NOTTINGHAMSHIRE
Fire & Rescue Service
Creating Safer Communities

Nottinghamshire and City of Nottingham
Fire and Rescue Authority

IMPLEMENTATION REVIEW OF THE 'SUSTAINABILITY STRATEGY FOR 2020'

Report of the Chief Fire Officer

Date: 26 February 2021

Purpose of Report:

To present Members with a review of the implementation of the 'Sustainability Strategy for 2020'.

Recommendations:

It is recommended that Members:

- Note the contents of the report.
- Receive updates on the full integrated risk management planning process during the 2021/22 year.

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1. BACKGROUND

1.1 In response to reductions in grant funding and subsequent pressures on finances, the Chief Fire Officer (CFO) presented a report to the meeting of the Fire Authority in February 2016 entitled 'Sustainability Strategy for 2020', to consider and mitigate the long-term potential shortfall of £4.5m.

1.2 Part of the strategy was to consider changes to operational service delivery to maximise the availability of resources in line with risk and demand. Underlining this was the expectation to avoid a reduction in the number of appliances and potential station closures, maintain the current crewing model of riding 'five and four' and, at the same time, generate efficiencies.

1.3 In pursuance of this aim, the CFO presented a report to the meeting of the Fire Authority on 22 September 2017 seeking approval from Members to consult the public on the 'mixed crewing' model.

1.4 In February 2018, the Chief Fire Officer presented a report entitled 'Sustainability Strategy Consultation Outcomes' to the Fire Authority with options to change the operational service delivery model. This report was endorsed and the proposal to implement 'mixed crewing' at two stations was approved.

1.5 That report required the CFO to present a further outcome report to the Fire Authority to review the model's implementation and effectiveness. The onset of coronavirus at the start of 2020, and subsequent demands on the Service, has delayed the presentation of that information to Members.

2. REPORT

2.1 Since the implementation of a 'mixed crewing' model at the Retford and Ashfield fire stations, the Service has undertaken an interim review and evaluation of the model, its impacts on service delivery and the efficiencies that it has presented.

2.2 This interim review, presented at Appendix A to this report, presents an initial assessment of performance for Members, however a full, detailed review of fire cover, response standards and performance will be undertaken as part of the Service's integrated risk management planning (IRMP) process which will be presented to the Fire Authority later this year.

2.3 This review was formulated through the assessment of financial information, the review of incident and availability data, through modelling of incident responses and engagement with the workforce. A comparable period of nine months both before, and after, the implementation of 'mixed crewing' was utilised data analysis, with a period of three years being utilised for modelling data.

2.4 The proposals for a ‘mixed crewing’ approach highlighted an anticipated increase in attendance times of five minutes, during the hours of 6pm and 8am, when the appliances would be crewed by On-Call personnel. This was due to the additional time for On-Call personnel to respond to the station from their home address or workplace.

2.5 A review of operational incident attendance data shows that Ashfield station has had a 2 minute and 18 second increase in incident attendance times for the first appliance during these times.

2.6 The same dataset for Retford station highlights an average increase in attendance times of 4 minutes and 54 seconds, for the first appliance.

2.7 Both increases in attendance times, during the On-Call period of cover, are below the anticipated increase of five minutes. Additionally, across the Service, the response standard has remained under the target of an average of 8 minutes to all incidents, at 7 minutes 48 seconds during the review period.

2.8 Modelled data shows the implementation of ‘mixed crewing’ has led to an increase in the average attendance time for all incident types except for those incidents within ‘high-risk’ areas. The average modelled attendance time, for the Service as a whole, to ‘high risk’ areas has not altered and remains at 7 minutes 12 seconds.

2.9 One of the identified challenges to implementing the ‘mixed crewing’ model was the need to increase On-Call staffing numbers, particularly at the Retford station. To address this, the Service has supported both stations with recruitment in their local areas, including the wrapping of appliances, engagement with local businesses and promotional activity in local media.

2.10 At the time of ‘mixed crewing’ implementation, Ashfield’s On-Call establishment was 14 and has been maintained at that level to date. Retford’s On-Call establishment has increased from 11 at time of implementation to currently 14 personnel.

2.11 The recruitment and retention of On-Call firefighters is an ongoing challenge across the whole fire and rescue sector. The Service continues to provide additional support for both On-Call sections through the Service’s Sustainability of On-Call Team, whilst playing an active role nationally as part of the National Fire Chiefs Council (NFCC) On-Call Working Group.

2.12 The Service has also recently initiated a project to explore the provision of new On-Call contracts to increase the recruitment and retention of On-Call personnel across the Service. Further details of this will be presented to Members once a feasibility trial has identified undertaken.

2.13 A further identified challenge for the proposed ‘mixed crewing’ stations was the availability of two appliances, 24 hours a day. The interim review highlights that:

- At Ashfield, the average availability of both appliances from April 2019 to March 2020 was 70%. The average time that only one appliance was available was 24%. Both appliances were unavailable for 6% of the time*.

- At Retford, the average availability of both appliances for the same time period was 45%. The average time that only one appliance was available was 44%. Both appliances were unavailable for 11% of the time*.

  *It is important to note that when specific appliances are unavailable, operational cover up moves are made to ensure there is a suitable level of fire cover across all areas of the service.

2.14 Availability, up to the current date of this report, has remained similar for the Ashfield appliance but has improved for Retford station with both appliances available for an average of 53% of the time.

2.15 Whilst the report highlights how attendance time to 'high risk' areas has not been impacted, the periodic unavailability of the second appliances has impacted the attendance times to fulfil pre-determined attendances (PDAs) to incidents of greater than one appliance, such as 'life risk' (P1) incidents.

2.16 For context, during the review period, there were 16 'P1' incidents in Ashfield station area and 11 in Retford and there are no local or national standards for attendance times after the first appliance.

2.17 Current incident data shows that peak incident demand, across a typical day, occurs between 11am and 10pm. The period of wholetime cover at mixed crewing stations does not optimally cover this period (8am – 6pm).

2.18 This was acknowledged during the consultation of 'mixed crewing' and it was highlighted how other factors, such as On-Call availability and the actual number of incidents that occur after 6pm, must be considered. Additionally, the impact of a permanent afternoon/evening shift on wholetime staff and the ability to effectively manage transfer of resourcing between shift-based and 'mixed crewing' stations, as and when required, must be considered.

2.19 Analysis shows that, since the implementation of 'mixed crewing', both stations have increased the number of safe and well visits (SWVs), and wider prevention activities, conducted in their local communities. This has been part of a focussed increase under the Safer Communities Strategy and is targeted at the most vulnerable in our communities.

2.20 The review, and feedback from some personnel, has highlighted impacts on available time to complete all required tasks during the shortened day shift.

2.21 Employee welfare continues to be a priority for the Service, as do considerations around an ageing workforce. An intended additional benefit of the 'mixed crewing' model, for wholetime firefighters, was the potential positive impact on individual's work / life balance, by removing the need to work nights and providing a shorter working day.

2.22 The majority of individuals at Ashfield and Retford have positively reported on the impact of not working night shift, alongside the shorter working day. However, the consequence of working a shorter working day results in the need for additional days/hours to be worked outside of a 'usual' shift pattern, to meet individual's contractual requirements. Many firefighters report that this disproportionately impacts their private lives.

2.23 A small number of personnel at 'mixed crewing' stations have requested to transfer to stations that operate the traditional crewing system. However, this also demonstrates the increased choice and flexibility offered to workforce by having a variety of wholetime duty systems in operation.

2.24 Operational crews, both wholetime and On-Call, and Officers involved in the implementation, have shown great commitment and flexibility in making 'mixed crewing' model a workable success.

2.25 The interim review has highlighted a number of recommendations, and areas for assurance, from the implementation of 'mixed crewing'. These include the increased financial savings, the increase in prevention activities, less impact on response times during On-Call periods of cover and no increase in attendance times to 'high risk' areas of the community.

2.26 The recommendations from the report, including a review of the provision of second appliances and a review of wholetime shift timings and working arrangements will be incorporated in to the Service-wide assessment for the integrated risk management planning process in 2021, which will be presented to Members.

3. FINANCIAL IMPLICATIONS

3.1 One of the primary drivers for the implementation of the 'mixed crewing' model was to make financial savings as part of the Service's 'Sustainability Strategy for 2020'. This requirement to make savings was due to the Service receiving a reduction in central funding which meant it was facing a potential budget shortfall of £4.5 million.

3.2 The forecasted savings from the introduction of the 'mixed crewing' staffing model at Retford and Ashfield stations were exceeded. Predicted savings from the implementation of this model were £1.12m. Actual savings realised were £1.18m.

3.3 This is mainly related to a lower than forecasted increase in On-Call costs at Retford station and an increased saving against associated wholetime costs across both stations.

3.4 The implementation of the 'mixed crewing' model meant that the Service did not have to remove any appliances, or close any fire stations, to meet efficiency targets.

4. HUMAN RESOURCES AND LEARNING AND DEVELOPMENT IMPLICATIONS

4.1 The implementation of ‘mixed crewing’ resulted in the reduction of the wholetime establishment by 28 posts. This reduction was realised through management of the workforce plan including planned retirements, vacancy control and not recruiting wholetime trainees.

4.2 During the implementation of ‘mixed crewing’, there were no formal grievances received by the Service, highlighting the effective manner in which staff and representative body engagement was delivered.

4.3 Engagement with the workforce and representative bodies resulted in a smooth transitional process, in line with planned timescales, with minimal disruption to service delivery.

5. EQUALITIES IMPLICATIONS

An equality impact assessment (EIA) was undertaken as part of the ‘mixed crewing’ implementation project. This EIA highlighted a number of potentially positive and potentially negative impacts for employees and the public. These impacts have been addressed through this report and will be considered in future recommendations by Service management.

6. CRIME AND DISORDER IMPLICATIONS

There are no crime and disorder implications arising from this report.

7. LEGAL IMPLICATIONS

There are no legal implications arising from this report.

8. RISK MANAGEMENT IMPLICATIONS

8.1 The Service continues to support the crewing of On-Call appliances at the two ‘mixed crewing’ stations through a combination of management interventions to mitigate any impacts to our communities.

8.2 The ongoing recruitment and retention of On-Call personnel is a priority for the Service and will continue to be supported through the Sustainability of On-Call Team.

9. COLLABORATION IMPLICATIONS

There are no collaboration implications arising from this report.

10. RECOMMENDATIONS

It is recommended that Members:

10.1 Note the contents of the report.

10.2 Receive updates on the full integrated risk management planning process during the 2021/22 year.

11. BACKGROUND PAPERS FOR INSPECTION (OTHER THAN PUBLISHED DOCUMENTS)

None.

John Buckley
CHIEF FIRE OFFICER

NOTTINGHAMSHIRE
Fire & Rescue Service
Creating Safer Communities

A REVIEW OF THE IMPLEMENTATION OF THE 'SUSTAINABILITY STRATEGY FOR 2020'

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SECTION 1: EXECUTIVE SUMMARY

1.1 On the 1st April 2019, Nottinghamshire Fire and Rescue Service (NFRS) implemented a 'mixed crewing' response model at two of its fire stations; Retford and Ashfield.

1.2 The 'mixed crewing' model is a wholetime response model during the day (between 08:00 and 18:00) and an On-Call response model overnight (between 18:00 and 08:00).

1.3 One of the primary drivers for the implementation of a 'mixed crewing' approach was to deliver a more efficient response model as part of the Service's 'Sustainability Strategy for 2020'.

1.4 'Mixed crewing' was one of five strategic project areas that collectively aimed to deliver savings of £4.5m.

1.5 The predicted savings from the introduction of the 'mixed crewing' was £1.12m annually. The actual savings realised were £1.18M annually.

1.6 When implementing 'mixed crewing', the Service excepted that, between 1800hrs and 0800hrs, the attendance times of appliances would be slower due to On-Call staff having to respond from their home or workplace to stations, whereas wholetime staff are immediately available on station to respond. The typical 'turn in' time for On-Call stations is five minutes from the time of alert.

1.7 Data shows that the mixed crew stations have been successful in limiting the expected increase in response times to below the predicted five-minute increase. In fact, the response times of Ashfield's appliance is notable as there has only been a 2 minute and 18 second difference in incident attendance times[1] between the current overnight On-Call model and the previous wholetime response model.

1.8 At Retford station, the period of time covered by On-Call personnel has seen an average increase in attendance times of 4 minutes and 54 seconds; in line with the forecasted increase.

1.9 Despite an increase in average attendance times at these stations, modelled data shows the average attendance time, for all incidents across the Service, remained below the Service's response standard[2] of 8 minutes, at 7 minutes 48 seconds.

1.10 Modelled data shows that since the implementation of 'mixed crewing', there has been an increase in the average attendance time for all incident types, except for those incidents within 'high-risk' areas.

[1] Attendance time is defined as the time taken from the first appliance being mobilised by Control, to time of arrival at the incident

[2] NFRS's Strategic 2019-2022 plan makes a commitment to respond to all incidents, on average in less than eight minutes.

1.11 The average modelled attendance time, for the Service as a whole, to high risk areas,[3] has not altered and remains at 7 minutes 12 seconds.

1.12 One of the known challenges to implementing the 'mixed crewing' model was the need to increase On-Call staffing numbers to enable the availability of two appliances overnight.

1.13 Data on appliance availability shows since the implementation of 'mixed crewing' Ashfield had two appliances available 70% of the time. Specifically, overnight, two appliances were available 57% of the time.

