



INTEGRATED RISK MANAGEMENT PLAN
YEAR ONE - 2004/2005

PROJECT NO.2

REVIEW OF RIDERSHIP FACTOR

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1. INTRODUCTION

- 1.1 This project has been undertaken to meet the requirements of the Integrated Risk Management Plan (IRMP) project no.2 and has involved an examination of the existing Lancashire Fire and Rescue Service (LFRS) 'ridership factor'(RF).
- 1.2 The rationale is outlined in the Year One IRMP and is based on the stated aim of the Combined Fire Authority (CFA) to place a much greater emphasis on preventative activity as a means of enhancing community safety. In this particular project, the RF has been re-visited with the objective of releasing human resources from a primarily emergency response role to one in which prevention is the principal activity.
- 1.3 To aid understanding, an important distinction must be drawn between the objective nature of the ridership factor (a basic mathematical calculation) and the largely subjective nature of crewing levels (the staffing arrangements for emergency vehicles) which are a result of authority policy. A full explanation of each is contained within this report.

2. BACKGROUND

- 2.1 The ridership factor (RF) is the calculation which is used to determine how many firefighters are needed to ensure the provision of one firefighter for 24 hours per day, 365 days per year on a wholetime 42 hour shift duty station. It is not utilised to determine staff numbers for other duty systems which the authority may employ e.g. day-crewing, day duty or flexible duty.
- 2.2 Wholetime shift stations operate a day/night duty system which results in an average commitment by each firefighter of 42 hours per week over an eight-week cycle, organised around a four 'watch' (shift) arrangement. Whilst notionally each firefighter is available for a quarter of the year:

365 (days) multiplied by 2 (shifts per 24 hour period) divided by 4 (watches)

suggesting an availability of 182.50 shifts per firefighter, a number of absences must be factored into the equation to take account of leave, training, sickness and other non-availability. The RF therefore incorporates an allowance for each element to ensure the provision of adequate staff numbers on a 24-hour basis throughout the year.

2.3 This is represented as:

$$\frac{X}{X - [L + T + S + O]}$$

where:

x = total number of available shifts, L = Leave, T = Training, S = Sickness and O = Other absences

3. EXISTING RIDERSHIP FACTOR

3.1 The RF currently stands at 1.45, a figure which has been utilised within Lancashire since it was formulated during the last major fire cover review in 1996. In simple terms, this means that 1.45 firefighters are needed to maintain one rider position throughout the year having taken into account all anticipated absences.

3.2 This 1996 RF was derived from an examination of the constituent elements for a one-year only period (1995) which gave the following breakdown:

TABLE 1 – EXISTING RIDERSHIP ELEMENTS	
ABSENCE PER FIREFIGHTER DUE TO	NUMBER OF SHIFTS LOST
Leave	33.50
Training	11.82
Sickness	7.45
Other	4.12
TOTAL	56.89
REMAINING SHIFTS PER FIREFIGHTER	125.61

3.3 Applying the equation then produced the ridership factor:

$$\frac{182.50 (x)}{182.50 (x) - 56.89 (L+T+S+O)}$$

$$\frac{182.50}{125.61} = 1.45 \text{ (RF)}$$

3.4 As is evident, any variation in one or more of the constituent elements will affect the overall figure and the use of one-year only totals can significantly distort the RF if it covers a period in which unusual patterns of absence occur. For the purpose of this report, a 3-year

average has been used in order to produce a more representative picture.

4. HISTORICAL ACTIVITY

4.1 To determine a more accurate figure, an in-depth examination of all absences for the three-year period 1999 – 2001 was undertaken. This timeframe was selected for two reasons:

- Returns for the period had been provided to central government and agreed by the fire authority as accurate
- Subsequent years incorporated strike periods and a recruitment freeze, both of which could significantly distort results

4.2 The approach was twofold in that each constituent element was examined individually, year-by-year following which a mean average over the 3-year period was calculated.

