

**LONDON**

**AMBULANCE**

**SERVICE**



**CAD 2010 PHASE 2 PROJECT**

**REQUIREMENT CATALOGUE**

ISSUE 1.1

PRODUCT NUMBER – FS 3.2.1

## Approval and Acceptance

| Status<br>(Approval or Acceptance) | Version   | Date       | Authority       |
|------------------------------------|-----------|------------|-----------------|
| Approved                           | Issue 1.0 | 10/11/2005 | Project Manager |
| Accepted                           | Issue 1.1 | 16/11/2005 | Project Board   |
|                                    |           |            |                 |
|                                    |           |            |                 |

## Document History

| Version                   | Date          | Change Description  | Authority       |
|---------------------------|---------------|---|-----------------|
| Draft 0.1 to<br>Draft 0.7 | To 10/11/2005 | Document under development.<br>Draft 0.4 submitted to quality review, all actions in response to observations made approved by Project Executive.<br>Up issued to Issue 1.0 | Project Manager |
| Issue 1.0                 | 10/11/05      | Approved by Project Manager   | Project Manager |
| Issue 1.1                 | 16/11/05      | Following renaming of Gold Control, all relevant references changed accordingly.<br>Email acceptance by Project Board   | Project Board   |
|                           |               |   |                 |

## Distribution

| Version   | Date                         | Recipients      |
|-----------|------------------------------|-----------------|
| Issue 1.1 | Preparatory to<br>29/11/2005 | LAS Trust Board |
|           |                              |                 |
|           |                              |                 |
|           |                              |                 |

---

## CONTENTS

|  |           |
|--|-----------|
| <b>1. Purpose .....</b>  | <b>4</b>  |
| <b>2. Composition .....</b>  | <b>4</b>  |
| <b>3. Introduction .....</b>   | <b>4</b>  |
| <b>4. Stakeholder Engagement.....</b>  | <b>4</b>  |
| <b>5. Information Sources.....</b>   | <b>5</b>  |
| 5.1. Overview.....   | 5         |
| 5.2. Current Sources.....  | 5         |
| 5.3. Additionally Required Sources.....  | 6         |
| <b>6. User Requirements.....</b>   | <b>7</b>  |
| 6.1. Overview.....   | 7         |
| 6.2. Architectural Requirements - Outline .....                                      | 7         |
| 6.3. Business Area Requirements - Outline .....                                      | 8         |
| 6.4. Business Area Requirements - Summarised .....                                   | 9         |
| 6.4.1. Overview .....  | 9         |
| 6.4.2. Emergency Operation Centre (EOC) .....  | 9         |
| 6.4.3. Call Taking & Gazetteer .....   | 11        |
| 6.4.4. Superintendent & Sector Controller.....                                       | 12        |
| 6.4.5. Allocation & Dispatch .....   | 13        |
| 6.4.6. Mapping – MDT – Satellite Navigation – Crew.....                              | 14        |
| 6.4.7. Sector & Staff .....  | 16        |
| 6.4.8. Emergency Planning – Major Incident Handling –<br>Incident Control Room ..... | 17        |
| 6.4.9. Press & Public Affairs (PAPA) – Patient Advice Liaison<br>Service (PALS)..... | 18        |
| 6.4.10. Fleet .....  | 18        |
| 6.4.11. Automatic Medical Priority Dispatch (AMPD) - Quality<br>Assurance (QA).....  | 19        |
| 6.4.12. Electronic Patient Record – Hand Held & Other Input<br>Devices .....         | 19        |
| 6.4.13. Resource Centres – Meal Breaks .....   | 19        |
| 6.4.14. Management Information .....   | 20        |
| 6.4.15. Training .....   | 20        |
| 6.4.16. Central Intelligence Unit (CIU) & Loggist.....                               | 21        |
| <b>7. Conclusion .....</b>   | <b>22</b> |

## 1. PURPOSE

The purpose of this product is to define, in 'User Speak' what needs to be done to retain essential capability inherent within the existing Emergency Operation Centre (EOC) function; to redress the identified problems with, and satisfy the drivers or other reasons for change of the existing function, and exploit the opportunities discovered for London Ambulance Control functions.

## 2. COMPOSITION

This product is comprised of two parts:

- This document, summarising the requirements
- An MS-Excel spreadsheet containing the detail of the requirements.

The spreadsheet provides the detailed and definitive Catalogue of Requirements, still in 'User Speak'.

This document provides a two page, high-level outline of both the architectural and the business area requirements. It then provides a comprehensive summary of the requirements, grouped according to current business areas.

## 3. INTRODUCTION

London Ambulance Service (LAS) have commenced this initial 'Feasibility Study' following a long-held perception that a new Computer Aided Dispatch (CAD) system is required. This approach necessarily focuses attention upon changes to IT system(s), to which the business process must conform, rather than focussing upon the required business process that IT system(s) are required to support. This is a common cause of project failure and an area of lessons that were identified following the events of 1992.

Research during this stage, across all levels of the organisation, has emphasised that the fundamental need is for change to the way the organisation works and thereafter to the provision of IT to support those changes. In other words, this should be seen, not so much as an IT project but as a project delivering '*IT Enabled Business Change*'. It is for this reason that the requirements capture process has focussed on users and started by talking to them and recording their requirements in 'User Speak' as the essential basis for later translation into tender invitation(s) and technical specification(s). It is also the reason why the work to define existing and proposed business processes has become increasingly important during this stage and will become the driving force of subsequent stages.

Recognising this important shift in emphasis, the Project Board are now viewing the aim of this project as being a new CAD environment, rather than just new CAD system(s). This is entirely consistent with the backing paper entitled "CAD – The Way Forward" that was presented to the Trust Board on 22 February 2005 and which now forms part of the mandate for this project.

## 4. STAKEHOLDER ENGAGEMENT

Key to ensuring that business change remains focussed upon business needs and not IT solutions is ensuring that there is effective engagement with stakeholders.

The early formation of a Project Board, as the directing authority of the project, engaged directly with senior managers within key areas of the organisation who

would be impacted by, or who impacted upon, this project.

