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# Collection and Analysis of Emergency Services Data Relating to the Evacuation of the World Trade Centre Towers of 11 September 2001

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December 2004

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or online via the Office of the Deputy Prime Minister's web site.

Printed in Great Britain on material containing 75% post-consumer waste and 25% ECF pulp.

ISBN 1 85112 766 6

December 2004

Reference no. 04LGFG02767(7)

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# CHAPTER 1

## Executive Summary

The evacuation of the World Trade Centre (WTC) complex represents the largest full-scale evacuation of people in modern times. The survivors of this disaster hold a tremendous amount of information concerning their experiences of the conditions within the structures and the evolving evacuation scenario.

In December 2002, the Building Disaster Assessment Group (BDAG) of the UK Office of the Deputy Prime Minister (ODPM), engaged through the Fire Statistics and Research Division, the Fire Safety Engineering Group (FSEG) of the University of Greenwich to gather, collate, categorise, electronically store and finally analyse data concerning human experiences during the WTC evacuation. Reports were gathered from the literature published in the public domain. Over 250 separate accounts were gathered that described the behaviour of 260 occupants. The analysis of this data can be found in a report entitled “Collection and Analysis of Human behaviour data appearing in the mass media relating to the evacuation of the World Trade Centre Towers of 11 September 2001” [1].

Towards the end of 2003, FSEG obtained six PDF documents comprising approximately 5,000 pages of data relating to the WTC evacuation. This information consisted of:

- Four PDF documents of telephone and radio calls and conversations which occurred on the 11 September 2001 between New York and New Jersey Police agencies and callers.
- Two PDF documents comprised letters of commendation for individual Police Officers and an account of the incident by the Officer concerned.

BDAG requested that FSEG should enter this information into the database and analyse the information. This report focuses on the effectiveness of the emergency response and attempts to identify issues which might help future planning.

The main findings of this analysis are:

### **(i) Recognition of the situation:**

A majority of police officers for which we have data appear to have been aware from an early stage that the incident was at least an aircraft strike if not an explosion or act of terrorism, which would likely require the same mass response as in 1993. This type of situational awareness is essential if a rapid and effective response of emergency personnel is to be expected.

### **(ii) Police logistical and tactical response:**

Four police officers mention chaotic or confused emergency response, while seven police officers highlight that effective emergency response rapidly swung into action.

**(iii) Evacuation of tower concourses:**

It is apparent from civilian testimony that many people needed no prompting to rapidly evacuate from the towers. However, police accounts suggest that while the civilians required little prompting to the need to evacuate, they still required instruction as to the most appropriate evacuation direction, without which more lives may have been lost. This suggests that the uniformed Police presence gave an important direction to an already free-flowing evacuation.

**(iv) Police ascent of towers:**

It would appear from the available accounts that police did not penetrate the towers much above the half way point, with most not exceeding approximately a third of the way up. The available information would suggest that police (and other rescue services) found it difficult climb the stairs against the flow of fleeing occupants. If police rescue and fire fighting operations are to be undertaken in such tall structures, then it would appear that the availability of lifts, for emergency personnel use, should be considered as a high priority. Developing appropriate procedures for rescue operations using lifts should also be considered a priority. Even if lifts are not used, if police are to be used in such evacuation situations they should be trained in operational evacuation management strategies. Furthermore, in situations involving very tall buildings, alternate evacuation procedures should be explored, for example forming teams of top and bottom rescuers allowing the teams to work towards each other and/or pass on survivors to the next team down. Further research effort could be expended in attempting to define viable operating strategies, including what the optimum relationship might be between team size, the amount of floor space per storey to be searched, the number of floors and whether officers are working their way down or up.

**(v) Emergency Equipment:**

A considerable number of emergency vehicles were disabled by the cloud of choking dust and debris that developed following the collapse of the Towers. It is suggested that emergency vehicle air filters be examined for their suitability in operating in dusty environments that may result from building collapse. It was apparent that availability of self-contained breathing apparatus (SCBA) for Police and other emergency responders was crucial during this disaster. It is recommended that rescue personnel, including police services be provided with similar equipment and suitable training in its use and that use of such equipment should be incorporated into building disaster response planning.

**(vi) Command Posts:**

It is suggested that predetermination of command posts and Police rendezvous points in the vicinity of likely terrorist targets should be considered.

**(vii) Communications:**

Whilst information in the database is limited, what information is available suggests that had a robust transmission network been available and reserved for emergency services use, Police communication and liaison throughout the disaster would have been much improved. It is recommended that research be undertaken to ensure that rescue workers have effective and compatible communications systems (allowing inter-service communications) capable of responding to similar situations, both in large high rise buildings and in underground situations.

**(viii) Decision to evacuate the towers:**

A number of occupants trapped in the Towers called the Police to ask if they should seek shelter or attempt to evacuate. It is not clear if these calls were made because the callers did not receive appropriate local guidance or if they required additional information and advice. Regardless of the reason, it is clearly a concern that building occupants found it necessary to seek advice from authorities remote from the scene and hence not in a position to provide informed advice. This supports the view put forward in the accompanying report concerning the analysis of survivor accounts [1] that improved communication systems and procedures for disseminating information are needed in high rise buildings in order to allow occupants to more rapidly make appropriate evacuation decisions. Furthermore, some of the advice that was offered by these remote authorities was contradictory, some suggesting to flee while others to seek shelter. If remote emergency services are to provide more than moral support in response to telephone requests for advice, appropriate training is essential which is based on sound engineering principles.

**(ix) Trapped occupants:**

This study suggests that a number of people were trapped throughout the buildings, not simply within and above the impact zones. This reinforces the need to ensure that emergency telephone operators are trained to provide reliable advice regarding whether to seek shelter or to evacuate. It also highlights the need to better understand occupants' refuge behaviour, and reinforces the need to provide appropriate training for first responders who may be involved in search and rescue activities.

**(x) Locked exit routes:**

A disturbing finding was that there were a number of reports of doors in exit routes being locked. It is not clear why the doors in question were locked, it could have been for security reasons or because of software failures. However, such systems should be designed so that they fail safe and are able to be operated in emergency situations.

**(xi) Telephone calls by and to the Police:**

The majority (72%) of telephone calls by and to the Police investigated in this study were considered 'appropriate' in that they were of direct relevance to the unfolding disaster. However, approximately one-third of calls were of an 'emotional' nature such as family or friends of officers or Tower occupants calling or being called for reassurance or obstructive calls such as people calling the police to determine the status of New York's airports. While it may be considered natural to inquire after the well being of 'loved ones' involved in the front line, it must also be understood that undertaking this course of action during a major incident may have negative consequences. Of greater concern is the number of nuisance and time wasting calls made to the emergency services. There is probably little that can be done about such calls other than educating the public as to the seriousness of such calls. By highlighting the magnitude and harmful nature of such calls, this may discourage the more innocent time wasting calls in future.

# CHAPTER 2

## Introduction

In December 2002, the Building Disaster Assessment Group (BDAG) of the UK Office of the Deputy Prime Minister (ODPM), engaged through the Fire Statistics and Research Division, the Fire Safety Engineering Group (FSEG) of the University of Greenwich to gather, collate, categorise, electronically store and finally analyse data concerning human experiences during the World Trade Centre (WTC) evacuation. Reports were gathered from literature published in the public domain. Material sources ranged from survivor accounts printed in newspapers and newspaper web sites, interviews in the electronic media, survivor web sites and books. Over 250 separate accounts were gathered that described the behaviour of 260 occupants. Information appearing in print newspapers represents 70% of the accounts while information from websites (news and personal) represents 16% of the accounts. The remainder of the accounts have appeared in books, journals and the electronic media. These accounts provided information concerning 120 people from the North Tower of the WTC (WTC1) and 119 from South Tower of the WTC (WTC2) and 21 of unknown origin [1].

Towards the end of 2003, FSEG obtained six PDF documents comprising approximately 5,000 pages of data relating to the WTC evacuation. This information consisted of:

- Four PDF documents of telephone and radio calls and conversations which occurred on the 11 September 2001 between New York and New Jersey Police agencies and callers.
- Two PDF documents comprised letters of commendation for individual Police Officers and an account of the incident by the Officer concerned.

This document details the analysis of this data. The Police account transcripts (two PDF documents) are presented first in Section 4, telephone calls to the Police from occupants trapped in the Towers are presented in Section 5 and telephone transcripts by and to Police Officers and other emergency services during the disaster are present second in Section 6. Sections 5 and 6 are from four PDF documents. This report focuses on the effectiveness of the emergency response and attempts to identify issues which might help future planning.

# CHAPTER 3

## The Data

There were a number of difficulties associated with analysing the provided information. Issues associated with the analysis of the Police information include:

1. The PDF documents were all of scanned original documents which resulted in poor quality reproduction, making reading difficult.
2. Key information was regularly interspersed with extraneous information, such as calls to the Police from anxious relatives, or calls from news agencies attempting to find news stories.
3. Telephone transcripts often included the comment 'inaudible' from the transcribing typist, leading to missing information.
4. A number of Police accounts were hand-written and difficult to read.
5. Although some 1,710 pages of telephone transcripts were available, only a small proportion detailed evacuation-related events inside the WTC. The majority of the information, once extraneous detail was omitted, dealt with Police and emergency response issues. These issues are also covered by this Report. Given the nature and duration of the incident, inevitably a proportion of the evacuation-related and emergency response information was repetitive, with several callers alluding to the same event.
6. The majority of information within the Police transcripts dealt with Police and emergency response issues. Given the nature of Policing operations, inevitably a proportion of the evacuation-related and emergency response information was repetitive, with several officers recounting the same event. For example all seven officers who lead a group of 30 survivors from the carnage at the Police Desk in WTC2 essentially provided the same information.
7. The effect of many officers detailing the same events is clearly positive, in that our confidence in the data is increased by the high degree of inter-account corroboration, and it shows that the Police worked effectively in teams to evacuate survivors in teams. However this resulted in hundreds of pages of transcript information providing only limited new information.
8. Given that the Police mostly responded to the disaster from outside, much of the Police activity centred on the lower reaches of the WTC towers.
9. First-hand accounts from fire-fighters and telephone transcriptions of fire-fighter operations were not supplied, hence the only information regarding fire-fighter activities is second-hand from Police accounts.



10. The four PDF documents of Police telephone and radio calls consisted of many hundreds of pages of information in total
11. It was apparent from going through this information that a majority of it, about 60% was extraneous. The remaining information was entered into the database.
12. The original material were print outs of telephone and radio calls on the day. These were then scanned and the scanned documents were put into PDF format. It was not possible to copy or save the PDFs in electronic form.
13. Much of the telephone and radio transcripts re-iterated the Police action transcripts which were entered into the database first. This was to be expected as the Police Officer wrote an account of the day which would include events recorded at the time by telephone and radio taping. However the telephone and radio transcripts include new information not previously seen in either occupant or Police account data.

# CHAPTER 4

## Analysis of Police account data

In total transcript accounts from 56 New York/New Jersey Port Authority Police Department (PAPD) Police Officers provided useful information. The transcripts comprised the officers' accounts of the 11 September 2001 events, from immediately before the first aircraft hit WTC1, to late in the evening in some instances. In addition, accounts from five non-police staff were also investigated. These 61 individuals provided some 1827 records of experiences, observations and actions from the period immediately before first aircraft impact on WTC1, until much later in the day, well after the WTC2 collapse. This information was entered into the database [1] along with the other civilian information providing a ready means for analysis.

### 4.1 Prevention of further loss of life

The first priority of any emergency response is to prevent and limit any further loss of life, if loss of life has already occurred. This section details actions and experiences by Police Officers in achieving this objective for civilians, Police and emergency workers. Initial and subsequent assessments of the situation are prerequisites of any emergency response. Suspicion of terrorism and possible building collapse necessitates not only the evacuation of involved spaces, but the prevention of further ingress into those spaces and the precautionary evacuation of other spaces. This assessment process is considered first. Further issues covered relate to logistical and tactical matters, assistance with civilian evacuation of the WTC (excluding the Towers themselves, covered separately in Section 4.2 and excluding rescue/escape from the collapse(s), covered separately in Section 4.3) and the precautionary evacuation of neighbouring spaces. Of the 1827 records in the database, 438 records from 55 individual Police Officers were found to be appropriate to the issue of preventing of further loss of life.

#### 4.1.1 RECOGNITION OF THE SITUATION

No large scale response is possible without first recognising the magnitude of the situation. Police Officers either witnessed or were informed that there was an aircraft strike, or witnessed or were informed that that something had occurred. In Figure 1 to Figure 3 below 'T1' refers to the first aircraft impact, 'T2' to the second aircraft impact and 'collapse' refers to either or both towers falling. The number of Police Officers per category refers to the number who cited the category, either as the only category or as one of several, for example database 958 stated that colleagues '*informed me that either a plane had struck or a bomb had gone off, at the WTC*'. He is counted as both 'some kind of aircraft impact' and 'terrorism' (bomb). Of the 1827 Police records currently in the database, 169 records from 44 officers are used in Figure 1 to Figure 3.

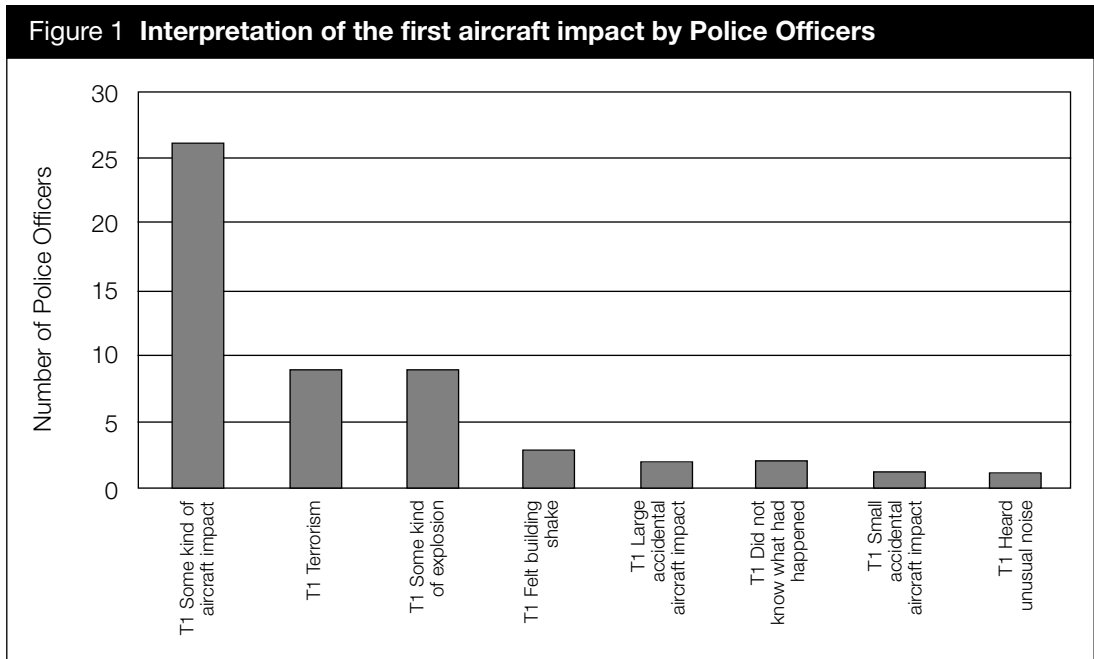
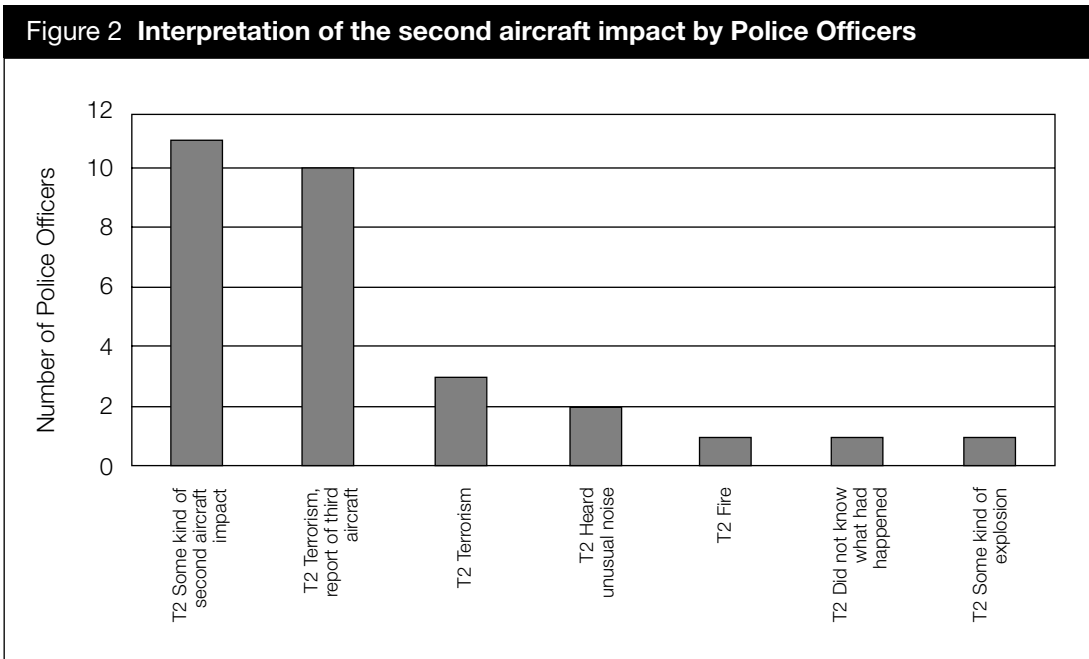
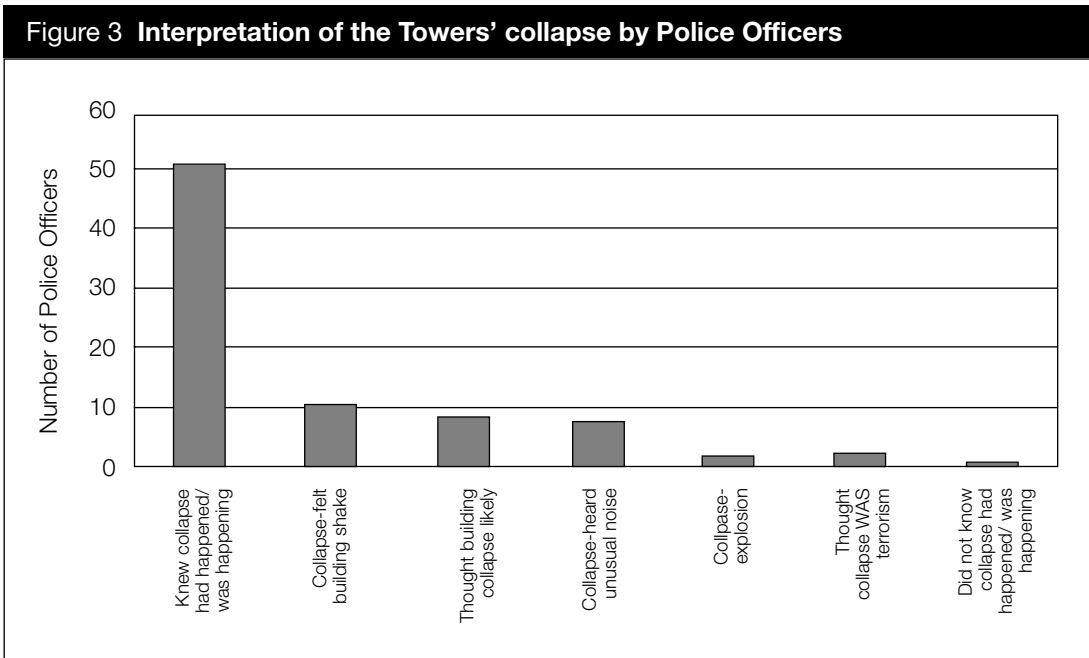


