



# REPORT ON COMMERCIAL FIRES FOR THE PERIOD APRIL 2002 – DECEMBER 2005

**TO BE PRESENTED TO: Chief Fire Officer**

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**STRATEGIC PLANNING DEPARTMENT**

*Date work received: December 2005*

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## Document Control

### Amendment History

Version / Issue No.	Date	Author	Remarks / Reason for Change
1.0	February 2006	K. Locke	Initial/ Draft
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### Related Documents

Reference No.	Title	Author	Version & Date

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## **1. Agreement**

For the purpose of this report the following agreement was made between the client and the Strategic Planning Department.

This work was requested by the Chief Fire Officer and received on December 2005

The Manager<sup>1</sup> has approved this report/ piece of work can be undertaken by the Strategic Planning Department.

If the scope of the work changes, authorisation must be again obtained and would be noted within the version control document sheet.

It was agreed that this report would be produced in draft format by February 2006, and would be sent electronically to the Knowledge Manager/ Director of Strategic Planning and Client for comment.

The Manager / Client agreed that their comments would be received back by February 2006.

The final report, which will always be in PDF format, would be produced by February 2006, subject to receiving comments.

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<sup>1</sup> Deb Appleton, John L Curtis, David Robinson, Sandra Parkinson

## 2. Summary

This report focuses on the analysis of commercial fires in Merseyside between April 2002 and November 2005. It concentrates on the associated spatial, social and financial implications.

In terms of spatial analysis, it became apparent that:-

- Over 50% of the 2958 commercial fires in Merseyside were concentrated within the district of Liverpool.
- Four station grounds that attended the largest amount of fires were in this district, with the city centre being the busiest.

Analysis however highlighted in terms of incidents per 1000 non-domestic premises, that the district of Knowsley should have the greatest probability of commercial fires, as this district has the greatest number of non-domestic premises/1000. Location was also analysed with reference to the different premises, Retail Buildings, Industrial Buildings, Commercial Premises and Educational Establishments, all of which witnessed a large number of incidents.

Social analysis<sup>2</sup> included examining the main causes of fire. It was apparent that malicious or deliberate actions resulted in over 40% of the total amount of incidents. This was also the main cause in nearly all premises types. It is important to highlight that there has been a significant decrease in the number of incidents occurring during the time period investigated.

Social analysis also explored the human impact of commercial fires in relation to injuries sustained. The total number of casualties during the period investigated was 134. 19% of injuries occurred to employees of Merseyside Fire and Rescue Service. In relation to the general public males aged 21 to 40 appeared to be the most vulnerable to receiving injuries in commercial fires. The most common cause of injury was classified as precautionary check-ups. 50% of all injuries occurred within the district of Liverpool.

Financial analysis<sup>3</sup> has illustrated that between April 2003 and December 2005 the total cost of commercial fires was £177,196,032. Merseyside Fire and Rescue Service incurred 13% of these costs.

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<sup>2</sup> the analysis of information that directly refers to the social impact on the population and infrastructure of society

<sup>3</sup> the analysis of information that directly refers to the economic/financial impacts on both the population and infrastructure

### ***3. Introduction***

This report presents an analysis of the data relating to commercial fires between April 2002 and December 2005, within Merseyside.

The data primarily focuses on the actual number of incidents, however, the related causes, as well as issues surrounding alarm ownership and spread of fire are considered. An analysis of injury related data in commercial fires is also undertaken. A costing analysis has been completed to ascertain the financial implications of commercial fires.

The term "commercial fire" is used to define any fire, which is described as non-domestic.

### ***4. Methodology***

To analyse the impact of commercial fires in the Merseyside area, the following methodology was adopted: -

- The period of analysis covered April 2002 to December 2005. This time period was chosen as it enabled all available recorded resources to be examined.
- Commercial fires account for one third of all building fires. This figure highlights that there is a necessity to analyse incident data, to improve and pinpoint types of fires taking place. The knowledge acquired from this report should contribute towards future Strategic and Local Planning.
- Risk throughout this project will be defined in the context of the number of incidents per 1000 non-domestic dwellings. This definition has been used to create a level comparison between the various districts and station grounds, thus for this project acting as an indicator of risk.
- The analytical tools and programmes adopted in this report included: Blue 8 Mapping Software, used as a visual analytical tool, BOSS Fires Reporting System, used to manipulate data sources to gain the relevant information. Excel was used as the primary tool for analysis, enabling the creation of graphs and tables.

## 5. Results

This chapter has been divided into sections to enable the main findings of the project to be presented clearly. The three main sections covered include: -

*Analysis of incidents.* This will focus not only on the number and type of incidents, but also and equally importantly on the underlying causes of incidents, the temporal and spatial dispersion of incidents, while providing an analysis based on the methods of fire detection and the spread of fire.

*Analysis of casualties.* This section will present the findings relating to the types of injuries associated with commercial fires, while also providing demographic information about the casualties.

*Cost Analysis.* This section will provide estimates of the different costs of commercial fires, both to Merseyside Fire and Rescue Service and the businesses themselves, based on figures published in The Economic Cost of Fire, taken from the Office of the Deputy Prime Minister (ODPM), Creating Sustainable Communities report.

The analysis therefore covers three key elements, which assists in providing a more complete socio-economic understanding of the impact of commercial fires by taking into account the human and financial aspects.

### 5.1 Analysis of Incidents

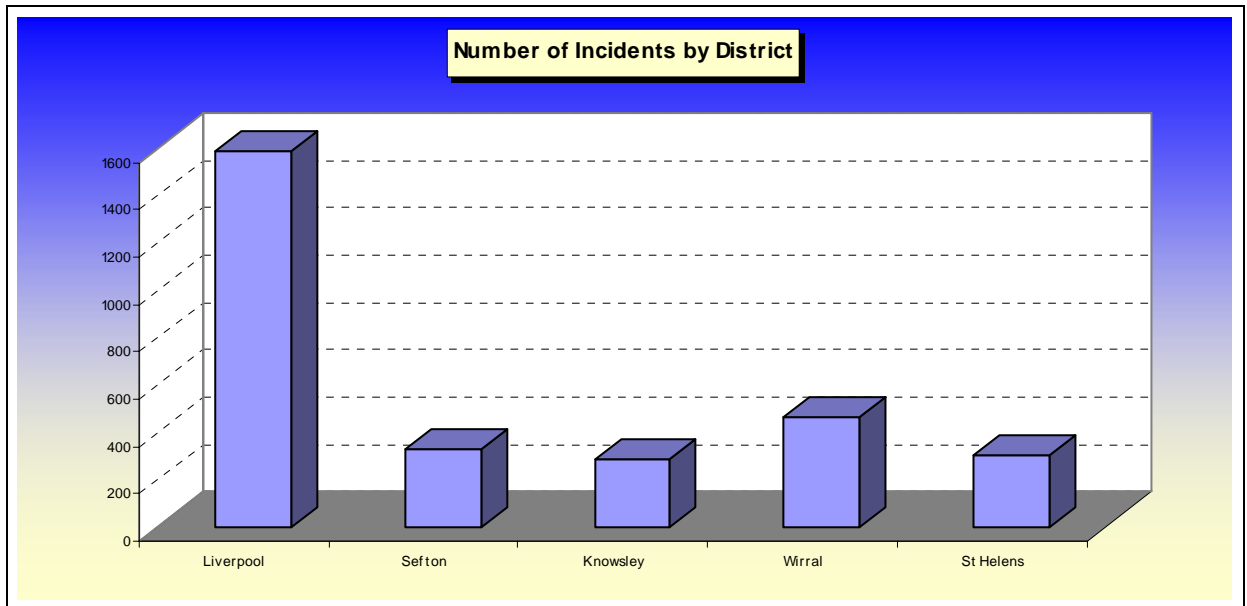
#### *Total Number of incidents*

There were 2958 Commercial Fires in total, in the Merseyside Region, between April 2002 and December 2005. Over half of these fires were concentrated in the district of Liverpool, while the remaining districts had a 10% - 18% share, as the graph and table below highlight.