The Trust Chairman, Chief Executive, many of the Directors and other senior managers were interviewed briefly, by the Project Manager, in the early weeks of the project to help determine the justification for the project in terms of the problems with the existing facilities and the desired outcomes of the project, leading to a document mapping the business benefits sought (Problems with Existing Facilities - Product No. FS 2.1).

Other work conducted at the very beginning of this stage determined the existing organisational structure for LAS which was then analysed to identify those business areas that were either existing or potential direct users of CAD technologies or of the data directly derived from those technologies (User & Workshop Analysis - Product No. FS 3.4). This contributed to the preparation of the Initial List of Stakeholders (Product No. FS 1.5) and to the conduct of a sequence of requirement workshops incorporating users representing all of the identified areas of business use.

## **5. INFORMATION SOURCES**

### **5.1. OVERVIEW**

Formulating a comprehensive list of requirements is an inexact science in which completeness of content increases as the scope of information sources expands. However a point of expansion is reached where the degree and value of further input received is disproportionate to the effort required and the further delay caused to progress.

The sections below identify the sources of information that have contributed to this product and those additional sources from which this research has identified that further information is required. More information will always be forthcoming and the project recognises that the LAS, as an organisation, is continually evolving and therefore this product should not be considered as being 'fixed in stone'. However, it is also important to recognise that continually moving boundaries and uncontrolled change can be a major obstruction to progress. For this reason, the project manages change to the products it develops through a Change Control Process which requires authority from the Project Board and dovetails into other project control processes.

As the project progresses, there will come points when the requirements for any particular phase have to be frozen in order to manage the tendering and development processes. The Project Board will provide direction to assist managing these boundaries appropriately.

### **5.2. CURRENT SOURCES**

This project has collected information from the following sources:

- a) A sequence of 6 sets of requirement workshops, inviting over 50 selected members of staff, and covering nearly 30 different groups of users, across existing and potential users of the CAD systems and/or the data from a new CAD environment. The organisational areas were determined through the User & Workshop Analysis (Product FS 3.4) and included:

- |                              |                             |                   |
|------------------------------|-----------------------------|-------------------|
| ▪ Emergency Operation Centre | ▪ Sector Supervisors        | ▪ Sector Training |
| ▪ EOC Supervisors            | ▪ FRU operators             | ▪ EOC Training    |
| ▪ Urgent Operation Centre    | ▪ Motorcycle Response Unit  | ▪ Press           |
| ▪ Emergency Bed Service      | ▪ Pedal Cycle Response Unit | ▪ Paramedics      |
| ▪ Patient Transport Service  | ▪ Human Resources           | ▪ HEMS            |

- Emergency Medical Technicians
- Emergency Planning Unit
- Patient Advice & Liaison Service
- Management Information
- Finance
- Fleet
- AMPDS Quality Assurance
- CTA Quality Assurance
- Staff Side
- Payroll
- Procurement
- IM&T

- b) Decomposition and analysis of the entire content of the "User Specification for Windows CAD, version 3.2". A document prepared entirely by the user community over a period that commenced some 18 months – 2 years before the start of this project.
- c) Definitions of requirement for the existing CAD systems, derived by 'reverse engineering' the existing EOC functions recorded within the Current Operational Control Capabilities (Product No. FS 1.2).
- d) Other, ad hoc, sources of information; i.e. review of requirement catalogues of other ambulance services (Kent & GMAS), input directly by the Project Team or Project Board, etc.

### 5.3. ADDITIONALLY REQUIRED SOURCES

Throughout the work of this stage the following additional sources of essential requirement information have arisen:

- e) Current mapping capabilities were specifically excluded from the work identified under Product No. FS 1.2, above, but the essentiality of their inclusion is now recognised.
- f) The Current Operational Control Capabilities (Product FS 1.2) analyses EOC but does not include Incident Control Room (IRC) or Urgent Operations Centre (UOC). It is proposed that any new CAD environment will rationalise all of these into a single 'control' capability. Whilst the requirement workshops have captured some requirements relating to these areas further work is necessary to ensure that existing capabilities are not lost, particularly in respect of the recent implementation of UOC and the current project to procure and implement Clinical Telephone Advice (CTA) software.
- g) Accurate and authoritative information to ensure requirements to address risk to the security of LAS CAD services and related information are proportionate and cost effective. The Project Board have approved the commissioning of external expertise to conduct a review of this aspect of requirement.
- h) Additional requirements emerging from a more thorough assessment of proposed changes to business process in the light of the recognised increase in focus upon business needs rather than IT needs, as discussed above.
- i) Additional requirements emerging from the work of the CAD 2010 Phase 1 Project 'Immediate Requirements' (also known as Windows CTAK).
- j) Re-assessment of requirements following the final decision of the Agenda for Change committee in respect of the business process to be implemented for the management of meal breaks for sector staff.
- k) Requirements of users external to the LAS who will be providing or receiving data through an interface with any new CAD environment to be developed.

## 6. USER REQUIREMENTS

### 6.1. OVERVIEW

The current Requirements Catalogue, in 'User Speak', comprises over 1400 individual requirements. These originate as follows:

|  |   |     |
|--|---|-----|
| ▪ Current Operational Control Capabilities | - | 158 |
| ▪ Requirement Workshops                    | - | 625 |
| ▪ Windows CAD document                     | - | 635 |
| ▪ Ad hoc sources                           | - | 33  |

The Requirements Catalogue is Appendix A to this document. It comprises an MS-Excel spreadsheet in which each requirement will be traceable from its source, throughout refinement into tender documents and, ultimately, to successful delivery or conscious rejection. To aid validation and business justification, the Catalogue records the mapping of each requirement against Problems with Existing Facilities (Product No. FS 2.1) and the Desired Outcomes determined from interviews with LAS Directors and senior managers; and with Business Benefits.

In most cases requirements have been articulated to the Project as generic statements requiring decomposition into more specific sub-requirements; both levels of detail are recorded within the Catalogue.

The Requirements Catalogue has, initially, attributed each requirement to the business area from which it originated. This creates a tie to existing business processes but it does not help development or visualisation of new ways of working, nor does it allow the catalogue to be ordered in a way that best supports the tendering process, development of technical specification, design and testing etc. In order to address this, the requirements are in the process of being assigned to System Functional Areas and the spreadsheet used will then enable them to be viewed from either perspective.