Figure 1 shows the interpretation of Police Officers as to the nature of the first aircraft to strike WTC1. Not surprisingly most Police Officers are aware from an early stage that some kind of aircraft impact had occurred. Only approximately 10 officers knew it was either terrorism or a large aircraft strike, which would have confirmed the gravity of the situation. However it is clear from Figure 1 that a majority of officers were aware from an early stage that the incident was at least an aircraft strike if not an explosion or act of terrorism, which would likely require the same mass response as in 1993 (as opposed to the event merely being ‘an unusual noise’ or not knowing what had happened after receiving a cue).

Figure 2 shows the interpretation of the second aircraft strike. The mode now was for officers to be aware of another aircraft strike, which of itself would have made them aware of the scale of their mobilisation. Mention of terrorism alone is actually less than in Figure 1, but this excludes officers who stated that they both knew it was terrorism AND were receiving reports of more terrorist aircraft en route. Taking the categories, ‘some kind of second aircraft impact’, ‘terrorism’, ‘more likely aircraft impacts’ and the observations that the towers were on fire together, and contrasting with the remainder of Figure 2 and all of Figure 1, the level of perceived emergency is now raised considerably. With this level of understanding of the situation, there would have been no doubt of the need for a mass mobilisation, and consideration not only of the towers themselves, but the evacuation of all areas and neighbouring zones to prevent further loss of life.



Despite the apparent gravity of the situation, some officers were surprised at the actual collapse of the towers. The collapse worsens an already critical situation, for now evacuation of the towers would no longer have been tenable, and the priority would have switched to a much larger, wider emergency response. Figure 3, which takes both tower collapses together, shows that most officers readily grasped the situation which confronted them.



Considering this data, it is clear that from an early stage, Police Officers knew that they were facing no 'routine' building fire, nor even a re-run of the 1993 disaster. They were facing a situation of massive logistical and tactical mobilisation, where the prevention of loss of life in neighbouring structures and the evacuation of Towers' concourse/plaza and other spaces was as much of a priority as evacuating the towers themselves were in 1993. Further, the collapse of the towers would have left officers knowing that these wider issues were now their main priority, in addition to rescue and extrication from the remains of the Towers.

#### 4.1.2 POLICE LOGISTICAL AND TACTICAL RESPONSE

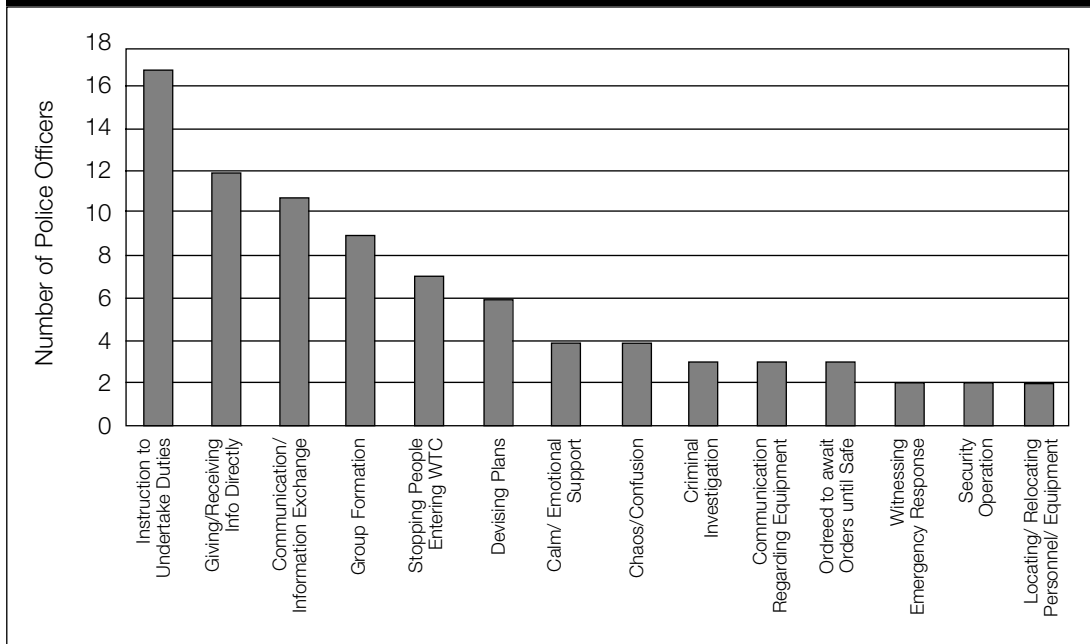
Of the 1827 Police Officer records currently held in the database, 115 records from 32 officers were considered pertinent to the issue of Police logistical and tactical response, excluding the evacuation of the towers themselves and rescue/escape/extrication from the collapsed towers themselves, dealt with in Sections 4.2 and 4.3. The categories used for analysis and examples of Police testimony are presented in Table 1 below. In the case of 'group formation' it should be recalled how different this was to the earlier civilian analyses from the towers. Here 'group' refers to Police officers joining forces at any time in any location (other than inside the Towers).

The 32 officers who provided information are presented in Figure 4. Many officers contributed to more than one category (resulting in 85 entries). This is to be expected given that officers saw, heard and did a great deal over a protracted period. However, within categories, officers were only counted once, even if the same officer contributed more than once to the same category (for example an officer could describe several group formations at different times in different locations).

Whilst the number of officers may be small, Figure 4 shows some interesting aspects of the unfolding disaster. Four officers mention chaotic or confused emergency response, but seven different officers mention that blocking further ingress to the Towers after the crisis commenced was a priority. The majority of officers refer to orders to undertake emergency duties and information being given and received, both face to face and through channels. The slope of Figure 4 begins with what might be said to be 'effectiveness' in terms of saving lives and preventing further loss, down to lesser matters such as waiting for further orders or simply noting other people's emergency activities. Even the tail of the skew, with the exceptions of 'chaos/confusion' and 'witnessing emergency response', suggests officers attempting to affect a cogent, organised response. For example, the two officers who mention the security operation launched parallel to the emergency operation. Database 930 stated that an emergency team '*was available and operational 24 hours a day, seven days a week for months, providing core emergency and operational communications*' and 875 reported that '*at 08:51 he directed the Port Authority Central Police Desk to immediately begin a job-wide manpower mobilisation. These actions set in motion an instantaneous commencement of the largest life-saving evacuation (25, 000 people) in American history*'. Whilst it was not possible to link Figure 4 to documented emergency preparations made after the 1993 bombing it is apparent that officers handled the major emergency more effectively than ineffectively.

**Table 1 Categories of Police logistical and tactical response and examples of testimony per category**

<b>Category of Police logistical and tactical response</b>	<b>Database</b>	<b>Example Testimony</b>
Instruction to Undertake Duties	945	<i>'I directed Sgt Kaulfers to remain in New Jersey to take control of crowd control problems'</i>
Giving/Receiving Information Directly	954	<i>'During this time I was approached by a NYPD chief asking for information about the building and clearing the lobby ASAP. He stated "the lifts are about to fall and we'll all get killed"</i>
Communication/ Information Exchange	919	<i>'I told him I needed to go over to the Financial Centre to ascertain the feasibility of locating there. It was around this time that I felt the second plane hitting Tower 2'</i>
Group Formation	964	<i>'While at the Lincoln Tunnel Police Command I was directed to assemble a group of officers to respond to the WTC. I believe I took 15 officers to the WTC'</i>
Stopping People Entering WTC	933	<i>'While forming teams and assembling equipment to make entries into WTC, Captain Whitaker informed the undersigned that no-one was to enter the buildings, they were structurally compromised and could collapse'</i>
Devising Plans	935	<i>'At 09:00 Captain Whitaker made the critical decision to begin the immediate evacuation of the entire World Trade Centre complex. This decisive action directly resulted in the safe exodus of thousands of people at the WTC'</i>
Calm/Emotional Support	956	<i>'All officers were accounted for, everyone was again advised to be calm, and that we were not going to rush into any situation that would put them in jeopardy'</i>
Chaos/Confusion	959	<i>'It was apparent that CPD did not have a clue what was happening at the WTC. We could not believe the CPD transmission to respond to the 'West Street entrance of Tower 1 where a command post is being set up in the lobby of Tower 1''</i>
Criminal Investigation	934	<i>'Following the second aircraft striking Tower Two, while he was continuing to evacuate people away from danger, Detective Wheeler located a cameraman who had captured that event on video. Detective Wheeler secured the evidence and returned it to the Police'</i>
Communication Regarding Equipment	891	<i>'A PATH maintenance man asked me what he could do to help. I asked him if he could turn both escalators on and upwards (to speed evacuation). He was able to do this'</i>
Ordered to await Orders until Safe	966	<i>'Approx 1 hour later another WTC building started to collapse and all officers were ordered to stay put at the north'</i>
Witnessing Emergency Response	919	<i>'When I left the Lobby of Tower 1 there were still many fire fighters and fire chiefs there'</i>
Security operation	962	<i>'I requested the PAPD dog handlers to search and secure the gym, prior to allowing officers to re-enter. Once secure a security perimeter was established'</i>
Locating/Relocating Personnel/Equipment	936	<i>'The convoy of equipment then left JFK for the WTC, the first group upon exiting the Battery Park Tunnel was confronted with the first tower collapse'</i>

**Figure 4 Number of Police Officers mentioning various logistical and tactical matters**

#### 4.1.3 EVACUATION OF THE TOWERS' CONCOURSES

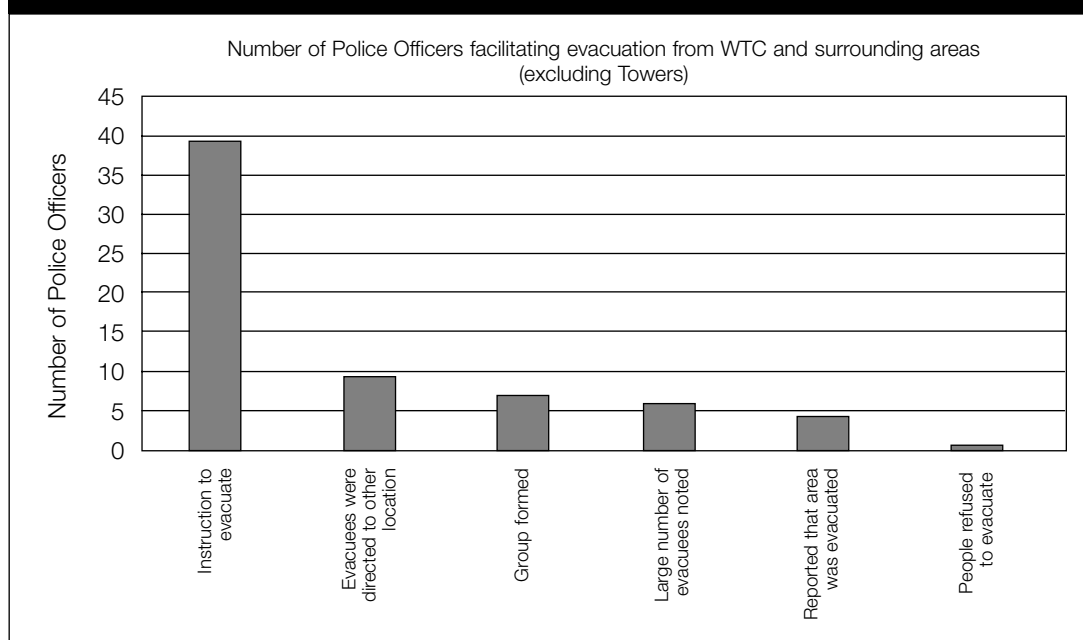
In addition to assisting the evacuation of the Towers, Police Officers also expedited evacuation from the concourses, lobbies, plazas, underground rail transit, shopping centres, neighbouring hotels and office spaces that comprised the vast WTC complex. Indeed most of the emergency response would have been in these spaces. Arriving after T1 from elsewhere in the city, difficulties accessing and ascending the Towers and the short timescale would have limited emergency response high in the Towers. It is clear from Police transcripts that they mobilised as quickly as possible and directed resources within these outer spaces, to speed and direct evacuation and to assist injured civilians. Also the Police had to clear the surrounding streets of civilians, bystanders, media personnel etc. both after the two aircraft strikes, and especially after the collapses spread a cloud of choking debris and missiles across the area. It is known that some 3000 people perished in the disaster. It is not known how many survived due to prompt, effective Police action in the Towers' lower aspects and surrounding district.

Of the 1827 Police records held in the database, 131 records from 41 Police Officers were considered suitable regarding the expediting of egress from the WTC concourses and surrounding streets, throughout the duration of the emergency. Figure 5 shows the 41 officers who stated in their transcripts that they facilitated egress at some point. Categories refer to stated experiences in relation to the facilitation of egress. Some officers have contributed to more than one category.

Given the scale of the event it is not surprising that most officers in Figure 5 directly or vicariously instructed people to get away from the scene as quickly as possible. Only one officer (903) noted people reluctant to evacuate. He stated that *'it looked as if the procession of people was not going to end. I had to physically grab people to get them to leave, because they were stopping to use payphones'*. With this one exception all officers allude to prompt evacuation as being the only concern. Officers arrived at the scene and were directed to various locations, working as a team to speed and direct the flow of people. Of five officers who reported that the evacuation comprised large

numbers of people, two stated that this occurred out of the concourse areas **before** the second aircraft strike. Database 879 stated that *'as thousands of people left the towers I observed and assisted numerous injuries'*. This suggests that many more people opted for immediate evacuation than opted to remain in the Towers.

**Figure 5 Number of Police Officers who expedited evacuation from WTC concourses and surrounding streets, per category of stated evacuation experience**



It was not possible to wed the number, location and instructions used by officers with a measurable increase in evacuation speed or efficiency. It is apparent from civilian testimony that many people were very concerned with evacuating as quickly as possible irrespective of emergency service prompting. However some Police accounts suggest that this evacuation haste still required direction, without which more lives may have been lost. For example 871 stated that;

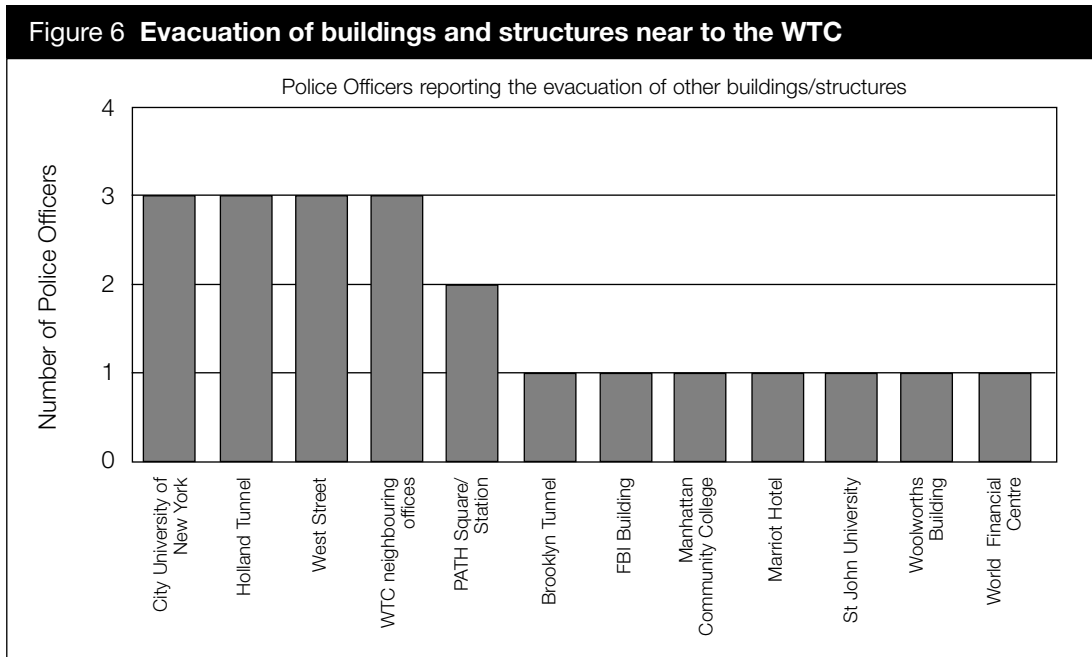
*'we had to send people coming down from the mezzanine through the concourse level so that they could exit via Building 5. We did not want to send them out through West Street because it was too dangerous with falling debris', and that 'people had been coming out of the stairwell at the mezzanine level and seemed to be confused where to go next; there were cops staged at different points on the concourse to guide people to Building 5 and exit'. Database 891 stated that an Inspector 'told us to stay at the bottom of the escalator, and to assist with the evacuation of the building. This was the evacuation route for WTC Building 1, which leads through the concourse, past the PATH escalator and up the escalator to the street through Building 5'.*

This suggests that the uniformed Police presence gave an important direction to an already free-flowing evacuation.



