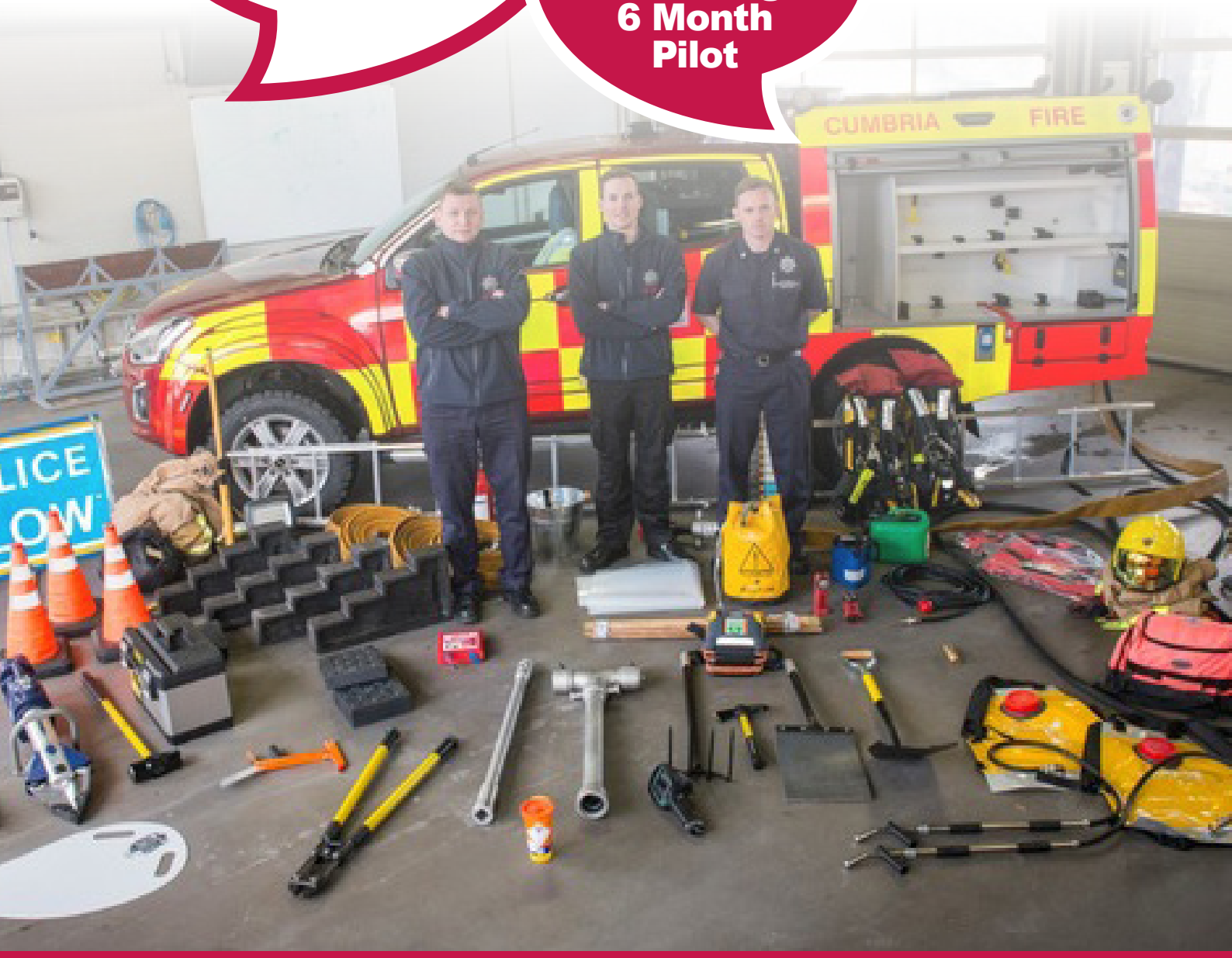
Rapid Response Vehicle

Evaluation Report following 6 Month Pilot



15 April to 15 October 2019

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1. Executive Summary

Following the 6 month pilot of the Rapid Response Vehicle (RRV) at both Staveley and Arnside fire stations which took place between 15th April and 15th October 2019, this evaluation report has been produced to identify if the pilot has worked effectively for the communities of Cumbria.

Following the evaluation and associated data analysis, it is clear the RRVs have provided a highly effective and innovative emergency response vehicle which has met the needs of the communities and the associated risk profile. The new state of the art vehicles have proven to be an valuable resource appropriate to the risks and demands in the pilot areas and have been effective in response to all incidents attended.

The piloting of the new vehicles is in line with the Integrated Risk Management Plan (IRMP) 2019-2023, which is underpinned by Cumbria Fire and Rescue Service (CFRS) Risk Based Evidence Profile (RBEP). The RRV pilot and the information contained within this evaluation report has clearly demonstrated the vehicles have made significant positive impact on service provision to communities.

The RRV provides a viable resource that responds effectively to incidents allowing for immediate action and to prevent escalation.

Key objectives that have been met:

Effectiveness
- Improved operational effectiveness
- Improved availability within stations
- Improved response times

Efficiency
- Improved cost-effectiveness
- Reduced environmental impact

People
- Improved work-life balance for On-call firefighters

The equipment provided on the RRV is modern, state of the art and can be safely deployed with a crew of three. The pilot and effectiveness of the vehicles has been scrutinised and every incident attended has been assessed to determine if the vehicle and the equipment have been able to successfully demonstrate they are suitable to allow firefighters to make safe interventions at all incidents. The size, design and capabilities of the RRV allow for access to areas that would be unachievable in a standard Type B fire appliance. The RRV can also navigate areas of traffic congestion and smaller roads and tracks more quickly than a traditional fire appliance.