4.3 Leave

4.3.1 This included allocated scale A and B leave together with all public holidays, and to determine a total, the sum of all leave taken was divided by the average rider establishment figure (number of staff designated to crew emergency vehicles).



4.3.2 Table 2 shows that over the three years, absence due to leave ranged from 31.36 to 31.74 shifts with a mean average of 31.61 over the period. This contrasts with the current RF allowance of 33.50.

4.4 Training

4.4.1 The training element encompasses several aspects:

- Off-watch training where the firefighter is unavailable for operational duties for the complete shift
- Rota/compensatory days taken before or after which arise as a direct consequence of the training undertaken
- Recruit training is also included in the RF and an Office of the Deputy Prime Minister (ODPM) calculation is made to reflect the number of equivalent shifts which are lost whilst the training is underway. This is represented as:

$$N = \frac{A \times T \times 7}{2}$$

where N = number of shifts, A = number of recruits, T = weeks in training, 7 = days in the week and 2 = the factor for producing a shift equivalent.

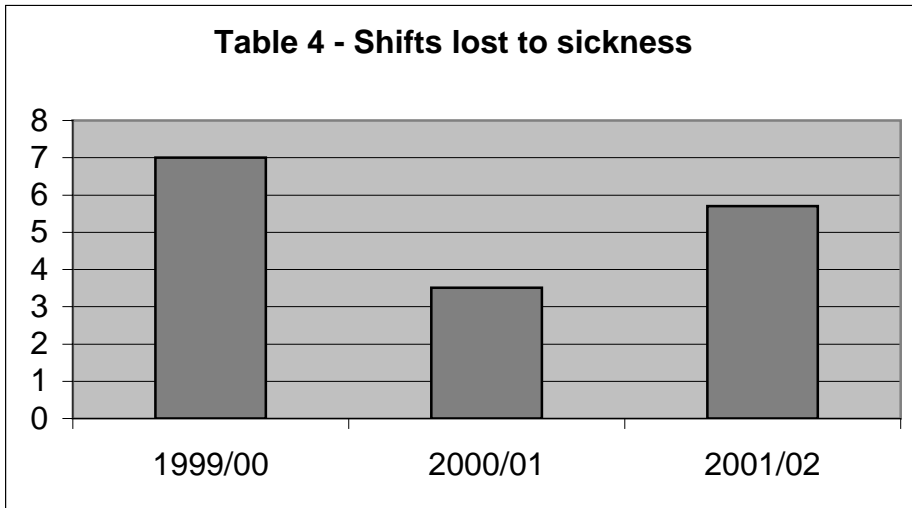
4.4.2 Any leave taken by recruits during training is also incorporated into the overall total.



4.4.3 Table 3 shows that over the three years, absence due to training varied from 6.22 to 7.30 shifts with a mean average of 6.91 over the period. This contrasts with the current RF allowance of 11.82 .

4.5 Sickness

4.5.1 During the last review in 1996, the good practice benchmark of 5% of shifts remaining after leave was used to determine the extent of sickness absence, with a resultant 7.45 shifts utilised within the RF.



4.5.2 As Table 4 shows, the performance of LFRS staff has resulted in a reduction on this 7.45 figure in each year. Over the three years, absence due to sickness has varied from 3.51 to 7.00 shifts with a mean average of 5.40.

4.6 Other absences

4.6.1 Any absence which falls outside the preceding three categories is classed as 'other' for ridership calculation purposes. Many components make up this element with the more prominent detailed below.

- Modified duties where firefighters are unable to undertake their normal duties due to a medical condition but are actively engaged in a non-operational role
- Special leave where firefighters are absent due to family bereavement or activities as a trade union official, school governor or magistrate
- Parental leave where firefighters are absent as a result of maternity, paternity or adoption leave
- Detached-out duties where firefighters are temporarily transferred from their normal place of work to another function e.g. fire safety and where they are not replaced on shift for the duration of the absence
- Compensatory leave where firefighters receive time in lieu (straight time or enhanced by half) of payment for activity undertaken over and above the 42 hours per week



4.6.2 Table 5 shows that over the three years, absence due to 'other' varied from 6.55 to 9.28 shifts with a mean average of 7.66 over the period. This contrasts with the current RF allowance of 4.12.

