Statement of
Mike Brown
Chief Operating Officer
London Underground
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London Underground – Background Information

London Underground (LU) is the world's oldest underground railway network. The first section opened between Paddington to the east and Farringdon Street – near to the business district "City" of London in 1863. There are 253 miles of route, 45% of which is in tunnel. Track voltage is 630v DC (4 rail system). There are 273 stations served by Underground trains, and of these 255 are operated by LU.

London Underground provides a public transport railway service to London. It is part of Transport for London, a public transport authority under the direct control of the elected Mayor of London.

Approximately 3 million passenger journeys are undertaken each day on the Underground network – roughly the same number as on the whole of the rest of the rail network across the United Kingdom.

The busiest staion on the Underground network is Victoria with 75.6 million passengers per year. 150,000 people enter the tube system every hour.

Some 6000 staff work on stations. All stations on the network have a staff presence and larger locations in Central London will have 20 or more staff on shift at any one time, assisting with train dispatch, safety & security and customer information.

Operation

In November 2003, London Underground reorganised its operational structure to focus around each Tube line under the overall leadership of Managing Director Tim O'Toole.

The new structure is headed by Chief Operating Officer, Mike Brown, who is reported to by three Service Directors. Each Service Director is responsible for a grouping of lines which are maintained and improved by a separate Infrastructure Company.

Under the Service Directors are ten line General Managers each responsible for running and improving performance on their line, covering both trains and stations.

While the line General Managers concentrate on the day-to-day running of the service, the Service Directors look at long-term development and overall network performance. They are out and about on the network understanding the complexities and issues unique to each line.

The Public Private Partnership established by the Central UK Government, has set up three private sector consortia to take responsibilty for the maintenance and renewal of the track, infrastructure, trains, signals and other assets, while London Underground is responsible for the operation of these contracts and for the operation of the system.

In addition to the funding this generates, the Mayor of London and Transport for London have secured additional investment for capital programmes in the Underground.

The Security Situation before 7th July 2005

CCTV - the London Underground system has over 6000 cameras on nearly all stations and in trains.

620 Police officers are permanently assigned to London Underground.

6000 front line station staff are deployed across the Tube's Stations. These staff work either on platforms, at ticket barriers, in local station control rooms or on patrol across one or more stations.

All trains have a driver in the cab, who is in contact by radio with a line control centre (there are 7 such rooms across the network.)

The majority of attacks before July 7th were carried out by Irish republican terrorists, who had been involved in terrorism in all parts of the UK (not just Northern Ireland); who usually (although not always) gave a warning prior to their bombs exploding.

The bombings of 7th July were unprecedented in terms of the numbers of people killed and injured in the United Kingdom railway attacks. Prior to that date, most attacks had been designed to disrupt or damage assets rather than cause mass loss of life.

The Underground is an environment where the millions of people conveyed each day have no full check on their identity. No screening of their possessions take place and there are only ticket gates to control movement in and out of the system.

The phenomenon of the suicide bomber means any traditional measures of detection and interception is likely to be ineffective. Here effective response to an incident is the key.

The so called HOT principle is used by London Underground Staff and the police to manage unattended items discovered at Railway stations. The use of these protocols has saved the London Underground system from a large number of closures over many years, as there are typically over 300 items left on the network each day.

H - Is the item hidden, or concealed from view? – explosive devices are not usually left in an obvious place because of the risk that they will be detected before exploding. Fear of failure is the biggest factor for a terrorist.

O – Is the item obviously suspicious – does it look like a bomb (wires, power supply or other elements to indicate it may be a device.)?

T – Is the item typical of what might be expected at a particular location? – for example genuine lost property is often found in a place where people have been queuing or congregating before moving on to another location.

The success of this protocol on the Underground system has significantly reduced the number of security alerts where the system has had to close whether fully or in part. It is our belief that these protocols remain relevant for unattended items – although not in the case of a suicide attack.

After the 9/11 attacks in the United States of America, London Underground played a full part in the resilience planning process put in place by the UK Government and supported by the Mayor of London. There has been a manager seconded to the London Resilience team (LRT) since it was established and this has ensured that the operational realities of a mass transport metro system can be properly considered in political and investment decisions.