The RRV has proven to significantly improve availability on the On-call fire stations. The RRV pilot shows increases in availability of 27% for Arnside and 22% for Staveley during 2019 when comparing crewing requirements for a Type B Fire Engine, and increases of 17% for Arnside and 12% for Staveley during the same period in 2018.

This increased availability and reliability also means that firefighters can respond more quickly as part of an initial attendance, or as a supporting resource as demonstrated in the improved turn-out and response times shown within this report. This earlier intervention at incidents can prevent escalation and therefore a reduction in the community impact from an incident.

The relatively lower cost of running the RRV, alongside reduced environmental impact, also optimises cost-effectiveness and value-for-money.

2. Introduction

Cumbria's changing demographics and risks requires CFRS to recognise the need for innovation in order that it can maintain an effective response model. Key on-going challenges requires the service to develop and innovate.

Areas of consideration include:

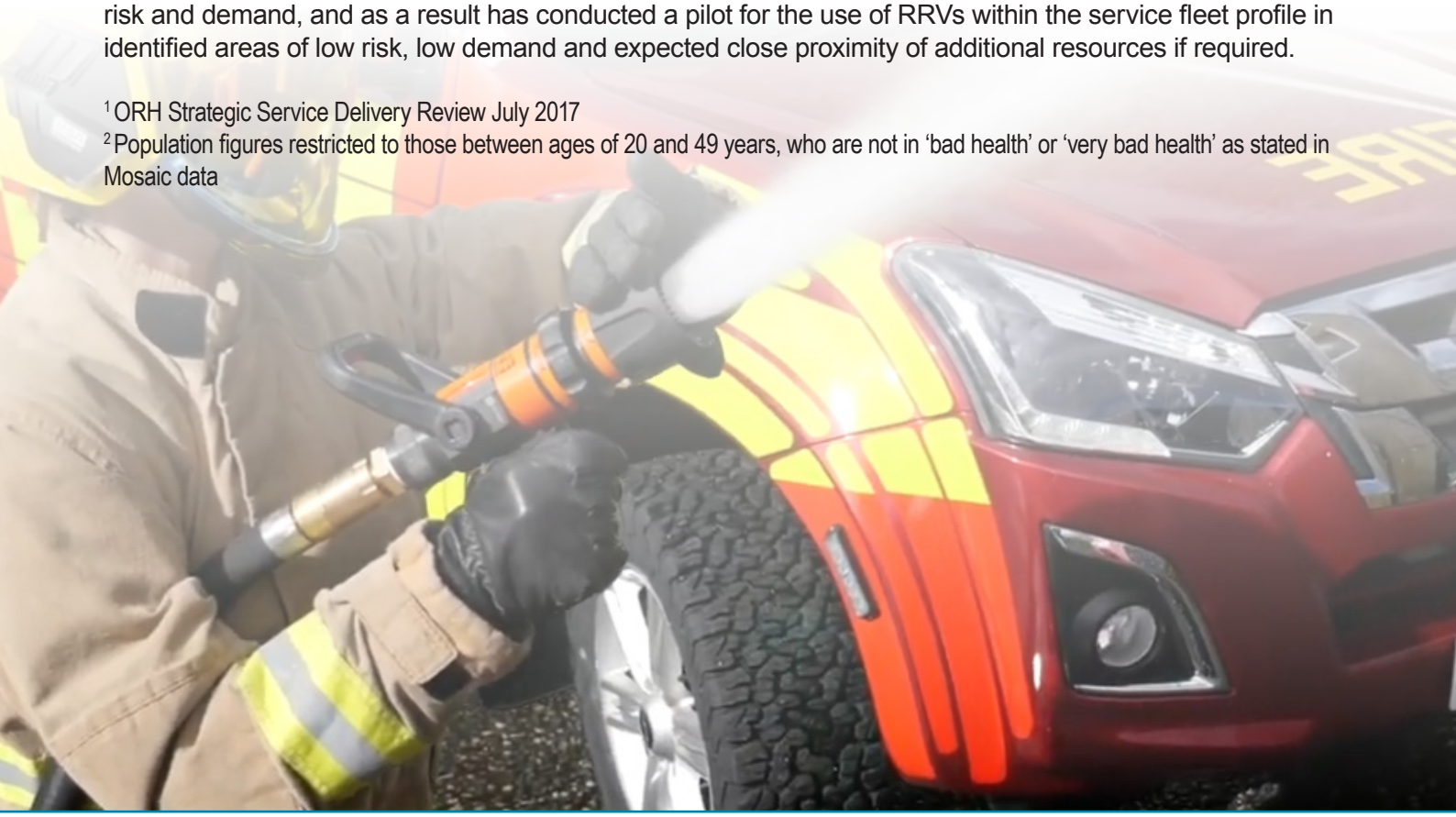
- **The changing profile of risk and demand -** The rate of fires has decreased by 8% over the past 10 years, with accidental dwelling fires also decreasing by 8% (2009/10-2018/19). Risks such as Road Traffic Collisions are also decreasing with a 53% reduction between 2006 and 2018.

- **The changing profile of service provision** - In order to optimise efficiency and effectiveness across emergency response, CFRS has significantly increased collaboration with other services and now supporting broader multi-agency working such as missing persons initiative with Cumbria Police, Joint Emergency Services Officers and blue light hubs. In alignment with both local and national expectations the service has an increased focus on prevention and protection activities such as the widening of the health agendas within Safe and Well visits.

