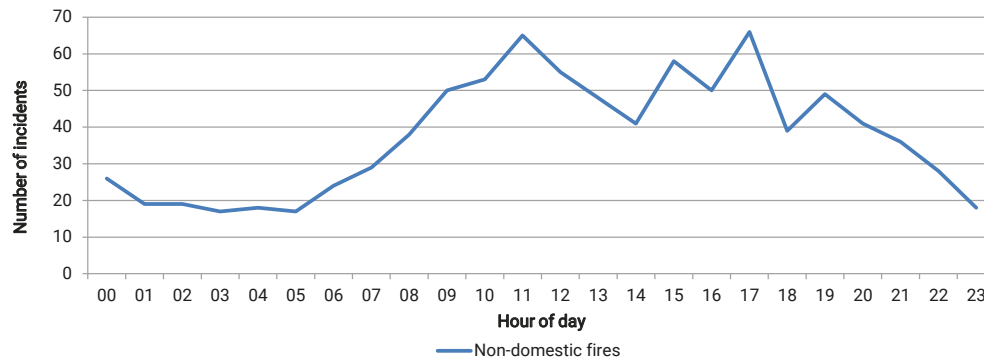
Non-domestic fire causes 2014/15 - 2018/19

Legend:
- Other electric appliances
- Deliberate ignition
- Cooking appliances
- Other known
- Mains electrics
- Unknown
- Smokers materials
- Welding / blowlamp
- Mechanical heat and sparks
- Spontaneous combustion
- Vehicle electrics
- Other
- Industrial processes
- Other gas appliances
- Spread from secondary fire

Non-Domestic Primary Fires - Where

Hotspot Legend
- Lowest Density
- Highest Density

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Deliberate Ignition Fires – When

Deliberate ignition (arson) fires by year 2014/15 - 2018/19

Deliberate ignition (arson) fires by month 2014/15 - 2018/19
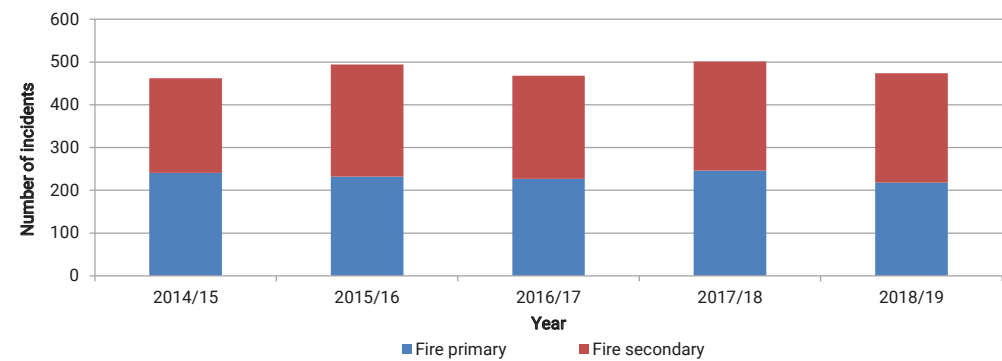
Deliberate ignition (arson) fires by day 2014/15 - 2018/19
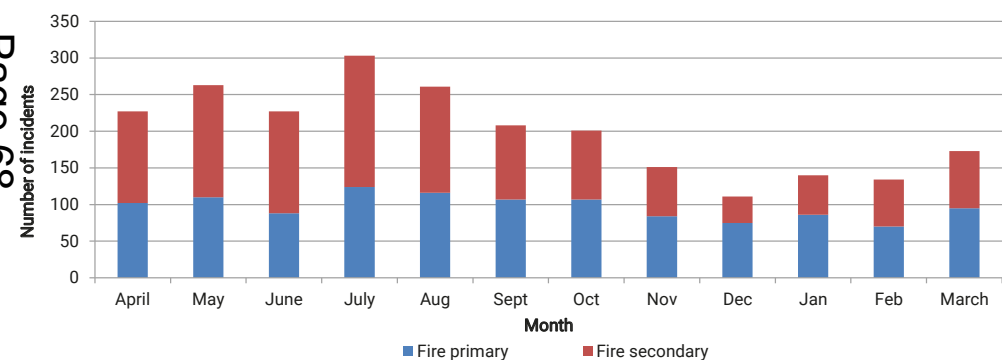
Deliberate ignition (arson) fires by hour of day 2014/15 - 2018/19

Page 68
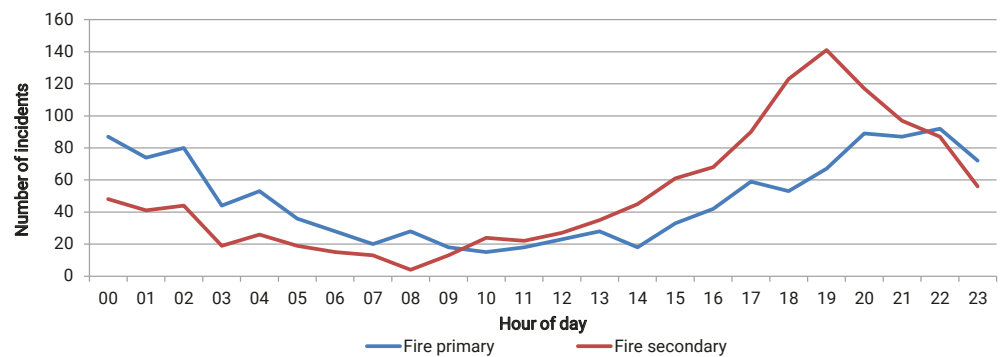
Deliberate Ignition Fires – What

Deliberate ignition (arson) primary fires by property category 2014/15 - 2018/19

Legend:
- Vehicles — 47%
- Non residential — 24%
- Dwellings — 13%
- Grassland, woodland & crops — 8%
- Outdoor structure — 6%
- Other residential — 2%
- Other — 0%
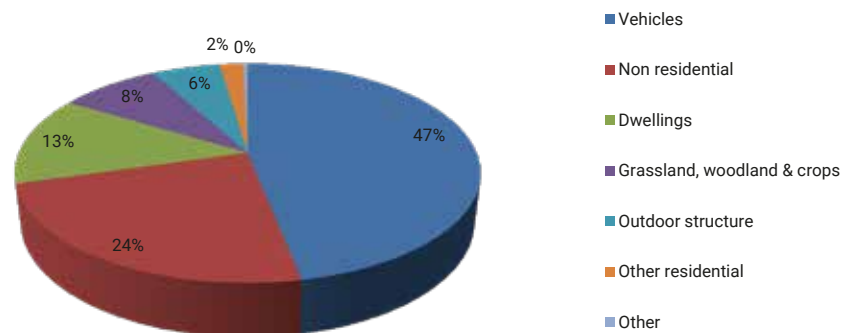
Deliberate ignition (arson) secondary fires by property type 2014/15 - 2018/19

Legend:
- Refuse / refuse container — 65%
- Grassland — 20%
- Outdoor structure — 7%
- Derelict building — 7%
- Derelict vehicle — 1%

Deliberate Ignition Fires – Where

Hotspot Legend
- Lowest Density
- Highest Density

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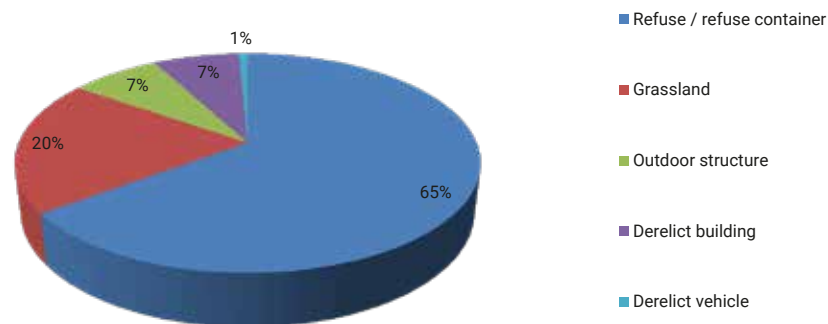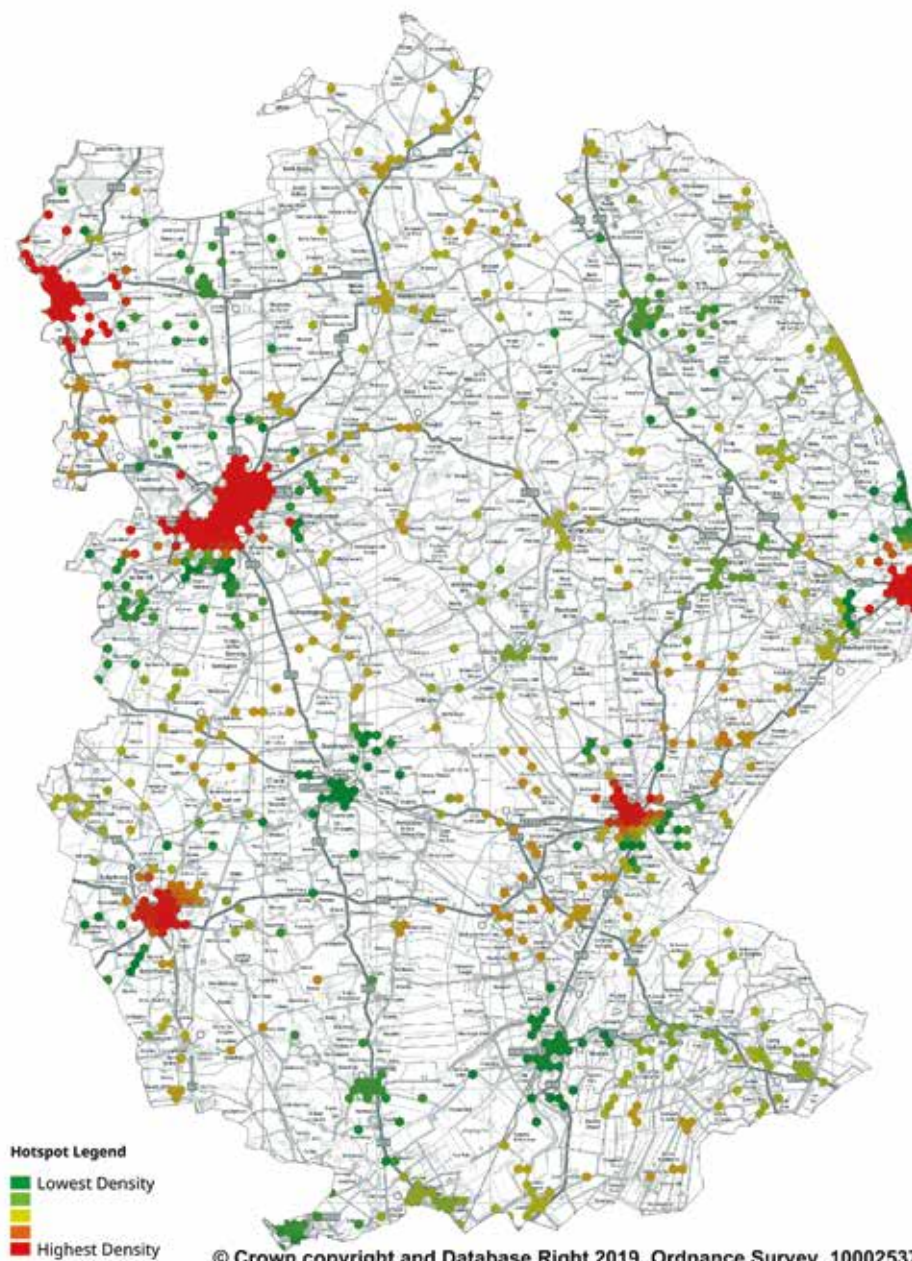
Deliberate Ignition Primary Fires – Where

Deliberate Ignition Secondary Fires – Where

Hotspot Legend
- Lowest Density
- Highest Density

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Hotspot Legend
- Lowest Density
- Highest Density

