HEREFORD & WORCESTER
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FIRE AND RESCUE SERVICE

Strategic Understanding of Risk

Incident Type – Demand

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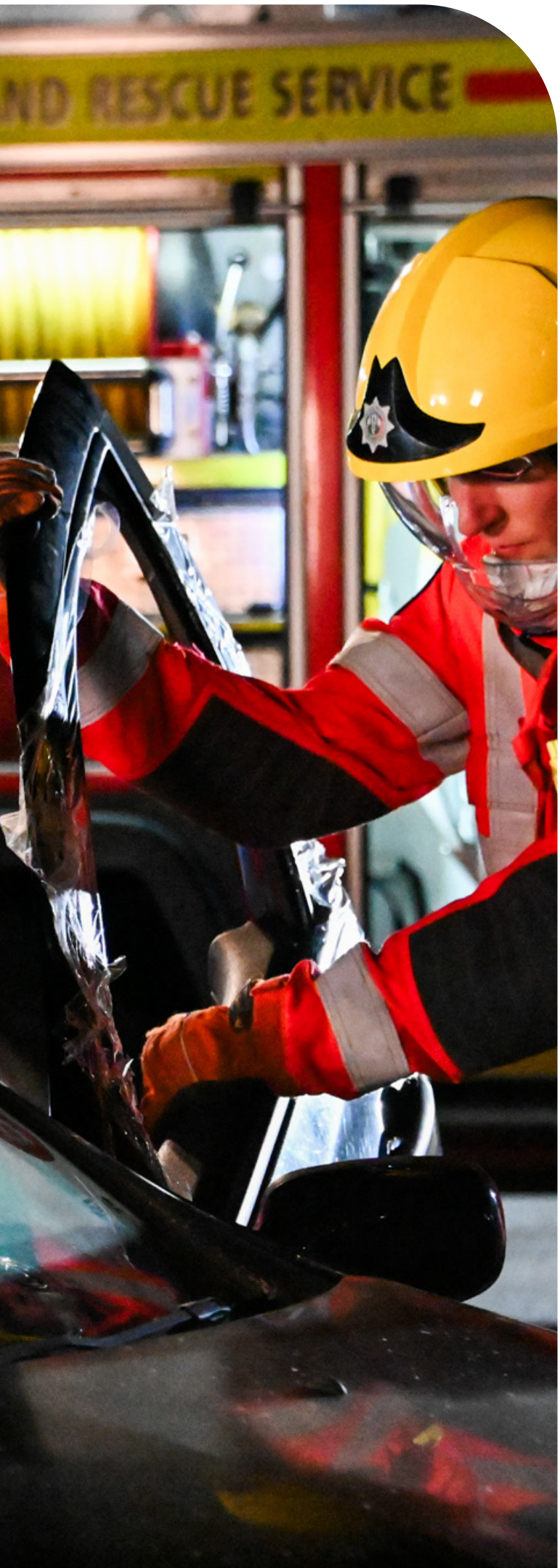

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Introduction

Herefordshire and Worcestershire are among some of the safest counties to live in England. Whilst Hereford and Worcester Fire and Rescue Service (HWFRS) is very productive given its relative size, the overall call volume compared to other Fire Services nationally is low. It is important to analyse the frequency of incident types HWFRS attend and the impact to those involved as this tells us the 'Demand' for our services. By doing so, HWFRS can ensure we have the right resources in the right locations to best serve our communities and mitigate the risks they face.

For the purpose of this document, the term 'incident type' refers to a call that is received by Fire Control and subsequently recorded in the Command & Control System (internal system allowing mobilisation of assets to attend emergencies), while the National Incident Types are set by the Home Office. HWFRS Command & Control System allows creation of 'bespoke' incident types, when a new incident type emerges and requires a standardised record, e.g. electric vehicle fire.

In the case of HWFRS, the Command & Control System at present contains 140 incident types and these are subsequently translated into one out of 97 incident types established by the Home Office for the Incident Recording System (IRS) (National database of all emergencies attended).

The initial incident type can be modified by Fire Control when more information is provided by the caller, which occasionally may result with re-assessment of the incident type and upgrade or degrade of the response by the Service, e.g. on average 5% of the automated false alarms are found to be real fires which require a full emergency response (use of blue lights).

This Demand document is based upon five fiscal years (1 April 2019 to 31 Mar 2024) of incidents attended by HWFRS within the territory of Herefordshire and Worcestershire only. This document also aligns with the Service's Addendum on the Emergency Driving Graded Response which provides more guidance for the crews when responding to different emergencies.

