

November 2021

# Data Analysis and Modelling

Gemma Polmear



# Agenda

- **Introduction**
- **Analysis within Emergency Services**
- **What can Cadcorp offer?**
- **Example projects and work packages**
- **Summary and benefits**

# Introduction

- **UK emergency services have a wide range of obligations**
  - Front line response
  - Community engagement/prevention
  - Protection and enforcement
  - Risk management planning
- **Increased pressure on resources**
  - Budget cuts
  - Evolving statutory requirements
- **Crucial to align resources to risk**
  - Justified, data-driven, intelligence-led approach

# Analysis within Emergency Services

- **Location is key**
  - Combine data sources for powerful analysis, modelling and visualisation
- **All stages of the incident life cycle**
  - Mobilisation
  - Incident command
  - Fire investigation
  - Trend analysis
  - Quantification of risk
  - Modelling operational changes

## Cadcorp

Fire and rescue services benefit from independently performed, tailor-made risk and workload modelling

**U** K fire and rescue services have an extensive range of obligations. These extend from front-line response, covering a wide variety of incident types, to community engagement/prevention work, fire investigation, and protection and risk management planning. With budget cuts and increasing pressure on resources, alongside evolving statutory requirements and inspections by Her Majesty's Inspectorate of Constabulary and Fire & Rescue Services (HMICFRS), it has never been so crucial for fire services to align resources to risk. It is imperative to take a justified, data-driven, intelligence-led approach to response, planning, decision making and evaluation. Location lies at the heart of fire and rescue resource planning, risk analysis and strategic management. Using a Geographic Information System (GIS), spatial data can be combined with other data sources to create powerful applications for analysis, modelling and visualisation. Applications and data products can be created and developed to support all stages of an incident life cycle. These can range from mobilisation in the control room through to incident command on the fireground and fire investigation, to later analysis patterns, quantify risk and model operational changes. Cadcorp works with a combination of both fire service and Ordnance Survey data to create detailed, bespoke risk models, ranging from geographical areas to individual addresses. Your organisation could be looking to create an overall review of community risk, make a strategic assessment of resource locations, model degradation scenarios, or prioritise the order in which addresses should be targeted for interventions. If so, you can benefit from Cadcorp's expertise and experience within both fire and rescue and GIS. An auditable, intelligence-led approach can provide a strong base against scrutiny and allows metrics for internal evaluation moving forwards. Cadcorp services and software are used for but are not limited to:

- **Command and Control Data:** for more efficient and accurate mobilising. Road speed modelling, turnout times, backup systems for dynamic mobilising systems
- **Incident Management:** geographical data on the fireground, delivered on mobile devices
- **Cover Modelling:** static and dynamic operational coverage, with consideration for underlying risk
- **Resource Optimisation:** degradation planning, optimal resource locations and attendance time analysis
- **Scenario Modelling:** assessing the impact of changes in shift patterns, duty systems, appliances and station locations
- **Response Standard Analysis:** blanket or variable standards, aligned to risk
- **Integrated Risk Management Planning/Community Risk Assessment:** holistic area profiling, risk modelling at property and area level
- **Targeting and Prioritisation:** for prevention and protection activities, audits, Safe and Well visits
- **Community Campaigning:** area profiling for targeting community events
- **On-Call Recruitment:** geographical and workforce profiling around on-call fire stations
- **Evaluation:** post-change analysis of operational impact
- **Information Dissemination:** for internal and public consumption



◀ Location lies at the heart of fire and rescue resource planning, risk analysis and strategic management.



◀ Risk models range from geographical areas to individual addresses.

