

Proposal to Implement a Medium Term Strategy for Aerial Appliances

BCPL08 –25.05.05

Contents

1	Executive Summary	Page 2
2	Introduction	Page 3
3	Birkenhead Retained System	Page 6
4	Methodology.	Page 8
5	Data collection	Page 9
6	Data analysis	Page 11
7	Conclusion.	Page 14
8	Recommendations.	Page 15

Appendix A - Best Value Considerations leading to a
Medium Term Strategy

Appendix B - Framework of Affordability

1. Executive Summary

Action 2.11 of Merseyside Fire and Rescue Service's year two Integrated Risk Management Plan (IRMP) states that MFRS will *'examine alternate staffing options for the authorities aerial appliance capability and implement changes to staffing supported by that review.'*

It is proposed to implement our medium term strategy for aerials, the first phase of which will be to alter the staffing arrangements for the aerial appliance located at Birkenhead to retained.

This report will demonstrate that Birkenhead's aerial appliance, crewed on a retained basis will, when used in conjunction with the City Centre based aerial appliance, continue to meet our commitment to safeguarding our communities.

In reaching this conclusion historical data concerning some 1900 incidents over a seven-year period has been analysed and assessed. Computer software has been used to enable a prediction of our future operational response based upon historic precedent.

A benchmarking exercise has been carried out with other U.K. fire services with regard to aerial appliance attendance times. The results of this exercise revealed that, of the seven services examined, only one had seen fit to establish specific attendance times and that these were 'within 30 minutes – on request. This benchmarking exercise demonstrates that the commitment to aerial appliance attendance times made within Merseyside Fire and Rescue Service's IRMP far exceeds the commitments considered appropriate by other services serving metropolitan areas in the U.K., and our three neighbouring fire and rescue services.

2. Introduction

Since the advent of integrated risk management planning (IRMP) in 2004, Merseyside Fire & Rescue Service has articulated a number of proposals in relation to the operational provision of aerial appliances. The exhortation of ODPM for Fire and Rescue Service's to ensure that the right resources are in the right place, at the right time applies equally to both 'over provision' and 'under provision'. Extensive analysis of historical incident data had demonstrated that maintaining a fleet of 5 aerial appliances on a whole time basis i.e. permanently crewed 24 hours a day, represented an extremely inefficient use of resources.

During year one IRMP (2004/2005), and after careful risk assessment and analysis, Merseyside Fire and Rescue Service;

- (a). Reduced the fleet of aerial appliances to 4, removing the aerial located at Croxteth Community Fire Station from service.
- (b). Removed aerial appliances from all predetermined attendances.
- (c). Established interim response times for aerial appliances, pending further analysis.

MFRS also expressed an intention to replace two of the remaining aerial appliances with combined pump platform appliances¹ but this proposal was suspended following a suggestion received from operational personnel to make aerial appliances retained.

¹ Effectively a standard pumping appliance with a high reach capability

Medium Term Strategy (3 Years)

Merseyside's aerial appliance strategy is based upon maintaining an ability to provide an aerial appliance for operational purposes at all four corners of a typical building, should the need arise. Analysis of incident data and predictions based upon the historic requirement for aerial appliances demonstrate that, whilst it is important that these four appliances are crewed on a 24/7 basis, the retained crewing system is perfectly adequate to meet the need.

As a consequence of further analysis and a benchmarking exercise relating to the provision of aerial appliances in other fire and rescue services, Merseyside's IRMP Year 2 Action Plan proposes the following actions:

2.8 Evaluate the concept of combined pump platforms

2.11 Examine alternative staffing options for the Authority's aerial appliance capability and implement changes to staffing supported by the outcome of that review

It is proposed that, ultimately, the aerial appliances located at Birkenhead, Eccleston and Southport will be crewed with a variety of crewing systems, including retained, whilst the aerial appliance at City Centre Community Fire Station might be replaced with a combined pump platform, crewed on a whole time basis. Further evaluation is being undertaken to confirm the suitability of these new types of vehicle. It is further recommended that the Authority adopt a response standard for all aerial appliances, which will be that the first aerial will attend within 30 minutes of request.

The proposal to implement a retained crewing system for Birkenhead's aerial appliance is the first phase of the IRMP 2 transition process in respect of this strategy for aerial appliance provision.

APPENDIX 1 (CFO/107/05)

The purpose of this report is to provide a detailed analysis and rationale of the proposal to staff the aerial appliance located at Birkenhead Community Fire Station on a more efficient basis. This report will focus solely upon Birkenhead and aerial appliance cover for the Wirral.

The Authority believes that there is scope to improve the efficiency of Fire and Rescue Services when responding to incidents whilst still maintaining the highest standards.