#### 4.1.4 EVACUATION OF OTHER SPACES

The WTC complex was surrounded by other high-rise structures, many smaller buildings, schools, shops and streets. When the second aircraft struck WTC2 precautionary evacuations of neighbouring spaces became necessary, as it could not have been known at the time that other explosive devices had not been planted. Of the 1827 Police records in the database, 23 records from 17 officers were found to refer to evacuation of buildings and tunnels in the vicinity of the WTC. Figure 6 shows that according to Police Officers currently held in the database, 12 other structures/enclosures were evacuated. This figure is probably an underestimate. Some officers report more than one precautionary evacuation to have taken place.



## 4.2 Evacuation and rescue from the Towers

The first aircraft to hit WTC1 is thought to have claimed some 400 lives. After attempting to prevent further loss of life, Police involvement in the evacuation of WTC1 and WTC2 was a major priority (undertaken simultaneously). Of the 1827 records in the database, 83 records from 31 individual Police Officers were felt to be pertinent to the Police effort in the Towers before the collapses.

#### 4.2.1 POLICE ASCENT OF THE TOWERS' STAIRWAYS

The Towers comprised some 110 floors and three main staircases. Upon arrival at the scene Police Officers were assembled into rescue teams to ascend the stairs and assist civilians. Figure 7 shows how high in the Towers officers managed to ascend, where specific floors were named, as opposed to the officer merely stating that he/she ascended stairs. For 16 officers about whom we have information, they did not penetrate the Towers beyond half way up, in fact most officers only reached a quarter to a third of the way up.

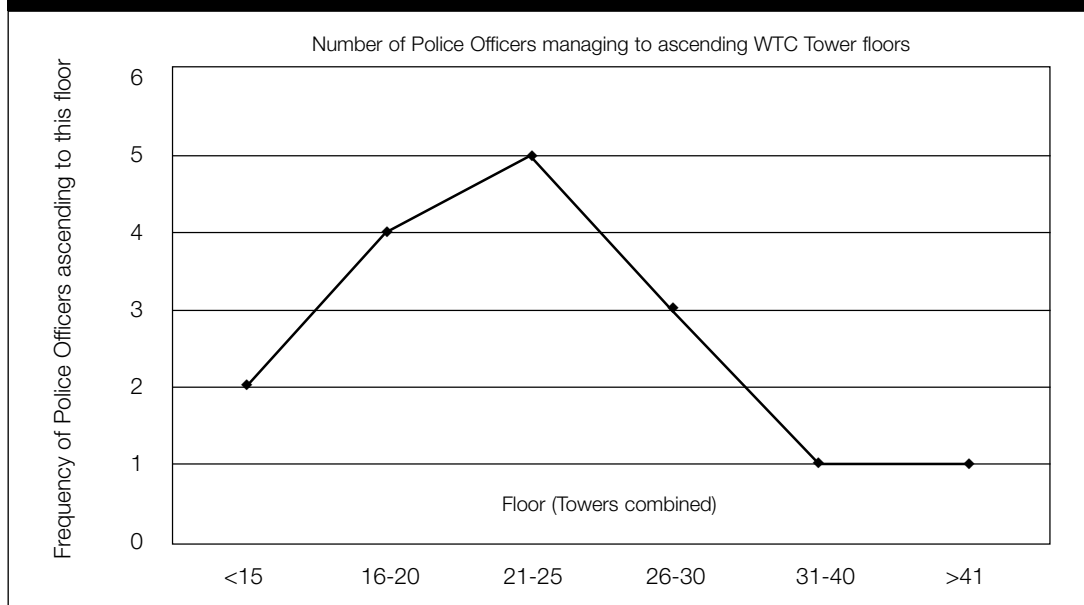
**Figure 7 Ascent of the Towers' staircases by Police Officers in the database**

Table 2 shows eight records from six officers who specified where in the Towers people were trapped. An officer can report people trapped in more than one location, for example 875 stated that *'at 09:29 WTC Police Desk informed me that people were trapped on the 87th and 89th floors of 2 WTC. FDNY was aware of this'*. The same officer also stated that *'at 09:11 WTC Police Desk reported to me that 100 people were trapped in the Windows on the World, 1 WTC 107th floor. I acknowledged. During this time FDNY have steadily been making an ascent up the B-Stairs, 1 WTC and were aware of the situation'*. Taking Figure 7 and Table 2 together it seems that officers, although they helped many people out of the floors they did manage to reach, did not reach high into the Towers where many other people were trapped.

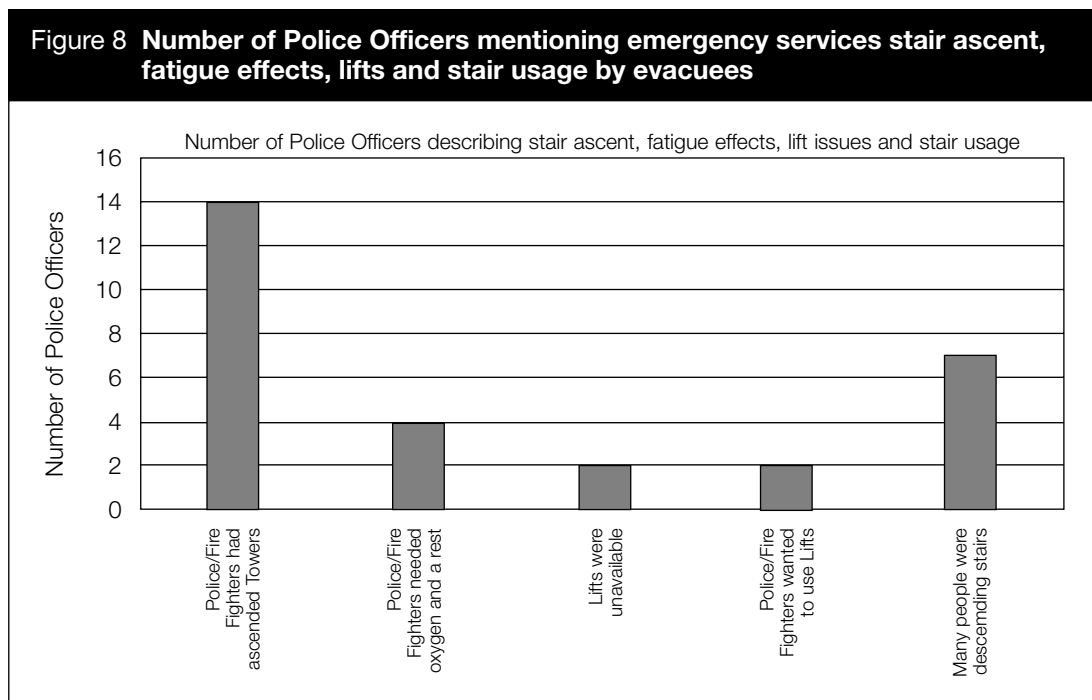
**Table 2 Police Officers in the database reporting where in the Towers people were trapped**

People trapped on floor	Number of Police Officers reporting or who knew trapped people's location
Floor 13	1
Floor 79	1
Floor 87	1
Floor 89	1
Floor 107, 'Windows on the World'	5
Upper floors, unspecified	2

It is not the place of this report to state whether Police Officers should or should not have attempted to evacuate people high in the Towers. It does appear however that given officers arrived from elsewhere after the first aircraft strike, and then had to ascend countless floors, it may have been preferable to either leave the evacuation to the WTC organisation, or have officers (and fire-fighters) use the lifts to commence a sweep downwards from the top rather than upwards from the bottom. This point is further illustrated by considering some stair-related events noted during the emergency response.

#### 4.2.2 STAIR-RELATED EVENTS

It is clear that many Police Officers and fire-fighters ascended the stairs after the first aircraft strike. Figure 8 is derived from 29 records from 19 officers. Figure 8 shows the number of officers stating that officers and fire-fighters ascended stairs in the Towers (whether floors were specified or not, using different records to Figure 7). Also shown are observations made by emergency personnel regarding the ‘need to rest’, ‘availability of elevators (lifts)’, ‘desire to use lifts’ and observations of many evacuees descending the stairs (records not used in Section 4.1).

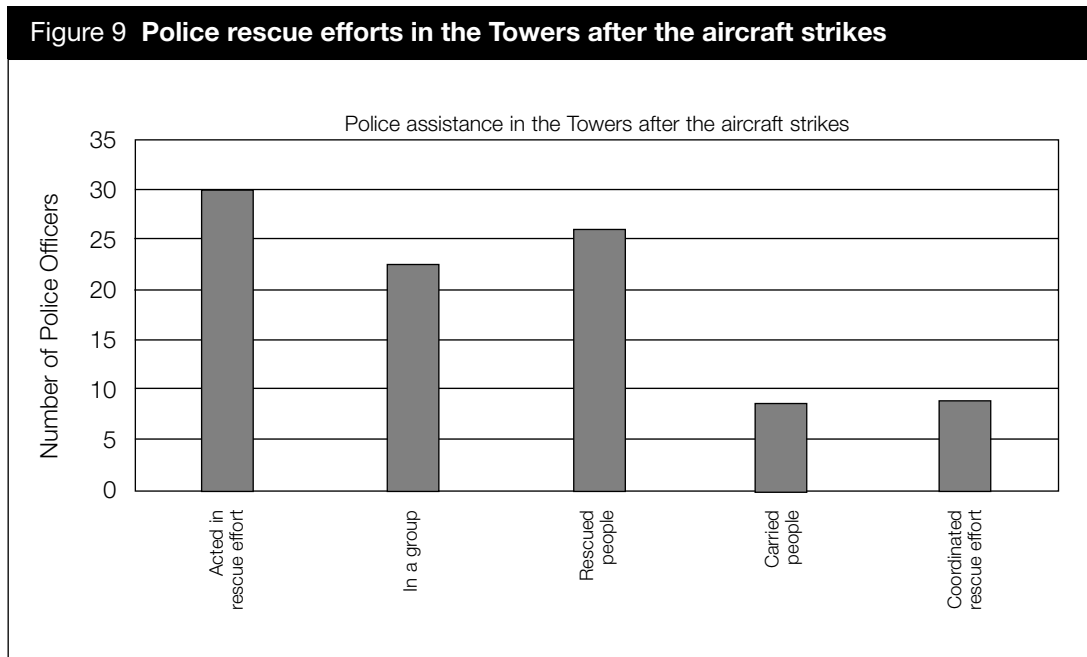


It is apparent from Figure 8 that many more officers ascended the stairs to rescue people than we have specific floor information for. Also noteworthy is that officers reported themselves and other officers and fire-fighters needed to stop and rest, and that some fire-fighters actually required oxygen after ascending the stairs with their heavy equipment. This of course is **before** fire fighting and rescue efforts commenced. Officers also report that lifts were unavailable, and that the fire-fighters were desperate to utilise lifts. Many people flowing down the stairs while emergency personnel ascended would have further hampered the emergency response. It is not known whether the WTC emergency plan entailed reservation of lifts for emergency personnel use only. It is apparent that the aircraft impacts took out lifts sooner or later. If emergency response, Police rescues and fire fighting operations are to be undertaken in such tall structures, then it would appear that the availability of lifts, for emergency personnel use, should be considered as a high priority.

#### 4.2.3 EVACUATION AND RESCUE FROM THE TOWERS

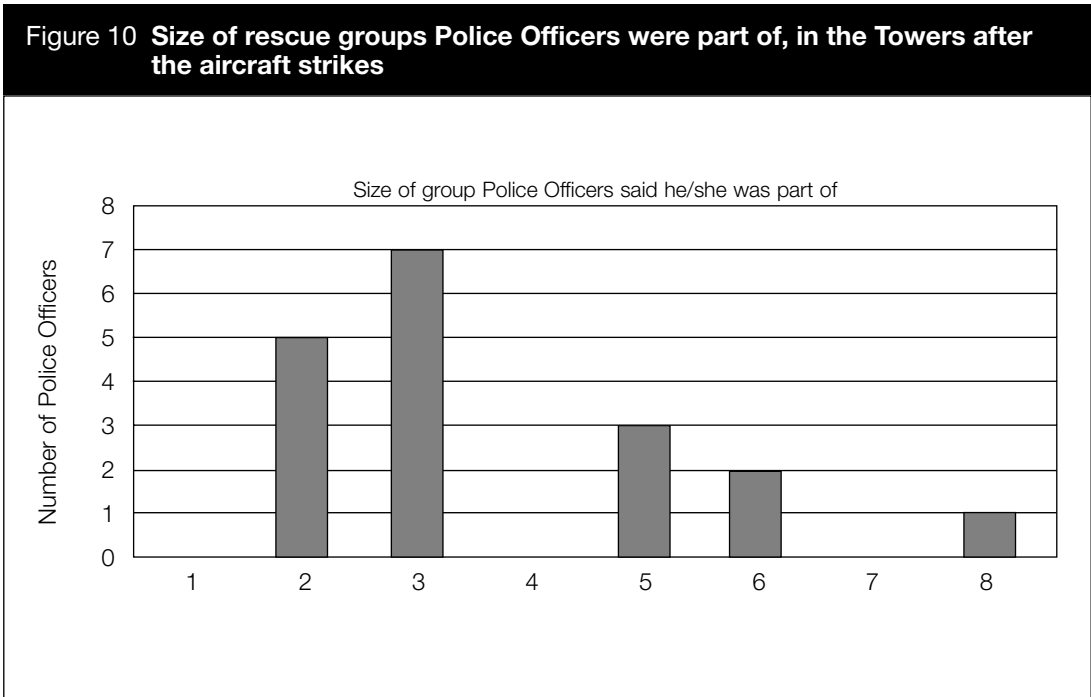
A major priority of the Police and other emergency services at the scene was to ascend the Towers and direct people out, and to assist people out, carrying them down the stairs if necessary. Figure 9 and Figure 10 show the number of officers stating that they (or another named officer) assisted in the rescue effort in the Towers, including any concourse information unused in Section 4.1. This information is included here, as

officers sent, shepherded or carried people down the stairs to the lobbies and concourses, where other officers would have joined the assistance. Figure 9 and Figure 10 show 45 records from 32 officers. Records which indicate group membership in Figure 9 are re-used in Figure 10 where the size of the group was indicated.



Some 30 officers reported being part of the rescue effort, and a majority of these did so in a group with other officers. Twenty-six officers specifically stated that they rescued people, rather than just being in the Towers helping the rescue effort in some unspecified manner. Given these numbers many lives must have been saved by this Police action, particularly due to its coordinated nature. For example 959 stated reported *'as the Police continued up the stairs Chief Romito had officers check each floor was vacated'*. As this action saved many lives but the Police may not have managed to ascend more than a third of the way up, consideration again should be made of the issues of emergency service lifts. Note some officers carrying people down many flights of stairs, for example 913 was reported to have *'slowed his own descent, thereby further risking his own life, assisting in carrying a heavy fellow Port Authority employee down numerous flights of stairs to safety'*. Alternatively a procedure might have been developed of officers splitting into top and bottom teams, and working towards each other.

The contribution of Police teamwork is underscored by considering the size of the rescue group which officers said they were part of, shown in Figure 10. Whilst the database contains limited data, what there is shows officers reporting being in group sizes of between two and six officers. It cannot be known with much certainty from this information what the optimum relationship might be between group size, the amount of floor space per storey to be searched, the number of floors and whether officers are working their way down or up. What can be said however is that an officer working in a group was an effective strategy, and should be included in any emergency plans. Further research effort should be expended in attempting to define viable operating strategies.