1.14 The average availability of both appliances at Retford was 45% of the time and, specifically overnight, two appliances were available 21% of the time.

1.15 Overnight, for 'mixed crewing' stations, first appliance response times is better than predicted for both stations. However, due to the unavailability of the second appliances, the attendance times to fulfil pre-determined attendances (PDAs) to incidents of greater than one appliance has been increased.

1.16 Data shows that the current peak incident demand across a typical day occurs between 11:00 and 22:00. The current period of wholetime cover at 'mixed crewing' stations does not optimally cover this period.

1.17 Data shows that since the implementation of 'mixed crewing', both stations have increased the number of Safe and Well Visits (SWVs) and wider prevention activities undertaken in communities. This increase, however, is less than the average increase that has been seen across other single appliance stations over the same period.

SCOPE

1.18 This report will review financial data to see if the predicted savings, through the implementation of 'mixed crewing', have been met.

1.19 This report will also examine the impact on services delivered to the community through the implementation of the 'mixed crewing' duty system at Retford and Ashfield fire stations. It will do this by:

- evaluating any changes to the operational response times to incidents
- evaluating prevention activity since the implementation of 'mixed crewing'.

BACKGROUND

1.20 A reduction in public sector funding by central government meant that the Service was facing a potential budget deficit of £4.5 million in forthcoming years. It was therefore necessary for the Service to review its operating model and identify efficiencies to meet the financial pressures it was facing.

[3] The 'high risk' category defines those areas within the County that are the most at risk. Further detail on the calculation of risk categories can be found in the appendix

1.21 The Service detailed is efficiency plan in the 'Sustainability Strategy for 2020' report. This was presented to the Fire Authority, and endorsed, in February 2016.

1.22 Part of this strategy recommended changes to the Service's response model to maximise resource availability at times of peak demand and implement a more cost-effective delivery model, to meet the forecasted financial pressures.

1.23 It was acknowledged that there was a collective responsibility to deliver the most effective service to the public within the financial constraints that were outside the control of the Fire Authority and the Fire & Rescue Service senior leadership.

1.24 When implementing this new duty system, the Service anticipated that, during the 1800hrs to 0800hrs period, the attendance times to incidents would be slower due to the fact that On-Call staff have to respond to station, whereas wholetime staff are typically immediately available. The 'turn in' standard for On-Call stations is five minutes from alert. It was therefore expected that there would be an estimated five-minute increase in response times at these stations during the periods of primarily On-Call crewing.

1.25 The implementation of 'mixed crewing' was a new way of working for the Service. It was acknowledged that crews would have to work differently as they would not have a 'night shift' to cover. The Serviced aimed to facilitate the new ways of working through voluntary agreements with personnel to undertake the new crewing model.

1.26 The work pattern of 'mixed crewing' stations, as with wholetime stations, is defined by the Service's 'working day' procedure.

1.27 As there is no night shift, crews would have to undertake all core activities during the day. This includes training, equipment checks and prevention and protection activities.

1.28 It was anticipated that there would be a reduction in prevention activities due to activities normally undertaken after 18:00, such as Safe and Well Visits (SWVs), bring delivered by On-Call staff who, traditionally, have less forecastable availability than wholetime crews.

1.29 The introduction of a 'mixed crewing' model at Retford and Ashfield stations was introduced on the 1st April 2019 at 08:00.

SECTION 2: REPORT

Financial Information

2.1 One of the primary drivers for the implementation of the 'mixed crewing' model was to make financial savings as part of the Service's 'Sustainability Strategy for 2020'.

2.2 This requirement to make savings was due to the Service forecasting a reduction in central Government funding which meant it was facing a potential budget shortfall of £4.5 million.

2.3 The introduction of the ‘mixed crewing’ model enabled the Service to maintain the same total number of fire appliances but, during periods of lower demand, staff them using an On-Call model as opposed to a wholetime crewing model.

2.4 This model would see financial savings generated through a decrease in the wholetime establishment. Once fully implemented there would be a reduction of 28 wholetime operational posts.

2.5 The forecasted savings from the introduction of the ‘mixed crewing’ staffing model at Retford and Ashfield stations were exceeded. Predicted savings from the implementation of this model were £1.12M. Actual savings realised were £1.18M. This is mainly related to a lower than forecasted increase in On-Call costs at Retford station and an increased saving against associated wholetime costs.

2.6 Of note; when implementing ‘mixed crewing’ no jobs were put ‘at risk’ and no redundancies were required. The Service reduced its establishment figure through workforce planning using the retirement profile, not filling existing vacancies, and not recruiting new staff.

2.7 The implementation of the ‘mixed crewing’ model meant that the Service did not have to remove any appliances, or close any fire stations, to meet efficiency targets.

SAVINGS REVIEW

2.8 **Retford:**

- The estimated Wholetime savings were -£586,935. This was based on the reduction of 10 Firefighters(FF), two Crew Managers (CM) and two Watch Manager (WM) posts.
- The estimated increase in On-Call costs were between £20,081 and £33,039.
- The estimated net saving was between £553,896 and £566,855.
- The actual wholetime saving was £611,725 (19/20 compared with average of 17/18 and 18/19).
- The actual increase in On-Call costs was £3,002 (19/20 compared with average of 17/18 and 18/19).
- The actual net saving at Retford station was £608,723.

2.9 **Ashfield:**

- The estimated Wholetime savings were -£586,935. This was based on the reduction of 10 FF, two CM and two WM posts.
- The estimated increase in on-call costs were between £41,639 and £62,588.
- The estimated net saving was between £524,347 and £545,297.
- The actual wholetime saving was £634,182 (19/20 compared with average of 17/18 and 18/19).

- The actual increase in On-Call costs was £66,746 (19/20 compared with average of 17/18 and 18/19).
- The actual net saving at Ashfield station was £567,436.

2.10 When reviewing financial data, it was identified that the project code assigned for the implementation of 'mixed crewing' does not appear to have been utilised correctly. Only seven items were reported against the project code, totalling £346.91. This omission has meant that accurate reporting against the project costs has not been possible in all areas.

MAINTAINING AVAILABILITY

2.11 Although financial information has not been kept centrally by the Service, from information maintained locally by the District Managers at Ashfield and Retford, it has been possible to estimate the associated costs of maintaining appliance availability.

2.12 The following costs have been estimated assuming an On-Call appliance would consist of four Firefighters and one Watch Manager. The overtime rate was at time-and-a-half and the overtime was not pensionable.

2.13 Additional staffing support was required at Ashfield for a total of 150 hours and 30 minutes within the first year:

Ashfield	
On-Call crew costs:	£3,294.06
Individual crew members:	£1,095.12
Total:	£4,389.18

Figure 1: A table showing the estimated additional cost of maintaining appliance availability at Ashfield station.

2.14 Additional staffing support was required at Retford for a total of 662 hours and 45 minutes within the first year:

Retford	
On-Call crew costs:	£14,345.10
Individual crew members:	£5,698.68
Overtime costs:	£4,235.12
Total:	£24,278.90

Figure 2: A table showing the estimated additional cost of maintaining appliance availability at Retford station.

2.15 The above data shows that the costs for maintaining appliance availability at Retford are over four times that which was required at Ashfield with costs totalling £24,278.90.

2.16 Although this data shows that the costs to maintain appliance availability at both stations was £28,668.08, the Service realised savings of over £600k more than was originally forecast through the implementation of 'mixed crewing'.

HISTORICAL DATA ANALYSIS

2.17 The historical analysis contained within this report compares the operational activity within a nine-month period before the implementation of 'mixed crewing' (01/04/18 – 31/12/18) with the same nine-month period after 'mixed crewing' was implemented (01/04/19 – 31/12/19).

2.18 The data taken from this period presents information for analysis but does not allow a causal relationship to be drawn in relation to the implementation of the 'mixed crewing' duty system. This is due to the number of other variables which may have influenced the data.

2.19 The table below (Fig 3) shows that station mobilisations decreased for the majority of stations between the two periods. Only five stations saw an increase in mobilisations during this time:

Station Name	Mobs Before MC	Mobs After MC	Difference	% Change
Stapleford	116	171	55	47.41
Tuxford	71	100	29	40.85
Bingham	116	142	26	22.41
Misterton	43	48	5	11.63
Southwell	33	34	1	3.03
Eastwood	127	123	-4	-3.15
Mansfield	787	722	-65	-8.26
Carlton	486	430	-56	-11.52
East Leake	52	46	-6	-11.54
London Road	1831	1617	-214	-11.69
Collingham	67	53	-14	-20.90
Arnold	981	776	-205	-20.90
Highfields	798	626	-172	-21.55
Edwinstowe	380	296	-84	-22.11
West Bridgford	689	536	-153	-22.21
Blidworth	229	175	-54	-23.58
Stockhill	2045	1535	-510	-24.94
Newark	615	444	-171	-27.80
Worksop	824	592	-232	-28.16
Hucknall	242	171	-71	-29.34
Harworth	212	138	-74	-34.91
Ashfield	846	513	-333	-39.36
Retford	462	264	-198	-42.86

Warsop	128	68	-60	-46.88

Figure 3: A table detailing the historic difference in station mobilisations for nine months before and nine months after the implementation of mixed crewing.

2.20 Ashfield station saw a 39% decrease in mobilisations in the nine months after the 'mixed crewing' model was implemented (a decrease of 333 mobilisations). Over the same period, Retford station saw a 43% decrease in mobilisations (a decrease of 198 mobilisations). These decreases are greater than the baseline change, across all stations, of -21%.

2.21 It can also be seen from the information within Figure 3 that all but five stations saw a decrease in the number of mobilisations over the time periods which were analysed. Of those five stations, Tuxford and Misterton are geographically closest to the 'mixed crewing' stations and could therefore have reasonably been expected to be impacted by changes.

2.22 The graph below (Figure 4) shows that the attendance times across the Service to high risk areas (12 secs), primary fires (6 secs) and secondary fires (12 secs) all decreased over the period analysed. Attendance times to low risk areas (6 secs), road traffic collisions (6 secs) and other special services (12 secs) all increased.

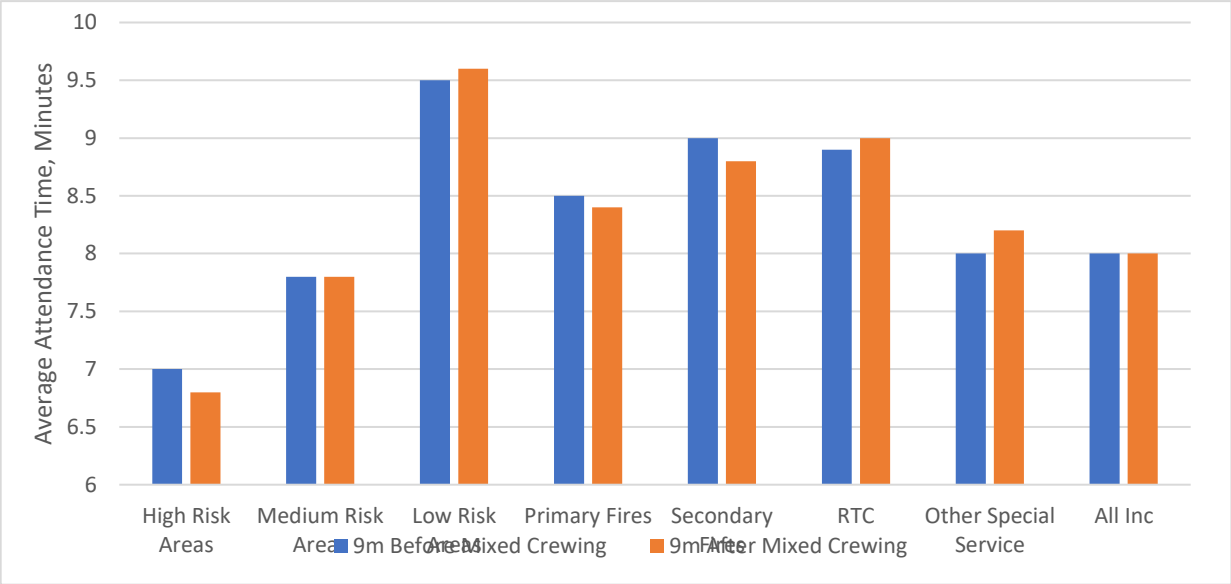


Figure 4: A graph showing the historic changes in average send to arrive times for all risk categories and incident types for the service.

2.23 It can also be seen in Figure 4 that the attendance times, for all stations, to high and medium risk incidents are under the Service's attendance target of 8 minutes.

2.24 Analysis of the attendance time information relating to the 'likely turn out areas'[4] of Ashfield and Retford appliances shows that both stations have been quicker in attending an average of all incidents since the implementation of 'mixed crewing'.

2.25 Retford's average attendance time during the day has improved from 8 minutes 48 seconds to 8 minutes 36 seconds. Whilst Ashfield's average attendance time during the day has improved from 7 minutes 54 seconds to 7 minutes 6 seconds.

2.26 The average attendance time within Retford's 'likely turn out area' at night has increased from 8 minutes 6 seconds to 13 minutes. This is an increase of 4 minutes and 54 seconds is under the anticipated increase of 5 minutes.

2.27 The average attendance time within Ashfield's likely turn out area at night has increased from 8 minutes to 10 minutes 18 seconds. This is an increase of 2 minutes and 18 seconds and is significantly under the anticipated increase of 5 minutes.

