

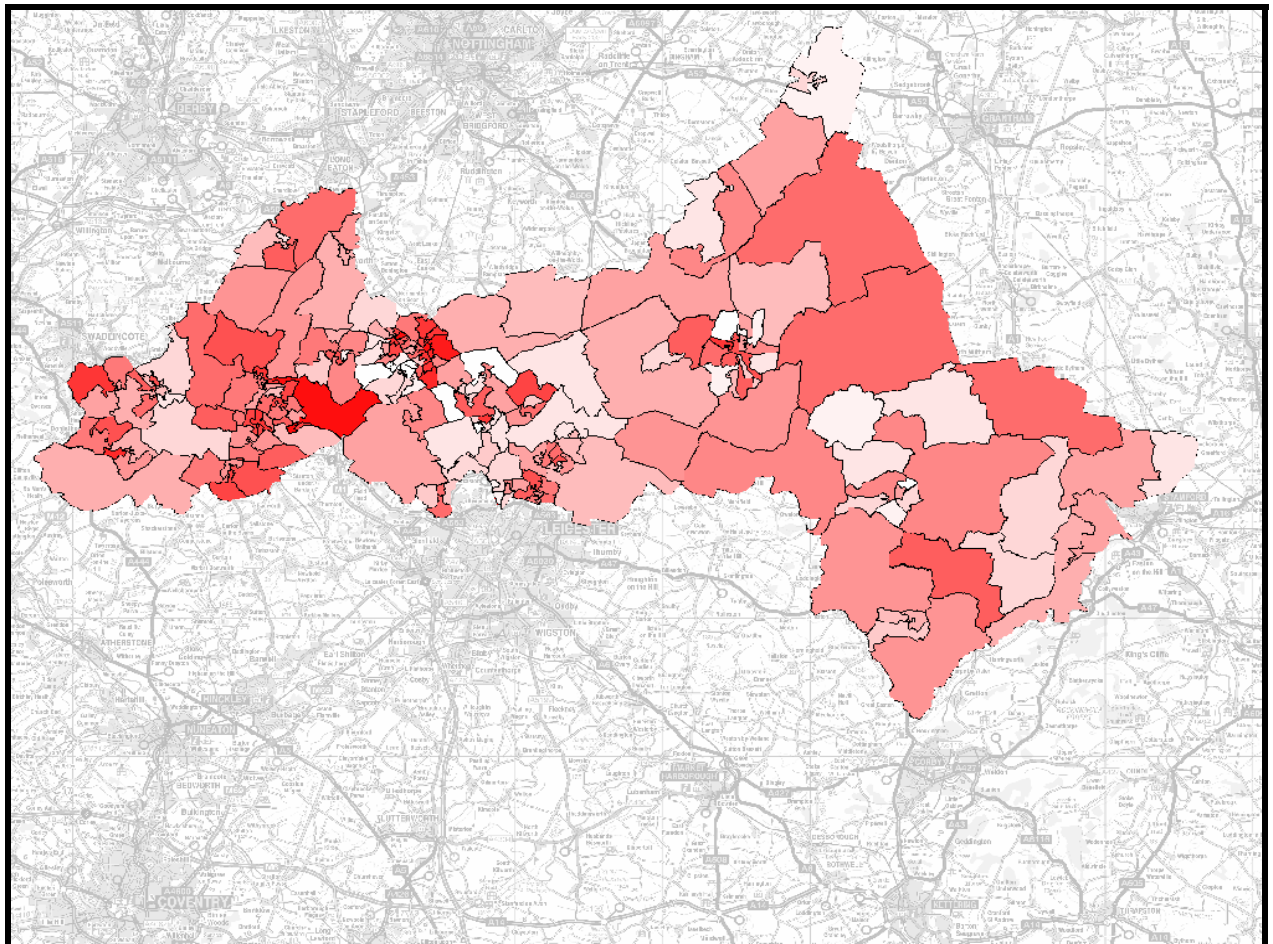
LEICESTERSHIRE

FIRE and RESCUE SERVICE

NORTHERN REVIEW

FOR

IRMP 2008



EXECUTIVE SUMMARY

The Northern Review was conducted to examine, in some depth, our understanding of the inherent risk and current station deployment within the area of North Leicestershire and Rutland (target area).