### 4.3 Evacuation and rescue from the collapsed Towers and streets

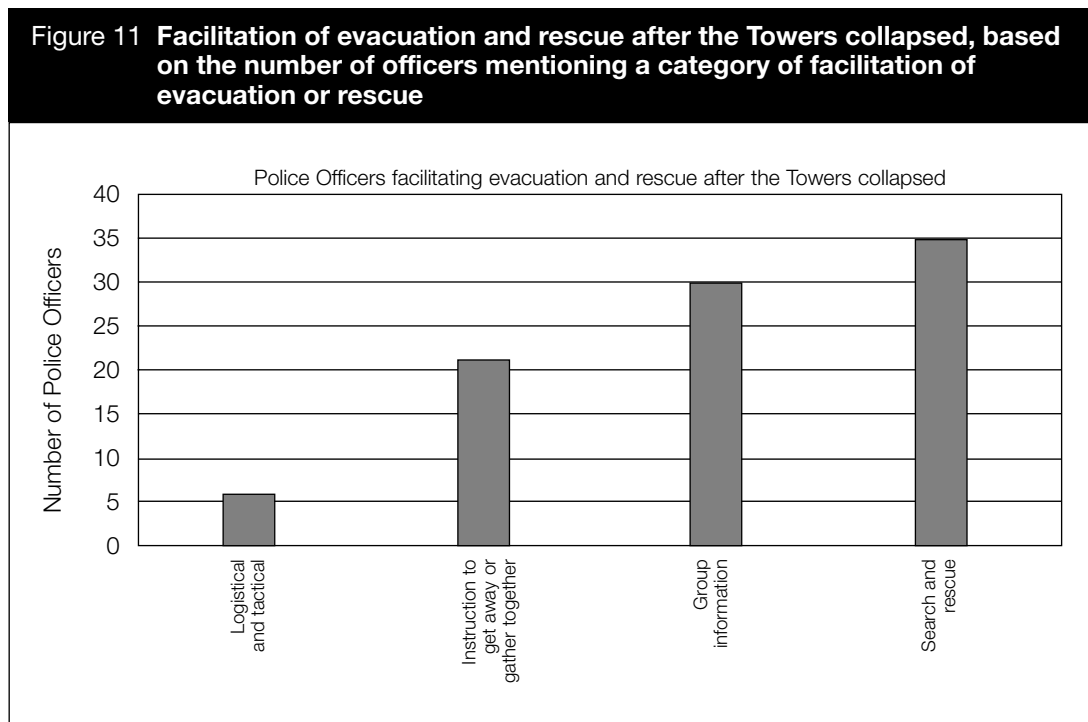
Any chance of survival for those in the Towers and staircases probably dissipated with the collapse. However even after the collapse, the concourses and other spaces underpinning the Towers were still survivable. Also the surrounding streets were thrown into darkness and were blanketed by choking debris, after the WTC2 and then WTC1 collapsed. This section considers evacuation but particularly rescue from this environment. Of the 1827 records in the database 210 records from 46 Police Officers were considered relevant to the issue of evacuating people, searching and rescuing after the towers collapsed. These are shown in Figure 11 to Figure 15 below.

#### 4.3.1 POLICE ACTIONS AFTER THE TOWERS COLLAPSED

When the Towers started to crumble Police Officers and other emergency personnel had to run for their lives outside the Towers, and had to dive for cover and seek shelter inside the Towers. Following this, searching for and rescuing people from the remains of the Towers and from the surrounding areas, were the main priority. Figure 11 includes Police Officers involved in the streets around the ruins of the WTC concourses after the Towers collapsed as well as in these ruins. This reflects the massive devastation inflicted on the whole area, which was subjected to a cloud of darkness and choking debris.

Figure 11 suggests that the collapses may have shifted the priority from a more logistical and tactical response, part of the attempt to organise a systematic evacuation, to more of an ‘escape’ scenario, characterised by yelling at people to get away from the area or to gather together in groups. This was to be expected given the collapses that occurred. Immediately following this, 30 officers reported gathering themselves and any obvious survivors together into groups to find a way out of the area. Also 35 officers

report that they conducted searching and rescuing activities, either alone or in concert with others. It is not known what if any training underpinned this response, but it appears that it must have resulted in getting many survivors to safety who may not otherwise have done so. For example, 955 stated that *'we gathered all the people into the hallway and looked for an escape route'*, and concerning 919 *'after escaping potential injury he again risked his own life by returning inside the World Trade Centre to search for additional victims'*. If this is the case, examination of why group formation and rescue efforts in the vicinity of the remains of the Towers was effective is worthy of consideration.



#### 4.3.2 GROUP SIZES DURING ESCAPE FROM THE COLLAPSED TOWERS

Figure 10 showed that Police group size where information was available varied from two to six officers, during assistance of evacuation from the towers. The same analysis is possible for Police group sizes escaping from the Towers collapsed. Most officers deployed during the disaster would have been located in concourse or other basement spaces. In Figure 12 and Figure 13 the 'group formation' records used in Figure 11 are reused and identify officers who specify group size, both for the group of fellow officers and the number of civilians they collected and led to safety after the collapses. Figure 12 and Figure 13 discount records from the vicinity of the towers, considering only behaviour in the remains of the Towers' concourses, lobbies, shopping centre etc after the Towers collapsed. Records and officers who simply refer to being in a group or joining together with an unspecified number of other officers are excluded from the analysis. A 'police group' is a collection of Police Officers who joined together to get themselves out only, or who grouped civilians together to escape after they themselves grouped.

**Figure 12 Size of Police group during escape from the remains of the Towers, based on the number of officers specifying group size**



Figure 12 shows that a surprisingly large number of Police Officers were able to survive the Towers falling on and around them and then group together with colleagues. Whether through training or initiative officers collected to the greatest extent possible. They were then in a position to collectively gather civilians and determine an escape route. This course of action appears to have worked well and may have been more efficient than if the officers had attempted to work alone. Further, Figure 13 shows available estimates of the size of the groups of civilian survivors led to safety by grouped Police Officers. An arbitrary group size of ten is assumed where an officer stated that 'many', 'numerous' or 'countless' surviving civilians were grouped together.

**Figure 13 Size of civilian group led out by Police during escape from the remains of the Towers, based on the number of officers specifying civilian group size**

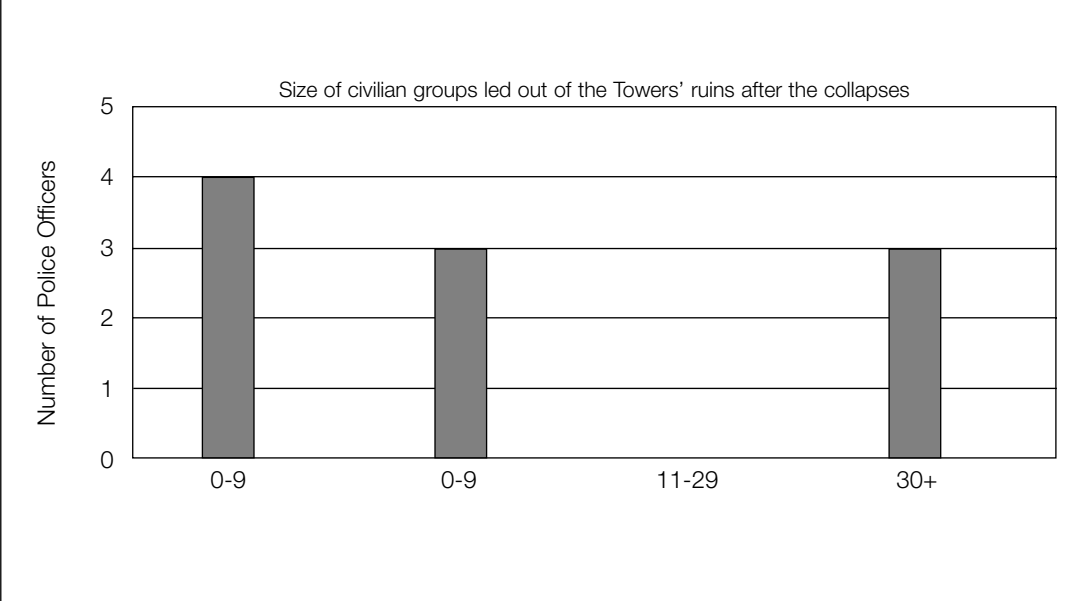
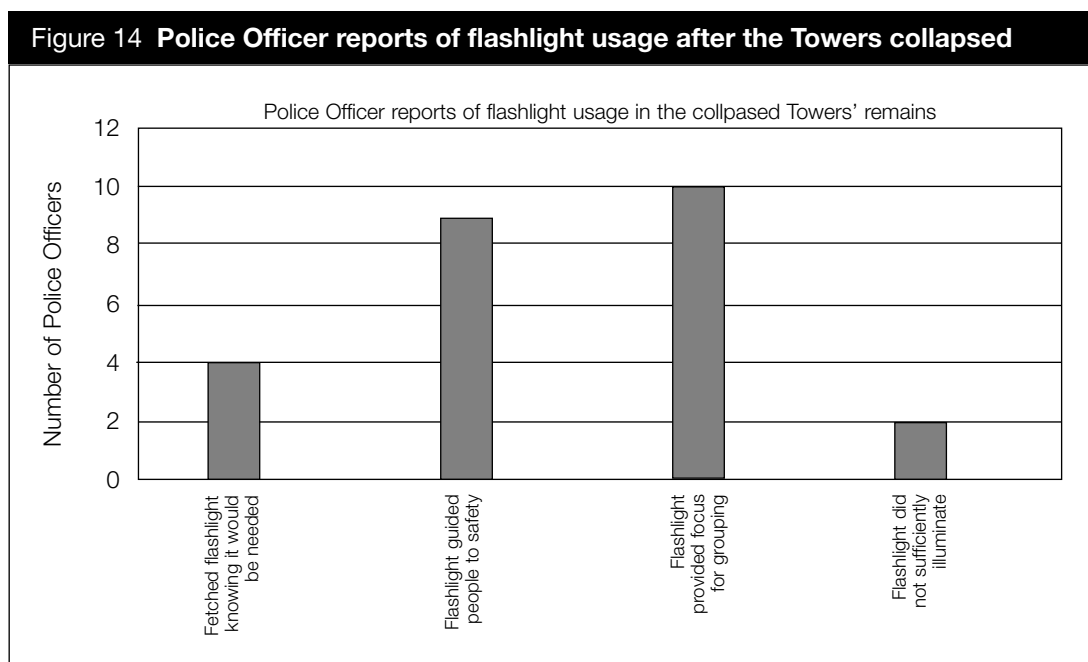


Figure 13 shows that large numbers of civilian survivors of the collapses were grouped and led to safety. This of course refers only to information available. In reality many more officers grouped together and led many more civilians to safety than we have data for. For example it was reported that 870, *'acted with a team of at least six other officers to lead a group of thirty people to safety from near police desk and out through Boarders bookshop'*.

It appears then that the formation of Police and civilian groups as a first action by officers surviving the collapses contributed to saving of life and should be incorporated into disaster planning. Further it is clear from many officers' accounts that the possession of flashlights and formation of human chains greatly contributed to escape from the dark ruins of the Towers.

### 4.3.3 POLICE FLASHLIGHTS

Several Police Officers referred to the use of flashlights in the dark ruins of the WTC after the Towers collapsed. Twenty records from 12 Police Officers used in Figure 11 are re-used in Figure 14, as they were not only involved in groups, search and rescue, but did so specifically using flashlights. Also used are seven records from six officers not used previously. This information is displayed in Figure 14.



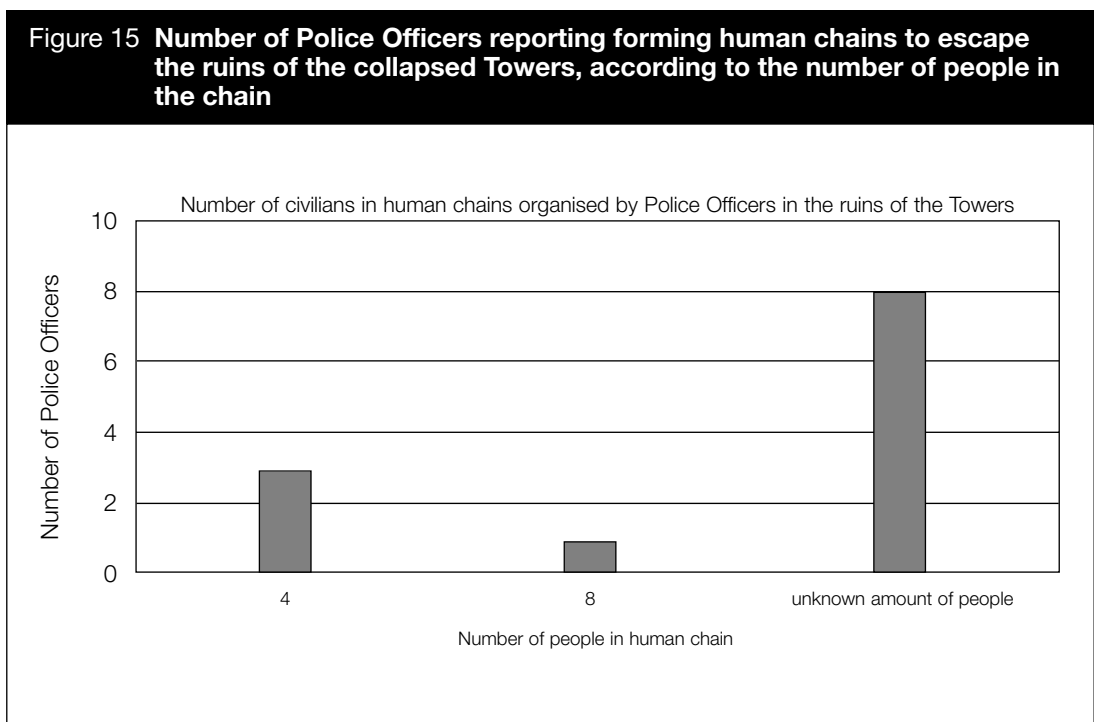
Four officers mention bringing flashlights with them from the outset, or fetching a flashlight during the emergency, in anticipation of their likely effectiveness. The mode in Figure 14 is for officers to describe flashlights as being successful at getting people to group together in the darkness before attempting to escape. For example 871 stated that *'I then realised I had a flashlight. As I turned it on some people began to yell for help. It was like everyone woke up and saw this light, which gave them hope'*. Officers also describe using the flashlight to illuminate an escape path after survivors grouped. For example 875 stated that *'I was trapped in the debris of the initial building collapse. I continued to lead others to safety by mustering all those I could find and leading them to safety. I used my flashlight. At this time 2 people in that area saw the beam and made contact with me'*. Obviously a torch can be used to gather then lead



people so we would expect officers to have done both. Only two officers refer to their flashlights being insufficient in the darkness after the Towers collapsed. A clear majority of available information points to flashlights making an extremely useful contribution to evacuation from the Towers' collapsed ruins. Many civilians and Police Officers may not have survived without them.

#### 4.3.4 HUMAN CHAINS

In addition to the successful use of flashlights in the dark remains of the WTC, many Police Officers organised surviving civilians into human chains, which were then led to safety. Fifteen records from 12 Police Officers used in Figure 11 are re-used in Figure 15 as they were not only involved in groups, search and rescue, but did so specifically by forming survivors into chains. A 'chain' was a conga line of people holding onto the person in front.



Whilst three officers in Figure 15 report that the human chain they led out of the collapsed WTC ruins comprised only four civilians, one officer stated that there were eight in his chain, and a majority of officers state that it was an unknown number of civilians. It seems probable that the length of the chains, whilst unknown, would have exceeded four persons, in some instances at least. It was shown in Figure 13 that groups of up to 30 civilians at a time were led out and that some officers spoke of leading 'numerous' people out. Also 903 stated that;

*'suddenly a man in a suit appeared to my left. I could hear other voices. I continued yelling for people to assemble by me. As best I could muster I told this group that we were getting out of here. I grabbed the man's suit, he grabbed me and we formed a chain', and that 'I learned that the power was still on in the subway so I got everyone to bug the wall'.*

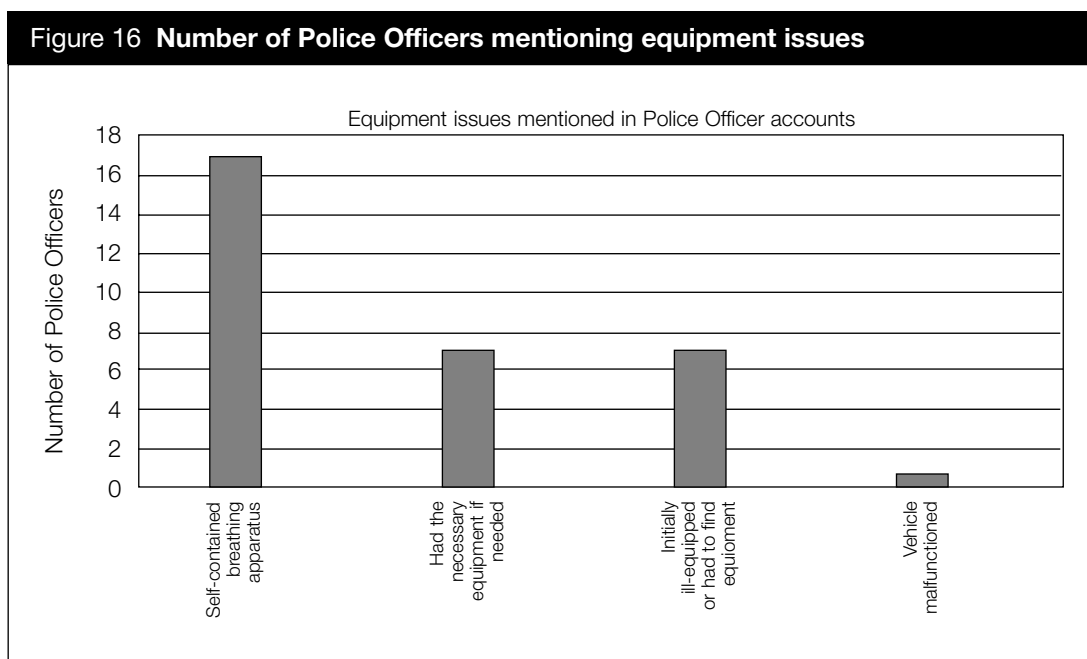
Whatever the length of the human chains, it appears that the Police strategy of getting people together and holding onto each other, as officers with flashlights led the way, was an effective evacuation strategy which should be incorporated into future emergency planning.