Merseyside Fire and Rescue Service (MFRS) have a statutory duty to secure continuous improvement and endeavour to achieve best value for its local council taxpayers.

This report will examine aerial appliance crewing arrangements to ensure that MFRS is making efficient and effective use of its resources in this area. The report will explore the possibility of 'using more efficient working practices where appropriate' as recommended in the National Framework Document. A 'Best Value Review' approach has been adopted in developing this medium term strategy and these preliminary considerations are included at Appendix A.

This report assesses historical data and utilises the latest GIS modelling software to investigate whether the proposed changes to aerial appliance crewing are feasible. Benchmarking against other U.K. Fire Services has been undertaken to ensure that our response and cover remain relevant to the risk. They will continue to be amongst the most challenging in the country.

3. Birkenhead Retained System

The proposal is to staff Birkenhead's aerial appliance with appropriately skilled fire fighters on a retained system. We already have significant interest from serving firefighters for working a whole time retained system.

Whole time retained is when whole time fire fighters make themselves available during their off-duty hours to return to duty as and when required.

In this instance all retained personnel must be aerial appliance drivers and they must live, or provide a base, within close proximity to the Birkenhead fire station. The proximity to the station is an essential aspect of the system because personnel are required to respond to the station quickly during the period that they are 'on call'. This ensures that the aerial appliance can be mobilised in the fastest possible time. The retained personnel are issued with an 'alerter' (pager) which they keep about their person at all times when they are 'on call'

How are retained personnel mobilised.

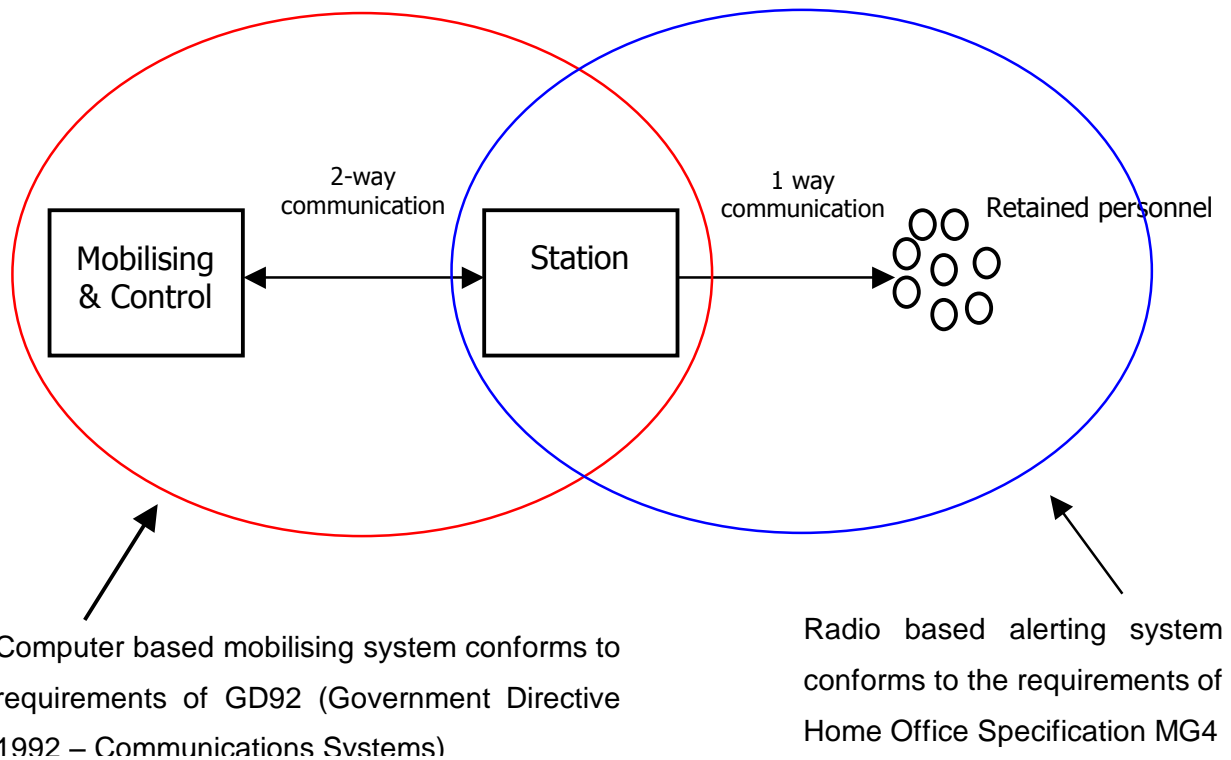
Crews are mobilised to the station via their alerter in the event of a fire call.