Ordnance Survey data images are reproduced from Ordnance Survey ©L with permission of Her Majesty's Stationery Office. © Crown Copyright and database right. 2021/05 00002526

Contact Cadcorp to discuss any ideas or requirements at your organisation. Our team of specialists can provide both a quality assurance service, or full project consultancy that is tailored to best meet your organisational requirements. Cadcorp understands that collaboration between fire services is key. We run an active customer community and host UK Emergency Services conferences. To learn more about the next event, go to <https://cdcp.io/es21>

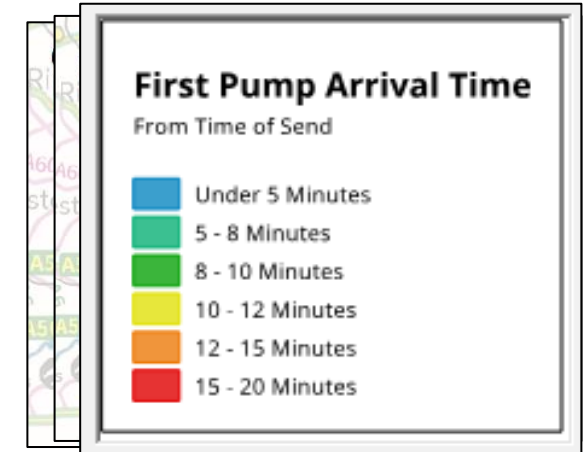
For more information, go to <https://www.cadcorp.com/>

# What can Cadcorp offer?

- **Bespoke work packages**
  - Advice and support
  - Quality assurance
  - Full project consultancy
- **Data processing and analysis**
- **Risk analysis**
- **Modelling**
- **Evaluation**

# Data Processing and Analysis

- **Road network and road speeds**
  - Modelled attendance times
  - Coverage mapping
  - Order of turnout
- **Response time analysis**
  - Setting or measuring against response standards
- **Analysis for recruitment**
  - Profiling and mapping on-call staff



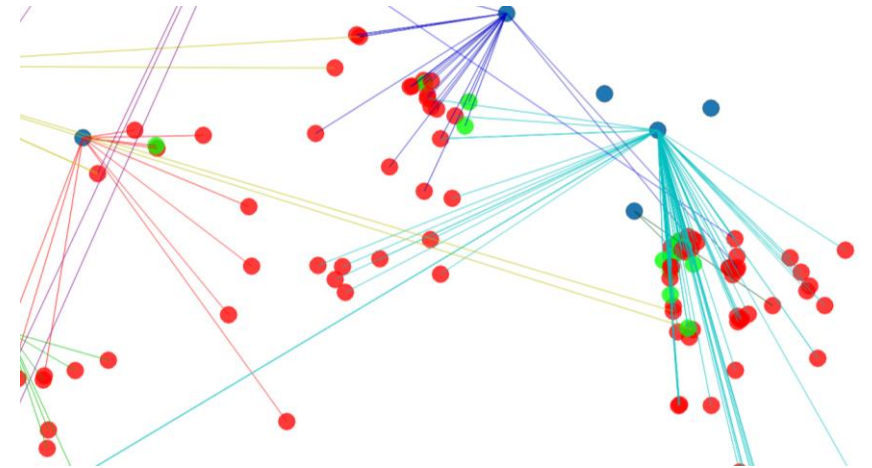
# Risk Analysis

- **Geographical risk mapping**
  - By area
  - By household
  - By premises
  - Targeting, prioritisation, alignment of resources
- **Risk indices**
  - Comparative risk for different categories
    - Sociodemographic classification
    - Household composition
    - Property type



# Modelling

- **Resource optimisation**
  - Degradation planning
  - Resource locations
- **Scenario modelling**
  - Assessing the impact of changes
    - Shift patterns
    - Duty systems
    - Appliances
    - Station locations





# Evaluation

- **Post-change analysis of operational impact**
  - Attendance times
  - Coverage
  - Impact on modelled risks
- **Assessment of alternative methodologies**
  - Impact of assumptions
  - Comparisons of data inputs

# Summary and Benefits

- **Tailored work packages**
  - Integration of a range of datasets
  - Support and advice, quality assurance, full consultancy
  - Attention to detail
- **Auditable, data-led approach**
  - Strength against scrutiny
  - Metrics for internal evaluation and performance monitoring
- **Improvements in efficiency**
  - Increased accuracy for mobilising
  - Better prioritisation of resources
  - Precision in predictive metrics

---

# Questions?

---

t. 01438 747 996 | [gemma.polmear@cadcorp.com](mailto:gemma.polmear@cadcorp.com)