2.28 The overall average attendance time within Retford's 'likely turnout area' has increased from 8 minutes 30 seconds to 10 minutes 48 seconds since the implementation of 'mixed crewing'.

2.29 The overall average attendance time within Ashfield's 'likely turnout area' has increased from 8 minutes to 8 minutes 48 seconds since the implementation of 'mixed crewing'.

MODELLING ANALYSIS

2.30 Modelling and analysis was undertaken using data over a period of three years (01/01/2017 – 31/12/2019).

2.31 These models included 'mixed crewing' with two appliances being staffed 24 hours a day, a model with two appliances available during the day and a single appliance at night and a further model with a single appliance available during the day and night.

2.32 A model was also undertaken to compare the 'mixed crewing' model of two appliances being available 24 hours a day and a model of a single appliance available 24 hours a day.

2.33 The nature of the modelling undertaken has removed any other variables as a potential factor for change. Any changes in the modelling outputs can therefore be said to be caused solely by the implementation of 'mixed crewing' at Ashfield and Retford fire stations and any subsequent effect due of concurrent incidents.

[4] The 'likely turn out area' is defined within this report as the geographical area which would be covered by Retford and Ashfield appliances given that they were available at station and being crewed by the day shift. These areas can be seen in the 'day' section of *map 1.*

2.34 Modelling was undertaken by the Service's GIS Team using 'Workload Modeller'. Analysis has assumed that all appliances were available at home station if they were not at an incident.

2.35 The modelling used has not reflected any cover-moves which may have occurred but does reflect the concurrent nature of some of the incidents which occurred during the selected time frame.

2.36 For the purposes of this modelling, it has been assumed that all attending appliances will be from Nottinghamshire Fire and Rescue Service and not utilising over-border support.

2.37 Analysis shows a reduction of 307 mobilisations (-21%) at Retford and a reduction of 581 mobilisations (-23%) at Ashfield over three years has been caused by the implementation of 'mixed crewing'. This is due to the reduction in the station's 'likely turnout area' overnight. This reduction is due to the mobilising system identifying the fastest response, which factors in the anticipated five-minute response to station by On-Call crews.

2.38 It can also be seen from the table below (Figure 5) that those stations which are local to the 'mixed crewing' stations have received mobilisations to incidents which would previously have been attended by Ashfield and Retford, when operating as a traditional wholetime response model.

Station Name	Mobs Without MC	Mobs with MC1	Difference	% Change
Misterton	171	198	27	15.79
Tuxford	418	472	54	12.92
Collingham	211	236	25	11.85
Mansfield	2686	2967	281	10.46
Hucknall	742	819	77	10.38
Blidworth	744	813	69	9.27
Eastwood	568	614	46	8.10
Edwinstowe	1260	1353	93	7.38
Worksop	2578	2714	136	5.28
Warsop	389	405	16	4.11
Harworth	747	773	26	3.48
Southwell	237	238	1	0.42
Stockhill	7213	7233	20	0.28
Arnold	3257	3266	9	0.28
Newark	1763	1767	4	0.23
West Bridgford	2743	2745	2	0.07
Highfields	2212	2213	1	0.05
London Road	6642	6643	1	0.02
Bingham	609	609	0	0.00
Carlton	1821	1821	0	0.00
East Leake	253	253	0	0.00
Stapleford	693	693	0	0.00

Retford	1483	1176	-307	-20.70
Ashfield	2505	1924	-581	-23.19

Figure 5: A table detailing the modelled difference in station mobilisations over a three-year period (single appliance available 24 hours).

2.39 It can be seen from Figure 5 that the implementation of 'mixed crewing' has caused a reduction in mobilisations at Ashfield and Retford stations only. Almost all other stations are modelled to be impacted by the introduction of 'mixed crewing' to some degree due to the nature of concurrent incidents.

2.40 The graph below, (Figure 6), shows that the implementation of 'mixed crewing', with only a single appliance available, has caused an increase in the average modelled attendance time for all incident types, with the exception of those incidents within 'high risk' areas. The average modelled attendance time to 'high risk' areas has not altered.

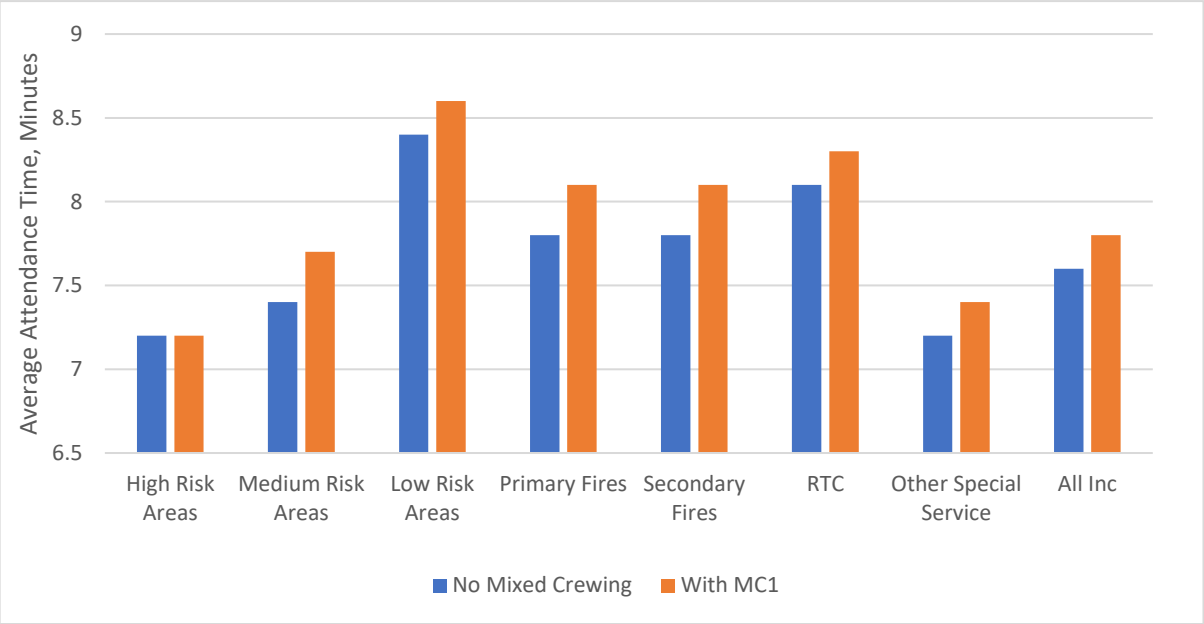


Figure 6: A graph showing the modelled changes in average 'send to arrive' times for all risk categories and incident types (single appliance available - 24 hours).

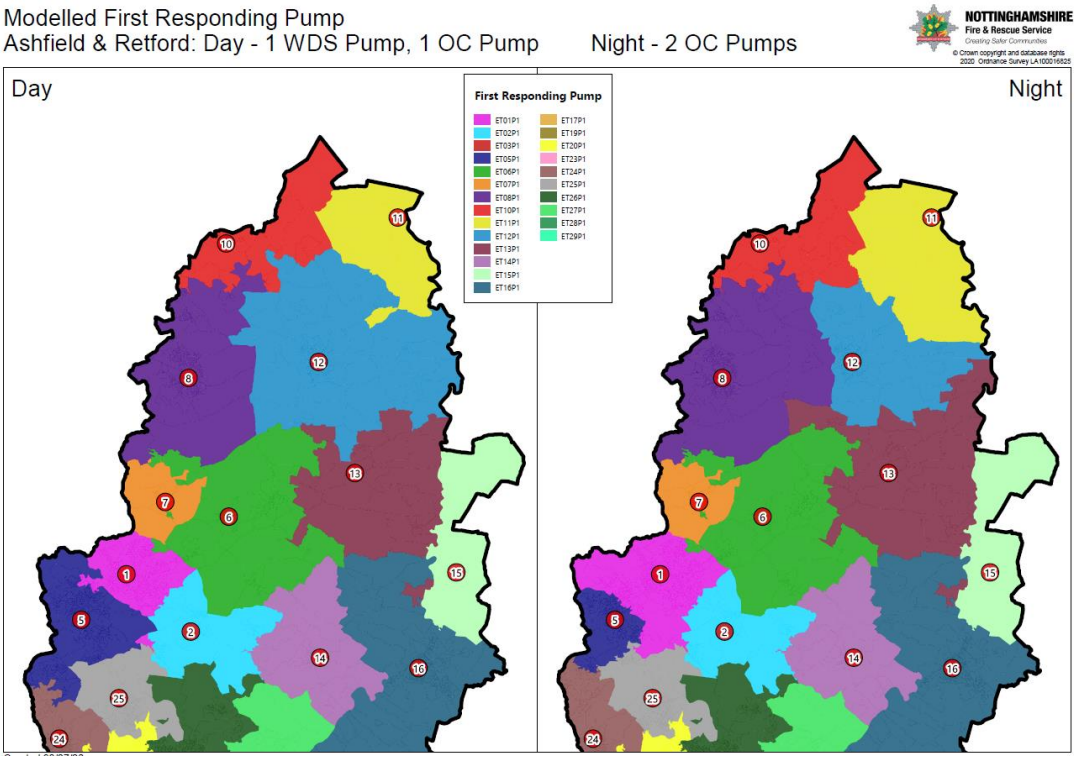
2.41 It can also be seen that attendance times to incidents within 'low risk' areas and to road traffic collisions (RTCs) has risen further above the Service's attendance target of 8 minutes.

2.42 Average attendance times to 'primary fires' and 'secondary fires' have been modelled to rise above 8 minutes from the implementation of 'mixed crewing', with a single appliance available.

2.43 The average attendance time for the Service to all incidents remains below the attendance target of 8 minutes, at 7 minutes 48 seconds.

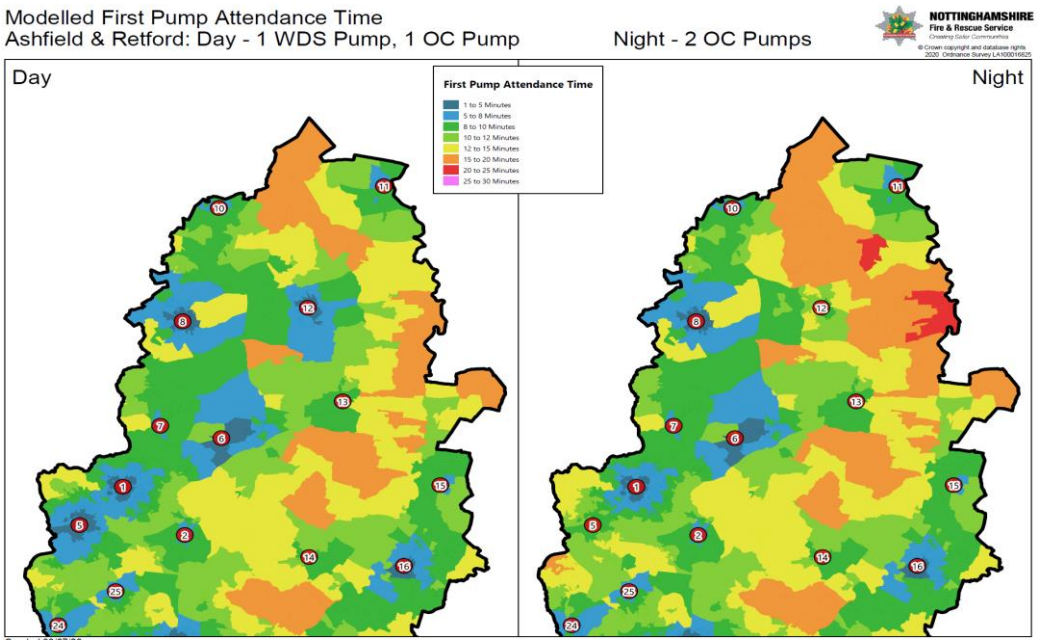
2.44 It can be seen from Map 1, below, that the modelled 'likely turn out areas' for Retford and Ashfield are reduced overnight where 'mixed crewing' has been implemented. The 'likely turn out areas' for the surrounding stations reach

further during the night due to the extended ‘turnout’ times at Retford and Ashfield.



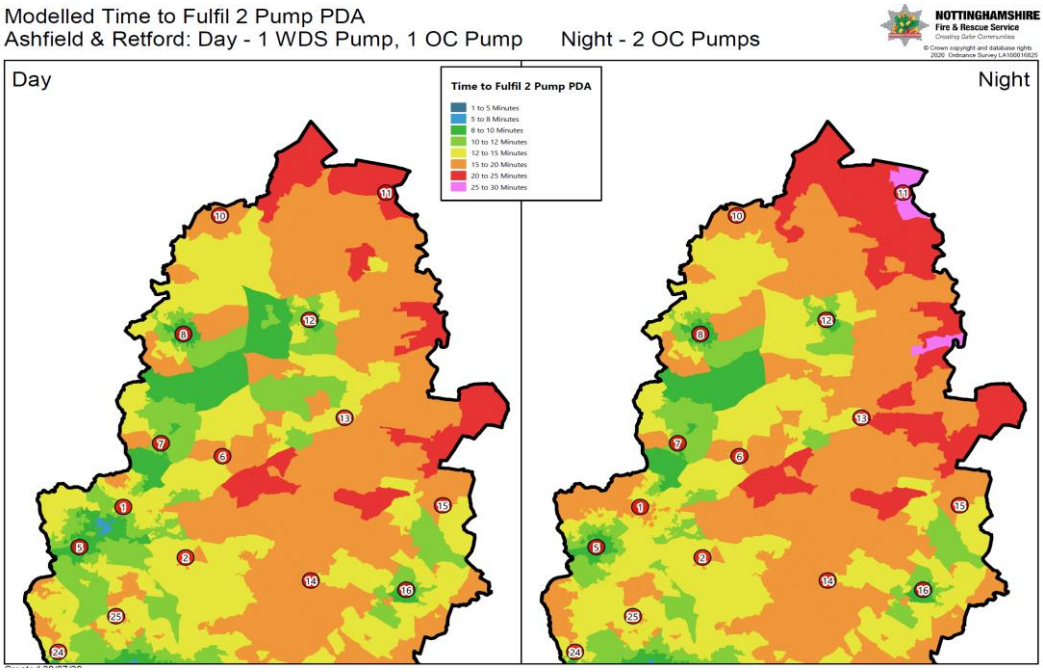
Map1: A comparison of the modelled first appliance attendance to where mixed crewing has been implemented and all appliances are available at Retford and Ashfield.