5. DISCUSSION

5.1 An analysis of absence over the 1999 – 2001 period indicates a fluctuation amongst individual elements year-by-year, and a significant variation in overall RF when compared to the 1.45 currently applied.

TABLE 6 – REVISED RIDERSHIP ELEMENTS	
ABSENCE PER FIREFIGHTER DUE TO	NUMBER OF SHIFTS LOST
Leave	31.61
Training	6.91
Sickness	5.40
Other	7.66
TOTAL	51.58
REMAINING SHIFTS PER FIREFIGHTER	130.92

Applying the equation now produces a revised ridership factor of:

$$\frac{182.50 (x)}{182.50 (x) - 51.58 (L+T+S+O)}$$

$$= \frac{182.50}{130.92}$$

$$= \mathbf{1.39 (RF)}$$

5.2 Whilst the calculation of a RF can only relate to a specific point in time, the adoption of a 3-year average gives a much clearer picture of events and allows for a realistic assessment of the extent of absence across the constituent ridership elements. In advocating 1.39 as a new RF, it must be acknowledged that all elements will fluctuate over time. Equally, it must also be recognised that all can be influenced through effective management action.

5.3 It is therefore recommended that the CFA adopt a revised RF of 1.39 for future calculation purposes and that the figure is reviewed on a programmed basis. The consequence of any revised RF can now be explored through a consideration of crewing arrangements.

6. CREWING ARRANGEMENTS

6.1 In seeking to outline the options available to the Authority, two points should be reiterated:

- The ridership factor applies only to wholetime 42 hour shift personnel
- Crewing policy is a matter for the CFA

6.2 Notwithstanding the above, it is also CFA policy that changes advocated through the integrated risk management process should be incremental, low-risk and evidence based.

6.3 Confidence levels

6.3.1 The term 'confidence level' is used to denote the extent to which a fire authority meets the stated objectives of its crewing policy. By way of example, the current policy of LFRS is for a minimum of five staff on the first pumping appliance (or at a one pump station), four on the second pumping appliance and two (or to a very limited extent one) on special appliances e.g. aerial ladder platform. Furthermore, this policy also aspires to meet such levels on 100% of occasions and in theory at least, the RF is adequate to achieve such ends.

6.3.2 In practice, however, this has not been the case as table 7 shows. The 'establishment' figure refers to the approved number of personnel specifically provided to crew fire appliances. Prior to repeal in 2004, it was a requirement for all fire authorities to submit an annual establishment return for approval by the ODPM.

TABLE 7 - % CONFIDENCE LEVELS				
YEAR	1999/00	2000/01	2001/02	AVERAGE
ESTABLISHMENT FIGURE	783	786	783	784
CONFIDENCE LEVEL MET	88.8%	87%	91.6%	89.1%

6.3.3 Several factors contribute to this shortfall, principal amongst which are that:

- Establishment totals fluctuate throughout the year as staff retire and are replaced with recruits
- Crew numbers exceed confidence levels on many occasions
- Staff are detached out to undertake other duties without being replaced on the watch
- A rise in 'voluntary' activity has resulted in an increase of compensatory leave being accrued

6.3.4 Whilst the confidence level adopted in Lancashire is based on a 100% aspiration, central government targets are significantly lower. Though the historical rationale is somewhat difficult to establish, the origins are to be found in Home Department (for many years the government department with responsibility for the fire service) Circulars 43/1958 and 9334/1958. These outlined that while the 'Secretaries of State did not think it right to promulgate a rigid guide on manning standards, they would generally be prepared to approve establishments on the basis of 5 on the first pump and 4 on the second on 75% of occasions'.