The project aim was to challenge the status quo and determine where service improvements may be possible.

Additionally, the project has informed the development of our attendance standard and provided an improved understanding of how community safety interventions might be tailored for specific risk areas. The setup of tools, data and skills will enable LFRS to drive an improved targeted programme of community safety activities based on at risk groups.

Having embarked on this project it soon became clear that LFRS needed to review data quality, analysis tools, techniques and skills to effect a sound and robust approach to evaluating current provision; with a view to developing improved predictive methods and modelling to drive decisions about emergency cover.

Now that a sound platform and associated methodology has been developed, it is recommended that LFRS maintain progress to further analyse and assess options that exist around vehicle and station deployment. Professional judgement must be informed by a sound evidence base and to have reached conclusions based on limited data and unsafe models would have led to exposure of the Service and the public. LFRS is therefore now better placed carry out options appraisals and to stand by subsequent decisions based on the activity and progress of this project.

It should be noted that the actions completed and ongoing in this area will also ensure that LFRS is better placed to meet the requirements of additional drivers such as data provision to Regional Control Centre (RCC) as part of the FiReControl project and sharing data with partners for Local Area Agreement (LAA) purposes.

This report concludes with recommendations relating to areas to be developed further; and it is recommended that steps (phase 2) be taken to carry out a thorough interpretation of the outcomes.

BACKGROUND

1. LFRS had identified the need to enhance our IRMP with improved risk analysis/evidence base for decision making.
2. The assumption has been made that the data categories, thinking and tools used and developed within the review of the Northern area can be used in similar reviews of the Central and Southern areas of the Service.
3. The acquisition of land in the Birstall area provides the opportunity to build a new fire station – the effect on neighbouring stations needed to be understood.
4. The Northern Review forms part of the Combined Fire Authority Integrated Risk Management Plan and the 2007 – 2010 Action Plan.
5. The project contributes to Aim 2 outlined in Strategic Aims of the CFA 2007 – 2010 Improvement Plan ‘ Achieving excellence in Response and Intervention’
 - a. Objective 2 : ‘By September 2008 we will have refined our range of response standards applicable to all incident types’.
 - b. Objective 3 (part) : ‘By April 2008 we will have completed a review of the risk associated with the North of Leicestershire and Rutland’.
 - c. Objective 3 (part) : ‘By April 2010 we will have completed our plans to develop a new fire station...’ in the Birstall area.

PROGRESS AND RESEARCH

Risk Analysis and associated tools

Considerable progress has been achieved in the following areas:

Base Dataset

It was essential that a base dataset be determined, validated, aligned and used consistently to underpin analysis in the Fire Services Emergency Cover Toolkit (FSEC), the Cadcorp GIS mapping system and Access and Excel for data manipulation. The base dataset derived covers the period 1st January 2003 to 31st December 2007. Covering a period of five years, the base dataset is considered to be of sufficient size and duration to allow for robust analysis.

Fire Services Emergency Cover (FSEC) Toolkit

The FSEC Toolkit is managed by the Strategic Planning and Performance Team. In November 2007 the toolkit was assessed by the Mott MacDonald 'Health Check'. The resulting report has been thoroughly reviewed and the recommendations therein have been resolved. This means that the FSEC tool is now calibrated and configured to allow for modelling to commence generating outputs in the dwellings and special services modules. The Other Buildings module requires further development activity - see Other Buildings section on page 8.

Incident Activity

Thorough analysis of incident activity across the whole county and specifically the Northern area has been completed. This analysis includes time series (by day, month and time), station and incident category breakdown and detailed dwelling fire cause and location study.

Road Network

FSEC performs its calculations based on the underlying road network. The network has been edited extensively, with main emphasis being placed on the motorways, A class and B class roads to ensure that the time taken to arrive at road junctions along the routes is reflective of real life travel time and distances. This means that when the model is run the outputs can be considered to be valid on the major routes. There is still work to be completed on detailed areas such as one way streets and vehicle restriction zones in the major towns and city. However, this is an area that can continue to be refined over time. This activity has improved the outputs generated for the ten minute travel time screen shots. These illustrate the area that can be covered by fire stations based on a ten minute time span including the turnout time of the station.