2.45 It can be seen from Map 2 (below) that there is an increased attendance time at night due to the extended turn out time of the on-call crews.

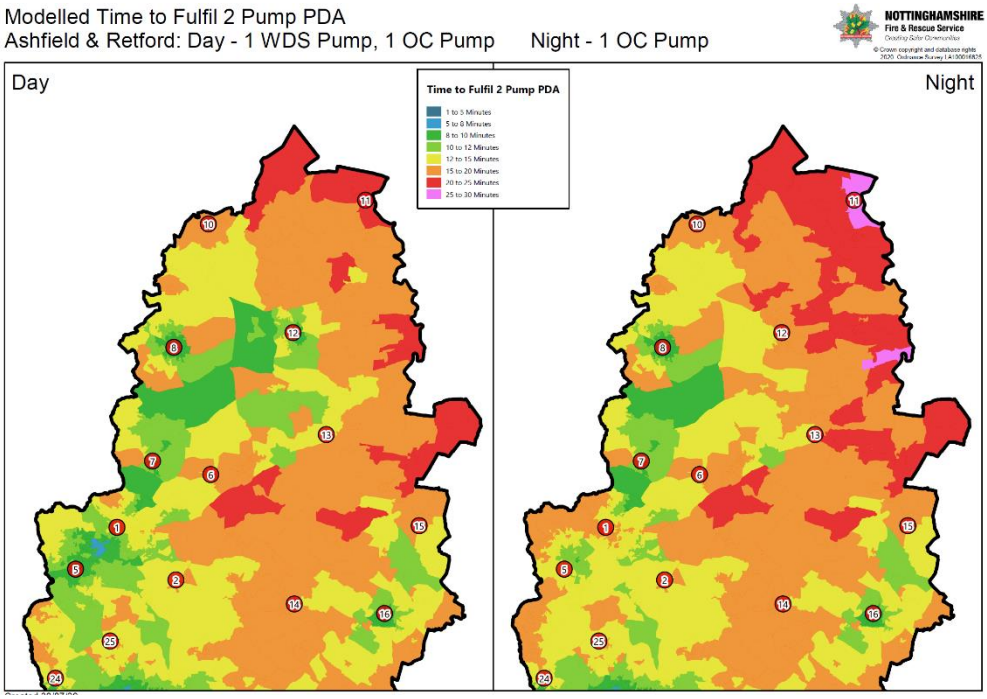


Map 2: A modelled comparison of the first pump attendance times where mixed crewing was implemented and all appliances are available at Retford and Ashfield.

2.46 Below, maps 3 and 4 show the increase in the time required to achieve a two appliance pre-determined attendance (PDA) during the night with 'mixed crewing'. It can also be seen that the time to achieve that PDA is extended further when only a single appliance is available at Retford or Ashfield.

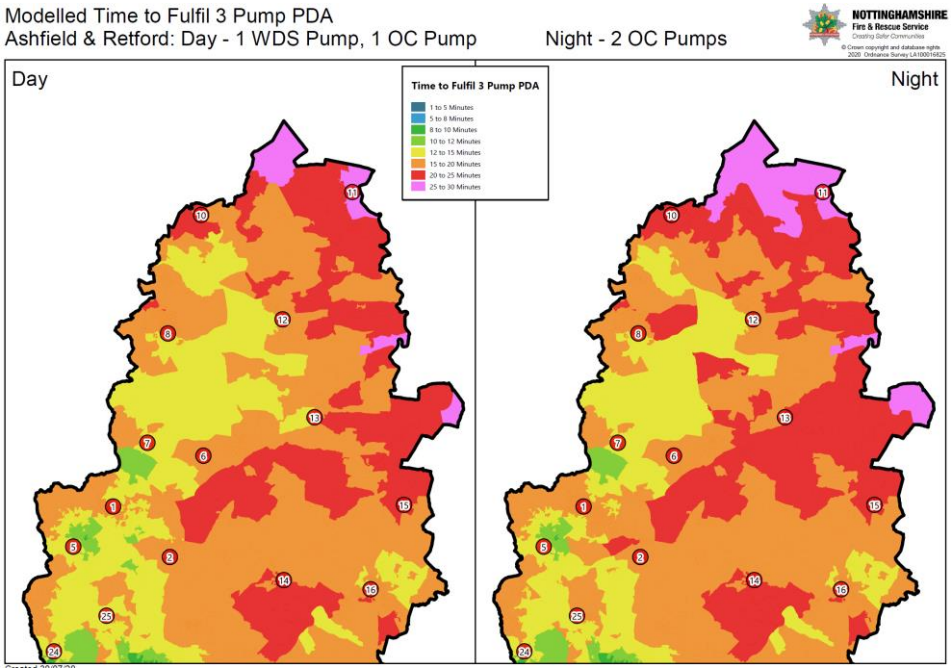


Map 3: A modelled comparison of the time taken to fulfil a two-pump predetermined attendance (PDA) where mixed crewing has been implemented and all appliances are available at Retford and Ashfield.

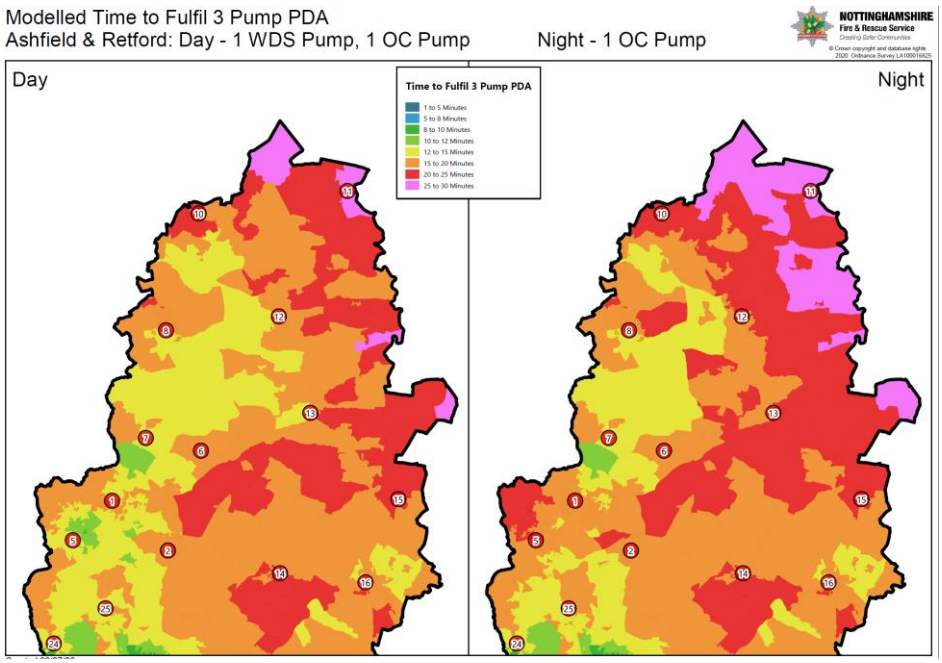


Map 4: A modelled comparison of the time taken to fulfil a two-pump predetermined attendance (PDA) where mixed crewing has been implemented and a single appliance is available at Retford and Ashfield at night.

2.47 Maps 5 and 6, below, show the increase in the time required to achieve a three appliance pre-determined attendance (PDA). It can be seen that the time to achieve that PDA is also extended further when only a single appliance is available.



Map 5: A modelled comparison of the time taken to fulfil a three-pump predetermined attendance (PDA) where mixed crewing has been implemented and all appliances are available at Retford and Ashfield.



Map 6: A modelled comparison of the time taken to fulfil a three-pump predetermined attendance (PDA) where mixed crewing has been implemented and a single appliance is available at Retford and Ashfield at night.

2.48 The table below (Figure 7) shows that there is a reduction in the modelled mobilisations of Retford and Ashfield appliances when both appliances are available. However, when compared to the changes in mobilisations demonstrated in Figure 4, it can be seen that having both appliances available at Retford and Ashfield reduces the number of additional mobilisations for other stations and limits the reductions for the mixed crewing stations.

Station Name	Mobs with MC 2 pump	Mobs with MC 1 pump	Difference	% Change
Collingham	210	236	26	12.4%
Tuxford	449	472	23	5.1%
Blidworth	778	813	35	4.5%
Misterton	190	198	8	4.2%
Worksop	2635	2714	79	3.0%
Mansfield	2891	2967	76	2.6%
Hucknall	800	819	19	2.4%
Warsop	399	405	6	1.5%
Edwinstowe	1337	1353	16	1.2%
Eastwood	608	614	6	1.0%
Harworth	769	773	4	0.5%
Arnold	3263	3266	3	0.1%
Stockhill	7228	7233	5	0.1%
Bingham	609	609	0	0.0%
Carlton	1821	1821	0	0.0%
East Leake	253	253	0	0.0%
Highfields	2213	2213	0	0.0%
London Road	6643	6643	0	0.0%
Newark	1767	1767	0	0.0%
Southwell	238	238	0	0.0%
Stapleford	693	693	0	0.0%
West Bridgford	2745	2745	0	0.0%
Ashfield	2079	1924	-155	-7.5%
Retford	1327	1176	-151	-11.4%

Figure 7: A table detailing the modelled difference in station mobilisations over a three-year period between a mixed crewing model utilising 2 pump availability against single pump availability.

2.49 The graph below, (Figure 8) shows that there is an average six second decrease in the modelled attendance time to high risk areas when the second appliance is available against only a single appliance being available at Ashfield and Retford.

2.50 There are no other modelled average attendance time changes when comparing two appliance availability against single appliance availability at Retford and Ashfield.