By analysing the 'Likelihood' of an incident occurring and the 'Consequence' of the incident for the individuals involved, it can be seen that no incidents across Herefordshire and Worcestershire are classified as 'High'. In fact, almost 90% are in the 'Low' category demonstrating the low-risk nature of the two counties.

Introduction continued

Category	Score	Number of incident types	Number of occurrences	Contribution to the total (%)
High	21-25	0	0	0.00
Medium High	16-20	4	1,234	3.22
Medium	11-15	7	2,260	5.89
Medium Low	6-10	17	366	0.95
Low	1-5	37	34,508	89.94
		65	**38,368**	**100.00%**

Each incident type was examined using a risk assessment style approach in two dimensions, i.e., its Likelihood (frequency of occurrence) and its Consequence (severity of injuries experienced by casualties) within the last five years. The final classification was determined by using a matrix, where a total score (Likelihood multiplied by Consequence) would show not only the frequency of attendance but also the impact on the individuals involved.

Incidents identified as high, medium high and medium levels will be investigated further in line with the National Fire Chiefs Council (NFCC)'s methodologies and more detailed information will be presented in a Strategic Understanding of Risk document. However, it must be stressed that incident types which scored lower will not be dismissed but addressed at a later stage.

Finally, the Strategic Understanding of Risk document will include results of analyses carried out following the NFCC Methodologies which were developed to address following risks:

- National Risk Methodology for UK FRS: Domestic Dwelling Fires;
- Road traffic collisions;
- Other building fires;
- HWFRS Water Methodology.

Methodology
Incident Likelihood

In order to evaluate the Incident Likelihood, the statistical method called "bucketing" (or in other words "grouping") was used to assign each incident type (high, medium high, medium, medium low and low occurrence) during the last five fiscal years.

This method involves reducing the complexity of the data by grouping similar values together, making it easier to analyse and understand the distribution of frequencies across the all incident types.

The analysis included the following steps:

1. **Data Collection:** This assessment was based on the incidents attended by the Service during the last five fiscal years (1 April 2019 to 31 Mar 2024), excluding over the border calls. The initial incident type recorded was examined. As soon as a call is received by Fire Control, they use the incident classification to trigger the appropriate response to the emergency.

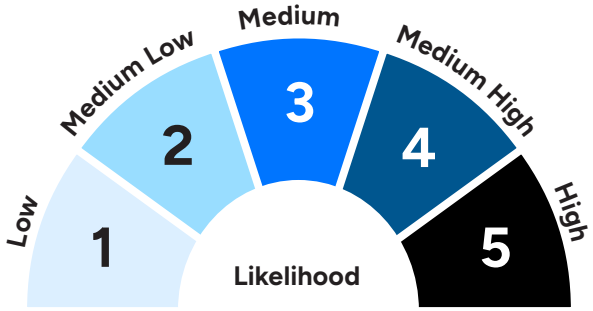
2. **Range Determination:** The minimum and maximum frequencies in the data series were first identified.

3. **"Bucketing":** The range of frequencies was then divided into five equal intervals, where each "bucket" represents a group of incident type frequencies using following formula:

$$\textbf{Bucket Range} = \frac{(\text{Max Value} - \text{Min Value})}{\text{Number of buckets}}$$

4. **Classification:** Each incident type was then assigned one of the five frequency groups ("buckets") based on its frequency within the data series.

As a result, all incident types were assigned one of the five Incident Likelihood groups:



Description	Number of incident types
Incident categories with 10,000 or more occurrences.	1
Incident categories with occurrences between 1,000 and 9,999.	9
Incident categories with occurrences between 100 and 999.	20
Incident categories with occurrences between 100 and 499.	18
Incident categories with fewer than 100 or no occurrences.	17

Please note that out of 97 incident types available in the Incident Recording System, 65 were actually used for classifying calls during the last five fiscal years and their frequencies are listed below.