*Table One: Illustrating number of commercial fires by district between April 2002 and Dec 2005*

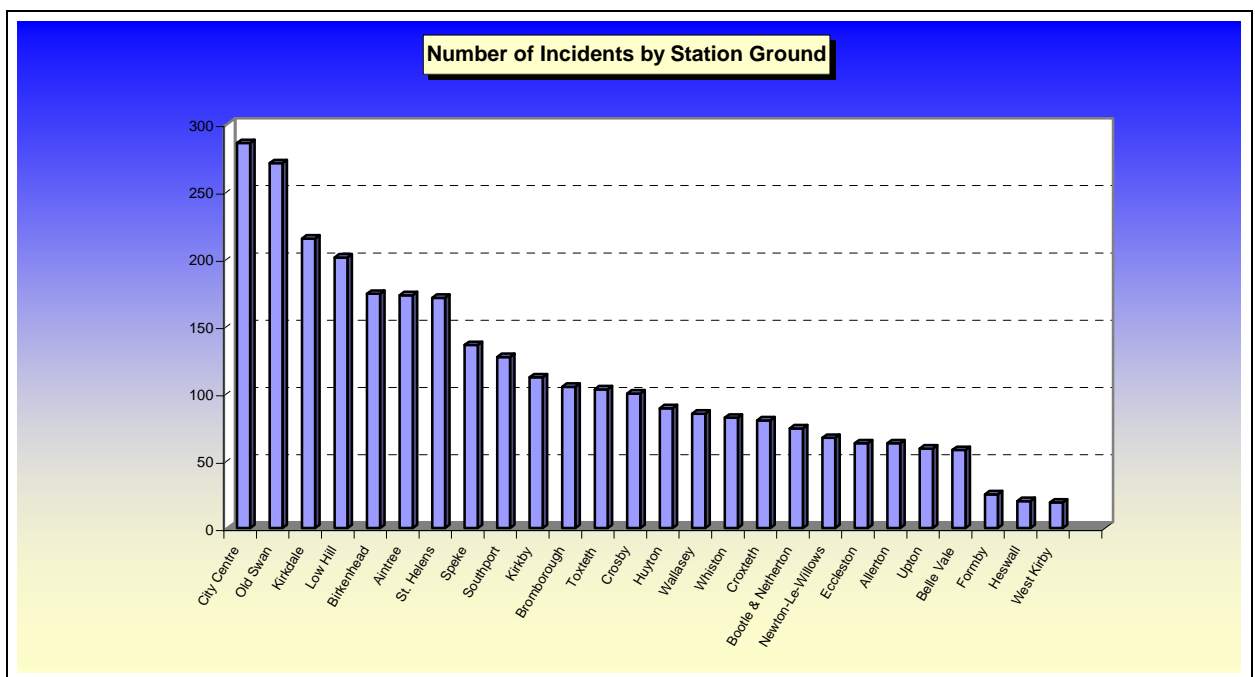
District	Number of Incidents
Liverpool	1586
Sefton	326
Knowsley	283
Wirral	462
St Helens	301

Graph one: Illustrates number of Commercial Fires by Local Authority District between April 2002 and Dec 2005



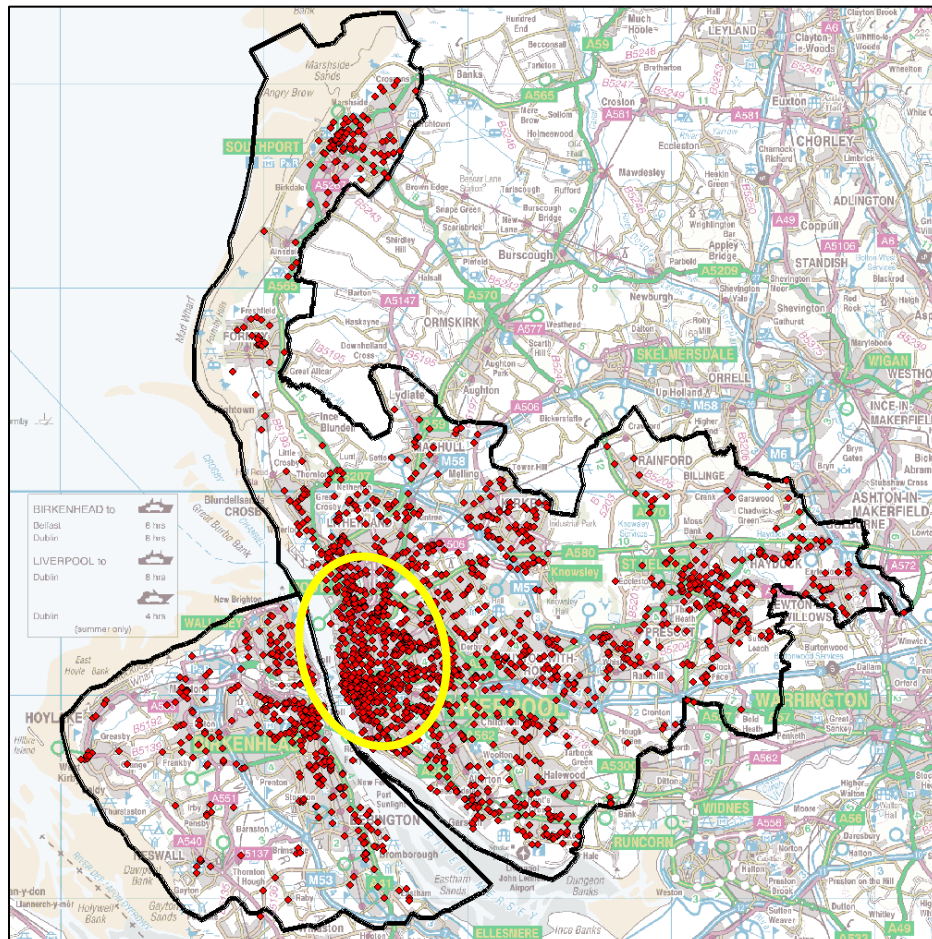
With the figures above it is no surprise that the four Station Grounds that attended the greatest amount of Commercial Fires all fell within the district of Liverpool, with the busiest Station Ground being in the City Centre. It is significant to note that approximately 60% of all fires that occurred in Wirral fell within Birkenhead's Station Ground.

Graph Two: Illustrates number of commercial fires by station ground between April 2002 and Dec 2005



## Location Analysis

Map One: Illustrates the location of commercial fire incidents in Merseyside

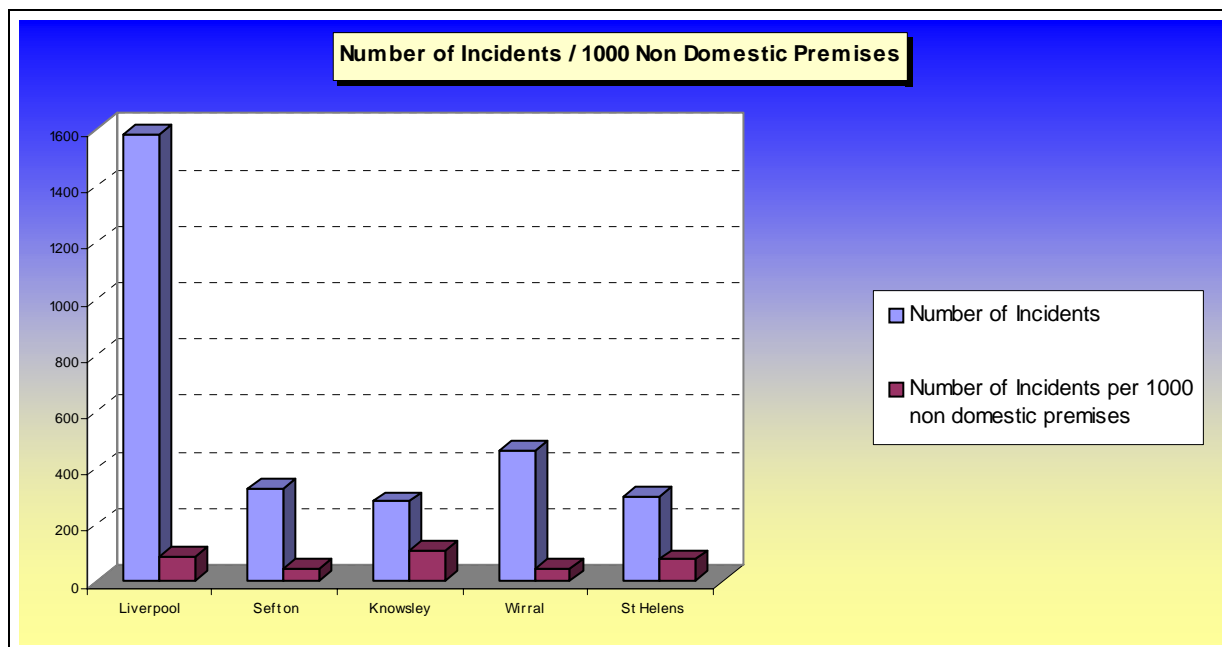


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While the graphs and table presented previously have highlighted the distribution of commercial fires across the Merseyside region, this map acts as a visual illustration of the information contained in the graph. It facilitates a new dimension of understanding, by enabling a higher degree of location analysis; the actual location of each incident can be identified. The heavy clustering of incidents in the city centre and surrounding areas is clearly seen by the density of red dots.

