



---

## **A104 To-Be Process Description**

### **Business Process Model**

*Customer: Provincial Government of the Western Cape (PGWC)  
Medical Emergency Transport and Rescue Organisation (METRO)  
Emergency Medical Services (EMS)*

METRO EMS Confidential



---

## Document History

---

### Revision History

Revision Number	Revision Date	Summary of Changes	Changes marked
1.1	2010-01-28	Final Version	No

---

### Approvals

This document requires following approvals.

Name	Title
Dr. Cleeve Robertson	Director – Emergency Medical Services

---

### Distribution

This is the intended distribution list for this document:

Name	Title
Dr. Krish Vallabhjee	Chief Director EMS - Provincial Government of the Western Cape (Sponsor)
Dr. Cleeve Robertson	Director – Emergency Medical Services
Dr Shaheem de Vries	Deputy Director - Emergency Medical Services
Johan Schoombee	Project Manager – Emergency Medical Services
Dr Paul von Zeuner	Information Management - Provincial Government of the Western Cape
Steve Hurwitz	Centre of e-Innovation - Provincial Government of the Western Cape
Dr. Alan MacMahon	Deputy Director - HealthNET

A printed copy and soft copy on CD media will be handed to Dr Shaheem de Vries for further distribution within EMS and PGWC.



# Contents

- 1. Introduction..... 6
  - 1.1 Identification..... 6
  - 1.2 Document Context..... 6
  - 1.3 Document Description..... 6
  - 1.4 Purpose..... 7
  - 1.5 References..... 7
  - 1.6 A notation explanation..... 7
- 2. Operational Context..... 9
- 3. “To-Be” EMS Operational Process Detail..... 11
  - 3.1 Call Handling..... 14
    - 3.1.1 Caller..... 15
    - 3.1.2 Call Handler..... 16
    - 3.1.3 External Call Handler..... 16
    - 3.1.4 Dispatcher..... 16
    - 3.1.5 Supervisor..... 16
    - 3.1.6 Log A Call..... 17
    - 3.1.7 Determine Whether To Call Back Caller..... 18
    - 3.1.8 Answer Call..... 19
    - 3.1.9 Transfer to EMS..... 21
    - 3.1.10 Verify Caller And Establish Event And Priority..... 23
    - 3.1.11 Transfer To Health Contact Centre..... 34
    - 3.1.12 Capture Advanced Booking..... 35
    - 3.1.13 Capture Event Information..... 36
    - 3.1.14 Address Verification..... 37
    - 3.1.15 Assign Event To Dispatcher..... 38
    - 3.1.16 Handle Escalated Call..... 40
  - 3.2 Incident Handling..... 42
    - 3.2.1 Commander..... 43
    - 3.2.2 Gather METHANE Information..... 43
    - 3.2.3 Follow Protocol..... 45
    - 3.2.4 Gather Further Information..... 46
    - 3.2.5 Initiate Actions..... 46
    - 3.2.6 Monitor Incident..... 47
    - 3.2.7 Change Protocol..... 48
  - 3.3 Issue Advance Booking Schedule..... 48
  - 3.4 Dispatching..... 49
    - 3.4.1 Dispatcher..... 50
    - 3.4.2 Response Unit..... 51
    - 3.4.3 Group 1 – Automated..... 51
    - 3.4.4 Group 2 – Could Be Automated..... 51
    - 3.4.5 Group 3 – Could Be Automated..... 51
    - 3.4.6 Determine Estimated Response Time..... 51




---

3.4.7	Determine Auto-Dispatch Appropriate.....	53
3.4.8	Accept Responsibility .....	55
3.4.9	Determine What To Dispatch .....	57
3.4.10	Dispatch Resource.....	63
3.4.11	Request Acknowledgement From Dispatched Resource.....	64
3.4.12	Acknowledgement Of Dispatch By Resource .....	66
3.4.13	Allocate Booking To Transport .....	66
3.4.14	Handle Escalated Event .....	68
3.5	Emergency Patient Handling .....	69
3.5.1	Dispatcher .....	70
3.5.2	Response Unit .....	71
3.5.3	EMS Resource.....	71
3.5.4	Navigate To Site.....	71
3.5.5	Resource On Site Confirmation .....	72
3.5.6	Assessing Patient.....	72
3.5.7	Evaluate and Take Appropriate Action.....	74
3.5.8	Find Additional Information .....	76
3.5.9	Determine And Designate Healthcare Facility .....	77
3.5.10	Transport To Healthcare Facility .....	91
3.5.11	Handed Over To Healthcare Facility .....	94
3.6	Non-Emergency Patient Handling.....	96
3.6.1	Dispatcher .....	98
3.6.2	EMS Resource.....	98
3.6.3	Navigate To Site.....	98
3.6.4	Resource On Site Confirmation .....	99
3.6.5	Evaluate and Take Appropriate Action.....	99
3.6.6	Find Additional Information .....	103
3.6.7	Determine And Designate Healthcare Facility .....	104
3.6.8	Transport To Healthcare Facility .....	117
3.6.9	Handed Over To Healthcare Facility .....	118
3.7	Resource Scheduling .....	121
3.7.1	Update Transport Availability Plan .....	123
3.7.2	Update Leave Taken/Predicated .....	123
3.7.3	Update Equipment Availability .....	124
3.7.4	Update Service Conditions.....	125
3.7.5	Update Squad Structure .....	125
3.7.6	Prepare Demand Information.....	127
3.7.7	Create Resource Schedule.....	128
3.7.8	Review and Update Resource Schedule.....	130
3.7.9	Publish Resource Schedule .....	130
3.7.10	Instantiate Initial Squad Schedule.....	131
3.7.11	Supervisor Adjustment.....	132
3.8	Resource Tracking.....	132
3.8.1	Record Vehicle Location .....	134



---

3.8.2 Record Resource Location And Status ..... 134

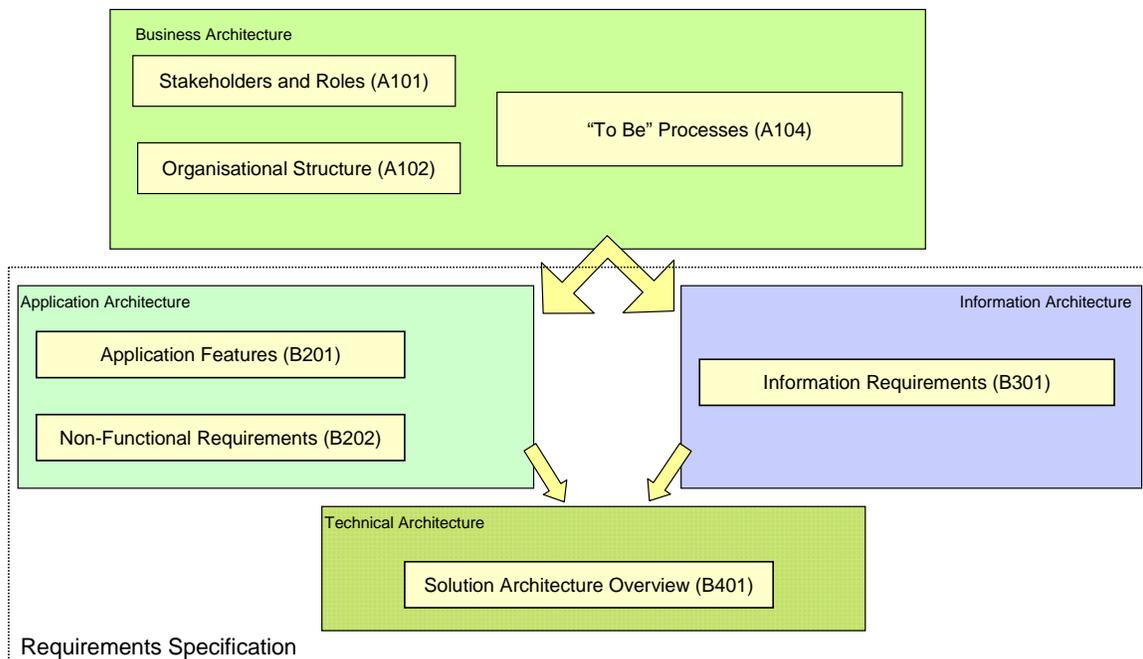
# 1. Introduction

This chapter identifies the document and the business to which it relates, describes the contents of the document, and states its purpose.

## 1.1 Identification

This document describes the “To-Be” Business Processes Model (BPM) for the Emergency Medical Services (EMS) core operational process. This Project is a Requirements Specification Phase for Provincial Government of the Western Cape (PGWC) METRO EMS in preparation for a Tender for Services.

## 1.2 Document Context



## 1.3 Document Description

The Business Process Model (BPM) is the "Business" component of the Enterprise Architecture. A BPM identifies and defines the business processes, which are required in order for the enterprise to meet its business objectives. In this case the operational objectives of EMS. It identifies the natural boundaries and partitioning of these business processes, and shows how these different partitions, or groups, relate to each other by means of the flow of information, dependencies and events that influence the processes.



This BPM is to identify all the operational processes that are needed to support the operational objectives of an Emergency Medical Services operation.

The processes were determined firstly by reflecting on the “As-Is” process and the determining how it can be improved. This was done via workshops with experienced personnel. It was also referred to a Subject Matter Expert for input and their feedback was considered. There after this was reviewed by the whole team for comment and then the approver before being signed off.

---

## 1.4 Purpose

In more general terms the Business Process Model (BPM) is used:

- To ensure future applications are aligned with the business processes of the PGWC METRO EMS (primarily emergency control centre operations focused).
- To provide a basis of the functional business requirements that the applications need to support.
- As a basis for partitioning business function - this helps to deal with the complexity of the process, whilst maintaining a single, comprehensive view of the operations.

More specifically the “To-Be” BPM was done to establish how EMS wants to run their operations in future. It lays the ground work for the features that they expect of the applications and technology solutions to come.

Some observations of limitations, needs or specific decisions by the EMS personnel in the workshops are provided. This is not intended as a complete list of issues, risks or solutions. Neither has a “gap analysis” been done between the “As-Is” and the “To-Be” process for any of these observations to be seen as a “how to” resolve the short comings of the “As-Is” process. The observations are only to set the context of the process description.

---

## 1.5 References

This document is based on and refers to the following documents:

- [1] Hasso Platner Institut, University of Potsdam, Authors: Gero Decker, Alexander Grosskopf, Sven Wagner-Boysen, "BPMN – Business Process Modelling Notation, wall chart".
- [2] A101 Stakeholders v1.1
- [3] A102 Organisation Structure v1.1
- [4] A103 As-Is Process v1.1

---

## 1.6 A notation explanation

The notation used in this report is Business Process Modelling Notation (BPMN) version 1.2. It is a standard for business process modelling currently maintained by the Object Management Group (OMG). See Annexure A for a full list diagrammatic shapes that are used in BPMN v1.2 [1]. In addition also see the "wikipedia" explanation of what BPMN is [http://en.wikipedia.org/wiki/Business\\_Process\\_Modeling\\_Notation](http://en.wikipedia.org/wiki/Business_Process_Modeling_Notation) . Annexure A also explains that a simplified subset has been used to make the diagrams easily understandable by the intended audience.

Each of the activities, events and objects, as well as the connections between them is described in further detail in this document. The activities are each given a unique identity number. This starts with L1, L2, et cetera to indicate what level the activity is. This is followed by a unique number for that level. For



---

example L2.4 is an identity number for a L2 activity. No indication is given as to which L1 diagram this is found on. The reason for this is so that the L2 activity could be moved to wherever it needs to be without changing its unique number.



---

## 2. Operational Context

This document is a description of the operational processes related to EMS emergency control centres both at Tygerberg and the District emergency control centres of Moorreesburg, Beaufort West, Bredasdorp, George and Worcester. Their operations are designed to react to four types of demand on the EMS services, namely:

- Incident management, which is normally handled by the METRO Control desk;
- Patient emergencies;
- Non-emergency transport of patients; and
- HealthNET prebooked medical transport services.

The Cape Town metropole services will run as East and West areas within which there are smaller zones that are based on groupings of healthcare facilities. However the Districts are not split and have a smaller number of healthcare facilities and EMS resources at their disposal. The District emergency control centres also perform this service for Fire and Traffic, whereas in Cape Town the Fire and Traffic Departments have their own contact numbers and control centres (and systems). The METRO Control desk controls incidents within the metropole and supervises incidents that occur in, and are controlled by the District emergency control centres. It is the intention that the To-Be operations should be such that any of the emergency control centres could take over any other District or even part or the whole of the Cape Town metropole.

Here follow some observations of limitations, needs or specific decisions by the EMS personnel in the workshops. This is not intended as a complete list of issues, risks or solutions. Neither has a “gap analysis” been done between the “As-Is” and the “To-Be” process for any of these observations to be seen as a “how to” resolve the short comings of the “As-Is” process. The observations are only to set the context of the process description.

### **Some observations:**

- The main business objective remains the same as for the “As-Is” process. Namely to get EMS resources to the incident/patient as quickly as possible. In the “As-Is” process there are many areas where unnecessary time is lost between receiving the call and arriving at the incident location. This has been addressed in the “To-Be” process where possible.
- All the information that is being recorded and kept must be able to be used to produce meaningful statistical and management information. In fact the statistical information is necessary for better resource scheduling. In addition historical information specific to a Caller an Incident and / or a Patient is helpful to have and use during the Call Handling.
- Information at the time of operational response must be clearly visible and easily accessible.
- Voice communications by radio and telephone do not provide for clearly conveying of information. This often leads to misunderstanding and things needing to be spelt out or repeated. A text communication augmented with radio would be better.
- A well integrated vehicle tracking, which provides a location by latitude and longitude, is required. This should enable real-time visual tracking of all Resources and Events.
- There is a need for integration into the Healthcare Facility applications. Purposefully this should provide all available information about emergency arrivals. In addition there should be follow up information provided back to EMS about the patient’s referrals.



- 
- The EMS emergency control centres rely heavily on the availability of those EMS Resources. They therefore need more specific information from those that “control” the resources so that they can suggest an EMS Resource schedule that matches their needs based on statistical and other known Environmental Conditions.



### 3. “To-Be” EMS Operational Process Detail

The operational process simplistically requires:

- Taking and directing a call after determining the urgency and type of emergency
- Directing activities through dispatching and / or scheduling services
- Executing the service including the transport of patients to Healthcare Facilities

The Level 1 (L1) overview diagram (on the next page) of the EMS operational process clearly indicates these elements through these core activities, namely: Call Handling, Incident Handling, Issue Advance Booking Schedule, Dispatching and either the Emergency Patient Handling or Non-Emergency Patient Handling sub-processes. These are fundamental to the operational process of the EMS emergency control centre in the fulfilment of its role to accept calls from various parties and where required direct and provide medical transportation and rescue services appropriate to the call. To be noted is that when a Call is about an Incident then the Incident Handling is initiated in parallel to the initial Dispatching. Thereafter the Incident Handling controls all other related calls and initiates Dispatching as and when required. The supporting sub-processes of Resource Scheduling and Resource Tracking are necessary to provide the emergency control centre with accurate up to date information about the resources that are available for them to deploy as necessary. Whereas Follow Up On Patient and Follow Up On Incident point to management activities that close out the patient and incident services respectively. The Issue Advance Booking Schedule sub-process shows where in the process this service is initiated after the advance bookings have been allocated from an initial Call.