### 6.2. ARCHITECTURAL REQUIREMENTS - OUTLINE

The requirements indicate a need for a distributed and fault tolerant architecture. This means a single 'system' (i.e. a potential suite of applications) with near perfect availability that can be accessed by dedicated or non-dedicated desktop computers located anywhere in which the LAS can provide a suitable (and suitably secure) network connection. This includes control room(s), HQ offices, ambulance stations and other premises; as well as mobiles (e.g. The Emergency Control Vehicle) or other secure remote access facilities.

Access will be controlled and the scale and scope of the operations that a user can perform or the data they can access will depend upon the business need of their particular post. The result will mean managers able to access the information to enable them to manage; control rooms (or virtual control rooms) located at multiple locations with capacity to increase the number of control rooms, and the ability to share the loading of demand; provision of immediate resilience in case of catastrophic failure; opportunities for satellite offices or ambulance stations to enhance capacity by dealing with calls under conditions of exceptional demand or major incident.

Users will be able to access the system(s) via ergonomically designed graphical user interfaces (GUI); i.e. Windows-based screen functionality, providing an efficient and effective presentation of real-time data that paints a comprehensive but concise

operational picture of the current command area (whether it be of geographical or incident type delineation). It will readily support screen-based functionality to focus down, expand out, summarise, search, reconfigure or interact with the data.

It should integrate with appropriate telephone and radio facilities, taking account of the imminent National Radio Project. Interfaces are required with suitable mapping applications and Automatic Medical Priority Dispatch (AMPD) or other structured questioning protocols and it should have the capability to support advanced interaction with mobile data terminals (MDT). It should also support interfaces with LAS Patient Transport Services (PTS); with facilities being developed under the National Programme for IT (NPfIT) and, through this, enable communication with NHS partners. It should interface with existing partner emergency services (e.g. Metropolitan Police Service) and be capable of readily accommodating further interfaces with any number of additional partner emergency services (e.g. Fire Service, Transport for London, City of London Police, British Transport Police and the Strategic Coordination Centre).

The requirements clearly indicate a scale of change that will be progressively developed over a number of years and derived from a variety of suppliers. During this period the system will be continually developing within a structured and controlled environment. In fact the requirements recognise that change is a constant feature of the modern world and LAS must continually move with that change, especially within the fast moving field of information technology and communications. For this reason, the system(s) of the new LAS CAD environment must not be allowed to stagnate again and the requirements reflect this by incorporating needs for the continual capture of new requirements to support regular (perhaps annual) upgrade path in much the same way as the IT industry is regularly upgrading hardware and software products.

To maximise flexibility, reduce reliance upon any one supplier, increase competition and support resilience the requirements anticipate a modular approach using open standards that are, wherever appropriate, compliant with the emerging standards and structures of the NPfIT.

### **6.3. BUSINESS AREA REQUIREMENTS - OUTLINE**

The requirements indicate a need for advanced, flexible call taking and incident/resource control facilities that focus information at the point where it is needed and present it in a form that readily assists recognition of its priority and the assimilation of its content. The new CAD environment must offer maximum flexibility and local configurability regarding separation or combining of control room functions and regarding the designation of geographic or incident related areas of control.

It should reduce reliance upon separate positions to handle different types of response options and those that cause separation of the 'control' function into component parts of Allocator, Dispatcher and Radio Operator; this includes, for example, Motorcycle Response Unit (MRU): Cycle Response Unit (CRU): Fast Response Unit (FRU) and the Helicopter Emergency Medical Service (HEMS). Without constraining management's opportunities for flexibility it should support the concept of the 'Omni-Competent' Controller who could manage all aspects of a call, i.e. from 'Receipt to Resolution'.

The new system is required to capture management information and be readily capable of enhancement to expand, adapt or adjust the information captured. It should record key performance indicators and present real-time readout of performance.



It should provide automatic alerts to a whole raft of functions across LAS (not just within the control room) when events occur that exceed any of a non-limited list of user definable trigger points. Alerts, messages and/or prompts are predominantly required to be produced directly within the CAD application but the capability is also required to enable these to be sent to other applications, via interfaces, and especially via email. It should support advanced Major Incident Control capabilities and on-scene major incident handling, enabling the Emergency Control Vehicle (ECV) to operate as part of a 'virtual' control room; provide (or accommodate) Electronic Patient Record Forms; remote access for key staff; interaction with existing and/or future satellite navigation systems; interface with many other LAS systems including Payroll, Resource Centres PROMIS, Fleet and HR, or their successors.

The new CAD environment is required to exploit technology that assesses many factors to propose the most suitable resource to assign to an incident and be able to identify whenever a preferable resource becomes available for incidents already assigned a resource. It should include technology utilising anecdotal data to predict future demand in order to recommend resource deployment to meet that demand. Either directly or through an interface with PROMIS or its successor the system is required to provide facilities to plan and model the potential collective demand of future events (or spikes) identifying deficiencies and enabling models to be stored and automatic alerts to be set when deficiencies are detected or when specific trigger points are reached. It should automatically monitor the number of vehicles required to support crew rosters and provide alerts whenever a deficiency is detected or predicted. The new system should not be limited to managing only LAS resource types but have the flexibility and capability to accommodate a range of other health care resource types in accordance with the NHS strategic direction.

## **6.4. BUSINESS AREA REQUIREMENTS - SUMMARISED**

### **6.4.1. Overview**

The following sections summarise the requirements for each of the major Business Areas.

The phrase 'the system' is frequently used as an alternative generic title representing the 'new CAD environment' and the two phrases should be considered interchangeable.

### **6.4.2. Emergency Operation Centre (EOC)**

A new CAD environment is required to accommodate all existing and non-redundant call taking and dispatch functionality of EOC. It must provide a robust, flexible and properly structured data architecture, consistent (wherever appropriate) with that used, proposed or expected for NPfIT and capable of supporting predetermined and ad hoc reporting and selective real-time text searching.

Incidents must be capable of categorisation and viewing according to an LAS configurable list of incident types; e.g. Emergency, Urgent, Non Urgent. Multiple reports of the same incident will be linked according to predetermined rules and levels of authority with the resultant 'master view' (report) providing a suitable concatenation of all relevant log information, with capabilities to annotate according to source. Real-time reporting will provide a flexible display of any incident or collection of incidents grouped according to criteria selected by the current operator including, for example, incident types and/or elements of answers to questioning protocols. Incident logs will record all actions carried out in relation to that incident and all

relevant patient movements.