- **On-call firefighter recruitment and retention** - Effective recruitment and retention of On-call firefighters is becoming much more difficult for CFRS. An independent review of the provision of On-call services[1] identified a key risk for CFRS in the sustainability of a number of On-call fire stations as a result of diminishing recruitment pools. This is particularly the case in rural areas where demographic changes can result in prohibitively low numbers within station catchment areas. For example, Arnside has a total recruitment pool of 435 individuals[2] within a 5 minute turn-in time which only increases to 441 when the turn-in time (the time allowed for a firefighter to report to the fire station when his/her pager is activated) is increased to 10 minutes. Similarly, Staveley has a recruitment pool of 397 within a 5 minute turn-in time which increase to only 433 for a 10 minute turn-in time.

In response to these challenges CFRS continues to evolve service provision to best match resources to risk and demand, and as a result has conducted a pilot for the use of RRVs within the service fleet profile in identified areas of low risk, low demand and expected close proximity of additional resources if required.

[1] ORH Strategic Service Delivery Review July 2017
[2] Population figures restricted to those between ages of 20 and 49 years, who are not in 'bad health' or 'very bad health' as stated in Mosaic data



3. Background

This evaluation measures the impact of two RRVs which have been operating from Arnside and Staveley community On-call fire stations with the associated information, training, instruction and supervision. Details of the implementation of the pilot are below.

Timeline

A 6 month pilot was conducted between 15 April 2019 and 15 October 2019.

Rapid Response Vehicles

Rapid Response Vehicles are 4x4 double cab vehicles, with a tank capacity of 300 litres and a crewing capacity of 3 firefighters. They would replace the standard Type B fire appliance at appropriate fire stations. The Type B fire appliance has a tank capacity of 1,800 litres and a minimum crewing of 4 firefighters.

Type B Fire Appliance

Rapid Response Vehicle

The RRV pump is a self-propelled high pressure water pump with a variable flow hose reel branch and allows a state of the art fine fogging system to be utilised. This enables firefighters to utilise the water in the most efficient way and allows adjustments in water application from 15 litres per minute up to 150 litres per minute.

The rescue equipment is a battery powered combination rescue tool which operates independently and therefore requires no hoses or power pack and allows crews to deploy the equipment quickly when attending Road Traffic Collisions and other Special Service calls.

The appliance also has two breathing apparatus sets and a full first aid kit including an Automatic External Defibrillation unit.

The RRVs were made available alongside the current fire station appliances until the evaluation was completed. This ensured maintenance of full service delivery for the duration of the 6 month pilot period until the impact was fully understood.

Location of RRVs

Arnside and Staveley On-call fire stations were identified as suitable for the pilot as both stations have lower levels of risk and demand in line with the RBEP. These stations also have nearby support from their neighbouring stations.

Arnside is 4 miles from Milnthorpe, and 4 miles from the Lancashire Fire Station of Silverdale. Kendal and Windermere Fire Stations are both 5 miles from Staveley.

Arnside has an average of 20 incidents per year within its station area and has an average of 17 mobilisations of its Type B appliance per year[3]. Staveley has an average of 13 incidents per year within its station area and its Type B appliance has an average of 32 mobilisations per year.

A further factor for consideration with these two stations is the low levels of availability, this is also impacted with the difficulties of recruitment and retention. Average availability for Arnside in 2018/19 was 65%, and the estimated number of individuals who live within the standard 5 minute turn-in time for is 435[4].

The average availability for Staveley was 80% in 2018/19, and the estimated number of individuals who live within the standard 5 minute turn-in time for is 397.

Operational Profile

During the pilot, the RRV at Staveley was mobilised automatically when Kendal received an incident and Arnside's RRV was mobilised when Milnthorpe received an incident. This was to ensure the RRVs were tested against the broadest range of operational incident types to allow the most robust evaluation to inform the service policy going forwards.

The RRV can assist with intervention activities to reduce risk escalation, pending the arrival of further resources. Staff are trained to ensure operations are conducted only after a dynamic risk assessment confirms actions can be safely undertaken. The dynamic risk assessment would also identify any need for further resources.

[3] Average over 3 year period 2016/17 to 2018/19
[4] ORH Strategic Service Delivery Review July 2017

4. Objectives

The RRV pilot aimed to achieve a range of objectives as detailed below:

4.1. Effectiveness

Improved operational effectiveness
The pilot aimed to determine operational effectiveness against a wide range of incident types, alongside establishing any benefits to operational effectiveness, such as increased flexibility in accessing geographically difficult areas.

Improved availability within stations
The RRV has been designed to safely respond to operational incidents with a crew of 3. This crewing model has increased availability in areas with historical recruitment and retention issues.

Improved response times
It is anticipated that response times will be faster for RRVs compared to standard fire appliances. This has been proven through the 6 month pilot period and is shown at 6.3 within this evaluation report.

4.2. Efficiency

Improved cost-effectiveness
Staff costs will be reduced as a result of revised crewing models.
Capital costs will also be reduced due to the difference in costs between RRVs and Type B appliances.

Reduced environmental impact
The Fleet and Asset Strategy 2018/23 details the ambition of CFRS to have a significant effect on CO2 emissions, with a key aspect moving to more fuel efficient vehicles.

4.3. People

Improved work-life balance
An improvement in staff satisfaction through delivering improved service and allowing greater flexibility in working patterns and work-life balance.