## ***Number of Incidents per 1000 Non-Domestic Premises***

*Graph Three: Illustrates the number of incidents per 10000 non-domestic premises for the period April 2002 to December 2005*



The above graph compares the actual number of incidents in relation to the number of non-domestic premises in each district (per 1000 non-domestic premises).

This graph highlights that despite the district of Liverpool having the greatest actual number of incidents, in terms of the number of non-domestic premises, the greatest probability of a commercial fire would appear to be in Knowsley, as this district has the greatest number of non-domestic premises/1000. These figures highlight the need to gain further understanding of commercial fires by analysing the type of property they are occurring in and importantly the causes of the fire.

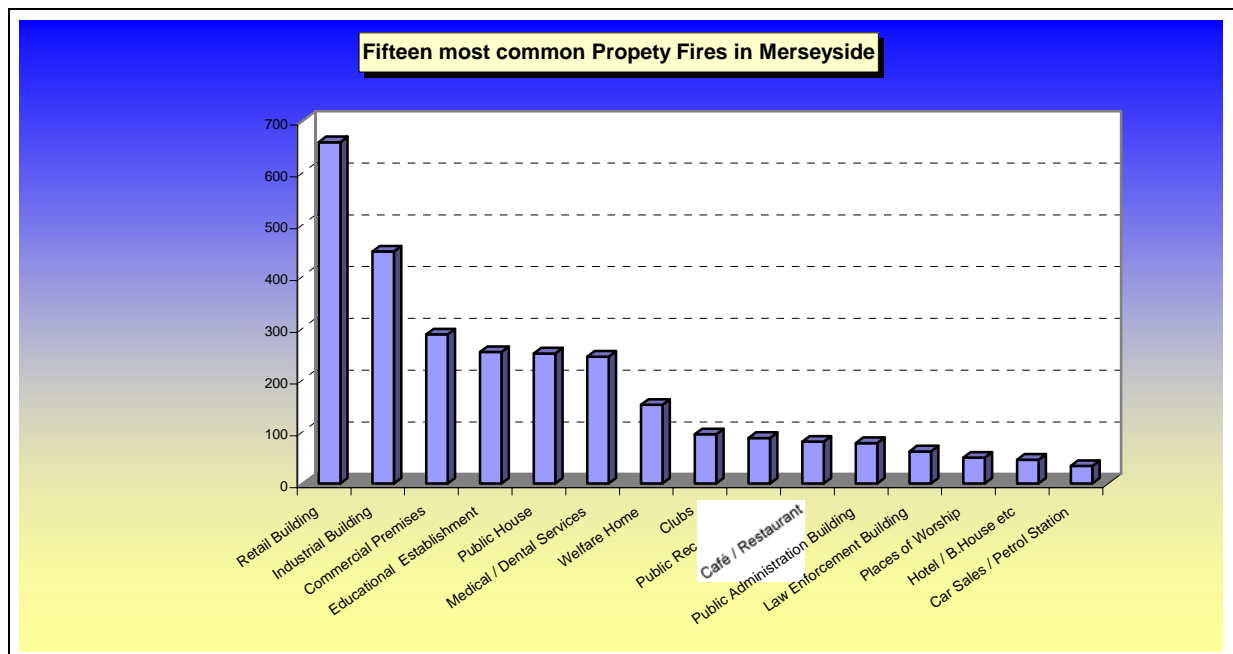
### ***Property Analysis***

Commercial Fires are used to define all non-domestic fires, however, this covers a vast area, therefore, to gain greater awareness it is necessary to identify the type of premises that have witnessed the greatest number of fires during the time period being analysed.

Analysis has highlighted that within Merseyside, the property types that lie in the top quartile, and therefore have seen the greatest number of fires are, in numerical order; Retail Buildings, Industrial Buildings, Commercial

Premises and Educational Establishments, (these vary slightly when analysis is undertaken at the district scale).

*Graph Four: Illustrates the most common property fires in Merseyside for the period April 2002 to December 2005*



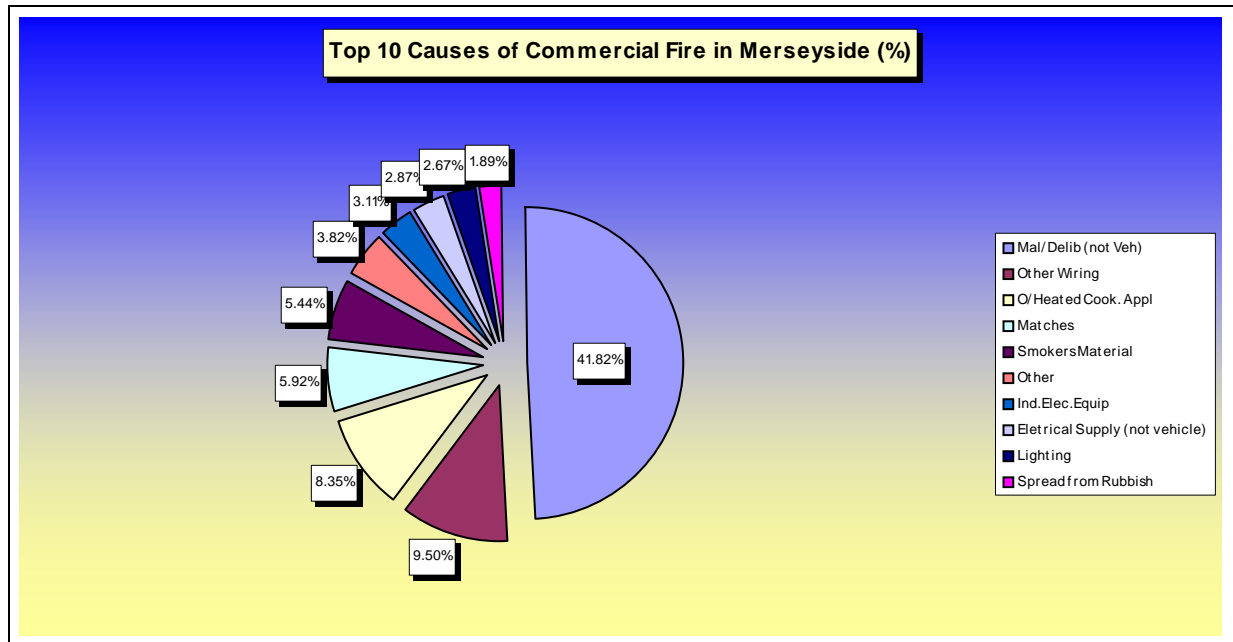
Fires in retail buildings account for approximately 22% of all commercial fires, while the total number of fires in retail and industrial premises combined contribute to nearly 40% of all commercial fires. Identifying the premises that had the greatest number of commercial fires during the period under investigation facilitates future targeting, in an effort to reduce the overall number of commercial fires.

### ***Cause Analysis***

To develop measures to enable the reduction in commercial fires, it is not only important to identify the high incident premises but also to isolate the major causes of these fires in general, and by premises type. The greater the knowledge acquired through analysis, the more informed future planning could be.

The chart below focuses on the top ten causes. It illustrates that during the time period under analysis, approximately 40% of all commercial fires, for all related premises, in the Service as a whole, were caused due to malicious or deliberate actions. This figure is significant; each of the remaining top ten causes all total less than 10%.

Graph Five: Illustrates the top 10 causes of commercial fires in Merseyside for the period April 2002 to December 2005



The following table contains a substantial amount of information, however, it does enable cross analysis between different premise types and cause, which enables greater understanding of commercial fires.