This team has led work in areas such as evacuation of parts of London, chemical, biological and radiological attacks and, most visibly has arranged table top and live emergency exercises. The largest of these was a weekend exercise at Bank London Underground Station which simulated a chemical attack at one of the largest, most complex stations on the network. This was a multi agency exercise which was also attended by political leaders.

The learning from all exercises played a vital role for Underground senior managers in revising training and in their own actions on July 7th.

The LRT also enabled the joint development of a battery powered track trolley – designed to enable emergency service personnel to travel down the tunnel to an incident train while wearing their heavy and cumbersome protective suits. Although the events of July did not require such protective suits to be worn these trolleys were deployed to help with casualty and later with body recovery.

As well as these larger scale exercises, London Underground arranges every year a smaller scale live incident - again with the co-operation and involvement of the police, fire and ambulance services. While these exercises cannot involve all members of staff who might benefit from such practical training, they do present a very real scenario for the senior and middle management team to experience and to learn lesson from.

In March 2004 London Underground hosted a security conference in London for key personnel from other transport operators across the world. There were representatives from the USA, Russia, Israel, Spain & France – all of who had suffered from terrorist attacks. With unfortunate irony, the attacks on Madrid happened during this conference.

A further security conference is being arranged in London this autumn sponsored by UITP (International Association of Public Transport) and hosted by Transport for London.

Events of July 7th

At 08.49, 3 explosions happened simultaneously and without warning across the Underground network. 2 of the explosions were on trains on the Circle Line; one as a train had just left Edgware Road station to the west end of London on its way to Paddington. This train was passing another (Eastbound) Circle line train at the time as the bomb exploded. The other bomb on the Circle line exploded on a train which had just left Liverpool Street station on its way to Aldgate.

The third explosion took place in the narrower, deep level, Piccadilly line on a train which had just departed King's Cross St Pancras station on its way to the next Station, Russell Square. The tight, deep level tunnel, led to a higher number of deaths and serious injuries here than elsewhere.

At 09.47 a further bomb exploded at Tavistock Square on a bus. This was very close to the Russell Square incident.

In total 38 people were murdered on the Underground – 7 at Edgware Road; 7 at Liverpool Street and 24 at Russell Square. 700 people were injured. Also 14 people were killed on a bus at Tavistock Square.

For upwards of half an hour London Underground Staff were the first responders to the incidents. Station staff, train drivers based at Edgware Road, cleaners and a large number of managers recovered the dead and the dying in horrific circumstance at all sites. The drivers of all 4 trains (2 involved at Edgware Road) were among the many that performed with amazing courage, dedication and compassion for several hours.

As it became clear as to the scale and nature of the incidents, the entire Underground system was evacuated. This followed a well rehearsed plan and ensured that apart from one train (stuck behind the one that exploded at Russell Square , the entire system was evacuated of over 200,000 people in less that one hour after the call was made to evacuate. This was a remarkable achievement especially as the capacity of the mobile (cell) phone network was unable to cope with the volume of calls being made by members of the public.

During the day, the emergency services took full control of the 3 sites while London Underground began to plan for recovery. Trains were moved back to the depots in the unaffected parts of the network and less than 24 hours after the incident, the entire rest of the network was operational.

Recovery of the network

In accordance with our contingency plan, a recovery team was established led by a Service Director. This role was to ensure that working with the police all evidence was gathered as required but that the imperative for service restoration was also made. It was also vital to ensure that all engineering repair resource was able to be deployed immediately as the sites were released by the police.

Trains ran through Aldgate on 25th July. The Edgware Road section resumed on 29th July and the Piccadilly line resumed through Russell Square on 4th August – 4 weeks after the explosion.

It is worth pointing out that the rapid restoration of 80% of the service - less than 24 hours after the explosions gave confidence to London and the UK overall.
As of mid September 2005, passenger numbers are at the same level as they were in 2004.

The new normality

Operational issues

On 8th July, all staff were put in high visibility orange vests across the network. In addition all managers with any operational experience were deployed across the network and also asked to wear orange vests.

Police deployment was unprecedented with major patrols at the main central London Stations and over the next weeks there would be occasions when every station on the Tube network had at least 2 police officers deployed, through the operational day – in addition to regular station staff. 100 extra police officers have been funded by London Underground and are now being recruited – bringing the total to 720.