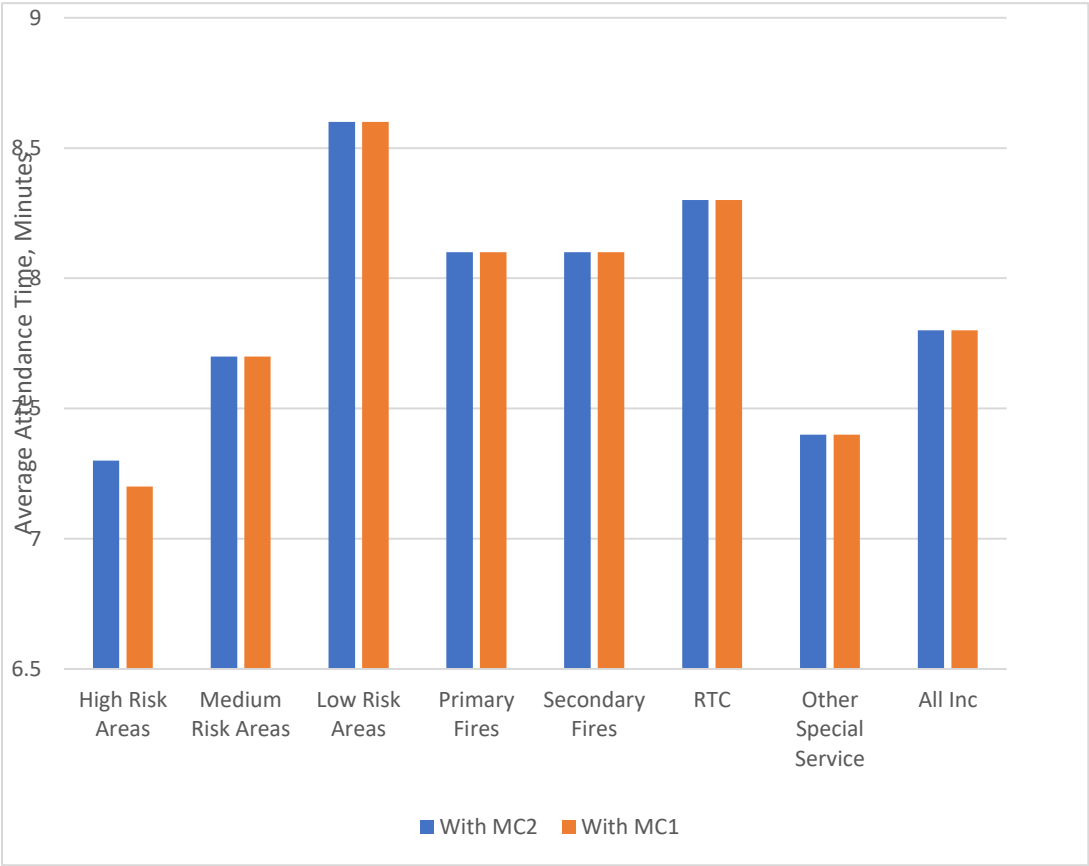
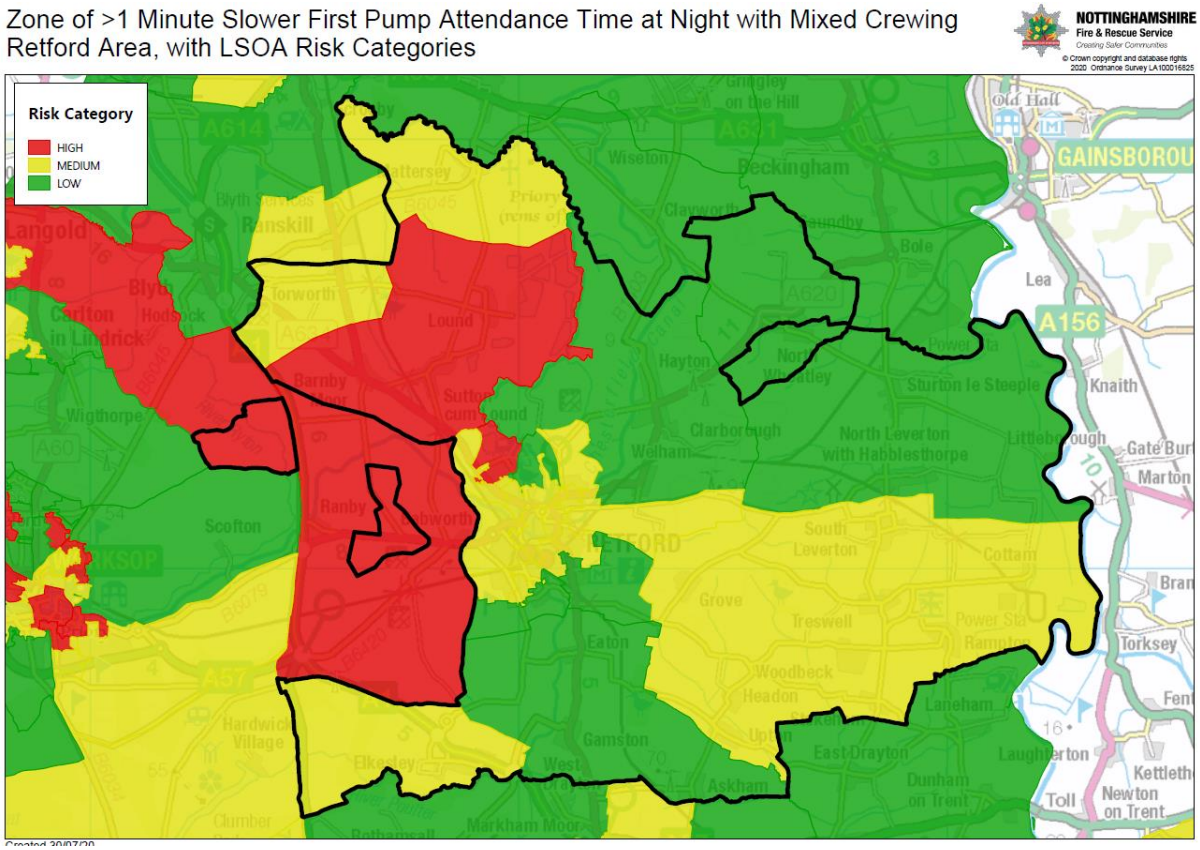


Figure 8: *A graph showing the modelled changes in average send to arrive times for all risk categories and incident types comparing a mixed crewing model utilising 2 pump availability against single pump availability.*

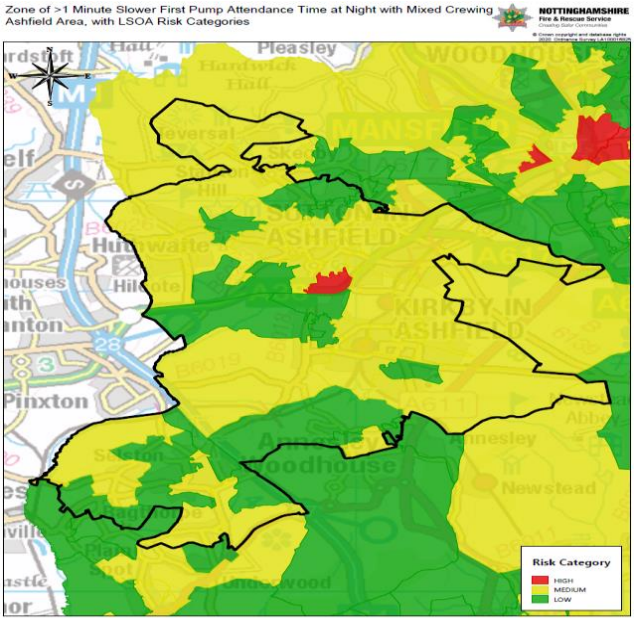
2.51 The map below (Map 7) shows that there has been an increase in the average attendance time to areas around Retford. This includes some areas which are categorised as 'high risk'.

2.52 During the compilation of this report it has become apparent that the Lower Super Output Area (LSOA) containing HMP Ranby is the second highest 'risk area' within Nottinghamshire. This has been attributed to the increase in the number of deliberate fires at HMP Ranby in recent years.



Map 7: The area around Retford which has had an increase in average attendance time of one minute or more overlaid with a risk categorisation.

2.53 The map below (Map 8) shows that there has been an increase in the average attendance time to the area around Ashfield. This includes one area which is categorised as 'high risk'.



Map 8: The area around Ashfield which has had an increase in average attendance time of one minute or more overlaid with a risk categorisation.

APPLIANCE AVAILABILITY

2.54 Centrally available, historical On-Call availability data was only available to inform this report from August 2020.

2.55 The graph below (Figure 9) shows that the average availability of both appliances at Ashfield from April 2019 to March 2020 was 70%. The average time the second appliance was unavailable was 24%. Both appliances were unavailable for 6% of the time.

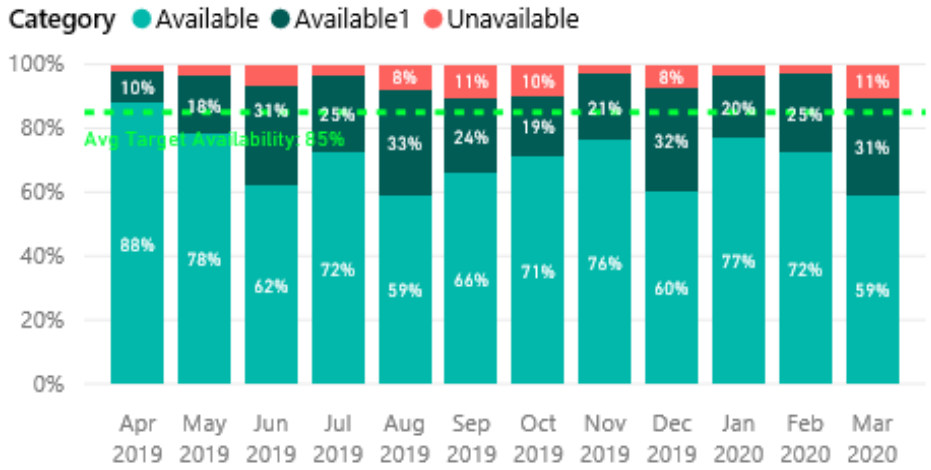


Figure 9: A chart showing the overall appliance availability at Ashfield.

2.56 It can be seen from Figure 10, below, that both appliances are available for an average of 57% of the time during the night at Ashfield from April 2019 to March 2020. Both appliances are available for 41% of the time during the night. Both appliances were unavailable for 2% of the time during the night.

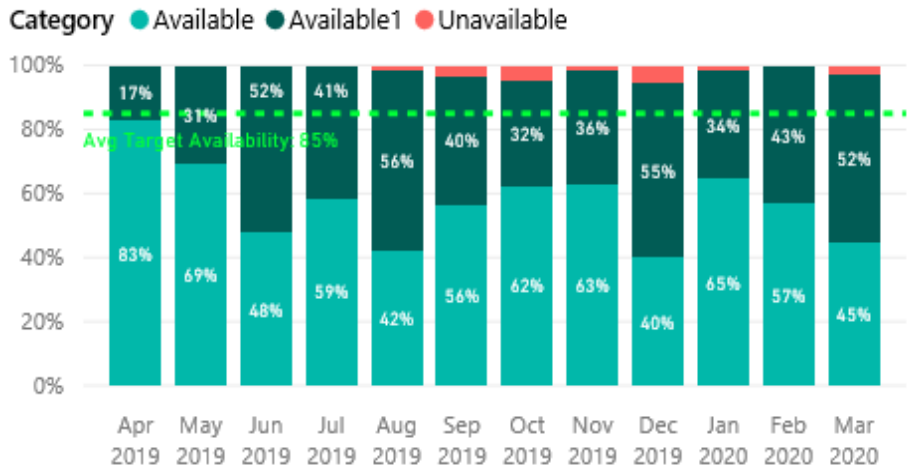
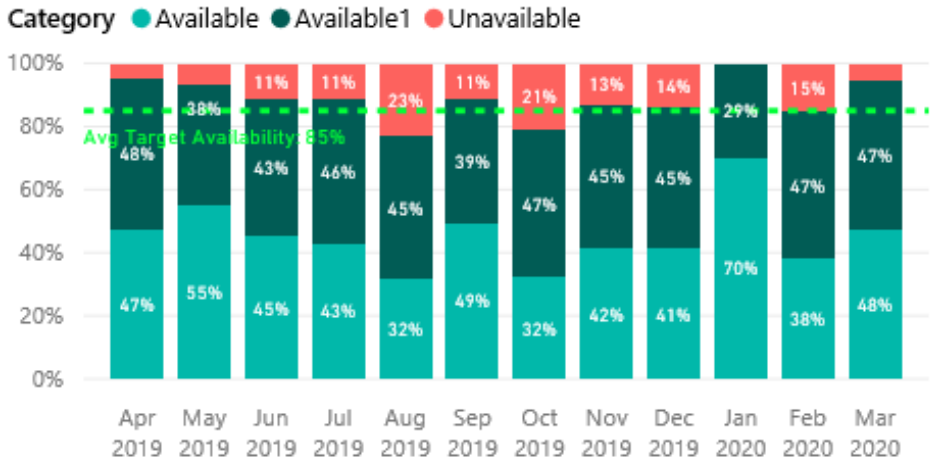


Figure 10: A chart showing the availability of appliances during the night at Ashfield.

2.57 The graph below, (Figure 11) shows that the average availability of both appliances at Retford from April 2019 to March 2020 was 45.3%. The average time the second appliance was unavailable was 43.3%. Both appliances were unavailable for 11.4% of the time.

Figure 11: A chart showing the overall appliance availability at Retford.



2.58 The graph below (Figure 12) shows that a single appliance is available for an average of 74% of the time during the night at Ashfield from April 2019 to March 2020. Both appliances are available for 21% of the time during the night. Both appliances were unavailable for 5% of the time during the night.

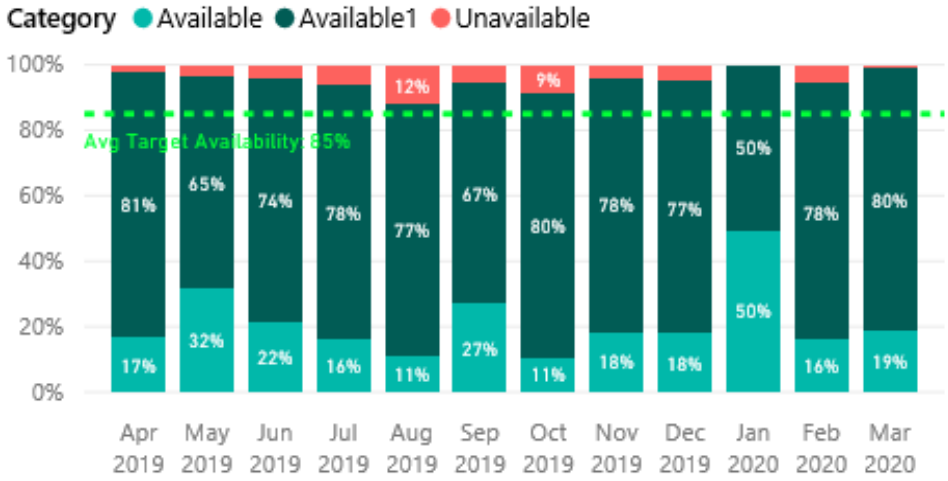


Figure 12: A chart showing the availability of appliances during the night at Retford.

2.59 Ensuring the availability of the On-Call appliance has required support from the Sustainability of On-Call (SoOC) team, On-Call and wholetime personnel providing cover and appliance ‘cover moves’.

2.60 The Day Shift Crewing Procedural Document provides detail on the pre-planning of On-Call support through the SoOC team and the hierarchy of control measures for the purpose of maintaining appliance availability.

INCIDENT PEAK DEMAND

2.61 It can be seen from the graph below (Figure 13) that the peak times for operational demand between 1st April 2018 and 31st March 2019 follow the previous trends of being between 11:00 and 22:00. Appendix 15 shows that this pattern has remained constant for the last four years.