Table Two: Illustrating the different causes of fire by premise type for the period April 2002 to Dec 2005

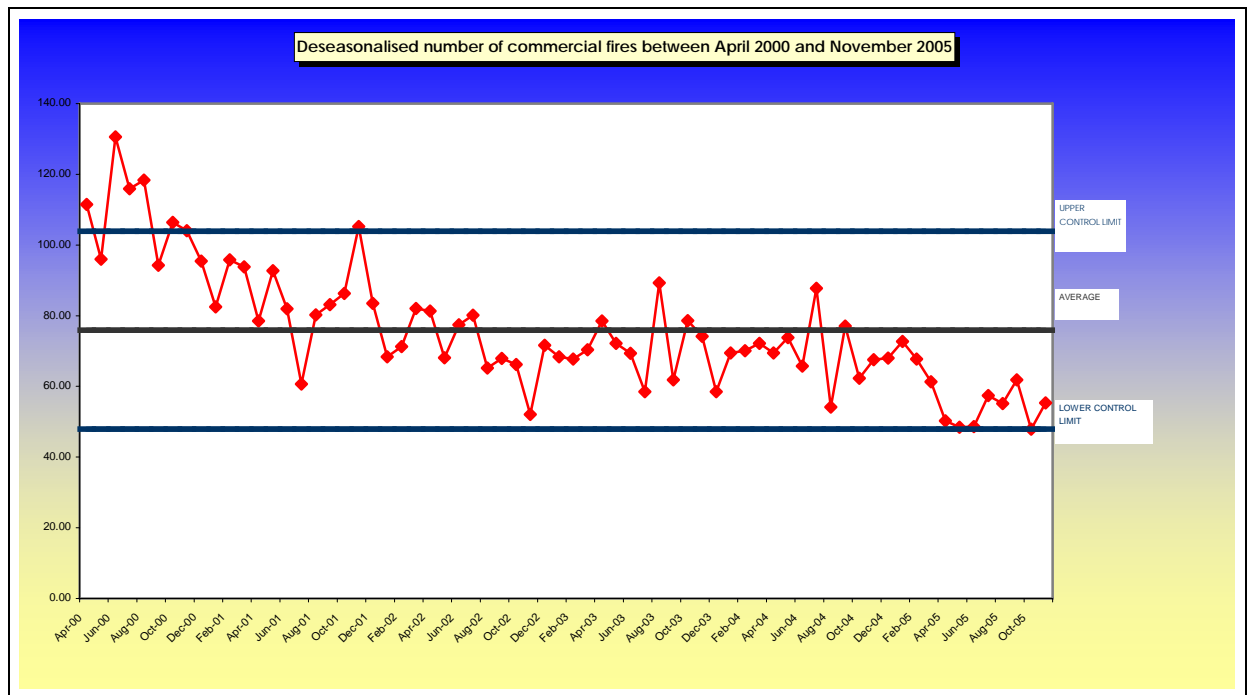
	Mal/Delib	Smokers Material	O/Heated Cook. Appl	Spread from Rubbish	Ind. Elect. Equip	Electrical Supply (not veh)	Matches	Other Wiring	Other	Lighting
Industrial Building	44.32%	1.66%	3.32%	1.66%	16.07%	5.26%	5.54%	9.14%	11.08%	1.11%
Retail Building	47.23%	4.29%	8.94%	3.40%	2.50%	3.76%	5.72%	15.21%	4.29%	4.65%
Medical/dental serv.	22.54%	15.49%	26.76%	2.35%	0.94%	5.16%	6.57%	11.27%	4.23%	4.69%
Public House	69.03%	5.75%	4.42%	1.33%	0.88%	0.44%	8.41%	5.31%	3.54%	0.88%
Educational est.	62.16%	3.60%	6.31%	1.80%	1.35%	0.45%	9.46%	8.56%	3.60%	2.70%
Commercial Premises	50.00%	4.47%	5.69%	3.66%	0.41%	3.25%	8.94%	16.26%	2.03%	5.28%
Public Rec.Building	72.29%	2.41%	2.41%			4.82%	7.23%	6.02%	2.41%	2.41%
Welfare Home	27.78%	24.60%	25.40%		1.59%	2.38%	2.38%	9.52%	2.38%	3.97%
Clubs	60.00%	3.53%	2.35%	3.53%	1.18%	5.88%	5.88%	11.76%	1.18%	4.71%
Public Admin Building	55.88%	7.35%	11.76%	1.47%	1.47%	1.47%		16.18%	2.94%	1.47%
Places of worship	74.47%	2.13%	2.13%	6.38%	2.13%		6.38%	4.26%		2.13%
Bus Shelter/terminal	80.00%						20.00%			

The table highlights that with the exception of fires in medical / dental buildings the primary cause of all commercial fires was due to malicious or deliberate actions. This table also enables the identification of the other main causes of fire for each premise type, for example in welfare

homes and medical / dental services, smoker's material are a significant cause of fire.

### **Date Analysis**

*Graph Six: Illustrates the number of commercial fires by month for the time period April 2000 to November 2005*



The graph above is based on an extended time scale, from the original scale set out at the beginning of the report; it shows the number of commercial fires on a monthly basis.

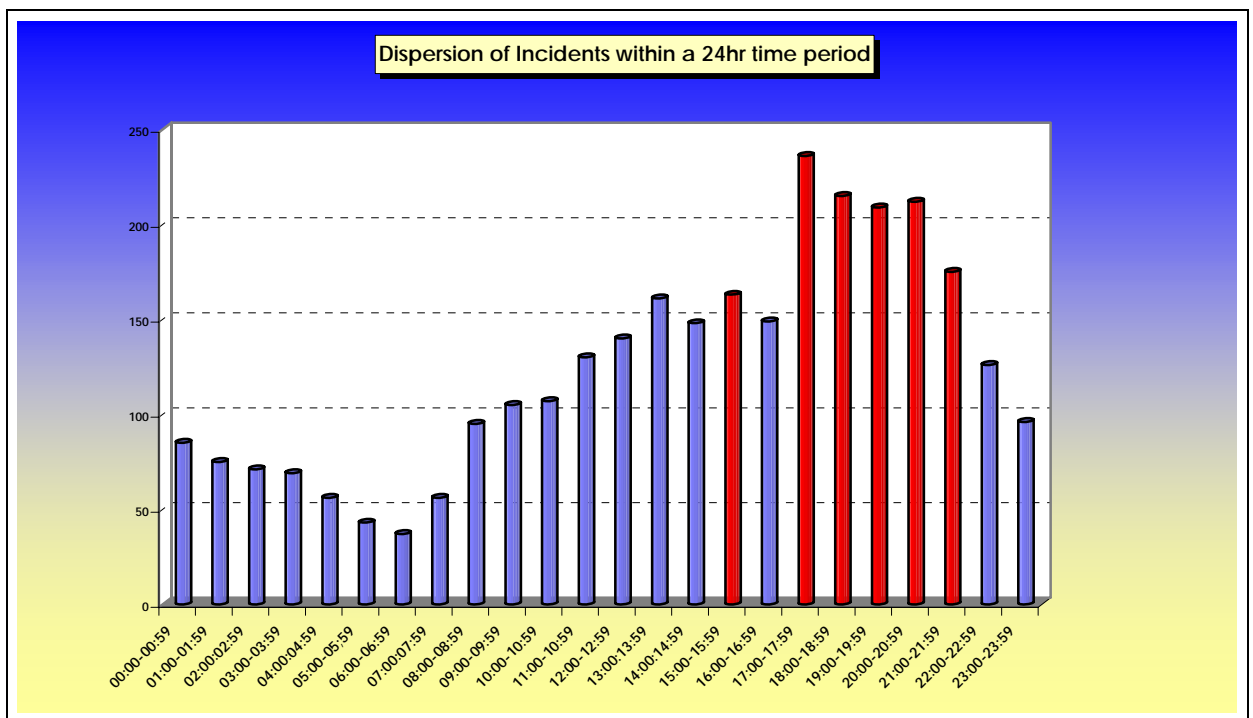
By increasing the time scale a greater understanding of trends can be achieved. This graph shows that in general the number of commercial fires decreased from April 2000 to approximately August 2002, the number of incidents then remained fairly constant, floating around the expected average, before witnessing a further decrease in December 2004, a downward trend that appears to be continuing.

This downward trend could be due to the implementation of the fire precautions work place regulations act 1997 (amended 1999). Even though the act was established in 1997, it was not adopted until mid 2000 in Merseyside Fire and Rescue Service. This act meant that small commercial premises without fire certificates could be entered by fire safety officers and fire risk assessments had to be completed, thus fire awareness rose.