Methodology continued
Incident Likelihood

Incident type at Control (IRS)	Number of incidents	%
Likelihood: High		
Alarms – Automatic Fire Alarms (AFA)	13,833	36.05%
Likelihood: Medium High		
Fire – Fire in the open – small	4,776	12.45%
Humanitarian or Assistance – Assist other agency	3,111	8.11%
Hazardous Material – Vehicle leaking fuel	1,500	3.91%
Fire – Fire	1,429	3.72%
Rescues – RTC persons trapped (small vehicles)	1,407	3.67%
Fire – Building	1,348	3.51%
Fire – Vehicle small	1,295	3.38%
Rescues – Rescue from entrapment	1,071	2.79%
Humanitarian or Assistance – Flooding	1,014	2.64%
Likelihood: Medium		
Rescues – Rescue from water	755	1.97%
Fire – Persons	672	1.75%
Hazardous Material – Gas involved	635	1.66%
Fire – Smoke in the open	568	1.48%
Rescues – Persons locked in	518	1.35%
Fire – Chimney	489	1.27%
Rescues – Animal rescue small	454	1.18%
Fire – Fire now out	337	0.88%
Fire – Vehicle large	316	0.82%
Rescues – Lift persons shut in	303	0.79%
Hazardous Material – Leaks	229	0.60%
Rescues – Building collapse	208	0.54%
Humanitarian or Assistance – Dangerous structure	205	0.53%
Fire – Electrical installations	198	0.52%
Fire – Barn	172	0.45%
Rescues – RTC persons trapped (large vehicles)	167	0.44%
Rescues – Animal rescue large	159	0.41%
Rescues – Suicide attempt	142	0.37%
Humanitarian or Assistance – Persons locked out	141	0.37%
Hazardous Material – Unidentified smell	120	0.31%

Methodology continued
Incident Likelihood

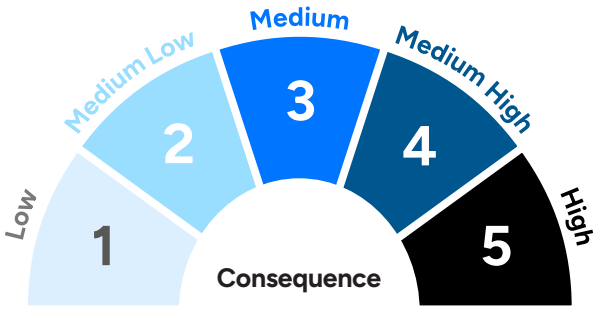
Incident type at Control (IRS)	Number of incidents	%
Likelihood: Medium Low		
Hazardous Material – Haz mat major	93	0.24%
Fire – Railway embankment	86	0.22%
Fire – Fire in the open – large	84	0.22%
Fire – Caravan / camping	71	0.19%
Humanitarian or Assistance – Advice given	61	0.16%
Fire – Derelict property	57	0.15%
Humanitarian or Assistance – Fire safety issue	51	0.13%
Rescues – Rescue from height	48	0.13%
Fire – Persons on fire	40	0.10%
Fire – Road furniture	29	0.08%
Rescues – Boat rescue	20	0.05%
Humanitarian or Assistance – Boat stability	20	0.05%
Rescues – Rescue from mud	16	0.04%
Fire – Cylinder other	15	0.04%
Fire – Aircraft light	13	0.03%
Hazardous Material – Suspicious powder	12	0.03%
Explosion – Explosion	11	0.03%
Fire – Boat	10	0.03%
Likelihood: Medium Low		
Fire – Late fire call	9	0.02%
Alarms – Smoke alarm	8	0.02%
Fire – Abandoned call	7	0.02%
Rescues – Railway accident	6	0.02%
Hazardous Material – (H10) Hazard Zones	5	0.01%
Alarms – Fire alarm at FRS property	5	0.01%
Humanitarian or Assistance – RTC	3	0.01%
Rescues – Rescue from entrapment (non-emergency)	3	0.01%
Fire – Chimney thatch	2	0.01%
Civil Disturbance / Unlawful Act – Bomb confirmed	2	0.01%
Fire – Railway train passenger	2	0.01%
Fire – Building thatched	2	0.01%
Humanitarian or Assistance – Supply water	1	0.00%
Rescues – Rescue from confined space	1	0.00%
Civil Disturbance / Unlawful Act – Civil disturbance	1	0.00%
Alarms – Gas alarms	1	0.00%
Civil Disturbance / Unlawful Act – Bomb suspected	1	0.00%

Methodology continued
Incident Consequence

This analysis was based on the number of casualties (i.e. persons rescued without injuries, persons rescued with injuries and persons deceased) which were reported for each incident type between 1 April 2019 and 31 Mar 2024 in the Incident Recording System (Question 2.3 – What was the incident type when the call was received by the control room?).

All three data series of casualties were independently examined using "bucketing" method previously described (please see Incident Likelihood section) and assigned in order from the most to the least severe consequences (from top to the bottom).