© Crown copyright and Database Right 2019. Ordnance Survey. 100025370
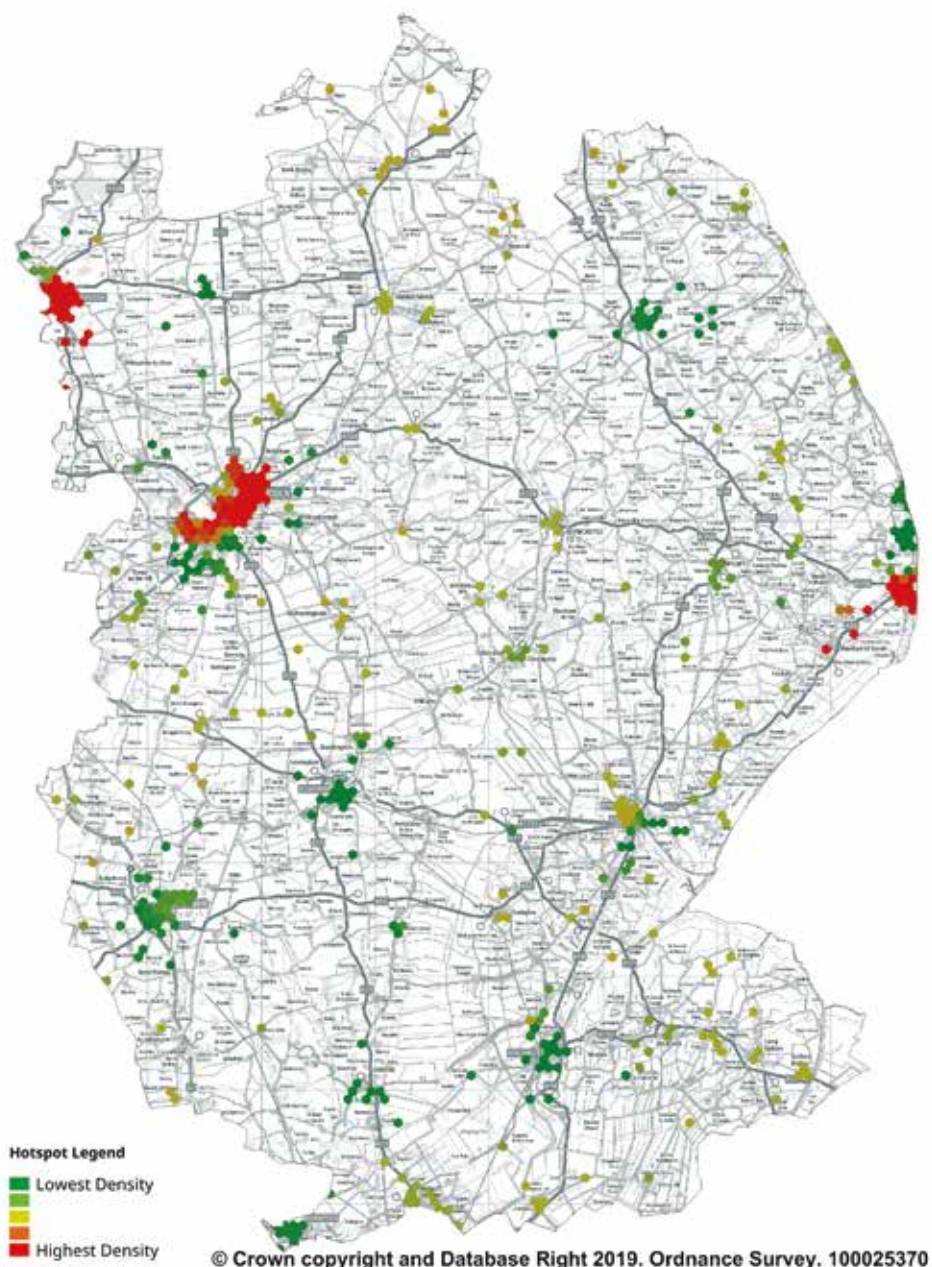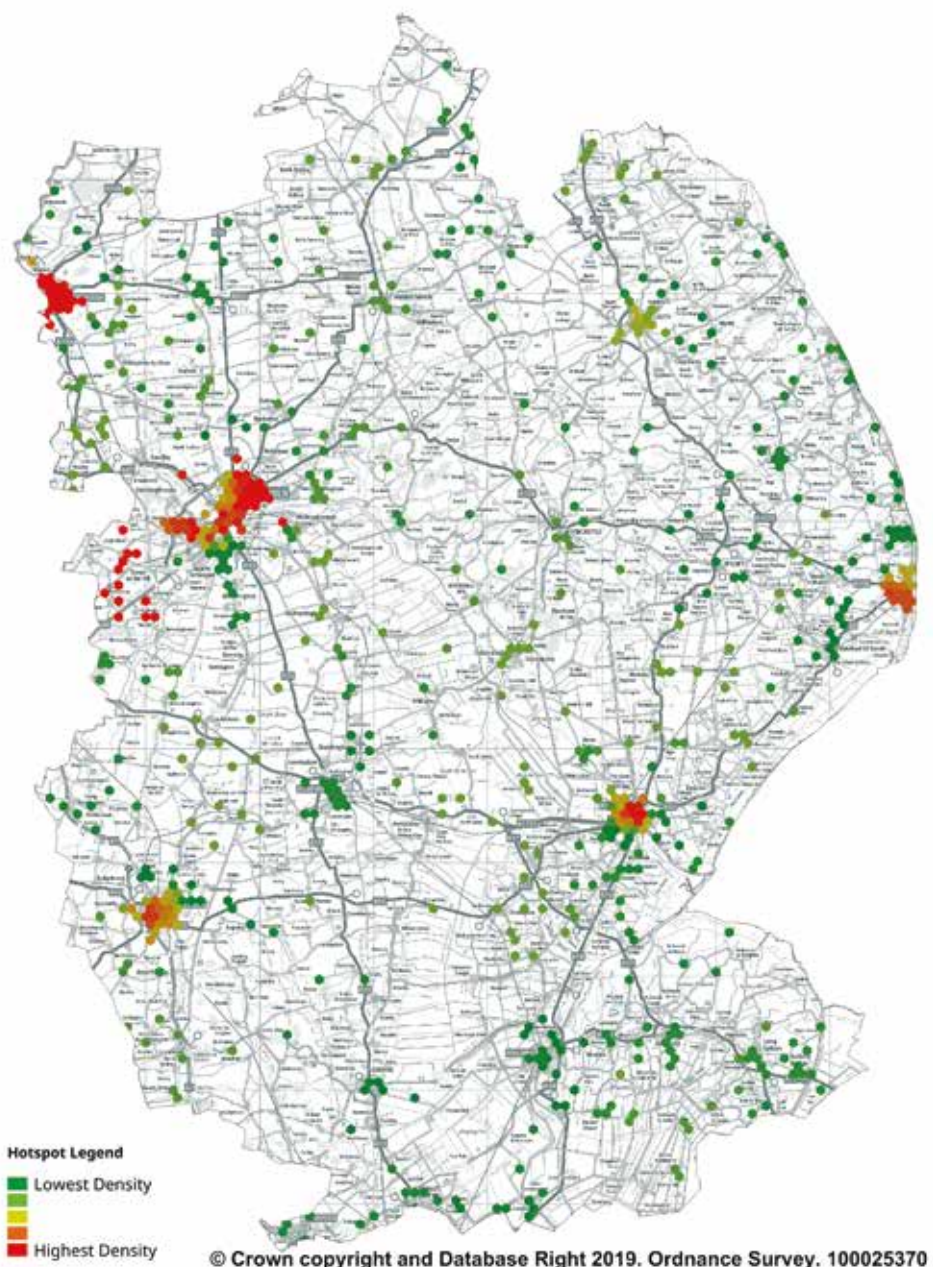
Fire Injuries and Fatalities Overview

The number of people involved in fire is recorded within the Incident Recording System by different categories;
1) Fatality, 2) Injured (which includes where a person was rescued with an injury) and 3) Rescued (without injury).

The line chart below illustrates the number of people involved where their death or injury is recorded as being related to the fire. This chart also shows all people who were injured as a result of the fire, regardless of their severity of injury, explained in more detail below.

(Note; in 2014/15 there were two recorded rescues from fires and in 2015/16 there was zero.)

20% of fire related injuries are recorded where the severity of injury was such that treatment in hospital was required (135 people over five years). Therefore 80% of fire related injuries, 525 people, were either recommended to seek a precautionary check, or were given first aid at the scene. Severity codes where treatment was required in hospital are counted and reported against National Indicator 49 (iii) for internal reporting.

People involved in fires (fire related injuries) 2014/15 - 2018/19
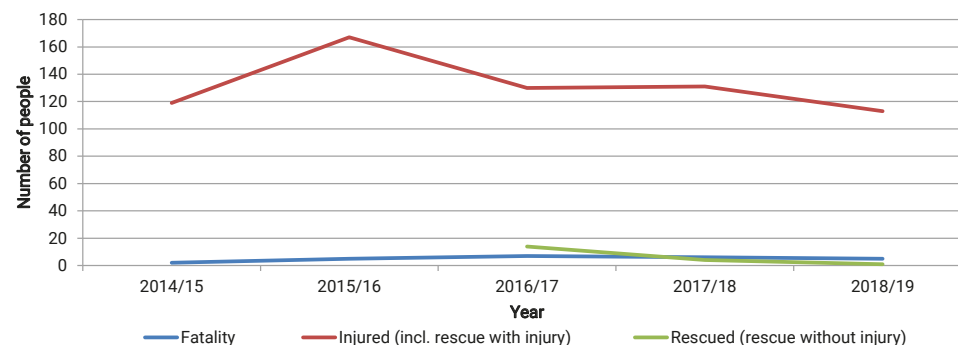
Fire related injuries severity of injury 2014/15 - 2018/19

- Precautionary check recommended
- First aid given at scene
- Victim went to hospital, injuries appear to be slight
- Victim went to hospital, injuries appear to be serious
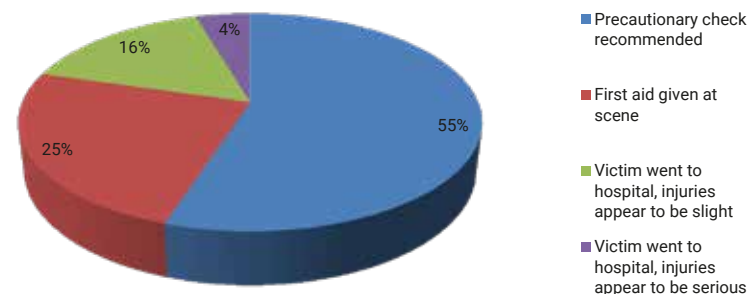
Fire Fatalities – When

Fire related fatalities by month 2014/15 - 2018/19

Fire related fatalities

Fire Fatalities – Who and What

Fire related fatalities by property category 2014/15 - 2018/19

- Dwelling
- Outdoor structure
- Road vehicle
- Non-domestic
- Outdoor
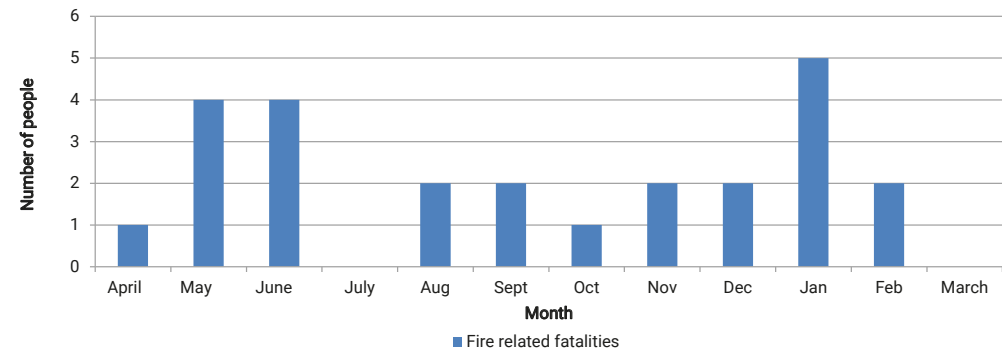
Fire related fatalities by day 2014/15 - 2018/19

Fire related fatalities
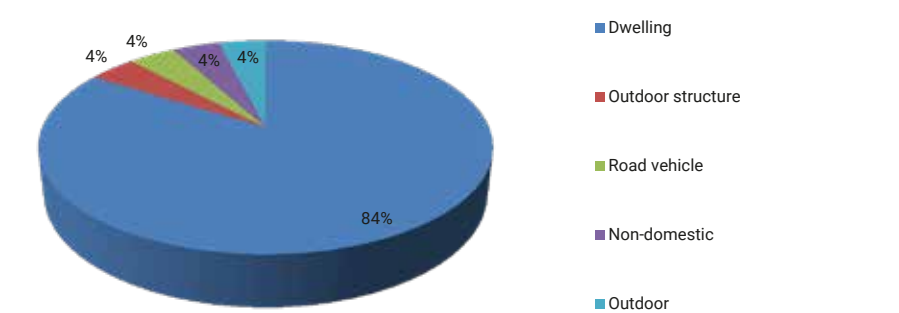
Fire related fatalities by age and gender 2014/15 - 2018/19

Female   Male

Fire related fatalities by hour of day 2014/15 - 2018/19

Fire related fatalities
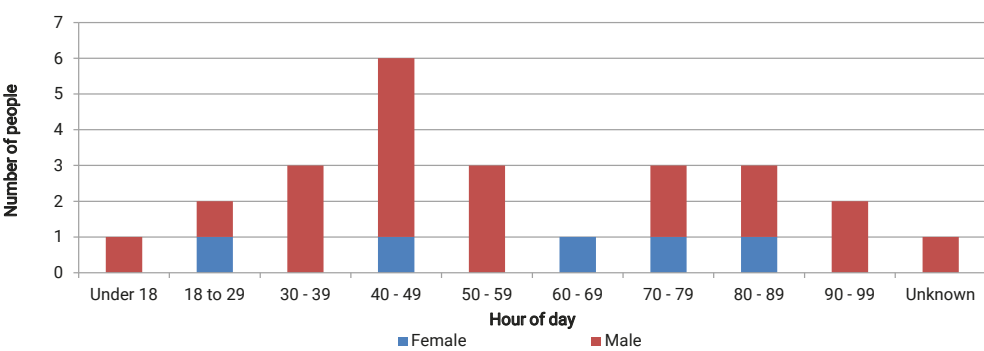
Fire related fatalities ethnicity by district council 2014/15 - 2018/19

