Key recommendations from project FIRE21

Frykmer, Tove

2024

Document Version:
Publisher's PDF, also known as Version of record

Link to publication

Citation for published version (APA):
Frykmer, T. (2024). *Key recommendations from project FIRE21*.

Total number of authors:
1

Key recommendations from project FIRE21

Author: Tove Frykmer, Division of risk management and societal safety, Lund University
Lund, 2024-12-19

This document summarises key recommendations from project FIRE21. The recommendations are based on results from 1) professionals through the workshop with Räddningstjänsten Syd (Rsyd) and the Norwegian survey and 2) acquired experiences and knowledge from project members. Details can be found in following reports:

Frykmer, T. (2025). Projekt FIRE21 - Key individual problem-solving qualities in the fire and rescue services: a survey in Norway
https://portal.research.lu.se/sv/publications/projekt-fire21-key-individual-problem-solving-qualities-in-the-fi

Frykmer, T. & Johnson, V. (2024). Projekt FIRE21 - Sammanställning workshops Räddningstjänsten Syd (Rsyd) och Malmö Stad
https://portal.research.lu.se/sv/publications/projekt-fire21-sammanställning-workshops-räddningstjänsten-syd-rs

Iliopoulos, S. & Frykmer, T. (2024). Project FIRE21 - Internal workshop on recommendations
https://portal.research.lu.se/sv/publications/project-fire21-internal-workshop-on-recommendations

Key recommendations from professionals

In the workshop with Rsyd and in the Norwegian survey, we posed the question if they thought that there will be a need for new qualities in the future, and, if so, which. Here, the answers are presented as recommendations on which qualities to prepare for and develop to meet future needs.

Rsyd described that they might have to handle a new generation where individualism may be more important than the collective, which could lead to less efficient collective problem-solving. They further mentioned a need to keep up to date on new knowledge and an ability to collaborate with "new" organisations.

Table 1 below describes suggestions of new qualities in the Norwegian survey (note that it is shortened in relation to the original table).

Table 1. Summary of future qualities.

New qualities needed in the future
Team competence
Communicative qualities, to better collaborate with other agencies and the public.
Leadership education, pedagogical and social competence.
Educating leaders
Future-looking / specific /building technical competence
Important to stay updated. There will be more electrical and hydrogen-based vehicles.
Competence on new energy carriers
More competence on artificial intelligence.
Battery fires and weather-related events will increase.
Increased competence with solar power and car/boat batteries.
Fighting extreme weather
Increased competence on natural events like flooding and landslides, will affect building collapses.
First aid when it comes to gunshot wounds and knife wounds.
Larger battery packs. High voltage in solar power. Larger events at sea.
Increased focus on collaboration, have a common goal. Maybe course on operative psychology and team building.
Increased collaboration between several FRS (focusing on the joint command system).
Society demands closer collaboration between agencies to reach a good level of preparedness in relation to future scenarios.
Focus on societal needs and not on what the FRS can and wants to do.
Increased focus on health, environment and safety to reduce risk for firefighters before and during incidents.
Need for more competence within health and mental problems.
Interdisciplinary competence in the team
Don't forget the team. If the team is built in peacetime, we can adjust to changes in the society.
More and better exercises focusing on communication.
Training on larger and more complicated events with many actors.
Assignments/course/exercises on how groups collaborate.
Need to use drones
Common situation understanding.
Control stress
Risk of qualified people choosing other professions, we will not get the best people like we do today, based on current changes in education (vocational school leading to less heterogenous groups. Competence within electricity/ventilation/plumbing/building construction/mechanics is needed.
Practical competence and practical understanding.

Key recommendations from project members

As part of the project, an internal workshop was organised to brainstorm on potential problems for the fire and rescue services, and recommendations on how to improve the handling of these problems. Table 2 below summarises the recommendations, per so called problem cluster. Also, a potential organisation that could develop the recommendation is suggested, where found relevant.

Table 2. Summary of project recommendations.