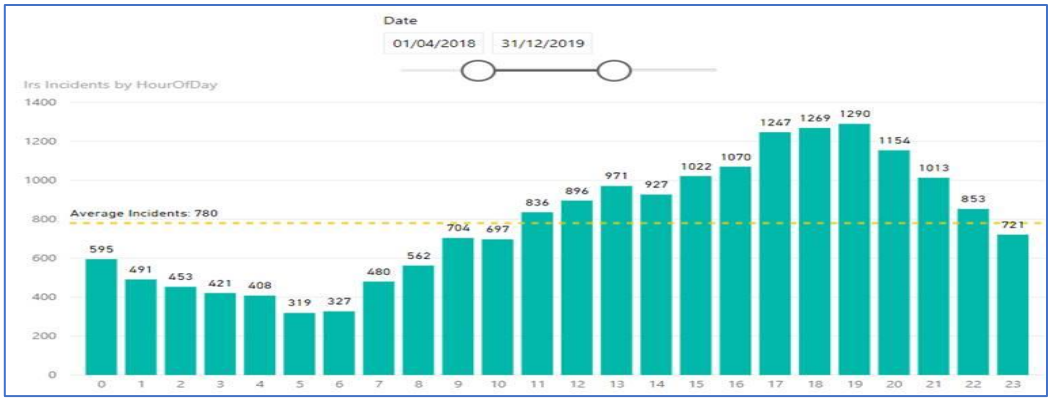


Figure 13: A graph showing the distribution of incidents by the hour of the day between 1/4/2018 and 31/12/2019

2.62 The working day for wholetime staff on mixed crewing stations is 08:00 until 18:00. This work pattern does not align to the known peak incident demand period. Data shows that the wholetime shift ends before the peak demand period.

2.63 Aligning the wholetime cover period to peak demand periods would decrease the response times to incidents, however, On-Call cover can be more difficult during the daytime due to primary employment commitments. Additionally, the provision of a wholetime crewing model to cover the 'peak hours' is anticipated to present challenge from the workforce and representative groups.

WORKING DAY

2.64 The implementation of 'mixed crewing' was a new way of working for the Service. It was acknowledged that wholetime crews would have to work differently as they would not have a night shift.

2.65 As there is no night shift, crews would have to undertake all core activities during the day. This includes training, equipment checks and prevention and protection activities.

2.66 It was anticipated that there would be a reduction in prevention activities due to activities normally undertaken after 18:00, such as Safe and Well Visits (SWVs), bring delivered by On-Call staff who, traditionally, have less forecastable availability than wholetime crews.

2.67 Day shift crewing staff work under the Service's Collective agreement. However, whereas whole time staff work an annualised time of 2190 hours. Staff on mixed crewing stations work 2034 hours per year. 156 hours less per year.

2.68 The work pattern of mixed crewing stations is defined by the series 'working day' procedure.

2.69 A review of Procedure 2144 (Wholetime Duty System Operational Stations – Working Day) was carried out to ascertain the amount of time allocated to different activities depending on the shift pattern being worked.

2.70 The information contained within the table below is taken from the appendix of Procedure 2144 and assumes that the breaks for WDS are taken at the times contained within the appendix. Recommended break periods are not detailed within the Day-Shift Crewing standard working day, so those times reflect the fullest possible amount of time allocated to a category, without the inclusion of discretionary break times (recorded as zero).

2.71 It can be seen from the table below (Figure 14) that number of hours available to the Day Shift Crewing (DSC) personnel, compared to wholetime working, is reduced in all aspects, with the exception of 'Business Safety Checks'.

Activity	Wholetime 42 Hr week	Day Shift Crewing	Change
Parade, Handover, Checks	732	274.5	-457.5
PT	732	366	-366
Directed/Target Led Activities	1830	915	-915
Break	640.5	0	-640.5
Meal	732	366	-366
Community Safety	732	427	-305
Built Environment/Training for Risk	457.5	244	-213.5
Business Safety Checks	366	427	61
Station Routines and Standard Tests	366	152.5	-213.5
Station Admin and Personal References	366	152.5	-213.5
Station Admin/Self Study/NCAT	1464	152.5	-1311.5
Cleaning	366	183	-183
TOTAL	**8784**	**3660**	**-5124**

Figure 14: A table showing the annual allocation of hours for categories of station activities.

PREVENTION ACTIVITIES

2.72 Prevention activity is key to delivering the Service's commitment of '*Creating Safer Communities'*.

2.73 As referenced previously, the implementation of 'mixed crewing' means that crews would have to work differently. Not only does 'mixed crewing' effect the station's response model, it also directly effects how they deliver prevention activities.

2.74 The 'mixed crewing' model means that the majority of prevention activity has to be completed during the day with On-Call staff undertaking some prevention activities during the evening.

2.75 Figure 9, above, shows that with a wholetime staffing model, 732 hours per year are dedicated to prevention activity (183 hours per Watch).

2.76 With 'mixed crewing' there are 427 hours dedicated to prevention activity per year (213.5 hours per watch).

2.77 Therefore, there are 305 hours less per year of time dedicated to prevention activities at 'mixed crewing' stations.

2.78 The primary prevention activity for the Service is the delivery of Safe and Well Visits (SWVs).

2.79 The graph below (Figure 15) shows the increase in the amount of prevention activities undertaken at both Ashfield and Retford.

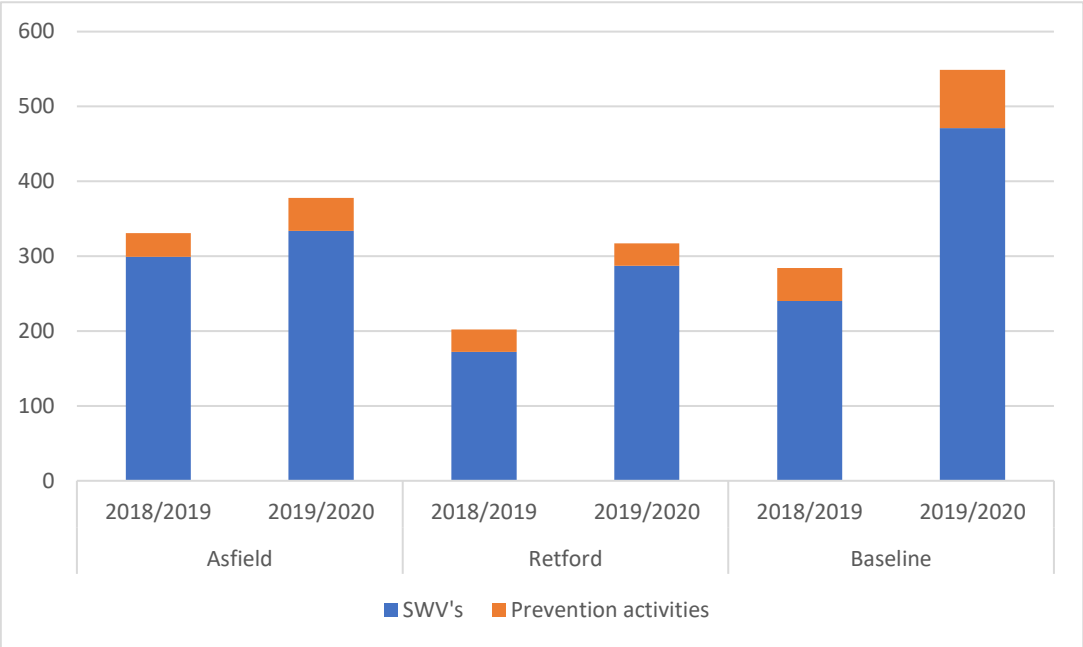


Figure 15: A chart showing the prevention work undertaken by Ashfield and Retford compared against a baseline average of single appliance stations.

2.80 Data shows that since the implementation of ‘mixed crewing’, the number of Safe and Well visits (SWVs) and wider prevention activities has increased. Specifically, there has been a 12.5% increase in prevention activities at Ashfield and a 34% increase at Retford.

2.81 Although an increase is noted at both stations, across the Service there has been a drive to increase prevention activity under the ‘*Safer Communities Strategy*’. As a result, all stations have increased productivity in this area. The baseline rise, on average, across all wholetime, one appliance stations areas has been a 47% increase in productivity.

2.82 Referring to allocated time for prevention activities (Figure 14 -WT stations allocated 732 prevention hours per year and mixed crewing allocated 427 hours) it can be seen that mixed crewing stations have 42% less dedicated time to deliver prevention activities.

2.83 Using this formula shows that the increase in baseline performance was greater than should be expected for Retford station, and less than should be expected for Ashfield.

SECTION 3:
AREAS OF ASSURANCE AND RECOMMENDATIONS

3.1 Areas of assurance:

- The Service was able to introduce a significant change to its operational response model and exceed the amount of savings required.
- Stations have been successful in limiting the predicted five-minute increase in attendance times at Ashfield and Retford between 1800 and 0800.
- Despite an increase in attendance times, the Service is still able to respond, on average, to all incident types within its target of eight minutes.
- Despite an increase in attendance times overall, there has not been an increase in the average attendance times to ‘high risk’ areas.
- Retford station has shown a proportionate increase in prevention activities in line with the baseline increase of wholetime one appliance stations.

3.2 Recommendations:

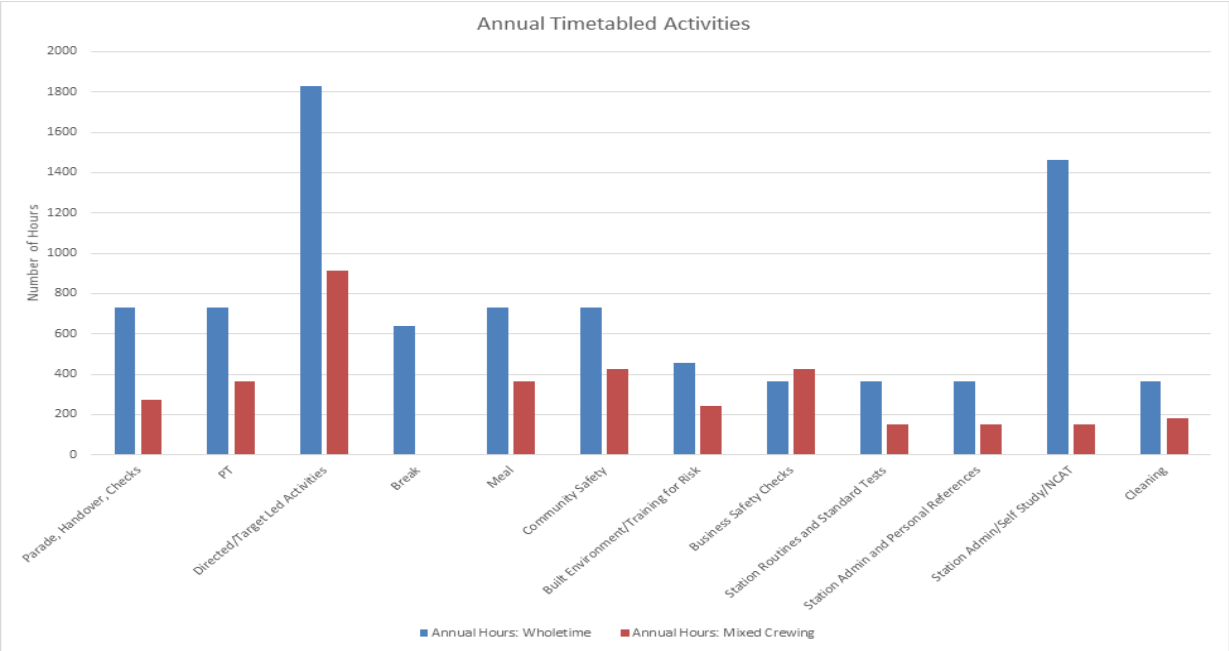
- The Service should review the requirement of second appliances at ‘mixed crewing’ stations, especially during periods of lower demand.
- The Service should ensure that the start and finish times for wholetime shifts at ‘mixed crewing’ stations still align to Service needs.

- The Service should consider a review of Procedure 2144 (Wholetime Duty System Operational Stations – Working Day) to ensure that it facilitates all core activities for ‘mixed crewing’ stations.