## Time Analysis

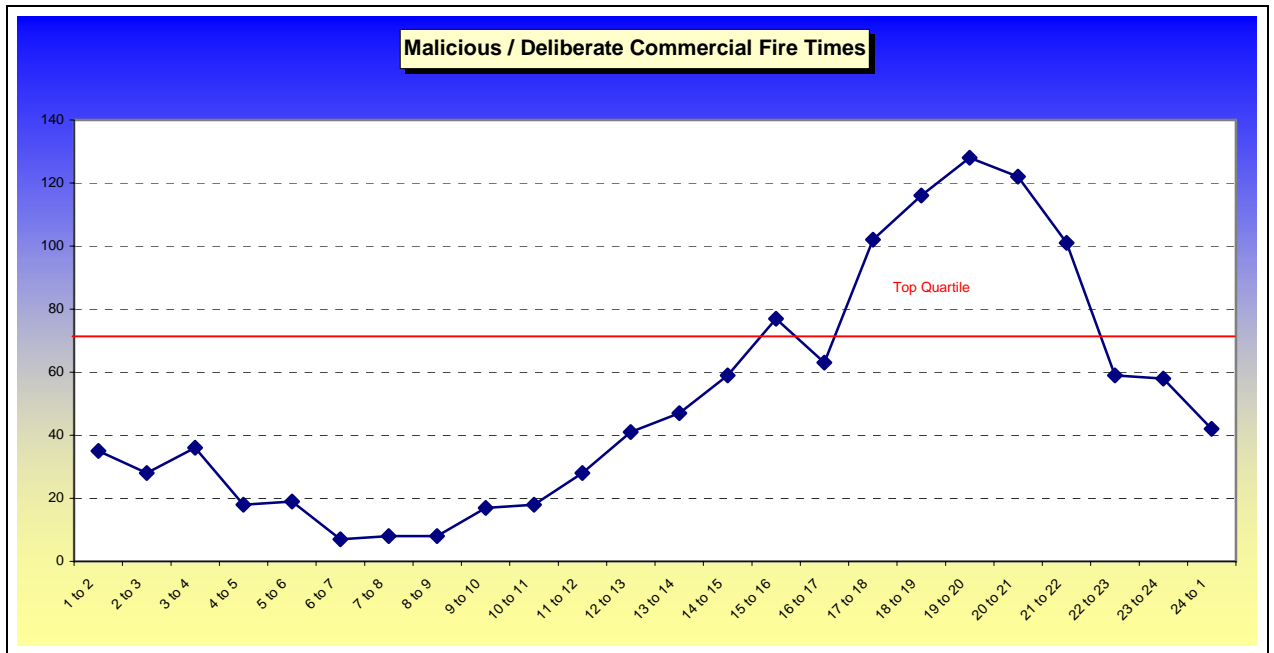
A further element of understanding surrounding commercial fires can be gained through temporal analysis. The graph below illustrates the dispersion of incidents through the 24-hour period. The peak time period for incidents in Merseyside occurred between 17.00hrs and 22.00hrs, with the peak time falling between 17.00hrs and 18.00hrs.

*Graph Seven: Illustrates the dispersion of incidents over the 24-hour period for the period April 2002 to December 2005*



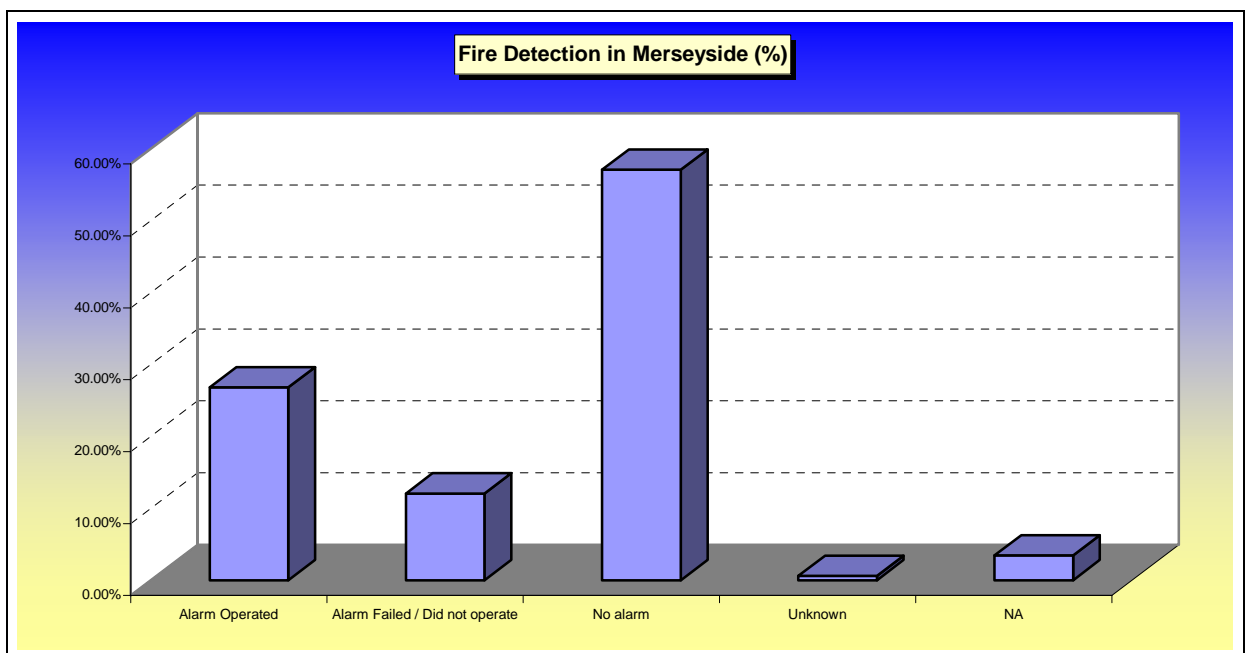
A further graph was designed to illustrate the dispersion of commercial fires caused by malicious or deliberate actions, this graph can be seen below. It is not surprising that the peak period for malicious or deliberate fires coincides with the overall trend described above. The top quartile of incidents occurred between 17.00hrs and 22.00hrs. These times could be significant for numerous reasons. Firstly, in some premises these identified peak hours are out of normal office hours and the premises could therefore be vacant, making them an easier target for arsonists, and secondly, in other premises, especially between 17.00hrs and 18.00hrs employees could be leaving or shift patterns changing.

Graph Eight: Illustrates the peak time period in which malicious / deliberate commercial incidents occurred



### Fire Detection and Spread Analysis

Graph Nine: Illustrates the % of detection of commercial incidents in Merseyside for the period April 2002 – December 2005



This graph presents the percentages of the different fire detection methods for commercial fires in Merseyside. Over 50% of the premises

that were affected by commercial fires had no detector system. In approximately 24% of incidents a detector system operated, while in approximately 10% of incidents the detector failed to operate.

To gain further understanding simple regression techniques were adopted based on the findings in the table below. The table shows the percentage of working detectors and the percentage of fire spread contained to one room for each station ground.

Correlation analysis, which is a technique that assesses the strength of the association of two variables, resulted in an  $r^2$  value of 0.51; indicating that there is an association between commercial premises having working detectors and the extent of fire spread being contained. This does not take into account other factors, which could influence the level of spread.

*Table Three: Illustrates the % number of premises in each station ground where spread of fire was contained to one room and where a fire / smoke detector was operational*

Station Ground	Working Smoke Detector	Spread of Fire	Station Ground	Working Smoke Detector	Spread of Fire
Kirkdale	13.49%	74.42%	Formby	36.00%	76.00%
City Centre	47.90%	84.97%	Southport	39.37%	84.25%
Low Hill	25.37%	79.60%	Allerton	28.57%	69.84%
St. Helens	21.05%	79.02%	Speke	19.12%	72.06%
Newton-Le-Willows	16.42%	79.10%	Toxteth	27.18%	79.61%
Huyton	16.85%	76.40%	Old Swan	23.25%	74.91%
Whiston	33.73%	81.93%	Belle Vale	25.86%	70.69%
Eccleston	28.57%	76.19%	Birkenhead	14.37%	72.99%
Kirkby	25.00%	75.89%	Bromborough	44.76%	80.95%
Bootle & Netherton	20.27%	78.38%	Heswall	20.00%	90.00%
Aintree	33.53%	87.28%	Upton	39.86%	74.58%
Croxteth	15.00%	76.25%	West Kirby	31.58%	94.74%
Crosby	17.00%	73.00%	Wallasey	28.24%	76.47%

Map 2 A: Illustrates the spatial distribution of premises that had fire detectors that did not activate.

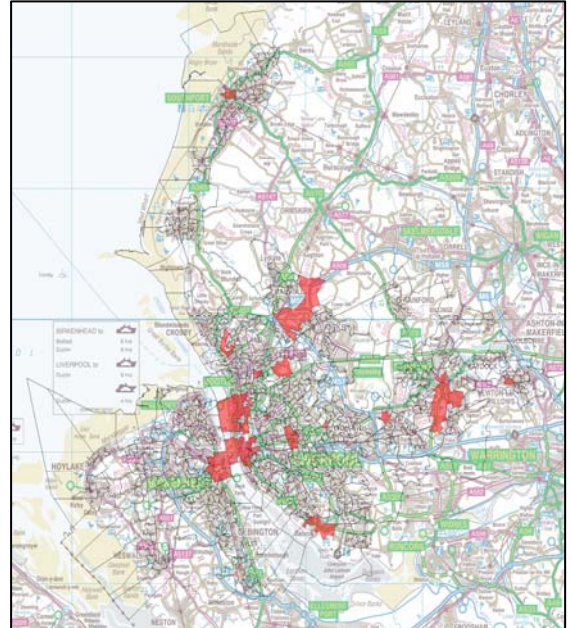
Map 2 B: Illustrates the spatial distribution of premises that had no fire detectors

Map 2 C: Illustrates the spatial distribution of premises that had working fire detectors.