#### **Some terminology:**

Here follows some terms that are used throughout process description that follows.

#### **Event / Incident / Call / Booking:**

An **Incident** is defined by the incident types (see Annexure B) but generally this is something like a multiple vehicle accident with people trapped.

A **Call** is when someone calls in to request emergency medical services or report an Incident. Within the emergency control centre the response to a Call is also called a Call but this can be confusing.

Therefore this document uses the term **Event** when referring to either an Incident or the response to a Call for a Patient Emergency or Non-Emergency service.

A **Booking** is when someone requests a service in advance. This is usually for inter district and or inter healthcare facility transfers (i.e. HealthNET and TRANSMETRO).

#### **Response Unit / EMS Resource / Ambulance:**

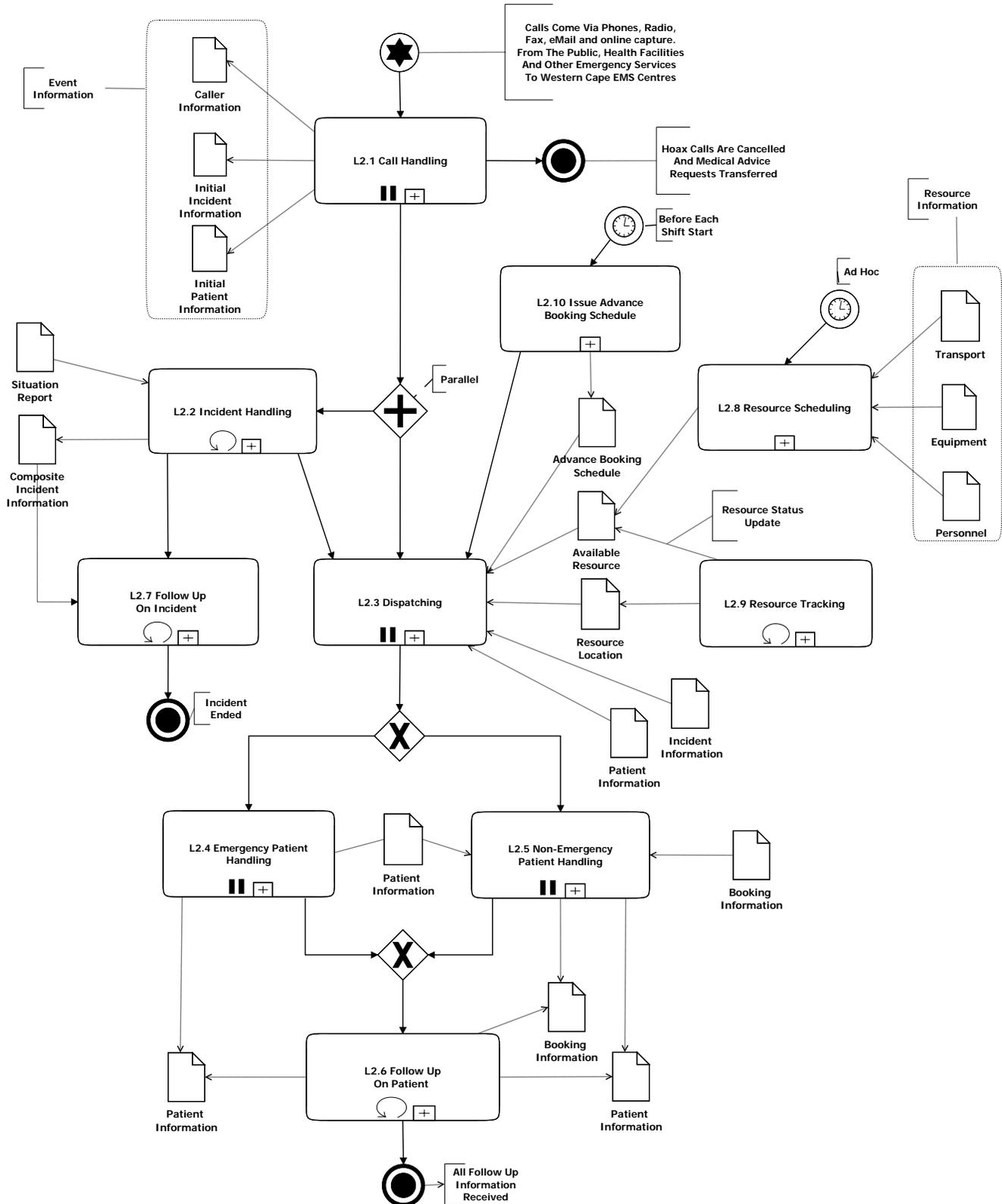
EMS does not only provide an **Ambulance** service but also rescue services and patient / out-patient transport. Therefore the term **EMS Resource** has been used in this document to mean all resources that the EMS emergency control centre directs in the operation of their services. In addition **EMS Resource** means the vehicle, equipment and personnel that form a unit to provide the service.

In addition the term **Response Unit** is used to describe a “unit” from any emergency service (3<sup>rd</sup> party emergency services, fire, traffic or police) that either respond to an Event or are “on scene”. In the processes described here this most often is also an EMS Resource.

**BPMN diagram: EMS Operational Process Overview (see next page).**



# L1.1 - EMS Operational Process Overview





In this Level 1 (L1) overview diagram (on the previous page) there are certain key aspects of the process and its components that are important to describe to understand the high level generic view of this operational process.

### **Start and End**

The process starts with a call from a Caller via many mechanisms but usually telephone for patient emergencies and often radio for incidents. Once an incident is deemed over and a follow up has been done the process ends for an incident. For patient handling (emergency or not) the process ends after a patient follow up with the healthcare facility the patient was handed over to.

In the detail of the process description at both Level 2 and 3 there are other interim starts and stops that indicate how the process flows from one process diagram to another. There are also other specific “stop” and termination points at the detailed level.

### **Event Information**

The term Event relates to the “event” that has happened, for which services might have been required, and which needs to be recorded by EMS. This therefore starts with the **Caller Information** and then depending on what type of Event either **Patient Information** and / or **Incident Information**. In the description that follows Event information therefore refers to both Patient and Incident information depending on the context. It can also mean Caller information in addition to Patient and / or Incident information. The idea is that whatever Callers, Patients, EMS Resources, et cetera that are involved in an Event should be linked together and stored for audit and reporting purposes. This includes voice logs and any other evidence available.

During Call Handling the Event Information is primarily the Caller Information and the “initial” Patient Information and / or Incident Information, most critically location with severity / priority being determined. Thereafter during the rest of the process the Patient Information and / or Incident Information is augmented by the Response Unit most often an EMS Resource. The Event Information could need to be added to with additional information even after it has been closed during Follow Up On Incident and / or Follow Up On Patient. For an incident all the information about the incident is referred to as **Composite Incident Information**.

### **Resource Information**

This is all the information about all the **EMS Resources**. An EMS Resource is a “unit” that could be composed of a form of **Transport** and / or **Equipment** and the **Personnel** that operate them. The Transport is typically ambulances, response cars, rescue units, transports, helicopters and aeroplanes. Most Equipment is standard depending on the type of Transport and the level of care it is used for namely: Advanced Life Support (ALS), Intermediate Life Support (ILS) and Basic Life Support (BLS). But some equipment, for example incubators, need to be specifically indicated as part of a specific EMS Resource. The Personnel are also expected to have the qualifications dependant on the “unit” they are assigned to. Basic information like names and cellular telephone numbers are used.

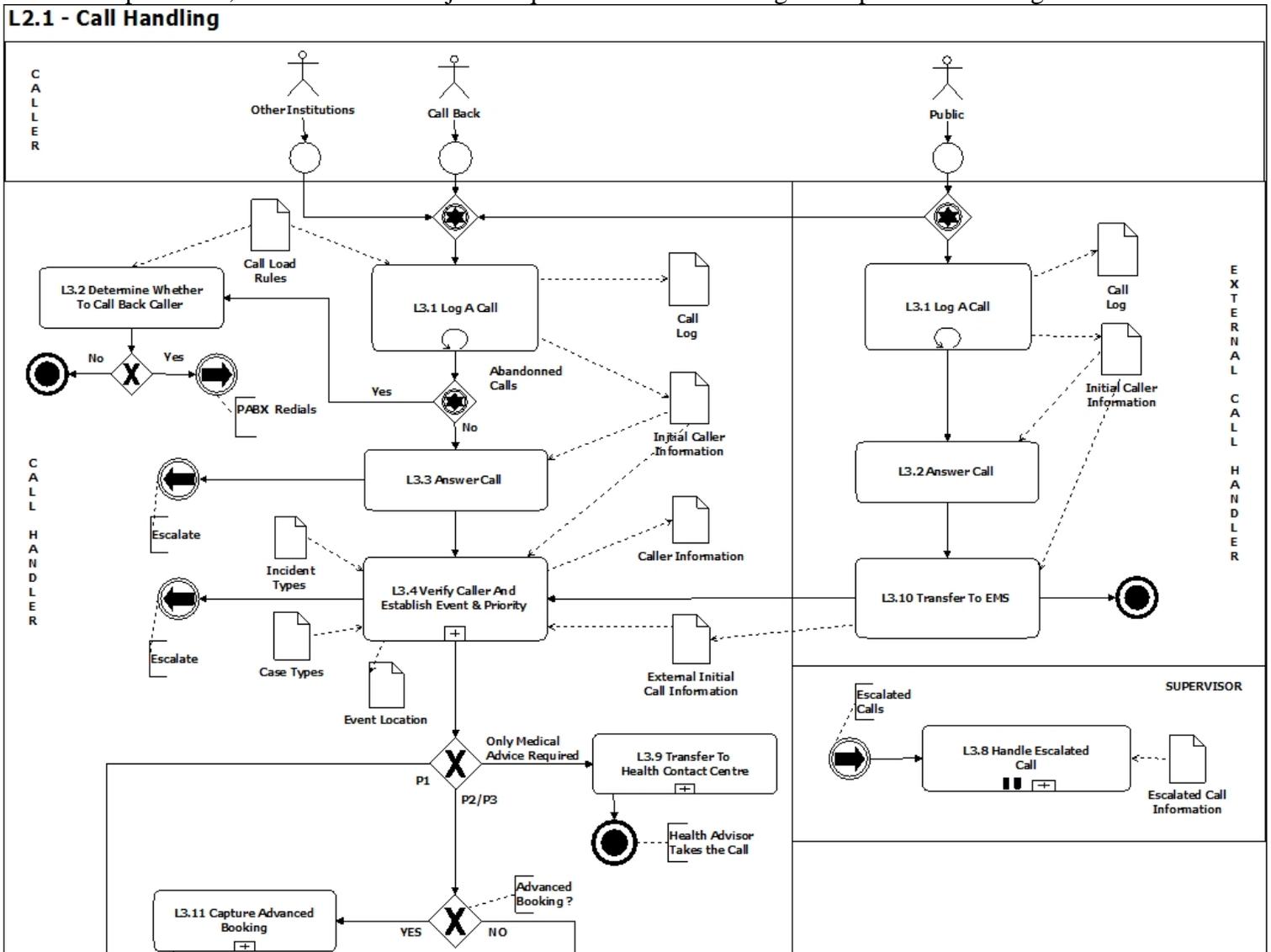
The term **Response Unit** is specifically used to refer to the first “unit” on site. This does not necessarily need to be an EMS Resource. It could be any other emergency service, traffic or SAPS that provide the Dispatcher with the initial on site Situation Report.



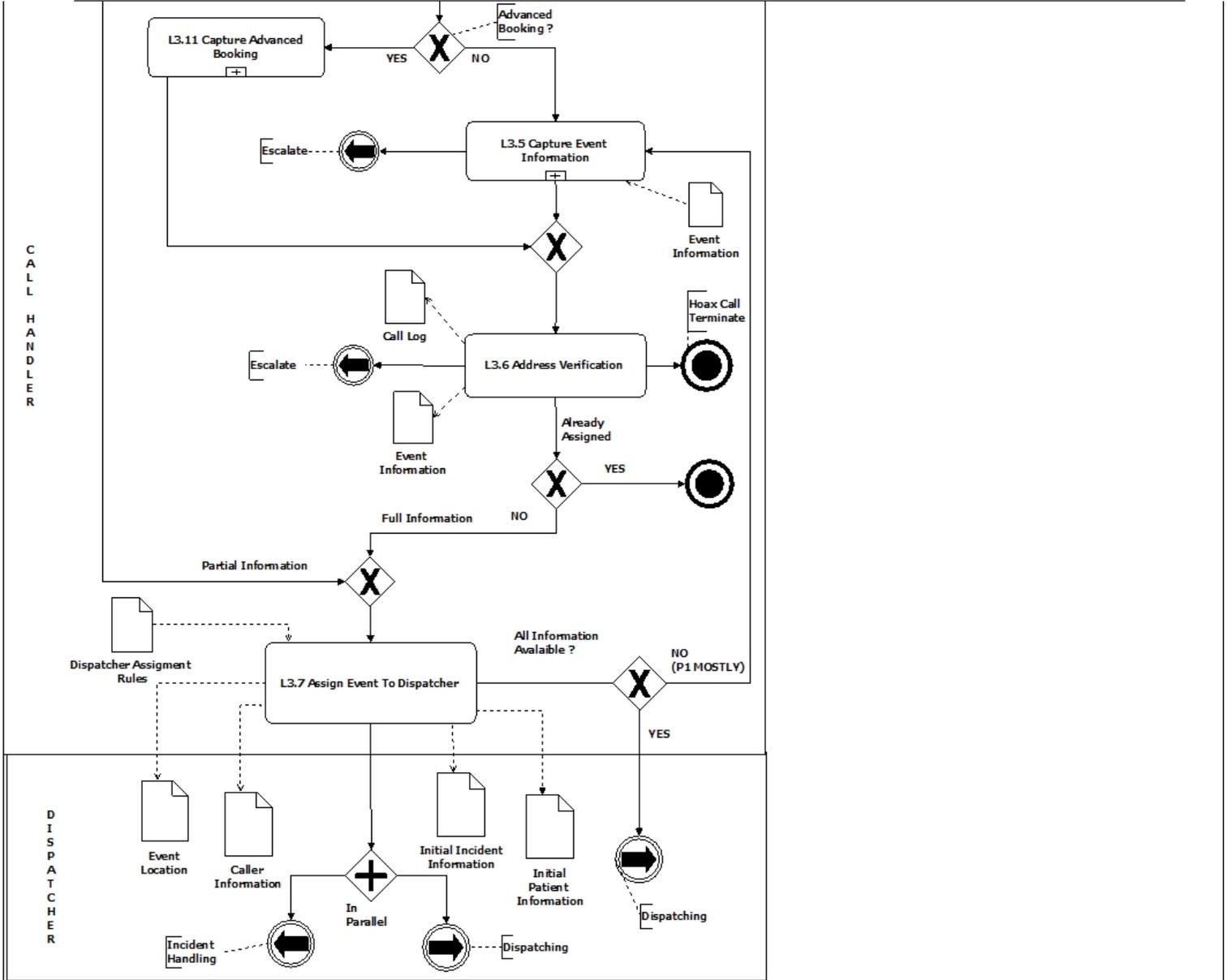
### 3.1 Call Handling

Type: Sub-process with multiple instance  
ID: L2.1

Call Handling is one of the core sub-processes of the EMS emergency control centre operations. It is the process of gathering information when a call is received about an event. It primarily documents the interaction between a Caller, Call Handler, including an External Call Handler and the handover to a Dispatcher. Call escalation is also illustrated with the interaction between the Call Handler and the Supervisor. The External Call Handler is when a call is received by 3<sup>rd</sup> party call centres such as 112 and then later transferred to a Call Handler at the EMS emergency control centre. The different roles, tasks, sub-processes, and information objects required for Call Handling are depicted in the diagram below.