British   Not stated   Other white

Page 72
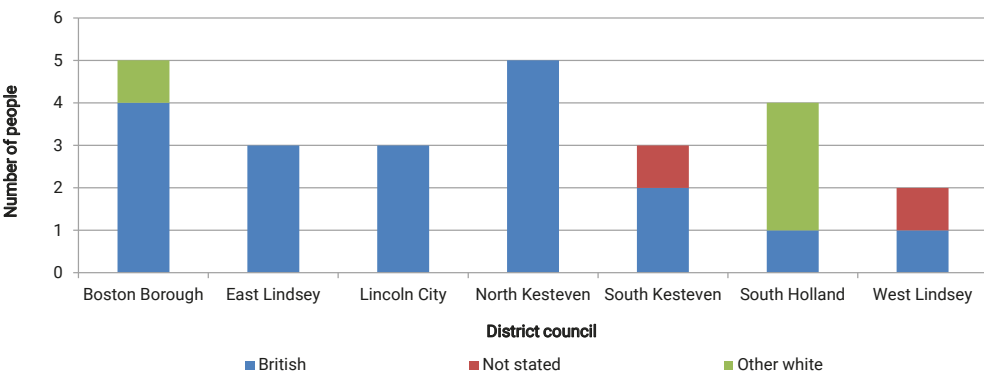
Fire related fatalities by cause of fire 2014/15 - 2018/19

- Deliberate ignition — 32%
- Smokers materials — 20%
- Space heating — 12%
- Other electric appliances — 12%
- Other known — 8%
- Other gas appliances — 8%
- Unknown — 4%
- Collision — 4%
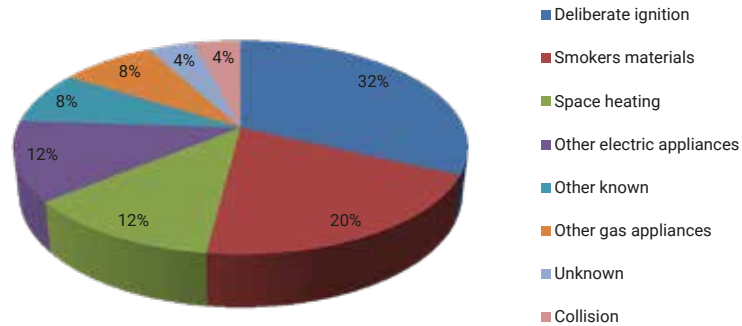
Fire related fatalities household occupancy (dwellings only) 2014/15 - 2018/19
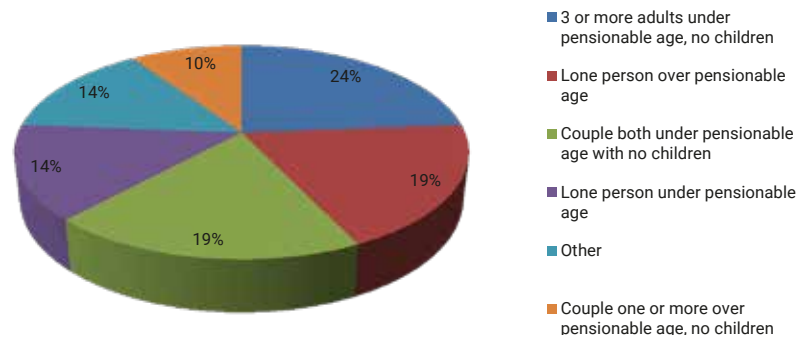
- 3 or more adults under pensionable age, no children — 24%
- Lone person over pensionable age — 19%
- Couple both under pensionable age with no children — 19%
- Lone person under pensionable age — 14%
- Other — 14%
- Couple one or more over pensionable age, no children — 10%

Fire Fatalities – Where

Number of Fire Related Fatalities
- 0
- 1
- 2
- 3

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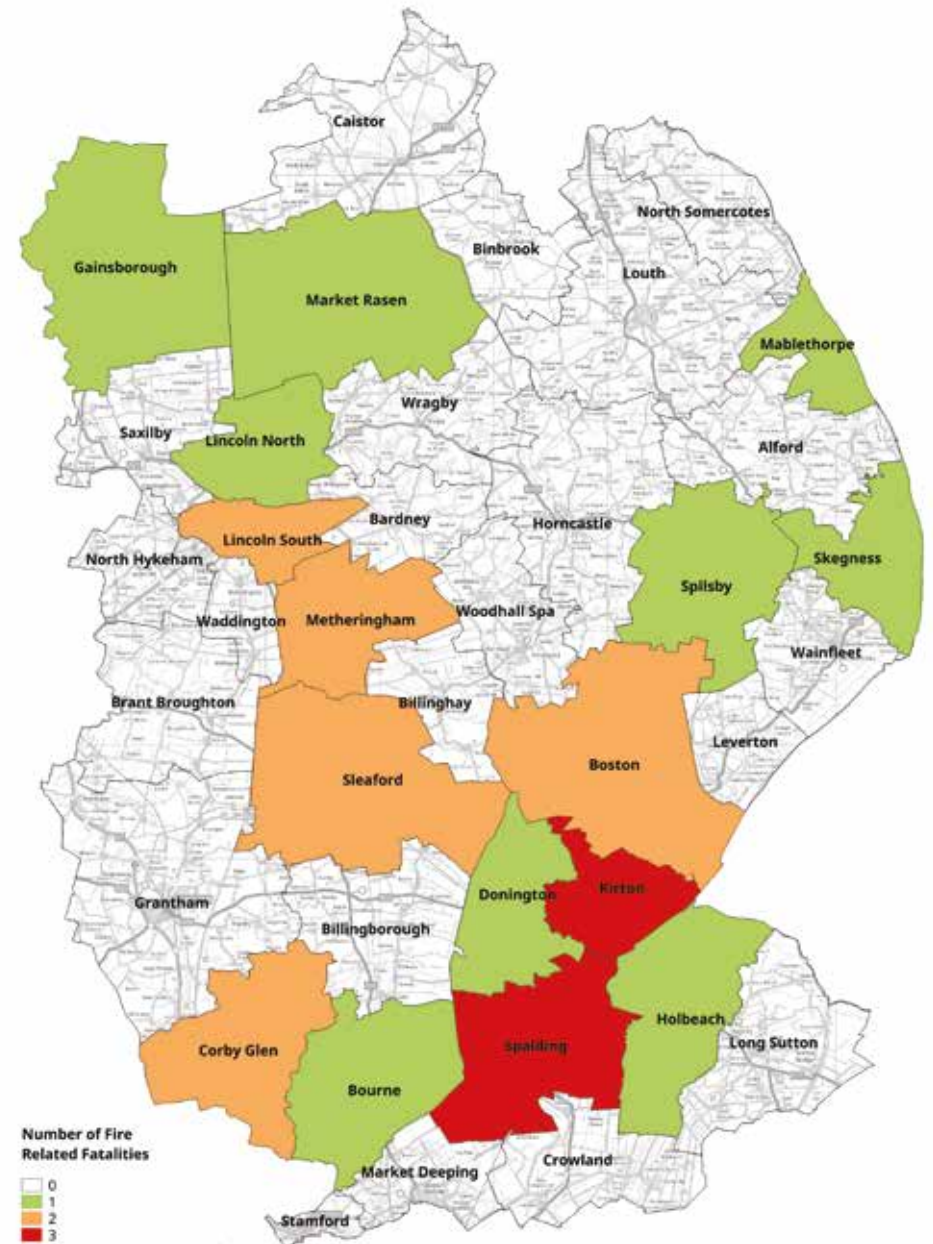
Fire Injuries - When

Fire Related Injuries – What and Who

Fire related injuries by month 2014/15 - 2018/19

Fire related injuries by property category 2014/15 - 2018/19

Legend:
- Dwelling
- Non residential
- Outdoor
- Road vehicle
- Outdoor structure
- Grassland, woodlands & crops
- Other residential

Values shown: 70%, 16%, 5%, 2%, 2%, 1%

Fire related injuries by day 2014/15 - 2018/19
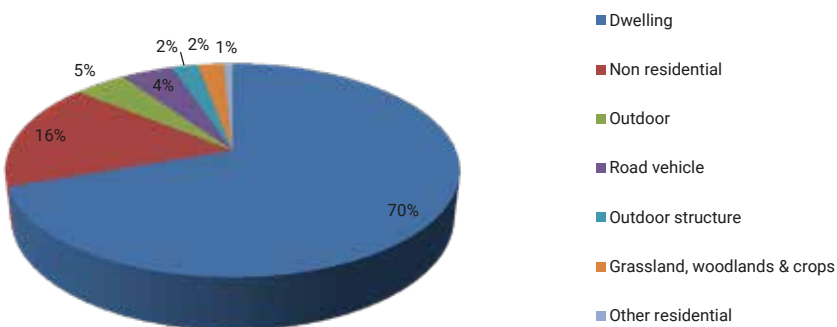
Fire related injuries by age and gender 2014/15 - 2018/19

Fire related injuries by hour of day 2014/15 - 2018/19

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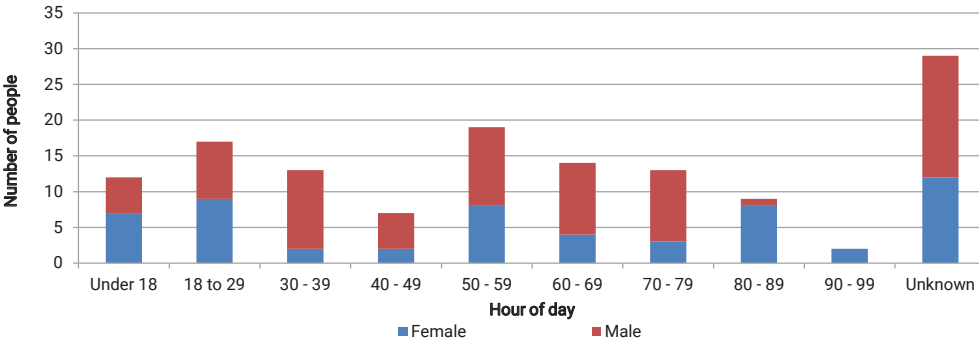
Fire related injuries by ethnicity by district council 2014/15 - 2018/19

Fire related injuries household occupancy (dwellings only) 2014/15 - 2018/19

Legend:
- Lone person over pensionable age — 22%
- Lone person under pensionable age — 16%
- 3 or more adults under pensionable age, no children — 15%
- Couple one or more over pensionable age, no children — 14%
- Couple with dependant children — 9%
- Other — 8%
- Lone parent with dependant children — 5%
- 3 or more adults with dependant children — 5%
- Couple both under pensionable age with no children — 5%
- Not known — 1%

Fire related injuries by cause of fire 2014/15 - 2018/19

Legend:
- Cooking appliances — 26%
- Deliberate ignition — 16%
- Other electric appliances — 15%
- Other known — 14%
- Smokers materials — 9%
- Unknown — 6%
- Naked light — 4%
- Children with fire — 3%
- Space heating — 2%
- Mains electrics — 2%
- Spread from secondary fire — 2%
- Welding / blowlamp — 1%

Fire related injuries circumstances leading to injury 2014/15 - 2018/19

Legend:
- Fighting fire (including attempts) — 19%
- Not applicable — 13%
- Discovering fire — 13%
- Not known — 9%
- Trapped by fire because unaware, e.g. asleep — 7%
- Suspected under influence of alcohol — 6%
- Injured escaping — 6%
- Injured rescuing person — 5%
- Trapped by smoke — 4%
- Immobile, bed / chair ridden — 3%
- Returned to fire — 3%
- Injured by blast — 3%
- Intentionally sustained at start of fire, e.g. suicides & attempts — 2%
- Injury accidently sustained at start of fire — 1%
- Injured rescuing property or animals — 1%
- Other — 1%
- Suspected under influence of drugs — 1%

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Fire Injuries – Where

Number of Fire Related Injuries

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Special Service – Road Traffic Collision (RTC) - When