The alerter system includes a number of built-in fail-safe features including:

- The alerter system will automatically acknowledge all calls received from the mobilising centre via a 2-way communication facility.
- A complete back up system will be available at the station in the event of a failure.

**APPENDIX 1
(CFO/107/05)**

- The signal strength from the station will be greater than required to compensate for variations in reception caused by buildings, terrain or other local circumstances.
- There will always be more personnel 'on call' than are required to crew the appliance This arrangement provides resilience in the event of unforeseen problems relating to personal emergencies, poor signal etc.
- Spare alerters are available at the station.



Adjustment to Salary

It is proposed that personnel volunteering for the whole time retained system will receive a 15% increment to their salary (currently £3750). This payment will include

- Initial turnout payment
- First hour payment
- 2 hours per week training/standard testing commitment

This payment is significantly above the nationally recommended payment and reflects a commitment to introducing greater flexibility through retained working.

4. Methodology

Research.

1. All incident data was gathered from the MFRS incident reporting system (FIRES). The data collected and analysed related to every aerial appliance incident attended in the past seven years. This report assumes that an aerial appliance was actually deployed at an incident where the 'time in attendance' at that incident was twenty minutes or over. This twenty-minute period sifts out pre-determined attendances, where the appliance may have attended the incident but not subsequently been used.
2. Risk Management's Geographical Information System (GIS) has been used to predict appliance attendance times and detailed maps have been produced showing isochromes for a 30-minute attendance time to all incidents within Merseyside.
3. Previous IRMP actions have culminated in the removal of aerial appliances from pre-determined attendances and the reduction of aerial appliance cover across Merseyside from five aerial appliances to the current capacity of four.
4. Risk Management Departments within other Fire and Rescue services were contacted to provide information relating to the attendance times that they have committed to within their respective IRMP's.

5. Data Collection.

Merseyside Fire and Rescue Service published its Year 2 IRMP in April 2005. The plan includes a commitment to maintain the interim aerial appliance attendance times established in our first year IRMP pending further deliberation.

A benchmarking exercise was carried out with our neighbouring Fire and Rescue services and other larger metropolitan Fire & Rescue Services.

With the exception of Lancashire FRS, none of the other Fire and Rescue Services have established a response time for aerial appliances. Consequently, it is now considered both appropriate and acceptable to establish a 30-minute response standard to all incidents where an aerial appliance is requested throughout MFRS.

Table 1: Aerial appliance response in other Fire and Rescue Services

Service	High Risk	Commercial	Other	PDA
Merseyside	10 minutes	15 minutes	20 minutes	Removed from PDA
GMC	No specified time	No Specified Time	No specified time	Removed from PDA
Cheshire	No specified time	No specified time	No specified time	Removed from PDA
Lancashire	30 minutes	30 minutes	30 minutes	Removed from PDA
Strathclyde	No specified time	No specified time	No specified time	Still aerial PDA's
South Yorkshire	No Specified Time	No specified time	No specified time	Removed from PDA
West Yorkshire	No Specified Time	No Specified Time	No Specified Time	Removed from PDA
Tyne and Wear	No Specified Time	No Specified Time	No Specified Time	Removed from PDA

5.1 Aerial Appliance Incident Data – Merseyside Incidents

Major fire incidents and special service calls attended by all aerial appliances throughout Merseyside during the past seven years. (Special Service calls are, for example, removing roof tiles in strong winds and are predominantly not life threatening). The incidents attended by Birkenhead are highlighted in bold text.

Table 2: All Merseyside aerial appliance incidents attended.

	City centre	Eccleston	Southport	Croxteth	Birkenhead	Total
Major Fire	437	140	50	174	279	1080
Special Service Call	118	24	17	25	75	259
TOTAL	555	164	67	199	354	1339

- Aerial appliances were simultaneously utilised at separate incidents on 37 occasions in 7 years.
- Aerial appliances were simultaneously utilised at the same incident on 56 occasions in 7 years.
- Birkenhead’s aerial appliance was utilised at a total of 354 primary fire incidents and special service calls during the seven-year period. Of these, only 179 were within the Wirral area (See Table 3 – below). This equates to 50 incidents a year or around 4 incidents per month.

5.2 Aerial Appliance Incident Data – Wirral Incidents

Wirral major fires and special service calls at which the Birkenhead aerial appliance was utilised during the seven-year period.

Table 3: Wirral incidents attended by Birkenhead’s aerial appliance.