6.3.5 It is the case, however, that two related aspects are fundamental in determining confidence levels, namely

- a) The number of personnel required to achieve anticipated objectives; and
- b) The number of personnel required to achieve a) above in a safe manner

6.3.6 If this contention is accepted, it is extremely difficult to defend a position in which staffing levels vary on a day to day basis, and it is further suggested that a detailed analysis of a) and b) is the only manner in which long term crewing policy can be objectively determined.

6.4 Crewing requirements

6.5 Whilst current LFRS policy aspires to a 5 – 4 – 2 (1) 'normal' crewing level on 100% of occasions, it is accepted that such levels cannot always be achieved. It is therefore permissible to drop crewing to 4 – 4 – 2 (1) 'minimum' levels when unusual difficulties occur. As such levels still permit operations to be conducted in a safe fashion - a conclusion reached in the absence of any evidence to the contrary - a policy which provides for crewing at this level must clearly be considered. In addition to the 'normal' and 'minimum' levels, a third alternative termed 'optional' crewing which provides 5 – 2 (1) on one pump stations and

4 – 4 – 2 (1) on two pump stations is also explored. In all examples, station totals are 'rounded up' to the nearest whole number.

6.6 Tables 9, 10 and 11 outline the staff requirements based on the three levels utilising the revised RF of 1.39. For purposes of comparison, however, table 8 shows existing provision arising from the application of a 1.45 RF at a normal crewing level of 5 – 4 – 2 (1).

TABLE 8 – NORMAL CREWING AT RF OF 1.45							
Wholetime Shift Station	Pumps	Specials	Crewing	RF 1.45	X 4 Watches	Round Up	Total by Area
N11 Lancaster	2	1	11	15.95	63.80	64	
N12 Morecambe	1	1	7	10.15	40.60	41	
N32 Fleetwood	1		5	7.25	29.00	29	134
W 30 Blackpool	2		9	13.05	52.20	53	
W31 Bispham	1	1	7	10.15	40.60	41	
W36 St Annes	1		5	7.25	29.00	29	
W37 South Shore	1	1	7	10.15	40.60	41	164
E70 Accrington	2	1	11	15.95	63.80	64	
E71 Blackburn	2	1	11	15.95	63.80	64	
E76 Darwen	1		5	7.25	29.00	29	157
P90 Burnley	2	2	12	17.40	69.60	70	
P94 Nelson	1		5	7.25	29.00	29	
P74 Rawtenstall	1		5	7.25	29.00	29	128
C50 Preston	2	2	12	17.40	69.60	70	
C53 Bamber Bridge	1		5	7.25	29.00	29	
C57 Penwortham	1		5	7.25	29.00	29	128
S54 Chorley	1	1	7	10.15	40.60	41	
S56 Skelmersdale	1		5	7.25	29.00	29	70
Totals	24	11	134	194.30	777.20	781	781

6.7 Using 1.45 the staffing requirement when each station is rounded up to the next whole number is 781. The approved establishment when last agreed by the ODPM was 783 whilst staff in post at 31st March 2004 was reported as 760.

6.8 Table 9 outlines the establishment following application of a 1.39 RF at a normal crewing level of 5 – 4 – 2 (1).

TABLE 9 – NORMAL CREWING AT RF OF 1.39							
Wholetime Shift Station	Pumps	Specials	Crewing	RF 1.39	X 4 Watches	Round Up	Total by Area
N11 Lancaster	2	1	11	15.29	61.16	62	
N12 Morecambe	1	1	7	9.73	38.92	39	
N32 Fleetwood	1		5	6.95	27.80	28	129
W 30 Blackpool	2		9	12.51	50.04	51	
W31 Bispham	1	1	7	9.73	38.92	39	
W36 St Annes	1		5	6.95	27.80	28	
W37 South Shore	1	1	7	9.73	38.92	39	157
E70 Accrington	2	1	11	15.29	61.16	62	
E71 Blackburn	2	1	11	15.29	61.16	62	
E76 Darwen	1		5	6.95	27.80	28	152
P90 Burnley	2	2	12	16.68	66.72	67	
P94 Nelson	1		5	6.95	27.80	28	
P74 Rawtenstall	1		5	6.95	27.80	28	123
C50 Preston	2	2	12	16.68	66.72	67	
C53 Bamber Bridge	1		5	6.95	27.80	28	
C57 Penwortham	1		5	6.95	27.80	28	123
S54 Chorley	1	1	7	9.73	38.92	39	
S56 Skelmersdale	1		5	6.95	27.80	28	67
Totals	24	11	134	186.26	745.04	751	751