RTCs by month 2014/15 - 2018/19
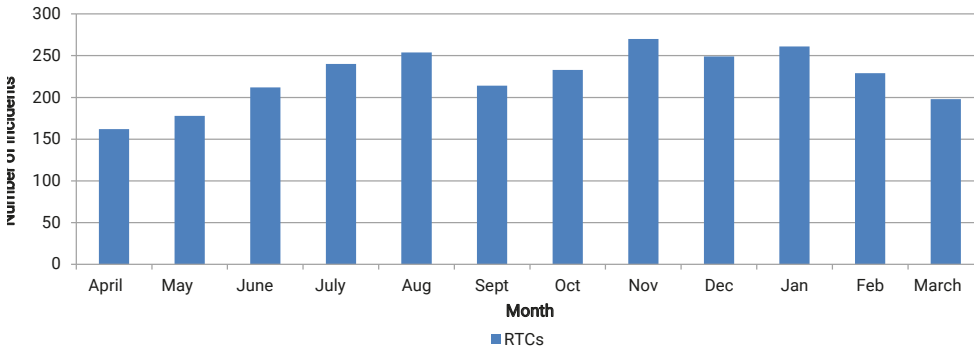
RTCs by day 2014/15 - 2018/19
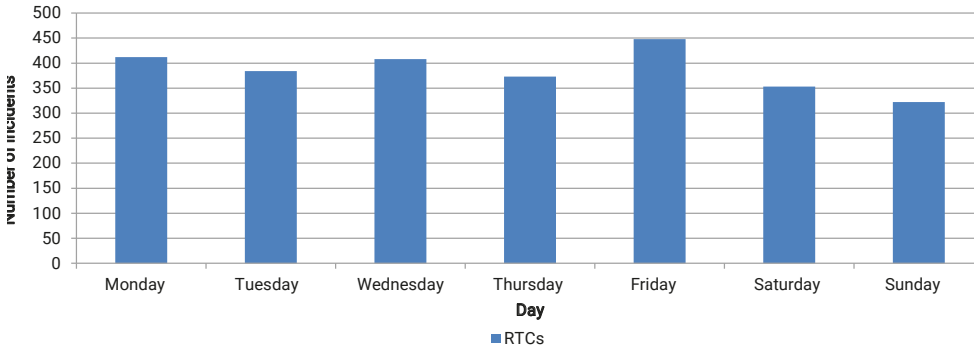
RTCs by hour of day 2014/15 - 2018/19
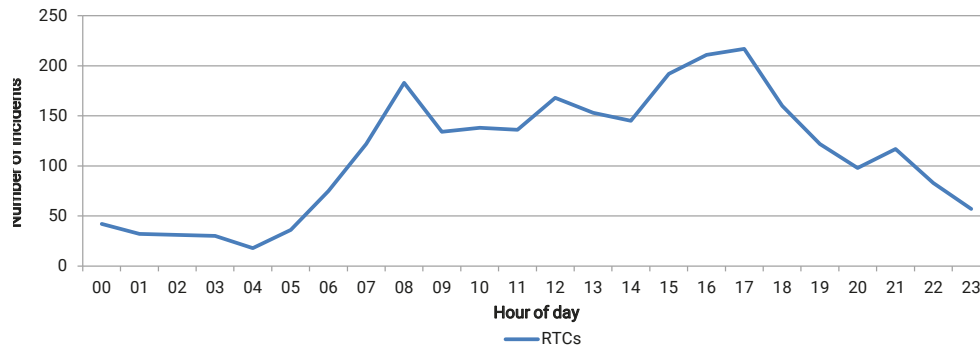
RTCs by type of action 2014/15 - 2018/19

Legend: RTC - extrications · RTC - services only · RTC - no F&R action

Special Service – Road Traffic Collision (RTC) - Where

RTC Density/KM
- Zero
- Very Low
- Low
- Low-Medium
- Medium
- Medium-High
- High
- Very High

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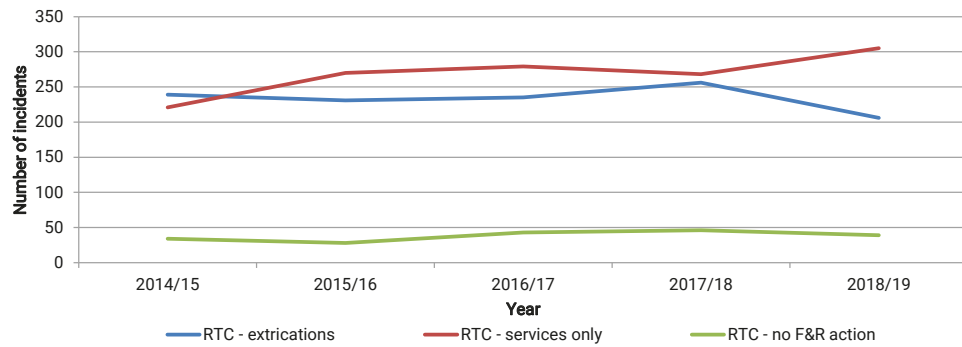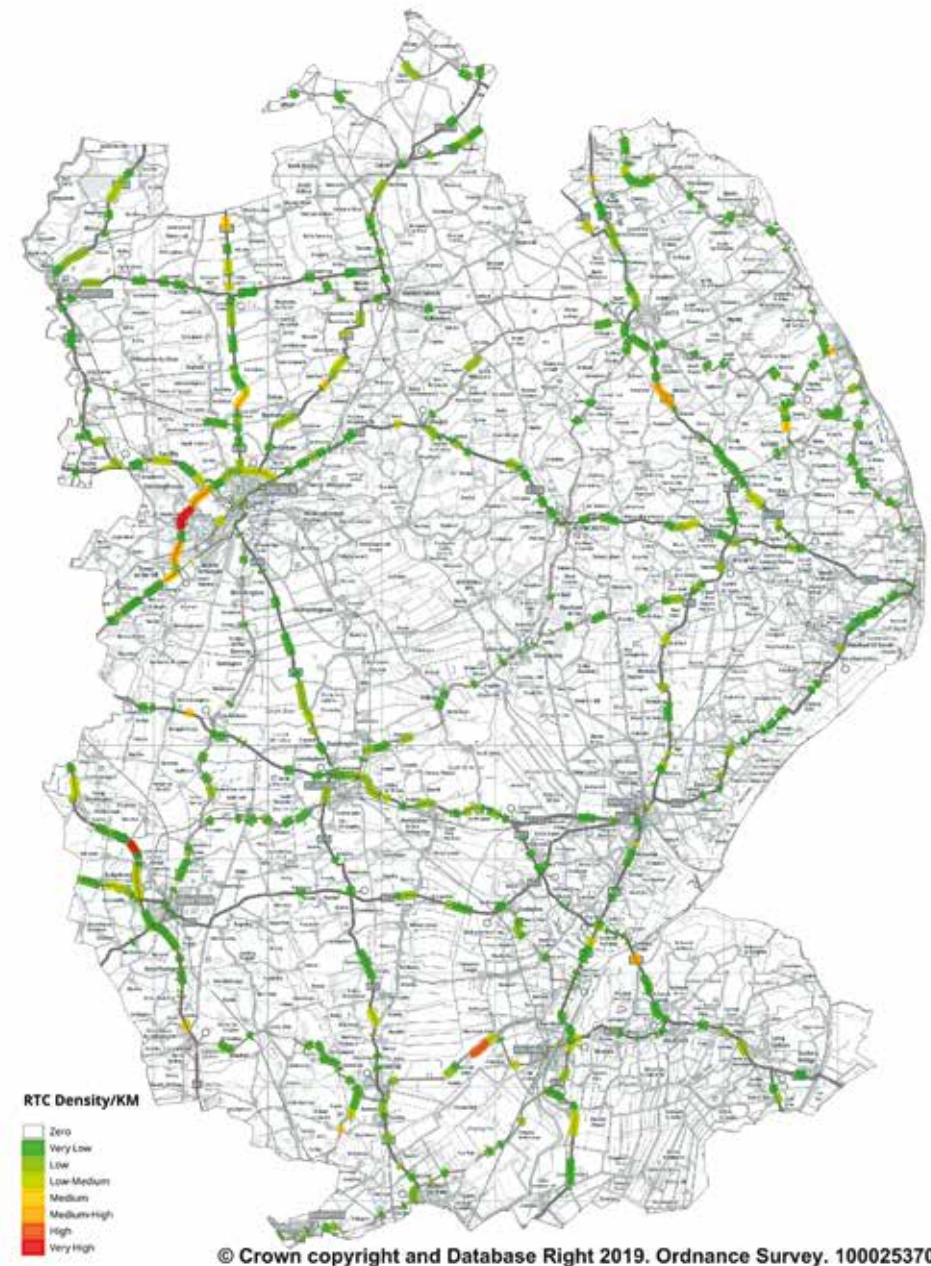
Special Service – Co-responder – When

Co-responder by year 2014/15 - 2018/19

Co-responder by day 2014/15 - 2018/19

Co-responder by hour of day 2014/15 - 2018/19
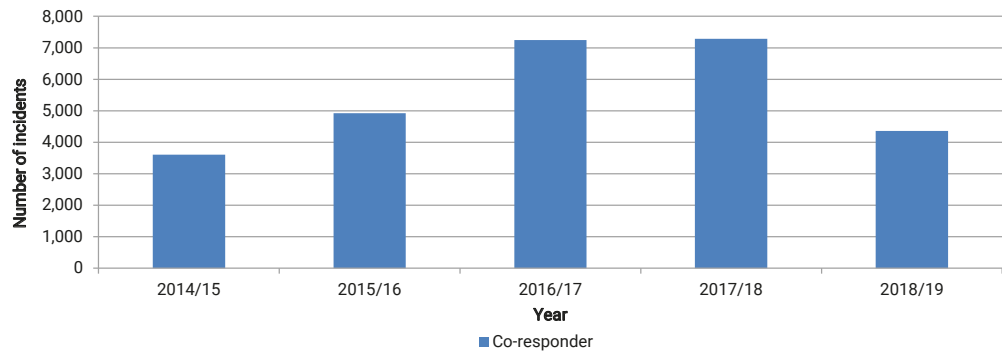
Co-responder by type of action 2014/15 - 2018/19

Legend:
- Ambulance in attendance - no action by LFR
- LFR administered oxygen
- LFR used defibrillator
- LFR monitoring - awaiting ambulance
- Casualty deceased
- Patient conveyed to hospital by LFR
- LFR assisted ambulance to carry patient
- LFR provided other assistance
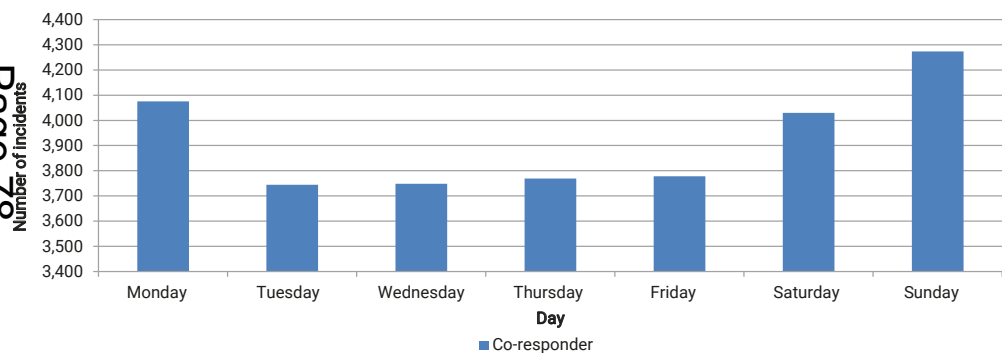
Other special service calls by month 2014/15 - 2018/19

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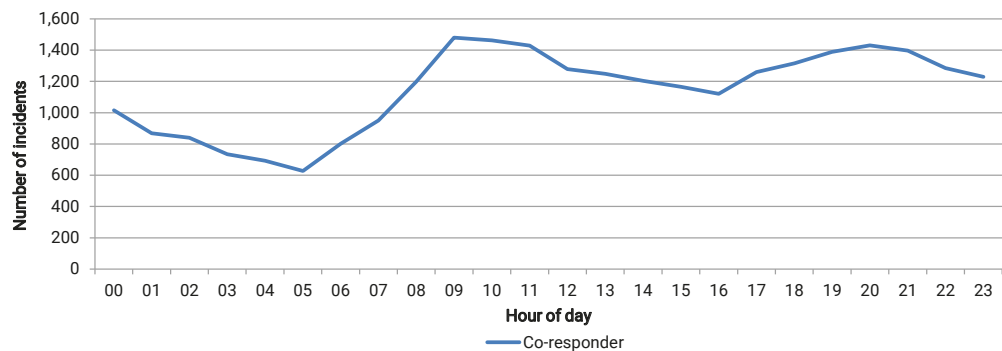
Other special service calls by day 2014/15 - 2018/19

Other special service calls by type and year 2014/15 - 2018/19
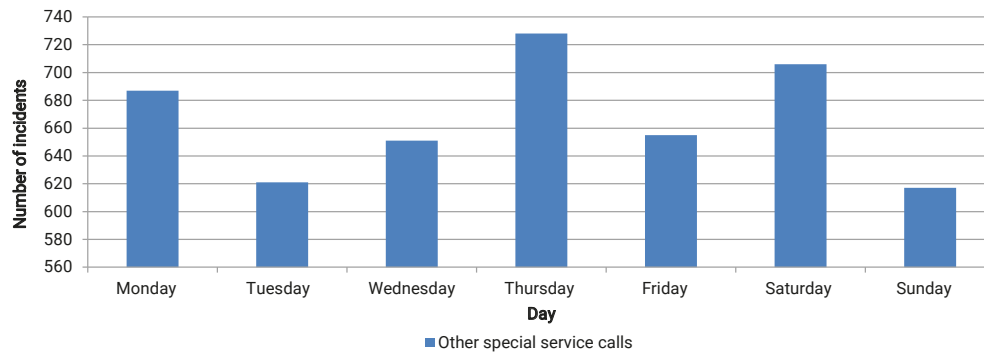
Other special service calls by hour of day 2014/15 - 2018/19
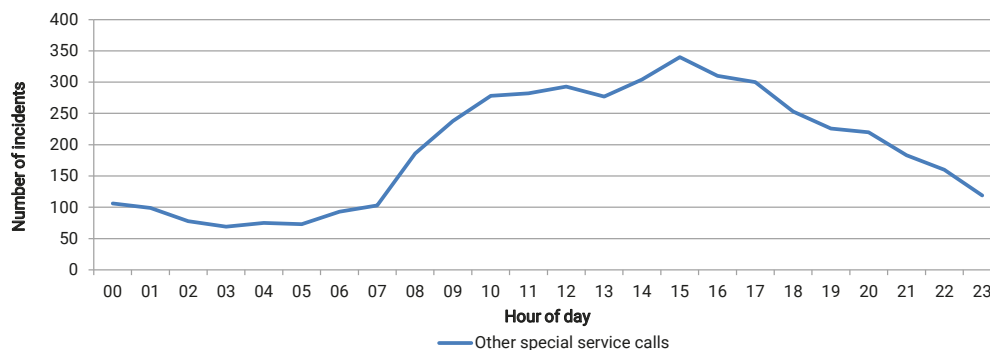
Other special service calls by type of action 2014/15 - 2018/19

Legend:
- Effecting entry
- Assistance to police and ambulance
- Inspection - officer or appliance
- F&R not required - false alarm
- Water - remove / provide
- Spillage / leakage
- Rescue / release people
- Animal rescue
- Lift release
- First aid
- Removal of objects
- Precautionary action
- Making safe
- Any other special service call
- Suicides
- Other

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Special Service – Co-responder – Where

Special Service – Other - When

Hotspot Legend
- Lowest Density
- Highest Density

Co-Responder Station
- No
- Yes

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Hotspot Legend
- Lowest Density
- Highest Density

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False Alarms – Types

False alarms are defined as 'where the FRS attends a location believing there to be a fire situation but on arrival discovers no such incidents exists or existed' and are broken into three categories:

1) False Alarm AFA – Calls initiated by fire alarm or fire-fighting equipment operating.