Facilities are required for locally establishing and/or selecting key points within the entire incident handling process (from receipt to resolution) when the incident log will be automatically time-stamped and duration between selected key points will be calculated. Locally configurable rules will automatically produce alerts to the current user and/or other defined recipients when permitted targets are either approached or exceeded. Locally configurable and flexible real-time and historic reporting facilities are required to provide various specific and general reports of performance against targets across different time-scales.

Facilities are required for the creation and management of interactive checklists to be available to operators for certain incident types or events, together with associated actions or other essential information.

Flexible, expandable, operator-configurable and sorted displays are required of incidents and resources. Required functionality will permit the reliable and efficient association of an incident and resource(s) through suitable direct, on-screen interaction, either initiated from the point of view of the incident or of the resource(s). The capability is required to track and manage resources; their status and means of contact; associate a staff resource type with a vehicular or other resource type; and to provide summarised information about staff skill profiles is readily assists assimilation in support of incident management.

Multiple methods are required for the population of caller and/or patient data to ensure flexibility whilst also enabling rapid and accurate call taking leading to swift selection and assignment of appropriate resource(s) to incidents. Wherever possible facilities must support use by disabled staff.

Facilities offering diversification beyond the existing traditional emergency telephone system are required for the receipt of emergency and non-emergency calls in support of the evolving common public communications methods and those of elderly or disabled people. For example: text messaging, sign language via video conferencing, web interfaces.

Facilities are required to exploit alternative messaging between control functions and single or multiple response staff; e.g. text messaging, and to log these messages as integral elements of incident, resource and/or vehicle and call sign logs.

The new system is required to proactively manage major incidents and the resources allocated accordingly with the provision of alerts, checklists and operator prompts according to incident type and/or scale.

A link with London A&E hospitals is required to provide real-time information about hospital statuses, diversions, waiting times, and so on.

The system is required to provide flexible and expandable facilities for the receipt and storage of vehicle telemetry to support staff safety, incident logging, scheduled and unscheduled vehicle maintenance.

The new system is required to support interfaces with facilities being developed under the National Programme for IT (NPfIT) and, through this enable communication with NHS partners. It should provide a 2-way interface with existing partner emergency services (e.g. Metropolitan Police Service) and be capable of readily accommodating further interfaces with any number of additional partner emergency services (e.g. Fire Service, Transport for London, City of London Police, British Transport Police). Every transmission across these interfaces is required to be added to appropriate logs.

The system is required to record key information of Service Level Agreements with other organisations and record the date, time reasons, extent, variation and

conclusion of that utilisation, together with any supervisory notes about the nature or quality of the service provided.

#### **6.4.3. Call Taking & Gazetteer**

A new CAD environment is required to provide quick, accurate, comprehensive, multiple and flexible means of determining and recording the details of callers to the control rooms, patients, the source of a call, the location of the incident concerned and any associated information to assist delivery of best care to the patient and/or secure the safety of staff.

Facilities are required to enable caller details to be populated automatically from Caller Line Identification (CLI) information embellished by the Enhanced Information Service for Emergency Calls (EISEC) providing location information of BT landlines. In the case of mobile phones, the new system is required to receive and store data plotting the start, intermediate, current and final area of signal origin and, from comparison, determine the direction of travel.

Integration with a mapping system is required to display icons or 'shading' representing call and incident locations and the area of a mobile phone signal, together with its movement. Integration is also required with the chosen system for Automatic Medical Priority Dispatch (AMPD).

A comprehensive, flexible and locally managed gazetteer database is required that must be integrated with the call taking and control functions and is capable of identifying the co-ordinates of all UK locations to an accuracy 10 metres. The gazetteer (or an associated function) is required to include facilities to enable population of call and/or incident address and/or location information using quick search, selection and predictive text features to speed input and increase accuracy. It is required to support 'sounds-like' or fuzzy searching; the inclusion of underground and main line train stations or other key transport terminals together with references for their known exist/entrances; and to have a means for operators to flag a gazetteer error for future correction. It must support ad hoc as well as integrated search facilities. Where an address is not available the new CAD environment is required to support recording the location in relation to known locations/landmarks stored within the gazetteer.

The new system is required to include a comprehensive, locally managed and fully audited 'locality database' for the additional storage of information to assist delivery of best care to the patient and/or secure the safety of staff. This will include locally configurable criteria for the activation of a prompt to call takers to establish a suitable RV point for response crews; detail of sites associated with hazardous substances including the provision of access to relevant contingency plans. Functions are required to cause the automatic search of addresses against this database with results readily displayed and added to appropriate logs.

The new system is required to have the capability to produce detailed, layered maps identifying local resources, local calls and multiple calls originating from the same location. It will interface with a suitable external electronic feed to provide real-time weather information to desktop terminals, MDTs or other remote or mobile devices.

Alternative or rationalised device selection and input methods are required to reduce the reliance on and limitations of the variety of manually operated devices, e.g. keyboard, telephone keypad & handset, radio, touch-screen and to support the move towards 'omni-competent' operators. Improved facilities are required for the handling of conference calls with Language Line.

Where a call relates to a chargeable service the new system is required to identify this for billing purposes and record details of all planned and actual component costs.

#### **6.4.4. Superintendent & Sector Controller**

A new CAD environment is required to enable local control room supervisors to create temporary user accounts for use, within a control room, by LAS staff or members of the Red Cross of St John Ambulance; to dynamically define control room roles and to assign and configure the functions and facilities available to those roles; to enable or disable the workstation(s) at which those roles can be performed and/or the workstation(s) at which specific functions will be available. It is also required to enable local supervisors to dynamically define the scope (geographic or incident/event related) of control responsibility relevant to any control room workstation, including Emergency & Urgent Operations Centre, Incident & Event Controls, Special Incident or control desks, Sector Desks, etc.

A control room supervisor shall also be able to create or delete the shift pattern for a selected response call sign where that call sign has not been allocated the default shift pattern.

