False Alarms in Walsall & Wolverhampton

(Black Country North)

Analysis of incident data to identify areas and property types from whom false alarms are most likely to originate, and help target prevention and education

April 2011 to March 2014

Data Intelligence Hub

December 2014

False Alarms in the Black Country North

Introduction

Between April 2011 and March 2014, West Midlands Fire Service (WMFS) appliances attended 3,606 incidents in the Black Country North (BCN) which were later found to be false alarms.

Responding to false alarms drains resources for both for WMFS and the originating premises.

False alarms may disrupt the crews' community safety activities or training, and delay response to real emergencies. They are also costly and disruptive for the affected business in terms of productivity when they result in evacuation.

Repeat false alarms at the same premises may lead to complacency and therefore a delay or lack of response to what may be a real emergency from the occupants of these buildings.

Reducing false alarms is also likely to improve road safety to some degree, as it would result in fewer appliances travelling to incidents on blue lights.

Finally, there is a cost attached to any response to incidents, from appliance maintenance to fuel, as well as the environmental cost of thousands of appliance movements; these financial and environmental impacts would also be greatly reduced by a cut in response to False Alarms.

Methodology

While the data analysed for this report covers the last three full financial years, in some circumstances data for the first six months of 2014/15 to date has been used to ascertain whether, for instance, a specific issue is still ongoing. In particular, this was used to help identify repeat premises.

Summary

False Alarm Equipment:

There has been a 5.8% decrease in FAEs in the Black Country North since 2011/12. Wolverhampton incurred a greater proportion of incidents, but also a greater decrease. This reduction mirrors the increasing trend in AFGs.

The cost of travelling to and back from incidents and attending them can be estimated to be £701,066 over the three years analysed.

Despite the overall fall, FAEs in dwellings have increased, which is likely linked to data quality checks re-classifying old people's homes (non-residential) to sheltered housing

(dwellings). Education premises, entertainment venues, and retail premises have also seen an increase in incidents.

The top two causes of activation were faulty alarm systems (28.5%) and cooking or burnt toast (26.8%).

Overall, corridor/hall was the place where most FAEs originated from, with 46.7% (1,684 incidents). This prominence is likely to be linked to alarm and firefighting equipment being primarily installed in this location.

False Alarms Good Intent:

FAGs fell by just over a quarter in 2012/13 but have since stabilised. There were more FAGs in Walsall than Wolverhampton, and although both boroughs saw a similar reduction in 2012/13, while Wolverhampton's incidents fell by 6.2% in 2013/14 Walsall's remained virtually unchanged with a reduction of less than 1%.

The main reason for FAGs for both boroughs was controlled / intentional burning, which has increased by 21.1% in 2013/14 compared to the previous year, and has also increased in the first six months of 2014/15 compared to the same time period last year. This is likely to be partially linked to the data quality work undertaken to improve the recording of such incidents.

The main high-density areas for bonfire/controlled burning FAGs are in Short Heath, Pleck, and Caldmore/Palfrey in Walsall, and in Springfield, Whitmore Reans, and Graiseley in Wolverhampton.

44.4% of FAGs were outdoors, which is consistent with the main reason being controlled / intentional burning.

The cost of travelling to and back from FAG incidents and attending them can be estimated to be £379,738 over the three years analysed.

False Alarm Malicious:

Malicious false alarms attended by WMFS have reduced by more than half since 2011/12. This is likely to be partly due to the reduction in public telephone kiosks, thereby removing the potential for anonymous calls. In addition, educational packages do warn of the consequences of maliciously calling the Fire Service, for instance blocking of the originating mobile phone.

Just over 9% of FAM incidents between April 20011 and September 2014 took place in Caldmore, Walsall. Three properties in particular were repeat locations.

The two most common incident types for malicious false alarms are Fire (16%, 78 incidents) and House Fire (11.7%, 57 incidents).

False alarm calls tend to report incidents at dwellings (259 incidents, 53.2%) and outdoors (109 incidents, 22.4%).

Recommendations / Actions for consideration

False Alarm Equipment:

The installation of **smart technology** such as detectors capable of simultaneous measurement of heat, smoke and carbon monoxide requires an initial investment; however the benefits to both the Brigade and the affected premises may offset this cost. In some cases only a small number of detectors may need replacing, for instance those which are repeatedly activated due to their positioning.

Charging for the false alarms attended in excess of a specified number of incidents should also be considered. Not only would it help cover WMFS's costs for attending, but it may also provide an incentive to repeat premises to make further efforts to reduce these incidents by installing smart detectors and/or better maintaining their alarm systems.

Restrictions on charging imposed by Localism Act can by overcome by implementing a "non-attendance" policy unless certain criteria are met (e.g. lone worker, reports of fire or smoke), and offering the premises (including businesses and hospitals) a service in exchange for a yearly fee.

The table below shows the maximal potential reduction in FAEs in the BCN which could be achieved through a range of solutions.

Potential solution	Potential reduction
Replace detector with smart technology (e.g. multi-sensors)	87.6%
More rigorous maintenance	32.4%
Better installation/positioning	34.4%
Better protection for break glass / equipment	5.0%
Better communication (e.g. informing FS of testing)	0.2%
Non-attendance when not enough information provided	3.1%

A number of assumptions were made to obtain the reduction figures above, the main one being that the proposed solution would actually work. It was also assumed that the cause of actuation was accurately recorded.