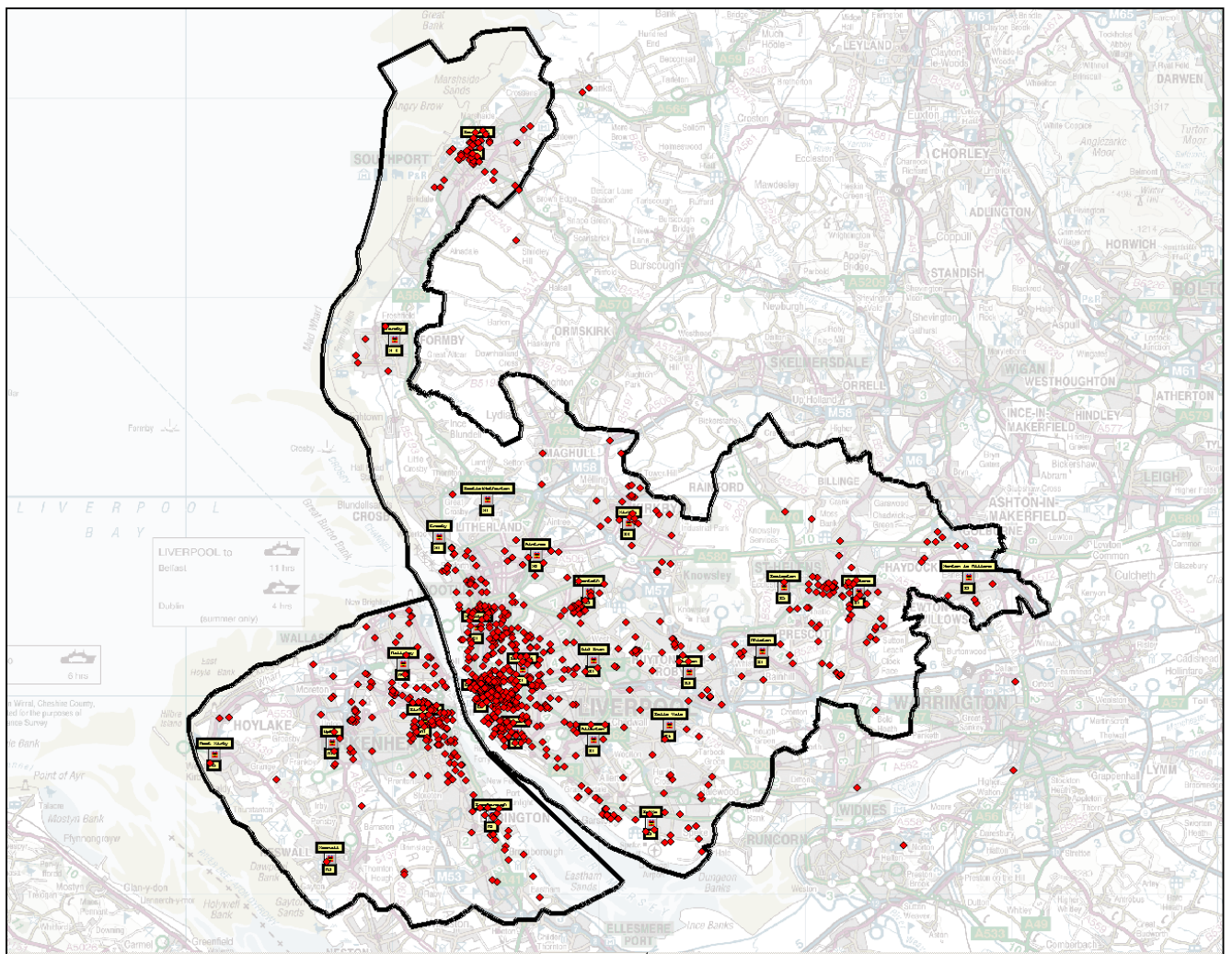
TYPE OF INCIDENT	NUMBER OF INCIDENTS
Major Fires	132
Special service call	47
Total Incidents	179

- 179 Wirral primary fire incidents and special service calls were attended by Birkenhead's aerial appliance.
- On average the Birkenhead aerial appliance attended approximately 25 such incidents a year or 2 incidents per month.

