



Data Driven Support to UK Fire Services:

Helping Fire and Rescue Services efficiently engage with businesses most susceptible to fire related incidents – targeting the right businesses with less resource

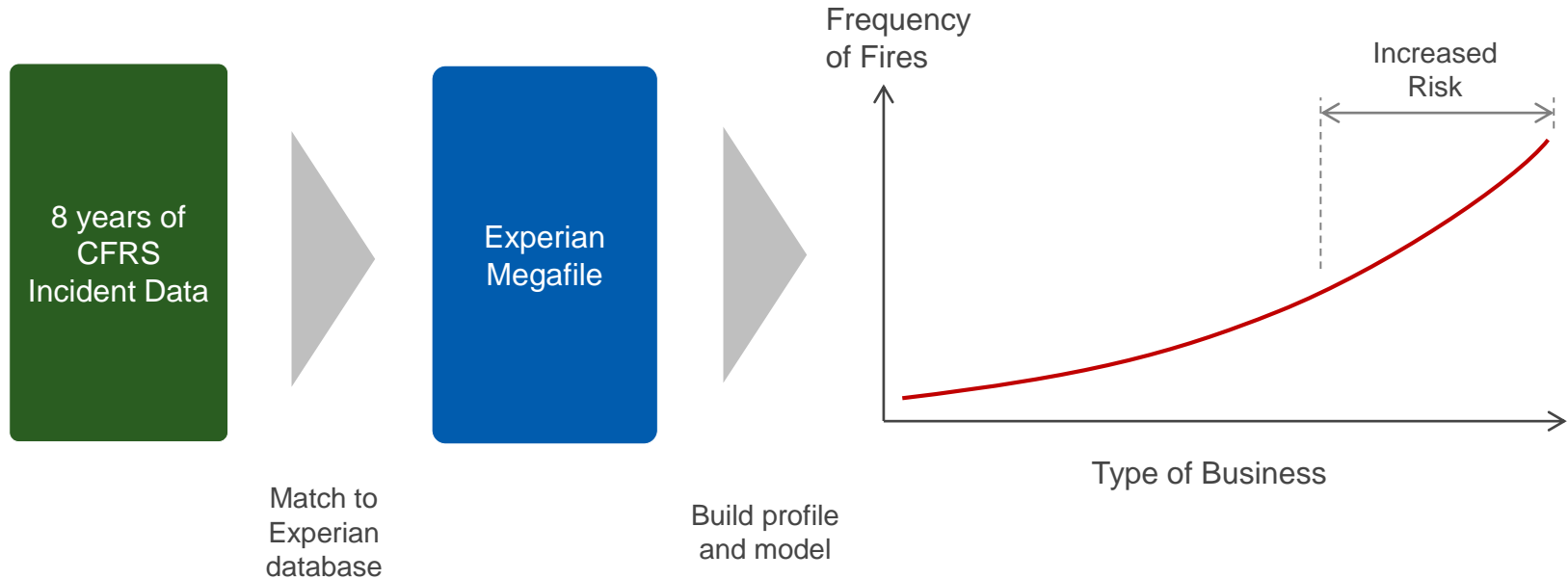
Cadcorp Fire Services Analysis Conference

Summary of the Incident Risk Score



Purpose and Method

The Fire & Rescue Services believe that certain types of business are more likely to experience commercial fires, so Experian aimed to identify the profiles of these businesses so they can be targeted proactively for fire prevention.



The Experian pH UK Megafile

Experian's flagship business-to-business database



The **breadth** of the Megafile comes from merging and de-duplicating publicly-available business data sources



The **depth** of the Megafile comes from enriching company profiles with information from specialist data sources

The Megafile includes: **3.8M live businesses**, covering **3.6M verified trading addresses**, enhanced with data including financials, marketing preference flags, emails, and corporate hierarchy

Summary of the Incident Risk Score

Profiling risk of fire



- We profiled which types of businesses were most likely to have fires
- In line with what common sense would tell us, there are three things that increase the risk of fire:
 1. The presence of a large number of people
 2. The presence of material or stock that could be flammable
 3. Places where food is being cooked