6.8 As is evident, the staffing requirement is reduced by 30 posts from 781 to 751. Adoption of the 1.39 RF at normal crewing levels will facilitate an overall reduction of 32 posts from the current shift rider establishment of 783.

6.9 Table 10 outlines the establishment following application of a 1.39 RF at a minimum crewing level of 4 – 4 – 2 (1).

TABLE 10 – MINIMUM CREWING AT RF OF 1.39							
Wholetime Shift Station	Pumps	Specials	Crewing	RF 1.39	X 4 Watches	Round Up	Total by Area
N11 Lancaster	2	1	10	13.90	55.60	56	
N12 Morecambe	1	1	6	8.34	33.36	34	
N32 Fleetwood	1		4	5.56	22.24	23	113
W 30 Blackpool	2		8	11.12	44.48	45	
W31 Bispham	1	1	6	8.34	33.36	34	
W36 St Annes	1		4	5.56	22.24	23	
W37 South Shore	1	1	6	8.34	33.36	34	136
E70 Accrington	2	1	10	13.90	55.60	56	
E71 Blackburn	2	1	10	13.90	55.60	56	
E76 Darwen	1		4	5.56	22.24	23	135
P90 Burnley	2	2	11	15.29	61.16	62	
P94 Nelson	1		4	5.56	22.24	23	
P74 Rawtenstall	1		4	5.56	22.24	23	108
C50 Preston	2	2	11	15.29	61.16	62	
C53 Bamber Bridge	1		4	5.56	22.24	23	
C57 Penwortham	1		4	5.56	22.24	23	108
S54 Chorley	1	1	6	8.34	33.36	34	
S56 Skelmersdale	1		4	5.56	22.24	23	57
Totals	24	11	116	161.24	644.96	657	657

6.10 In this example, the staffing requirement is reduced by 124 posts from 781 to 657. Adoption of the 1.39 RF at minimum crewing levels will facilitate an overall reduction of 126 posts from the current shift rider establishment of 783.

6.11 Table 11 outlines the establishment following application of a 1.39 RF at an optional minimum crewing level of 5 on one pump stations, 4 on two pump stations and 2 (1) on special appliances.

TABLE 11 – OPTIONAL CREWING AT RF OF 1.39							
Wholetime Shift Station	Pumps	Specials	Crewing	RF 1.39	X 4 Watches	Round Up	Total by Area
N11 Lancaster	2	1	10	13.90	55.60	56	
N12 Morecambe	1	1	7	9.73	38.92	39	
N32 Fleetwood	1		5	6.95	27.80	28	123
W 30 Blackpool	2		8	11.12	44.48	45	
W31Bispham	1	1	7	9.73	38.92	39	
W36 St Annes	1		5	6.95	27.80	28	
W37 South Shore	1	1	7	9.73	38.92	39	151
E70 Accrington	2	1	10	13.90	55.60	56	
E71 Blackburn	2	1	10	13.90	55.60	56	
E76 Darwen	1		5	6.95	27.80	28	140
P90 Burnley	2	2	11	15.29	61.16	62	
P94 Nelson	1		5	6.95	27.80	28	
P74 Rawtenstall	1		5	6.95	27.80	28	118
C50 Preston	2	2	11	15.29	61.16	62	
C53 Bamber Bridge	1		5	6.95	27.80	28	
C57 Penwortham	1		5	6.95	27.80	28	118
S54 Chorley	1	1	7	9.73	38.92	39	
S56 Skelmersdale	1		5	6.95	27.80	28	67
Totals	24	11	128	177.92	711.68	717	717

6.12 Here the staffing requirement is reduced by 64 posts from 781 to 717. Adoption of the 1.39 RF at optional crewing levels will facilitate an overall reduction of 66 posts from the current shift rider establishment of 783.