2) False Alarm Good Intent – Calls made in good faith in the belief that the FRS really would attend an incident.

3) False Alarm Malicious – Calls made with the intention of getting FRS to attend a non-existent incident, including deliberate/malicious and hoax intentions.

Locations of all False Alarms shown below:

Hotspot Legend

Lowest Density

Highest Density

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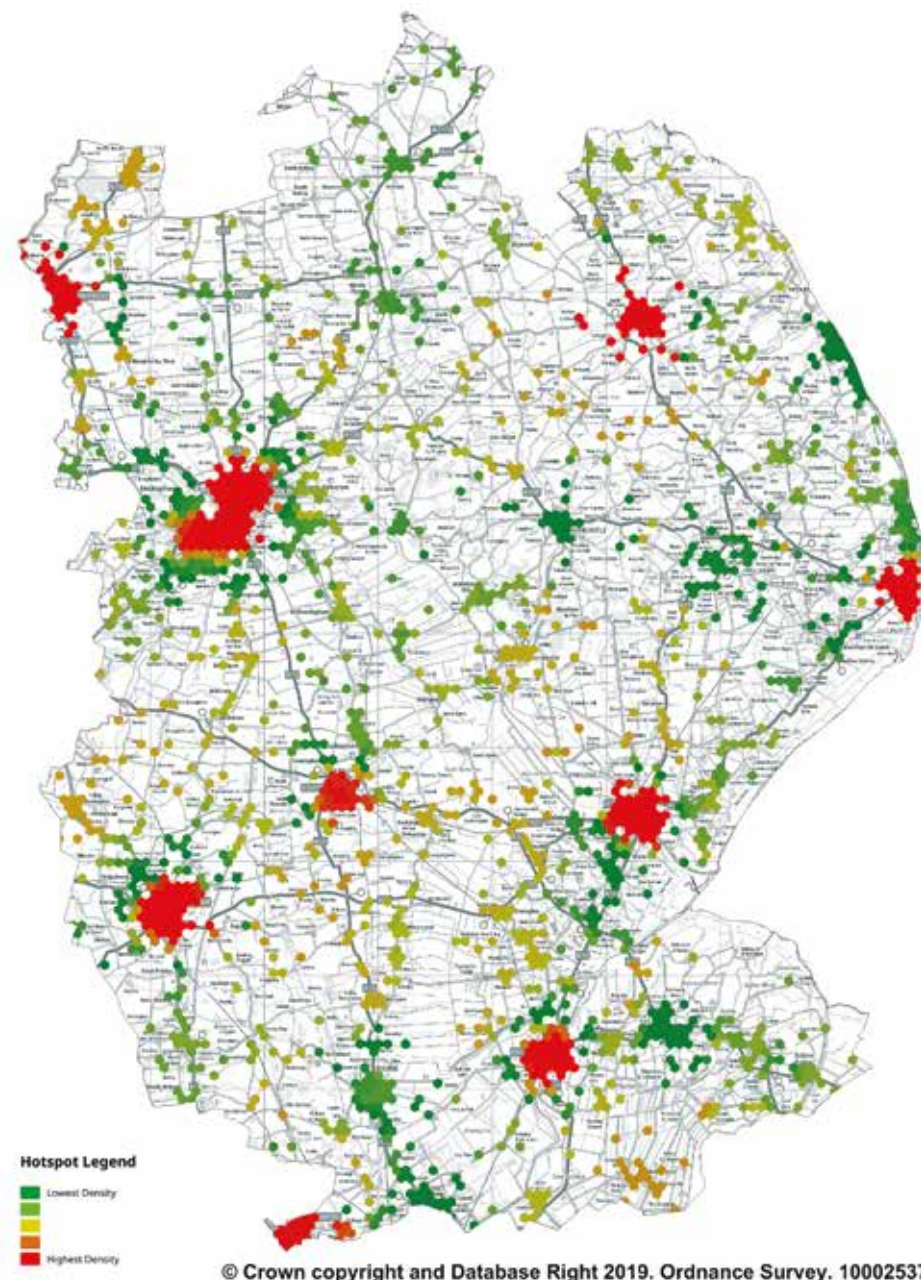
The breakdown of attendances to these types of false alarms over the five year period 2014/15 to 2018/19 is shown below.

Types of false alarms attended 2014/15 - 2018/19
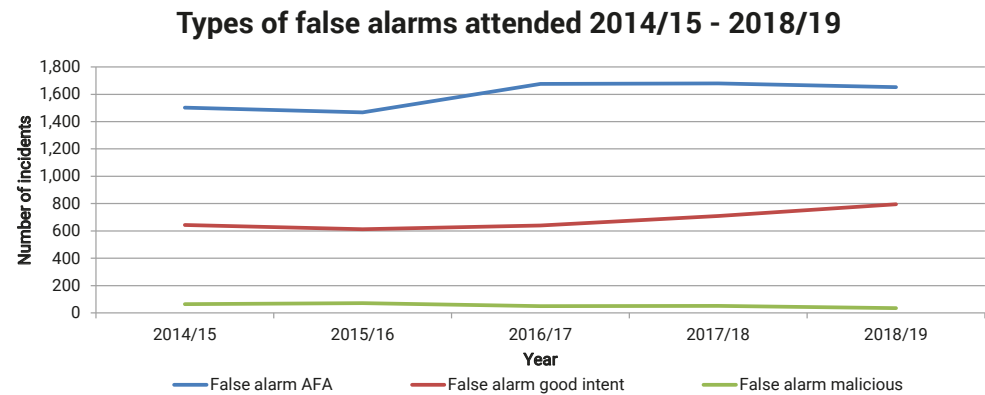
False Alarm AFA incidents broadly fall into two distinct groups, occurring in Domestic and Non-Domestic properties.

False alarm AFA by property category 2014/15 - 2018/19
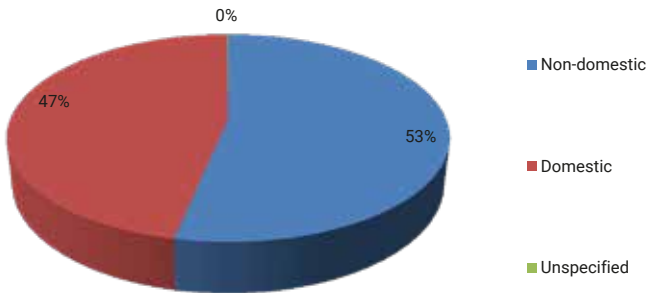
False Alarm AFA – Domestic – What

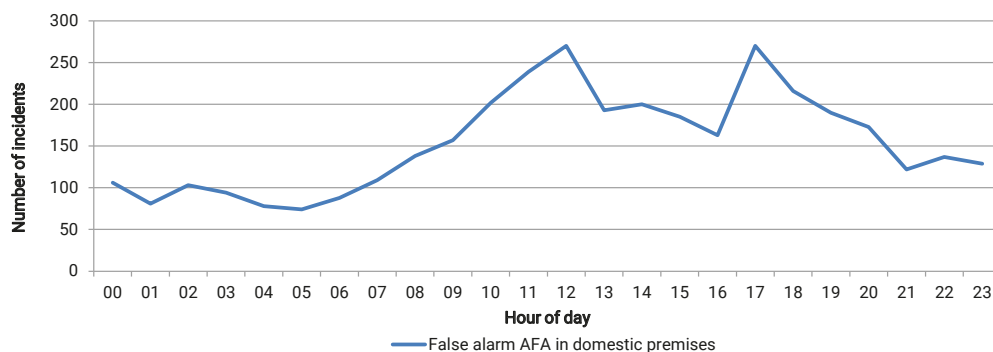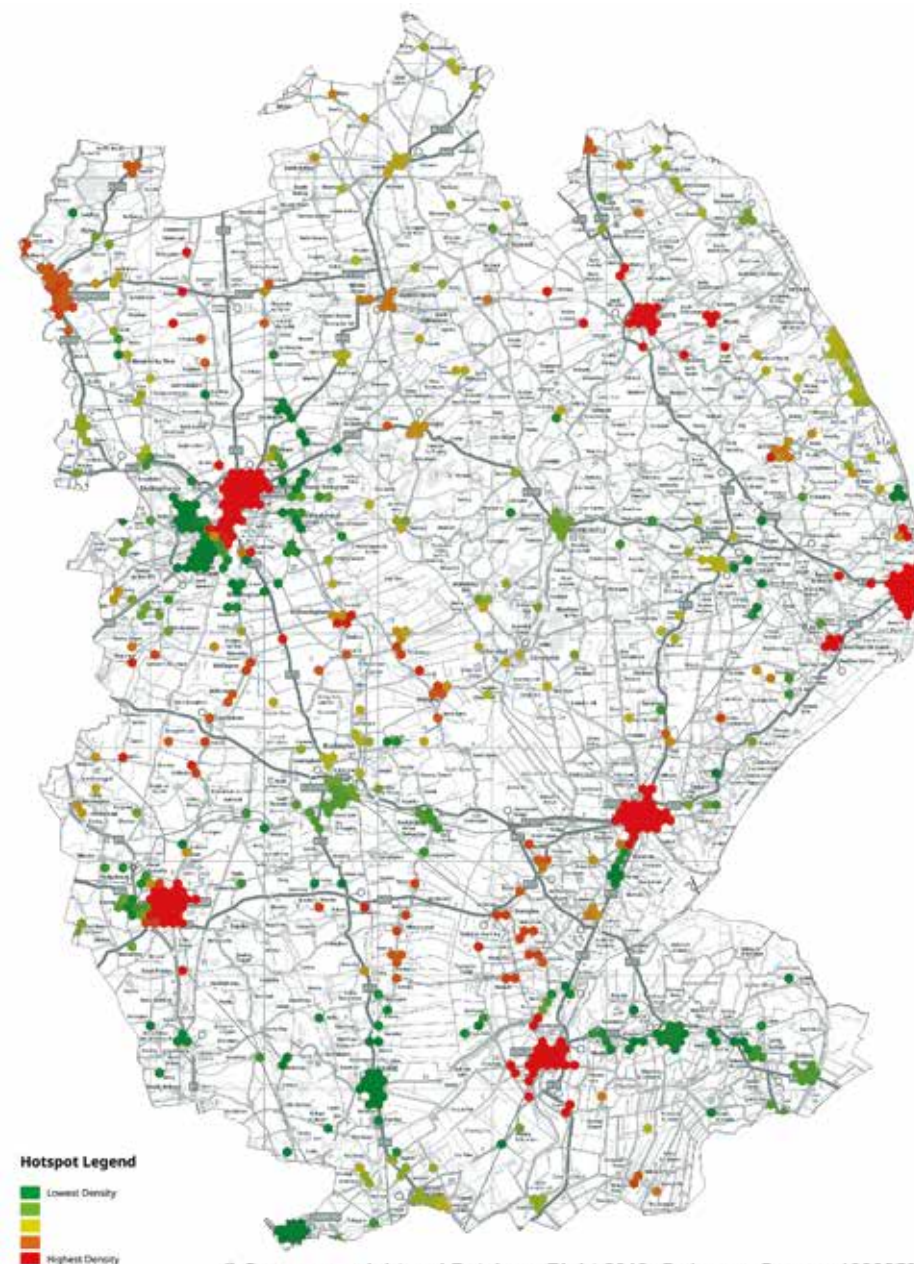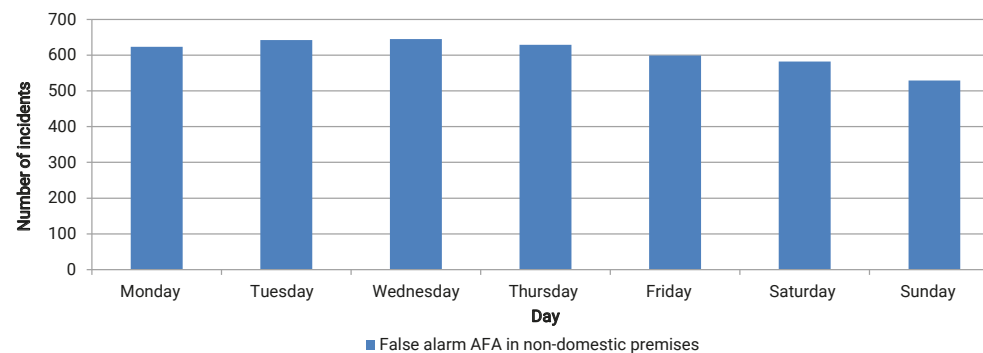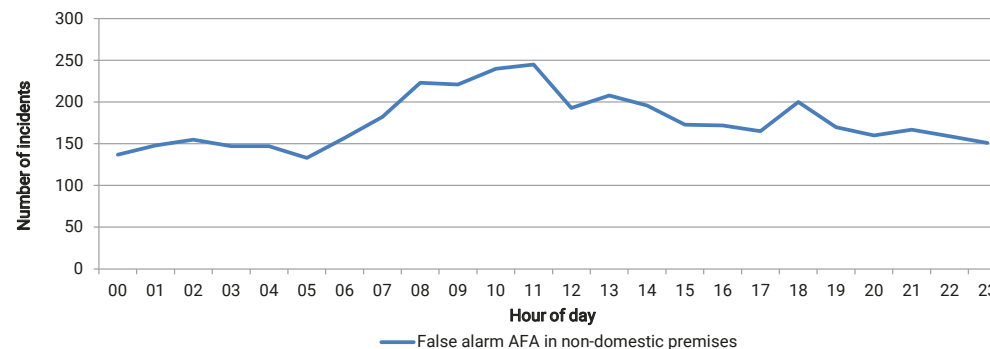**Cause of false alarm AFA incidents in domestic premises 2014/15 - 2018/19**