The Incident Consequences were established in a following manner:



Description

- High number of injuries and fatalities, fewer rescues.
- Many injuries, some rescues and multiple fatalities.
- Higher number of injuries, moderate rescues and few fatalities.
- Some injuries, significant number of rescues and few or no fatalities.
- Few or no injuries, mostly rescues and no fatalities.

Please note that out of 97 incident types available in the IRS, 65 were actually used for classifying calls during the last five fiscal years and their frequencies are listed below:

Incident type at Control (IRS)	Rescues	Injuries	Fatalities
Consequence: High			
Rescues – RTC persons trapped (small vehicles)	303	1220	53
Humanitarian or Assistance – Assist other agency	494	690	147
Hazardous Material – Vehicle leaking fuel	115	673	8
Rescues – Rescue from water	629	50	45
Consequence: Medium High			
Rescues – Rescue from entrapment	483	131	7
Rescues – Persons locked in	341	29	2
Fire – Persons	52	130	19
Rescues – RTC persons trapped (large vehicles)	27	113	16
Fire – Building	12	108	0

Methodology continued
Incident Consequence

Incident type at Control (IRS)	Rescues	Injuries	Fatalities
Consequence: Medium			
Rescues – Lift persons shut in	263	1	0
Humanitarian or Assistance – Flooding	134	4	2
Fire – Vehicle small	12	68	1
Rescues – Building collapse	16	61	2
Fire – Fire	22	48	0
Hazardous Material – Gas involved	19	33	6
Rescues – Suicide attempt	46	8	1
Hazardous Material – Haz mat major	6	41	6
Humanitarian or Assistance – Persons locked out	42	5	2
Rescues – Rescue from height	28	10	0
Fire – Persons on fire	2	22	1
Rescues – Boat rescue	21	0	0
Fire – Aircraft light	1	3	2
Hazardous Material – Unidentified smell	2	0	3
Rescues – Railway accident	0	2	3
Consequence: Medium Low			
Alarms – AFA	14	26	0
Fire – Fire now out	3	14	1
Fire – Fire in the open – small	0	14	0
Rescues – Rescue from mud	10	3	0
Humanitarian or Assistance – Advice given	6	3	0
Fire – Caravan / camping	2	5	0
Hazardous Material – Suspicious powder	3	1	1
Rescues – Animal rescue large	0	5	0
Fire – Barn	0	4	0
Humanitarian or Assistance – Dangerous structure	0	2	0
Humanitarian or Assistance – RTC	0	2	0
Consequence: Medium Low			
Fire – Boat	0	4	0
Fire – Electrical installations	0	2	0
Hazardous Material – Leaks	0	2	0
Explosion – Explosion	0	1	0
Fire – Chimney	0	1	0
Fire – Fire in the open – large	0	1	0
Hazardous Material – (H10) Hazard Zones	0	1	0
Rescues – Animal rescue small	1	0	0

Methodology continued
Incident Consequence

Incident type at Control (IRS)	Rescues	Injuries	Fatalities
Rescues – Rescue from confined space	1	0	0
Rescues – Rescue from entrapment (non-emergency)	1	0	0
Alarms – Fire alarm at FRS property	0	0	0
Alarms – Gas alarms	0	0	0
Alarms – Smoke alarm	0	0	0
Civil Disturbance / Unlawful Act – Bomb confirmed	0	0	0
Civil Disturbance / Unlawful Act – Bomb suspected	0	0	0
Civil Disturbance / Unlawful Act – Civil disturbance	0	0	0
Fire – Abandoned call	0	0	0
Fire – Building thatched	0	0	0
Fire – Chimney thatch	0	0	0
Fire – Cylinder other	0	0	0
Fire – Derelict property	0	0	0
Fire – Late fire call	0	0	0
Fire – Railway embankment	0	0	0
Fire – Railway train passenger	0	0	0
Fire – Road furniture	0	0	0
Fire – Smoke in the open	0	0	0
Fire – Vehicle large	0	0	0
Humanitarian or Assistance – Boat stability	0	0	0
Humanitarian or Assistance – Fire safety issue	0	0	0
Humanitarian or Assistance – Supply water	0	0	0

Methodology continued
Incident Type Matrix

The final incident type assessment was established by the application of the Matrix (where Incident Likelihood was multiplied by Incident Consequence giving a score:

Matrix		Consequence				
		1	2	3	4	5
Likelihood	1	1	2	3	4	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25

