

PLEASE NOTE: This is a rough outline only. It is intended to help you think through the case.
Exam solutions are expected to be in fully developed sentences and paragraphs.

Charlottesville Fire Department (CFD)

Issue(s)

Is the RTI suitable as a MCS to ensure that the KSFs are achieved?

Background

CFD serves two areas: City of Charlottesville and part of Albemarle County
 These areas are quite distinct from one another in terms of demographics and property
 CFD had 5 engine companies, 1 aerial ladder, 68 paid personnel and a volunteer force.
 Albemarle County did not have a paid fire department, however the CFD assisted with fires when close by
 The county contributed to the annual budget of the city fire department
 The chief is trying to determine a method for comparing CFD's results with other similar fire departments
 Other relevant factors...

KSF

Effectiveness: measured by 7 specific criteria
 Minimize the incidence of fire, loss of life, personal injury, and property loss
 Productivity (efficiency): measured by 5 specific criteria
 Minimize total loss - sum of expenditures and dollar property loss.

Evaluation of MCS

The organizational structure appears to be centralized
 CFD appears to be treated as an expense centre
 The budget appears to be a key control mechanism
 This is appropriate for a NPO that is not revenue generating
 CFD's Chief has decided to use the RTI study to measure effectiveness and productivity
 Is the RTI study suitable for the chief's purposes?
 The RTI study included 1400 fire departments for a 3-year period
 Evaluate the size of this sample for use as a comparative measure
 Evaluate the length of the time for the study for use as a comparative measure
 Evaluate the grouping of the study data by RTI for use as a comparative measure
 There were no groupings that exactly matched CFD
 However it does not appear that there is any other data to use
 Evaluate the specific measures for effectiveness and productivity
 Evaluate the fairness of the measures
 Are any of the measures things that are not under the significant control of CFD?
 Do these measures clearly communicate priorities to CFD staff
 Do any of the measures conflict with one another?
 What would happen if CFD had to choose between two fires - one with
 potential for large loss of property and one with potential for loss of life
 Do these measures help balance priorities?
 CFD may not want to engage in educational programs in order to save costs
 however, this may conflict with reduction of loss of property and life
 Is there potential for spurious relationships between measures and results?

Recommendations

What components of the current MCS would you keep?
 What would you eliminate?
 What other items would you add to the MCS to make it more E&E?

Quantitative Analysis

NOTE: The purpose of quantitative analysis is to help understand the nature of the problems that may occur as a result of the MCS. There may be a current crisis to resolve that requires numerical calculations, but we also want to consider how the MCS causes those problems to develop, and how to adjust the MCS to help prevent future occurrences.

What do you learn about Charlottesville Fire Department's MCS by using the numbers in the case? Use these observations to strengthen your analysis.

Specific evaluation of results for Albemarle County

pink = calcs without two large fires

Albemarle County	Ring city; pop between 5,001 & 25,000; mostly volunteer		Lower 25%		Median		Upper 25%	
Prevention:	Number of files per 1000 of population protected	2.98	6.63		9.42		15.95	
Suppression	Dollar property loss per capita		5.10		7.69	9.38	11.98	27.47
	Dollar property loss per \$1,000 market value		0.34		0.50		0.75	2.69
	Dollar property loss per fire		438.51		938.21		1,647.40	3,102.00 9,219.00
	Civilian injuries per 100,000 population		0.00	5.05	7.93		21.73	
	Civilian injuries and deaths per 100 fires		0.00		0.85	1.70	1.79	
	Firefighters injuries and deaths per 100 fires		0.00		0.58	1.70	2.65	
Levels of Effort	Expenditures per capita	5.28	8.08		15.02		21.02	
	Expenditures per \$1,000 market value of property		0.51	0.52	0.98		1.44	
Productivity measures	Total cost per capita		18.36		28.75		30.77	32.76
	Total cost per \$1,000 market value of property		0.96		1.38		2.05	3.20
	Total cost per fire		1,467.00		2,635.00		3,638.00	10,993.00

Conclusions / Recommendations

It would appear that CFD is not effective in Albemarle County.

Although there is a lower number of fires, the property loss is considerably higher than the highest range, and the injury level is between median and high.

Less is spent on effort in this area, resulting in a very high cost per capita and cost per fire.

CFD's efforts with Albemarle County are considered "volunteer" - however most of the staff is paid.

The classification is based on the fact that they are a secondary response team for this area.

However, to be really a good comparison would need to know how the efforts compare to other mostly-paid departments that respond to similar outlying areas.

There are factors outside of CFD's control: the low population density, the market value of the property, distance from Charlottesville

Factors CFD did control included the way injuries and deaths were reported, and the amount of protective clothing and training the department had.

For the county, the impact of this is offset by the use of other volunteers without this level of protection and training.

Important considerations

- 1) Low population density reduces fire hazard.

However, it is low compared to OTHER SIMILAR AREAS.

This is not a result of CFD's efforts - and will likely not remain positive as population grows.

- 2) Property loss per capita and per \$1,000 of market value of property is high.

This is skewed by two large industrial fires -one in 1973 and one in 1974.