False Alarms Good Intent:

Consider appealing to residents planning large bonfires or controlled burning to let WMFS as well as their neighbours know in advance, so as to reduce Brigade attendance at false alarms due to bonfires or controlled burning.

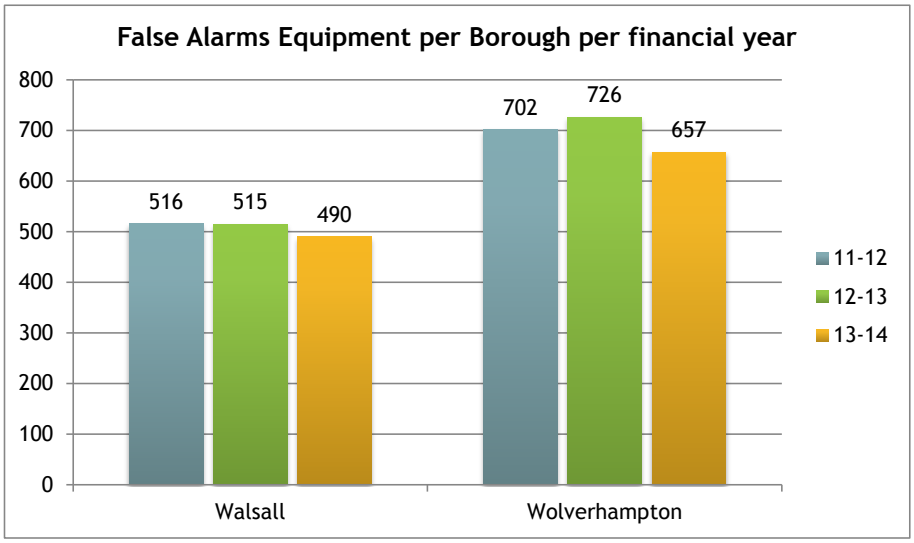
False Alarm Malicious:

Consider education and prevention measures at the Caldmore properties highlighted as repeat locations.

I. False Alarm Equipment (FAE)

Overview:

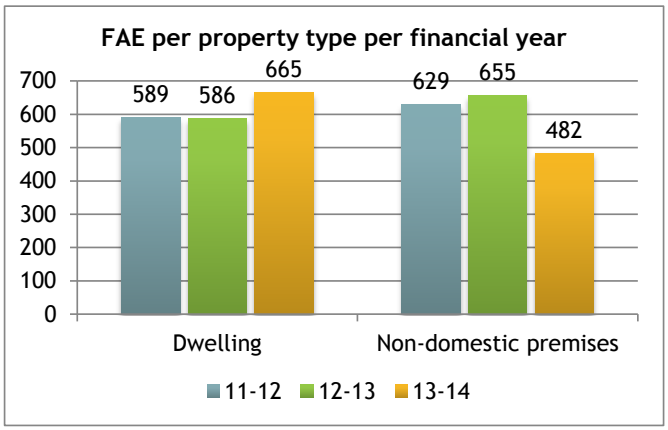
There were 3,606 total incidents in the three years analysed: a small increase in 2012/13 (+1.9%, +23 incidents) but a reduction in 2013/14 (-7.6%, -94).



Wolverhampton had a greater proportion with 57.8% (2,085 incidents), but also had a greater reduction in 2013/14 (-9.5%, -69).

Both boroughs have seen an overall reduction.

FAEs in **dwellings** have **increased** by 12.9% between 2011/12 and 2013/14, while those at **non-domestic** premises have **reduced** by 23.4%.



WMFS appliances spent a total cumulative time[1] of 1,072 hours in attendance and 343hrs travelling to incidents which were false alarms due to equipment.

[1] Cumulative time in attendance at or travelling to an incident is calculated by adding up the time each appliance (BRV, PRL or AFA vehicle) spends at or travelling to this incident. For instance, if three appliances spent 1hr each at an incident, the cumulative time in attendance is 3hrs.

If we apply the 2014/15 special service charges, the cost of attending these 3,606 incidents was approximately £683,526[2].

Assuming that each appliance was travelling from home station to each incident and returned to home station afterwards, travel costs for FAE incidents amounted to approximately £17,540[3].

Dwellings accounted for half of FAE incidents, with 1,840 incidents over the three financial years; the second highest was health facilities, representing 19.7% (711 incidents).

Most non-domestic property types have experienced a reduction in FAEs since 2011/12, which is reflected in the overall fall in FAE incidents.

The following four property type groups have experienced an increase:

Property Type Group	2011/12	2013/14	Difference
Education	31	55	77.4%
Entertainment, dining, recreation and venues	35	51	45.7%
Retail, single shops and specialist service premises	52	60	15.4%
Dwellings	589	665	12.9%

Education saw the greatest increase, although this mainly took place over 2012/13 with a 74.2% increase compared to 2011/12 (+23 incidents), followed by an increase of one incident in 2013/14.

Likewise, incidents at entertainment venues increased to 55 in 2012/13 compared to the previous year, but then reduced slightly in 2013/14.

Retail premises have seen a year on year increase in FAE incidents, while incidents at dwellings were stable in 2012/13 then increased by 79 in 2013/14.