This document aims to evaluate the RRVs against each of the objectives listed above.

5. Methodology

A number of quantitative performance indicators have been analysed to determine the impact of the RRV including:

- Availability – by night and day
- Response times – by night and day
- Type of incident attended
- Distance covered to incidents
- Fuel consumption from vehicle types
- Staff cost per annum

Qualitative measures were also used to determine the impact of the RRV including:

- Hot Debrief (Form completed following every incident)
- RRV evaluation form (Form completed following every incident)
- RRV action plan (completed when required)
- Operational Assurance (when applicable)
- Staff Survey

The Operational Assurance Team (OAT), through active incident monitoring (AIM), have ensured that CFRS proactively monitors, evaluates and reviews operational incidents and associated response arrangements and performance. Providing quality assurance and feedback, allowing changes to procedures, policy, and equipment and training where applicable. In addition, the working group has held meetings every month to evaluate progress of the pilot and feedback opportunities to improve.

A mid-way pilot evaluation was conducted in July 2019, with any learning integrated into the pilot process through the working group, these included improvements to the equipment stowage and layout of the RRV.

6. Findings

The evaluation demonstrates that the RRVs have successfully met the evaluation objectives and received a positive response from those crew members on the pilot station areas.

Specific findings in relation to each of the evaluation objectives are detailed below:

6.1. Improved Operational Effectiveness

Since the pilot commenced the two RRV's have successfully responded to 142 incidents in total; Staveley's RRV was mobilised to 111 incidents (9 of which were in Staveley's station area) and Arnside's RRV to 31 incidents (6 of which were within Arnside station area).

Photo: RRV attending a Road Traffic Collision during the pilot period

Incident by type

Incident Type	Arnside C63R1	Staveley C69R1
False Alarm	11	59
Fire	14	23
Special Service	6	29
Grand Total	31	111

Table: Profile of incident types attended

The majority of incidents attended by Arnside RRV were fires (45%) and for Staveley the majority of incidents attended were false alarms (53%).

Incidents attended by type for Arnside RRV and Staveley RRV

Incident Category	Description	Arnside C63R1	Staveley C69R1
False Alarm	Automatic Fire Alarm (AFA) Residential	7	25
	Smoke Alarm	3	15
	Building Fire		7
	AFA Commercial		4
	Fire		2
	Small Fire		2
	Cylinder		1
	Persons Locked		1
	Rescue of Person		1
	Vehicle Fire	1	1
	Caravan - Caravan/Camping	1	
Fire	Small Fire	5	10
	Building Fire	2	4
	Vehicle Fire	3	3
	Caravan - Caravan/Camping		2
	Boat/Barge		1
	Chimney Fire		1
	Explosion		1
	Smoke Alarm	1	1
	Cylinder	1	
	Persons Reported	1	
Special Service	RTC	3	12
	Rescue of Person		5
	Persons Locked		3
	SSC		2
	Animal Rescue	1	1
	Assist Other agency		1
	Dangerous Structure		1
	Flooding	1	1
	Humanitarian or Assistance		1
	Petrol Incident	1	1
	Rescues		1
Grand Total		**31**	**111**

Arnside attended 6 special service calls, including one flooding incident.

Staveley attended 29 special service incidents including 12 RTCs.

Arnside attended 3 RTCs which were 10% of its incidents

Staveley attended 12 RTCs which comprised 11% of its incidents.

RRV incidents by mobilised and attended

Mobilised/ In attendance	Arnside C63R1	Staveley C69R1
Booked in attendance	20	68
Mobilised but did not book in attendance	11	43
Total Mobilisations	31	111

The Arnside RRVs booked in attendance at 65% of the total incidents that it was mobilised to, and 67% of the incidents occurring within Arnside station area. Staveley RRV booked in attendance at 61% of the total incidents that it was mobilised to.

RRV incidents attended by fire station area

Station Area of Incident	Arnside C63R1	Staveley C69R1
FBC60 - Kendal	4	83
FBC69 - Staveley		9
FBC70 - Windermere		5
FBC07 - Keswick		2
FBC45 - Grange		2
FBC61 - Ambleside		2
FBC66 - Milnthorpe	13	2
FBC67 - Sedbergh		2
FBC43 - Coniston		1
FBC64 - Kirkby Lonsdale	6	1
FBC65 - Kirkby Stephen		1
FBC68 - Shap		1
FBC63 - Arnside	6	
Lancs	2	
Grand Total	31	111

Table: Profile of Arnside and Staveley RRV incidents by Station Area

Only 6 of the 31 incidents attended by Arnside RRV were in Arnside station area. These were 4 x false alarms (3 were residential false alarms and one was reported by a person) and 2 x small fires.

Only 9 of the 111 incidents attended by Staveley RRV were in Staveley station area. There were 7 x false alarms (2 residential, 1 commercial and 4 other), 1 x small fire and 1 x RTC.

These low figures reflect the lower levels of risk and demand within the two station areas.

Feedback on RRVs

Throughout the pilot there has been no feedback that identifies any operational concerns in terms of resource or crew availability when dealing with the incidents the RRVs have attended.

The following quotes from the public and crews highlight the increased flexibility in operational response enabled by the RRVs, allowing resources to access remote areas of Cumbria that standard fire appliances may not be able to reach.

"We had to go off road to gain access to this incident [Grass fire] so positive result there…extinguished using 300lts of water [from RRV tank]."

"The fire service is a vital component in the rescue operations; RRV's are much more flexible in that it can get to the more remote isolated part of the coast".