## 4.4 Operational issues

Several operational issues were apparent from reading Police transcripts. These are dealt with in this section. It should be recalled that this report seeks only to highlight from the transcripts any issue that may be of relevance to building disaster planning. It was not possible, for example, to link the database information with Police manuals, procedures, equipment protocols etc. The issues highlighted here cover Police emergency rescue equipment, command posts, Police roll calls, first aid, telephone and radio calls made and Police Desks located at the WTC. Of the 1827 records in the database, 277 records from 49 individual Police Officers were found to be appropriate to operational issues.

### 4.4.1 EMERGENCY RESCUE EQUIPMENT

In addition to flashlights several officers refer to various items of equipment, such as bunker gear, personal protective equipment, rescue equipment, medical bags, radios, fire fighting equipment, face masks and self-contained breathing apparatus (SCBA) and oxygen bottles for use with SCBA. Of the 1827 records held in the database, 43 records from 23 officers were felt to be relevant to Police emergency rescue equipment issues. Information on equipment issues is presented in Figure 16.



The database did not contain enough officers mentioning the specific items of equipment listed above enough times for any single item of equipment to be described individually. However, two exceptions were vehicles and SCBA. Whilst only one officer mentioned vehicle malfunctioning it was felt important to re-iterate his statement. This officer, 960, stated that *'some vehicles were overheating due to the dust from the*

*building collapse getting into the air intake*'. It would be a surprise if many emergency vehicles were in fact not disabled by the cloud of choking debris that enveloped the whole surrounding area when the Towers collapsed. It is possible that this issue may not have been considered before. It is recommended that emergency vehicle air filters be examined for their suitability in operating in dusty environments that may result from building collapse.

SCBA was the single most frequently cited item of emergency equipment in the database, with 17 Officers referring to it. Also noteworthy in Figure 16 is the fact that as many officers reported being initially ill-equipped to enter the WTC or deal with the emergency, or had to go and find equipment, often unsuccessfully, as were properly equipped to act effectively as soon as they arrived at the WTC site.

From Police accounts it appears that SCBA played a major role in the emergency response to the disaster. Officers knew that they were faced with a smoke environment and may need to ascend many flights of stairs in the Towers. It appears that issues arising from the 1993 bombing of the WTC led a procedure of SCBA being a key aspect of the Police response. For example 958 stated that,

*'I stopped at a fire station en route to obtain several Scott Air Packs as I did in the 1993 bombing. A fireman stated that he would have to obtain authorisation. I immediately continued on my way'*.

An example of the SCBA used by officers is provided in Figure 17. SCBA is further considered below in Figure 18, which shows the number of Police Officers mentioning various SCBA issues as opposed to officers only mentioning SCBA in Figure 16. Hence some officers have contributed to more than one field in Figure 18

**Figure 17 Example of the SCBA successfully used by PAPD officers during the World Trade Centre disaster (minus oxygen bottles)**



Whilst only three officers specify the successful use of SCBA all officers in Figure 18 imply that it was anticipated that the equipment would be successful. The mode was for officers to obtain and use SCBA and the next greatest number of officers being those who could not enter the WTC until they had SCBA. Five officers stated that they

could not obtain SCBA because other officers had already taken all of the available packs i.e. so many Police Officers wanted to don SCBA and enter the WTC to rescue people that the equipment soon ran out.

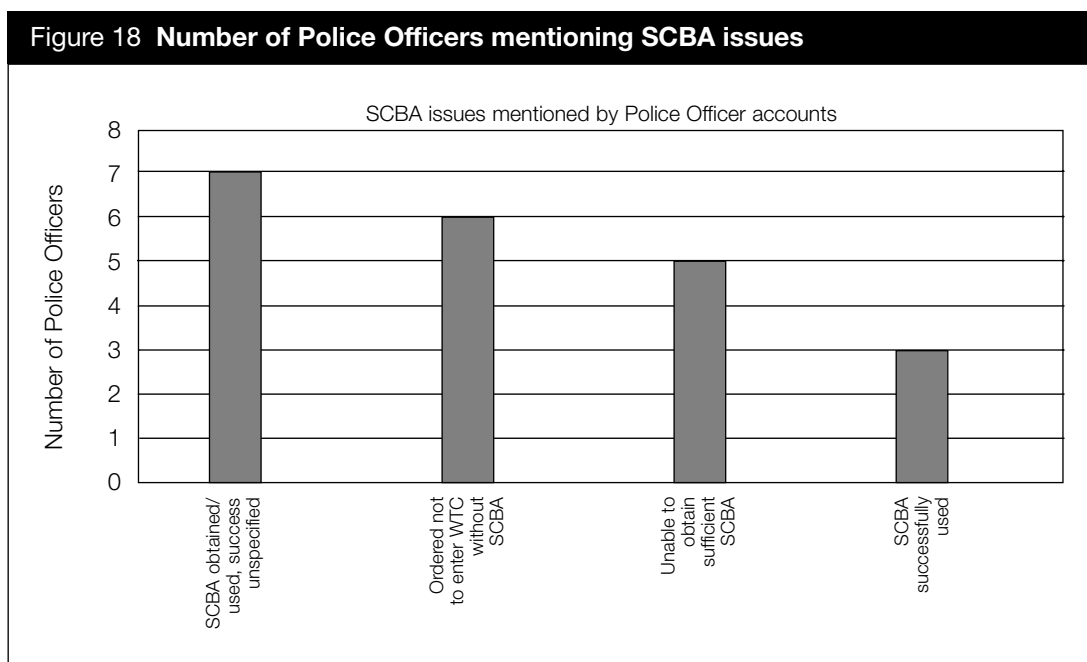
It is also apparent from Police accounts that SCBA was useful for first aid procedures, for example 896 stated that;

*‘as requested by NYFD (possible Fire Fighter heart attack) we responded to the 19th floor to assist. When we arrived we administered oxygen to 2 Fire Fighters who were sitting on the floor’.*

Also the following comment concerning the actions of 921 was made,

*‘he continued to evacuate people north on West Street and share the air in his Scott Air Pack with people having breathing difficulty’.*

It is apparent that availability of SCBA for Police and other emergency responders was crucial during this disaster. If the Police are to play the same role in future that they played in this disaster, then providing and training for such equipment should be incorporated into building disaster response planning.

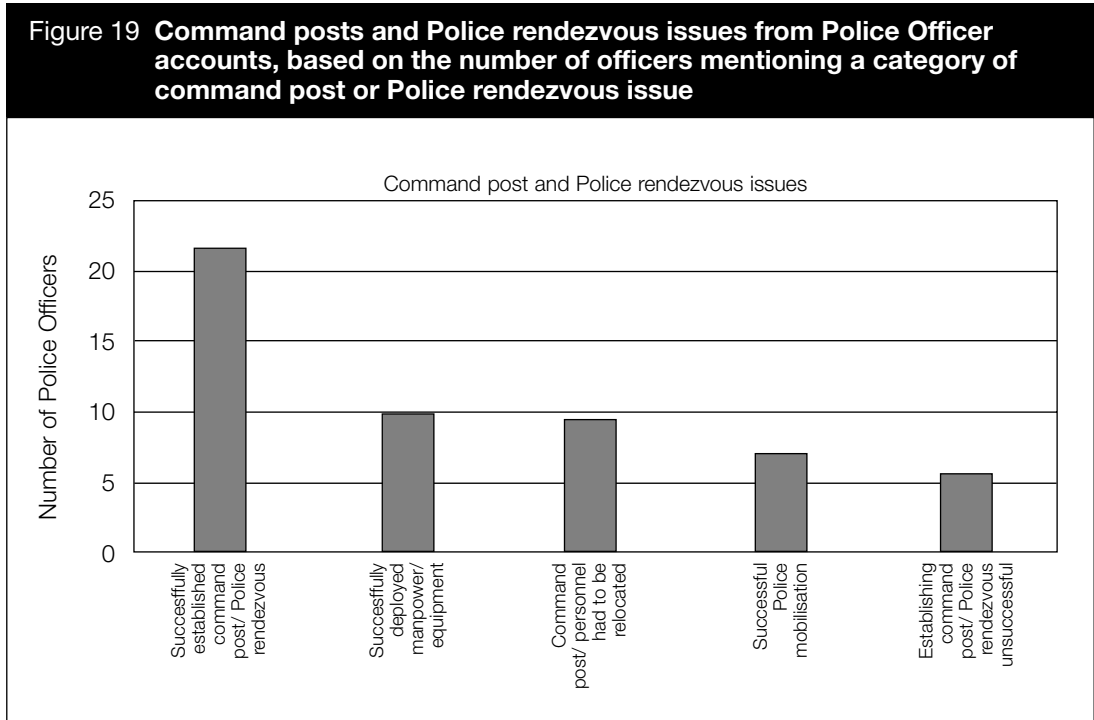


#### 4.4.2 COMMAND POSTS AND POLICE RENDEZVOUS

As might be expected several officers refer to the issue of setting up and moving command posts during the disaster, officers having to rendezvous with others and deployment of manpower and equipment. Of the 1827 records held in the database, 94 records from 26 officers were felt to be relevant to the issue of Police command posts and rendezvous. These are presented in Figure 19. ‘Command post’ refers to any base of operations that Police were using, such as emergency vehicles with communications and equipment or more fixed arrangements.

Despite the constraints of the unfolding disaster the Police appear to have been successful in establishing and maintaining bases of operation and organising and

equipping officers in the field. Only five officers confirm difficulties of establishing command posts and liaison with other officers, due to the physical conditions of the disaster such as the likely building collapse and the debris field. However more officers report that a command post had to be moved once established, for the same reasons. Predetermination of command posts and Police rendezvous points in the vicinity of likely terrorist targets would have been beneficial, in this situation.



#### 4.4.3 POLICE ROLL CALLS

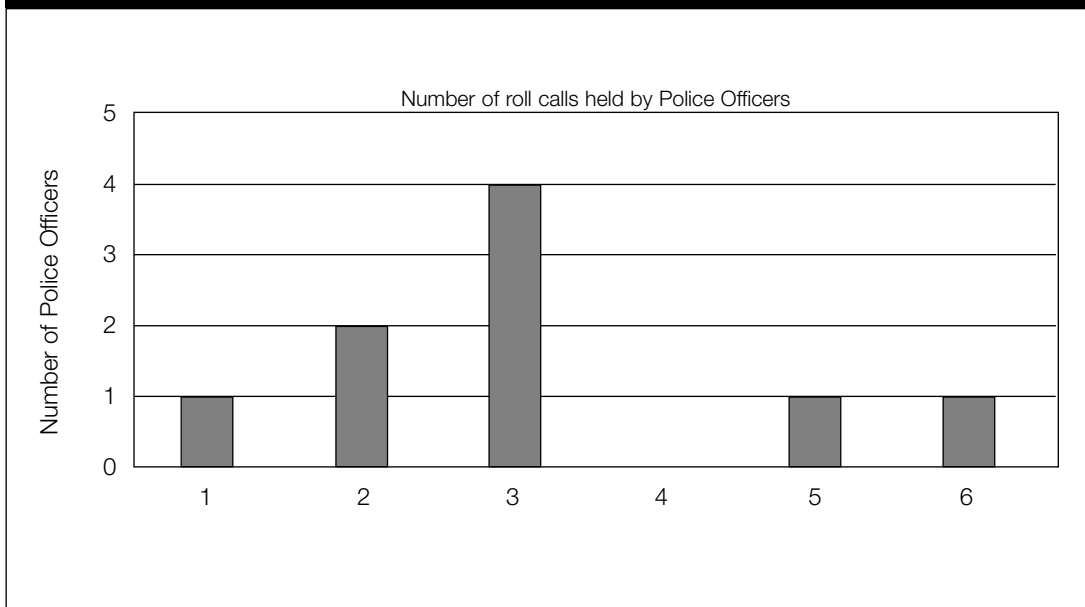
In the event of a major incident where Police Officers are required to enter hazardous areas, it is imperative that records be taken of who exactly is where when. Of the 1827 records in the database 32 records from 17 officers were found to be useful regarding Police roll calls. These are shown in Figure 20 and Figure 21.

From Figure 20 it is apparent that multiple Police roll calls were held during the disaster. It is not known whether this activity detracted the Police from other activity, or exactly how many roll calls were held. Figure 20 may be an underestimate. It does however seem likely that repeatedly holding roll calls was beneficial to the emergency operation, as a note of who exactly was where would assist Police deployment and rescue efforts. For example, 957 stated

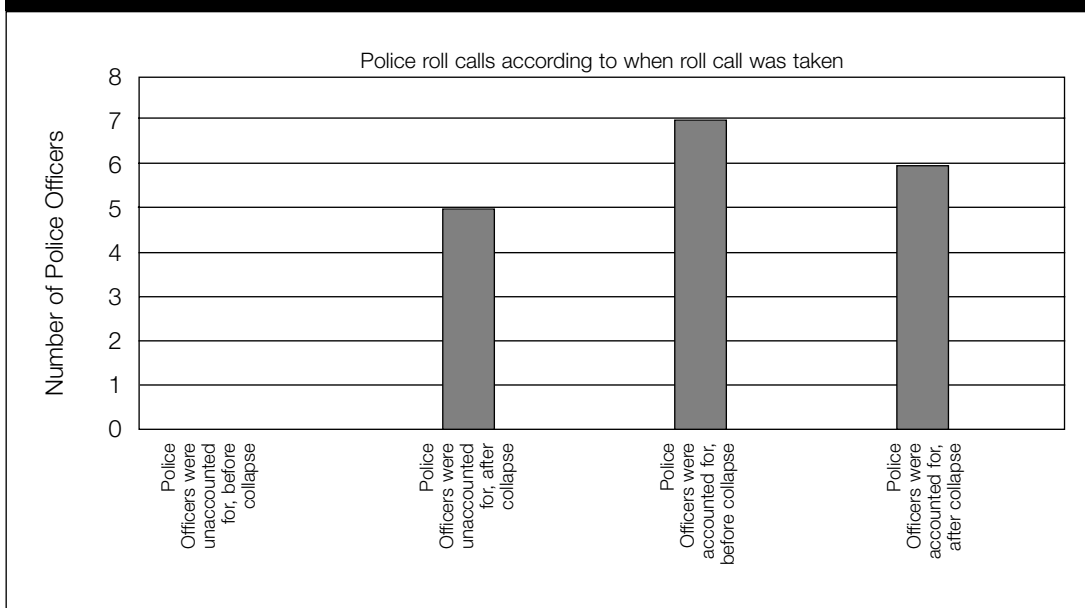
*‘I ran north on West Street and came into contact with a number of our officers. While regrouping I started to list officers I knew were alive’.*

This information would be especially necessary after the Towers collapsed, as shown in Figure 21, which combines the two Towers.

**Figure 20 Number of roll calls held by Police Officers, reported in Police Officer accounts, based on the number of officers who indicated a number of roll calls held**



**Figure 21 Roll calls according to when the roll call was taken, by number of Police Officers referring to roll calls**



It appears in Figure 21 that not knowing who was where was, not surprisingly, worse after the Towers' collapsed than before, based on officers who reported whether or not they knew of other officers' whereabouts. Five officers state that officers were unaccounted for after the collapses. Further the collapses did not interrupt officers' attempts to note other officers' whereabouts, as indicated by the almost equal number of officers reporting that logging of who was where occurred before, and after, the collapses. Whilst the information is somewhat patchy, it seems that the procedure of holding repeated roll calls played an important role in the emergency response to this disaster. Officers in the field needed little encouragement to hold regular roll calls.

#### 4.4.4 FIRST AID

The disaster resulted in as many casualties as there were fatalities. All emergency responders were faced with civilians requiring treatment for a variety of injuries, including life-threatening breathing complications, burns from the fire and the aviation fuel and many other injuries. For example 964 stated that,

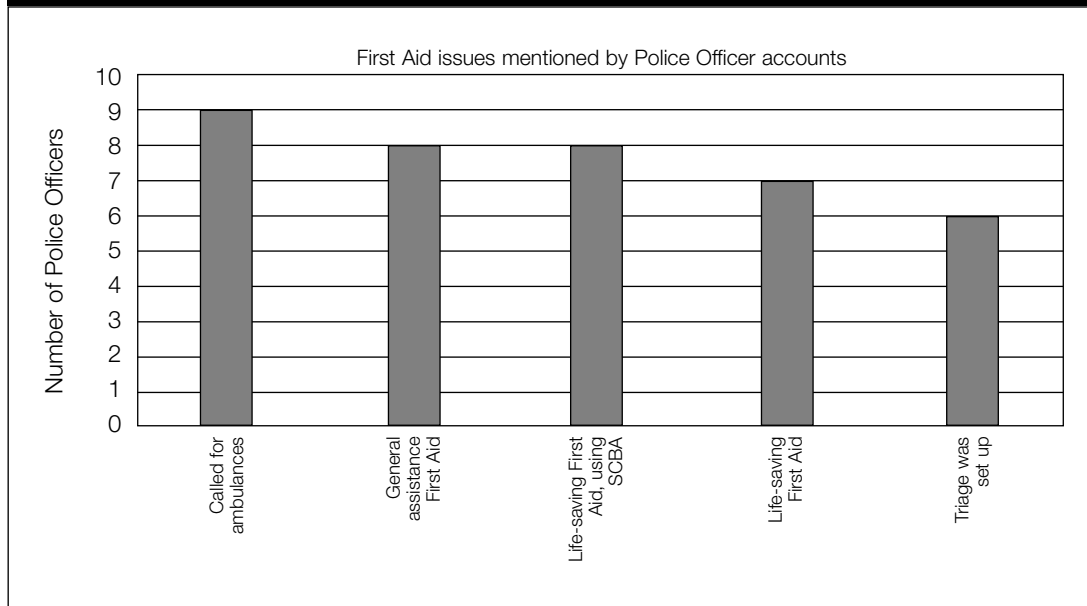
*'I was not prepared for the horrors. I saw people with flesh coming off their bodies, hair singed and lacerations everywhere, and a tremendous amount of despair'.*

Many Police Officer accounts refer to various issues to do with assisting such victims. An arbitrary categorisation scheme for officers mentioning aid issues is presented in Table 3.