Socio-demographics

FSEC Risk proxy

Socio-demographic factors are a key risk proxy for consideration in any risk analysis process. Embedded within FSEC are Potential Risk Factors (PRF) from national fire research. The risk groups are made up of households that comprise:

- Lone pensioners
- Rented accommodation
- Single parent families
- Limiting long term illness

Screenshots of the locations of these risk factors have been produced in the target areas. It is evident that there are some station areas that have low levels of risk in the locale. The following grid identifies the risk proxy present in each target area.

STATION	Lone Pensioners	Rented	Single parent	Limiting long term illness
Loughborough	Y	Y	Y	Y
Melton Mowbray	Y	Y	Y	Y
Syston	Y	Y	Y	Y
Coalville	Y	Y	Y	Y
Ashby de la Zouch	Y	Y	N	Y
Moira	Y	Y	N	Y
Shepshed	N	Y	N	N
Oakham	Y	Y	N	Y
Uppingham	Y	N	N	Y

Key

	Relatively high levels
	Average levels
	Below average levels
	No levels present

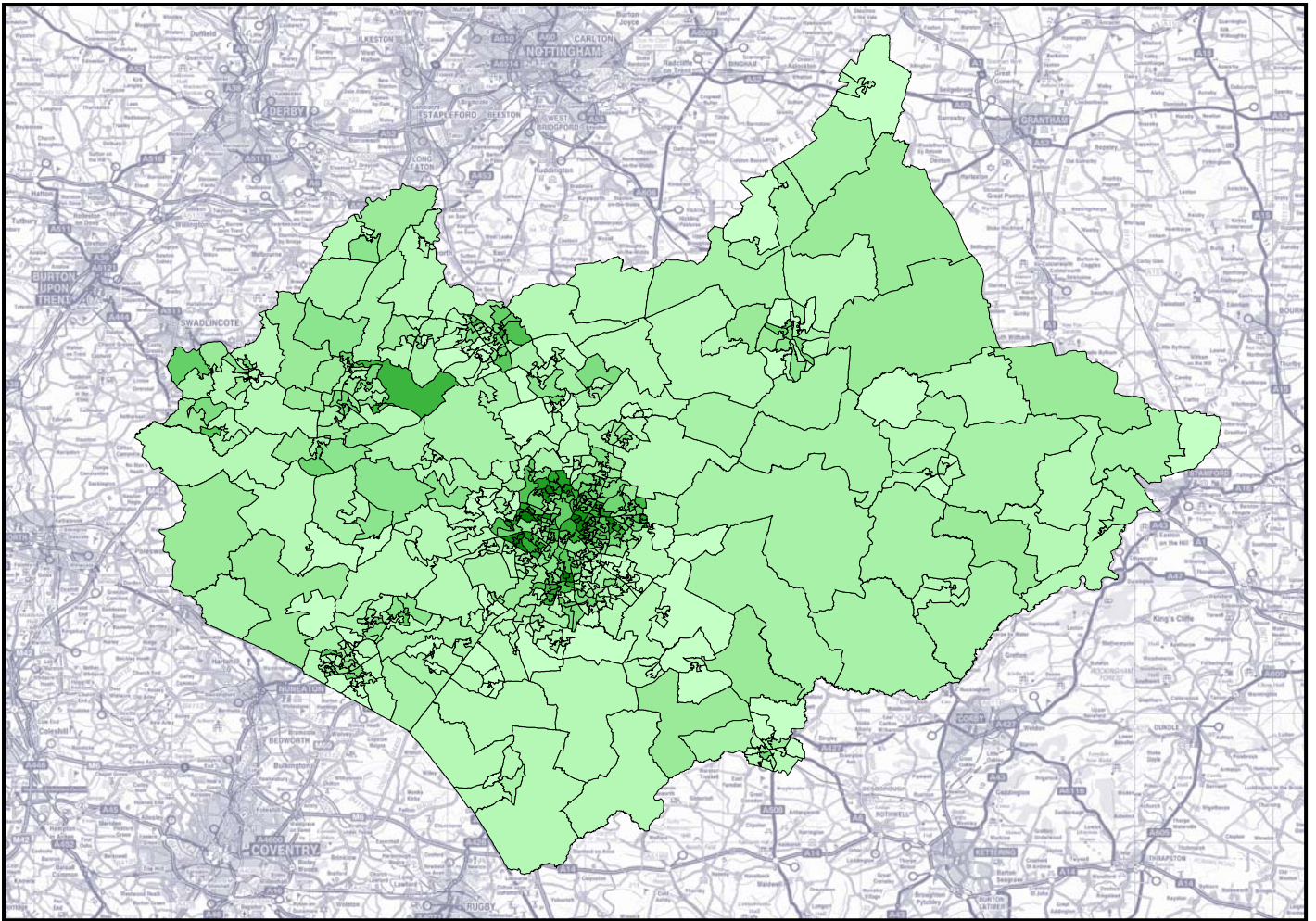
Consideration should be given as to the effect on communities of any proposed changes to station configuration. Additionally this risk grid can be used to target risk communities in the area.