Without these, property loss would have been substantially less for both years.

- 3) Per capita and per fire losses were skewed by a low population density in the county area, and the low number of fires occurring in the city.

- 4) County had slower response times, meaning fires were more established before help arrived.

- 5) Civilian injuries and deaths per 100 fires were very high - due to the way they were reported by CFD

ALL civilian injuries, no matter how slight, were reported as injuries by CFD. It is not clear whether other centers only reported more serious injuries.

Injuries and deaths are grouped together. 25 percent of injuries might be due to slower response time, because of being in the country.

- 6) Firefighter injuries and deaths per 100 fires was higher than in the city - likely due to the county volunteers that would respond to these fires.

Volunteers wore less protective clothing and had fewer training hours.

- 7) Expenditures per capita and per \$1,000 of market value were low for both city and county. This may be a cause for the higher property loss figures.

It is an indication that the fire department was not as effective in the provision of fire protection as it might have been - due to resource misallocation or underfunding.

- 8) Total cost per fire is misleading, as it combines expenditures with property loss. It is not possible to tell whether the force spent more fighting the fire, or whether the property loss was higher.

- 9) High total cost due to extremely high property loss.

Charlottesville	Urban Center: pop 25,000 - 100,000: fully paid		Lower 25%		Median		Upper 25%		
Prevention:	Number of files per 1000 of population protected		7.24	10.68	12.78		19.23		
Suppression	Dollar property loss per capita		5.39		10.4	10.9	14.96		
	Dollar property loss per \$1,000 market value		0.31		0.54	1.25	2.1		
	Dollar property loss per fire		393.94	1,021.00	1,111.97		2,210.82		
	Civilian injuries per 100,000 population		13.84		19.09		28.48	35.71	
	Civilian injuries and deaths per 100 fires		0.86		1.66		2.23	3.34	
	Firefighters injuries and deaths per 100 fires	0.84	1.07		2.51		4.14		
Levels of Effort	Expenditures per capita	8.61	20.92		24.77		31.75		
	Expenditures per \$1,000 market value of property	0.62	0.86		1.84		3.22		
Productivity measures	Total cost per capita	19.51	23.12		33.1		44.17		
	Total cost per \$1,000 market value of property		1.01	1.42	1.66		5.99		
	Total cost per fire	1,827.00	2,373.00		3,041.00		4,134.00		

RTI did not offer a category for a center city with a mostly paid force. Therefore it was classed as an urban center with a fully paid force.

Charlottesville had lower costs, but higher losses than average. It appears that CFD is not spending an adequate amount of resources on prevention.

The department's focus on training and equipping its firefighters resulted in lower fire fighter injuries and deaths, but there were higher civilian injuries and losses.

It appears that CFD has not been effective in utilizing resources to reduce the personal and property loss in Charlottesville.

More resources should be expended to ensure adequate fire protection programs and initiated and to ensure that loss can be mitigated when responding to occurrences.

A positive factor is the lower property loss, but this is not something that resulted from CFDs efforts. It is a result of lower industrial property levels, leading to lower property values in the area.

Important considerations

- 1) Charlottesville does not have a well-developed fire protection program. Needs more time spent on public education and fire prevention programs

- 2) Property loss per capita and per \$1,000 of market value of property were higher than median due to low number of firefighters per engine company.

This impacted the number and type of suppression activities that could be initiated.

- 3) Property loss per fire was below median, due to lower amount of industry in Charlottesville. This is not under control of CFD.

Important considerations									
1)	Charlottesville does not have a well-developed fire protection program. Needs more time spent on public education and fire prevention programs								
2)	Property loss per capita and per \$1,000 of market value of property were higher than median due to low number of firefighters per engine company. This impacted the number and type of suppression activities that could be initiated.								
3)	Property loss per fire was below median, due to lower amount of industry in Charlottesville. This is not under control of CFD. Industrial loss tends to have higher property loss than non-industrial.								
4)	Civilian injuries and deaths per 100 fires were very high - due to the way they were reported in Charlottesville. ALL civilian injuries, no matter how slight, were reported as injuries by CFD. It is not clear whether other centers only reported more serious injuries. Injuries and deaths are grouped together. Charlottesville had one death due to fire per year, and 19 injuries. This might not be as serious as some other centres that might have had more deaths and fewer injuries.								
5)	Fighter injuries and deaths per 100 fires were extremely low, due in part to mandatory protective clothing and required training for firefighters. This is under control of CFD. It is also possible that fewer injuries were REPORTED than in other departments.								
6)	Expenditures per capita and per \$1,000 of market value were low for both city and county. This may be a cause for the higher property loss figures. It is an indication that the fire department was not as effective in the provision of fire protection as it might have been - due to resource misallocation or underfunding.								
7)	Charlottesville's lower costs may also be in part because they did have some volunteers, but were being compared to fully paid forces. Without this, Charlottesville would likely have had to hire more personnel.								
8)	Total cost per fire is misleading, as it combines expenditures with property loss. It is not possible to tell whether the force spent more fighting the fire, or whether the property loss was higher.								
9)	Total cost is low, but due to low expenditures, while still having high property loss.								