6. Data Analysis.

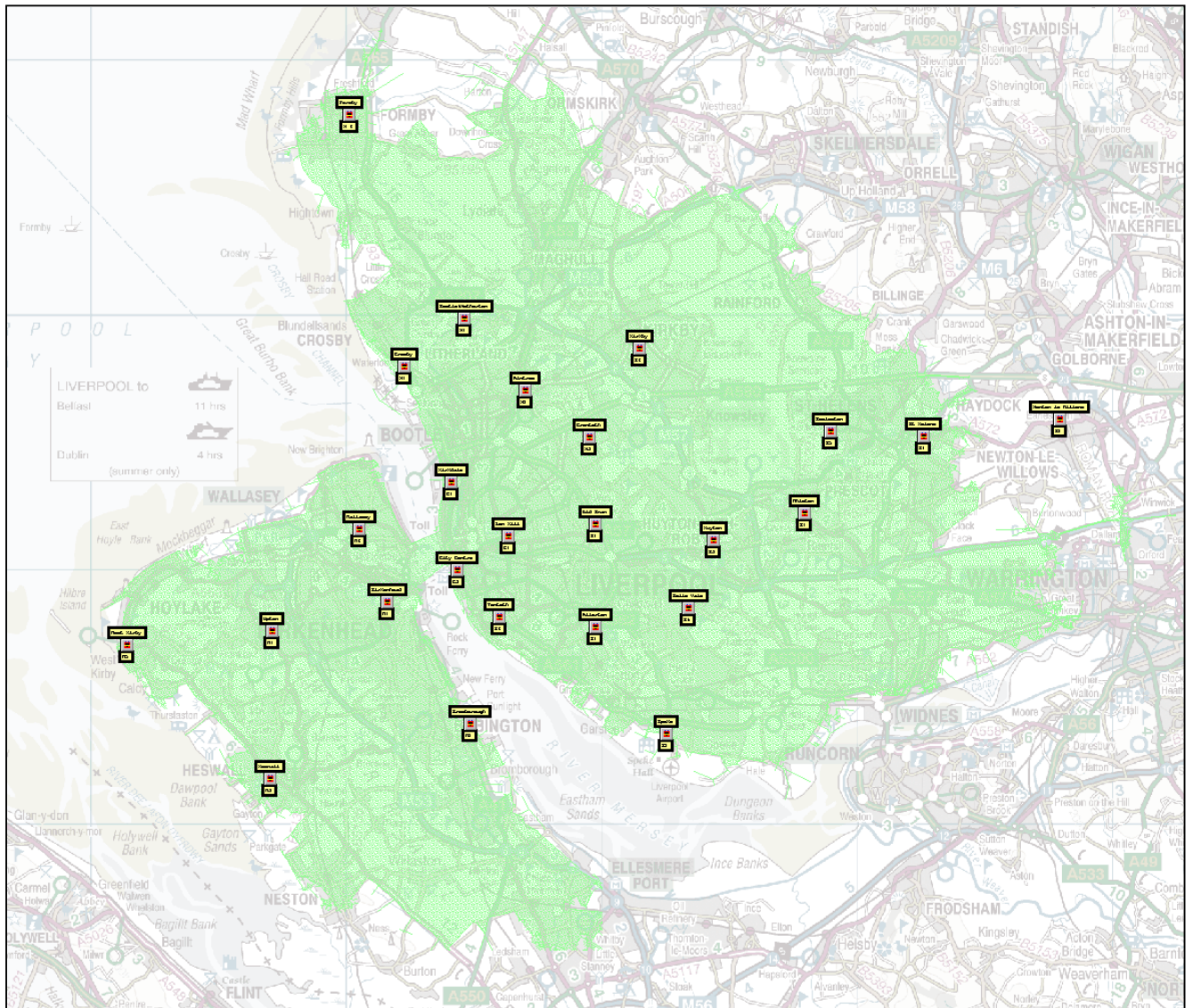
6.1 Aerial Incidents

The map below shows all incidents attended (for longer than 20 minutes) by aerial appliances within Merseyside. It clearly shows the predominant areas of risk across the county. It is evident that the predominant area of Wirral where incidents have occurred is located in the north of Birkenhead's station area.