Indices of Multiple Deprivation

Overall levels of deprivation in the county are low. The Northern area of the county is a relatively affluent and rural location with only a few pockets of deprivation evident, mainly in the areas of urbanisation such as Loughborough and Charnwood.

Leicestershire County Council have produced a thorough assessment of deprivation and the document can be located at www.leics.gov.uk/statistics

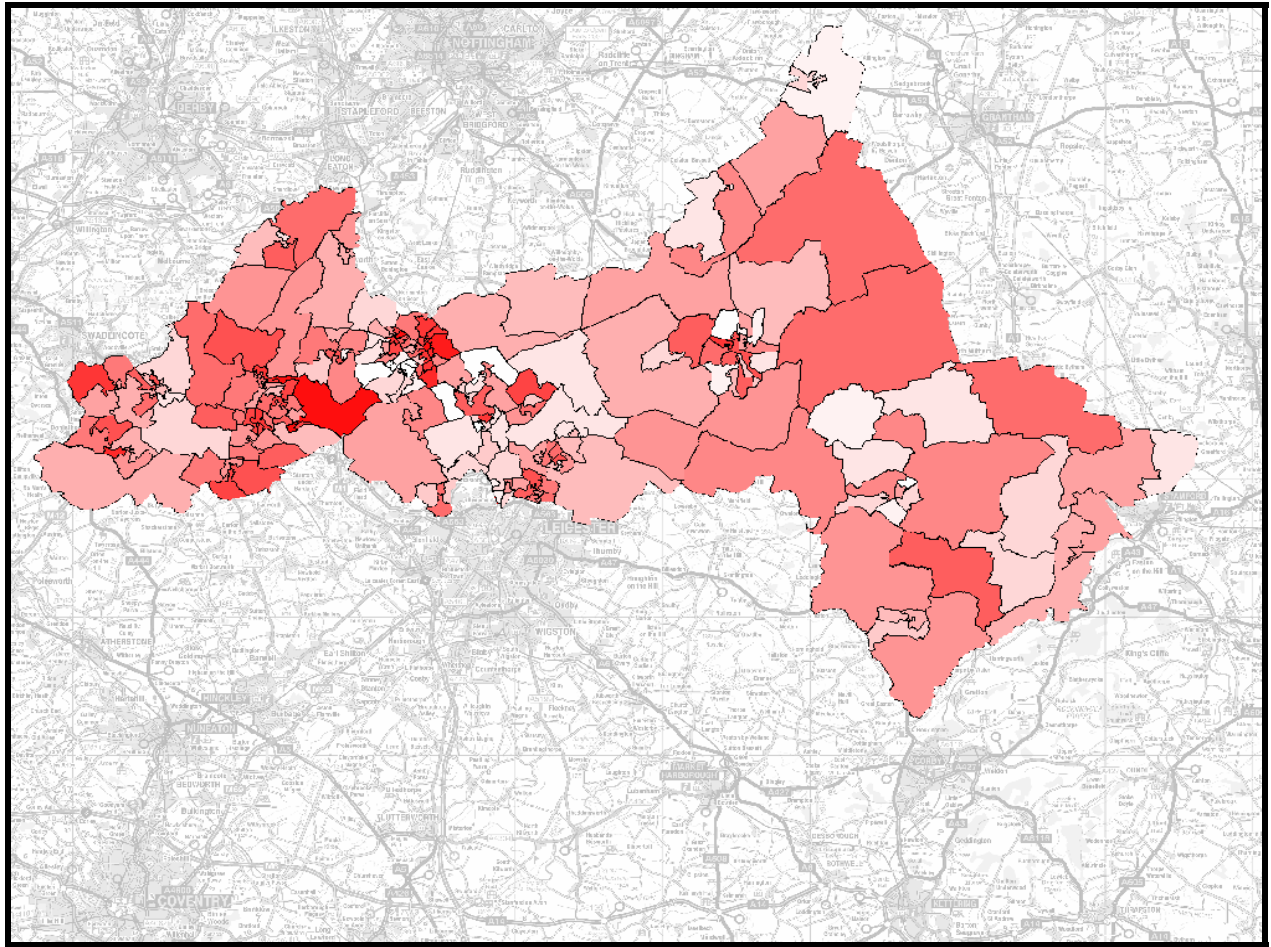
An analysis of IMD scores is included here as an overview.