Incident type at Control (IRS)	Likelihood	Consequence	Score	Category
Rescues – RTC persons trapped (small vehicles)	4	5	20	Medium High
Humanitarian or Assistance – Assist other agency	4	5	20	Medium High
Hazardous Material – Vehicle leaking fuel	4	5	20	Medium High
Fire – Building	4	4	16	Medium High
Rescues – Rescue from water	3	5	15	Medium
Fire – Vehicle small	4	3	12	Medium
Fire – Fire	4	3	12	Medium
Humanitarian or Assistance – Flooding	4	3	12	Medium

Methodology continued
Incident Type Matrix

Incident type at Control (IRS)	Likelihood	Consequence	Score	Category
Fire – Persons	3	4	12	Medium
Rescues – RTC persons trapped (large vehicles)	3	4	12	Medium
Rescues – Persons locked in	3	4	12	Medium
Fire – Fire in the open – small	4	2	8	Medium Low
Hazardous Material – Gas involved	3	3	9	Medium Low
Alarms – AFA	5	2	10	Medium Low
Fire – Fire now out	3	2	6	Medium Low
Rescues – Lift persons shut in	3	3	9	Medium Low
Hazardous Material – Haz mat major	2	3	6	Medium Low
Fire – Persons on fire	2	3	6	Medium Low
Rescues – Suicide attempt	3	3	9	Medium Low
Hazardous Material – Unidentified smell	3	3	9	Medium Low
Rescues – Animal rescue large	3	2	6	Medium Low
Fire – Barn	3	2	6	Medium Low
Humanitarian or Assistance – Dangerous structure	3	2	6	Medium Low
Rescues – Building collapse	3	3	9	Medium Low
Rescues – Boat rescue	2	3	6	Medium Low

Methodology continued
Incident Type Matrix

Incident type at Control (IRS)	Likelihood	Consequence	Score	Category
Rescues – Rescue from height	2	3	6	Medium Low
Fire – Aircraft light	2	3	6	Medium Low
Humanitarian or Assistance – Persons locked out	3	3	9	Medium Low
Fire – Late fire call	1	1	1	Low
Rescues – Rescue from entrapment	1	4	4	Low
Fire – Road furniture	2	1	2	Low
Fire – Chimney	3	1	3	Low
Fire – Smoke in the open	3	1	3	Low
Hazardous Material – Suspicious powder	2	2	4	Low
Hazardous Material – Leaks	3	1	3	Low
Rescues – Animal rescue small	3	1	3	Low
Humanitarian or Assistance – Fire safety issue	2	1	2	Low
Fire – Railway embankment	2	1	2	Low
Fire – Vehicle large	3	1	3	Low
Fire – Caravan / camping	2	2	4	Low
Rescues – Rescue from mud	2	2	4	Low
Fire – Cylinder other	2	1	2	Low

Methodology continued
Incident Type Matrix

Incident type at Control (IRS)	Likelihood	Consequence	Score	Category
Fire – Electrical installations	3	1	3	Low
Fire – Derelict property	2	1	2	Low
Fire – Boat	2	1	2	Low
Humanitarian or Assistance – Advice given	2	2	4	Low
Humanitarian or Assistance – Boat stability	2	1	2	Low
Fire – Fire in the open – large	2	1	2	Low
Explosion – Explosion	2	1	2	Low
Rescues – Railway accident	1	3	3	Low
Hazardous Material – (H10) Hazard Zones	1	1	1	Low
Fire – Building thatched	1	1	1	Low
Rescues – Rescue from confined space	1	1	1	Low
Alarms – Smoke alarm	1	1	1	Low
Humanitarian or Assistance – RTC	1	2	2	Low
Fire – Chimney thatch	1	1	1	Low
Alarms – Gas alarms	1	1	1	Low
Fire – Railway train passenger	1	1	1	Low
Fire – Abandoned call	1	1	1	Low

Methodology continued

Incident Type Matrix

Incident type at Control (IRS)	Likelihood	Consequence	Score	Category
Rescues – Rescue from entrapment (non-emergency)	4	1	4	Low
Alarms – Fire alarm at FRS property	1	1	1	Low
Civil Disturbance / Unlawful Act – Bomb suspected	1	1	1	Low
Civil Disturbance / Unlawful Act – Civil disturbance	1	1	1	Low
Humanitarian or Assistance – Supply water	1	1	1	Low
Civil Disturbance / Unlawful Act – Bomb confirmed	1	1	1	Low
Rescues – Ship sinking	1	1	1	Low

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