In addition to the above, health facilities remained the second highest in number of incidents each year, despite a 25.2% reduction since 2011/12.

Automated Fire Alarms (AFA) and alarms incident types accounted for 73.8% of FAE incidents.[4] These were predominant in non-domestic incidents, while over a quarter of dwelling FAEs were received through Careline.

[2] This only includes BRV, PRL, AFA vehicles and, in two incidents, an aerial and prime mover. Officers were not included in the calculation, and cost incurred from travel time is calculated separately. The SSC charges were applied in 15mins increments to reflect actual cost rather than what would be charged if the incidents were chargeable SSCs

[3] This uses a fuel cost of £1.01/L of fuel as of 12/11/2014, and assumes a 1L of fuel per mile consumption

[4] This includes the following original incident types: AFA, AFA Fire, AFA Life Risk, Alarms, Alarms Fire, and Alarms Life Risk.

The top two causes of activation were **faulty** alarm systems (28.5%) and **cooking** or burnt toast (26.8%). Cooking tended to be highest for dwellings, while faulty equipment occurred mostly in non-domestic premises.

Overall, **corridor/hall** was the place where most FAEs originated from, with 46.7% (1,684 incidents). This prominence is likely to be linked to alarm and firefighting equipment being primarily installed in this location.

However, this is heavily influenced by incidents at dwellings, where 67.1% of incidents originated from a corridor/hall.

EDUCATION PREMISES:

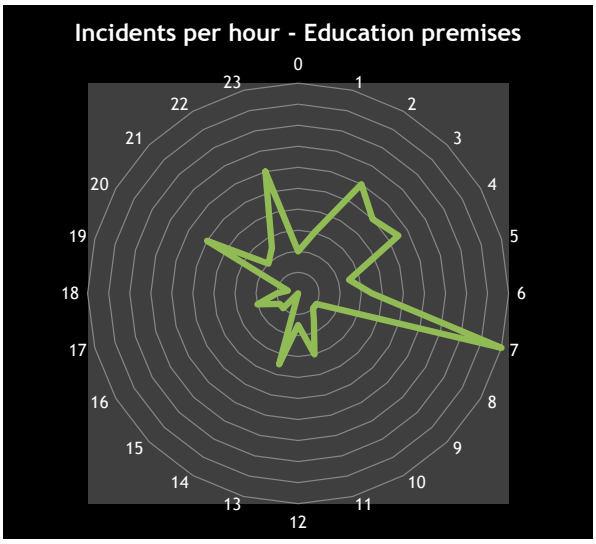
FAE incidents at education premises almost doubled in the last three years.

Secondary schools and special education needs schools/colleges accounted for almost half of incidents at education premises, with 34 incidents each (24.3%).

17% of incidents at education premises were caused by **faulty alarms in corridors/halls**.

The graph to the right illustrates the distribution of incidents around a 24h clock. It shows that FAE incidents tend to take place **late at night/early in the morning**, when no one is on the premises.

There was no noticeable pattern across the week, although incidents were generally lower over the weekend.



The total cumulative cost of attending incidents at education premises over the last three financial years was approximately £35,000. The average cost per incident was approximately £250, which is one of the highest averages.

ENTERTAINMENT VENUES:

FAEs at entertainment venues increased by 57.1% in 2012/13 compared to the previous year (35 to 55). Despite a reduction of 7.3% in 2013/14, they remain higher than three years ago.

Nightclubs were the entertainment venue with the most incidents over the last three years:

Property type	% of Entertainment incidents	No. of incidents
Nightclub	16.3%	23
Football stadium	10.6%	15
Leisure centre	9.9%	14
Gymnasium	8.5%	12
Bar or wine Bar	7.8%	11
Public house	7.8%	11

Faulty alarm equipment was the most likely cause of FAEs at entertainment venues, followed by **dust** and **steam**. The alarms most often activated in **corridors and halls**.

The graph to the left illustrates how FAEs at entertainment venues are distributed throughout the day. It shows that incidents mostly take place in the **late evening and early morning**.

They were also highest from **Tuesday to Friday**.

The total cumulative cost of attending incidents at entertainment venues over the last three financial years was approximately £27,500. The average cost per incident was approximately £195, which is one of the highest averages.

RETAIL PREMISES:

Overall, retail premises accounted for 9.4% of FAEs at non-domestic premises, the third highest. However, increases in the last two years have resulted in retail premises making up 12.5% of FAEs at non-domestic incidents in 2013/14, the second highest.

Supermarkets, department stores, and shopping centres/retail parks together accounted for almost half of the retail FAE incidents:

Property Types	% of incidents	No. of incidents
Supermarket	24.1%	40
Department store	15.7%	26
Shopping centre or retail park	6.0%	10
All others	54.2%	90

Around a third of alarm activations originated from the **shop floor,** and almost half because they were **faulty**.

The graph to the right illustrates how FAEs at retail premises are distributed throughout the day. It shows that incidents tend to happen **between 20:00 and 07:00**.

Across the week, incidents are lowest on Sundays and Mondays, and peak on **Wednesdays**.

The total cumulative cost of attending incidents at retail premises over the last three financial years was approximately £40,000. The average cost per incident was approximately £241.

DWELLINGS:

Between April 2011 and March 2014, WMFS attended 1,840 FAE incidents at dwellings, representing 51% of FAEs in the Black Country North.