(Continued on next page)



### 3.1.1 Caller

Type: Lane

The Caller is the role of the person who makes the call regarding an event or booking. The Caller can either be the public, other institution or an automated call back for missed calls.

An institution is either another Emergency Service such as the fire department, the traffic department, or healthcare facilities calling the EMS Emergency Control Centres. Or it could be an EMS resource on duty that comes across an incident or patient emergency.

The public can be defined as members of the general public calling the EMS emergency control centres or other call centre i.e. 112, 107, cellular phones providers for assistance.



---

### 3.1.2 Call Handler

Type: **Lane**

The Call Handler is the role of the person who receives the call at the EMS emergency control centre. The Call Handler will capture the information regarding the event or the booking. The Call Handler will assign the event initiated by the call, to a Dispatcher. This could either be after taking down all the details of the event and hanging up with the Caller or if after reviewing the details it is determined it is a Priority 1 event then it will be assigned immediately to a Dispatcher and continuing the conversation with the Caller to get more details.

The Call Handler can receive a call via telephone or radio. The person receiving the call might be playing a different role when the call comes in but when they answer the call, they become the Call Handler during the duration of that call. For instance if a dispatch desk e.g. the METRO CONTROL desk receives a call via radio, they become the Call Handler.

For Non-Emergency Patient transport the Call Handler role would be automated when receiving an online booking from a Healthcare Facility on behalf of a patient or it could need the Call Handler to capture the booking from the information received in a fax.

### 3.1.3 External Call Handler

Type: **Lane**

The External Call Handler is the role of the person who receives the call at a 3<sup>rd</sup> party call centre or at the other emergency services. The External Call Handler will capture the Caller information and if they determine that METRO EMS services are required they will transfer the Call to the EMS emergency control centre. The Call will be transferred along with the Call Information (including Call Log) and Initial Event Information to an EMS emergency control centre Call Handler. Only the EMS emergency control centre Call Handler will assign the call to a Dispatcher.

### 3.1.4 Dispatcher

Type: **Lane**

The Dispatcher is the role of the person who handles the event or the booking once the Call Handler has established the priority and captured the event information. In some cases, the Call Handler and the Dispatcher can be the same person. This is the case in the District emergency control centres.

In the case of a Priority 1 (P1) emergency the Dispatcher could be dispatching whilst the Call Handler is still finalising the event information with the Caller.

### 3.1.5 Supervisor

Type: **Lane**

The Supervisor is the role of the person who manages the Call Handler. The Supervisor handles problematic calls and any other issues that can arise during the Call Handling process.



### 3.1.6 Log a Call

Type: **Repeating sub-process**

ID: **L3.1**

Role: **Call Handler or External Call Handler**

All incoming telephone calls are logged by the telephone system before the Call Handler picks up the call. The information about the call, such as time of call, incoming telephone number, GIS location of Caller and duration of call is logged in a Call Log.

If the incoming telephone number is available, the telephone system can redial the number and put the call in the queue if the call is abandoned before the Call Handler picks it up (see Determine Whether to Call Back the Caller). The Call Load rules are used to monitor the incoming call load so that the appropriate number of Call Handlers can be made available during peaks and the load is redistributed amongst Call Handlers if necessary. Possibly other call centres, e.g. 112 do not do this, i.e. for External Call Handlers. This is indicated as a repeating sub-process because for the entire time that the Caller is connected to the call centre the call is recorded and its duration is logged. In addition the call volumes are monitored and redistributed amongst the Call Handlers to manage the volume.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Caller	Log A Call	The public either call the EMS emergency control centre directly or they might call another emergency service or 3 <sup>rd</sup> part call centre. When the Caller calls any Call Centre the call is logged by the telephone system. If the Caller calls another Emergency Services the at least the time of the call is logged.
<b>Sequence Flow</b> Source -> Destination	Log A Call	Determine Whether To Call Back Caller	For EMS emergency control centre calls if the call is abandoned, it should be determined whether to call back the Caller when the telephone number is available.
<b>Sequence Flow</b> Source -> Destination	Log A Call	Answer Call	Once the call is picked up, the Call Handler must start speaking to the Caller, whenever possible in the Callers preferred language.
<b>Object Flow</b> Source -> Destination	Log A Call	Call Log	When the call is logged all the information received is kept in the Call Log. It is the output to this task and is added to during the tasks that interact with the caller.
<b>Object Flow</b> Source -> Destination	Call Load Rules	Log A Call	The Call Load Rules are used to manage the load of incoming calls. During peaks, the Call Handlers load can be redistributed if required. It is



Connector	Source	Target	Notes
			an input to this task.
<b>Object Flow</b> Source -> Destination	Log A Call	Initial Caller Information	The contact telephone number of the Caller might be available from the telephone system. The GIS location of the Caller might also be obtained at this point. It is the output to this task.

### 3.1.6.1 Call Log

Type: **Object**

This object is the output to the Log a Call task. When the call is logged, a report is produced from the information received such as time of call, duration of call, incoming telephone phone number. The Call log is created when the call is received and is thereafter updated until the call is terminated.

The Call log also includes a voice recording of the call for quality assurance purposes.

### 3.1.6.2 Initial Caller Information

Type: **Object**

This object is the output to the Log a Call task. The telephone number of the Caller might be available from the information that is coming through the telephone system. The GIS location from where the Caller is calling might also be available. From the telephone number the physical address or the area determined by the prefix could also be available.

### 3.1.6.3 Call Load Rules

Type: **Object**

The Call Load Rules are applied whilst monitoring the incoming call load so that the appropriate number of Call Handlers can be made available during peaks and the load is redistributed amongst Call Handlers when and where necessary.

### 3.1.7 Determine Whether to Call Back Caller

Type: **Task**

ID: **L3.2**

Role: **Call Handler**

If a call is abandoned before a Call Handler answers it, the telephone system is able to redial the number and send it to a queue for next available Call Handler to pick up.

The Call Load Rules are used to determine after how many times a telephone number should be redialled. As well as whether calls to a specific emergency control centre number need special attention. For example if there are special emergency control centre numbers that are used for P1 emergencies or incidents then any abandoned calls to this number would need special attention and a Call Back would be desired.

The call can be abandoned at any stage of the Call Handling process. If it had already been answered it would be best to schedule the Call Back to the same Call Handler if possible. In addition the previous Call Information should be available to the Call Handler.



### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Log a Call	Determine Whether To Call Back Caller	If the call is abandoned, the telephone system is able to call back the Caller if the telephone number is available.
<b>Sequence Flow</b> Source -> Destination	Log a Call	End Event - Terminate	The call is terminated when telephone system cannot call back the telephone number. Or when a rule says it should not be called back.
<b>Sequence Flow</b> Source -> Destination	Log a Call	Intermediate Event - Link telephone system Redials	If the call is abandoned, the telephone system is to able redial the telephone number if available.
<b>Object Flow</b> Source -> Destination	Call Load Rules	Determine Whether To Call Back Caller	The Call Load Rules are used to determine after how many times a telephone number should be redialled. As well as whether calls to a specific emergency control centre number need special attention. After a certain number of redials, the telephone system will stop based on these rules.

#### 3.1.7.1 Call Load Rules

Type: **Object**

The Call Load Rules are used to determine after how many times a telephone number should be redialled. As well as whether calls to a specific emergency control centre number need special attention. After a certain number of redials, the telephone system will stop based on these rules.

#### 3.1.8 Answer Call

Type: **Task**

ID: **L3.3**

Role: **Call Handler or External Call Handler**

This task is the action of verbally answering the call by the Call Handler.

The Call Handler identifies the language spoken by the Caller, and if necessary transfers the call to another Call Handler who can communicate with the Caller in the same language.

The Call Handler information will be updated on the call log.

The Call Handler will escalate the call to the Supervisor if s/he is having difficulties liaising with the Caller. Depending on the circumstances the Supervisor could either:

- take over the Call;
- listen into the Call on mute;



- conference into the Call so that s/he can participate in the conversation.

**Connections**

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Log a Call	Answer Call	Once the call is picked up, the Call Handler must start speaking to the caller.
<b>Sequence Flow</b> Source -> Destination	Log a Call	Intermediate Event – Link Escalate	The Call Handler can escalate the call to supervisor if required.
<b>Sequence Flow</b> Source -> Destination	Answer Call	Verify Caller And Establish Event And Priority	Once the Call Handler has answered the phone, s/he needs to verify the Caller information and establish event information.
<b>Sequence Flow</b> Source -> Destination	Answer Call	Transfer to EMS	Once the External Call Handler determines that the Call has the need for Emergency Medical and / or Rescue services they will transfer the Call and all the Call Information to the EMS emergency control centre.
<b>Object Flow</b> Source -> Destination	Initial Caller Information	Answer Call	The contact telephone number of the Caller might be available from the telephone system. The GIS location of the Caller might also be obtained at this point. From the telephone number the physical address or the area determined by the prefix could also be available. This could help determine the probable language of the Caller. It is the input to this task.

**3.1.8.1 Initial Caller Information**

*Type:*            **Object**

This object is the input to the Answer Call task. The telephone number of the Caller might be available from the information that is coming through the telephone system. The GIS location from where the Caller is calling might also be available. From the telephone number the physical address or the area determined by the prefix could also be available. This could help determine the probable language of the Caller.



### 3.1.9 Transfer to EMS

Type: **Task**

ID: **L3.10**

Role: **External Call Handler**

This task is the only done by the External Call Handler when they determine that the Call has the need for Emergency Medical and / or Rescue services.

The External Call Handler transfers the Call with all the information they have so far determined from the Caller to the EMS emergency control centre and requests and receives a reference number for the Call that is handed over. The EMS Call Handler continues to verify the Caller and establish the Event.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Answer Call	Transfer to EMS	Once the External Call Handler determines that the Call has the need for Emergency Medical and / or Rescue services they will transfer the Call and all the Call Information to the EMS emergency control centre.
<b>Sequence Flow</b> Source -> Destination	Transfer to EMS	Verify Caller And Establish Event And Priority	Once the External Call Handler transfers the call to the EMS control centre and requests and receives a reference number for the Call that is handed over. The EMS Call Handler continues to verify the Caller and establish the Event.
<b>Sequence Flow</b> Source -> Destination	Transfer to EMS	Terminate Event	The External Call Handler then terminates his part in the call and closes the 3 <sup>rd</sup> party call centre Call Log.
<b>Object Flow</b> Source -> Destination	Initial Caller Information	Transfer to EMS	The contact telephone number of the Caller might be available from the telephone system. The GIS location of the Caller might also be obtained at this point. From the telephone number the physical address or the area determined by the prefix could also be available. It is the input to this task.
<b>Object Flow</b> Source -> Destination	Transfer to EMS	External Initial Call Information	During the Call the External Call Handler captures information about the Caller and what Event they are reporting. In addition a Call Log is kept with voice recording of the call. This information is transferred with



Connector	Source	Target	Notes
			the Call to the EMS control centre.



### 3.1.9.1 Initial Caller Information

*Type:* **Object**

This object is the input to the Transfer to EMS task. The telephone number of the Caller might be available from the information that is coming through the telephone system. The GIS location from where the Caller is calling might also be available. From the telephone number the physical address or the area determined by the prefix could also be available.

### 3.1.9.2 External Initial Call Information

*Type:* **Object**

During the Call the External Call Handler captures information about the Caller and what Event they are reporting. In addition a Call Log is kept with voice recording of the call. This information is transferred with the Call to the EMS control centre.

### 3.1.10 Verify Caller and Establish Event and Priority

*Type:* **Sub-process**

*ID:* **L3.4**

*Role:* **Call Handler**

This sub-process has been described in a Level 3 diagram to illustrate the verification process ([See Level 3 Detail: Verify Caller and Establish Event and Priority](#)), but here follows an overview of the sub-process.

The first step for the Call Handler is to ask the Caller questions to verify the source of the call, the identity and the location of the Caller as well as to establish information about the Event namely its nature, severity and location. If available, the Call Handler will use the Initial Caller Information obtained from the telephone system to verify whether the location of the Caller is in fact also the location of the Event. If not they will then establish the Event location.

The Call Handler will ask questions to determine whether the call is about an Event that is an Incident and the Incident Type or for patient transport what the Case Type is and its priority (see Annexure B). This priority classification is a dispatch priority and indicates what response time will be strived towards.

Incidents are always a Priority 1 (P1). Calls for patient emergencies are either a Priority 1 (P1), as per specific Case Types ([see Emergency Patient Handling](#)) or Priority 2 (P2), when they are not able to walk, or otherwise Priority 3 (P3) ([see Non-Emergency Patient Handling](#)). Calls for advance bookings by healthcare facilities for inter healthcare facility transfers or inter district transfers are usually P3 or P2 but could be P1. Usually the out-patient transportation (HealthNET) bookings are P3 but could sometimes be P2.

For P1 Events, the Event needs to be assigned to a Dispatcher immediately after a partial registration, whilst the Call Handler is gathering more information about the Event. In the case of a patient emergency the response is described in Dispatching and then Emergency Patient Handling. In the case of an Incident the response is described in Incident Handling, Dispatching and possibly either or both Emergency Patient Handling and Non Emergency Patient Handling.

For P2 and P3 the Call Handler continues to gather all the information required from the Caller and thereafter assigns the Event to a Dispatcher. In this case this is described in Dispatching and Non Emergency Patient Handling.

If the Call Handler determines that the patient only requires assistance from a health advisor, s/he transfers the call to the Health advisor.



If the Caller requests an advanced booking, the Call Handler captures the booking information. The Call Handler can also escalate the call to the Supervisor if required.