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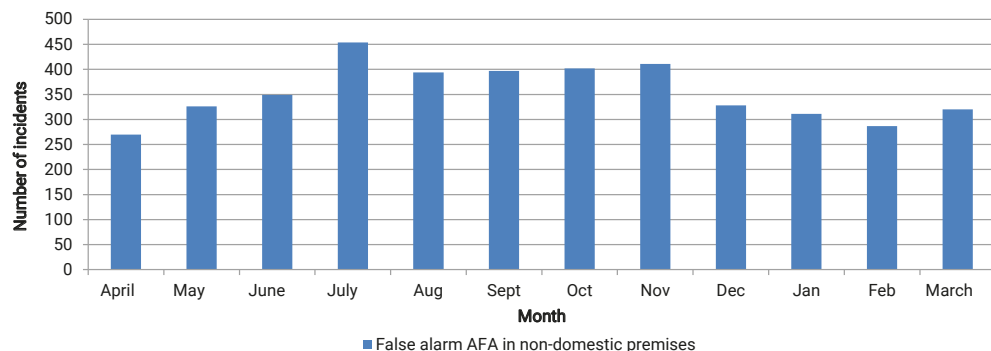## False alarm AFA in domestic premises by month 2014/15 - 2018/19

False alarm AFA in domestic premises by day 2014/15 - 2018/19

## False alarm AFA in domestic premises by hour of day 2014/15 - 2018/19

Hotspot Legend

Lowest Density

Highest Density

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False Alarm AFA – Non-Domestic – What

Cause of false alarm AFA incidents in non-domestic premises 2014/15 - 2018/19
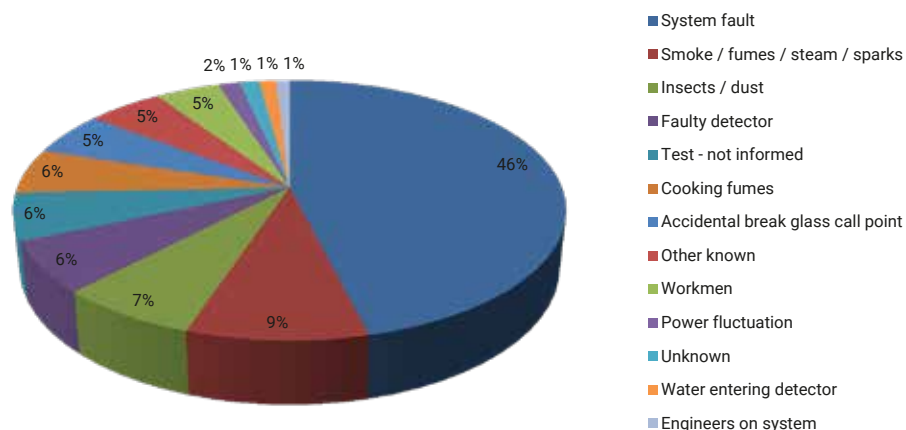
- System fault
- Smoke / fumes / steam / sparks
- Insects / dust
- Faulty detector
- Test - not informed
- Cooking fumes
- Accidental break glass call point
- Other known
- Workmen
- Power fluctuation
- Unknown
- Water entering detector
- Engineers on system

False Alarm AFA – Non-Domestic - When

False alarm AFA in non-domestic premises by month 2014/15 - 2018/19

False alarm AFA in non-domestic premises by day 2014/15 - 2018/19

False alarm AFA in non-domestic premises by hour of day 2014/15 - 2018/19

False Alarm AFA – Non-Domestic - Where

Hotspot Legend

- Lowest Density
- Highest Density
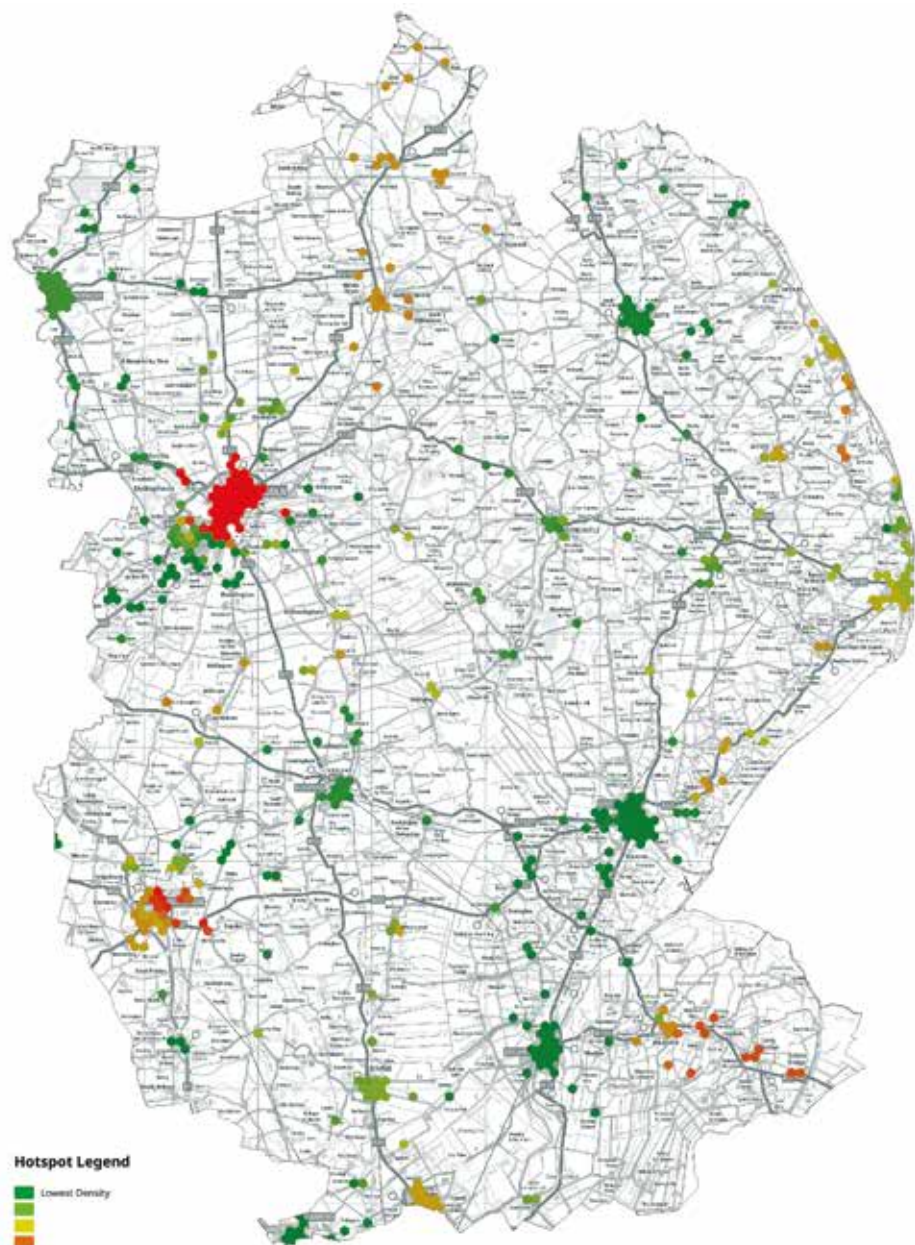
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False Alarm Good Intent – What

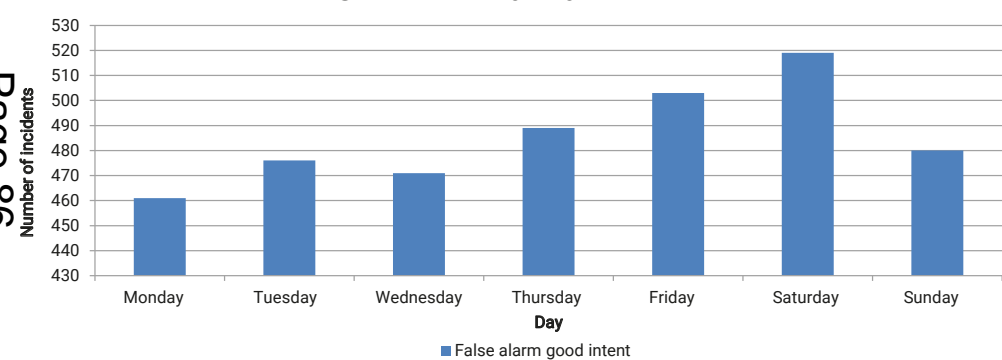**Cause of false alarm good intent incidents 2014/15 - 2018/19**

Legend:
- Controlled burning — 49%
- Smoke / fumes / steam / sparks — 21%
- Other known — 12%
- No incident found — 9%
- Cooking fumes — 5%
- Other alarm — 3%
- Insects / dust — 1%
- Unknown — 0%
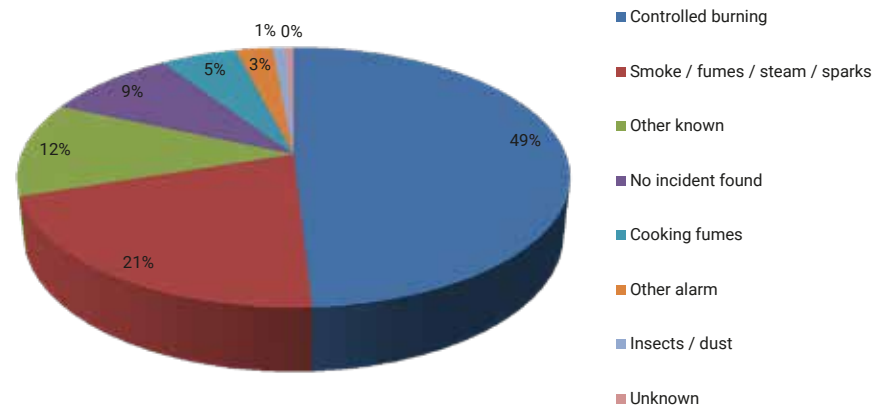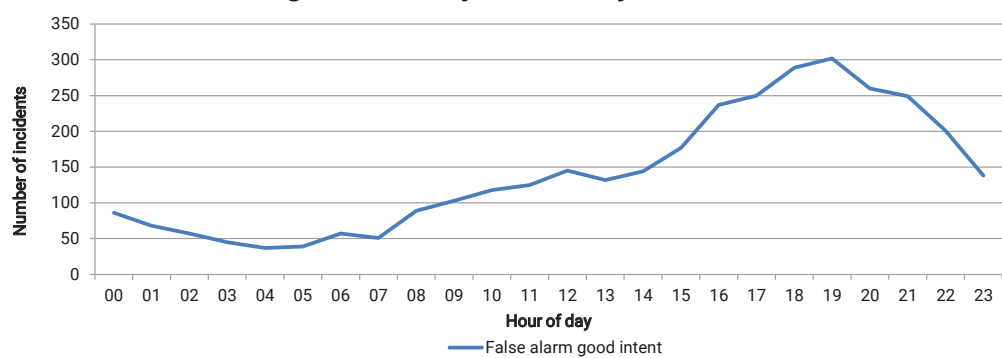
False Alarm Good Intent - When