7. CONCLUSIONS

- 7.1 This report has outlined the manner in which the ridership factor is calculated and highlighted the significant impact which any variation can have on shift rider establishment levels. An explanation of crewing arrangements and confidence levels has also been incorporated to aid understanding of the relationships involved.
- 7.2 An analysis of absences over a three-year period indicates that the current RF can be reduced from 1.45 to 1.39. In seeking to pursue the Authority aim of releasing resources for preventative activity, a number of alternative scenarios have been explored. Whilst it is evident that the application of a 1.39 RF to the normal, minimum or optional crewing levels will enable such ambitions to be realised, it is equally apparent that the extent of release will be determined by the chosen option. Irrespective of choice, the adoption of a revised RF will have significant staffing implications. Whilst the release of operational personnel meets a key authority aim, a number of other considerations should be noted.
- 7.3 Firstly, it must be understood that any revised RF will continue to incorporate allowances for 'other absences'. This will permit shift based personnel to undertake other duties off watch e.g. project work though such flexibility is limited and operational staff must be allowed to function without staffing levels being compromised through non-anticipated absences. A specific examination of the 'other absences' element should feature as part of the monitoring and review process outlined in 8.5 below whilst it will also be necessary for managers to operate within clearly defined staffing parameters and to develop a more proactive approach towards absence management.
- 7.4 Furthermore, it should be acknowledged that several other IRMP projects are underway which may release operational personnel through alternative vehicle/equipment provision and/or staffing arrangements. In addition, a major exercise to determine the fire safety staff requirements of the service on the basis of the Lancashire risk profile is taking place. Final decisions are scheduled for the September 2004 CFA meeting.
- 7.5 Whichever option is selected, significant human resource implications will arise as a result of the re-allocation of posts and/or re-deployment of existing personnel. Careful consideration should be given to transitional arrangements with meaningful staff dialogue a key requirement through both managerial and representative body routes.
- 7.6 As indicated earlier, an in-depth evaluation of crewing arrangements is needed to ensure that all options are fully explored and that selected systems facilitate both effective and safe operation. Whilst traditionally, operational deployment through ridership has focused on the number of staff who are actually on fire appliances, the principle of overall

attendance requirements whereby adequate resources are deployed to an incident via different forms of transport, e.g. Watch Commander in a car, should be a part of any such review.

- 7.7 Finally, it remains the position of the Authority that changes arising out of IRMP should be low risk, incremental and evidence based. Furthermore, they should lead to improved levels of community safety at a strategic level. With such considerations in mind a number of recommendations are outlined in Section 8.

8. RECOMMENDATIONS

- 8.1 A revised ridership factor of 1.39 should be adopted.
- 8.2 Crewing should continue at 'normal' levels of 5 – 4 – 2 (1) pending the outcome of a full operational task analysis which should be undertaken as part of IRMP Year 2.
- 8.3 A revised operational shift based establishment of 751 should be approved with recruitment planned to support this figure.
- 8.4 Decisions regarding re-allocation and/or re-deployment as a result of the revised RF should be deferred until September pending the outcome of other IRMP projects when a comprehensive picture of resource requirements will be available.
- 8.5 Ongoing monitoring of constituent RF elements should be undertaken with an impact analysis conducted after 12 months of operation at the revised level
- 8.6 An internal consultation exercise with accredited representatives should be undertaken in accordance with Authority policy.