While numbers were similar in the first two financial years, there was a 12.9% increase in 2013/14 compared to 2012/13. This is likely partly due to **data quality** issues, where

some premises had been incorrectly recorded as old people's homes (residential non-domestic) and were subsequently changed to sheltered housing (dwelling).

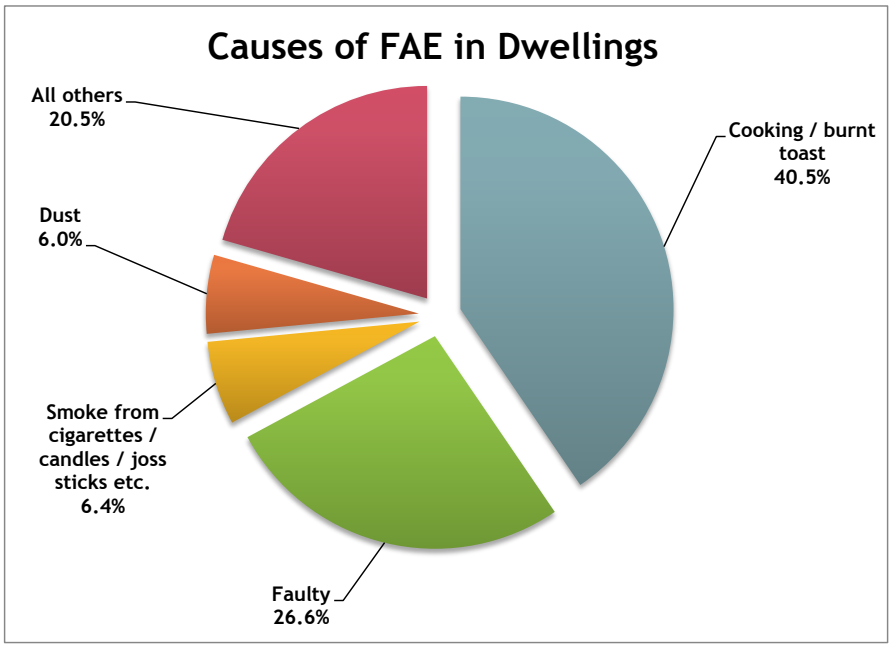
Identifying the type of dwelling where most incidents took place can be challenging as on many occasions the same address will be recorded under different heading. For instance 27 Lord Street in Wolverhampton is recorded as six different types of dwelling.

Nevertheless, the two main property types were purpose built flats and purpose built sheltered flats, which are commonly used interchangeably. This is consistent with Mosaic type M59 (People living in social accommodation designed for older people) being the most represented.

Corridors and halls were the place most FAEs originated from, with kitchen in second place. The top four are illustrated below[5]:

[5] Picture of house obtained from www.vancouver-real-estate-direct.com through Google images search.

Almost 80% of FAEs in dwellings were caused by **cooking/burnt toast**, **faulty** alarms, **smoke**, or **dust**:



A quarter of incidents originated from a **communal area;** those were mainly in **corridors or halls**.

FAEs taking place in communal areas were more likely to be caused by **faulty** alarm equipment, while half of the non-communal area incidents were due to **cooking/burnt toast**.

There were just 29 incidents at properties recorded as Houses of Multiple Occupancy (HMOs).

Unlike incidents at non-domestic premises, FAEs at dwellings are more likely during the **daytime**, especially between 10:00 and 18:00.

Over the three years analysed, WMFS appliances spent a total of 218hrs travelling to and 545hrs attending FAEs at dwellings. This translates as £375,422 total cost, or an average of £391 per incident.

Assuming that each appliance was travelling from home station to each incident and returned there afterwards, the cost of travelling to FAE incidents in dwellings amounted to approximately £11,420.

This accounts for 65.1% of the total travel cost of FAEs, while the number of dwelling FAEs represents 51% of the total number of incidents.

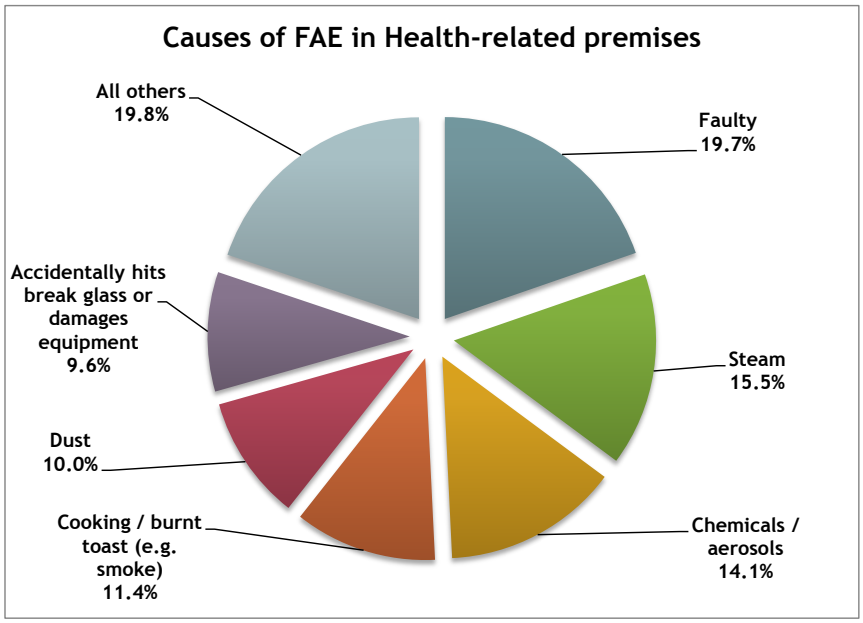
HEALTH:

The number of incidents at health-related premises dropped from 254 in 2011/12 to 190 two years later, which is likely a result of the work undertaken to reduce FAEs at hospitals. In particular, New Cross in Wolverhampton saw a reduction of 22.8% (-40 incidents) since 2011/12, and Manor in Walsall reduced its incidents by 40.5% (-17).