**Connections**

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Answer Call	Verify Caller And Establish Event And Priority	Once the Call Handler has answered the phone, s/he needs to verify the Caller information and establish Event information.
<b>Sequence Flow</b> Source -> Destination	Transfer to EMS	Verify Caller And Establish Event And Priority	Once the External Call Handler transfers the call to the EMS control centre and requests and receives a reference number for the Call that is handed over. The EMS Call Handler continues to verify the Caller and establish the Event.
<b>Sequence Flow</b> Source -> Destination	Verify Caller And Establish Event And Priority	Transfer To Health Contact Centre	If the Caller only needs medical advice and not an ambulance, the Call Handler will transfer the call to a Health Advisor who can assist.
<b>Sequence Flow</b> Source -> Destination	Verify Caller And Establish Event And Priority	Intermediate Event – Link Escalate	The Call Handler can escalate the call to supervisor if required.
<b>Sequence Flow</b> Source -> Destination	Verify Caller And Establish Event And Priority	Assign Event To Dispatcher	For incidents and Priority 1 patient emergencies, a vehicle needs to be dispatched immediately and then further information can be obtained from the Caller.
<b>Sequence Flow</b> Source -> Destination	Verify Caller And Establish Event And Priority	Capture Event Information	For P2/P2 patient services all the relevant information that the Caller has is captured before Dispatching.
<b>Sequence Flow</b> Source -> Destination	Verify Caller And Establish Event And Priority	Capture Advance Booking	By their nature advance bookings are captured and all the details determined before the dispatch occurs.
<b>Object Flow</b> Source -> Destination	Initial Caller Information	Verify Caller And Establish Event And Priority	The initial caller information available from the telephone system is used as a starting point to verify the call. It is the input to this process.
<b>Object Flow</b> Source -> Destination	Case Types	Verify Caller And Establish Event	The Case Types list is used to determine the priority and Case Type of the patient transport Event. It is the



Connector	Source	Target	Notes
		And Priority	input to this process.
<b>Object Flow</b> Source -> Destination	Incident Types	Verify Caller And Establish Event And Priority	The Incident Types list is used to determine the Incident Type. It is the input to this process.
<b>Object Flow</b> Source -> Destination	Verify Caller And Establish Event And Priority	Caller Information	The Caller information is more complete at this stage with correct Caller's telephone number, name and location. It is the output for this process.
<b>Object Flow</b> Source -> Destination	Verify Caller And Establish Event And Priority	Event Location	The Event Location describes where the Event is taking place such as street name, suburb etc. However the latitude and longitude location or GIS location is more beneficial. It is the output for this process.
<b>Object Flow</b> Source -> Destination	External Initial Call Information	Verify Caller And Establish Event And Priority	During the Call the External Call Handler captures information about the Caller and what Event they are reporting. In addition a Call Log is kept with voice recording of the call. This information is transferred with the Call to the EMS control centre.

### 3.1.10.1 External Initial Call Information

*Type:* **Object**

During the Call the External Call Handler captures information about the Caller and what Event they are reporting. In addition a Call Log is kept with voice recording of the call. This information is transferred with the Call to the EMS control centre.

### 3.1.10.2 Initial Caller Information

*Type:* **Object**

This object is the input to the Verify Caller and Establish Event and Priority process. The contact telephone number and GIS location of the Caller can sometimes be determined from the information that is coming through telephone service provider.

### 3.1.10.3 Case Types

*Type:* **Object**

This object is the input to the Verify Caller and Establish Event and Priority process. The Call Handler has a list of case types such as assaults, maternity, stroke to determine the priority and category of an event.



#### 3.1.10.4 Incident Types

*Type:* **Object**

This object is the input to the Verify Caller and Establish Event and Priority process. The Call Handler has a list of incident types such as vehicle accident, spills, fire activity to determine the priority and category of an event.

#### 3.1.10.5 Caller Information

*Type:* **Object**

This object is the output to the Verify Caller and Establish Event and Priority process. The Call Handler will capture the verified information on the Caller's name, contact number and location.

#### 3.1.10.6 Event Location

*Type:* **Object**

This object is the output to the Verify Caller and Establish Event and Priority process. The Call Handler will capture the event location, which is the address or area where the event occurred.

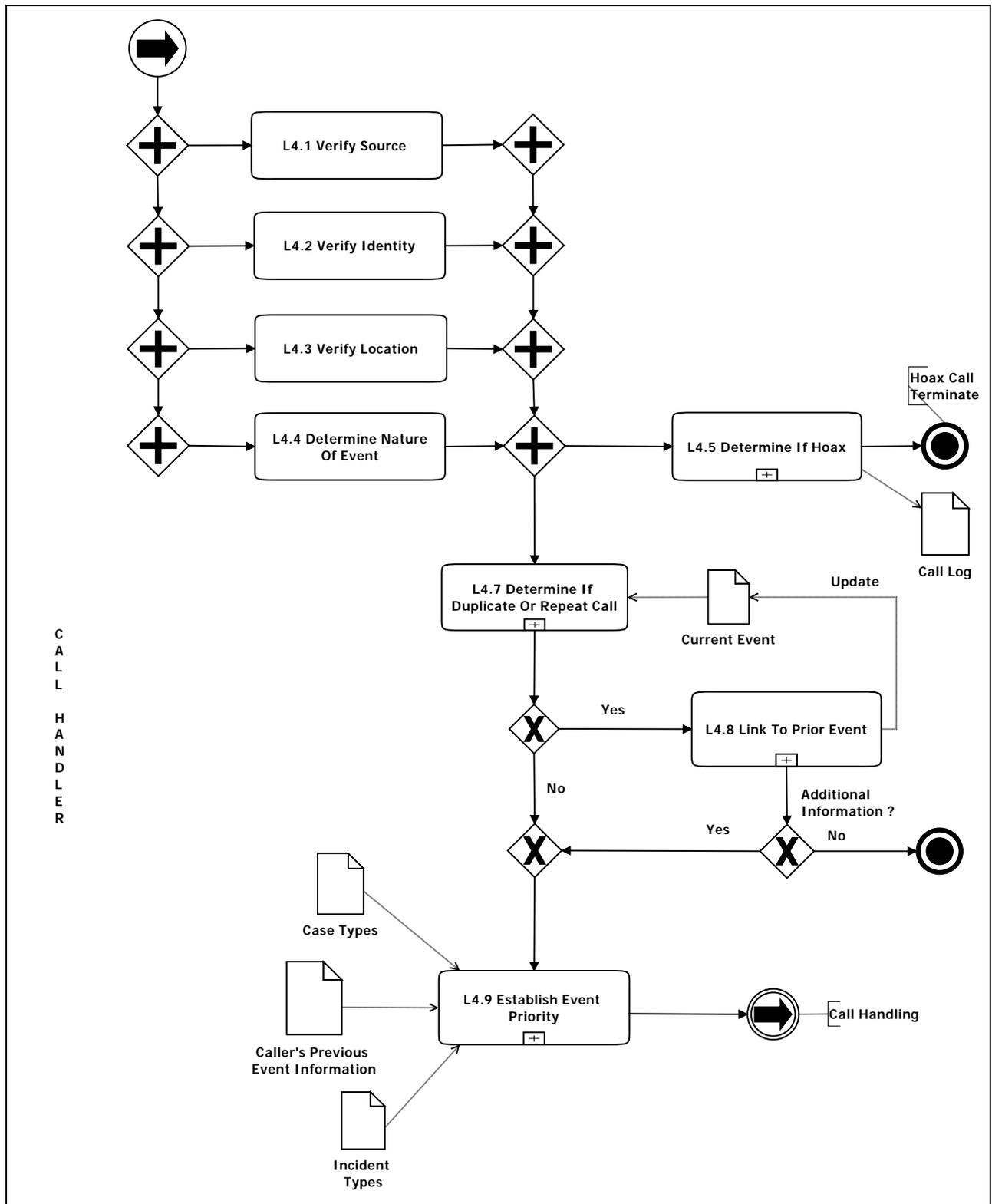
#### 3.1.10.7 Level 3 Detail: Verify Caller and Establish Event and Priority

This process was broken down further to a Level 3 diagram to illustrate the verification process. Tasks L4.1, L4.2, L4.3, L4.4, L4.5 and L4.7 are done in parallel.

**BPMN diagram: Verify Caller and Establish Event (see next page).**



### L3.4 - Verify Caller And Establish Event





### 3.1.10.7.1 Verify Source

Type: **Task**  
ID: **L4.1**  
Role: **Call Handler**

The Call Handler uses the initial caller information obtained from the telephone or radio service provider to verify the source of the call. The source of the call can be other institutions, members of the general public or an EMS resource on duty. The telephone number coming through the telephone system for other institutions will identify clearly which emergency service is calling, for instance 112 - emergency call centre 107- Fire and Rescue services,10111 – SAPS.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Answer Call	Verify Source	The Call Handler verifies if the Caller is from an institution or from the public.
<b>Sequence Flow</b> Source -> Destination	Verify Source	Verify Identity	In parallel the Call Handler verifies who the Caller is.

### 3.1.10.7.2 Verify Identity

Type: **Task**  
ID: **L4.2**  
Role: **Call Handler**

The Call Handler uses the initial caller information obtained from the telephone or radio service provider to verify the identity of the Caller. Previous historical information about a Caller should be made available to speed up the process of verifying the detailed information about the caller such as name, location etc.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Verify Source	Verify Identity	In parallel the Call Handler verifies the source of the Call.
<b>Sequence Flow</b> Source -> Destination	Verify Identity	Verify Location	In parallel the Call Handler verifies where the Caller is and whether it is also the scene of the Event they are calling about.

### 3.1.10.7.3 Verify Location

Type: **Task**  
ID: **L4.3**  
Role: **Call Handler**

The Call Handler uses the initial caller information obtained from the telephone or radio service provider to verify the location of the Caller. The GIS location of the Call Handler might be available or the area of the Caller could be available from the telephone number. The Call Handler will also verify if the Caller is at the same location as the Event.

The Call Handler verifies the location using street maps and territory maps.

#### Connections



Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Verify Identity	Verify Location	In parallel the Call Handler verifies who the Caller is.
<b>Sequence Flow</b> Source -> Destination	Verify Location	Determine Nature Of Event	In parallel the Call Handler will determine what the Event is that the Caller is calling about.

#### 3.1.10.7.4 Determine Nature of Event

**Type:** Task

**ID:** **L4.4**

**Role:** **Call Handler**

The Call Handler will establish the nature of the Event that the Caller is calling about. This is to know how to proceed further and possibly to determine if it is a duplicate or repeat call or a hoax call. Both other call centres and EMS emergency control centre can determine if a call is a Hoax, however only EMS emergency control centre can determine if the call is a duplicate or repeat call from the information they have of other calls.

#### **Connections**

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Verify Location	Determine Nature Of Event	In parallel the Call Handler will determine the location of the Caller and if the event they are calling about is at the same location.
<b>Sequence Flow</b> Source -> Destination	Determine Nature Of Event	Determine if Hoax	From the information obtained during verification, the Call Handler determines if the call is a hoax.
<b>Sequence Flow</b> Source -> Destination	Determine Nature Of Event	Determine If Duplicate Or Repeat Call	From the information obtained during verification, the Call Handler determines if the call is a duplicate or repeat call.



3.1.10.7.5 Determine If Hoax

Type: **Sub-process**

ID: **L4.5**

Role: **Call Handler**

From the information obtained during the verification the Call Handler might be able to determine whether the call is a hoax. For instance if the number is one that was previously used in a hoax call then the Call Handler will be alerted and they can ask specific questions about the surrounds or the event that the Caller is calling about. For instance when the location the Caller is calling from is no where near the Event they are describing. If the Call Handler determines that this might be a hoax call then they try and keep the Caller connected whilst the SAPS is asked to dispatch a vehicle to investigate. If the call is terminated the call information is still kept in the call log for future reference. A Call could also be declared a hoax once the dispatched Response Unit arrives on scene of the reported Event.

**Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Determine Nature Of Event	Determine if Hoax	From the information obtained during verification, the Call Handler determines if the call is a hoax.
<b><u>Sequence Flow</u></b> Source -> Destination	Determine if Hoax	End Event – Terminate	If the call is a hoax the SAPS is dispatched to investigate whilst the Caller is kept on the Call. When it is terminated the call log is still kept
<b><u>Object Flow</u></b> Source -> Destination	Log A Call	Call Log	When the call is logged, a report is produced from the information received by the telephone system. It is the output to this task.

3.1.10.7.5.1 Call Log

Type: **Object**

This object is the output to the Determine If Hoax process. When the call is logged the information about the call such as time of call, duration of call, incoming telephone phone number and voice recording are recorded. The Call log is updated during the call until the call is terminated. Information about a hoax call will also be recorded on the log.

3.1.10.7.6 Transfer to EMS Emergency Control Centre

Type: **Task**

ID: **L4.6**

Role: **Call Handler**

When the call is received by other call centres, it will be transferred to EMS emergency control centre if applicable once they have determined that the call is not hoax.

The other call centres will also transfer the verified initial caller information to the EMS emergency control centre so that this information does not need to be captured again.

**Connections**

Connector	Source	Target	Notes
-----------	--------	--------	-------



Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Determine Nature Of Event	Transfer To EMS Emergency Control Centre	From the information obtained during verification, the other call centres may transfer the call to EMS emergency control centre if applicable.
<b>Sequence Flow</b> Source -> Destination	Transfer To EMS Emergency Control Centre	Determine If Duplicate Or Repeat Call	The EMS emergency control centre then determines if the call is a duplicate or repeat call.
<b>Object Flow</b> Source -> Destination	Initial Caller Information	Transfer To EMS Emergency Control Centre	The other emergency service transfers the verified initial caller information to EMS emergency control centre.

### 3.1.10.7.6.1 Initial Caller Information

Type: **Object**

This object is the input to the Transfer to EMS Emergency Control Centre process. The verified caller information such as contact telephone number and GIS location of the Caller and event are transferred to the EMS emergency control centre.

### 3.1.10.7.7 Determine If Duplicate or Repeat Call

Type: **Sub-process**

ID: **L4.7**

Role: **Call Handler**

From the information obtained during the verification the Call Handler will determine if the call is a duplicate or repeat call. A duplicate call is when a different Caller than those who have already called, calls to report an already active Event. A repeat call is when the same Caller as previously called, calls again to report a change of status of the Event or asks for information e.g. the ETA of the Response Unit. At this stage, the call is handled by EMS emergency control centres which can determine from record of current events if the call is a duplicate or a repeat based on the Caller information and the nature of the Event and its location.

If the call is a duplicate or repeat, it is linked to current event it relates to and the additional information is recorded. Otherwise the Call Handler will proceed to establish the Event category and its priority.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Determine Nature Of Event	Determine If Duplicate Or Repeat Call	From the information obtained during verification, the Call Handler determines if the call is a duplicate or repeat call.
<b>Sequence Flow</b> Source -> Destination	Transfer To EMS Emergency Control	Determine If Duplicate Or	The EMS emergency control centre then determines if the call is a



Connector	Source	Target	Notes
	Centre	Repeat Call	duplicate or repeat call.
<b><u>Sequence Flow</u></b> Source -> Destination	Determine If Duplicate Or Repeat Call	Link To Prior Event	If the call is a duplicate or repeat call, the Call Handler will link it to the prior Event.
<b><u>Sequence Flow</u></b> Source -> Destination	Determine If Duplicate Or Repeat Call	Establish Event Priority And Category	If the call is not a duplicate or repeat call, the Call Handler will proceed to establish Event priority and category.
<b><u>Object Flow</u></b> Source -> Destination	Current Event	Determine If Duplicate Or Repeat Call	The Call Handler can use a current event list to identify if the current call matches a current event It is the input for this process.

### 3.1.10.7.7.1 Current Event

Type: **Object**

This object is the input to the Determine If Duplicate or Repeat Call process. The Call Handler uses the current event list to determine if an incoming call is a duplicate or repeat call based on similarities such as location and event.

### 3.1.10.7.8 Link to Prior Event

Type: **Sub-process**

ID: **L4.8**

Role: **Call Handler**

If the call is a duplicate or repeat call, it is linked to the current event. The Call Handler determines if additional information is available from the Caller and the information on the current event is updated accordingly. If no additional information available, the call is terminated.