<b>Table 3 Categorisation of Police First Aid efforts</b>		
<b>Type of First Aid undertaken</b>	<b>Database</b>	<b>Example of Police testimony</b>
General assistance/First Aid	965	<i>'I washed soot out of another officer's eyes and assisted him for other injuries'</i>
Life-saving First Aid	933	<i>'Approximately four blocks from the WTC, I observed a NYC Police Officer and Fire Fighter jump from a moving van and fall to the curb. Both were choking on ash and were having difficulty breathing. P.O. Dan McCarthy obtained bottles of water and we assisted both individuals in clearing their airways and exiting the area'</i>
Life-saving First Aid using SCBA	918	<i>'He assisted a woman who was extremely upset and disoriented. He used a 'buddy' breathing method from his Scott Air Pack to calm her and lead her to safety'</i>
Called for ambulances	945	<i>'I made a radio transmission to the PATH Police Desk concerning these observations, and an immediate ESU personnel response was authorised'</i>
Triage was set up	875	<i>'At 09:38 the WTC Police Desk reported that the triage is set up at 2 WTC. Chief Hall radioed Captain Whittaker that the triage is at Victoria Secrets shop. I acknowledge'</i>

Of the 1827 records in the database, 48 records from 25 Police Officers were found to be appropriate to the issue of First Aid during and after the disaster. These are presented in Figure 22.

**Figure 22 First Aid issues mentioned by Police Officer accounts, according to the number of officers who mentioned the issue**



Not surprisingly the most frequent issue mentioned in Police accounts is that ambulances were called for. Most officers would have had access to a radio. General and low-level assistance was also a common issue cited. The most interesting aspect of Figure 22 is that SCBA was used by several officers to assist their own and other people's breathing, without which many more victims may have succumbed. The nature of the destruction, with a cloud of choking smoke and debris rapidly spread across a wide area, was such that almost anybody might have required oxygen, not just older or less athletic victims. Coupled with 'Life-saving First Aid', such as burns victims and people with breathing complications but for whom SCBA was not mentioned, the availability of SCBA made a major contribution to reducing additional loss of life.

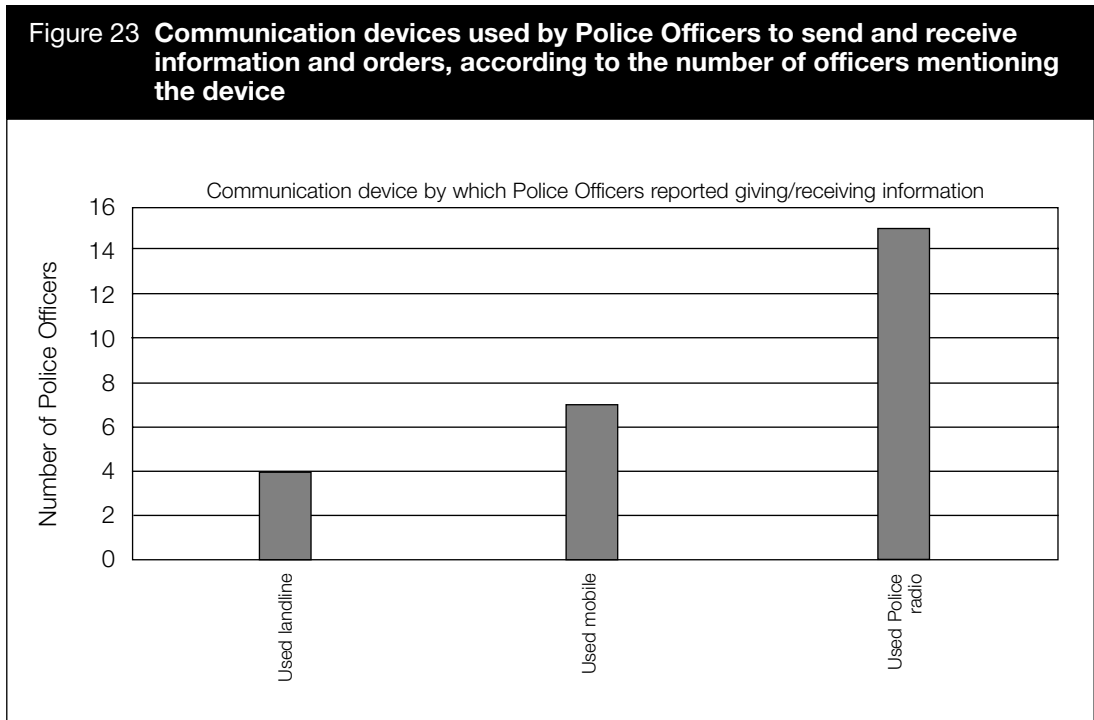
The ability to rapidly set up triage areas is also noteworthy. The researchers are not familiar with exactly which agency in the U.S. are required to undertake issues such as setting up triages or treating victims for injuries, nor is able to comment on how things should be or should have been. In the UK this responsibility currently rests with paramedics. Without being provided with specific questions from the emergency services little comment is possible beyond the above. What information there is in the database indicates that preparations before the disaster appear to have been effective. Alternately however, Figure 22 could be read in the reverse direction, namely that Police Officers frequently engaged in First Aid activities that perhaps other agencies should have, leaving the Police to undertake other duties.

#### 4.4.5 TELEPHONE USAGE AND POLICE RADIOS

In the event of any emergency it is to be expected that lines of communication between emergency services will be crucial. A disaster such as the downing of tall buildings is likely to effect communication by all means, such as by land line, mobile phone and radio. Information concerning radio communications was limited. All that could be achieved was to highlight telephone and radio usage factors mentioned in Police accounts. Figure 23 summarises this information. Of the 1827 records in the



database, 34 records from 18 individual Police Officers were found to be appropriate to the issue of telephone usage and Police radios.



Whilst information displayed only reflects what we know about, the pattern of Figure 23 follows the pattern that might be expected of an incident such as this, with Police radio and mobile communication being most apparent from Police transcripts. We can examine only the 22 officers reporting use of portable devices in Figure 23, to identify how well they functioned across the disaster timescale. This information is shown in Figure 24 below.

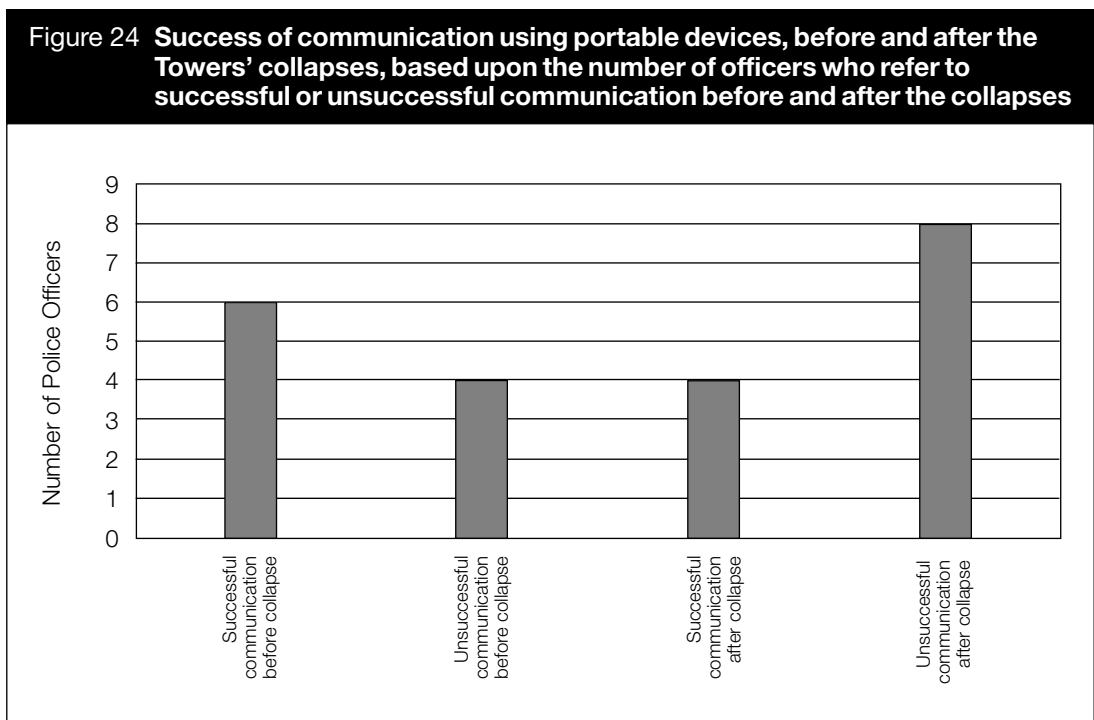
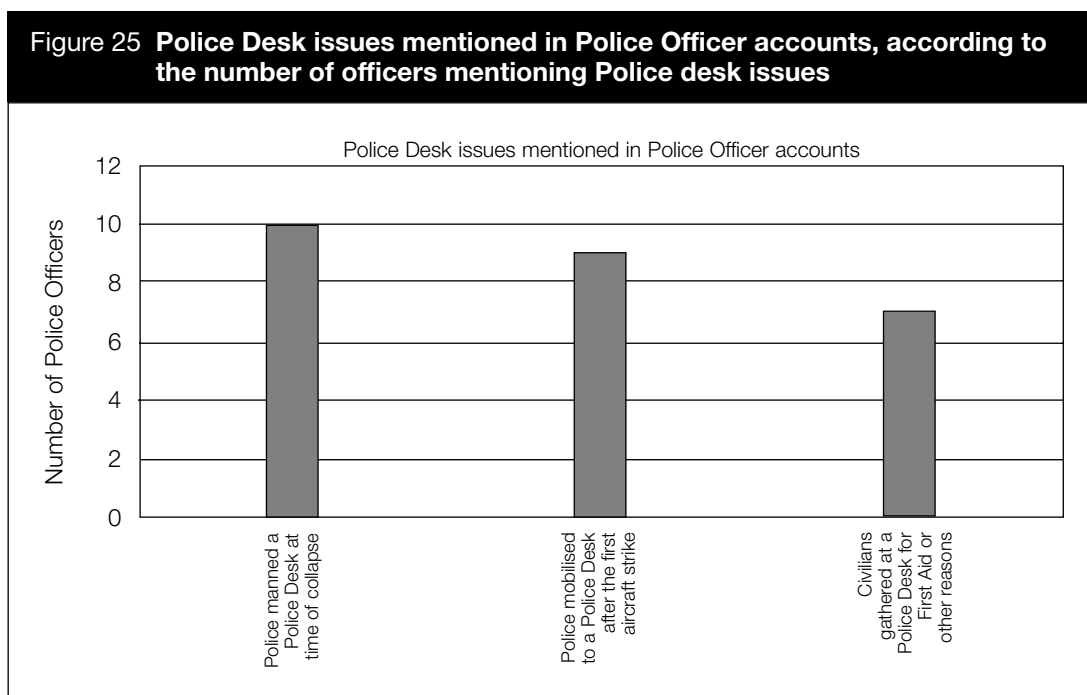


Figure 24 shows the effect that the 'Towers' collapses had upon portable communication (combining mobile phones and Police radios) for the 22 officers who refer to such communication. Database 957 stated that *'there was no communication as all our radios went dead with the collapse of Tower 2'*. This succinctly describes the problem that occurred, namely the dearth of mobile communication after the collapses. Note that communication was not lost altogether, as several officers **were** able to use radios after the collapses and several were **not** able to use mobile phones before the collapses, due to the effects of the aircraft impacts and the deluge of calls swamping the mobile networks. It will be recalled that in Figure 19 and Figure 21 problems of Police rendezvous and accounting for who was where were mentioned by some officers. Whilst information in the database is limited, Figure 24 suggests that had a robust transmission network been available and reserved for emergency service use, Police communication and liaison throughout the disaster would have been possible.

#### 4.4.6 POLICE DESKS

Many public buildings have an office or desk for Police use, manned at all times when the public has access to the building. The WTC complex was no exception, with several officers referring to pre-disaster Police focal points in their accounts. It is not known whether these positions were set up in response to the 1993 bombing or whether they were always a fixture at the WTC. A 'Police Desk' is taken to be any facility that officers referred to which existed at the WTC before the disaster, for Police use. There was a Police plaza, a desk in the lobby of each tower and a 'Fire Starters Desk' used by the Police. Figure 25 excludes many records already used in logistical and tactical issues, Police command posts etc. Of the 1827 records in the database, 26 records from 14 individual Police Officers were found to be relevant to Police Desks, after excluding records used elsewhere. Some officers contributed to more than one category in Figure 25.



It appears from Figure 25 that many officers were still at a desk at the time of the collapses, doing their duty and helping people as best they could. It is interesting to note that some officers recall civilians gathering at a Police point following the first

aircraft strike, for First Aid or other purposes. It will be recalled that in Figure 13 some officers reported leading groups of up to 30 civilians from the remains of the towers. These groups were frequently led from the vicinity of the Police desk. For example it was stated of 919 that,

*'be directed a team of at least six other PAPD Officers, who lead a group of thirty people to safety, from the devastation near the Police Desk, out to the relative safety of Church Street, through Boarders Bookshop'.*

A picture emerges then of several officers and large numbers of civilians in the area of the Police Desk before and during the collapses. Whilst there were no Police statements specifically on the subject, this raises the possibility that civilians saw the Police Desk as a place to congregate in addition to seeking help there, as evidenced by Figure 25. This question should be explored further, as if true, it would have extremely useful design and management applications. Intuitively it seems plausible that a Police Desk might be seen as a 'safe' place to be. Also of note in Figure 25 are officers who reported the Police Desk to have been a mobilisation point. This is a location where officers were told to go and report for duty, when they radioed or telephoned, after learning about the first aircraft strike. Clearly a pre-defined assembly point such as a Police desk would facilitate emergency service response.

# CHAPTER 5

## Analysis of telephone calls to Police by occupants trapped in the Towers

In Section 5 and 6 we examine data from four PDF documents of information from the WTC disaster. These documents comprised many hundreds of pages of typed transcripts of telephone and radio calls made by and to the Police located variously in the New York/New Jersey area. Section 5 deals with telephone calls made by occupants trapped in the Towers to the Police. Section 6 deals with calls the Police themselves made or received from other Police Officers, emergency services or other callers. Both Sections 5 and 6 are based on the same type of raw data so a description of this data and its analyses is required.

### 5.1 Analysis of Police telephone data

The data itself is in the form of statements, remarks and quotations from a Police Officer in a control room calling or being called from outside by telephone or radio, or is a quote from an outsider calling the Police with useful information. The telephone and radio data was coded as per Twin Tower occupant and Police accounts, as described in reference [1] and Section 4 of this report. Whilst anecdotal this information is the testimony of those actually involved in the disaster, as it occurred. Problems of subsequent trauma and the passage of time revising people's recollections of the day (as might effect a questionnaire survey today) are absent from this data. It was in its original, unedited form. The data represent a 'live recording' of the disaster. Each entry to the database was numbered to reflect the actions played out over time to the backdrop of the aircraft impacts, fire and building collapses. Each of the four telephone and radio transcript PDFs was printed out and read through, with data entry only commencing at the first positive identification that the first aircraft had struck the North Tower. The first page or so of each PDF might have described a car crash or some other emergency occurring prior to the first attack. Such extraneous material was discarded.

In this section the Police telephone and radio transcripts are examined to explore some questions which were not possible with the Police action transcripts. Much of the telephone and radio transcripts re-iterated the Police action transcripts which were entered into the database first. Indeed the Police action transcripts were accounts written shortly after the disaster in which the officer would have listed events recorded live by the telephone and radio transcripts. However the telephone and radio transcripts include new information not previously seen. This information is presented in this section, based on questions the researchers considered relevant.

The telephone and radio transcript database holds 1786 records from 105 people (Police Officers and those who called them), taken from the four PDF documents of hundreds of pages of telephone and radio calls.

## 5.2 The decision to evacuate from the Towers

It is apparent from telephone call transcripts that during the disaster calls to the Police were made by some occupants in the Towers who perceived themselves to be trapped. Whilst it is not the concern of this report to suggest what procedures *should* have been, in most situations it behoves the building’s management, public address announcements and fire wardens etc to take the lead in any building related situation. Rightly or wrongly something along these lines appears to have occurred in this disaster. Figure 26 below shows that we know of 20 telephone calls to the Police after the first aircraft strike, requesting advice as to whether or not to evacuate.

Of the 1786 records held in the database from telephone and radio transcripts, 20 records from 16 occupants specifically identify the number of telephone calls made to the Police by trapped occupants asking what to do after the aircraft strike(s), smoke spread in the Towers’ staircases and whether or not the occupant should try to evacuate. Figure 26 below displays these 20 telephone calls according to when they occurred and where the callers were located. The other buildings in the WTC complex, themselves several stories high, are combined with the South Tower as it was hit second and initially at least these other buildings may have been less effected than Tower 1.