Indices of Multiple Deprivation (IMD) for Leicestershire.

This map uses the Indices of Multiple Deprivation data to indicate the deprivation rank for each LSOA. There are over 600 LSOAs in Leicestershire, and these have been ranked 1-606, in accordance with their overall IMD score. The darker the green, the greater the deprivation. The map shows that the following areas are more deprived when compared to the rest of the county:

Central Leicester Coalville Loughborough



Indices of Multiple Deprivation (IMD) for the Northern Group.

This map uses the Indices of Multiple Deprivation data to indicate the deprivation rank for each LSOA within the North Group.

The darker the red the higher the level of deprivation. The map shows that the following areas are the most deprived within the Northern Group:

- Central Melton
- Coalville
- Whitwick
- Loughborough
- Western side of Ashby De La Zouch (in particular Blackfordby and Norris Hill)

Mosaic

LFRS has recently procured the Experian Mosaic dataset which will greatly enhance granularity of focus and enable the service to break down these risk factors into greater detail. For example, risk in relation to rented accommodation is more closely correlated to social rented rather than private rented. Mosaic analysis is a pending activity and so has not been included in this document. It is recommended that Mosaic analysis drives and becomes an integral part of targeted community safety activity and initiatives.

Other Buildings

Societal risk should be considered in any risk analysis, particularly as a major drain on resources comes from large scale make up incidents in this category. There is currently limited data available in FSEC and the CFRMIS Fire Safety databases that can be used to analyse and assess the impact of proposed changes to inherent commercial and risk premises. FSEC contains a dataset derived from Valuation Office data to give a broad view of risk. However, the attributes are yet to be completed that define the risk for individual premises. Consequently, risk areas and groups generated by the algorithms for the other buildings module, are also outstanding. The outputs generated by the modelling runs are therefore not yet fully robust. It is recommended that LFRS begin to collect data either manually or through import from CFRMIS to refine the understanding and collation of data to support improved modelling in this area.

Costs

Financial and budgetary information has been provided to update the costings required for FSEC. These figures currently lack face validity and require further examination.

Operational Availability of Resources

A clear understanding of retained availability through management information has been difficult to source for the purposes of the review. A station's influence on cover and the effect of cost in relation to availability is therefore not available. It is recommended that LFRS address this issue in order to refine outputs. Currently all stations are modelled as being fully available, but the 'ground truth' is that this is not the case. It is recommended that robust data systems should be evaluated to support configuration of FSEC and to make valid assessments of the impact of availability on vehicle and station deployment.