#### **Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Determine If Duplicate Or Repeat Call	Link To Prior Event	If the call is a duplicate or repeat call, the Call Handler will link it to the prior Event.
<b><u>Sequence Flow</u></b> Source -> Destination	Link To Prior Event	End Event - Terminate	If the call is a duplicate or repeat call, and no additional information available, the Call Handler may terminate the call.
<b><u>Sequence Flow</u></b> Source -> Destination	Link To Prior Event	Intermediate Event – Link Call Handling	If the call is a duplicate or repeat call, and additional information available, the Call Handler will capture the additional information.
<b><u>Object Flow</u></b> Source -> Destination			The Call Handler will update the



Connector	Source	Target	Notes
	Link To Prior Event	Current Event	current event list with the current call and information obtained from that call. It is the output for this process.

### 3.1.10.7.8.1 Current Event

**Type:** Object

This object is the output to the Link to Prior Event process. The Call Handler updates the event relating to the duplicate or repeat call on the current event list with the information obtained from the current call.

### 3.1.10.7.9 Establish Event Priority and Category

**Type:** Sub-process

**ID:** **L4.9**

**Role:** **Call Handler**

If the call is a not a duplicate or repeat call, the Call Handler needs to establish the event priority and category. The Call Handler also determines if the event is an incident and / or a patient related event. The Call Handler will use a case types list and an incident types list to determine the event’s priority and category. Example of case types are maternity, stroke etc. and examples of incident types are vehicle accident, spills, fire activity to determine the priority and category of an event.

The priority of the event will determine whether the event is sent to a Dispatcher immediately before any further step is taken. The category of the event determines if any other emergency services such as fire department, traffic department are required at the incident.

The event might not be a duplicate or repeat call of a current event but it might be a frequent caller calling for a regular event. The Caller’s previous event information is used to establish if the Caller needs an advanced booking or if the event needs to be attended to soonest.

#### Connections

Connector	Source	Target	Notes
<u>Sequence Flow</u> Source -> Destination	Determine If Duplicate Or Repeat Call	Establish Event Priority And Category	If the call is not a duplicate or repeat call, the Call Handler will proceed to establish Event priority and category.
<u>Sequence Flow</u> Source -> Destination	Establish Event Priority And Category	End Event – Link Call Handling	Once the Call Handler has established event priority and category, the call handling process continues according to the information obtained.
<u>Object Flow</u> Source -> Destination	Case Types	Establish Event Priority And Category	The Case types list is used to determine the priority and Category of the Event. It is the input to this process.
<u>Object Flow</u> Source -> Destination	Incident Types	Establish Event Priority And Category	The Incident types list is used to determine the priority and Category of the Event. It is the input to this process.



Connector	Source	Target	Notes
<b>Object Flow</b> Source -> Destination	Caller's Previous Event Information	Establish Event Priority And Category	The Call Handler will use caller's previous event information if it is a frequent caller whose information has been recorded from a prior event. It is the input to this process.

### 3.1.10.7.9.1 Case Types

**Type:** Object

This object is the input to the Establish Event Priority and Category process. The Call Handler has a list of case types such as assaults, maternity, stroke to determine the priority and category of an event that is either a patient emergency or non-emergency (see Annexure B).

### 3.1.10.7.9.2 Incident Types

**Type:** Object

This object is the input to the Establish Event Priority and Category process. The Call Handler has a list of incident types such as vehicle accident, spills, fire activity to determine the Incident type (see Annexure B). Incidents are always Priority 1 (P1).

### 3.1.10.7.9.3 Caller's Previous Event Information

**Type:** Object

This object is the input to the Establish Event Priority and Category process. The Call Handler will be presented with any matches to previous Callers from the Caller information of the current call. Thereby the previous Event Information that the Caller was involved with is available for the Call Handler to use. If the Caller is a frequent caller, the Call Handler can use this information to establish if the current event is similar to previous event and take appropriate action.

## 3.1.11 Transfer to Health Contact Centre

**Type:** Sub-process

**ID:** L3.9

**Role:** Call Handler

If the Caller requests medical advice, the call can be transferred to the Health Contact Centre so they can assist further. The call terminates with the call transfer as the Call Handler will not assist further.

This is not currently available and it is necessary to eliminate unnecessary transport of patients with trivial medical conditions. This is envisaged as a Department of Health service and not a future METRO EMS service.

### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Verify Caller And Establish Event And Priority	Transfer To Health Contact Centre	If the Caller only needs medical advice and not an ambulance, the Call Handler transfers the call to a Health Advisor who can assist.



Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Verify Priority And Category	Transfer To Health Contact Centre	If the Caller only needs medical advice and not an ambulance, the Call Handler transfers the call to a Health Advisor who can assist.
<b>Sequence Flow</b> Source -> Destination	Verify Priority And Category	End Event - Terminate	The Caller terminates the call when it is transferred to Health Advisor.

### 3.1.12 Capture Advanced Booking

Type: **Sub-process**

ID: **L3.11**

Role: **Call Handler**

If the Caller requires an advanced booking, the Call Handler captures the booking information such as pick up and drop off date and time, destination, escort required and equipment required. This will include any return trip information as well.

In addition the Call Handler might need to determine the patient's medical aid details and status and possibly preferred healthcare facilities if the booking is of a non life threatening nature.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Verify Priority And Category	Capture Advanced Booking	If the patient requires an advanced booking, the Call Handler starts capturing information about the booking.
<b>Sequence Flow</b> Source -> Destination	Capture Advanced Booking	Address Verification	The Call Handler will verify the pick up and drop off address once booking information captured, including for any return trip



### 3.1.13 Capture Event Information

Type: **Sub-process**

ID: **L3.5**

Role: **Call Handler**

For lower priority patient, the Call Handler starts capturing additional information about the patient before assigning to the Dispatcher. For instance age, mobility etc.

On the other hand, for an incident or patient emergency, after a partial registration and once it has been assigned to Dispatcher as a priority 1, the Call Handler is able to ask the Caller for further information if required

The partial registration event information captured initially by the Call Handler is used as a base for further questions to the Caller.

In addition the Call Handler might need to determine the patient’s medical aid details and status and possibly preferred healthcare facilities if the event is of a non life threatening nature.

The Call Handler can also escalate the call to the Supervisor if required.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Verify Priority And Category	Capture Event Information	The Call Handler can capture information about a patient or further information about an incident if required.
<b>Sequence Flow</b> Source -> Destination	Capture Event Information	Address Verification	Once further information captured about the event, the Call Handler can verify the address of the event.
<b>Sequence Flow</b> Source -> Destination	Assign Event To Dispatcher	Capture Event Information	The Call Handler can ask Caller for further information about the event after the call has been assigned to Dispatcher.
<b>Sequence Flow</b> Source -> Destination	Assign Event To Dispatcher	Intermediate Event-Link Escalate	The Call Handler can escalate the call to Supervisor if required.
<b>Object Flow</b> Source -> Destination	Event Information	Capture Event Information	The partial registration event information obtained by the Call Handler initially is used to ask further questions about the event. It is the input for this process.

#### 3.1.13.1 Event Information

Type: **Object**

This object is the input to the “Capture Event Information” process. The Call Handler can capture more event information if the caller has additional information about the event. The Event information will



already include the location and caller information but more information might be available about the patient or the incident.

### 3.1.14 Address Verification

Type: **Task**

ID: **L3.6**

Role: **Call Handler**

This is the task of verifying if the event address provided by the Caller is valid. If the Caller is at the incident or is the patient or is with the patient, the GIS location might be available from the mobile phone or fixed line telephone or radio service provider. In addition the Call Handler uses street maps and territory maps to confirm the address of the incident or the address of the patient or for telephone fixed lines the registered address of the Caller or from the area code of the Caller.

In some cases, the Call Handler can also identify if the call is a hoax and decide to terminate the call at this stage.

Once the verification has been done, the Call Handler can also terminate the call if the call has already been assigned to a Dispatcher (in the case of a P1 call) or if the call was for an advance booking it can also be terminated. Otherwise the call can be assigned to a dispatcher. In some cases this might also be needed if the Caller needs to provide detailed directions or rendezvous arrangements with the Dispatcher

The Call Handler can also escalate the call to the Supervisor if required.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Capture Event Information	Address Verification	Once additional information capture, the Call Handler needs to verify the address(es) of the event.
<b>Sequence Flow</b> Source -> Destination	Address Verification	End Event – Terminate	If the Call Handler identifies the call as a hoax or if the event has already been dispatched or it was an advance booking that was captured, the call is terminated
<b>Sequence Flow</b> Source -> Destination	Address Verification	Assign Event To Dispatcher	Once address verified, the event will be assigned to a Dispatcher if not already assigned.
<b>Sequence Flow</b> Source -> Destination	Address Verification	Intermediate Event - Escalate	The Call Handler can escalate the call to Supervisor if required.
<b>Object Flow</b> Source -> Destination	Address Verification	Event Information	The event information is updated with the correct address. It is the output for this process.
<b>Object Flow</b> Source -> Destination	Address Verification	Call Log	A report about the call information is produced as an output to this task.



### 3.1.14.1 Call Log

Type: **Object**

This object is the output to the Address Verification task. When the call is logged, a call record is produced from the information received such as time of call, duration of call and where possible also the incoming call telephone number. The Call log is updated when the call is received until it terminates. The call log also includes voice recording of the call.

### 3.1.14.2 Event Information

Type: **Object**

This object is the output to the Address Verification task. The Call Handler updates the existing event information with the verified address if it was incorrect. The record should contain the original and verified address as well as an indication that the address has been verified.

### 3.1.15 Assign Event to Dispatcher

Type: **Task**

ID: **L3.7**

Role: **Call Handler**

This is the task where the Call Handler assigns the event to the Dispatcher to take further actions. This is a role handover and only happens physically between two people if the role is not being done by the same person.

For an incident, the Call Handler would have done this task after a partial registration but prior to capturing further information about the incident (See L3.4).

For a Priority 1 patient event, the Call Handler would have also done this task after a partial registration but prior to capturing further information about the patient (See L3.4). For other priority patient events the Call Handler would have captured all the required information first, verified the address and then assign to a Dispatcher.

For an advance booking this does not happen because the Dispatching happens at the beginning of a shift when a schedule is provided for the EMS Resource (L2.10).

The Call Handler might use a Dispatcher Assignment Rules if there is a need to determine to which Dispatcher the event must be assigned. This could also be application assisted automatic assignment based on rules either to assign it to a group of Dispatchers to be picked up or to a specific Dispatcher depending on which rules are in force.

The available information such as the caller information, the event location, the patient information and the incident information will be available to the Dispatcher for further action.

This task will complete the Call Handling sub-process and the Dispatching and Incident Handling sub-processes will start for the Dispatcher.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Address Verification	Assign Event To Dispatcher	Once address verified, the event will be assigned to a Dispatcher if not already assigned.
<b>Sequence Flow</b>			If the patient is a Priority 1 patient,



Connector	Source	Target	Notes
Source -> Destination	Verify Priority And Category	Assign Event To Dispatcher	the Call Handler will immediately assign to dispatcher.
<b>Sequence Flow</b> Source -> Destination	Verify Caller And Establish Event And Priority	Assign Event To Dispatcher	For Priority 1 incidents, a vehicle needs to be dispatched immediately and then further information can be obtained from the Caller.
<b>Sequence Flow</b> Source -> Destination	Assign Event To Dispatcher	Capture Event Information	The Call Handler can ask Caller for further information about the event after the call has been assigned to Dispatcher.
<b>Sequence Flow</b> Source -> Destination	Assign Event To Dispatcher	Intermediate Event –Link Dispatching	Once assigned the event goes through the Dispatching process.
<b>Sequence Flow</b> Source -> Destination	Assign Event To Dispatcher	Intermediate Event –Link Incident Handling	Once assigned the incident goes through the Incident Handling process in parallel with Dispatching process.
<b>Object Flow</b> Source -> Destination	Dispatcher Assignment Rules	Assign Event To Dispatcher	The Call Handler uses the dispatcher assignment rules to determine the dispatch desk. This is an input to the task.
<b>Object Flow</b> Source -> Destination	Assign Event To Dispatcher	Caller Information	This is the information gathered about the Caller during the call by Call Handler. It is an output from this task for the Dispatcher
<b>Object Flow</b> Source -> Destination	Assign Event To Dispatcher	Event Location	This is the information gathered about the Event Location during the call by Call Handler. It is an output from this task for the Dispatcher.
<b>Object Flow</b> Source -> Destination	Assign Event To Dispatcher	Initial Incident Information	This is the initial information gathered about the Incident during the call by Call Handler. It is an output from this task for the Dispatcher.
<b>Object Flow</b> Source -> Destination	Assign Event To Dispatcher	Initial Patient Information	This is the initial information gathered about the Patient during the call by Call Handler. It is an output from this task for the Dispatcher.

### 3.1.15.1 Event Location

Type: **Object**



This object is the output to the Assign Event to Dispatcher process. The Dispatcher will receive the event location information capture by the Call Handler. The event location is the address or area where the event occurred.

### 3.1.15.2 Initial Incident Information

Type: **Object**

This object is the output to the Assign Event to Dispatcher process. The Dispatcher will receive the initial incident information captured by the Call Handler. The initial incident information will be for instance incident type and number of patients.

### 3.1.15.3 Initial Patient Information

Type: **Object**

This object is the output to the Assign Event to Dispatcher process. The Dispatcher will receive the initial patient information captured by the Call Handler. The initial patient information will be for instance the patient condition.

### 3.1.15.4 Caller Information

Type: **Object**

This object is the output to the Assign Event to Dispatcher process. The Call Handler will capture the Caller’s name, contact number and location. This information is essential if there is a need to contact the Caller once the event has been dispatched.

### 3.1.15.5 Dispatcher Assignment Rules

Type: **Object**

This object is the input to the Assign Event to Dispatcher process. The Call Handler will use the dispatcher assignment rules location to determine the dispatch desk.

## 3.1.16 Handle Escalated Call

Type: **Sub-process with Multiple instances**

ID: **L3.8**

Role: **Supervisor**

This is the process where the Supervisor handles the escalated calls that came through to him/her. The Supervisor will use the Escalated Call information to get information about the problematic calls.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Intermediate Event –Link Escalate	Handle Escalated Call	The call can be escalated by the Call Handler to Supervisor if required.
<b>Object Flow</b> Source -> Destination	Handle Escalated Call	Escalated Call Information	The Escalated Call information will assist the Supervisor with information about the problematic calls. It is an input to the process.



---

### 3.1.16.1 Escalated Call Information

*Type:* **Object**

This object is the input to the “Handle Escalated Call” process. The Supervisor uses call information of the escalated calls and take appropriate action.