Incident Risk Score

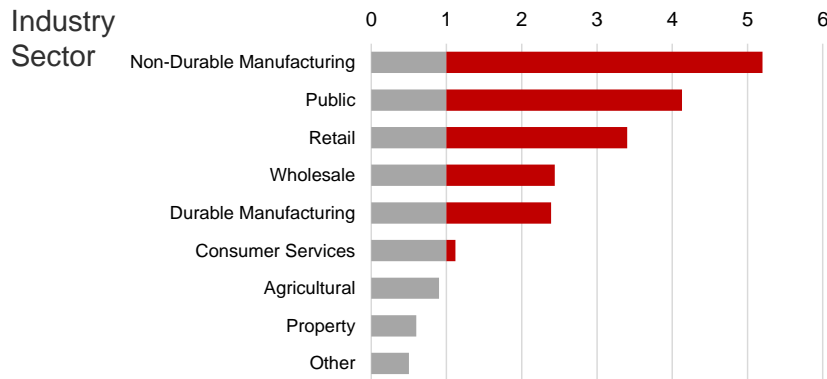
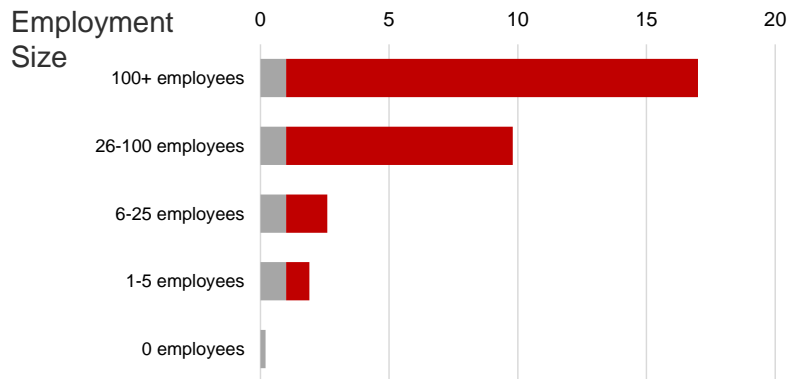
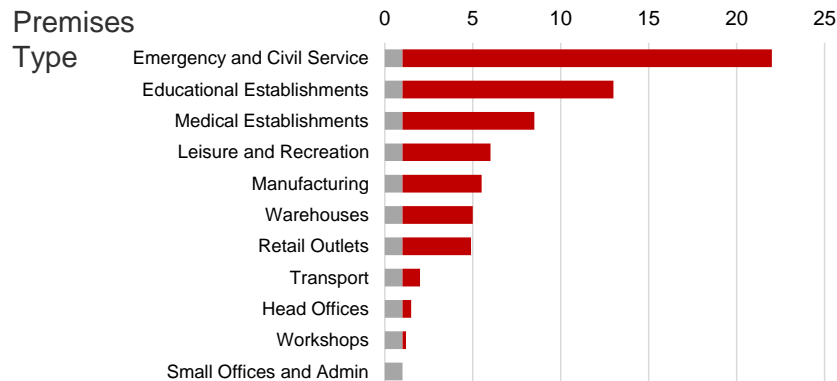


Premises with large numbers of people have fires more frequently

Each of these graphs shows the how many times greater the rate of fires per category is than compared to the average rate – grey is less than the average, red is above.

Frequency of fire shows a strong correlation with employment size.

Premises and sites that attract more people, such as public sector, retail and leisure centres have fires more frequently.



Incident Risk Score

Premises with stock or with kitchens have fires more frequently



Presence of Stock

Businesses that file accounts can indicate a value of physical stock on their balance sheet.

We have used this as a proxy to indicate if businesses are likely to hold a lot of items in warehouses and stockrooms.

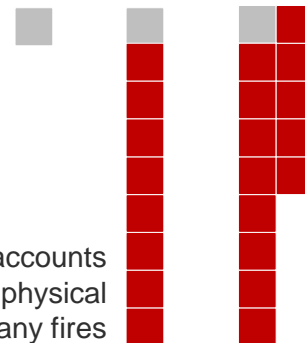
With more things to burn, fires could be more likely.

Food Standards Agency (FSA)

Businesses have to register with the FSA if they are a commercial property that prepares food for public consumption.

This means that many premises that use kitchen and cooking equipment on site will be registered on FSA.