CLG Research paper

Communities and Local Government have recently published a research paper 'Analysis of Fire & Rescue Service performance and outcomes with reference to population and socio-demographics' (Research Series 9/2008). The study contains a refresh of socio-demographic factors derived from Census and Indices of Multiple Deprivation that contribute to the likelihood of fire in the home. This recent study demonstrates an improvement on the previous risk factors from:

- a) Lone pensioners
- b) Single parents
- c) Limiting long term illness
- d) Rented

to:

- a) Single parents
- b) Never worked
- c) Caribbean/African and other black
- d) Single adult household

Deprivation is still a factor when associated with the factors above. As this intelligence is newly published it is recommended that socio-demographic factors be re-assessed for the County before any revision of deployment be progressed.

The risk models created by CLG involve Census, IMD and a combined model. Within the report (RS 9/2008) are charts and graphs that demonstrate the position of LFRS performance against national average and each model prediction. It is suggested that current intervention provision is good in all models against both measures. In the following graphs, LFRS is FRS 24.

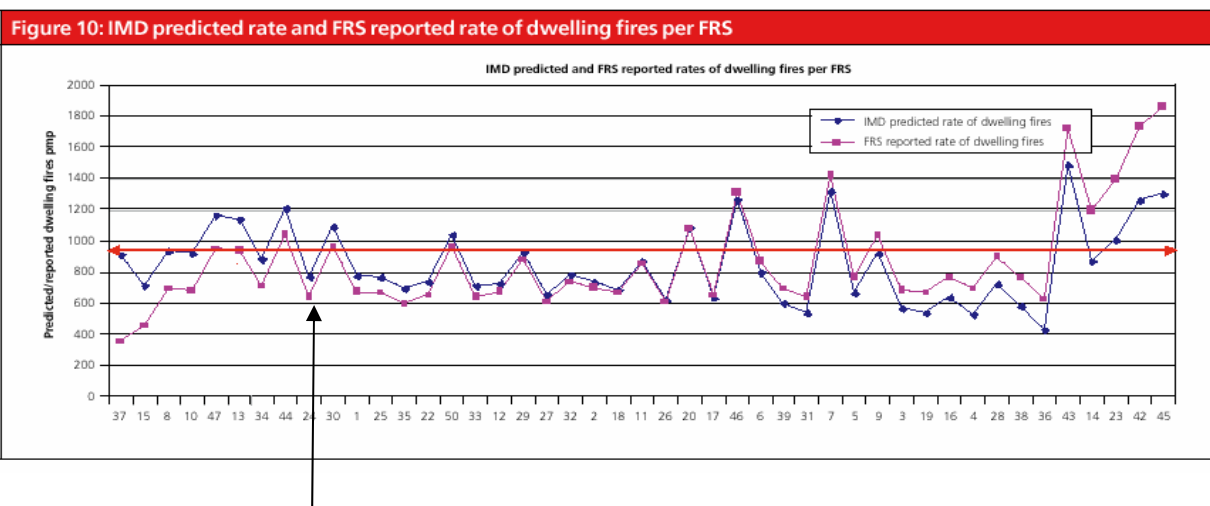
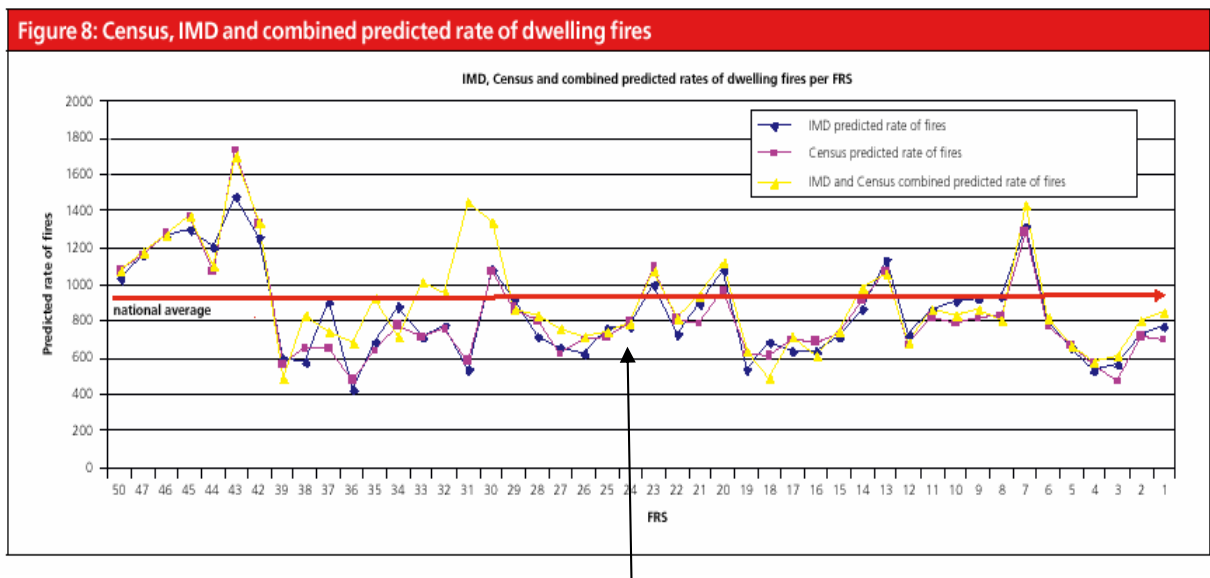
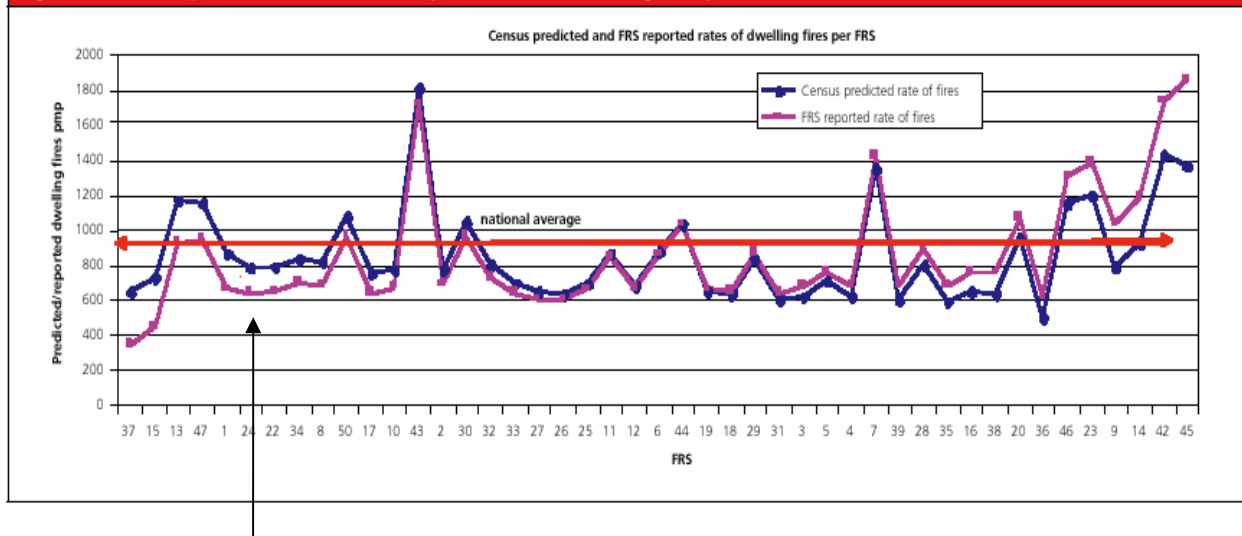


Figure 11: Census predicted rate and FRS reported rate of dwelling fires per FRS



The full report can be located at

www.communities.gov.uk/publications/fire/frsperformanceanalysis

FSEC Model Runs

A series of scenarios have been modelled using FSEC to commence alteration of station deployment options to generate a cost benefit spreadsheet. The results produced can be used to assess the effect of change in terms of changes to predicted figures in the following modules:

- Dwelling fatalities
- Other Building fatalities
- Special Service fatalities
- Other Building property damage
- Total FRS cost
- Number of additional lives saved
- Net additional cost
- Overall cost
- Overall cost difference

When measured against the base case [deployment as it currently is], we are able to quantify the effect of any proposed changes. The results should be used as a signpost to identify options for change.