*(The rest of page has been left purposely blank.)*



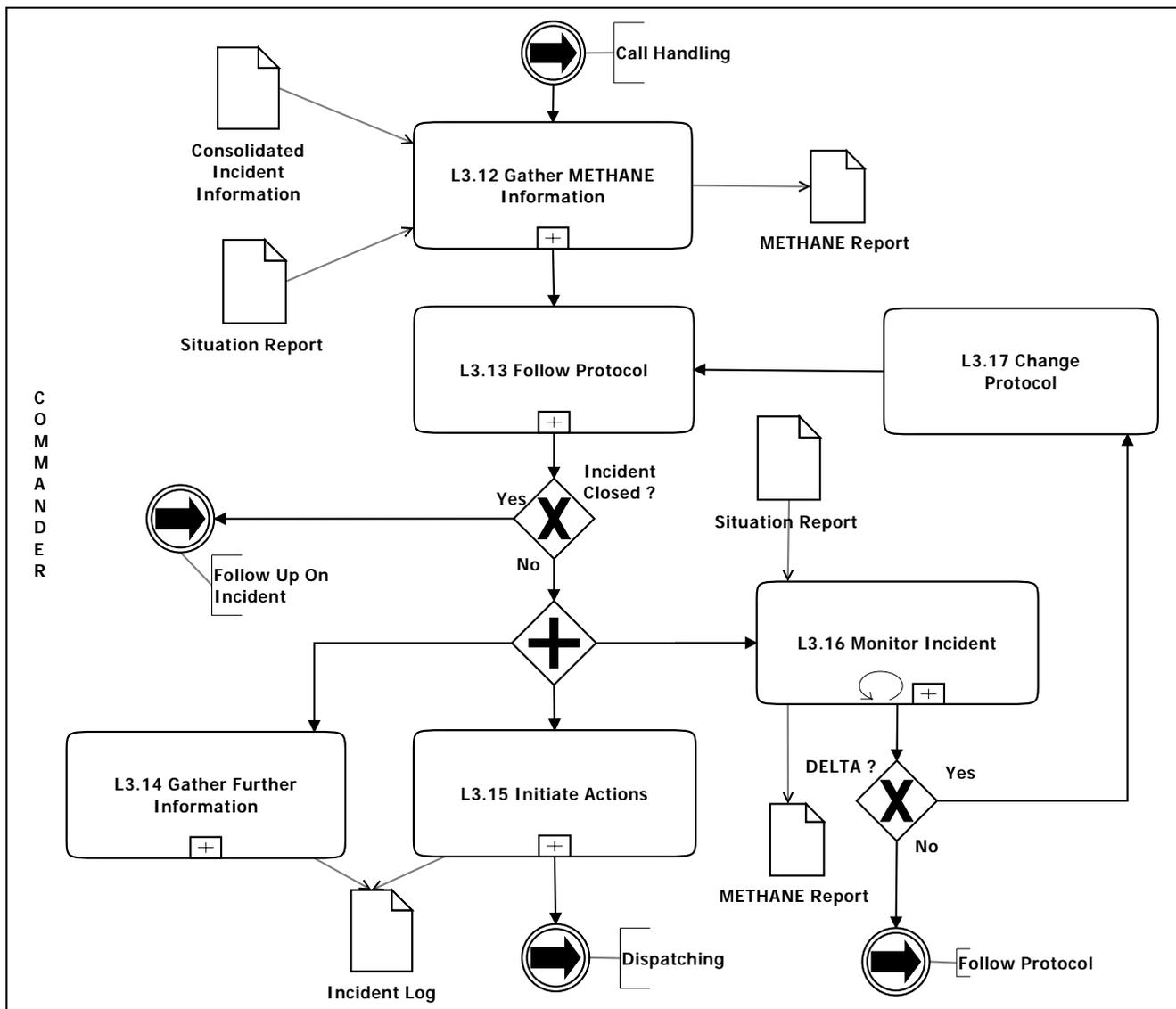
### 3.2 Incident Handling

Type: Sub-process with multiple instance

ID: L2.2

Incident Handling is one of the core sub-processes of the EMS emergency control centre operations. It is the process of monitoring and following incident protocols in managing an incident from start to finish. This includes dispatching any further Response Units including EMS Resources (see the Dispatching sub-process) to respond to the incident based on information gathered in the Call Handling sub-process. This describes the interaction between the roles of Call Handler, the incident Commander, the Dispatcher and the Response Unit, usually an EMS Resource. This is a multiple instance sub-process indicating that multiple incidents are handled at the same time using the same sub-process.

#### L2.2 - Incident Handling





### 3.2.1 Commander

Type: **Lane**

An incident is handled through a specific command structure to command and control the resources to most effectively handle the situation. The Call Handler takes the initial call and whether the incident is in the Metropole or in one of the Districts it is reported to the Tygerberg METRO desk. In the case of the Districts the Call Handler also takes on the role of a Dispatcher and dispatches the first response units. In the Metropole this is done by the METRO desk. A senior EMS officer gets to the scene and takes the role of the incident Bronze Commander. This role is to take decisions on site in directing resources. At the Tygerberg METRO desk another senior EMS officer assumes the role of a Silver Commander and this role is to co-ordinate resources over multiple incidents or the one current one in support of the Bronze Commander(s). The highest command position is the Gold Commander who co-ordinates all EMS resources for the Western Cape and interacts with other Provinces to request resources if required.

### 3.2.2 Gather METHANE Information

Type: **Sub-process**

ID: **L3.12**

Role: **Commander**

When an incident is declared it is managed by starting and continuing to keep updated a METHANE report.

METHANE is an acronym for:

- M(ajor incident)
- E(xact Location)
- T(ype of incident)
- H(azards)
- A(ccess and egress)
- N(umber and severity of patients)
- E(mergency services on scene)

The first Response Unit at the scene and then each subsequent Response Units Situation Report is used to update the METHANE Report. So this task is initially initiated from the Call Handling sub-process with the report by a Caller of an incident and thereafter by each further duplicate or repeat call that adds information. Thereafter the METHANE report is updated with each Situation Report received from a Response Unit ([see L3.16 Monitor Incident](#)).

The consolidated Incident Information gathered from one or more Callers by the Call Handlers is referenced in gathering the METHANE information. From this the correct Protocol to be followed is determined and is initiated.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Interim Event – Link, Call Handling	Gather METHANE Information	This task is initially initiated from the Call Handling sub-process with the report by a Caller of an incident and thereafter by each further Duplicate or Repeat Call that has new / updated



Connector	Source	Target	Notes
			information.
<b><u>Object Flow</u></b> Source -> Destination	Consolidated Incident Information	Gather METHANE Information	The Consolidated Incident Information is available to be referenced in gathering the METHANE information. It is an input to the process.
<b><u>Object Flow</u></b> Source -> Destination	Situation report	Gather METHANE Information	The first Response Unit at the scene and then each subsequent Response Units Situation Report is used to update the METHANE Report. It is an input to the process.
<b><u>Object Flow</u></b> Source -> Destination	Gather METHANE Information	METHANE report	The METHANE information is necessary to determine the characteristics of the incident. It is the output to the sub-process.
<b><u>Sequence Flow</u></b> Source -> Destination	Gather METHANE Information	Follow Protocol	From the METHANE information the correct Protocol to be followed is determined and is initiated. This is the purpose of this sub-process.

### 3.2.2.1 Situation report

Type: **Object**

This object is the input to the Gather METHANE Information. The first Response Unit at the scene and then each subsequent Response Units Situation Report is used to update the METHANE Report this is co-ordinated and reported by the Bronze Commander.

### 3.2.2.2 Consolidated Incident Information

Type: **Object**

This object is the input to the Gather METHANE Information. The Consolidated Incident Information is available to be referenced in gathering the METHANE information.

### 3.2.2.3 METHANE report

Type: **Object**

This object is the output to the Gather METHANE Information sub-process. The first Response Unit at the scene and then each subsequent Response Units Situation Report, co-ordinated and reported by the Bronze Commander, as well as the Consolidated Incident Information are used to update the METHANE Report. This identifies the characteristics of the incident and from this the correct protocol can be used to handle the incident.



### 3.2.3 Follow Protocol

Type: **Sub-process**  
 ID: **L3.13**  
 Role: **Commander**

From the METHANE information the correct Protocol to be followed is determined and is initiated. This then means that a logged sequence of steps needs to be followed based on a predetermined incident reaction protocol. These could be done in parallel and include Gathering Further Information, Initiating Actions (possibly including Dispatching EMS Resources) and continuing to Monitor Incident. The protocol will also determine when the Incident can be closed. Thereafter at some stage there will be a Follow Up On the Incident.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Gather METHANE Information	Follow Protocol	From the METHANE information the correct Protocol to be followed is determined and is initiated.
<b>Sequence Flow</b> Source -> Destination	Follow Protocol	Interim Event – Link, Follow Up On Incident	Once the incident is closed a Follow Up will be done on the incident. This will be to ensure that all procedures / protocols were correctly followed.
<b>Sequence Flow</b> Source -> Destination	Follow Protocol	Gather Further Information	The protocol could call for gathering further necessary information.
<b>Sequence Flow</b> Source -> Destination	Follow Protocol	Initiate Actions	In parallel to gathering further information the protocol could call for taking further actions that might include dispatching EMS Resources.
<b>Sequence Flow</b> Source -> Destination	Follow Protocol	Monitor Incident	In parallel to taking further actions the incident needs to be monitored.
<b>Sequence Flow</b> Source -> Destination	Change Protocol	Follow Protocol	If the incident situation changes significantly it might become categorised as a Delta incident which in turn necessitates a change in the protocol to be followed.



### 3.2.4 Gather Further Information

Type: **Sub-process**  
ID: **L3.14**  
Role: **Commander**

As per the protocol further information might need to be gathered or information given. The information should be included in the Consolidated Incident Information and the fact that the step in the protocol has been completed should be logged in the Incident Log.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Follow Protocol	Gather Further Information	The protocol could call for gathering further necessary information which must be added to the Consolidated Incident Information.
<b>Object Flow</b> Source -> Destination	Gather Further Information	Incident Log	The Incident Log is specifically used to log the progress of following the incident protocol. It is an output of this sub-process.

#### 3.2.4.1 Incident Log

Type: **Object**

This object is updated in the Gather Further Information sub-process. The Incident Log is a part of the Incident Information and it is used to specifically log the progress of following the incident protocol.

### 3.2.5 Initiate Actions

Type: **Sub-process**  
ID: **L3.15**  
Role: **Commander**

As per the protocol further actions might need to be initiated. These could include Dispatching EMS Resources or requesting assistance from other Emergency Services. These actions will form part of the Consolidated Incident Information and the fact that the step in the protocol has been completed should be logged in the Incident Log.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Follow Protocol	Initiate Actions	In parallel to gathering further information the protocol could call for taking further actions that might include dispatching EMS Resources.
<b>Object Flow</b> Source -> Destination	Initiate Actions	Incident Log	The Incident Log is specifically used to log the progress of following the incident protocol. It is an output of



Connector	Source	Target	Notes
			this sub-process.
<b><u>Sequence Flow</u></b> Source -> Destination	Initiate Actions	Interim Event – Link, Dispatching	This is when the action being initiated is Dispatching.

### 3.2.5.1 Incident Log

*Type:* **Object**

This object is updated in the Initiate Actions sub-process. The Incident Log is a part of the Incident Information and it is used to specifically log the progress of following the incident protocol.

### 3.2.6 Monitor Incident

*Type:* **Repeating sub-process**

*ID:* **L3.16**

*Role:* **Commander**

The incident needs to be monitored and this is done from all information received in Situation Reports, from new Calls about the same incident or from information gathered whilst the protocol is followed. In particular it must be monitored to see if it has changed into a Delta incident which means a need to change the protocol. A Delta Incident is usually declared when the number of casualties compared with the number of resources available means that EMS are not able to provide the services required and need “outside” help (see Annexure B).

#### **Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Follow Protocol	Monitor Incident	In parallel to gathering further information and taking further actions the incident needs to be monitored.
<b><u>Object Flow</u></b> Source -> Destination	Situation Report	Monitor Incident	The Situation Report of each Response Unit is co-ordinated and reported by the Bronze Commander and considered whilst monitoring the incident. This is input into this repeating sub-process.
<b><u>Object Flow</u></b> Source -> Destination	Monitor Incident	METHANE Report	The principles of the METHANE Report are used to determine if the characteristics of the incident have changed. This is an output into this repeating sub-process.
<b><u>Sequence Flow</u></b> Source -> Destination	Monitor Incident	Change Protocol	When the Incident status changes and it becomes a Delta incident then the protocol to be followed needs to change.
<b><u>Sequence Flow</u></b>			



Connector	Source	Target	Notes
Source -> Destination	Monitor Incident	Interim Event – Link, Follow Protocol	If the protocol for handling the incident was not changed then continue following the protocol.

### 3.2.6.1 Situation Report

Type: **Object**

This object is the input to the Monitor Incident repeating sub-process. When the resources are on site, they provide feedback to the Dispatcher called a situation report. The report is used to update the METHANE report and update the Consolidated Incident Information. It is used to monitor the situation of the incident.

### 3.2.7 Change Protocol

Type: **Task**

ID: **L3.17**

Role: **Commander**

If the incident situation changes significantly it might become categorised as a Delta incident which in turn necessitates a change in the protocol to be followed.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Monitor Incident	Change Protocol	When the Incident status changes and it becomes a Delta incident then the protocol to be followed needs to change.
<b>Sequence Flow</b> Source -> Destination	Change Protocol	Follow Protocol	If the incident situation changes significantly it might become categorised as a Delta incident which in turn necessitates a change in the protocol to be followed.

## 3.3 Issue Advance Booking Schedule

Type: **Sub-process**

ID: **L2.10**

The Issue Advance Booking Schedule is not a core sub-process of the EMS emergency control centre operations. It is initiated by a Timed Event – at the start of each shift. This is because it is a continuation of the process to complete the advance bookings that have been allocated from an initial Call. The Advance Booking Schedules are created and issued to the EMS Resources at the start of their shift. This is thereafter covered by the Dispatching sub-process and usually the Non Emergency Patient Handling sub-process.