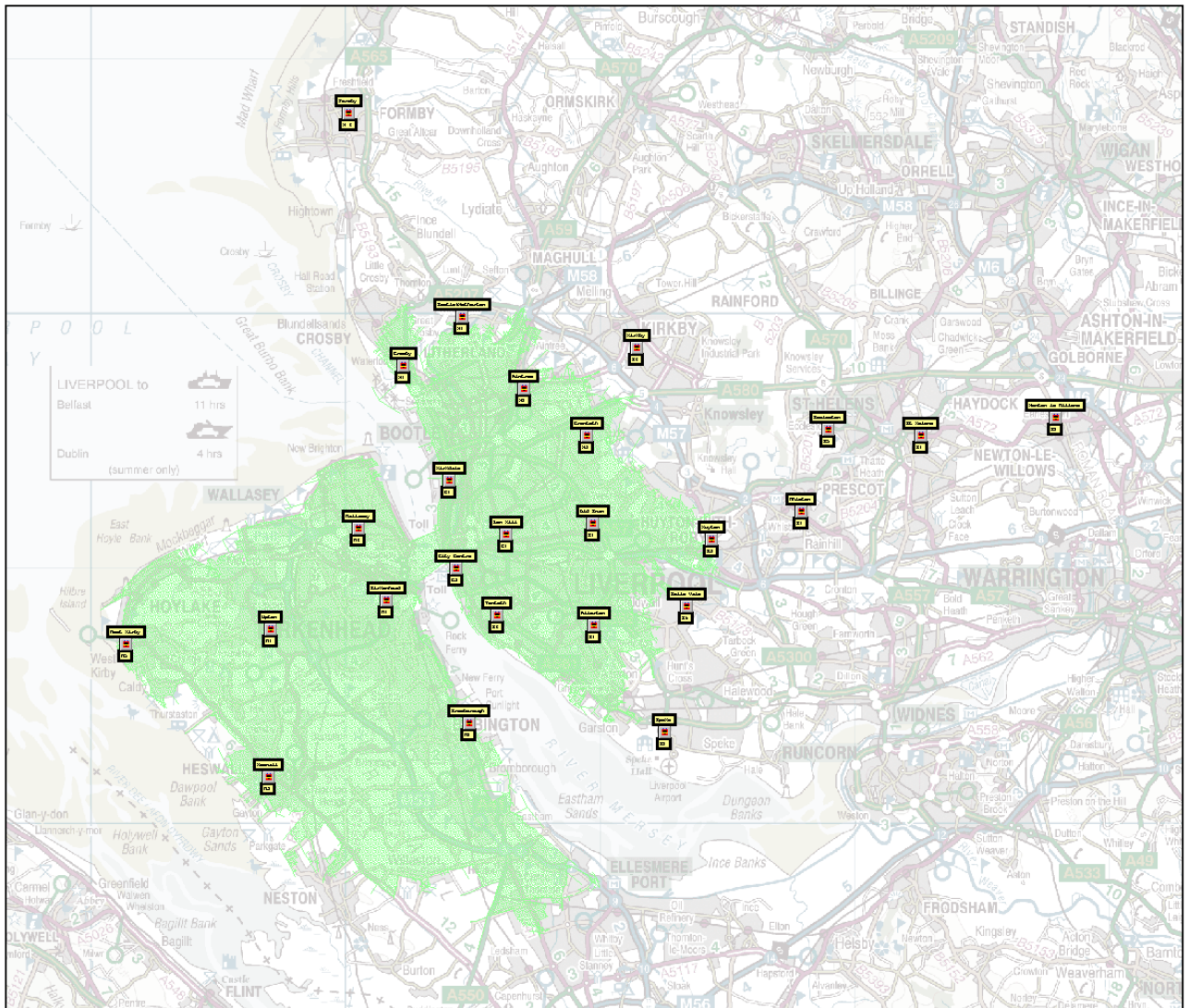
6.2 City Centre's Aerial Appliance Response

This map shows a 30-minute isochrome centred upon City Centre Fire Station i.e. it shows the extent of the area covered by City Centre's aerial appliance within a 30-minute mobilisation time. It is evident that the City Centre Appliance could provide adequate first response aerial cover for the Wirral area, without any additional aerial appliance at Birkenhead.



6.3 Birkenhead's Aerial Appliance Retained Response

This map shows a 20-minute isochrome centred upon Birkenhead Fire Station i.e. it shows the extent of the area covered by Birkenhead's retained aerial appliance within a 30-minute mobilisation time, allowing 10 minutes for personnel to respond to the station. It is evident that the time taken for personnel to respond to the station does not prevent the retained aerial appliance from providing adequate resilience cover for the Wirral.



7. Conclusion.

Historical incident data shows that Birkenhead's aerial appliance only attends approximately two working incidents per month within Wirral and a further two incidents elsewhere within Merseyside.

The average duration of deployment of aerial appliances within Merseyside, when utilised, is one hour and twenty-two minutes.

This means that MFRS is currently providing 720 hours of whole time aerial appliance cover per month at Birkenhead for approximately 5.5 hours of incident attendance, some of which may be provided from other locations.

This is a highly inefficient use of resources; the proposed cost savings associated with crewing Birkenhead's aerial appliance on a whole time retained basis are estimated to be in the region of £250,000 per annum.

When mobilised using the new automatic vehicle location system (AVLS), Birkenhead's whole time retained aerial appliance, in conjunction with City Centre's whole time aerial appliance will meet the attendance criteria.

If City Centre's aerial appliance is already committed to an incident and is not providing cover for the city centre or the Wirral then the retained crews will be alerted and the aerial appliance at Birkenhead can be mobilised to stand in at City Centre.

The likelihood of two aerial appliances being required simultaneously equates to 37 instances in seven years or an average of 5 times per year for the whole of Merseyside.

The relocation of City Centre Community Fire Station to St Anne's Street will improve access to the Mersey tunnels and facilitate improved aerial appliance cover.