The new system is required to enable local control room supervisors to activate or deactivate the Emergency Rule redefining approved responses to prioritised incidents. It must include facilities for the sending global messages to locally managed lists of addressees.

The new system is required to provide flexible and readily controllable facilities for local control room supervisors to edit the content, style, format and behaviour of the control room real-time information display panels.

Total flexibility is required of a new system to enable relevant control room roles to transfer the control of an incident to any other controller or control sector within the same or any other physical control room regardless of the incident state, resource assignment or the degree of progression from initial receipt of call.

The new system is required to provide for the management of locally definable electronic 'Action Lists' to be related to recognised chief complaints or response descriptors and for these to be presented automatically when an incident matching those criteria is received. When the level of response assigned, or the skills profile of the response assigned to an incident conflicts with established standards the new system is required to mandate a log entry by the controller documenting the reason for the assignment. A warning to the relevant controller is required when an incorrect resource type is assigned to an incident and clear information is required where multiple resources are assigned to, or being cancelled from, an incident.

The new CAD environment is required to enable locally configurable criteria for automatic pro-active monitoring and reporting of resource information to controllers covering, for example, where a resource status change restores availability and the resource has a quicker response time to an incident than that currently assigned; optimisation of stand-by locations where levels of resource availability become depleted. Where a controller is prompted to relocate resources to optimise stand-by locations or as a result of predicted demands, a 'snapshot' of the resource/location situation is required to be stored. The new system is required to be capable of automatically monitoring multiple sources of information that may impact upon the arrival time of resources to incidents and predict potential delays.

Facilities are required for a controller to send messages to specific, or nominated groups of mobile data terminal that require on-screen acknowledgement by the MDT operator.

#### **6.4.5. Allocation & Dispatch**

Facilities for the presentation, allocation and cancellation of resources within a new CAD environment are required to be comprehensive, flexible, configurable and readily assimilated with opportunities for automatic resource proposing and/or allocation based on locally definable and managed rules. A 'snapshot' of available resources against an incident should be stored when the taking of the call is complete. Any controller should be able to gain a total view of the operational resource picture at any time, and should be able to filter, refine, format or order this as required to meet operational need. This should include, for example, resource availability for response to a given incident, including calculated run times; available resources of other ambulance services; which resource(s) are assigned to an incident and facilities to display the detail of those resources. Wherever possible resource allocation is required to be through 'Windows' style drag & drop functionality and should accommodate either dragging a resource entry and dropping it onto an identified map location or the other way around, with on-screen confirmation of the transaction.

The new CAD environment requires facilities to link and manage duplicate calls without increasing risk to patients; to provide a summary of resource changes of status and to interface with PROMIS for rostering and vehicle crewing information.

The new system must have fully flexible facilities, controlled according to predetermined rules, for cancelling the allocation of resource(s) to an incident, logging the action and the reasons for the action.

The new system is required to provide facilities for the creation and maintenance of a variety of warnings/notifications/alert in response to locally definable criteria, for example:

- If a resource rejects allocation of an incident
- If allocated resources fails to change status indicating allocation accepted
- If an MDT fails to receive data transmitted to it
- If cancelling an allocation intending to allocate to a speedier resource but no other resource is assigned
- When possible match identified in 'Locality Database' or information from database sent to MDT
- When changes made to Critical key Questions
- When resource status indicates on-scene beyond predetermined duration

The capability is required within the new system to build and use anecdotal data from which to predict demand at a strategic, tactical and geospatial level; to provide warnings to a locally configurable list of recipients when available resources will not meet that predicted demand; and to recommend suitable resource stand-by locations to meet predicted demand.

The new system will be required to send messages by a variety of means, of a variety of types, to a variety of resources and to meet a number of eventualities. This includes, for example, to a DSO when a resource is dispatched to a location recorded within the 'Locality Database'; urgent messages to crews via mobile phone and facilities for call takers to send an urgent message direct to an MDT.

Facilities are required to incorporate the use of other remote devices to contact crews when away from a vehicle, store data and transmit to control room, via MDT, once the remote device is reconnected to vehicle.

Where a resource has no MDT, remote device or satellite positioning equipment facilities will be required ensure these resources are included within the global view of the controller who must receive a visible reminder of their IT limitations.

#### **6.4.6. Mapping – MDT – Satellite Navigation – Crew**

The new CAD environment is required to provide advanced, accurate, detailed and fully integrated mapping facilities providing fast responses to changes of location or resolution etc. and which can be scrolled smoothly and quickly in any direction. Due to the nature of calls handled in London this must cover the whole of the UK and providing entire London street maps capable of zooming, within a single screen, between the whole of London, down to clear identification of individual streets. Mapping facilities must have the capability to automatically convert co-ordinates to those used by current and/or future map books utilised by LAS or related agencies and readily reveal these when required in relation to any icon or position selected on-screen.

Integration is required to enable maps to display icons of a variety of shapes, colours, sizes and opacity, representing a range of locally determined and configurable features which will include, amongst other things, incident locations; locations referenced in the 'Locality Database' or similar listings; real-time plotting of resource (or user selected resource) locations; and the skills profile of each resource. The colour of resource icons is required to adjust automatically to represent its current status. Icons are required to readily reveal a greater level of detail about the incident(s), resource(s) or other feature(s) which they represent and without undue obstruction the remaining mapping display or other information. The facility is required to populate location information by selecting a position on the map. It is required that the viewable quality of any map, at any resolution, should be capable of being faded to aid viewing of icons and/or other 'overlay' information.

By default the maps are required to centre on the current position of the call being taken, the incident being viewed, the resource being interrogated or any other resource selected from a list of resources, but this default can be changed for the current session and manually restored.

Mapping facilities are required to support the global provision and management of visual information or overlays regarding, for example:

- One-way traffic flows
- Congestion & real-time capability to navigate around congestion hotspots
- Road works
- Road closures, including effective period
- Rerouting run time calculation around road works

In many cases these overlays are required to be 'intelligent' elements in that the new system is required to recognise and react to the position or boundary of a feature; its operational implications and any associated, locally defined rules or provision of alerts. Quick, simple and user-friendly facilities are required for the placing or describing of features, whether 'intelligent' or not, for example, the describing, designating and adjusting of a geographic area of control by initial manual drawing onto an electronic map.