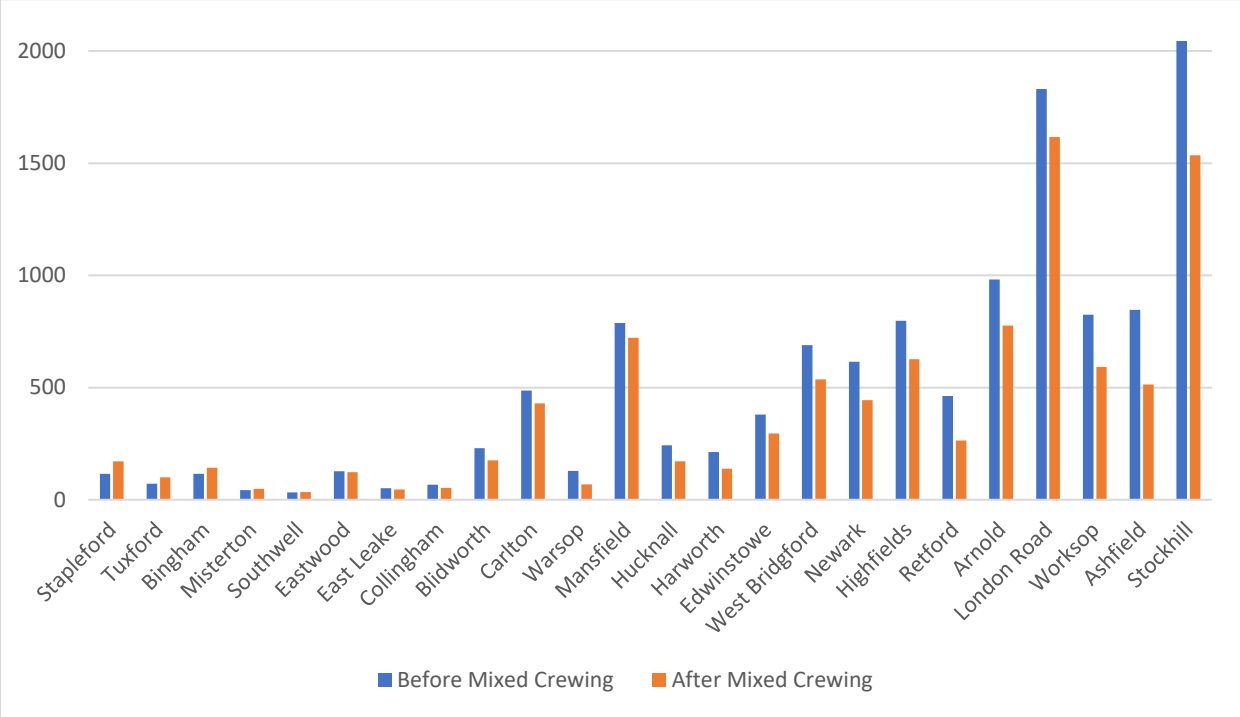
- The Service should ensure that all future costs associated with a project are attributed to the relevant code within Agresso to ensure accurate financial implications can be monitored and evaluated.

SECTION 4: APPENDICES

***Appendix 1**: A table showing the number of annual hours allocated to the different categories of activities at Wholetime (day and night shifts) and Day Shift Crewing.*



***Appendix 2**: A graph comparing the historic number of mobilisations per station.*



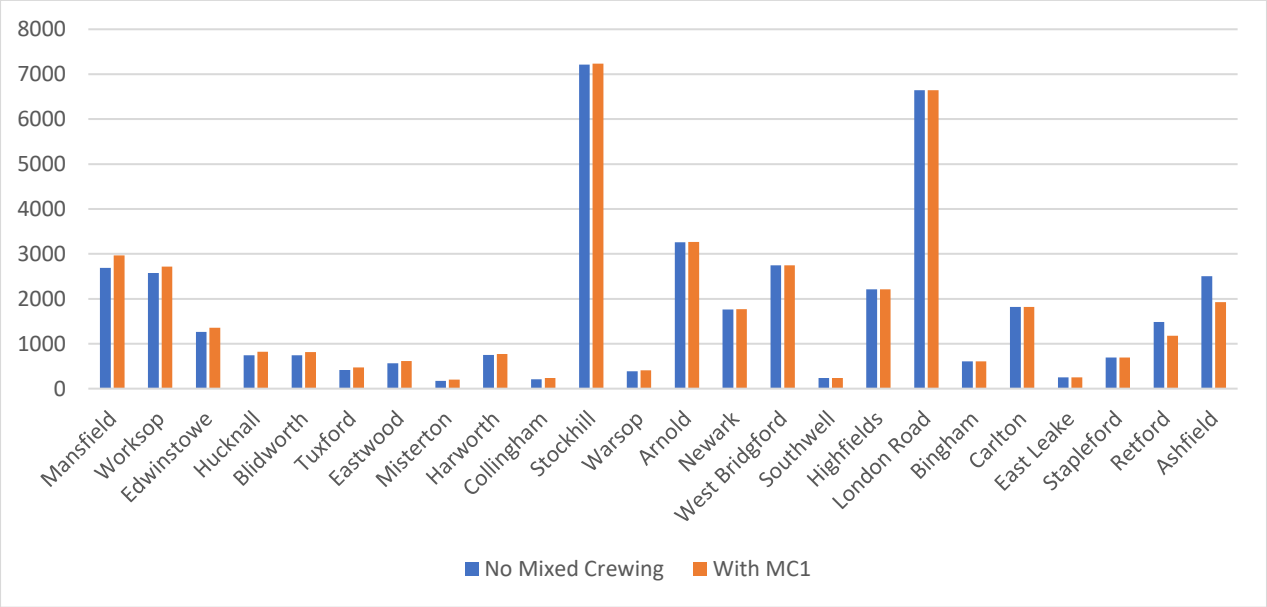
***Appendix 3**: A table showing the average attendance times to different risk categories and incident types for nine months before and nine months after the implementation of mixed crewing.*

	Before Mixed Crewing	After Mixed Crewing
High Risk Areas	7	6.8
Medium Risk Areas	7.8	7.8
Low Risk Areas	9.5	9.6
Primary Fires	8.5	8.4
Secondary Fires	9	8.8
RTC	8.9	9
Other Special Service	8	8.2
All Inc	8	8

***Appendix 4:** Table showing the percentage of incidents attended within eight minutes to different risk categories and incident types for nine months before and nine months after the implementation of mixed crewing.*

	Before Mixed Crewing	After Mixed Crewing
High Risk Areas	76.6%	78.3%
Medium Risk Areas	63.5%	62.3%
Low Risk Areas	46.4%	45.5%
Primary Fires	59.8%	57.5%
Secondary Fires	50.2%	51.6%
RTC	53.6%	51.2%
Other Special Service	62.3%	61.0%
All Inc	62.2%	61.9%

***Appendix 5**: A graph comparing the modelled number of mobilisations over a three-year period.*



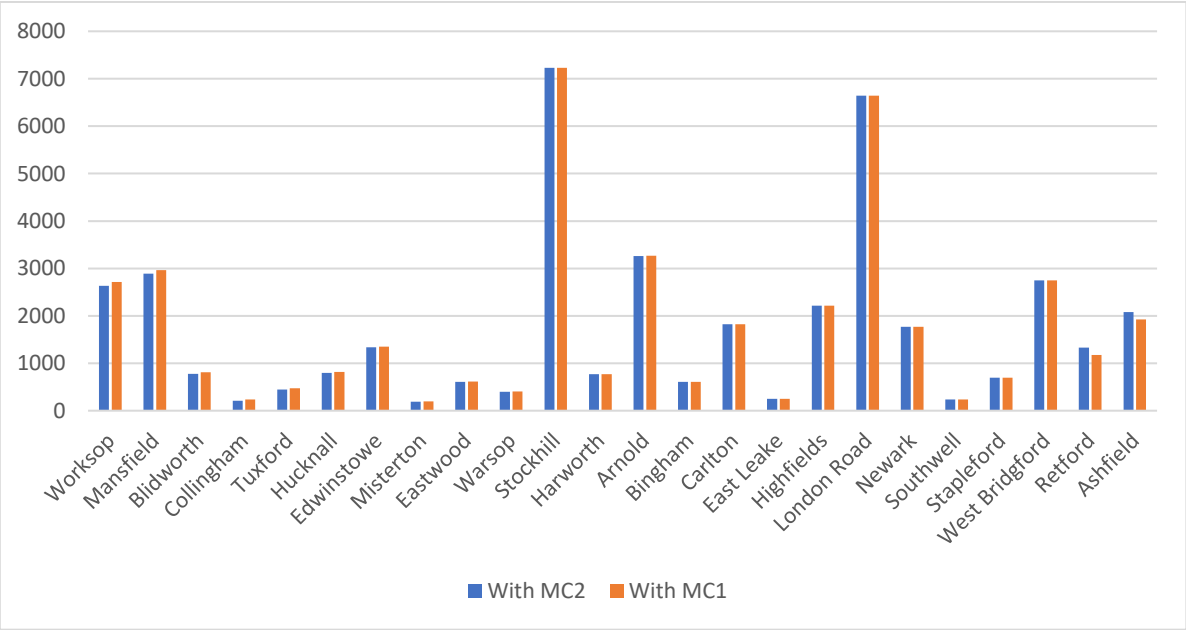
***Appendix 6**: A table showing the modelled average attendance times to different risk categories and incident types for a three-year period.*

	No Mixed Crewing	With MC1
High Risk Areas	7.2	7.2
Medium Risk Areas	7.4	7.7
Low Risk Areas	8.4	8.6
Primary Fires	7.8	8.1
Secondary Fires	7.8	8.1
RTC	8.1	8.3
Other Special Service	7.2	7.4
All Inc	7.6	7.8

***Appendix 7:** Table showing the modelled percentage of incidents attended within eight minutes to different risk categories and incident types for a three-year period.*

	No Mixed Crewing	With MC1
High Risk Areas	66.9%	65.8%
Medium Risk Areas	60.0%	55.7%
Low Risk Areas	50.3%	48.3%
Primary Fires	56.3%	53.1%
Secondary Fires	55.4%	51.7%
RTC	51.4%	48.6%
Other Special Service	64.2%	60.6%
All Inc	59.1%	56.1%

***Appendix 8:** A graph comparing the modelled number of mobilisations over a three-year period between a mixed crewing model utilising 2 pump availability against single pump availability.*



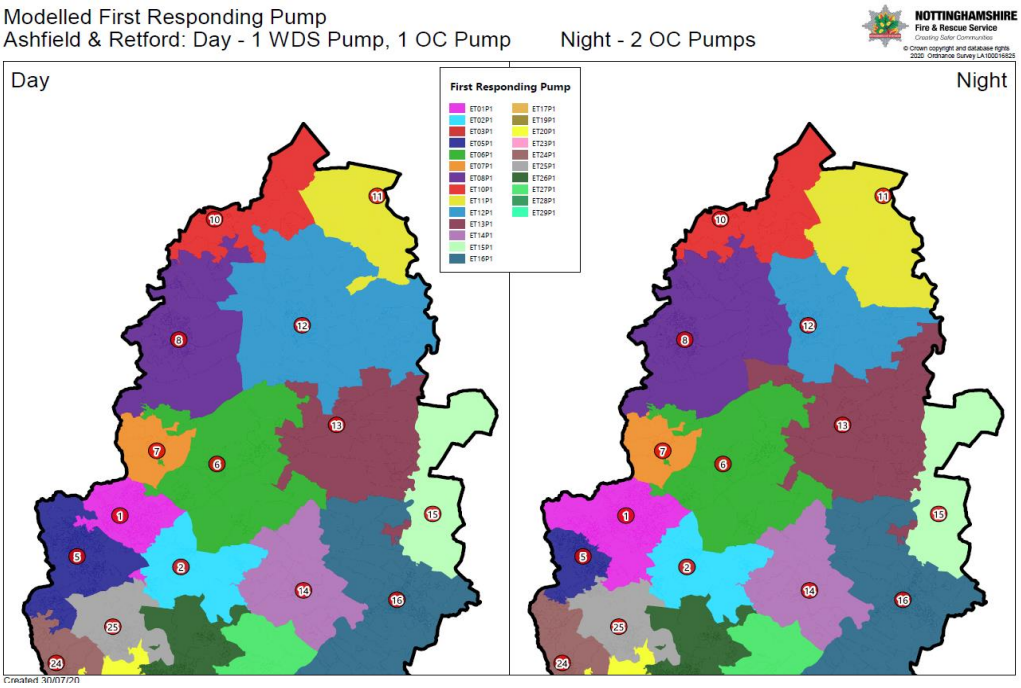
Appendix 9: *A table showing the modelled average attendance times to different risk categories and incident types for a three-year period between a mixed crewing model utilising 2 pump availability against single pump availability.*

	With MC2	With MC1
High Risk Areas	7.3	7.2
Medium Risk Areas	7.7	7.7
Low Risk Areas	8.6	8.6
Primary Fires	8.1	8.1
Secondary Fires	8.1	8.1
RTC	8.3	8.3
Other Special Service	7.4	7.4
All Inc	7.8	7.8

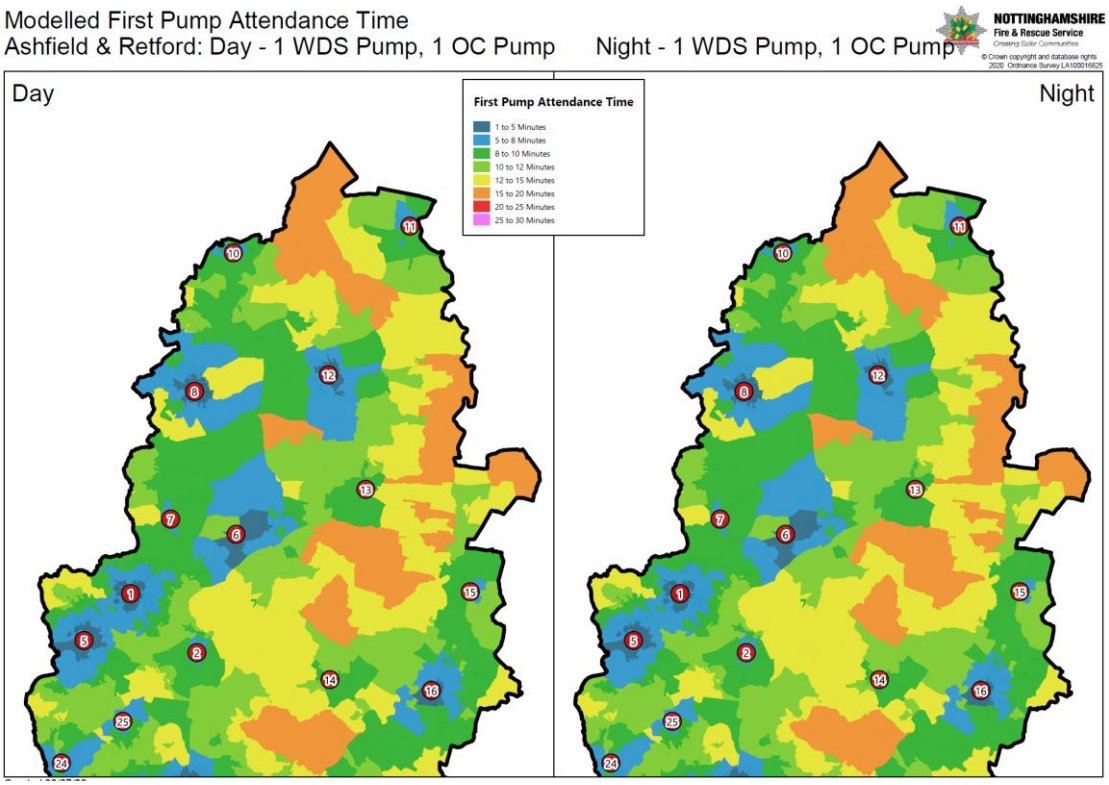
Appendix 10*: Table showing the modelled percentage of incidents attended within eight minutes to different risk categories and incident types for a three-year period between a mixed crewing model utilising 2 pump availability against single pump availability.*