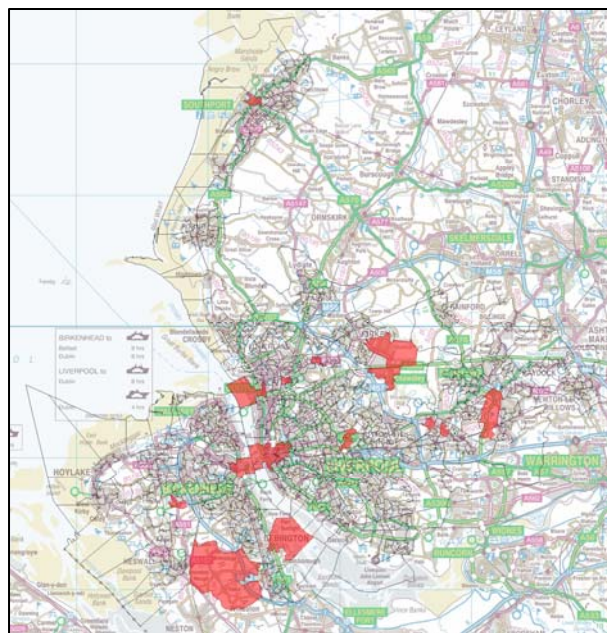
A



B



C



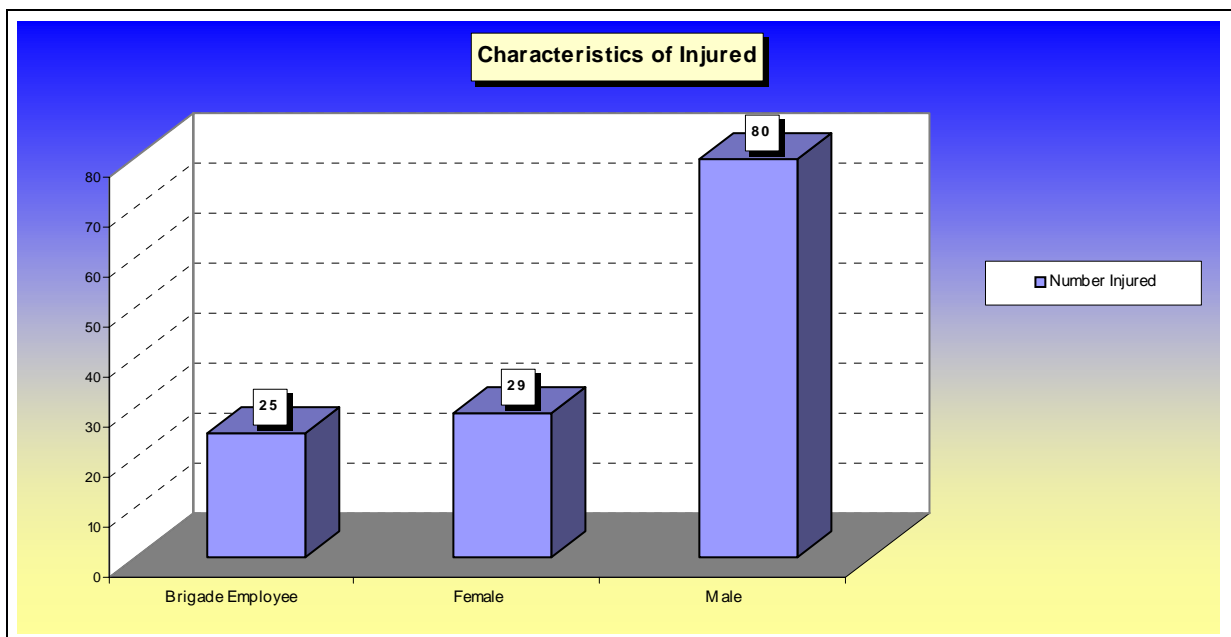
The Maps enable visual identification of hotspot areas where commercial fires have taken place. Focusing on Map C, it is possible to look at the areas, which had working alarms, to identify the different premise types located there. Hospitals, Seaforth Docks, large Industrial Sites and city centre retail outlets all are located within the identified areas. The situation is similar for Map A, areas associated with premises that had working smoke alarms, which did not operate. The premises once again include city centre retail outlets and known industrial areas. However, recognising the premises located within the areas identified in Map B is more difficult. This may be due to the fact that they are small and/or one off commercial premises, and thus harder to ensure that detectors are fitted and continuously fully operational.

## 5.2 Analysis of Casualties

### Demographic Characteristics

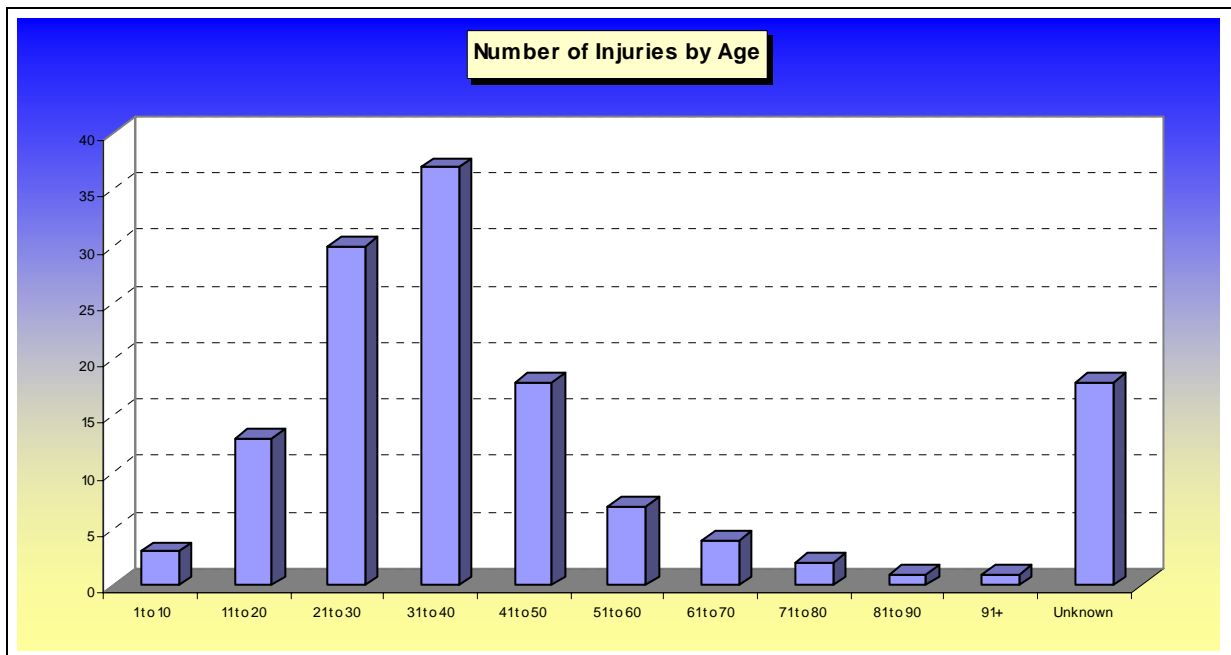
While it is important to understand the impacts of commercial fires in relation to the premise types affected and the causes, it is also vital to appreciate the social impact of these fires in relation to the individuals who suffer as a consequence, in terms of those injured. It is therefore necessary to identify the characteristics of those injured. The data collated at incidents limits the analysis to sex and age.

*Graph Ten: Illustrates the gender of those injured by commercial fires from April 2002 to December 2005*



The above graph looks at the number of casualties caused by commercial fires by gender. The total number of casualties for all commercial fires during the time period investigated was 134. Out of this total of 134, 25 of those injured were employees of the Merseyside Fire and Rescue Service, which is approximately 19%. In reference to gender, the largest proportion of those injured were male. If injuries to Merseyside Fire and Rescue Service employees are momentarily disregarded, 73% of injuries to the general public occurred to males, thus males would, based on this data appear to be more likely to be injured.