Enhanced staff briefings were instigated to ensure that train drivers and station staff had rapid access to information as it unfolded. This proved to be particularly important on the 21st July when 3 bombs failed to detonate on the Tube, but where the system was kept operational as we were able rapidly to communicate to all staff as to what had happened. It was the positive attitude which enabled the network to recover so quickly.

17,000 CCTV tapes were removed by the police immediately after the event of July 7th and it was vital that these tapes were replaced. This happened following a protocol which might normally only apply to one station or train. This was a significant challenge as the protocol only envisaged for no more than one day.

All stations and trains have public address systems and after the 7th July this was used to consistently give out security messages. It was also vital as a way of reassuring passengers as to the fact there were staff throughout the network concerned for their safety and security. London Underground senior managers had briefings at the highest level from the UK Government and/or the senior ranks of the police on at least a daily basis.

The criticality of the radio system has become even more obvious since the bombings. Although all radio communication did work (except for the incident trains) during the incidents, it has become clear since then that there are some weak areas of reception and transmission. Those parts of the network not above ground do not have access to the mobile (cell) phone network and therefore rely heavily on the operation of the radio infrastructure.

The existing plan to renew the radio system across the network has been revised and brought forward so that all lines will have a new radio system in place by the end of 2006. In the meantime additional hand held radios have been purchased to supplement the units fitted to each driving cab. Also on open sections of the railway (above ground) other conventional radios have been deployed to enable operation in the event of a failure in these areas.

However, in the meantime, the operational procedures of the Tube have been changed so that if the radio is inoperative (no transmission or reception between the train and the control room), passenger service will now be suspended.

Investment and Funding of security on the Underground

Prior to the 7/7 attacks London Underground were working on an agreed Security Improvement Programme. The project team assigned to this has now widened its remit to take on board lessons learnt from 7/7.

Overall investment in London Underground over the next five years will be £5.5 billion. This reflects both the London Underground directly managed investment, together with the capital works delivered through our Public Private Partnership and Public Finance Initiative contractors.

The Public Private Partnership arrangements are an integrated, upgrade and maintenance investment which have many security enhancements as part of their works.
At least £70 million of the Public Private Partnership works will be spent on safety and security related improvements over the next five years (does not include all station works as these are integral to the wider modernisation programme).

London Underground investment includes work on enhancing CCTV prior to the planned Public Private Partnership modernisations and refurbishments. Since 7th July following a review there are currently plans to accelerate delivery of these works over the next 6 months.

Other London Underground works include improvement to communications via station and train radio. Also to allow emergency services to use their radio systems underground.
The day to day spend for security and British Transport Police has been enhanced allowing recruitment of an extra 100 Police Officers. The annual policing cost for London Underground Ltd ongoing is £50 million. To support the police and security of London Underground costs a further £10 million. There has been an increase since 7/7 of roundly 10% of operational cost for safety and security measures.

The Future

London Underground will continue to work with the UK Government and other world wide agencies as technology improves in the fight against terrorism. Although there have been a number of trials of various detection and other portable and fixed devices across the world, it is not yet clear whether these justify the considerable investment and maintenance required. Also and more importantly, it is not yet clear whether these devices will effectively deter against a number of different risks - rather than lead both public, transport operator and police into an unrealistic state of feeling more secure. Clearly London Underground needs to be clear about the objective of installing new technology and clearly understand the real benefits.

Incident Review

As the network returned to normal it became obvious that there should be a full review of all lessons learnt form the events. This is not yet in its final draft; however there are a number of things which have emerged already and which will require further review. These include:

Car design:

As part of the full review of the events in July, there has been some feedback that the location of rails and grab poles in cars may have caused difficulty for some of the immediate rescue and recovery operation.

Staff Training:

Operational training is undergoing a full structural review within London Underground. This review will include the level of practical rescue and recovery training given to existing drivers and station staff. Already all staff on the underground undergo 5 full days refresher training every year. The content and duration of this is being reviewed.

Resources:

With 3 incidents sites and then further incidents on the 21st and 22nd July, there were times when the recovery and operations teams were fatigued. In future a planned phasing of rest periods will be implemented to ensure resource is available in a fit and healthy state at all times in a 24 hour period.

Multi site incident management:

Lessons were learnt regarding the management of multiple incident sites; mainly concerning the co-ordination and integration with the emergency services.

Mike Brown
Chief Operating Officer
London Underground Limited