False alarm good intent by month 2014/15 - 2018/19
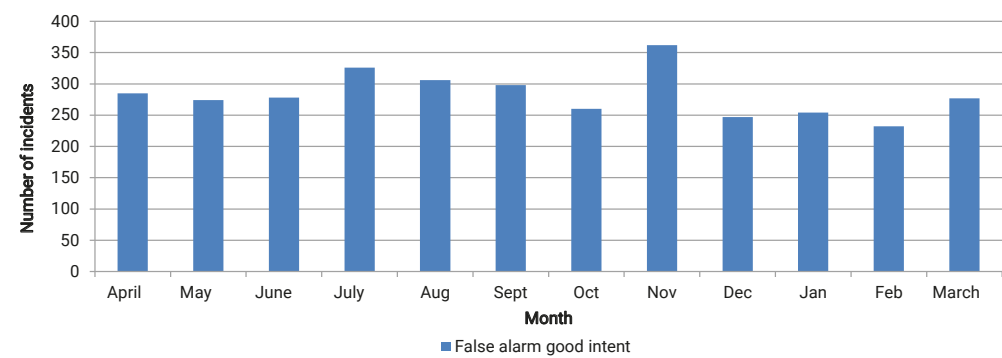
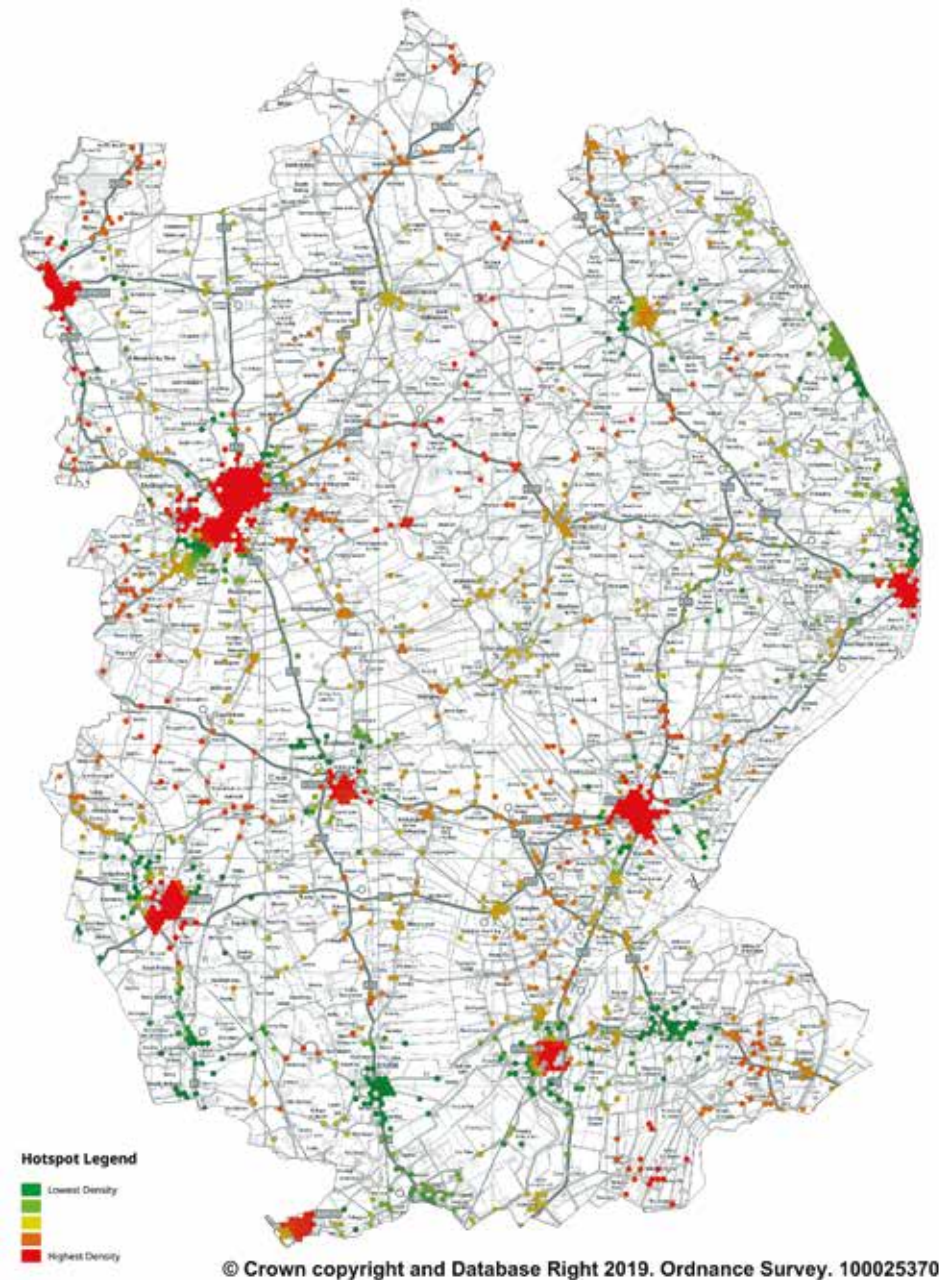## False alarm good intent by day 2014/15 - 2018/19
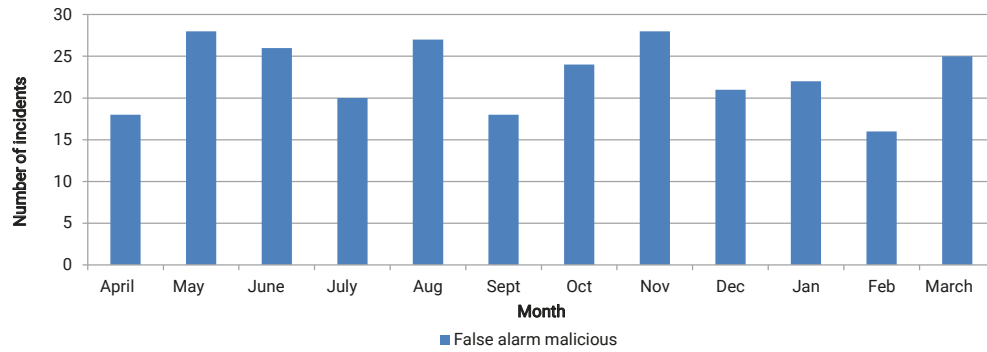

False alarm good intent by hour of day 2014/15 - 2018/19
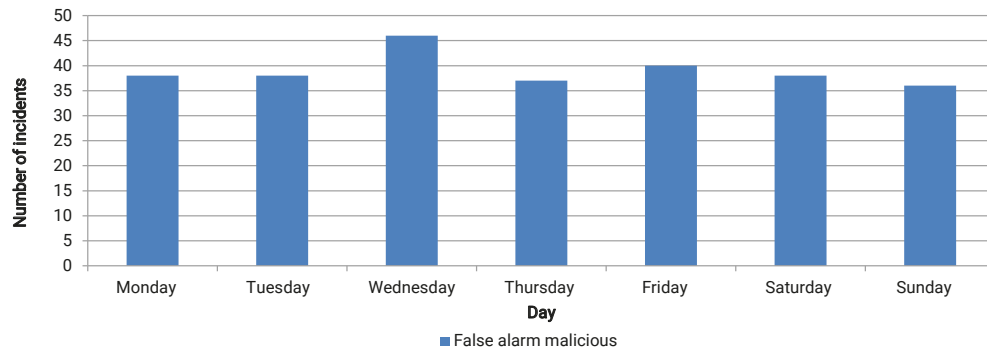
False Alarm Good Intent - Where

Hotspot Legend

Lowest Density

Highest Density

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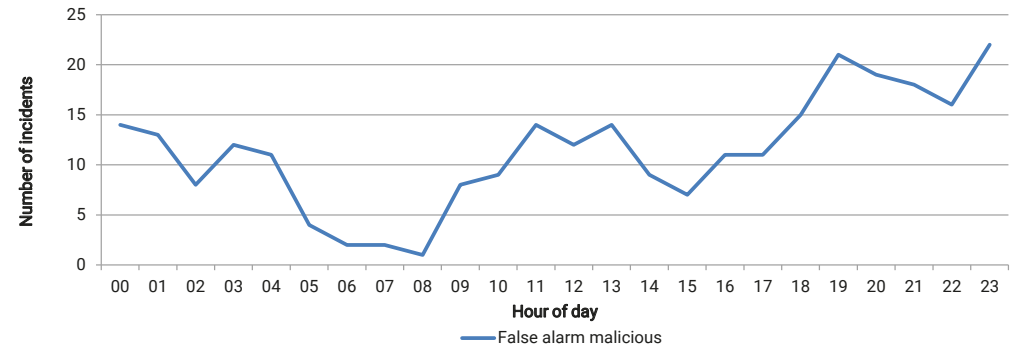
False Alarm Malicious - When
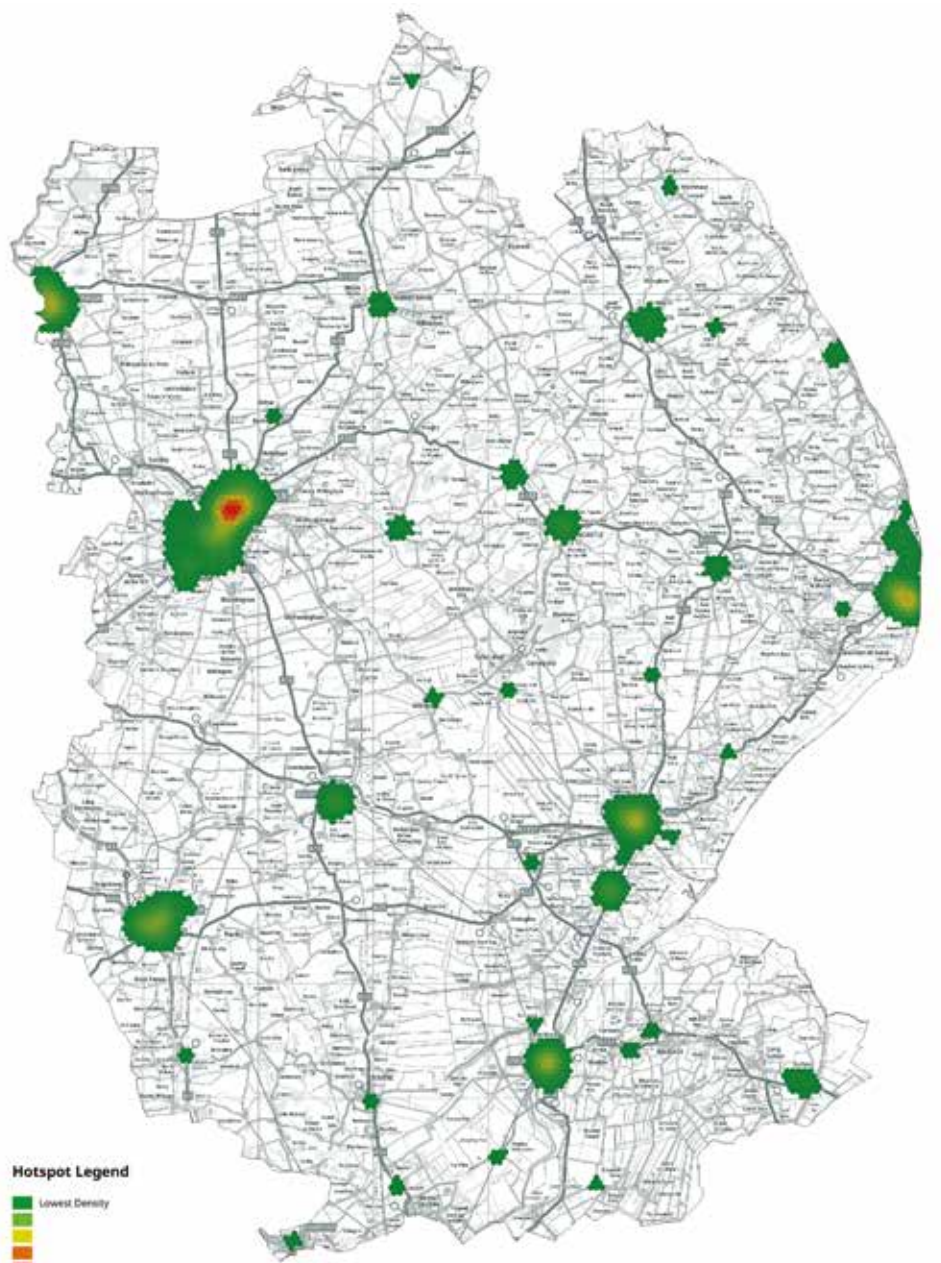
False alarm malicious by month 2014/15 - 2018/19

False alarm malicious by day 2014/15 - 2018/19

False alarm malicious by hour of day 2014/15 - 2018/19

False Alarm Malicious - Where

Hotspot Legend

- Lowest Density
- Highest Density

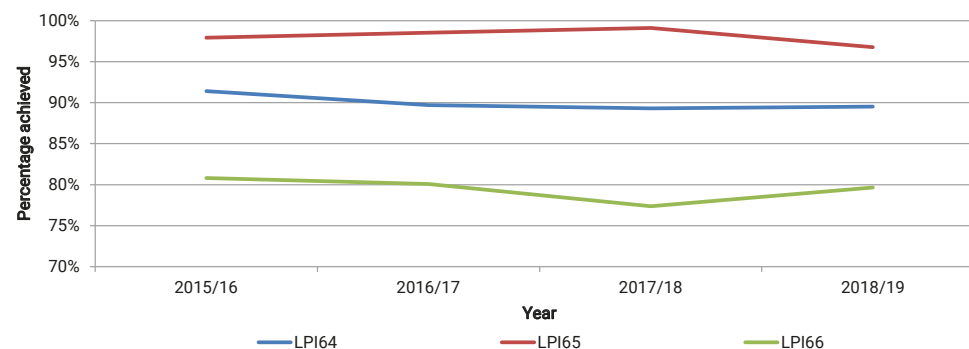© Crown copyright and Database Right 2019. Ordnance Survey. 100025370

Response times

Response to incidents is calculated using a drive time methodology from each Lincolnshire fire station. This factors in an allowance for the pumping appliance to respond from the station, added to a drive time footprint from the station. Our response strategy is for the following:

- First appliance to arrive at dwelling fires within the expected timeframe on 100% of occasions, with a 10% tolerance allowed. (Measured as Indicator LPI 64.)
- Second appliance to arrive at dwelling fires within 25 minutes on 100% of occasions, with a 10% tolerance allowed. (Measured as Indicator LPI 65.)
- First appliance to arrive at Road Traffic Collisions within the expected timeframe on 100% of occasions, with a 10% tolerance allowed. (Measured as Indicator LPI 66.)