This is the average rate of fires per site, represented by one square



Businesses that file accounts showing possession of physical stock have 9 times as many fires

And businesses that have registered with the Food Standards Agency are have 22 times as many fires

Incident Risk Score

Combining variables to create a single score



Premises Type

Sector

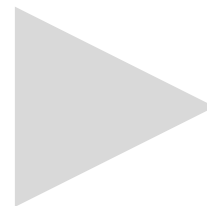
Employees

Stock Flag

FSA Flag



Combine the
variables



100 – highest risk



50 – average risk



1 – least risk

Model Validation

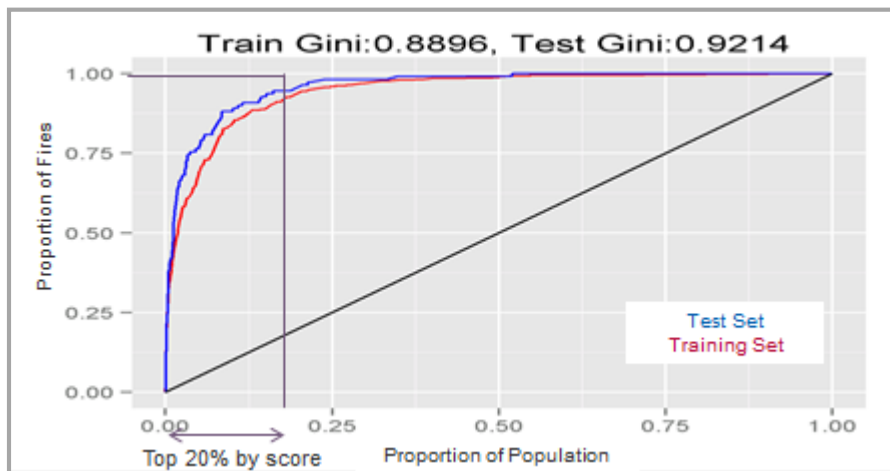
The Results



The model was built using all the fire data before 2014, with the fires from 2014 onward being used to validate the model.

When we apply the model to the unseen 2014 onwards data, our model gives high risk rating to those who went on to have a fire.

Campaigning to the top 20% of records by risk at the start of 2014 means you would have contacted over 80% of companies which went on to have a fire that year.



Model Validation

The Results



Additionally the model was applied to several fires which occur after the model was built. In each case the site scored within the top high 10% of sites by risk.

ADDRESS	MARSHALL MOTOR GROUP 699 MARSHALL MITSUBISHI Newmarket Road FEN DITTON CB5 8SQ	SAFAPAC LTD Stapledon Road, Orton Southgate, PETERBOROUGH	THE PRINCE ALBERT 62 Silver Street, ELY, CB7 4JF	THE VAULTS 14A TRINITY STREET, CAMBRIDGE	AMEYCESPA (EAST) LTD WATERBEACH WASTE MANAGEMENT PARK, Ely Road, LANDBEACH	FIRSTAN LTD 2 Cardinal West, GODMANCHESTER, PE29 2XN	JACK HUNT SCHOOL, Ledbury Road, Netherton, PETERBOROUGH, PE3 9PN
INCIDENT INCIDENT_MONTH TIME_OF_CALL PH_CO SITE_ID SITE EMPLOYMENT	3616 Jun 14:00:41 gbr100525104 gbr1011932684 c 6 to 25	8872 Sep 21:01:22 gbr105277231 gbr1019684338 d 26 to 100	3491 Jun 00:06:17 gbr112665106 gbr1002018848 c 6 to 25	6271 Aug 14:13:31 gbr110028475 gbr1001649867 b 1 to 5	5682 Jul 09:33:54 gbr100966800 gbr1000281685 d 26 to 100	7500 Aug 07:00:04 gbr100619326 gbr1025730262 e 100+	8860 Sep 16:32:18 gbr236186989 gbr1005190616 e 100+ Schools & Educational Establishments
PREMISE TYPE FSA REGISTERED HAS STOCK SECTOR SCORE PERCENTILE	Shops & Other Retail Outlets n Y Retail 92	Factories & Manufacturing n N Manuf. durable 96	Shops & Other Retail Outlets y N Retail 95	Shops & Other Retail Outlets y N Retail 92	Other n Y Public 97	Factories & Manufacturing n Y Manuf. Non durable 99	n N Public 99
SCORE CATEGORY	Very High	Very High	Very High	Very High	Very High	Very High	Very High

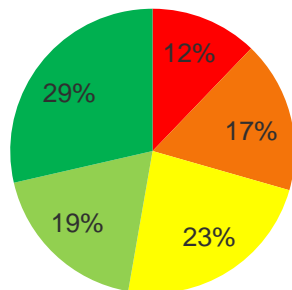
Incident Risk Score

Score distribution across the country



All UK sites

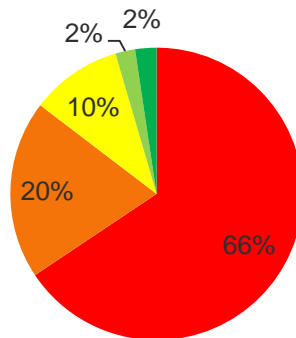
Score Category	Total	% of Total
Very High	488,738	12%
High	692,552	17%
Medium	935,302	23%
Low	749,340	19%
Very Low	1,146,782	29%
Total	4,012,714	100%