The new system is required to allow appropriate roles to record information pertaining

to hospital closures and associated diversions, which will automatically be presented to call takers or MDT operators when selecting a closed hospital together with suggested alternative hospitals, or override to initially selected hospital. In the case of an MDT initiated query, it will provide rerouting instructions through integration with the onboard satellite navigation system.

Robust, multi-functional, versatile and fully programmable Mobile Data Terminals (MDT) with user logon and adjustable volume control are required for use within LAS vehicles. They must be fully integrated, via high dependency telephone link, to the systems of the static CAD environment; to onboard satellite navigation systems and be capable of interfacing with future onboard medical diagnostic equipment and other handheld devices. They are required to accommodate, as a minimum, the 4 key display aspects of incidents, mapping, status change and navigation location selection. They should incorporate a 'panic button' sending a high priority, attributable signal to control room; automatically activating the vehicle radio microphones and creating an incident record. They support the use of swipe cards to enable engine start up; power up automatically when the host vehicle ignition is switched on but should power down independently of the ignition. The MDT is required to provide an audible warning whenever it receives data and they are required to have access to selective information data stores; for example:

- Relevant electronic pharmaceutical journal (e.g. MIMS)
- Online patient specific protocols
- LAS Major Incident prompt cards
- National Clinical Guidelines

MDTs of the new CAD environment are required to provide a screen notification on receipt of an incident or of any update to that incident and, prior to requiring a status change, display all of the information pertaining to an incident except caller information, key questions, log entries and timestamps. Upon receipt of incident details the co-ordinates of the incident location are required to be transmitted to the onboard satellite navigation system, which will determine and display appropriate routing information. Incident detail, together with a list of all resources assigned to it, will continue to be available to the MDT until the status 'red at scene' is selected.

The new system is required to have facilities to record hospital A&E waiting times and, where these are available, to transmit and display them on the MDT when a destination hospital is selected from the list. It will display a list of the nearest available hospitals suitable for the patient condition. It will have facilities for sending messages between the MDT and the control room; sending data concerning a blue call to the MDT of appropriate DSO; initiating requests for attendance of additional or differently skilled resources at an incident or for attendance of other emergency services/agencies; and initiating a request for attendance of the LAS helicopter. It will also support receipt of automatically created messages as safety checks for lone workers and control room warnings whenever these are not acknowledged.

The MDT is required to provide a permanent display of the high dependency telephone network signal strength. Whenever an MDT loses the network link (other than by switching off) it is required to immediately produce an audible and visible warning, which will remain visible until the connection is restored. Whilst the connection is lost all actions are required to be recorded internally and transparently transmitted to the control room when the connection is restored, marking all such log entries to indicate it was recorded whilst the MDT was off-line. Parallel features are required in the event failure of the static CAD systems.

The MDT is required to support local management of the list of acceptable statuses;

reasons associated with the 'unavailable' status; and the rules concerning status use. It will enable changing of status consistent with rules based upon current status and will offer the predicted next status for selection. Where the status 'unavailable' is selected a pick list of reasons is required for user selection and, once that selection is made, an alert will be sent to a list of recipients or recipient groups in accordance with a locally configurable list (e.g. DSO, Workshops, Loggist). A single 'running call button' is required to immediately cause a change of status; create a incident record and assign it to the relevant resource. All status changes and any associated reasons will be recorded.

The MDT is required to provide a visible notification of receipt of an incident cancellation and provide opportunity to accept or decline the cancellation and adjust the status accordingly.

The MDT is required to accommodate the collection, storage and transmission of a wide variety of data sets; for example:

- Patient observations/readings (Electronic Patient Record Form - EPRF)
- LAS standard reporting forms

The MDT is required to receive and retain information concerning due dates for MOT and vehicle servicing, providing suitable reminders both on screen and to the control room for transmission, via interface, with Fleet. The reminders are required progressively as the due date draws closer. The MDT is required to cease all but the most basic functions if the due date passes without the Fleet interface providing an updated due date.

#### **6.4.7. Sector & Staff**

The new system is required to provide facilities at ambulance stations for standby resources to monitor incident allocations, resource availability and receive an audible alarm of an allocation to a resource which is currently on standby at that ambulance station.

The distributed architecture is required to provide terminals to the new CAD environment on station complexes for use by managers, administration and sector staff. Access control and role descriptions will enable sector management to monitor local incident volumes, performance, resource availability and the progress of individual incidents or resources. This will include facilities to enable sector managers to establish two-way communication (voice or text) with mobile resources and to place requests with a control room for a resource to return to base for management purposes.

A new system is required to provide suitable facilities for staff with disabilities. It will support swipe card facilities for logging on and off duty. It will provide interfaces with LAS Payroll and HR (or Electronic Staff Record) systems for sharing attendance data, overtime, skill profiles, training, sickness etc. It will include a real-time 'directory' listing of all control room or sector staff logged on. An interface with PROMIS will provide access to staff shift patterns and enable review of future vehicle crewing details.

The new CAD environment is required to provide accurate generic real-time performance information and to provide sector managers with real-time and anecdotal individual resource or collective utilisation and performance information including facilities for the setting of user configurable criteria against which to report exceptions.

The new system is required to provide facilities for tracking and communicating with



resources that are not using vehicles equipped with MDT; e.g. cycle, motorcycle and ambulance crews whilst away from the vehicle.

#### **6.4.8. Emergency Planning – Major Incident Handling – Incident Control Room**

The new CAD environment is required to provide advanced, agile, effective and user-friendly facilities for the preparation and simultaneous handling of multiple major incidents and operation of Incident Control Room(s). This is particularly poignant in the wake of the 7<sup>th</sup> July 2005 London bombings and the scale of potential event(s), major incident(s), terrorist alert(s) or other disaster(s) during the period of the Olympic Games in 2012. This will require locally configurable rules to enable 'single action' (or as near to as possible) declaration of a 'Major Incident' and activation of Incident Control Room (IRC) facilities.

Consistent with requirements outlined under EOC, IRC can be established either with or without a specific geographic area of responsibility and have access to the full range of facilities, interfaces and means of communication enabling it to operate as fully functional, virtual control room. Pre-planned action lists for such incidents/events are required to be available on line with shared facilities to electronically acknowledge or comment on each action and all updates saved in a log. Likewise, the predetermined roles and responsibilities will be available electronically.