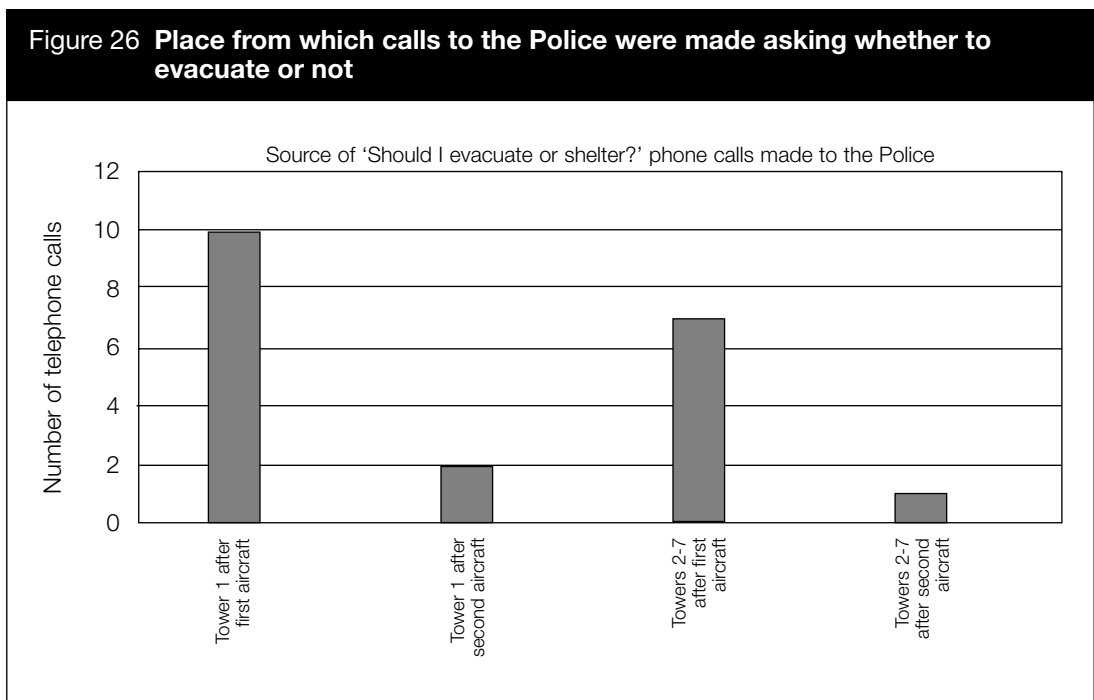
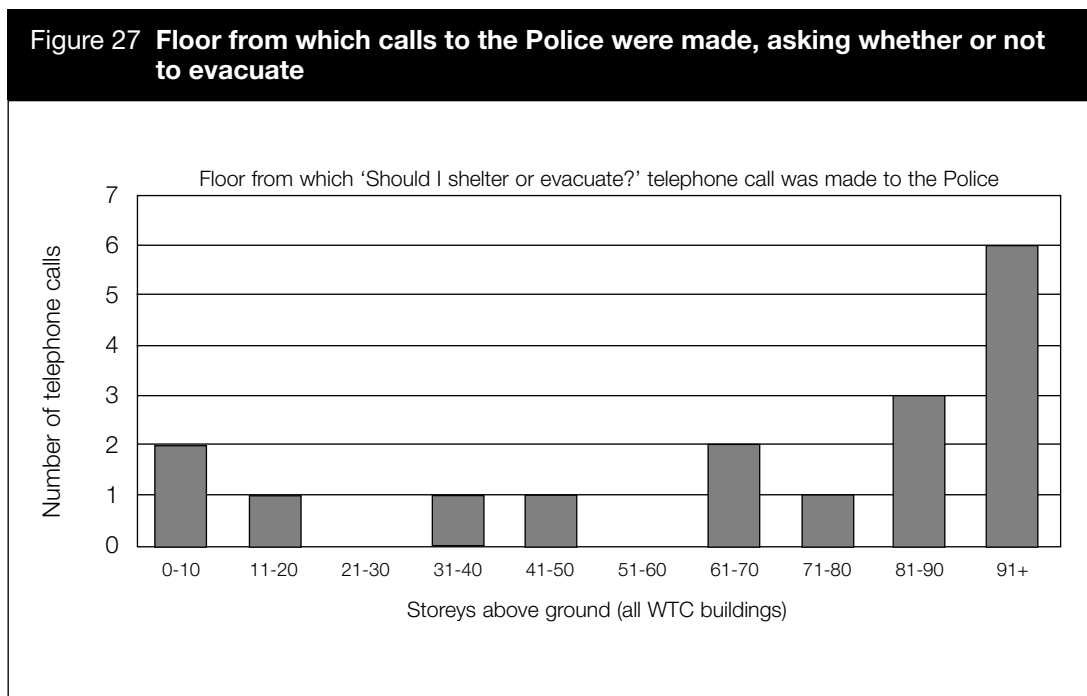


Figure 26 shows the trend that might be expected. The majority of telephone calls for which we have data, where the caller was asking whether he/she should seek shelter or escape were after the first aircraft struck WTC1. These people would have only known of the impact they saw or felt and then experienced the consequences of the impact i.e. fire, smoke, structural damage. Those in Towers 2-7 subsequent to the first impact were also moved enough to call as they would have been aware of the commotion but not presented with smoke (although debris rained everywhere outside). They would also have had the

dilemma or staying or going. The second aircraft impact seems to have left little doubt as to the gravity of the situation, and that a phone call for instructions serves little purpose to those fatally trapped. It should be recalled that of these 20 phone calls, 16 were a single call from 16 people, but four were a call then another three calls from the manageress of the ‘Windows of the World’ in WTC1. She and her 100 guests/employees were in a very difficult situation and her calls became increasingly frantic. That said one of the ‘Towers 2-7 after the first aircraft’ calls was a caller asking about a PA announcement to all of WTC2 to immediately evacuate (i.e. it answers a call anyone might have wanted to make). Hence the data could be presented as an equal number for the two ‘first aircraft’ classes in Figure 26 but they would still exceed the number of calls after the second aircraft.

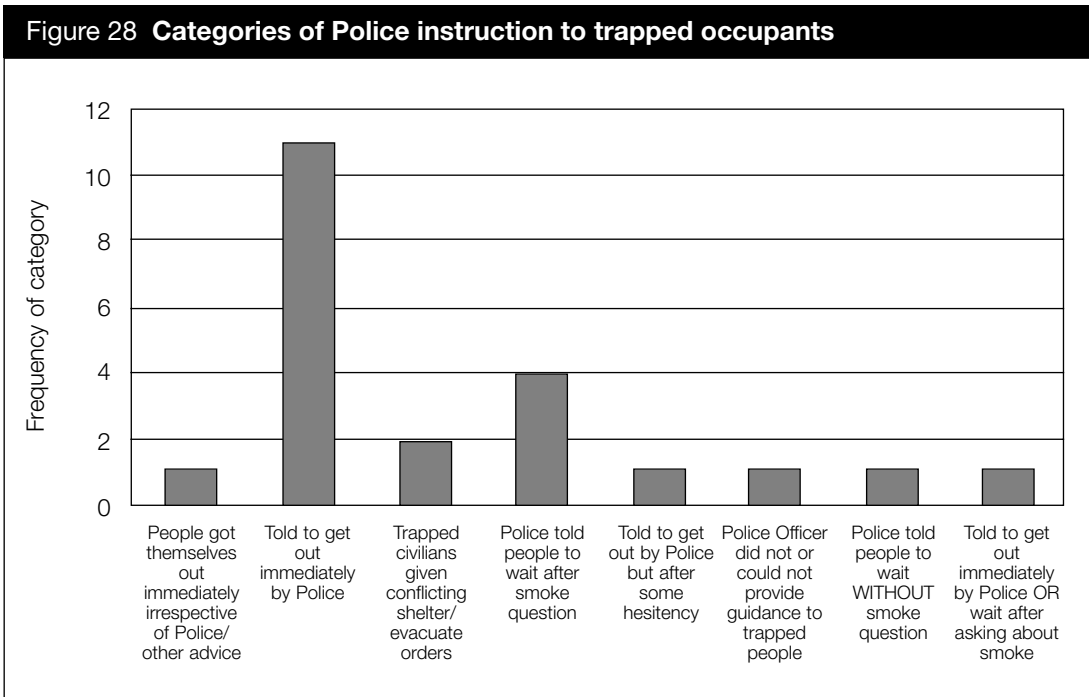
Figure 27 shows the 20 telephone calls discussed previously according to floor. The call regarding the PA announcement to all of WTC2 is not included here as the caller’s location was not known. Also discarded are two calls where the caller’s location was ‘WTC2’ or ‘Building 4’ (i.e. storey not known), making a total of 17 telephone calls for which we have information.

Clearly this is a small dataset and this should be borne in mind when analysing the data. Figure 27 suggests the level of escape or shelter anxiety during the formative stages of the disaster increased with increasing height above ground. As occupants above the impact zone in WTC1 were trapped due to the severing of the staircases, this would have had an impact on this behaviour. The fact that many occupants who jumped or fell to their deaths came from the upper floor regions supports this view.



It is apparent then that many occupants saw a call to the Police as a resolution of the evacuation dilemma, either instead of or in addition to the role of fire wardens and building management. The instructions given by the Police then become an issue, as shown in Figure 28 below. Of the 1786 records held in the database from telephone and radio transcripts, 23 records from 7 Police Officers and 11 trapped occupants (inferred from officers’ accounts) provide information on instructions given to the trapped occupants. Two officers made more one record. Table 4 gives examples of how this data was classed.

<b>Table 4 Examples of how Police instructions to trapped occupants were classed</b>	
<b>Class</b>	<b>Example Testimony</b>
People got themselves out immediately irrespective of Police/other advice	Officer: 'Andy was in One WTC when the first plane hit?' Nancy: 'No he was in the second one. He called and said they just blew up the second one. He said 'I'm getting out of here'. And then he called me from the office when the first building collapsed'
Told to get out immediately by Police	Caller: 'This is Pat Hoey. I am in the Trade Centre, Tower 1. I am with the Port Authority. We are on the 64th floor. The smoke is getting kind of bad. We are contemplating going down the stairway. Does that make sense? Officer: 'Yes, try to get out'
Trapped civilians given conflicting shelter/evacuate orders	Ken Smart: 'Hi (officer). I've got people on the 64th floor. They want to know if they should leave the building.' Officer: 'Absolutely, yes'. Ken Smart: 'They called 911 and were told to stay. So they should get out of the building?' Officer: 'Absolutely, yes'. Ken Smart: 'Even though 911 told them to stay where they're at?' Officer: 'Absolutely. We've been told to evacuate'
Police told people to wait after smoke question	Caller: 'There's people trapped on the ninth floor down, Four WTC. And they've called them on the phone, and they're not getting out'. Officer: 'Is there any report of fire there or anything?' Caller: 'Nothing. They don't want to go anywhere. They just want to stay in their office. The locksmith was supposed to escort them downstairs'. Cashin: 'You're going to have to get clearance'
Told to get out by Police but after some hesitancy	Police Officer: 'Hey Sarge, there's someone here from communications or something, he says people from 64 are contacting somebody, that they are in their offices on 64 and haven't heard any announcements as to whether they can evacuate. Who can they contact?. Sergeant: 'My radios are down. If they are not on fire (evacuate?). Police Officer: 'They say smoke is coming into their offices'. Sergeant: 'Ok I think they should hit the stairways and get the heck out of there. Yes, get out of there and go down the stairwells'
Police Officer did not or could not provide guidance to trapped people	Caller: 'Hi this is the Assistant General Manager at Windows on the World. We're getting no direction up here. We're having a smoke condition. We have most people on the 106th floor. The 107th floor is way too smokey. We need directions as to where to direct out guests and our employees as soon as possible'. Officer: 'We're doing our best. We've got Fire Department, everybody trying to get up to you dear. Call back in 2 or 3 minutes and I'll find out what direction you should try to get down. Are the stairways A, B and C all blocked off and smokey?'. Caller: 'Stairways A, B and C are all full of smoke and my fire phone is out. The condition up here on 106 is getting worse. Where can we go to avoid all this smoke?'. Officer: 'Call back in 2 minutes'
Police told people to wait WITHOUT smoke question	'We're on the 87th floor, Tower 2. We're trying to work out what's going on'. Officer: 'Just stand by. There's no condition (in Tower 2). The incident happened in One World Trade Centre. Just stand by'
Told to get out immediately by Police OR wait after asking about smoke	Caller: 'We're on the 83rd floor, suite 27, 1 WTC. What should we do? Should we walk down?' Officer: 'Can you get to the staircase?' Caller: 'I don't know. There are a lot of (people?) coming down'. Officer: 'We have officers on the way up to do an evacuation. If you can get to the stairs, go down. If not, get on the ground'. Caller: 'The window has been blown and there are 4 of us here'



Whilst it may seem obvious that in most instances the Police would tell occupants to immediately evacuate, on some occasions (see Figure 28) trapped occupants were given conflicting instructions and one officer (the one dealing with the Windows on World occupants) was unable to offer any positive guidance. Some officers told occupants without hesitation to evacuate, for example the caller (a Port Authority employee) who said *‘I’ve got people on the 64th floor. They want to know if they should leave the building?’* The officer replied: *‘Absolutely, yes’*. However the same employee said that *‘they called 911 and were told to stay. So they should get out of the building?’* and the officer again said *‘absolutely, yes’*.

Another officer was told by another Port Authority employee *‘we are on the 64th floor. The smoke is getting kind of bad. We are contemplating going down the stairway. Does that make sense?’* The officer replied *‘Yes, try to get out’*. However the same employee in a separate call to a different officer stated *‘I’m on the 64th floor, Tower 1. I’ve got about 20 people here with me. What do you suggest? Staying tight?’* The officer replied *‘Stand tight. Is there fire right there where you are?’* He was told *‘no there’s a little bit of smoke on the floor’*, to which the officer replied *‘it looks like there is also an explosion in Tower 2, so be careful. Stay near the stairwells and wait for the Police to come up’*. This highlights the difficulties faced by occupants not knowing what to do and being given conflicting advice by different authorities.

The Police themselves were remote from the situation and would have had little detailed information to go on. Some officers made the decision for others to evacuate by asking about smoke levels. Not only would all of the occupants and the Police in control rooms not have been able to adequately judge smoke density/toxicity levels to enable an ‘evacuate’ or ‘stay’ decision, where occupants reported that the smoke was dense and choking the officer had little to offer but reassurances that help was on the way. Some officers usefully told trapped occupants to get as low as possible, for example *‘just get down on the ground, we’ll be up there as soon as possible’*.

Only one officer resolved the dilemma in a constructive way by suggesting that occupants should leave if they could actually reach the stairs but wait if not. He stated

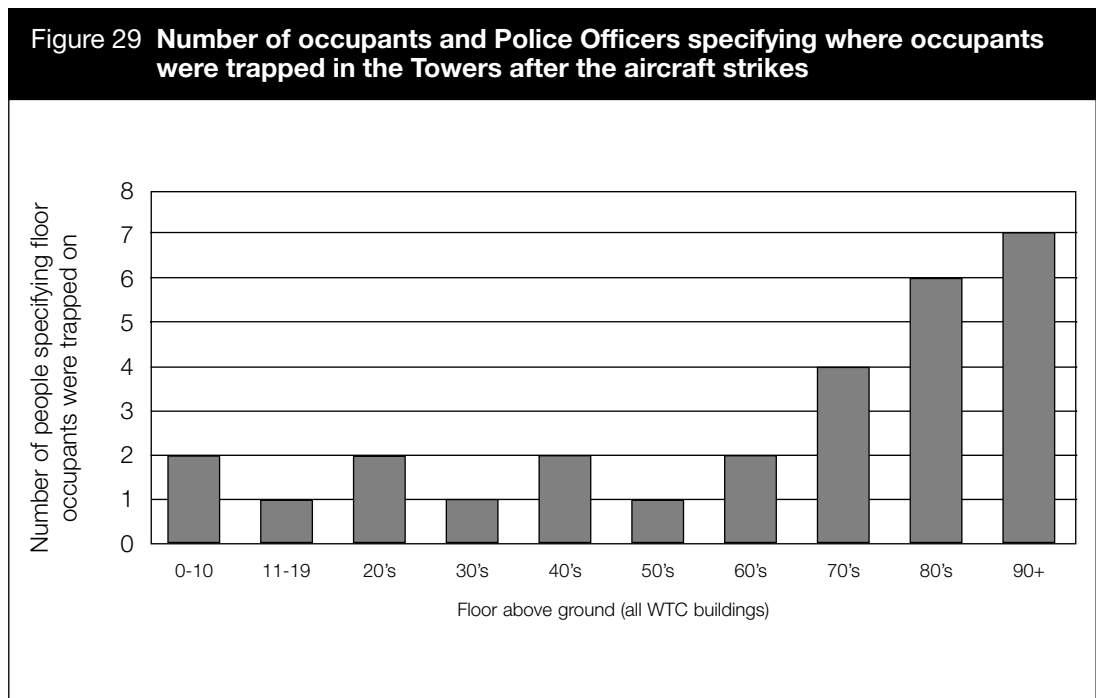


that *'we have officers on the way up to do an evacuation. If you can get to the stairs, go down. If not, get on the ground'*. Under the circumstances this was probably the best advice. If the Police or emergency services are to make evacuation decisions for high-rise buildings some training along these lines should be provided. Officers could be primed with specific questions concerning visibility through smoke, smoke acidity etc. If replies are below an agreed threshold occupants might be advised to attempt to evacuate or to seek shelter if above the threshold.