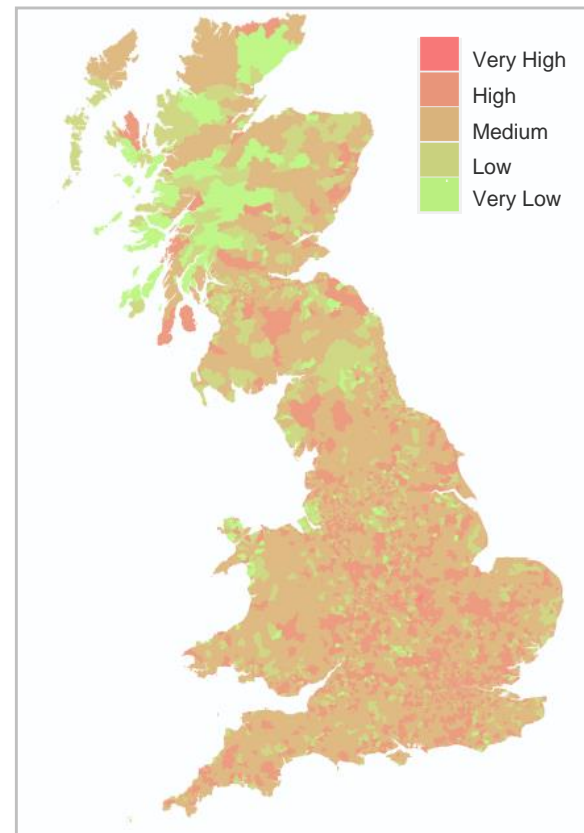
- Very High
- High
- Medium
- Low
- Very Low

Accidental fires

Score Category	Total	% of Total
Very High	1,865	66%
High	561	20%
Medium	287	10%
Low	62	2%
Very Low	67	2%
Total	2,842	100%



- Very High
- High
- Medium
- Low
- Very Low

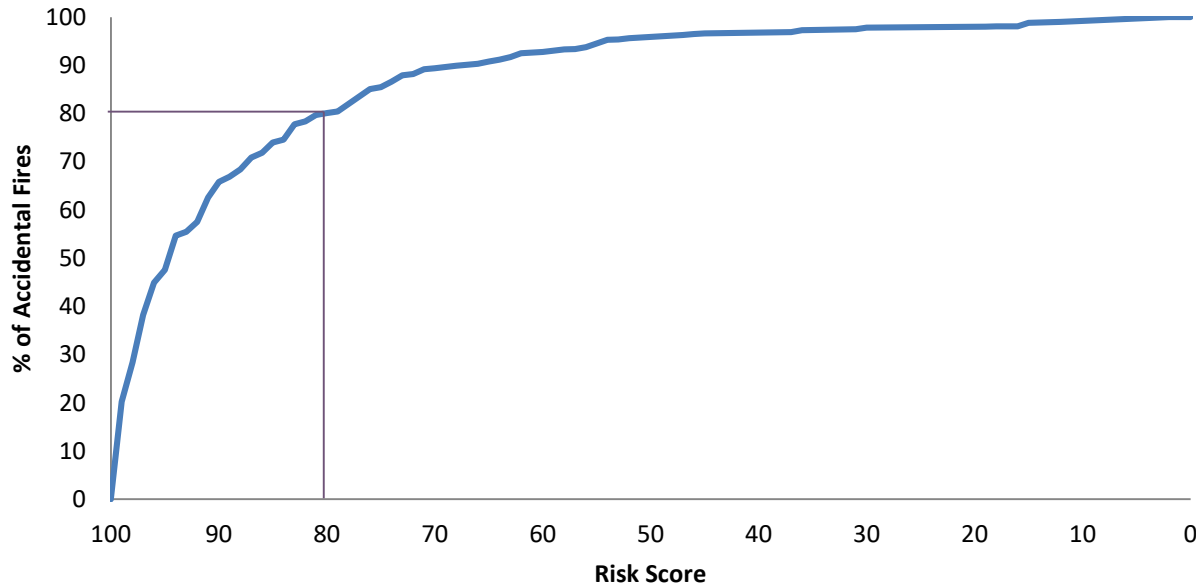


Incident Risk Score

The Results



When we arrange businesses by risk score we find that 80% of fires are found within the riskiest 20%