*Graph Eleven: Illustrates the division of injuries for commercial fires by age for the period April 2002 to December 2005*

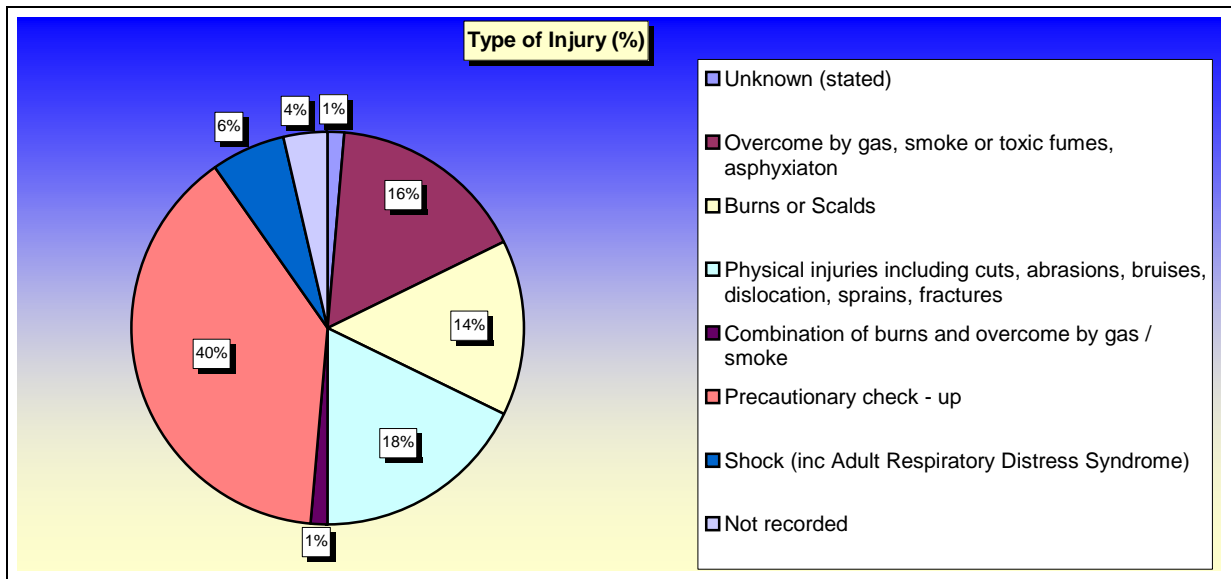


The graph above looks at the number of injuries by age. It clearly illustrates that between the ages of 21 – 40 more individuals suffered from injury. There is a rapid decline in the number of injuries from age 40.

### ***Analysis of Injuries***

Further analysis enabled the identification of those persons, who based on past evidence appear to be most vulnerable in commercial fires to injury. It is also important however to determine if there is/are any type(s) of injury that is/are related to commercial fires. This is illustrated in the chart below.

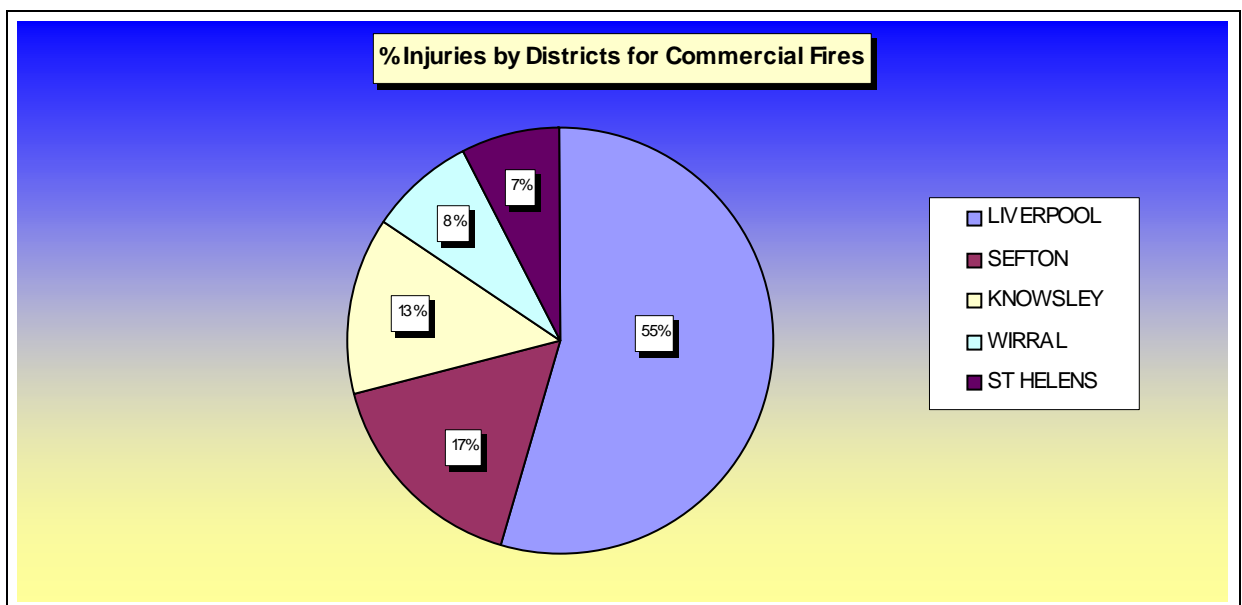
Graph Twelve: Illustrates the % of type of injuries caused by commercial fires between the period April 2002 to December 2005



The chart highlights that the most common cause of injury in relation to commercial fires are those referred to as precautionary check-ups. This can refer to those casualties who have no obvious injuries, and are checked either at the scene by ambulance personnel, in hospital or at a later time by their own doctor. Physical injuries, burns and scalds and being overcome by gas, smoke or toxic fumes are also significant injuries in relation to commercial fires.

### Spatial Analysis of Injuries

Graph Thirteen: Illustrates the % of injuries by district caused by commercial fires between the period April 2002 to December 2005



*Table Four: Illustrates the % number of injuries and incidents for each district*

<b>DISTRICT</b>	<b>Incidents</b>	<b>Injuries</b>
<b>LIVERPOOL</b>	54%	54%
<b>SEFTON</b>	11%	16%
<b>KNOWSLEY</b>	10%	13%
<b>WIRRAL</b>	16%	8%
<b>ST HELENS</b>	10%	7%

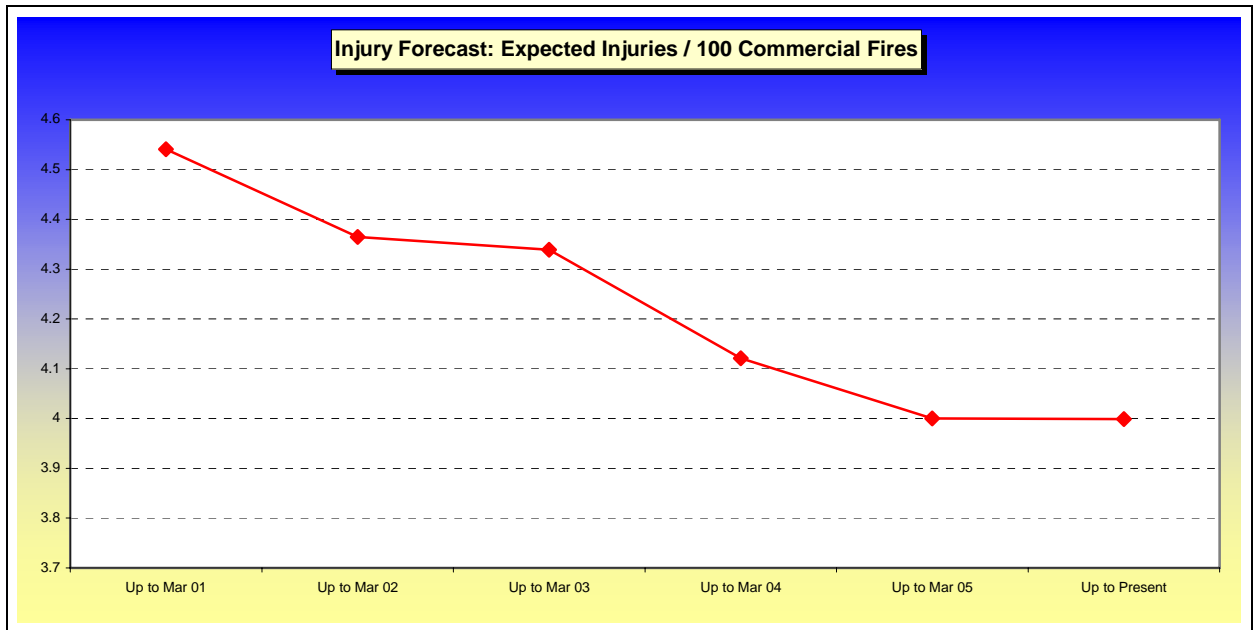
Previously, in an earlier chapter the number of incidents per district was highlighted. The above chart highlights the number of injuries by district. As outlined previously the district of Liverpool had the greatest number of incidents, and not surprisingly it also had over 50% of the total injuries. However, the table above highlights that despite the district of Wirral having the second greatest number of incidents it had one of the lowest rates of injury. The district of Sefton had a relatively high rate of injury in comparison to the number of incidents.

### ***Forecast Injury Analysis***

By using an excel based analytical / modelling forecast it was possible to predict the number of injuries expected per 100 commercial fires. Using historical data per 100 commercial fires it would be expected that there would be 5.46 injuries and 2.66 serious injuries. This figure can be compared to the forecasted figure of 9.48 for dwelling fires.

Further analysis was undertaken to illustrate how the expected number of injuries have decreased from 2000 to the present day. This reduction could be the result of action that the Service has implemented. The graph below shows the trend.