### 5.3 Where were occupants trapped in the Towers?

Whilst it is common knowledge that many occupants were trapped, how many occupants were trapped and where has not yet been firmly established. It was hoped to include in this section a measure of the numbers of occupants trapped. The available data however is insufficient to provide a definitive measure of numbers. What is provided here is an indication of numbers and locations.

Accounts of trapped people ranged from *'2 elderly people with a medical emergency who cannot walk down'* through *'floor 90, suite 51, I've got 5 people here'*, to a caller stating that *'I'm on the 64th floor in Tower 1, I've got about 20 people here with me'*, to the caller from *'Windows on the World on floor 106 (with) 75-100 people here'* and *'102nd floor above the fire, with at least a 100 people'*. It seems that groups of trapped occupants were of various sizes from as little as two to very groups of around 100. The lack of precision in the above quotes shows that it was not possible to firmly numerate the numbers of trapped people. However the floor of entrapment was more commonly pinpointed, as shown in Figure 29. Of the 1786 records held in the database from telephone and radio transcripts, 28 records from 28 occupants and Police Officers specify a floor in the Towers and neighbouring tall buildings where occupants were trapped.



Floor 0 in Figure 29 represents Basement Level 4 where some officers went to assist. Whilst Figure 29 only reflects what we know from the small amount of data that we have, it does demonstrate that while most of the accounts of entrapment occur at around or above the impact zones, people were reported being trapped throughout the buildings. This reinforces the need to ensure that emergency telephone operators are trained to provide advice regarding to seek shelter or to evacuate.

## 5.4 Locked doors

For those occupants who were not trapped and could use the stairs, further obstructions occurred during their evacuation, such as smoke, stair congestion or doors blocked by debris. Some Police action accounts also referred to obstructions during attempts to ascend the Towers. A great deal of information is available in the various databases on these issues. However it is apparent from Table 5 that some doors were actually **locked** during the evacuation, not blocked due to chance debris or fire effects, as shown by the testimony of five respondents.

It is not known why doors were locked. It may be that doors in corridors or stairways were purposefully locked the night before, with the aircraft strikes occurring between 08:46 and 09:02 the next day. If occupants ascended the Towers early morning via lifts they may have passed doors yet to be unlocked. Whilst it is accepted that doors are there for office security, it is a concern that some doors were actually locked and not quickly opened from a central command. Also noteworthy is that *'we can't use the software to open the doors'* and that the door remained locked *'due to fire or power loss'*. This issue should be explored in further research.

Table 5 Testimony of 5 respondents that doors during the WTC evacuation were actually locked			
Database	Time	Location	Transcript
973	> T1	WTC2, 87	Caller: <i>I just got a phone call from Englewood PD, in WTC 2. Between the 87th and 89th floors, the doors are locked and people are trapped upstairs'.</i>
982	> T2	WTC1, 22	<i>'We know from talking to staff on the 22nd floor that there's debris, ceilings fell down and they could not get the door open. So the Police and Fire Department are going up there to evacuate everyone'</i>
995	> T2	WTC2, 22, STAIRS	<i>'I am in the second one, on the 22nd floor. We have heavy traffic in the 'B' staircase as we make our way up. They cannot release any of the locked doors due to fire or power loss'</i>
985	> T2	WTC1, 16	Caller: <i>'We've got a lot of smoke and we can't use the software to open the doors'</i>
988	> T2	WTC1, 103, 'A' stairs	Caller: <i>'Stairway A, floor 103. People are stuck in the stairway. Open the god damn doors'.</i>

# CHAPTER 6

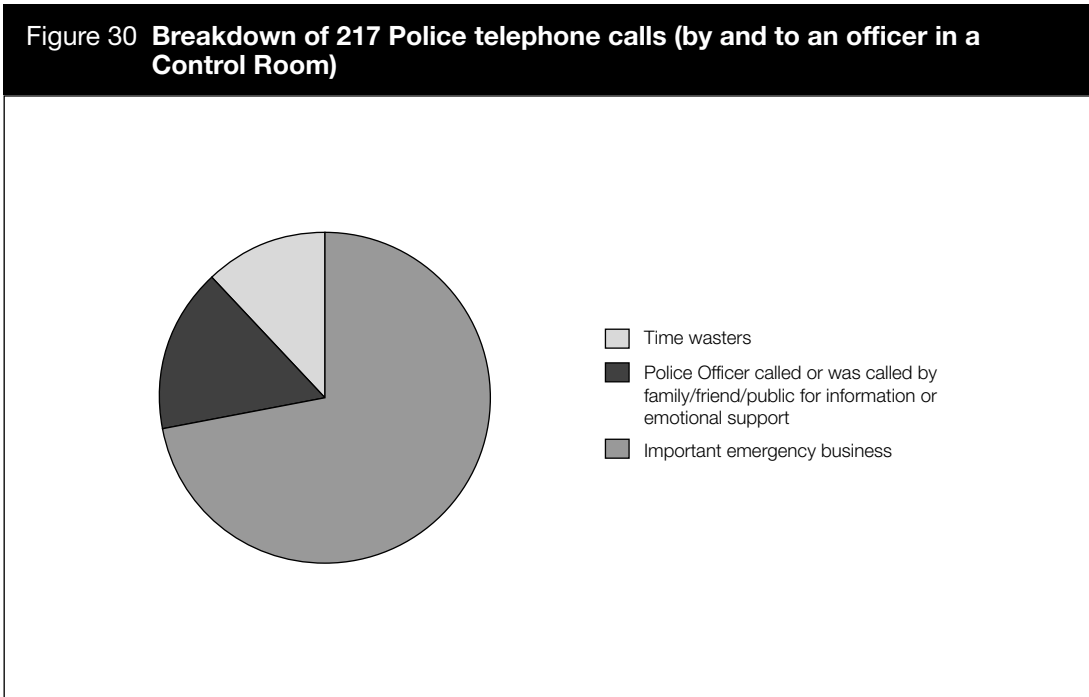
## Telephone calls made by and to the Police

The 1786 records held in the database were from 846 calls to or from emergency personnel made by 105 people. Of the 826 calls, 217 were telephone calls and 629 were radio calls. Radio calls were usually briefer hence more of them were contained in the transcripts.

### 6.1 Breakdown of Police telephone calls

Whilst calls to or from a radio are by professionals undertaking emergency duties, calls to the emergency services from telephones can be made by anyone. Figure 30 shows a breakdown of the 217 telephone calls in the database.

It is a welcome fact that in the wake of this disaster most calls in Figure 30 were appropriate and that effective use was made of those few telephone connections not compromised by the attack. Of the 217 calls telephone calls, 72% (157/217) were classed as 'important emergency business'. It is however a regrettable fact that even in a major disaster, the emergency services may be pestered by time-wasting and other nuisance calls. Of the 217 calls telephone calls, 12% (25/217) were classed as 'time wasters'. The remaining 16% (35/217) of calls were a Police Officer calling or being called for reassurance. This particular disaster was quickly established as a terrorist attack and was universally broadcast by the media. Yet the Police were still subjected to some time-wasting calls, as exemplified below. It is also a concern that many calls were to officers from their own or other officers' spouses, friends etc who saw the events on television and called his/her work to inquire if he/she was safe.



The public rang the Police to ascertain which tower was hit where and how badly, as they had a friend or relative in one of the towers. Also many officers themselves called family and friends to reassure them that they were safe. While all of these calls are understandable, together with the time wasters they approach a third of the telephone calls for which we have information. At a time of major crisis with so few telephone connections working it is imperative that discipline and professionalism hold, and that calls are for important emergency business only.

<b>Table 6 Examples of Police calls to or from concerned officers' family or friends</b>	
Michael: <i>'It's Michael, are you alright?'</i> Mark: <i>'I'm worried about you. Are YOU alright?'</i> Michael: <i>'I'm fine, where are you?'</i> (Note: their conversation went on for some time)	<i>'Kim, it's me. The shit just hit the fan at work. A plane hit the WTC. It's on fire. They're mobilising. I'll call you when I find out'</i>
Officer: <i>'Hello'</i> . Female: <i>'Hello'</i> . Officer: <i>'Something happened, just be careful. I love you'</i>	<i>'I don't know what's going to happen here, so I wanted to call and say I love you guys. Maria will think I am at the Trade Centre. Just let her know that I am at Newark Airport'</i>
Caller: <i>'Can I talk to Officer O'Neil?'</i> Officer: <i>'No'</i> (Hung up)	<i>'I need to speak to (unknown). I know Officer Schroeder won't be in'</i> . Officer: <i>'Ok ma'am we have a serious emergency going on, if you turn on the news you'll see that the Trade Centres have been bombed again'</i>

<b>Table 7 Examples of time waster calls to the Police</b>	
<p>Caller: <i>'Hi Officer, I reported a bad cylinder'</i>.  Officer: <i>'There's an emergency going on, don't you know what's going on?'</i> Caller: <i>'No I said it's a non-emergency'</i>. Officer: <i>'Don't you know what's going on in NYC? Turn on your television, I have to go. There is an emergency going on'</i></p>	<p>Caller: <i>'This is WCBS radio calling. Is there someone who can get on the air right now and talk a little bit about what's happening and what you guys are doing?'</i> Officer: <i>'That's a negative. You have to call media relations.'</i> Caller from WCBS radio: (continues several questions)</p>
<p>Officer: <i>'This is emergency, what emergency are you reporting'</i>. Caller: <i>'Oh I pushed the wrong button'</i></p>	<p>Caller: <i>'I rang earlier about a bus accident. No-one ever showed up'</i>. Officer: <i>'Which accident?'</i> Caller: <i>'I gave C2'</i>. Officer: <i>'There is a Police emergency at the WTC so we're mobilising all units. You're not going to have somebody respond to that location'</i></p>
<p>Officer: <i>'Hi there, there was a job for FedEx156. You can cancel it'</i>. Man: <i>'Alright'</i></p>	<p>Caller: <i>'Is the airport closed?'</i> Officer: <i>'Yes'</i></p>
<p>Susan from Bergen Airlines: <i>'I know you guys are crazed, but are we supposed to be evacuating the Airport? We are at Terminal A'</i>. Officer: <i>'No I don't think they are evacuating the Terminals, it's just the airport is closed'</i></p>	<p>Officer's wife/partner: <i>'Hi, sorry to bother you. I'm home with a really bad headache and I decided to take the day off'</i>. Officer: <i>'It's busy. A plane just hit the Trade Centre'</i>.  Officer's wife/partner: <i>'I just heard that. Kathy just called me and said it looked really bad'</i>.  (Note: the Officer continued to talk to wife/partner for some time)</p>

## 6.2 Number of telephone calls regarding Police mobilisation

Of the 217 telephone calls described in Figure 30, 157 were classed as 'important emergency business'. However 45 of these calls (29%) were an officer telephoning or being telephoned by another officer to tell him/her to come in for emergency duties. This raises the question of whether a more effective form of Police mobilisation should be considered which would free up the telephones for strategic and tactical concerns. For example the 'bleeper' system often used by staff in hospitals might have cut out some of the redundancy within the telephone calls that occurred during this disaster.

# CHAPTER 7

## Concluding comments

In addition to the analysis of survivor accounts from the WTC disaster, a collection of six PDF documents containing hundreds of pages of information relating to emergency services response to the WTC was analysed. This information comprised two PDF documents of transcripts from 56 New York/New Jersey Port Authority Police Department Police Officers and five non-police staff. These 61 individuals provided some 1827 records of experiences, observations and actions from the period immediately before first aircraft impact on WTC1, until much later in the day, well after the WTC2 collapse. The majority of this information relates to the operational issues associated with the emergency services. In addition, four PDF documents of telephone and radio calls from 105 people (Police Officers and those who called them) became available. These 105 individuals provided some 1786 records of experiences, observations and actions from the period immediately before first aircraft impact on WTC1, until after the WTC2 collapse. The majority of this information relates to the operational issues associated with the emergency services.

The main findings of this analysis are:

### **Recognition of the situation:**

A majority of police officers for which we have data appear to have been aware from an early stage that the incident was at least an aircraft strike if not an explosion or act of terrorism, which would likely require the same mass response as in 1993. This type of situational awareness is essential if a rapid and effective response of emergency personnel is to be expected.

### **Police logistical and tactical response:**

Four police officers mention chaotic or confused emergency response, while seven police officers highlight that effective emergency response rapidly swung into action.

### **Evacuation of tower concourses:**

It is apparent from civilian testimony that many people needed no prompting to rapidly evacuate from the towers. However, police accounts suggest that while the civilians required little prompting to the need to evacuate, they still required instruction as to the most appropriate evacuation direction, without which more lives may have been lost. This suggests that the uniformed Police presence gave an important direction to an already free-flowing evacuation.

### **Police ascent of towers:**

It would appear from the available accounts that police did not penetrate the towers much above the half way point, with most not exceeding approximately a third of the way up. The available information would suggest that police (and other rescue services) found it difficult climb the stairs against the flow of fleeing occupants. If police rescue and fire fighting operations are to be undertaken in such tall structures, then it

would appear that the availability of lifts, for emergency personnel use, should be considered as a high priority. Developing appropriate procedures for rescue operations using lifts should also be considered a priority. Even if lifts are not used, if police are to be used in such evacuation situations they should be trained in operational evacuation management strategies. Furthermore, in situations involving very tall buildings, alternate evacuation procedures should be explored, for example forming teams of top and bottom rescuers allowing the teams to work towards each other and/or pass on survivors to the next team down. Further research effort could be expended in attempting to define viable operating strategies, including what the optimum relationship might be between team size, the amount of floor space per storey to be searched, the number of floors and whether officers are working their way down or up.

#### **Emergency Equipment:**

A considerable number of emergency vehicles were disabled by the cloud of choking dust and debris that developed following the collapse of the Towers. It is suggested that emergency vehicle air filters be examined for their suitability in operating in dusty environments that may result from building collapse. It was apparent that availability of self-contained breathing apparatus (SCBA) for Police and other emergency responders was crucial during this disaster. It is recommended that rescue personnel, including police services be provided with similar equipment and suitable training in its use and that use of such equipment should be incorporated into building disaster response planning.

#### **Command Posts:**

It is suggested that predetermination of command posts and Police rendezvous points in the vicinity of likely terrorist targets should be considered.

#### **Communications:**

Whilst information in the database is limited, what information is available suggests that had a robust transmission network been available and reserved for emergency services use, Police communication and liaison throughout the disaster would have been much improved. It is recommended that research be undertaken to ensure that rescue workers have effective and compatible communications systems (allowing inter-service communications) capable of responding to similar situations, both in large high rise buildings and in sub-surface situations.

#### **Decision to evacuate the towers:**

A number of occupants trapped in the Towers called the Police to ask if they should seek shelter or attempt to evacuate. It is not clear if these calls were made because the callers did not receive appropriate local guidance or if they required additional information and advice. Regardless of the reason, it is clearly a concern that building occupants found it necessary to seek advice from authorities remote from the scene and hence not in a position to provide informed advice. This supports the view put forward in the accompanying report concerning the analysis of survivor accounts [1] that improved communication systems and procedures for disseminating information are needed in high rise buildings in order to allow occupants to more rapidly make appropriate evacuation decisions. Furthermore, some of the advice that was offered by these remote authorities was contradictory, some suggesting to flee while others to seek shelter. If remote emergency services are to provide more than moral support in response to telephone requests for advice, appropriate training is essential which is based on sound engineering principles.

**Trapped occupants:**

This study suggests that a number of people were trapped throughout the buildings, not simply within and above the impact zones. This reinforces the need to ensure that emergency telephone operators are trained to provide reliable advice regarding whether to seek shelter or to evacuate. It also highlights the need to better understand occupants' refuge behaviour, and reinforces the need to provide appropriate training for first responders who may be involved in search and rescue activities.

**Locked exit routes:**

A disturbing finding was that there were a number of reports of doors in exit routes being locked. It is not clear why the doors in question were locked, it could have been for security reasons or because of software failures. However, such systems should be designed so that they fail safe and are able to be operated in emergency situations.

**Telephone calls by and to the Police:**

The majority (72%) of telephone calls by and to the Police investigated in this study were considered 'appropriate' in that they were of direct relevance to the unfolding disaster. However, approximately one-third of calls were of an 'emotional' nature such as family or friends of officers or Tower occupants calling or being called for reassurance or obstructive calls such as people calling the police to determine the status of New York's airports. While it may be considered natural to inquire after the well being of 'loved ones' involved in the front line, it must also be understood that undertaking this course of action during a major incident may have negative consequences. Of greater concern is the number of nuisance and time wasting calls made to the emergency services. There is probably little that can be done about such calls other than educating the public as to the seriousness of such calls. By highlighting the magnitude and harmful nature of such calls, this may discourage the more innocent time wasting calls in future.

This study has provided insight into the response of the rescue services operating under extreme emergency conditions in high rise buildings. The information is useful in its own right in understanding how the emergency services responded to the World Trade Centre disaster of 11 September 2001. More significantly, the insight gained will be useful in shaping our emergency procedures for evacuation.

However, it should be noted that the data on which this study is based is far from ideal. In particular, the study has relied on:

- Due to the amount of relevant information available, the sample population size was small.
- Survey participants provided incomplete information.
- Inability to pursue specific themes of interest such as communications issues and the effectiveness of search and rescue operations due to the reliance on published statements.



# CHAPTER 8

## References

1. Galea E.R. and Blake S., “Collection and Analysis of Human behaviour data appearing in the mass media relating to the evacuation of the World Trade Centre Towers of 11 September 2001”, A report for the Office of the Deputy Prime Minister, Building Disaster Assessment Group, 2004.

