One member of the community commented

"We do need an RRV for country lanes… the big ones can't get to me".

However, whilst Arnside experienced no access issues, it was commented

"We haven't taken the RRV anywhere the Type B couldn't go".

One area raised by firefighters at Arnside station was that the RRV have a "good pump but restricted capacity" in relation to acting as a base pump for water relays.

During the trial period there were two building fires and three vehicle fires and five small fires attended by the Arnside RRV. Access to water needs to be considered and could be supported across the service, such as within the risk profiling for hydrants which would ensure prioritisation of hydrant maintenance within the station areas of RRVs.

For Arnside, the RRVs "limited equipment" is highlighted, specifically identifying within their station area the risk of the quicksand around the Kent Estuary, with firefighters commenting:

"We would like more sand rescue equipment on the RRV [but] 9/10 it does the job".

However, there were no incidents of this type recorded during the pilot period, and only one incident of this type has been recorded since April 2016. This does not mean the risk is not present, however the equipment provided needs to be monitored against any changes to risk profiles.

In contrast, the equipment was considered satisfactory at Staveley, with the following comment made:

"So far the kit and equipment appears to be good"

6.2. Improved Availability

The following section summarises the RRV availability against that of the standard fire appliance at Arnside and Staveley stations. Due to less crew being required to deploy the RRV, the availability gains are significant.

Arnside Availabilitv

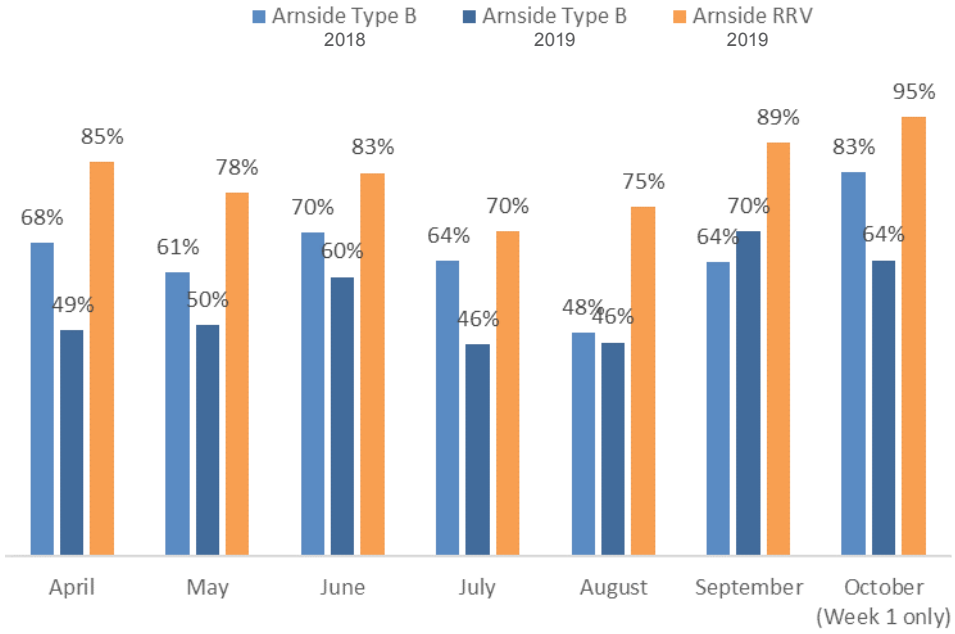


Chart: Arnside total % availability (24hrs) for standard fire appliance and RRV

For Arnside the total availability is significantly higher for the RRV for every month compared to availability of the standard fire appliance on the same months.

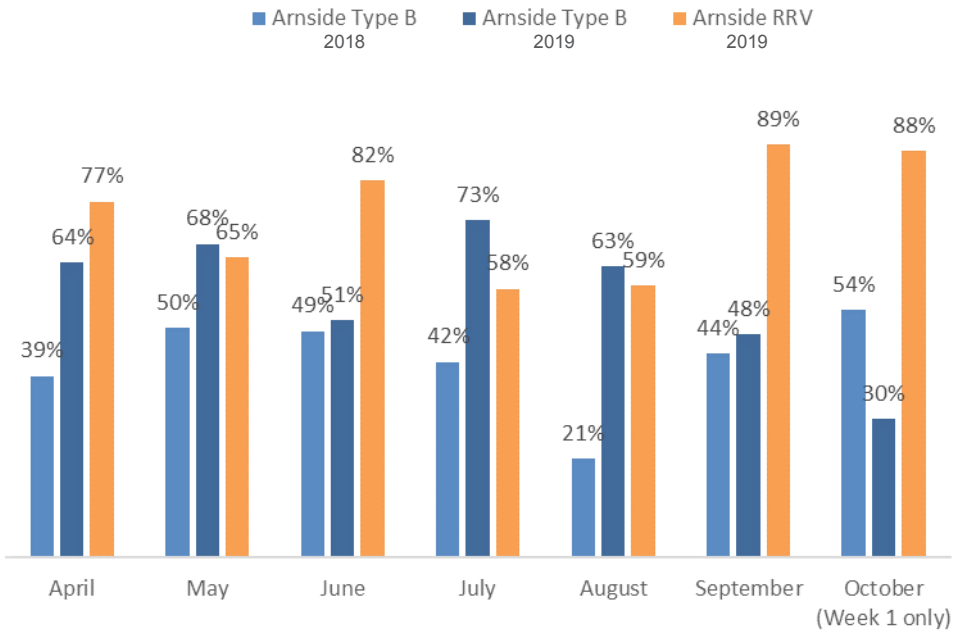


Chart: Arnside total % availability in the day (6am - 6pm) for standard fire appliance and RRV

For Arnside the daytime (6am to 6pm) availability is significantly higher for the RRV for every month compared to availability of the standard fire appliance on the same months.