Problem cluster	Recommendations	Potential organisation to develop recommendations
Understanding, identifying, solving problems	Developing taxonomies, validate/test with FRS. Develop checklists to be used in emergency call centres, e.g. on which actors to involve.	Research institution in collaboration with FRS FRS
Managing tunnel fires	Use the toll system to monitor type of fuel and cargo entering the tunnel.	
Geographic scope	Develop information technology for early warning systems, and for planning/distributing resources Use drone technology for overview. Look into literature on distributed decision-making/problem-solving, situation awareness, common operational pictures. Develop individuals' communication skills. Test different ways to present information.	Research institutions, private companies, agencies, FRS FRS Research institution in collaboration with FRS FRS Research institutions
Information problems	Look into IT tools/systems for collecting and presenting data, and AI tools for analysing data. Include education on ethical aspects of using such tools. Develop alternative analogue means for data handling to establish independent redundancy in case power grid fails or loss of satellites.	Research institution in collaboration with FRS FRS in collaboration with volunteers/amateur radio groups
Antagonistic threats	Acquire knowledge of antagonistic threats. Develop capabilities for grasping and conceptualising antagonistic threats. Increased collaboration with the Police.	FRS, assisted by research institution and/or security agencies Research institution in collaboration with FRS FRS
Technological challenges	Increase knowledge and training on analogue or "low-tech" communication tools.	FRS in collaboration with volunteers/amateur radio groups

	Introduce "fire mode" in buildings to unlock doors, windows in case of fires.	
	Have knowledge of cell phone coverage.	FRS
	Improve digital competence.	FRS
Structural problems	Closer cooperation between the FRS and city planning departments.	FRS and city planning departments
	Accessibility to building Information Modelling (BIM) and related software in operations.	FRS and local authorities
	Co-location of response actors.	Relevant response actors
	More practice-oriented education for the FRS.	FRS
	Train for key scenarios.	FRS
	Use careful and bottom-up-oriented approach to structural changes. Use a practice-informed SWOT analysis for investigating effects of structural changes.	National emergency management agencies (DSB, DEMA, MSB)
Working under "disturbed" conditions	Increase FRS knowledge and training on analogue or "low-tech" communication tools.	FRS in collaboration with volunteers/amateur radio groups
	Introduce nodes of experts/volunteers who can operate "low-tech" communication tools.	FRS in collaboration with volunteers/amateur radio groups

Following aspects around these recommendations are noteworthy:

- Same typology of recommendations for different problems

Several typologies of recommendations were proposed to address problems of different nature, and, therefore, seem to hold potential. These are: IT solutions to address technological/information challenges, problems related to the geographical scope of events and managing tunnel fires. Education and training, for structural problems, working under disturbed conditions, technological challenges, and antagonistic threats. Knowledge enhancement is also seen as important.

- Solutions create sub-problems

A suggested solution may also create secondary problems, such as overreliance on IT solutions, or co-locating FRS and partner organisations.

- Conceptual vs technical skills

Both kinds of skills are important for the FRS, and ought to be developed in a balanced manner. Conceptual skills are necessary to address the problem cluster of "Understanding, identifying and solving problems", but also to be able to visualise and understand problems related to the cluster of "Geographical scope". Technical skills are at the same time necessary to implement solutions. This type of knowledge is prevalent in the recommendations for different clusters, in relation to the need to enhance education.

- Negative ripple effects of structural changes

When restructuring top-down towards larger and more specialised fire and rescue services, the qualities in the rural fire and rescue services might be lost. Therefore, it is crucial to be aware of how to keep local knowledge and resources crucial for emergency preparedness in small communities when restructuring fire and rescue services from above. Suggestion is to use a bottom-up analysis to investigate possible effects of such changes.

Prioritising recommendations

Following recommendations were seen as most important by the two project participants who suggested how to prioritise recommendations:

Efficient sorting and validation of information as it is vital for improving how we identify, understand, and solve problems. IT and AI developments are useful for assisting in decision-making; however, validation and filtering is important to prevent misinformation or conflicting information.

A wider use of drones as a standardised equipment for FRS. FRS personnel can be further trained in the use of drones and in analysing data and imagery.

More training on "low tech" means of communication. New technologies allow for richer and more comprehensive data transfer; however, they are also more dependent on functioning power grid and satellite systems. These can both be subject to failure and a backup solution needs to be in place. Analogue communication back-up alternatives and relevant skill development can provide a safer means of communicating during the worst-case failure scenario.

The changing risk picture and the operational differences between urban and rural areas imply a difference in the way FRS respond to different types of incidents. An interactive actor map can help navigate a complex landscape of actors involved and the relevant responsibilities and tasks during an incident.