Graph Fourteen: Illustrates the trend of expected number of injuries for commercial fires from 2000 to the present day

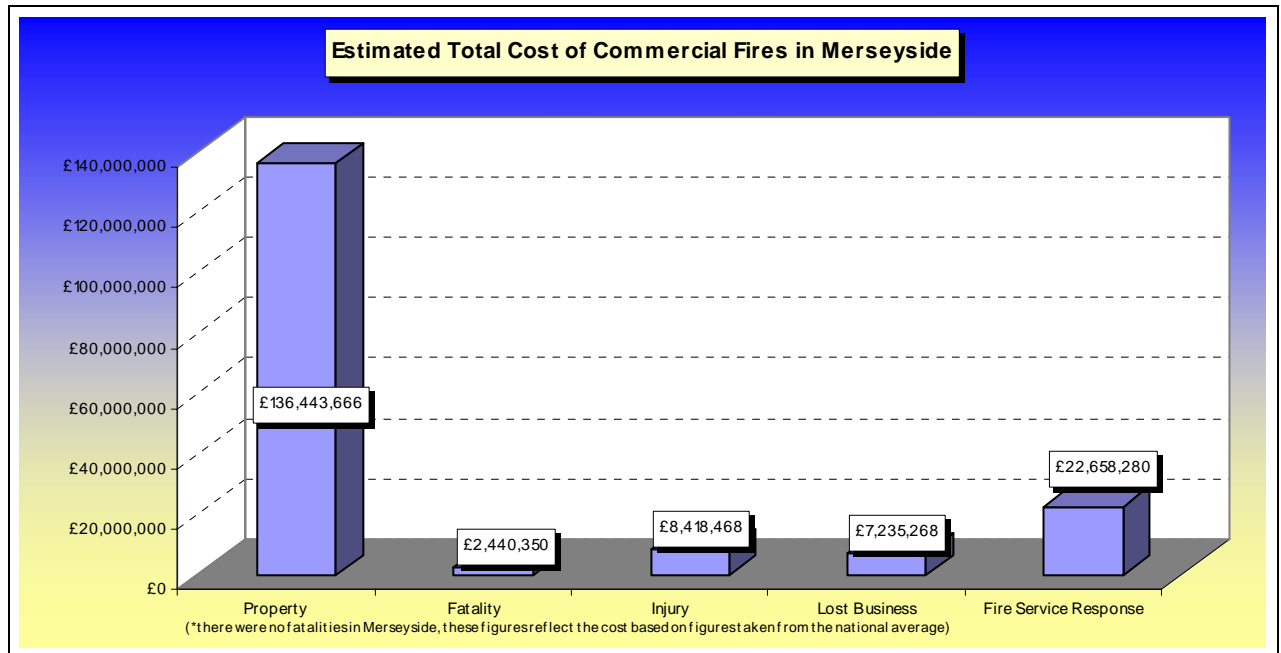


### 5.3 Financial Analysis

To gain a complete understanding of commercial fires it is necessary to comprehend the financial implications that commercial fires have on not only the Authority, but also to society as a whole. The figures are based on the period April 2003 to December 2005. As the graph below shows the total estimated cost of commercial fires in Merseyside was £177,196,032. (This estimate is based on the average cost of one commercial fire as stated by the ODPM; the number of commercial fires in Merseyside was multiplied by the average figure).

This total figure estimated can be broken down to gain a greater awareness of the impact of commercial fires; this is illustrated in graph fifteen.

Graph Fifteen: Illustrates the different costs of commercial fires for the period April 2002 to December 2005



Property damage was the most expensive cost related to commercial fires, accounting for approximately 77% of all costs. Fire Service Response costs accounted for approximately 13% of the total, equalling £22,658,280.

## 6. Conclusion

This report has highlighted many significant findings in relation to the geographical location, and socio-economic impacts of commercial fires in Merseyside.

It is important to stress that within Merseyside, commercial fires account for approximately one third of all building fires.

***In particular the significant findings for the time scale under investigation were:***

### ***Spatial/Location***

- There were 2958 commercial fire incidents in Merseyside. Over 50% of all commercial fires were concentrated within the district of Liverpool. The other four districts had a 10% – 18% of share of the total number of incidents. However, when a probability analysis was completed, which was based on the number of incidents per 1000 non-

domestic premises, the district of Knowsley came out as having the greatest probability of a commercial fire.

- The busiest station ground in relation to responding to commercial fires was the City Centre. It is also worth noting that approximately 60% of all fires that occurred in Wirral fell within the Station Ground of Birkenhead.
- The premises that witnessed the greatest number of commercial fire incidents in Merseyside were, Retail Buildings, Industrial Buildings, Commercial Premises and Educational Establishments. Incidents in Retail Buildings and Industrial Buildings contributed to approximately 40% of all commercial fires.

### ***Social/Temporal***

- In approximately 40% of all commercial fires the cause was a direct result of malicious or deliberate actions. The remaining top ten causes contributed less than 10% each to the total.
- With the exception of medical / dental premises, malicious / deliberate actions were the main cause of commercial fire in all premises.
- Since April 2000 the number of commercial fires in the Merseyside area has decreased from a rate well above the average to a rate significantly less than the average. Between 2002 and 2004 the number of incidents remained relatively constant, fluctuating around the average. However, in 2005 the number of incidents once again witnessed a decline.
- The peak time period for commercial fire incidents in Merseyside fell between 17.00hrs and 22.00hrs, with the peak hour falling between 17.00hrs and 18.00 hrs. These time periods coincided unsurprisingly with the peak times of fires caused by malicious or deliberate actions. It is also significant to note that the peak times could have been occurring outside of normal office hours in some premises or at change of shifts, which could explain the relatively low number of injuries.
- There appears to be a moderate relationship between premises having a working smoke alarm and fire spread being contained to one room. Though it is important to note that this finding was based on a simple regression and no other factors, which could have had an impact were considered. Other factors would include, the flammability of material within the premise, the layout of the building, occupancy of the building and whether fire doors were in existence and operational. This data however is not available to enable this analysis.
- The total number of casualties as a result of commercial fires for the period analysed was 134. 19% of the injuries occurred to employees of

the MF&RS. In reference to members of the general public 73% of injuries occurred to males. Persons in the age category of 21 to 40 suffered the greatest number of injuries. It would therefore appear that males between the ages of 21 to 40 are more vulnerable to injury in commercial fires.

- The most common form of injury in relation to commercial fires is defined as precautionary check-ups. Physical injuries, burns and scalds and being overcome by gas, smoke or toxic fumes, are also injuries related to commercial fires.
- Over 50% of injuries were located in the district of Liverpool. This is not surprising with the large concentration of commercial fire incidents in this area. However, despite the district of Wirral having the second greatest amount of incidents, the numbers of injuries were relatively low, whereas the district of Sefton had a relatively high rate of injuries in relation to the number of incidents.
- Injury forecasting based on the data analysed in this report shows that per 100 commercial fires, there would be 5.46 injuries, of which 2.66 would be serious. This figure can be compared to the expected number of injuries per 100 dwelling fires, which is calculated as 9.48. Further analysis has indicated that the number of injuries since 2001 in commercial fires has decreased from approximately 4.55 /100 commercial fires to 4 / 100.

### ***Financial***

- The total cost of commercial fires in Merseyside for the period April 2002 to December 2005 was £177,196,032.
- Fire Service Response costs accounted for 13% of the total cost of commercial fires.
- The largest cost by far was in relation to the damage done to property, this accounted for 77% of all costs, totalling £136,443,666.

### ***\*Future Strategic Target Areas***

- Through spatial analysis, which resulted in the creation of maps, it was possible to identify areas with high concentration of premises with either no detectors or detectors, which did not function. This report has highlighted how there is a medium association, medium being neither strong nor weak, between the spread of fire being contained to one room and the premises having a working detector. The 'British Standard' dictates the level/number of detectors a premise has to adhere to, and as such it is therefore impossible to force owners to

increase the number or positioning of these detectors if they have met the required standard. However, fire fighters could still visit the premises within the identified areas to highlight the financial losses to their company which could be saved by ensuring detectors are always fully operational.

- As malicious / deliberate intentions are a significant cause of commercial fires, and there appears to be a connection between the peak time period and the time when employees might be leaving or shift patterns changing. It might be beneficial for fire fighters or advocates to visit premises in pre identified areas to educate employees about fire safety whilst the numerous financial and social consequences of commercial fire are highlighted.
- While it is possible to identify areas where commercial fires could be reduced through Community Fire Safety interventions as listed above, it is important to note that other areas cannot be forgotten or neglected, as this project has shown while there are high areas of clustering of commercial fires, they are also dispersed throughout the Merseyside area.