Nevertheless, health premises incurred the second highest number of FAEs overall as well as during each financial year, representing between 16 and 22% of all FAEs each year, and accounting for around 40% of non-domestic incidents.

28.1% of alarms were activated in a **corridor / hall**, followed by **ward / sick bay** at 17.6%.

Faulty alarms were the main reason for FAEs in health-related premises:



General hospitals were responsible for over 86.6% of FAEs at health-related properties with 616 incidents, New Cross hospital incurring 498 of those.

The graph to the right shows that FAEs at health-related premises are at their peak **between 08:00 and 17:00**. Incidents during this time frame accounted for 60.3% of FAEs at health-related premises.

Over the three years analysed, WMFS appliances spent a total of 40hrs travelling to and 146hrs attending FAEs at health premises. This is equivalent to £94,263 in total cost, or an average of £133 per incident.

Nevertheless, the annual cost of attending these incidents was halved in 2013/14 compared to both previous years.

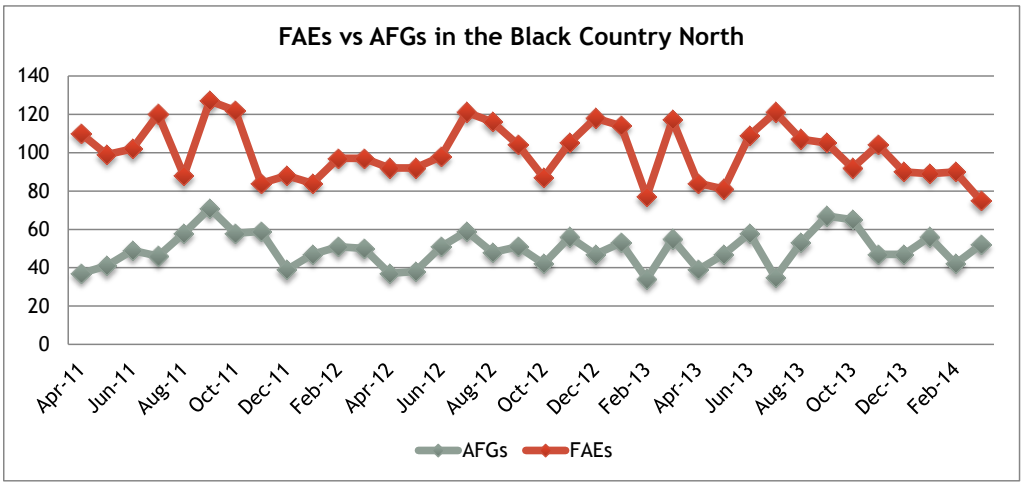
New Cross Hospital in Wolverhampton is the main repeat location in this category. There were 498 FAE incidents at the hospital in three years, although there was a reduction of 22.8% in 2013/14.

There have been 64 so far in the first six months of 2014/15

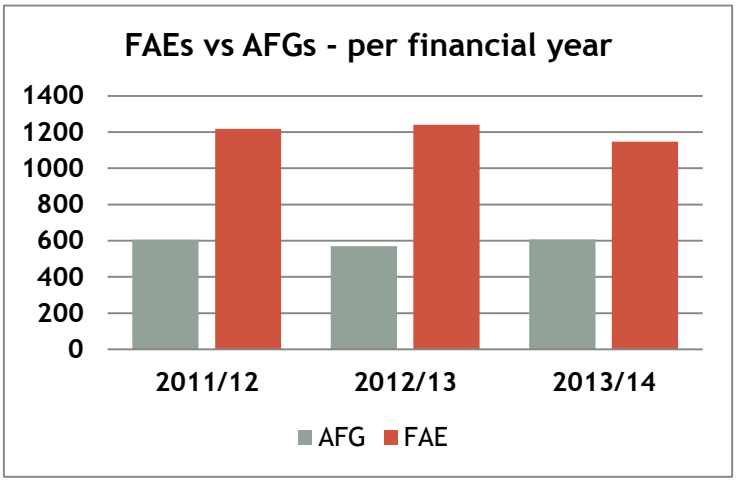
Impact of Call Challenge

Over the last three years, 2,123 calls from automatic fire alarms were not attended (AFG incidents).

The graph below compares monthly AFGs and FAEs. It shows that over the last three years, while following similar monthly patterns, AFGs have increased and FAEs have declined:



Likewise, the graph to the right shows that in 2012/13 AFGs reduced slightly and FAEs increased slightly, whereas the following year the opposite happened.