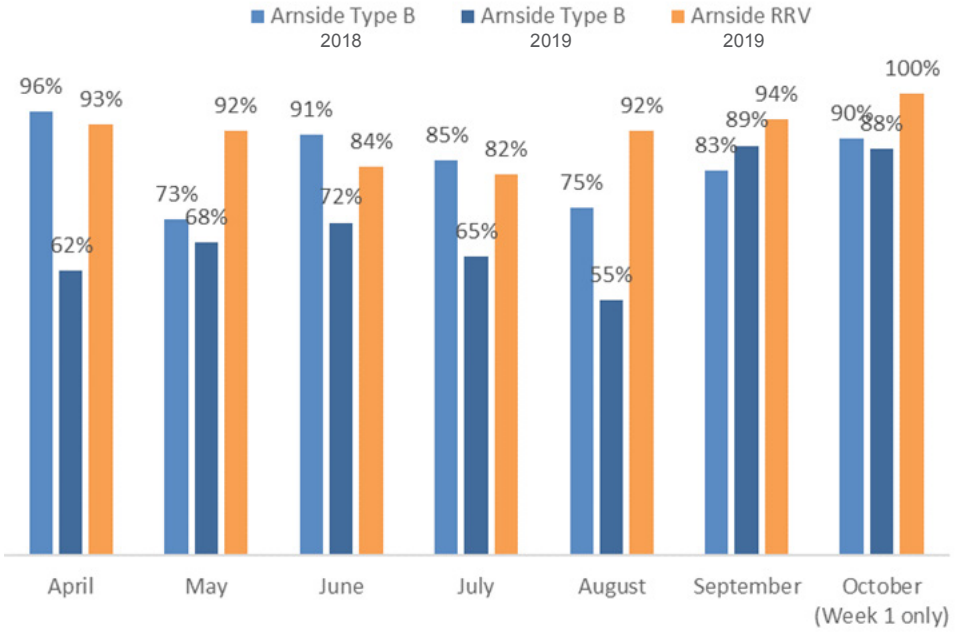


Chart: Arnside total % availability at night (6pm - 6am) for standard fire appliance and RRV

For Arnside the night-time (6pm to 6am) availability is also higher for the RRV for every month compared to availability of the standard fire appliance on the same months for 2019.

Staveley Availability

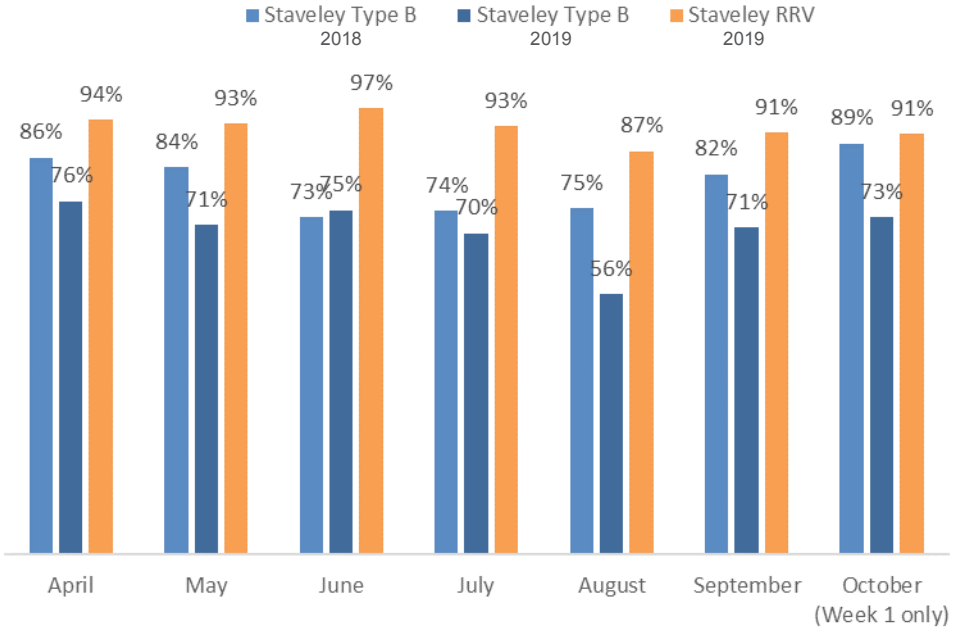


Chart: Staveley total % availability (24 hrs) for standard fire appliance and RRV

For Staveley the total availability is significantly higher for the RRV for every month compared to availability of the standard fire appliance on the same months.