8. Recommendations.

Implementing whole time retained crewing for Birkenhead's aerial appliance will benefit MFRS in the following ways:

- Maintains all commitments to aerial appliance attendance times
- Provides opportunities for suitably qualified staff to earn additional pay
- Enables the organisation to save approximately £250,000 per annum by more efficient use of resources (IRMP framework of affordability – Appendix B).
- Contributes to the achievement of IRMP year two action point 2.11
- The 30-minute attendance standard set for aerial appliances within Merseyside remains more challenging than our neighbouring services and other metropolitan services in the U.K. and, even with a retained aerial appliance we are outperforming our peer organisations.

The recommendation of this report is that the Authority adopts the following response standard, which will enable the first phase of the medium term (3 year) aerial appliance strategy to be implemented.

Birkenhead's aerial appliance should be altered from whole time crewing to retained crewing.

Appendix A

Best Value Considerations leading to a Medium Term Strategy

Aerial Appliance - Best Value Considerations Leading to Medium Term Strategy

Number	4
Reserves	1
Staff	40
Capital Cost	£340k each. Five appliances with a life expectancy of twelve years results in an annual capital cost of £140k, without taking any account of borrowing costs. If average life is extended to fifteen years the annual cost is reduced to £90k.
Revenue Cost	Insurance, maintenance, damage repairs, etc. estimated at £20k per annum. This does not take account of firefighter injuries resulting from use of this equipment (including RTA's) so it may be considerably larger). Salaries. £1.2m
Total Cost	Approximately £1.3m

Challenge

Are they needed, and if so how many and what types are required. If they are necessary, what is the most appropriate method of staffing them?

The uses of aerial appliances:

1 - High level rescue

Capability

Dependent on the appliance type. Below ten metres (three storeys in most building types) aerial appliances are unnecessary and the portable ladders carried on fire engines will achieve access. The highest aerials in common use in the UK reach to a height of about thirty metres and could be used for rescues up to the ninth floor of buildings when close access can be achieved.

Hydraulic platforms, because of the flexibility provided by the knuckles, can get into more positions than turntable ladders.

Locations

Properties higher than three storeys with clear hard standing close enough and of sufficient size and strength to take the appliance.

Frequency

Very rare. It is difficult to find firm evidence of any live rescues being achieved via aerial appliances which could not have been successfully carried out by other means.

Importance

Very high if there is no alternative method of achieving the rescue or if alternatives are likely to be so much less effective that a live rescue which was capable of being achieved would fail.

Attendance time requirement

As rapidly as possible after sufficient firefighters are in place to ensure a safe system of work and effect the rescue.

2 - Provision of high-level fire fighting monitors

Frequency

Approximately twenty five times per year one appliance will be used for about two hours. Once or twice per year two aerial monitors may be used at the same incident and on very rare occasions more than two aerial monitors have been used simultaneously and the same incident. It is possible, but very uncommon, for two or more aerials to be required at the same time at different incidents. These occurrences are too uncommon to constitute normal requirements. The total requirement for Merseyside amounts to between fifty and one hundred hours per annum. A cost of between £17k and £34k per hour of use when actually required.

Importance

Relatively high if the same fire fighting effectiveness could not be achieved by ground monitors, fire fighting jets and alternative fire fighting tactics.

Attendance time requirement

Cannot be used until adequate water supplies have been put in place. Safe deployment of aerial monitors requires careful dynamic risk assessment and it is usually neither possible nor appropriate in the very early stages of fire fighting. Where aerial monitors are used it is on extensive fires in large buildings. Provided the aerial appliance is requested promptly for any incident at which it will be required to provide fire fighting water, a thirty minute attendance time is adequate for all normal requirements.

Use 3 - High level access for inspection, making structures safe or assisting others (e.g. police removing persons from roofs).

Frequency

Ten to fifteen times per annum.

Importance

May be high on rare occasions although in the majority of cases there will be alternative solutions or sources of vehicle.

Attendance time requirement

Variable. Unimportant on most occasions but a more rapid attendance will be very beneficial for some situations.

Compare

Types:

Type 1 - Combined Platform Ladder

Performs all the functions of a hydraulic platform but it is difficult to see that the ladder performs any useful function at all. The complexity of the appliance adds to the initial cost and maintenance as well as increasing the risk of breakdown and making operator training more complicated. All this for limited apparent perceived benefit.

Type 2 - Turntable Ladder

General

Very poor capability as an aerial monitor. Limited ability to direct the nozzle from the head of the ladder. Typically 17 degrees. The inability to flex the ladder in the way that a hydraulic appliance operates prevents the head being manoeuvred into an optimum position.

With cage

Very limited two-person capacity which improves rescue capability over a ladder without cage but without the flexibility and space provided by a platform or CPL.

Without cage

Very few members of the public in need of rescue would have the capability of descending a high ladder unaided. Some could be guided down by firefighters but this process is very slow and difficult to control.