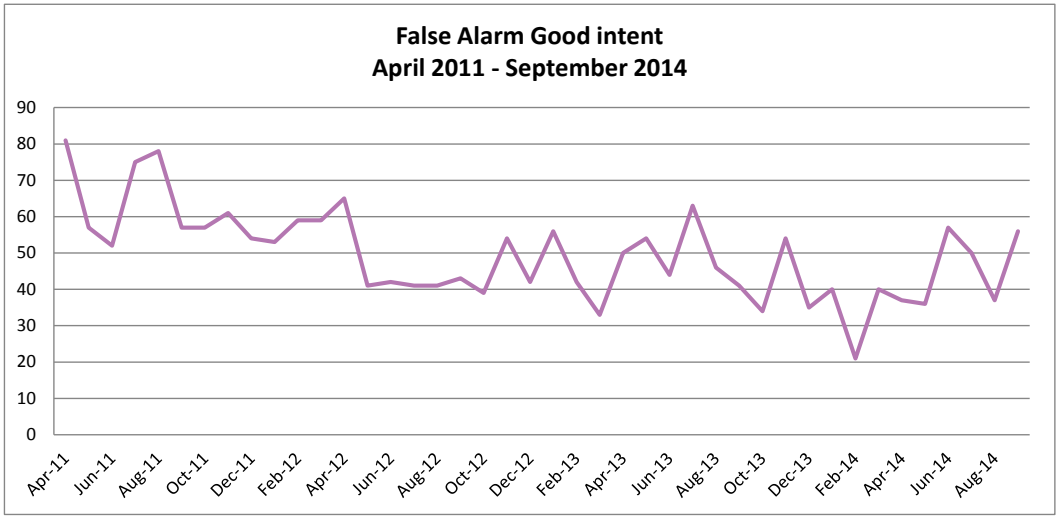
While the time that would have been spent in attendance at AFG incidents cannot be estimated and therefore no attendance cost can be calculated, by inferring that at least one appliance would have been mobilised and that this appliance was from the nearest station, the overall cost of travelling to and from those AFGs had they not been challenged would have been at least £5,670.

II. False Alarm Good Intent (FAG)

Data quality checks revealed that approximately 90 of the incidents recorded as FAG had been recorded with the wrong incident result type, mostly FAEs but also Primary and Secondary fires. The analysis below excludes those 90 incidents.

Over the three years analysed WMFS attended 1,804 FAG incidents.

FAGs fell by just over a quarter in 2012/13 but have since stabilised, with a reduction of just 3.2% in 2013/14, and of 8.4% in the first six months of 2014/15 compared to the same period last year.



There were more FAGs in Walsall: 1,007 compared to 797 in Wolverhampton. Although both boroughs saw a similar reduction in 2012/13, while Wolverhampton's incidents fell by 6.2% in 2013/14 Walsall's remained virtually unchanged with a reduction of less than 1%.

15.4% of FAGs (278 incidents) had an original incident type of '**Open**', followed by 8.5% '**Garden fire**' (153 incidents).

Temporal analysis

The graph to the left shows that FAG incidents increase throughout the day, peaking **between 20:00 and 21:00**.

FAG Cause

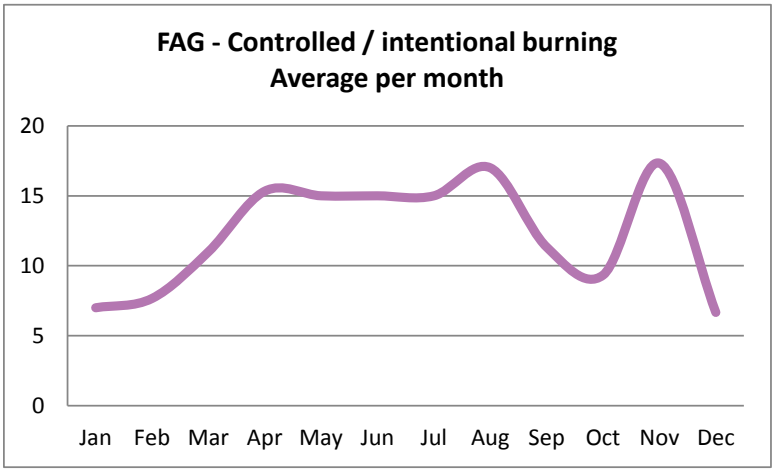
Data quality checks on the reasons listed under 'Other' showed that for 94 of these incidents it could have been recorded as one of the existing listed reasons. Analysis was undertaken after one of the listed reasons was applied to the 94 incidents.

The main reason for FAGs for both boroughs was **controlled / intentional burning**.