	With MC2	With MC1
High Risk Areas	65.8%	65.8%
Medium Risk Areas	55.7%	55.7%
Low Risk Areas	48.4%	48.3%
Primary Fires	53.1%	53.1%
Secondary Fires	51.8%	51.7%
RTC	48.6%	48.6%
Other Special Service	60.6%	60.6%
All Inc	56.1%	56.1%

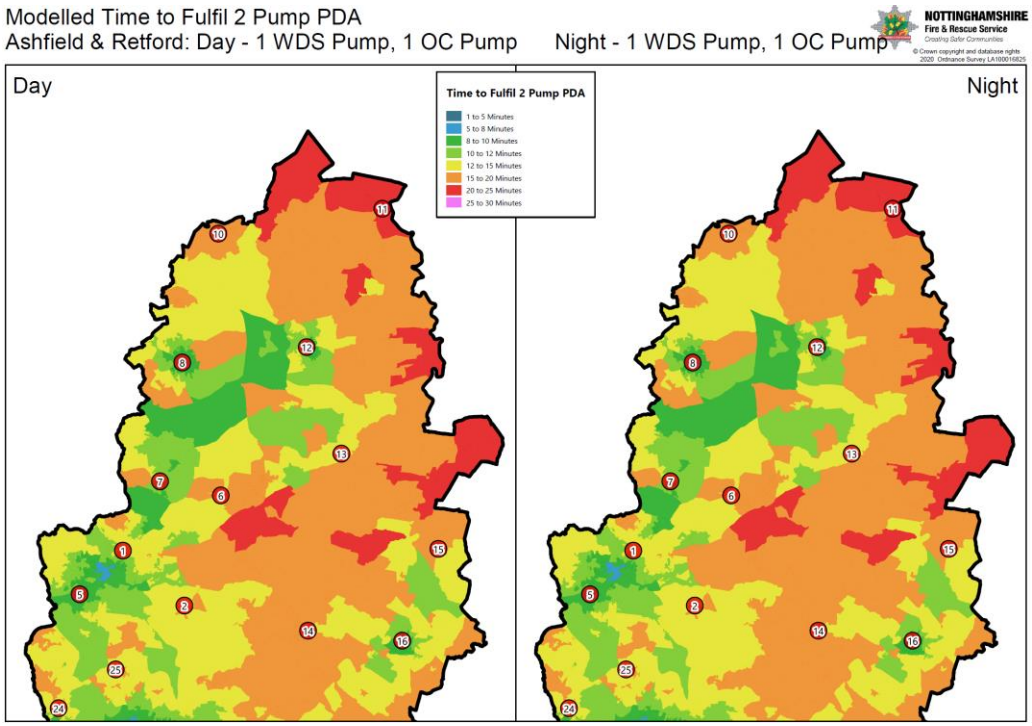
Appendix 11*: A comparison of the modelled first appliance attendance to where mixed crewing has not been implemented.*



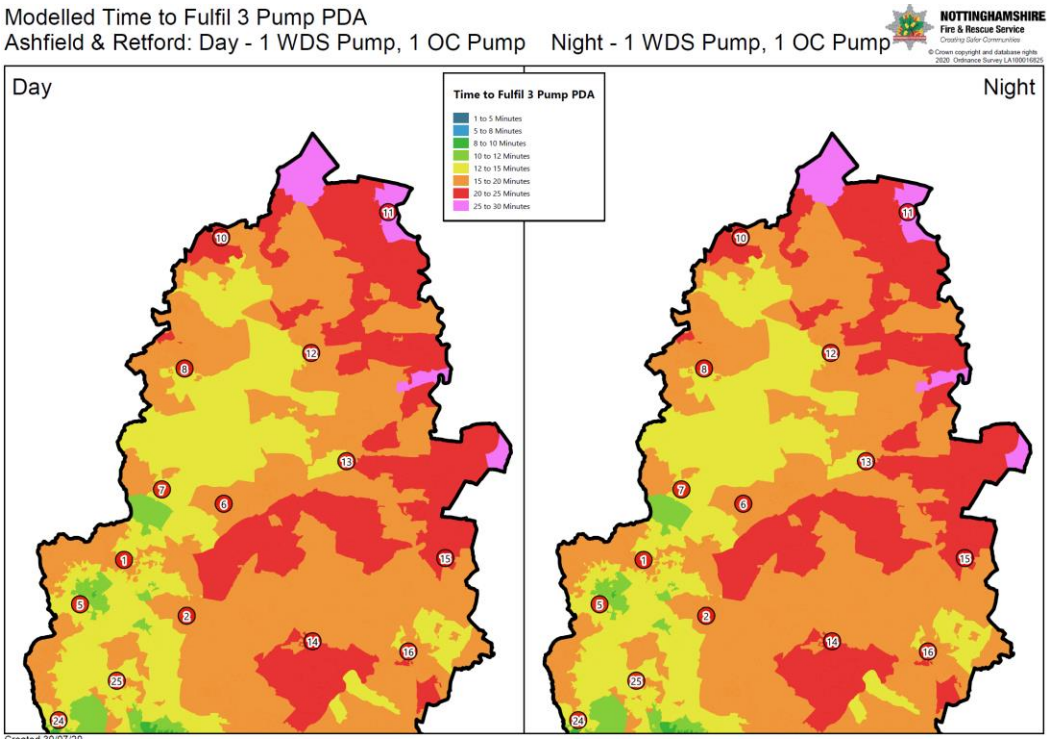
Appendix 12: *A modelled comparison of the first pump attendance times where mixed crewing has not been implemented.*



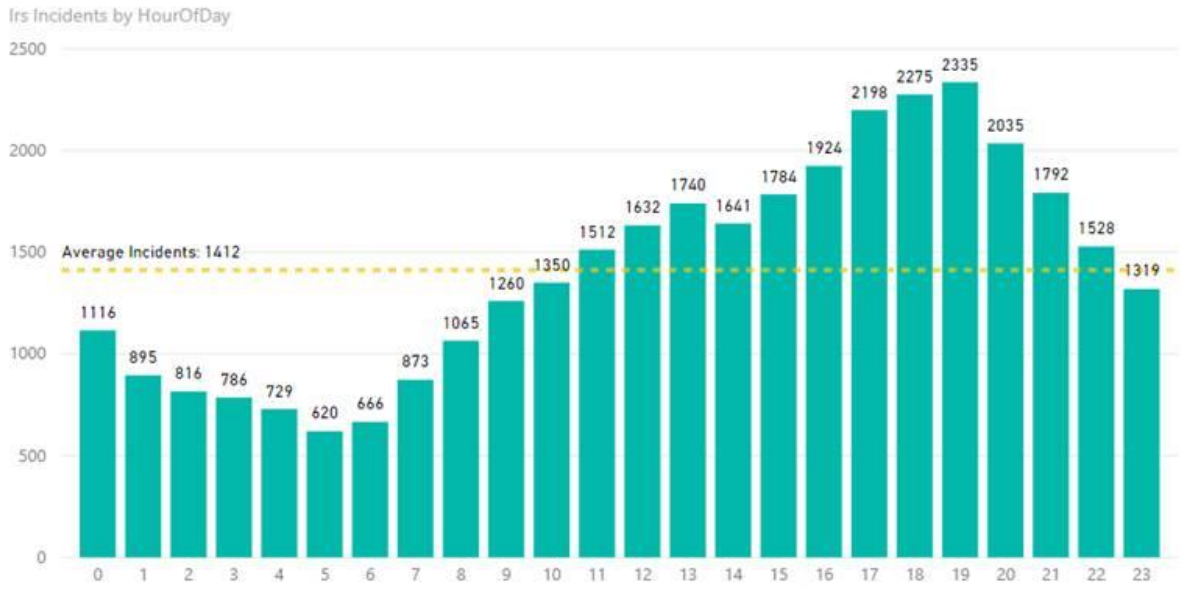
Appendix 13: *A modelled comparison of the time taken to fulfil a two-pump predetermined attendance (PDA) where mixed crewing has not been implemented.*



Appendix 14: *A modelled comparison of the time taken to fulfil a three-pump predetermined attendance (PDA) where mixed crewing has not been implemented*



Appendix 15: *A graph showing the distribution of incidents by the hour of the day between 1/4/2015 and 31/3/2019.*



Appendix 16: *Detail showing the use of the Agresso mixed crewing project code.*

New link Organise links

	T	TT	TransNo	#	Trans.date	Period	Account	Account (T)	Cat1	Cat2	Cat2 (T)	TC	Text	Amount
1	B	P6	9079843	0	30/08/2018	201905	4530	Printing	2013	1266	Mixed Crewing	IZ	Notts Fire & Safety On Call A4 Flyers + posters	82.31
2	B	P6	9079934	0	30/08/2018	201906	4530	Printing	2013	1266	Mixed Crewing	IZ	NFRS Flyers	40.00
3	B	P6	9080648	0	24/10/2018	201907	4523	Catering/Food & Beverages	2058	1266	Mixed Crewing	0	10 x SDc Meals for HR interviews	72.00
4	B	PY	2002812	526	23/10/2018	201907	1202	Operational Overtime	1005	1266	Mixed Crewing	0	5010 : Overtime @ 1.50 : Wholetime Duty and Control EE's : 201907	41.01
5	B	PY	2002833	4807	20/11/2018	201908	1202	Operational Overtime	1005	1266	Mixed Crewing	0	5010 : Overtime @ 1.50 : Wholetime Duty and Control EE's : 201908	0.81
6	B	P6	9081861	0	17/09/2018	201910	4530	Printing	2013	1266	Mixed Crewing	IZ	1 Batch of Notts Fire & Safety On Call A5 flyers	55.39
7	B	P6	9081862	0	07/09/2018	201910	4530	Printing	2051	1266	Mixed Crewing	IZ	Notts Fire & safety On Call A5 flyers	55.39
∑														346.91

Appendix 17: *Notes in relation to the calculation of the financial cost and savings.*

1. Estimated savings and increases have been adjusted for pay awards in order to be comparable with 19/20 pay rates

2. 2017/18 and 2018/19 actual costs have been adjusted for pay awards in order to be comparable with 19/20 pay rates

3. 2019/20 actuals have been adjusted to remove the impact of the increase in pension contributions

4. Payroll numbers are based on the number of people receiving basic pay (wholetime) or retaining fee (on-call), OR sick pay or parental leave pay in each period. No attempt has been made to analyse any other changes that would impact payroll costs, e.g. the number at each rank, pension membership, number in receipt of CPD payments, number at development rate etc.

5. Payroll costs charged to project codes have been excluded (this will exclude activities such as HVP training, attendance at major cross-border incidents)

Appendix 18: *Definition and calculation of Risk categories.*

Risk areas are determined using the scoring system detailed below and using historical data combined with indicators of deprivation levels. The ‘high risk’ category defines those areas within the County that are the most at risk.

A risk score for each Lower Level Super Output Area (LSOA) is calculated by combining six factors, each of which impact on Fire Service delivery. These factors include:

Incidents we have attended (data from the past five years):

- Dwelling Fires (“DwF”)
- Property fires at which injuries to members of the public have occurred (“Inj”)
- Deliberate non-domestic building fires (“DelB”)
- Special services incidents at which there is a risk to life (“SSC”)

Historic fatalities (data from the past five years):

- Deaths caused by property fires (“Fat”)

Deprivation Indicators Indices of Multiple Deprivation (IMD)

- IMD Score

These factors are weighted according to their importance and combined to give an overall Risk Score for each LSOA.

Weightings:

DwF: 1.9

Inj: 0.46

DelB: 0.05

SSC: 0.35

Fat: 0.04

IMD: 1.5

The top 8.5% of LSOAs become “High Risk”, the bottom 42.5% become “Low Risk” and those in between become “Medium Risk”. Examination of these risk scores allows us to see the relative distribution of risk throughout the County and City.

The Service Risk Map is updated annually, to include the most recent five years of data and most up to date IMD figures, and allows us to identify how the distribution of our highest risk areas may be changing.