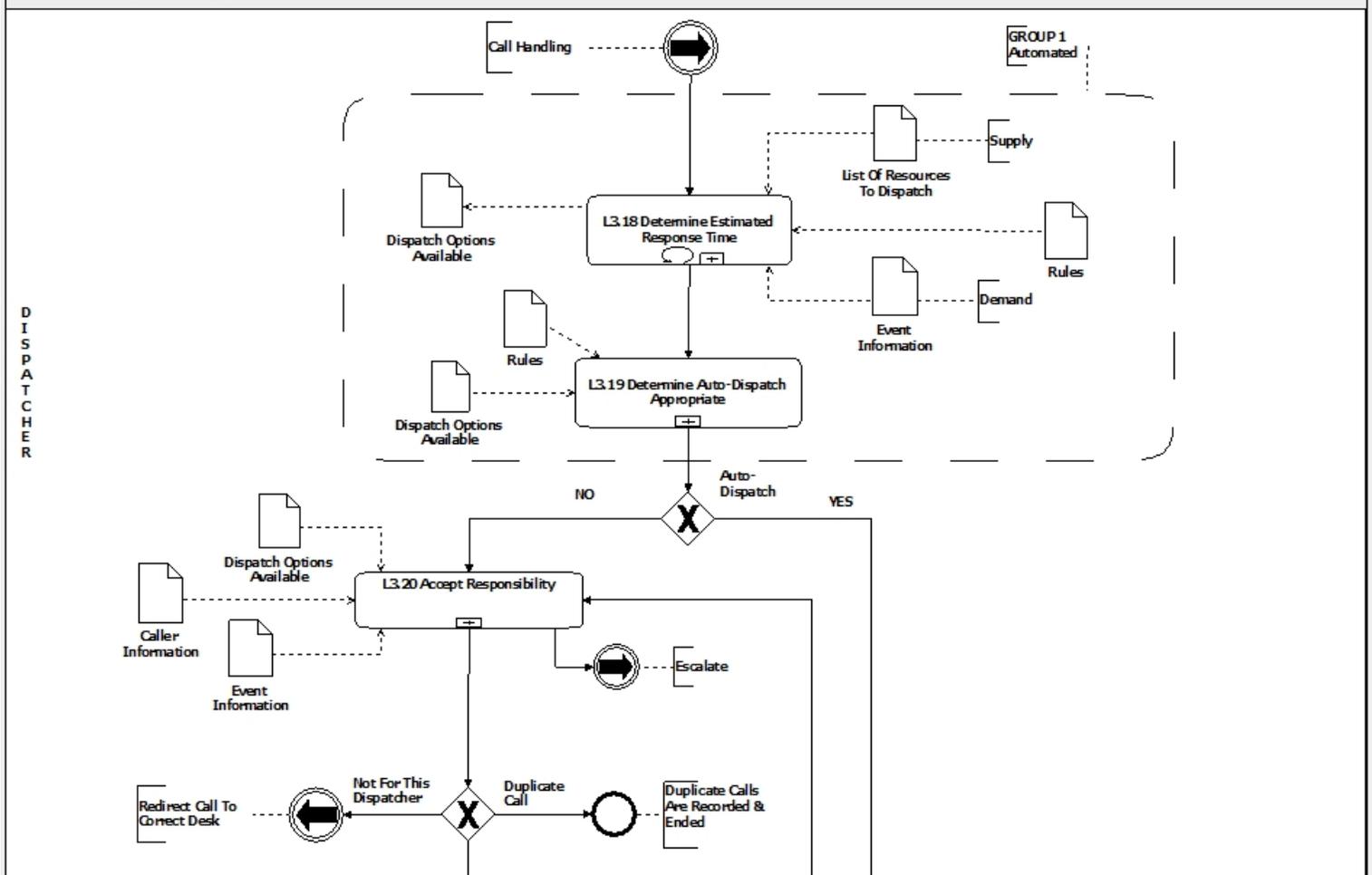
In the Districts this is the responsibility of the District Co-ordinator. In the Metropole this is the responsibility of the Depot Duty Officer. For HealthNET this is the responsibility of the Shift Leader.

### 3.4 Dispatching

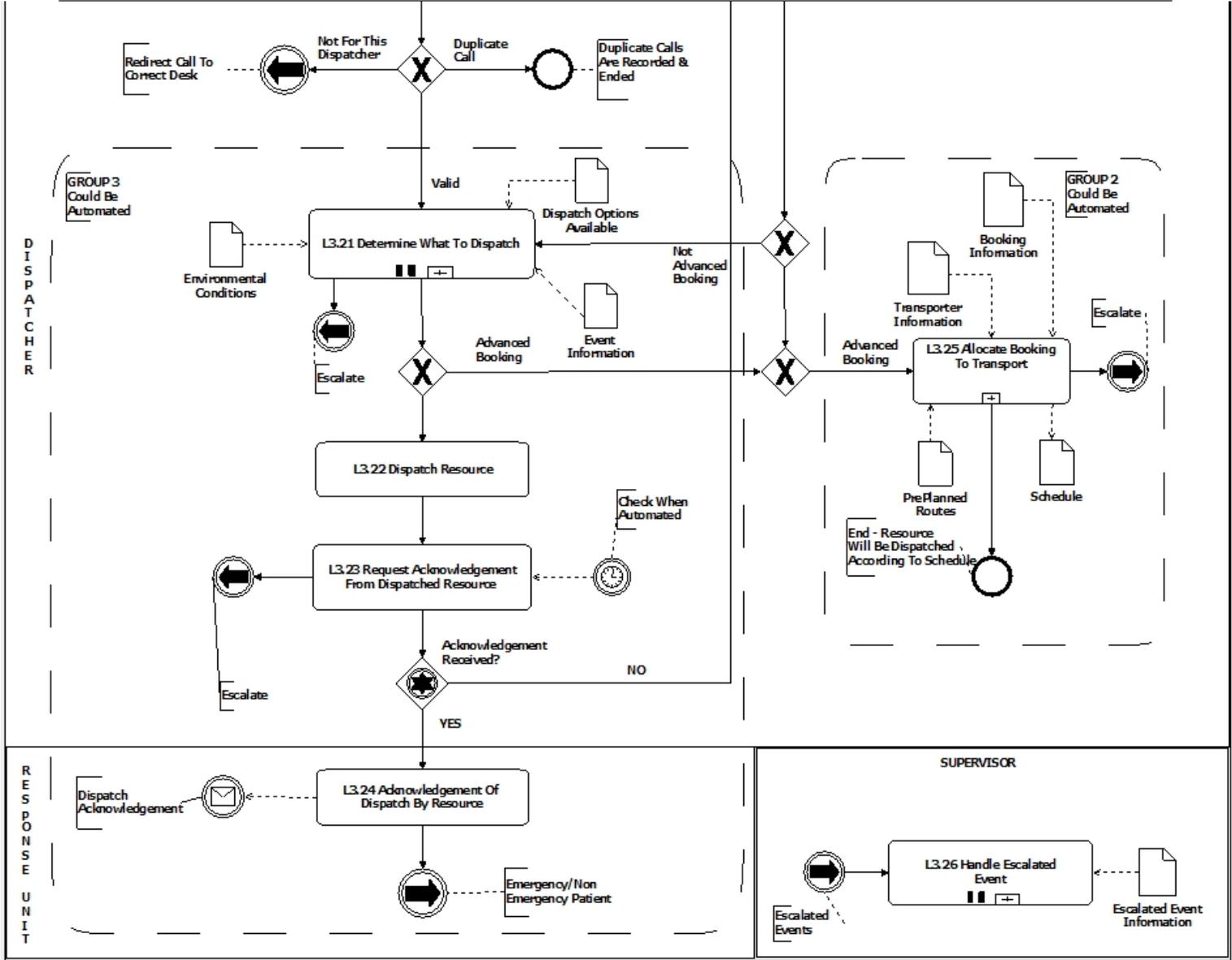
Type: Sub-process with multiple instance  
 ID: L2.3

Dispatching is one of the core sub-processes of the EMS emergency control centre operations. It is the process of determining what to dispatch to the event based on information gathered in the Call Handling sub-process. This describes the interaction between the Dispatcher and the Response Unit, usually an EMS Resource. Some processes in the dispatching process are automated based on given set of rules and others can be performed manually by the dispatcher or automated by the application. In other words either “automated and managed” or “application assisted and directed”.

#### L2.3 - Dispatching



(Continued on next page)



### 3.4.1 Dispatcher

Type: **Lane**

The Dispatcher is the role of the person who handles the event once the Call Handler has assigned the event to the dispatch desk. In some cases, the Call Handler and the Dispatcher can be the same person.



### 3.4.2 *Response Unit*

Type: **Lane**

The Response Unit is the role of the “unit” who arrives at the scene of the event. This could be an EMS Resource that the Dispatcher has dispatched or a “unit” from another Service or Emergency Service. So therefore in some cases, the Response Unit and the EMS Resource can be the same “unit”.

### 3.4.3 *Group 1 – Automated*

Type: **Group**

Group 1 is a grouping of two processes – Determine Estimated Response Time and Determine Auto-Dispatch Appropriate – which is automated and performed by the application, based a set of predefined rules.

### 3.4.4 *Group 2 – Could Be Automated*

Type: **Group**

Group 2 consists of one process – Allocate Booking to Transport – which can be performed by the Dispatcher or automatically by the application, based a set of predefined rules.

### 3.4.5 *Group 3 – Could Be Automated*

Type: **Group**

Group 3 is a grouping of four processes – Determine What to Dispatch, Dispatch Resource, Request Acknowledgement from Dispatched Resource and Acknowledgement of Dispatch by Resource – which could be performed by the Dispatcher or automatically by the application, based a set of predefined rules.

### 3.4.6 *Determine Estimated Response Time*

Type: **Looping Sub-process**

ID: **L3.18**

Role: **Dispatcher (Application assisted)**

When the call is assigned to the Dispatcher, the application will first automatically determine the estimated response time between the EMS resources and the location of the event.

The application will use the list of resources to dispatch and the event information as input, and based on a set of rules it will calculate the response time for available resource. For instance, the closest available ambulance might be 20 minutes away from the event but the closest available EMS response car might be 10 minutes away.

The set of Rules will be based on the same principles as L3.21- Determine what to Dispatch Level 3.

The application will produce a list of dispatch options available for the Dispatcher. The list will be sort by most appropriate options and estimated time.



### Connections

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Call Handling	Determine Estimated Response Time	When the Call Handler assigns the event to a Dispatcher, the application will first determine the estimated response time for each resource
<b><u>Sequence Flow</u></b> Source -> Destination	Determine Estimated Response Time	Determine Auto-Dispatch Appropriate	One the application has produced the various dispatch options; it can decide whether the dispatch should be automated or not based on a set of rules.
<b><u>Object Flow</u></b> Source -> Destination	List of Resources To Dispatch	Determine Estimated Response Time	When determining the estimated response time, the application needs to use the list of resources available to dispatch as criteria. It is the input to this process
<b><u>Object Flow</u></b> Source -> Destination	Event Information	Determine Estimated Response Time	When determining the estimated response time, the application needs to use the Event Information as criteria. It is the input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Rules	Determine Estimated Response Time	When determining the estimated response time, the application needs to use a set of rules to match the demand which is the event to the supply which is the resources available. It is the input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Determine Estimated Response Time	Dispatch Options Available	Once the application as calculated the estimated response time, a list of dispatch options available will be produced. It is the output to this process.

#### 3.4.6.1 List of Resources to Dispatch

Type: **Object**

This object is the input to the Determine Estimated Response Time process. The application uses the list of available resources which contains information such as the GIS location and equipment available to determine the supply of resources for a call.

#### 3.4.6.2 Event Information

Type: **Object**



This object is the input to the Determine Estimated Response Time process. The application uses the Event information which contains for instance the GIS Location or address of the event to determine the demand for the available resources for a call.

### 3.4.6.3 Dispatch Options Available

Type: **Object**

This object is the output to the Determine Estimated Response Time process. From the demand for resources and the supply of resources obtained from the event information and the list of resources to dispatch, the application produces a list of dispatch options based on estimated response time rules. For instance one of the options could be to an ambulance which is off loading a patient at a healthcare with a fastest response time than an ambulance on its way to a priority 2 patient. The list will be sort by most appropriate options and estimated times.

### 3.4.6.4 Rules

Type: **Object**

This object is the input to the Determine Estimated Response Time process. The application uses a set of rules to determine estimated response time and create the dispatch options available. For instance if the rule is response must be 15 minutes then only the available resources that can response within that time will be listed on the dispatch options list. The rules will be based on the same principles as L3.21 – Determine what to Dispatch.

### 3.4.7 Determine Auto-Dispatch Appropriate

Type: **Sub-process**

ID: **L3.19**

Role: **Dispatcher (Application assisted)**

When the application produces the list of dispatch options, it can then determine whether or not auto-dispatch is appropriate based on a set of auto-dispatching rules. This should only occur for P1 incidents and patient emergencies. But the rules could be changed.

This process is required to ensure that all resources are not dispatched automatically without any further intervention from the Dispatcher. In some cases, the Dispatcher might need to manually dispatch available resources to ensure that the event is attended to.

For instance, for Priority 1 incidents the resources can be dispatched automatically but some similar incidents at the same location, the dispatcher might need to decide whether it is the same incidents or not. For Priority 1 patients declared by the Call Handler in Call Handling process might also be dispatched automatically.

The Dispatch options available list will show the available resources in the order based on the determination rules so that they could be selected by the Dispatcher manually. S/he can determine what resource to dispatch and override the preference presented. The determination rules are depicted in L3.21 Level 3 diagram.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b>			Once the application has produced the



Connector	Source	Target	Notes
Source -> Destination	Determine Estimated Response Time	Determine Auto-Dispatch Appropriate	various dispatch options; it can decide whether the dispatch should be automated or not based on a set of rules.
<b><u>Sequence Flow</u></b> Source -> Destination	Determine Auto-Dispatch Appropriate	Accept Responsibility	If the dispatch is not automated, the Dispatcher needs to accept responsibility for it.
<b><u>Sequence Flow</u></b> Source -> Destination	Determine Auto-Dispatch Appropriate	Allocate Booking To Transport	If the dispatch is automated and it is an advanced booking then it needs to be allocated as resources are not dispatched immediately for those.
<b><u>Sequence Flow</u></b> Source -> Destination	Determine Auto-Dispatch Appropriate	Determine what to Dispatch	If the dispatch is automated, the application will automatically dispatch the resource based on a set of rules if it is not an advanced booking.
<b><u>Object Flow</u></b> Source -> Destination	Set of Auto-Dispatching Rules	Determine Auto-Dispatch Appropriate	The application will determine if auto-dispatch is appropriate based on a set of rules as not all events can be auto-dispatched. It is the input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Dispatch Options Available	Determine Auto-Dispatch Appropriate	The application will use the dispatch options list created by the previous process to determine if auto-dispatch is appropriate. It is the output to this process.

### 3.4.7.1 Auto-Dispatch Rules

*Type:* **Object**

This object is the input to the Determine Auto-Dispatch Appropriate process. The application uses a set of rules to determine if it is appropriate to auto-dispatch or not based on the dispatch options available. For instance it is appropriate to dispatch resources to a Priority 1 incident but not necessarily to a priority 2 patient.

### 3.4.7.2 Dispatch Options Available

*Type:* **Object**

This object is the input to the Determine Auto-Dispatch Appropriate process. The dispatch options available list will be used in conjunction with the set of rules to determine if it is appropriate to auto-dispatch a resource to an event.



### 3.4.8 Accept Responsibility

Type: **Sub-process**

ID: **L3.20**

Role: **Dispatcher**

If the application does not auto-dispatch the resource, the event will go to a Dispatcher. The Dispatcher will then need to accept responsibility for this event. When accepting responsibility for an event, the Dispatcher will receive all the information regarding this event as well as the Caller information.

If the application does auto-dispatch the resource, the Dispatcher still needs to accept responsibility for this event. When accepting responsibility for an event, the Dispatcher will receive all the information regarding this event as well as the Caller information. The Dispatcher must then immediately verify that s/he is satisfied with the resource that was dispatched.

The Dispatcher can also determine if the event should be transferred to another dispatch desk. For instance if the load is high at a given dispatch desk, the call can be transferred to another dispatch desk. This is done by escalating the dispatch to a supervisor who will transfer it.

In some cases the resource that a Dispatcher has dispatched might be required for a higher priority event. For instance, Dispatcher A dispatches an available ambulance to a Priority 2 patient. However Dispatcher B receives a Priority 1 event and needs the ambulance that was dispatched by Dispatcher A. In this case, Dispatcher B dispatches and re-routes the ambulance to the Priority 1 event. The Priority 2 patient will remain the responsibility of Dispatcher A. S/he is notified that the ambulance is no longer available so that s/he can find and dispatch another resource to the Priority 2 patient by using the new list of dispatch options available to determine what to dispatch.