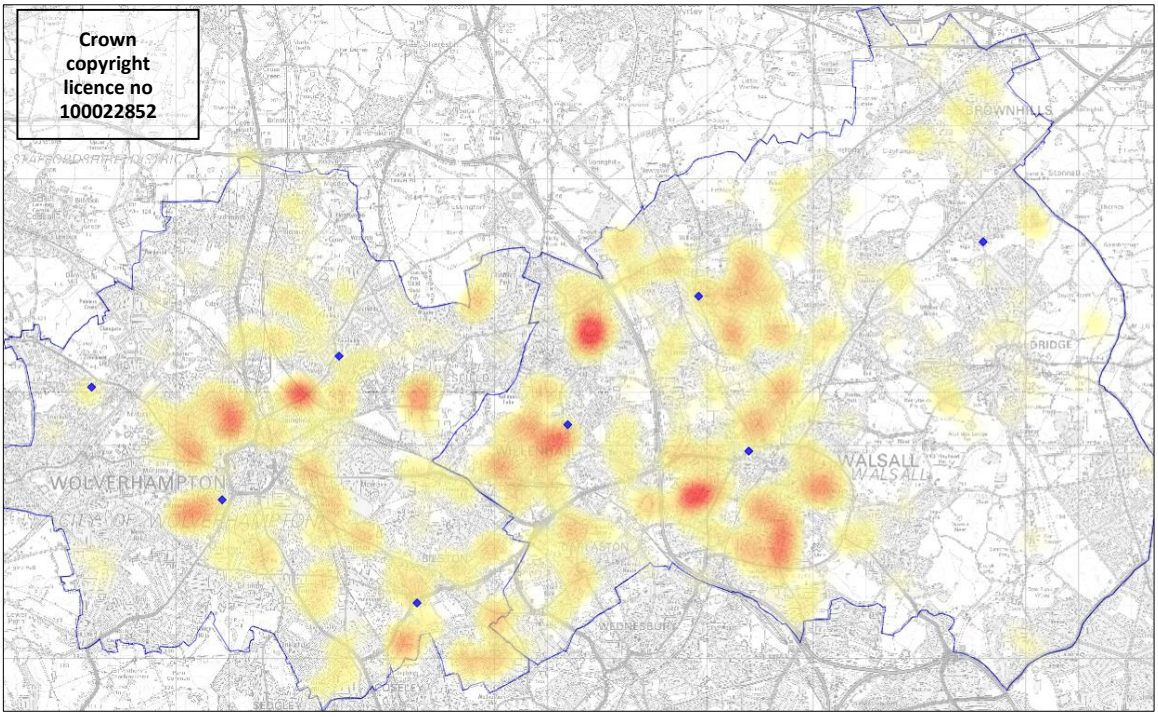
FAGs due to controlled burning have increased by 21.1% in 2013/14 compared to the previous year, and have also increased in the first six months of 2014/15 compared to the same time period last year.

This is likely to be partially linked to the data quality work undertaken to improve the recording of such incidents.

As would be expected, incidents relating to controlled / intentional burning tend to happen during the **spring and summer** months, when the weather is driest. There is a further peak in **November**, in particular on the 4th and 5th of the month, corresponding to Bonfire Night.



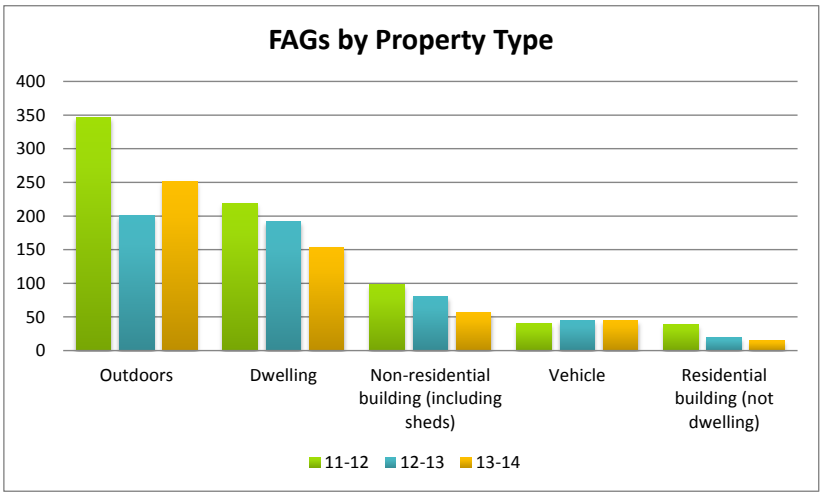
The map below shows high density areas of controlled burning FAG incidents:



The main areas are in Short Heath, Pleck, and Caldmore/Palfrey in Walsall, and in Springfield, Whitmore Reans, and Graiseley in Wolverhampton.

Property type

44.4% of FAGs were **outdoors**, which is consistent with the main reason being controlled / intentional burning. After a 42.1% decrease in 2012/13, outdoors FAGs increased by 25.4% in 2013/14, which is linked to the increase in controlled burning incidents, as mentioned in the previous section.



FAGs have slightly increased for **vehicles**, with 40 incidents in 2011/12 and 45 in both following years.