These response standards have been measured in this way for the last four financial years (starting in 2015/16) and the percentages achieved for each indicator is shown below.

Response standards performance 2015/16 - 2018/19

The 10, 15 and 20 minute response times can be seen below from each Lincolnshire Fire Station.

LFR Drivetimes
- 10 Minutes
- 15 Minutes
- 20 Minutes
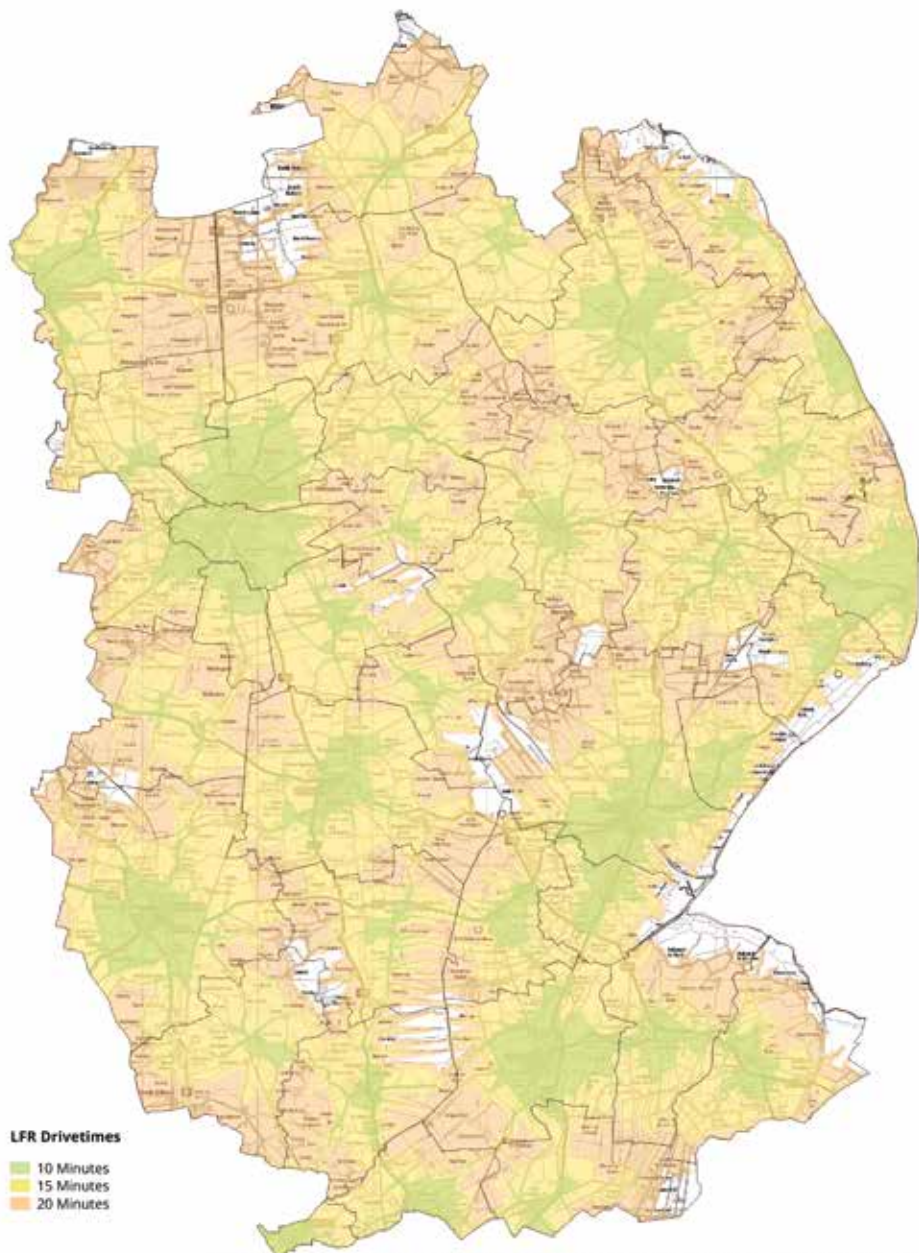
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On-call Availability

The availability of our on-call appliances has continuously dropped over the last 5 years, to its lowest point (below 80%) in 2018/19. There are well-documented challenges around on-call availability and the long-term sustainability of the current on-call model, which we will aim to address through both our response strategy and the recommendations from our RDS review project.
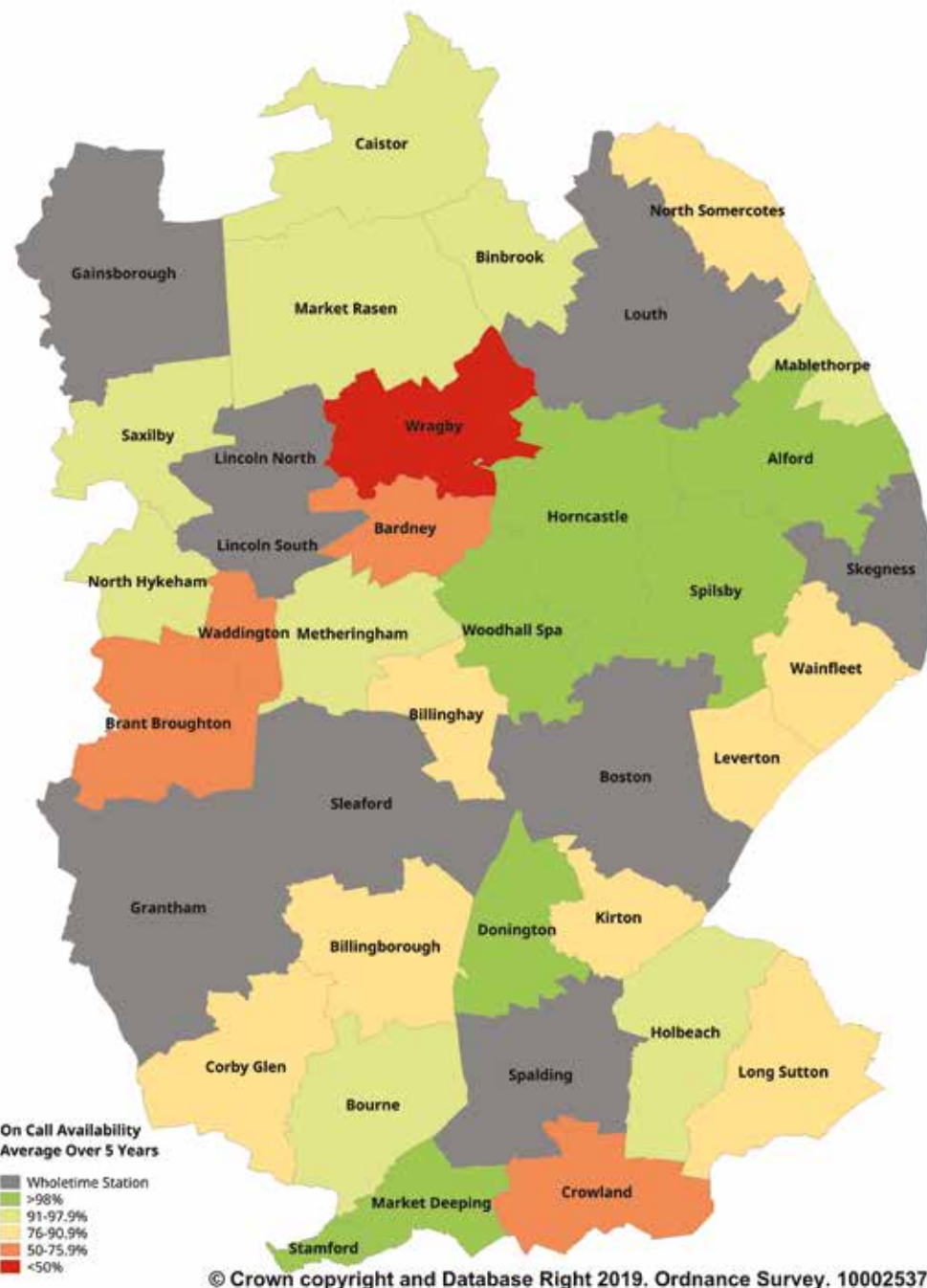

On-call availability 2014/15 - 2018/19

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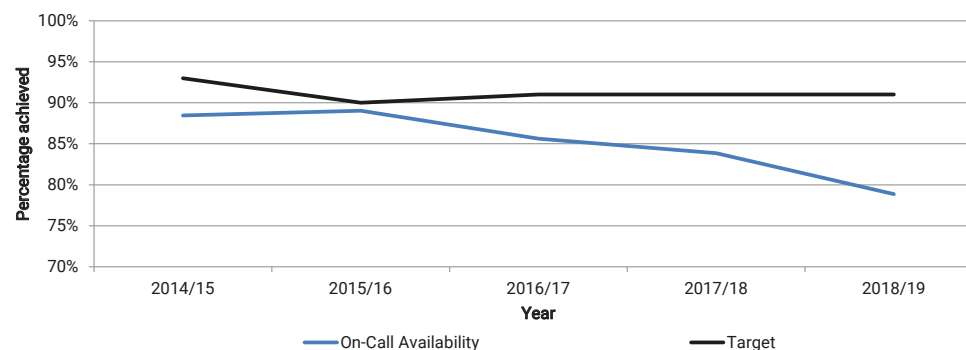
On-Call Availability – 5 Year Average Percentage

The following thematic map shows the average On-Call availability percentage over five years. The Wholetime / Lincolnshire Crewed stations have been removed from this cover map, and for Stamford, the percentage availability of the first appliance is shown.

On Call Availability Average Over 5 Years

- Wholetime Station
- >98%
- 91-97.9%
- 76-90.9%
- 50-75.9%
- <50%

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Corporate risks

We define corporate risks as those risks which have the potential to impact on the service internally, preventing us from conducting our business effectively. LFR analyses and reviews our corporate risks on a continuous basis by identifying in advance, potential sources of disruption and the impact it may have on delivery of our critical services. This is informed by a number of prevailing factors, both national and local and is linked to both Lincolnshire County Council's strategic risk register and the Lincolnshire Community Risk Register.

Corporate risk management is monitored routinely, recorded on our Corporate Risk Register and reported on at Service Management Board (SMB). A lead officer is responsible for each corporate risk ensuring appropriate control measures are in place. This ensures our risks are properly prioritised and resources allocated appropriately.

We build our resilience to corporate risks through effective Business Continuity Management (BCM). Our approach to BCM is aligned with that of LCC's emergency planning business continuity team, thus improving consistency and resilience across LCC and the wider LRF.

BCM involves identifying critical business activities and carrying out a business impact analysis for each area. Critical activities are deemed to be those which have to be performed in order to enable LFR to meet its most important and time-sensitive objectives, e.g. receiving 999 calls, responding to emergency incidents, fire investigation, supplying welfare to staff at critical incidents and managing vehicle defects etc.

LFR maintains a set of business continuity plans in readiness for use when an incident occurs. These plans are regularly tested through exercises to ensure we can continue to deliver our critical services throughout any major disruption.

References

- Lincolnshire Research Observatory
- Lincolnshire Road Safety Partnership
- Greater Lincolnshire Local Enterprise Partnership
- Central Lincolnshire Local Plan
- Lincolnshire Fire and Rescue Incident Recording System
- Experian Incident Risk Score Model
- Experian Mosaic
- Lincolnshire Joint Strategic Needs Assessment
- Joint Health and Wellbeing Strategy for Lincolnshire 2018
- Lincolnshire LRF Community Risk Register
- Environment Agency - Draft National Flood and Coastal Erosion Risk Management Strategy for England
- FM??? Global Heritage Fire – White paper
- Grenfell Tower Inquiry – Phase 1 report
- NTU national review of community risk methodology across the UK Fire and Rescue Service

UNDERSTANDING RISK IN LINCOLNSHIRE
2020 - 2023
LINCOLNSHIRE FIRE & RESCUE
COMMUNITY RISK PROFILE

Lincolnshire
COUNTY COUNCIL
Working for a better future