Based upon locally defined rules, a new system is required to automatically select and deploy an initial batch of resources and other equipment to the command of Incident Control, upon activation. The system will also support subsequent deployment of further resources to the command of Incident Control if required, but will only allow their release by Incident Control. Resources deployed in this way but not currently tasked are required to remain allocated to Incident Control, and on standby by until tasked. The emergency equipment vehicles (EEV) and the emergency support vehicle (ESV) will all be fitted with MDTs and satellite navigation.

The new CAD environment is required to provide advanced and speedily operated messaging and alert facilities utilising standardised, templated and/or one-off messages to communicate, via a variety of different media, to internal LAS and external addressees, in accordance with entries held in locally maintained distribution lists. Through this means, it will provide quick and/or automatic alerts to essential staff of incidents conforming to locally defined trigger points.

The new system is required to incorporate automatic facilities to initiate various levels of implementation of the 'Catastrophic Plan', subject to compliance with locally definable rules and upon receipt of acceptable and recoded authority.

Facilities are required within the new CAD environment for the issue and logging of graded major incident cancellation messages, including global 'All Stop' messages for use in the event of hoax calls.

The very nature of the business areas within this section means that the requirements form a continuum between those that should clearly fall within the scope of this project and those that should fall within the scope of other, more specifically focussed, initiatives. Analysis of project scope will look carefully at defining the appropriate point(s) of demarcation along this line. This is particularly relevant in respect of, for example; emergency planning tools and data stores; advanced, networked, interactive, briefing, monitoring and generalised real-time information displays; or the provision and automatic, selective population of electronic status boards from the CAD record of major incidents or events.

#### **6.4.9. Press & Public Affairs (PAPA) – Patient Advice Liaison Service (PALS)**

Managing the flow and content of information beyond the boundaries of LAS, particularly at times of disaster, is vital to the efficient operation of control services and to ensuring the provision of a professional and caring service to patients and other customers.

The requirement for a distributed architecture and controlled, role-based access rights to the new CAD environment will support the provision of facilities (24 hours per day) to enable both of these business areas to monitor, search and set rules for automatic alerts to minimise unnecessary enquiries and actions within the control rooms but maximise the capability of these areas to monitor the current, and recent historic, overall operational picture and details of specific individual events. The new environment is also required to provide online fully searchable access to non-recent data.

Through controlled, role-based access rights and to minimise duplicity within corporate data and the fragmentation of related data stores, the business areas within this section require facilities to add entries against incidents where they have engaged in a recordable action relevant to that incident. These will include, for example; the release of information to the press; important information regarding the current level, slant or scale of information to be released; the source and nature of any patient advice query received and the response given; agreed frequent caller care plans.

#### **6.4.10. Fleet**

The new CAD environment will provide LAS with mission critical control room services, maintaining the condition, safety and availability of the LAS fleet is critical to the performance of those services. Whilst the scope of this project will not include the provision or upgrade of a fleet system, it will require an interface with the fleet system together with flexible and expandable facilities for the receipt and storage of vehicle telemetry to support staff safety, incident logging, and effective co-ordination between operational demand and scheduled or unscheduled vehicle maintenance. This may, subsequently, drive a need for improvement to the capabilities of the fleet system.

Through interfaces with other corporate data sources the new CAD environment is required to collate and provide user configurable displays of staff/sector rosters; vehicle availability and list of non-available or non-utilised vehicles, associated reasons, the period concerned and the current fleet schedule for rectification. It should automatically monitor the number of vehicles required to support crew rosters and provide alerts whenever a deficiency is detected or predicted.

The new system is required to automate the process associated with a vehicle being taken 'off road', providing 'one-stop' notification, together with reasons and automatic alerts to control rooms, sector supervisors and fleet maintenance staff (or their sub contractors) for action in accordance with operational priorities. Similar requirements exist for the notification and recording of vehicle faults and corresponding scheduling of resolution or repair.

The new system is required to provide fully flexible facilities for the management, allocation and association of vehicle call signs to fleet numbers (allocated exclusively by Fleet) and to include facilities for allocation, on a regular or ad hoc basis, of call signs to non-LAS vehicles whether or not they are used by LAS crews.

#### **6.4.11. Automatic Medical Priority Dispatch (AMPD) - Quality Assurance (QA)**

The new CAD environment is required to provide capabilities for full integration with the selected AMPD and other triage, prioritisation or structured telephone questioning and clinical decision support products. This is required to include full audit logs of questions asked, answers given and decisions made, together with all necessary facilities for undertaking quality assurance of the processes followed and endorsing the record to show when QA has been performed.

The system is also required to support the manual application of structured triage and/or clinical decision support processes and recording of outcomes, in the event of sub-system or interface failure.

To support the expansion of the QA function, the system is required to provide a locally configurable means to record, manage and monitor various aspects of the control room functions and responses of staff to various prompts, alerts, warning or other elements of operational control.

#### **6.4.12. Electronic Patient Record – Hand Held & Other Input Devices**

The new CAD environment is required seamlessly to interface with the facilities and resources of the National Programme for IT (NPfIT), specifically with National Electronic Patient Records, which are required to be accessible to response crews through MDT and/or other hand held devices. A locally developed Electronic Patient Record Form (EPRF), compliant with NPfIT standards or other national guidelines, is required for deployment on MDTs and/or other handheld devices for the collection of data during attendance at incidents, including facilities for collection of results from onboard patient monitoring and diagnostic equipment. Via interfaces with national systems, it is required that initial population of the EPRF should be from the National Patient Record and; subsequently the data should be transmitted via the national network (N3) to the relevant NHS partner to whom the patient is referred or transported. Where more than one vehicle attends an incident the facility is required to share electronic data already captured by the first responder to arrive on the scene.

Whilst the MDT will remain the predominant non-voice communication with vehicles for the foreseeable future the new system is required to support the use of other hand held and input devices. The vehicle based non-voice communications equipment is required to support input through screen (MDT), keyboard, bar code reader and/or voice recognition facilities.