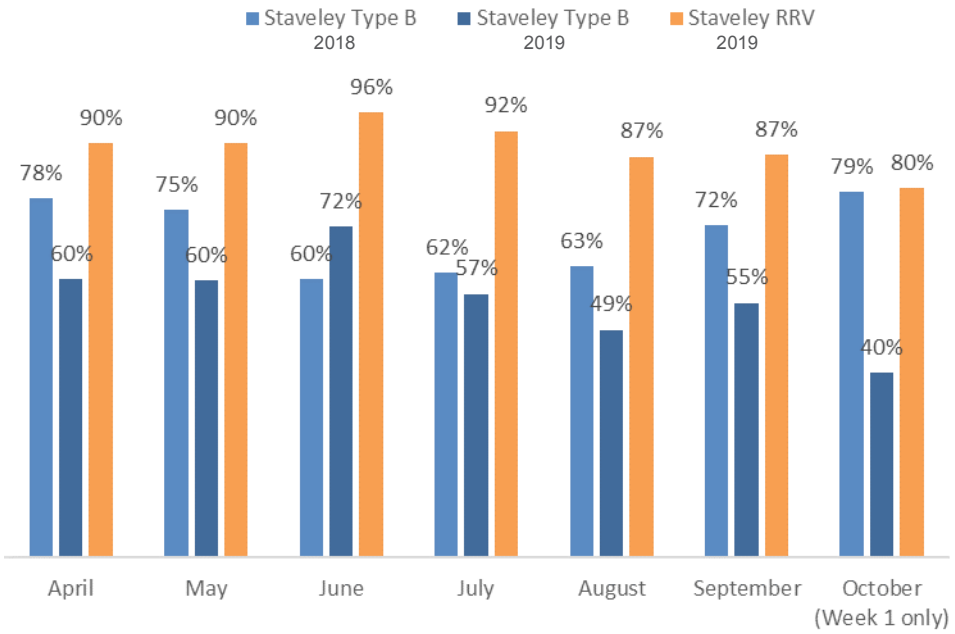


Chart: Staveley total % availability in the day (6am - 6pm) for standard fire appliance and RRV

For Staveley the daytime (6am to 6pm) availability is significantly higher for the RRV for every month compared to availability of the standard fire appliance on the same months.

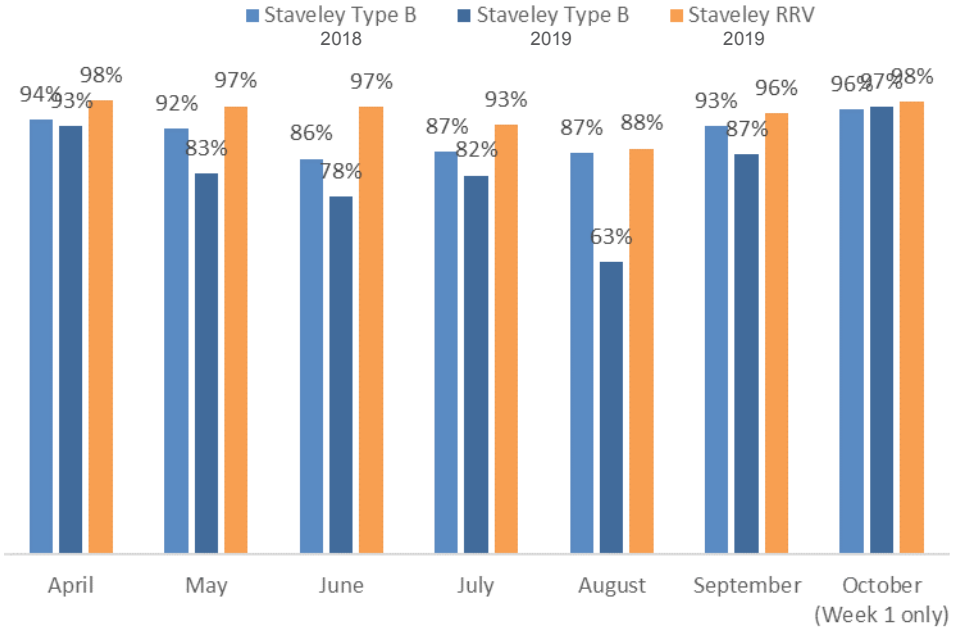


Chart: Staveley total % availability at night (6pm - 6am) for standard fire appliance and RRV

For Staveley the night-time (6pm to 6am) availability is also higher for the RRV for every month compared to availability of the standard fire appliance on the same months.

The table below shows the percentage difference in availability between the standard fire appliances and the RRV on Arnside and Staveley for the pilot period.

Month of availability	Arnside			Staveley		
	Total	Day	Night	Total	Day	Night
April	↑ 36%	↑ 13%	↑ 32%	↑ 18%	↑ 29%	↑ 6%
May	↑ 29%	↓ -3%	↑ 24%	↑ 22%	↑ 30%	↑ 15%
June	↑ 23%	↑ 30%	↑ 12%	↑ 22%	↑ 25%	↑ 19%
July	↑ 24%	↓ -15%	↑ 18%	↑ 23%	↑ 35%	↑ 11%
August	↑ 29%	↓ -4%	↑ 37%	↑ 31%	↑ 38%	↑ 25%
September	↑ 19%	↑ 41%	↑ 6%	↑ 21%	↑ 32%	↑ 9%
October	↑ 31%	↑ 58%	↑ 12%	↑ 18%	↑ 40%	↑ 1%
Average	**27%**	**17%**	**20%**	**22%**	**33%**	**12%**

Table: % change in availability comparing standard fire appliance (2019) to RRV (2019)

Month of availability	Arnside			Staveley		
	Total	Day	Night	Total	Day	Night
April	↑ 17%	↑ 38%	↓ -3%	↑ 8%	↑ 12%	↑ 4%
May	↑ 17%	↑ 15%	↑ 19%	↑ 10%	↑ 14%	↑ 5%
June	↑ 13%	↑ 33%	↓ -7%	↑ 24%	↑ 36%	↑ 11%
July	↑ 6%	↑ 16%	↓ -3%	↑ 18%	↑ 31%	↑ 6%
August	↑ 27%	↑ 38%	↑ 17%	↑ 12%	↑ 24%	↑ 1%
September	↑ 26%	↑ 45%	↑ 11%	↑ 9%	↑ 15%	↑ 3%
October	↑ 12%	↑ 34%	↑ 10%	↑ 2%	↑ 1%	↑ 2%
Average	**17%**	**31%**	**6%**	**12%**	**19%**	**4%**

Table: % change in availability comparing standard fire appliance (2018) to RRV (2019)

When comparing to 2019, the Arnside RRV shows an average of 27% more availability compared to a standard fire appliance during the pilot period, with an average increase of 17% availability during the day and 20% during the night. When comparing to 2018, the RRV has 17% greater availability in total, rising to 31% more during the day and 6% more at night.