This pattern is found in every population we have tested:

- CFRS 2006 – 2013 (model base)
- CFRS 2014 (validation base)
- 10 tested FRS 2015



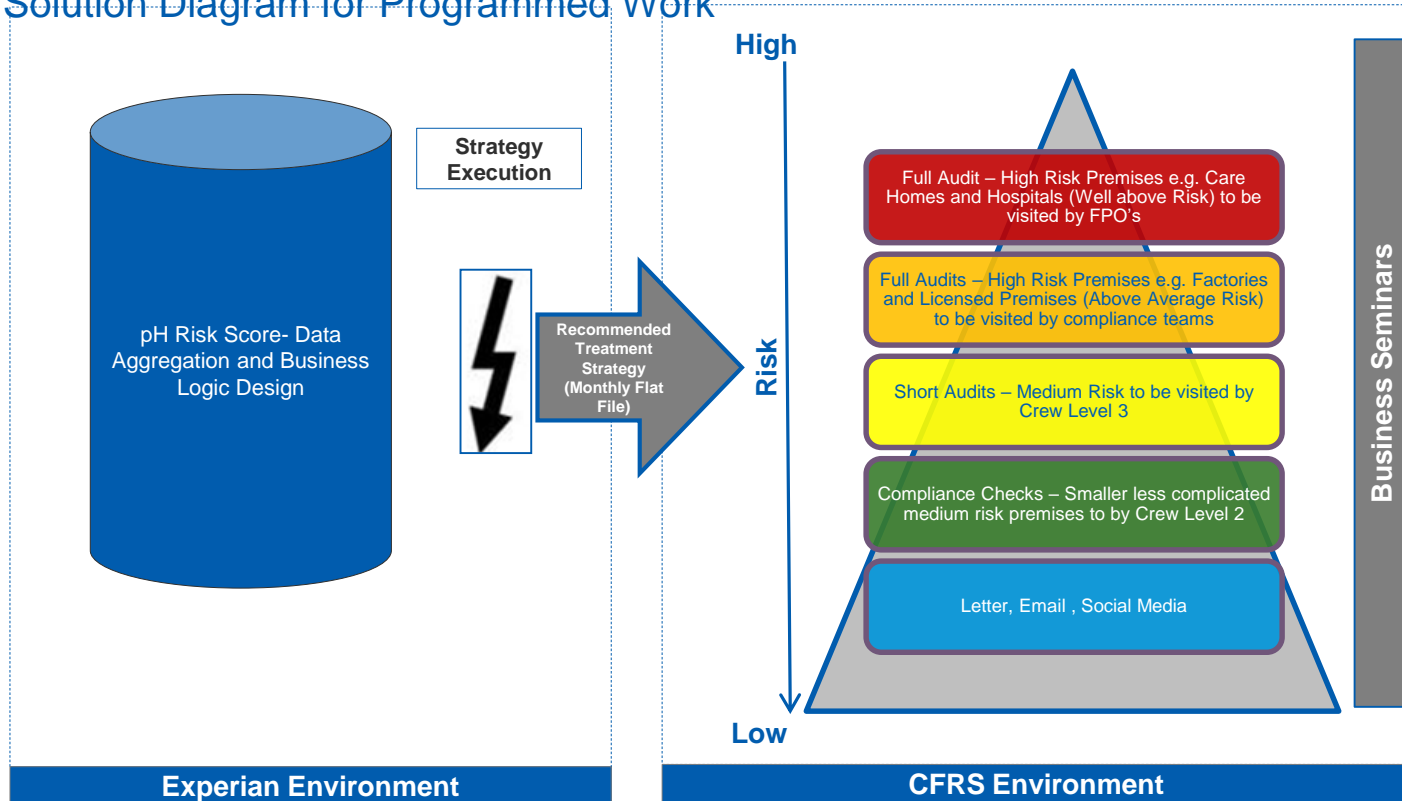
- The Experian Incident Risk Scored data utilises AddressBase Premium UPRN and Easting/Northing reference points to identify sleeping risk above commercial premises
- Updated file delivered quarterly (.csv format)

Potential Implementation Strategy



Score to be used:

Solution Diagram for Programmed Work





- Audit Program
- IRMP
- Driving Efficiency
- Refreshing Data
- Retained Firefighter Recruitment
- Primary Authority Scheme

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