CONCLUSIONS

Considerable effort has been invested in developing datasets and configuration activity to enable LFRS to analyse activity and risk in the Northern area in a robust and data driven environment. This document describes some of the outputs available to inform the decision making process. As expected, the Northern Review has raised as many questions as it answers but it is hoped that this document will be used to identify and take forward a number of station and vehicle deployment options for further study.

Currently LFRS does not have the tools and skills to assess workload impact on capacity and performance. Where a change to stations is considered, an assessment of the effect on surrounding stations in terms of increased or decreased activity would need to be carried out. Simply put, if a station is being considered for change then the incidents that would have been dealt with by that station would need to be attended by others, including 'over the border' stations.

Throughout this project, staff have developed their expertise and understanding of data and tools and have produced some useful and informative analysis. This needs to be built upon and driven by questions at strategic level to direct further study.

The data and understanding derived through this project suggest that indicative areas for further study include the permutations set out in the recommendations below.

RECOMMENDATIONS

VEHICLE DEPLOYMENT

- In respect of strategic emergency cover, Corporate Management Board consider there to be no case for a reduction in the overall level of operational resources. Detailed consideration of likely planning scenarios and recent operational events demonstrate that gross levels are at about optimum for 'normal' operations within Leicestershire and Rutland.

However, in respect of demand led emergency cover, an assessment of current outputs from Northern Review identifies a number of deployment options to take forward to stage two.

The following scenarios should be examined to quantify overlap with adjacent stations and the levels of residual risk if any overlaps are removed; and to quantify where strategic (distributive) cover can be improved, at the same time reducing local risk.

Removal of Shepshed station
Removal of Moira station
Make Melton <u>Wholetime (WT)</u>
Make Melton <u>Day Crewed (DC)</u>
Make Melton WT & DC
Make Oakham DC & <u>Retained</u>
Make Oakham DC 2 pump
Make Oakham <u>Retained</u> 2 pump
Make Oakham WT 1 pump
Birstall WT 1 pump (Syston removed)
Birstall DC 1 pump (Syston removed)
Birstall Ret 1 pump (Syston removed)
Birstall WT 1 pump - Loughborough Retained removed
Birstall DC 1 pump - Loughborough Retained removed

CREWING OPTIONS

- Build fully costed data inputs to support analysis and modelling of alternative crewing options, including nucleus crewing, and Low Levels of Activity and Response Stations (LLAR).

MANAGEMENT INFORMATION

- Provision of station and crewing costs is not readily available – maintain management information to enable accurate and timely cost assessments to be made.
- Retained crewing availability is not accurately captured – put in place a process to capture and analyse the impact of crew availability in relation to true costs per station.
- Assess station grounds and first attendance optimisation.
- Build up station profiles to provide station managers with relevant assessments of incident activity and causes in their specific area – including risk information, performance and socio-demographics.
- Re-visit socio-demographic risk factors based on CLG Research paper ‘Analysis of Fire & Rescue Service performance and outcomes with reference to population and socio-demographics’ (Research Series 9/2008).

SKILLS

- Build up resilience of skills [esp. cross directorate] to enhance robust modelling and analysis techniques.

FSEC

- Further refine data inputs into FSEC in the following areas:
 - Costs for individual stations to replace the generic costs used currently
 - Add station availability to take account of consistent time periods where appliances are not available.
 - Add incident data annually to utilise a rolling five year dataset.
 - Refine road network setup with actual travel time data derived from incident history.
 - Collect data for the Other Buildings Module – manually at first and move towards export from CFRMIS software.
- Add Mosaic data into FSEC to enable comparison with FSEC socio-demographic risks and improve targeted initiatives.

MOSAIC

- Commence analysis of incident data against recently acquired Mosaic data to produce a profile of at risk groups to drive community safety initiatives and targeted strategies.

- Assess impact of modelled station and vehicle deployments on risk groups.

WORKLOAD

- Assess options relating to workload modelling to supplement and complement risk modelling in FSEC.

NORMALISATION

- Develop processes, tools and techniques to add influence of normalisation factors, such as households and population, to enhance comparison of 'like for like' and eliminate spiking of areas of increased activity due to population.