Facilities are required for the collection, storage and transmission of digital images and video between a vehicle and control room and onward, via the national network (N3) to the relevant NHS partner to whom the patient is referred or transported.

#### **6.4.13. Resource Centres – Meal Breaks**

The new CAD environment is required to provide a seamless interface with the rostering system selected by LAS (PROMIS). Either through exploitation of the functionality of the selected rostering system or otherwise, it is required to provide a flexible and user-configurable view of current resource availability. Through the collation of information from a variety of sources and predicted resource demand, it is required to provide 'what-if' modelling capabilities and generate alerts, according to locally definable rules (established where possible by the use of artificial intelligence), to warn of predicted demand deficiencies.

Facilities are required to model the potential collective demand of future events (or

spikes) identifying deficiencies and enabling models to be stored and automatic alerts to be set when deficiencies are detected or when specific trigger points are reached.

The system is required to enable the local definition of a default shift pattern but allow appropriate users to amend the default on a per shift, per call sign, per sector basis; to manage when a crew starts earlier than, and/or continues beyond, their designated shift.

The new CAD environment is required to allow local definition of sector, call sign specific, geographical or event based default shift patterns but will default to a locally definable global shift pattern. The system is required to provide suitable alerts whenever a resource has not logged on within a locally definable time of the scheduled shift start time and/or where the rostering facilities determine a resource assumed to be double manned is only single manned.

Through local storage or interfaces with other corporate systems(s), the new CAD environment is required to provide fully searchable access to up-to-date and comprehensive records of the skill sets, level of training, experience and qualification of LAS and/or other personnel, together with their current operational status or availability.

A facility within the new CAD environment is required to ensure that local supervisors and/or managers are fully aware when a member of their staff reports for, or returns from, sickness; and the current reduction in their staffing levels due to sickness or other extractions.

Subject to ratification/clarification by the Agenda For Change – Meal Break Management Sub Committee, the new CAD environment is required to enable the definition of global, local or one-off scheduling of crew/call sign meal breaks; to provide alerts as required by locally definable rules when individual meal breaks become due; and record timestamps and log entries when a crew request release for a meal break, starts or ends a meal breaks, or are interrupted from a meal break; together with reasons why a requested meal break was delayed or the schedule brought forward. The new CAD environment is required to provide flexible facilities for producing reports to local and central supervisors and/or managers showing the adoption of meal breaks against schedule, the reasons for delay and facilities for approval of allowances applicable, where a meal break could not be taken within the scheduled period.

#### **6.4.14. Management Information**

For the exclusive purposes of the Management Information business area, the new CAD environment is required to include the provision a suitable new hardware platform upon which to host a replicated and synchronised data architecture within an identical (or compatible) database management system. Fault tolerant processes, tuned specifically to minimise performance degradation will operate regularly to copy or update all areas of relevant data from the live system to the Management Information platform where searches, reports and data manipulation can be undertaken without impact upon the live environment.

#### **6.4.15. Training**

The new CAD environment is required to include a training 'system' that replicates, so far as is operationally possible and practicable, the full functionality of the live system and, in those areas where accurate replication is not possible or practicable, then alternative representation of that functionality or facilities to mimic the functionality is provided.

The training system is required to be available to any user, according to the same rights of access as to the live system, and from any terminal at which the live system can be accessed. The training system is required to have dramatic and obvious visible difference to the live system that makes it very obvious to users which system they are logged into, without detracting from the reality of the experience or the functionality.

The training system is required to have facilities to enable trainers to define scenarios or record/copy calls and/or incidents from the live environment (including major incidents) for running during structured and controlled training sessions, with the means to 'roll back the clock' for review; partial or total rerun of the scenarios. It will include facilities for trainers to selectively corrupt static data or create challenging responses on a per-user or collection of users basis, and in order to test reactions.

Users and supervisors of the live system require the facility to mark the record of any live incident for automatic copy into the training system for analysis, complaint investigation or seeking personal learning, advice or exploration within a safe environment.

The training system is required to provide facilities to mirror, but not interact with, the live environment to enable the capability of trainees to be monitored against live events, in real time but without risk to the real world.

The system is required to record a user's attendance at training events, provide structured and automatically marked tests and record the results. This information will form part of Personal Development Records or contribution to other required qualification.

The new CAD environment requires the provision of comprehensive user training material supplied in a format that supports on-going maintenance, adjustment and upgrading by LAS Training Department.

#### **6.4.16. Central Intelligence Unit (CIU) & Loggist**

The new CAD environment is required to have swift and secure facilities (swipe card) for users to log on and off the systems and on and off duty. This should include all operational staff, whether control room or sector.

Interfaces are required with the LAS corporate Payroll system; Duty/Resource system (PROMIS) and HR/Training system so that duty/system log on or off provides an automatic record of hours work, remuneration due, and initiates any payment authorisation process that is required. It will also enable a comprehensive real-time listing of all staff that are currently on duty (and those due on duty) and correlate the duty against that planned by Resource Centres. This will enable a fully searchable skills profile/training record to staff on duty which can be used to assign appropriately trained and skilled staff to certain incidents.

The new system is required to include a variety of flexible and locally configurable facilities to provide additional support to staff welfare including, for example:

- the identification of lone worker resources, with scheduled or location based welfare checks and alerts when they are late or missed
- recording of crew exposure to dangerous substances or other conditions (e.g. radiation) and automatic control room alerts when further such incidents are assigned
- automatic control room and/or line manager prompts, in accordance with locally configurable rules, when incidents attended may require welfare considerations

- Potential for flagging addresses of LAS employees and generation of automatic alert to control room staff when address is involved in an incident and welfare issues may require attention.

The new system is required to maintain accurate records of 'do not resuscitate' patients providing automatic alerts when a relevant address is involved and enabling swift access to relevant details of the DNR order.

The new CAD environment is required to include enhanced facilities for the collection and dissemination, to briefings, mapping or satellite navigation; of information regarding temporary road closures, hospital closures and associated divers, daily events log from the Metropolitan Police, weather warnings and so on.

The system is required to enable appropriate users to record adjustments to a default shift pattern or duty rota, where necessary.

## **7. CONCLUSION**

This product addresses 'what' is required. Other products consider questions about 'how' these requirements may be provided.