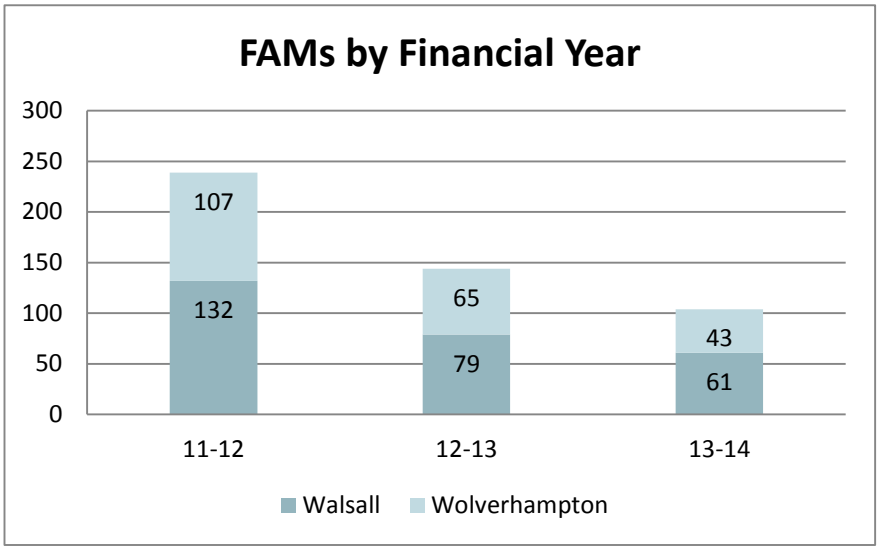
FAG Cost

Over the three years analysed, WMFS appliances spent a total of 213hrs travelling to and 548hrs attending FAGs at health premises. This is equivalent to £369,310 for attending the incidents and £10,428 for travel to and from.

III. False Alarm Malicious (FAM)

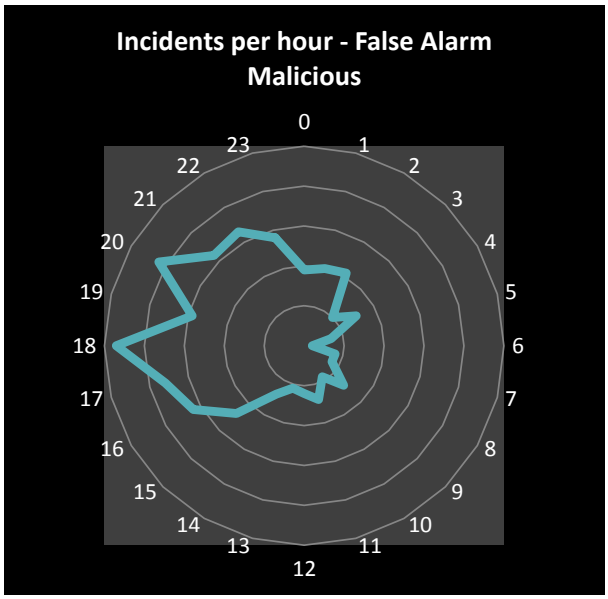
Temporal analysis

Between April 2011 and March 2014, WMFS attended 487 malicious false alarms; they have reduced by more than half (56.5%) between 2011/12 and 2013/14, although there have already been 64 in 2014/15 up to September, five more (30.6%) than over the same time period last year:

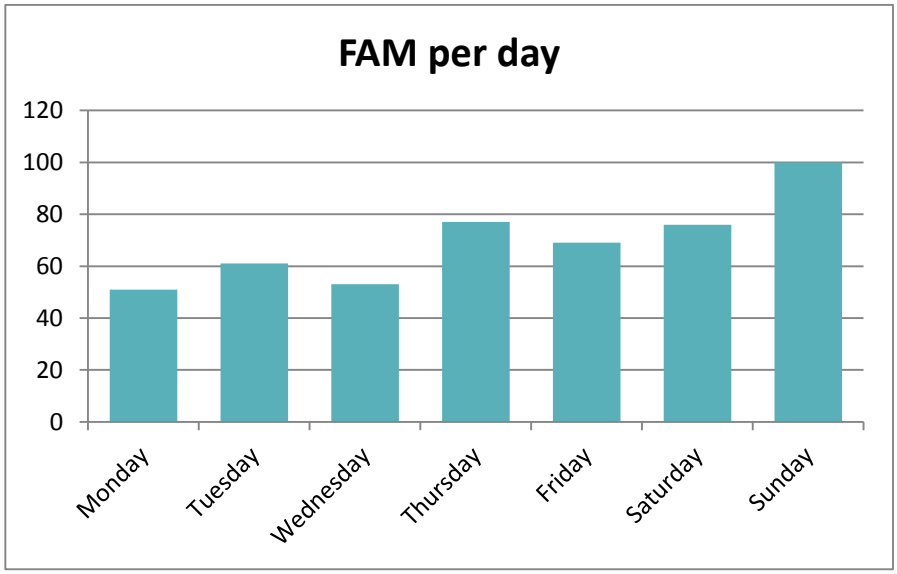


This is likely to be partly due to the reduction in public telephone kiosks, thereby removing the potential for anonymous calls. In addition, educational packages do warn of the consequences of maliciously calling the Fire Service, for instance blocking of the originating mobile phone.

The graph to the right shows that malicious calls increase in the **evening and early night**.



The graph below shows that malicious calls increase throughout the week to peak on **Sunday**:



Geographical analysis

Hotspot analysis shows that there is one main high density area of FAM incidents, situated in **Caldmore** in Walsall:

Between April 2011 and September 2014 there were 50 incidents at this hotspot location, accounting for 9.1% of all malicious false alarms in the Black Country North between April 2011 and September 2014.

Analysis of those 50 incidents reveals a higher proportion of reports of **people collapsing** and of calls originating from a **telephone kiosk** than other FAM incidents.

Incident and property type

The two most common incident types for malicious false alarms are **Fire** (16%, 78 incidents) and **House Fire** (11.7%, 57 incidents).

False alarm calls tend to report incidents at **dwellings** (259 incidents, 53.2%) and **outdoors** (109 incidents, 22.4%).