No credible case can be made for the continued use of turntable ladders. Their role has been completely superseded by other equipment.

Type 3 - Hydraulic Platform

Effective rescue vehicle with good capability of being manoeuvred into the necessary position to achieve the task. Good cage capacity. Best available appliance for access and high working. Reasonably adequate in many cases as a high level monitor but the cage prevents monitor entry through windows, skylights, loopholes, etc. to attack fires effectively.

Type 4 - Aerial Monitor

No rescue capability but better than all other options for high level firefighting because it can be taken through openings to get close to the point at which firefighting attack is required. No firefighters exposed to risk at the head of the appliance as is usually the case when other aerial appliances are used as monitors. When used with a remote operating system, it is by far the most effective way of providing a safe and effective system of work for an aerial monitor.

Type 5 – Combined Pump Platform

There are two main types of CPP. Both have the same aerial capabilities as a Hydraulic platform but are considerably more expensive to purchase. However, given that the one vehicle has a dual role, there is a potential capital saving because buying 1 CPP means that it is not necessary to buy both an aerial and a “standard” fire appliance:

1. A fire appliance with a hydraulic platform mounted on top. This fulfils the role of a "standard" fire appliance for the majority of the time whilst providing hydraulic platform capabilities for rescue and water tower use when required.
2. A hydraulic platform with limited fire appliance stowage capabilities.

Option 1 has greater potential, as it is more able to fulfill both roles. Savings in staffing resources are evident as instead of two appliances there is only the requirement for one.

Crewing Methods

Shift

This provides fast response, which is the same at all times, but it is very expensive. This should only be the chosen crewing method if it can be shown to be necessary to provide effective rescue and firefighting which is not capable of being provided by less costly staffing systems.

Day Crew

Also expensive, although about two thirds of the cost of shift crewing. This may be justified where night time travel is substantially faster than during the day and the extent of need requires instant turnout during the day to achieve the desired attendance times.

Alternate

Provision of shift or day crew personnel staffing two or more specialist appliances. This is a relatively efficient staffing method, which maintains a very fast turnout time in most circumstances and also provides full time, professional firefighters to assist with CFS and other non-emergency work.

Retained

Appliances are crewed on a 'retained' basis by either off duty wholetime personnel who make themselves available for specific off duty periods, or volunteer members of the community trained to a required standard but who have other occupations. All personnel are paid an initial retaining fee and a rate per hour for those occasions when their services are required. This means of crewing appliances has the potential to increase turnout times unless carefully managed but if a highly cost effective crewing system.

Non-uniformed

Operators could be trained and the probable costs of employment would be lower. However, these cost savings would be achieved at the expense of being unable to use these personnel on the incident ground for purposes other than their specialist role. In an environment where urgent activities must be undertaken in hazardous environments, the presence of such personnel would make it more difficult to ensure safe systems of work and could result in a requirement for the deployment of more personnel than would otherwise have been necessary. This option is not worthy of further exploration.

Contract staff

The same limitations apply as described for non-uniformed staff above but they will cost more so the economic case may not even exist. It is not possible to use short notice contract staff to cover unpredicted staff shortages because of the specialist operator skills required.

Compete

Contract hire

Because the operators will not be firefighters there are the same objections to using them at emergency incidents as have been described above. However, if it is possible to identify operators of similar equipment who are prepared to co-operate, it may be possible to compare costs of staffing, purchase, maintenance, training, etc. as a benchmark against which to measure our own costs.

Guidance in DCOL 1/1994

This guidance does not appear to use risk assessment, nor does it produce any evidence of the necessary and effective use of aerial appliances for the property types for which it says that aerial appliances should be considered for inclusion on the pre-determined attendance. IRMP risk assessment based guidance now supersedes this.

Conclusion

Adequate aerial provision for Merseyside could be provided by one 26.3 metre hydraulic platform and two aerial monitors of the same height. All three appliances should be crewed alternately on a day crew system with other specialist appliances. As an alternative to alternate crewing, staffing by retained personnel should be considered.

Appendix B

Framework of Affordability

Framework of Affordability

The framework of affordability set out in the IRMP applies equally to the 2005/06 financial year. The consultation draft of the Service Plan, incorporating the IRMP Action Plan for 2005/06, includes a number of items that have financial implications. Work is proceeding to fully cost these proposals and full costs and savings of all items will be included in the budget preparation documents considered by the Authority at the appropriate time. If the Authority has insufficient resources available in 2005/06 to fund any proposed IRMP Actions, they will have to be deferred until such stage as sufficient resources are identified. As in 2004/05, the final published version of the Action Plan (contained within the Service Plan 2005/06) will contain details of the costs or savings associated with each Action.