Again when comparing to 2019, The Staveley RRV shows an average of 22% more availability compared to a standard fire appliance during the pilot period, with an average increase of 33% availability during the day and 12% during the night. When comparing to 2018, the RRV has 12% greater availability in total, rising to 19% more during the day and 4% more at night.

It should be noted that Kendal fire station has moved to a 24 hour model of crewing from 2nd October 2019, therefore providing increased neighbouring support.

6.3. Improved Response Times

The difference in turn-out and response time between the RRV and the standard fire appliance at Arnside and Staveley is shown below. Firefighters raised a concern that the "size of the engine" of the RRV may result in decreased speed in attending incidents. Conversely, other firefighters commented:

"The RRV is easy to drive, the manoeuvrability is good (Good response) good moving through busy summer traffic and overall an improvement due to its speed."

The response times for the RRVs have been examined, looking at both turn-out time and total response time to understand any impact on these.

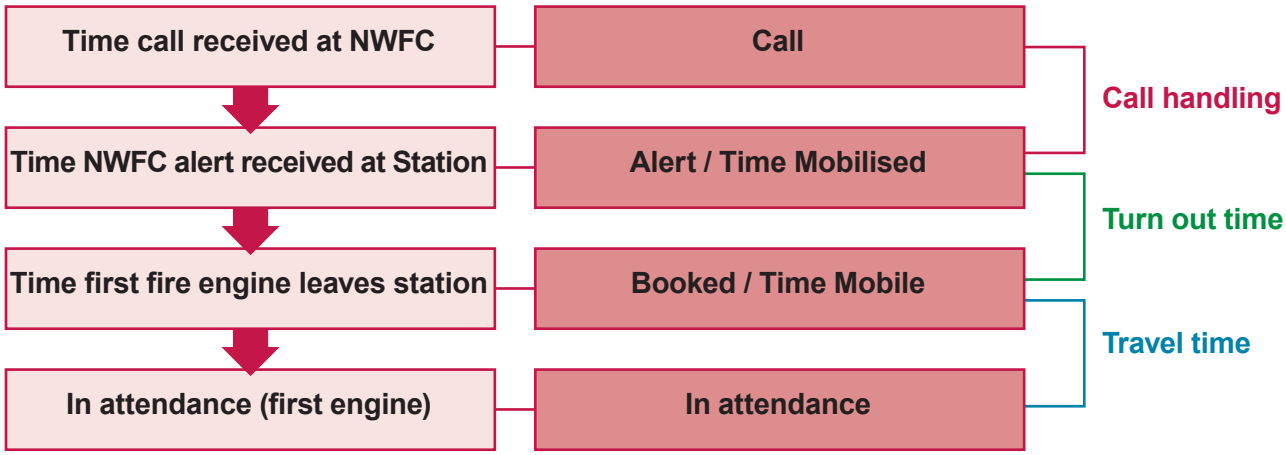


Diagram: Response Time definition

Within its IRMP, CFRS measures total response time as the turn-out time plus the travel time. The turn-out time, travel time and total response time are shown in the table below for all incidents that occurred in the fire station area by the RRV and by the Type B fire appliance.

For Arnside both turn-out and travel time was faster for the RRV, resulting in a faster total response time by 5 minutes 18 seconds. For Staveley the RRV turn-out time was faster and travel time was the same for the RRV and Type B appliance, resulting in a faster total response time of 3 minutes and 15 seconds for the RRV.

Month	Arnside		Staveley	
	Type B Appliance	RRV	Type B Appliance	RRV
	2018[5]	2019	2019	2019
Turn-out time	5m 35s	5m 7s	5m 17s	2m 2s
Travel Time	7m 51s	3m 1s	3m 57s	3m 57s
Response Time	**13m 26s**	**8m 8s**	**9m 14s**	**5m 59s**

Table: Average Response Times for Incidents within Station Area

6.4. Reduced Environmental Impact

Fuel consumption of the RRV is 36mpg compared to the Type B appliances at Arnside and Staveley which have a fuel consumption of 10 mpg. In terms of cost this equates to the RRV being 3.6 times more efficient. In addition this will lead to reduced carbon emissions, therefore environmental impact.

[5] Due to low number of incidents in 2019 the equivalent date range in 2018 has been used to estimate turnout and response time

6.5. Improved Work Life Balance

An improvement in work-life balance could not be measured during the evaluation due to limited data. However, this will be monitored and evaluated at the end of a full year of working with the RRV. Although what is clear and has been demonstrated throughout the pilot is the fact that due to the RRV requiring less crew members to staff the vehicle this has enabled staff to be available for calls for less time and therefore giving them better work life balance.

7. Conclusion

The RRV pilot has delivered against its objectives and has demonstrated increased efficiency and effectiveness in terms of service response to the communities where they have been operating.

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