In the Districts, there might be only one Dispatcher so redirecting event to another dispatch desk might not apply.

In case of a Delta incident, the districts dispatch desk might need to accept responsibility for events that are not in their district in order to assist another dispatch desk which is dealing with a Delta incident.

In cases where a resource is dispatched automatically by the application and a response is not received after a certain period of time from the resource, the application will force a Dispatcher to accept responsibility (See L3.23) for the event. The Dispatcher will then go through the process again to dispatch another resource or contact the same resource and determine what the delay for accepting the dispatch is. The Dispatcher can also escalate the event to the Supervisor if required.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Determine Auto-Dispatch Appropriate	Accept Responsibility	If the dispatch is not automated, the Dispatcher needs to accept responsibility for it.
<b>Sequence Flow</b> Source -> Destination	Accept Responsibility	Determine What To Dispatch	Once the Dispatcher accepts responsibility for the event and determines that the event is valid, s/he needs to determine what to dispatch.
<b>Sequence Flow</b> Source -> Destination	Accept Responsibility	Intermediate Event – Link	The Dispatcher can transfer the event to another dispatch desk if required.
<b>Sequence Flow</b>			If the Dispatcher determines that the



Connector	Source	Target	Notes
Source -> Destination	Accept Responsibility	End Event – Close	event is a duplicate or repeat call, it is linked to current event and ended.
<b><u>Sequence Flow</u></b> Source -> Destination	Request Acknowledgement From Dispatched Resource	Accept Responsibility	If a dispatched resource does not respond to the Request for Acknowledgement, the application will notify the Dispatcher to accept responsibility for the event and dispatch another resource.
<b><u>Object Flow</u></b> Source -> Destination	Event Information	Accept Responsibility	The Dispatcher will use the Event information to determine if the event is a duplicate or repeat call. It is the input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Caller Information	Accept Responsibility	The Dispatcher will use the Caller information to determine if the event is a duplicate or repeat call. It is the input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Dispatch Options Available	Accept Responsibility	The Dispatcher will use the dispatch options list created by the application to determine if the event needs to be reassigned. It is the input to this process.

### 3.4.8.1 Event Information

*Type:* **Object**

This object is the input to the Accept Responsibility process. The Dispatcher receives the Event information which contains for instance the GIS Location or address of the event when s/he accepts responsibility for the event.

### 3.4.8.2 Caller Information

*Type:* **Object**

This object is the input to the Accept Responsibility process. The Dispatcher receives the Caller's name, contact number and location etc when s/he accepts responsibility for the event. This information is essential if there is a need to contact the Caller once the event has been dispatched.

### 3.4.8.3 Dispatch Options Available

*Type:* **Object**

This object is the input to the Accept Responsibility process. From the demand for resources and the supply of resources obtained from the event information and the list of resources to dispatch, the application produces a list of dispatch options based on estimated response time rules. The Dispatcher can use that list to make appropriate decision.



### 3.4.9 Determine What to Dispatch

Type: **Sub-process with multiple instances**

ID: **L3.20**

Role: **Dispatcher or Application Assisted**

This is the process where the Dispatcher or the application determines which resources to dispatch to the event. There could be multiple instances of this process as many resources might need to be dispatched. If the process is automated the application will use the dispatch options available list produced in L3.18 – Determine Estimated Response Time to make a decision. The list will have the most appropriate option listed first based on estimated response times for the application to decide.

If the process is not automated, the Dispatcher uses the event information, the dispatch options available list produced by the application and the environment conditions report to make the decision.

The Dispatcher is able to see the captured and special information about events that are assigned to him as well as the resources status and location. Using the dispatch options available list, the Dispatcher can decide if it is necessary to dispatch immediately or not and whether to use the suggestions from the application or not.

The environmental conditions need to be taken into consideration as the resource that might be available for dispatching might not be able to access the event. For instance the road is blocked due to flooding and therefore the resource from another district might be required. The environmental conditions information is obtained from previous or current events information as resources will be asking the Dispatcher for additional information regarding the weather, the traffic etc. (See L3.33)

The Dispatcher might also need to go through this process again if the dispatched resources require further assistance once on site.

If the event is an advanced booking, the Dispatcher will either perform the Allocate Booking to Transport (See L3.25) or will instruct the application to perform this process. Once the advanced booking has been allocated the event will end.

The Dispatcher can also escalate the event to the Supervisor if required.

This process was broken down further to a Level 3 diagram to illustrate the decision making process (See Level 3 Detail: Determine What to Dispatch)

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Accept Responsibility	Determine What To Dispatch	Once the Dispatcher accepts responsibility for the event and determines that the event is valid, s/he needs to determine what to dispatch.
<b>Sequence Flow</b> Source -> Destination	Determine What To Dispatch	Dispatch Resource	Once the Dispatcher has determined what to dispatch, the resource is dispatched.
<b>Sequence Flow</b> Source -> Destination	Determine Auto-Dispatch Appropriate	Determine what to Dispatch	If the dispatch is automated, the application will automatically dispatch the resource based on a set of rules if it is not an advanced booking. The application will also issue and communicate the instruction and event details to the response unit.



Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Determine What To Dispatch	Allocate Booking To Transport	If advanced booking is received, the Dispatcher will either instruct application to process the advanced booking or s/he will do it themselves.
<b><u>Object Flow</u></b> Source -> Destination	Event Information	Determine What To Dispatch	The Dispatcher will use the Event information to determine what resource to dispatch. It is the input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Dispatch Options Available	Determine What To Dispatch	The Dispatcher will use the dispatch options list created by the application to determine what resource to dispatch. It is the input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Environmental Conditions	Determine What To Dispatch	When determining what resource to dispatch, the Dispatcher uses the information he has on hand about what other Environmental Conditions might affect what he can dispatch. For example his knowledge of peak hour traffic bottlenecks or the affect of weather conditions. It is the input to this process.

### 3.4.9.1 Event Information

*Type:* **Object**

This object is the input to the Determine What to Dispatch process. The Dispatcher receives the Event information which contains for instance the GIS Location or address of the event to assist him/her to decide appropriate resource to dispatch to the event.

### 3.4.9.2 Dispatch Options Available

*Type:* **Object**

This object is the input to the Determine What to Dispatch process. The Dispatcher receives a list of dispatch options available generated by the application. The Dispatcher can use the list in association with the event information to make the appropriate decision.

The application will also use this list to determine which resource to automatically dispatch.

### 3.4.9.3 Environmental Conditions

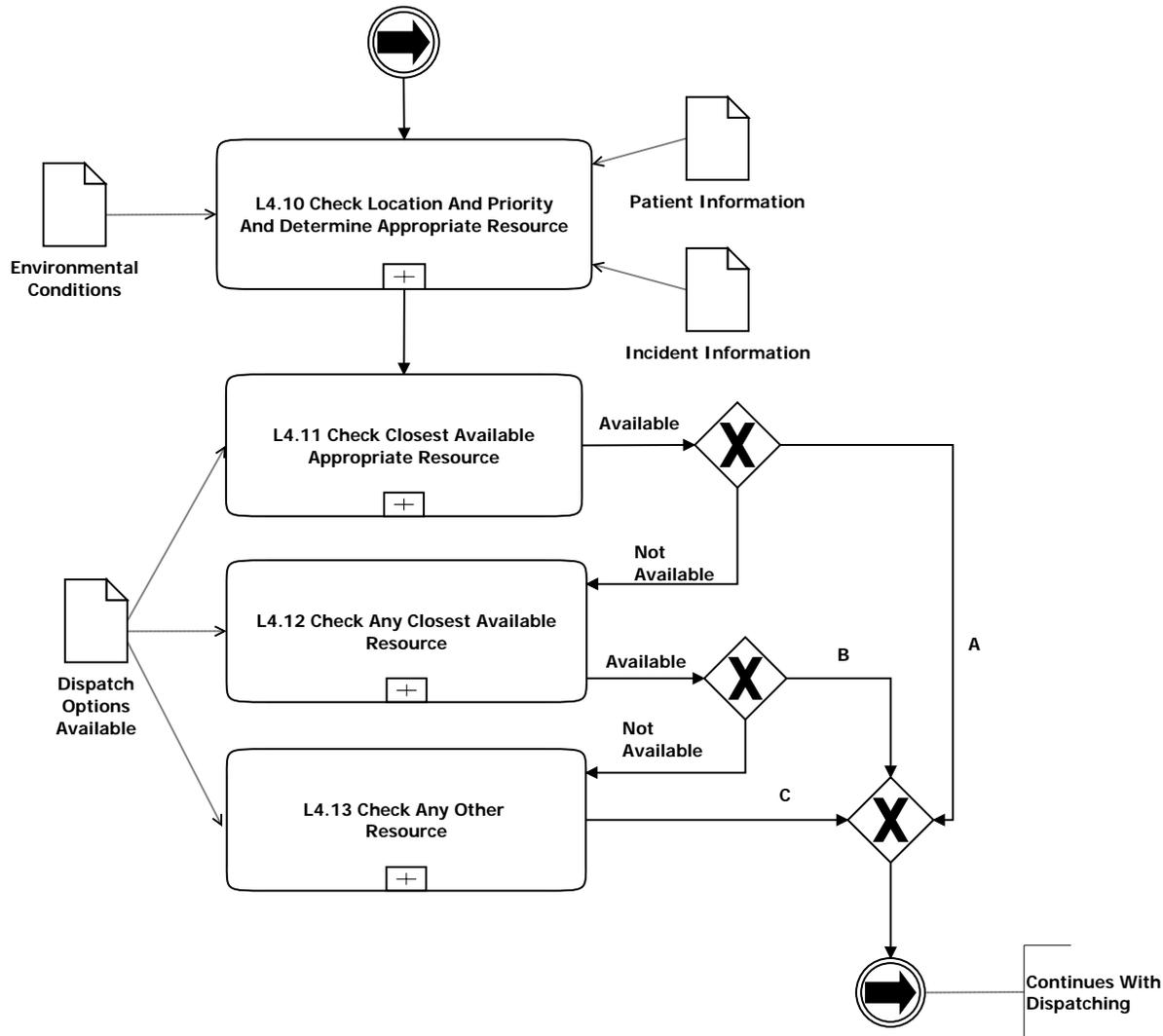
*Type:* **Object**

This object is the input to the Determine What to Dispatch process. The environmental condition in the area where the event is happening is essential as this will also determine whether the resource is appropriate or not and what route should the resource take to reach the location of the event. For instance, if there are floods alternative routes might have to be followed or a resource from a different district might be required.

### 3.4.9.4 Level 3 Detail: Determine What to Dispatch

This process was broken down further to a Level 3 diagram to illustrate the decision making process.

#### L3.21 - Determine What To Dispatch



#### 3.4.9.4.1 Check Location and Priority and Determine Appropriate Resource

Type: **Sub-process**

ID: **L4.10**

Role: **Dispatcher**

To determine what resource to dispatch, the Dispatcher uses the event information which will contain the patient information and incident information to check the priority and location of the event. This information is then matched to what the most appropriate EMS Resource would be or what other Response Unit would be appropriate to dispatch. The patient and incident information will be obtained from the Call Handler initially but will be supplemented by further information obtained from Response Unit on scene.



The Environmental conditions obtained from previous or current events information will also be used to determine the appropriate resource (See L3.33). For instance, if there are fires, some routes are blocked and the resources might not be able to access the event location via the common route and will have to find an alternative route.

**Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Accept Responsibility	Check Location and Priority and Determine Appropriate Resource	Once the Dispatcher accepts responsibility for the event, s/he can start checking for the location and priority of the event to determine what resources need to be dispatched.
<b><u>Sequence Flow</u></b> Source -> Destination	Check Location and Priority and Determine Appropriate Resource	Check Closest Available Appropriate Resource	Once the Dispatcher has checked the priority and location of the event, s/he can start identifying the appropriate resource.
<b><u>Object Flow</u></b> Source -> Destination	Patient Information	Check Location and Priority and Determine Appropriate Resource	The Dispatcher will use the Patient information to determine what resource to dispatch. It is the input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Environmental Conditions	Check Location and Priority and Determine Appropriate Resource	When determining what resource to dispatch, the Dispatcher uses the information he has on hand about what other Environmental Conditions might affect what he can dispatch. For example his knowledge of peak hour traffic bottlenecks or the affect of weather conditions. It is the input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Incident Information	Check Location and Priority and Determine Appropriate Resource	The Dispatcher will use the Incident information to determine what resource to dispatch. It is the input to this process.

3.4.9.4.1.1 Patient Information

Type: **Object**

This object is the input to the Check Location and Priority and Determine Appropriate Resource sub-process. The patient information is the information about the patient if there are any during an event. When the Dispatcher is initially determining what to dispatch to the event, the patient information will be



the information captured by the Call Handler during the Call Handling process. However if Response Unit determines that additional resources required, more information will be available about the patient via the situation report (See L3.29).

3.4.9.4.1.2 Incident Information

Type: **Object**

This object is the input to the Check Location and Priority and Determine Appropriate Resource sub-process. The incident information is the information about the event and not only about the patient. When the Dispatcher is initially determining what to dispatch to the event, the incident information will be the information captured by the Call Handler during the Call Handling process. However from the Response Unit Situation Report (L3.29) or further investigation it is determined that additional resources are required, more information will be available about the incident.

3.4.9.4.1.3 Environmental Conditions

Type: **Object**

This object is the input to the Check Location and Priority and Determine Appropriate Resource sub-process. The environmental condition in the area where the event is happening is essential as this will also determine whether the resource is appropriate or not and what route should the resource take to reach the location of the event. For instance, if there are floods a resource from a different district might be required.

3.4.9.4.1.4 Check Closest Available Appropriate Resource

Type: **Sub-process**

ID: **L4.11**

Role: **Dispatcher**

This is the process where the Dispatcher uses the dispatch options available list generated by the application to start looking for the closest available appropriate resource. If the resource is available, it is dispatched immediately to the event.

If the appropriate resource is not the closest, the Dispatcher will still dispatch it but then needs to look for any closest available resource (L4.12) to be dispatched so that that resource can offer either basic (BLS) or intermediate life support (ILS) as soon as possible and until the appropriate resource arrives.

**Connections**

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Check Location and Priority and Determine Appropriate Resource	Check Closest Available Appropriate Resource	Once the Dispatcher has checked the priority and location of the event, s/he can start identifying the appropriate resource.
<b>Sequence Flow</b> Source -> Destination	Check Closest Available Appropriate Resource	Check Any Closest Available Resource	If closest appropriate resource is not available then check any closest available resource.
<b>Sequence Flow</b>			If closest appropriate resource is



Connector	Source	Target	Notes
Source -> Destination	Check Closest Available Appropriate Resource	End Event – Link	available, it is dispatched to the event.
<b><u>Object Flow</u></b> Source -> Destination	Dispatch Options Available	Check Closest Available Appropriate Resource	The Dispatcher will use the dispatch options available list generated by the application to look for the closest available appropriate resource. It is the input to this process.

#### 3.4.9.4.1.5 Dispatch Options Available

Type: **Object**

This object is the input to the “Check Closest Available Appropriate Resource” process. The Dispatcher receives a list of dispatch options available generated by the application. The Dispatcher uses the list to determine the resources available to dispatch. For instance for a Priority 1 patient, the list will specify if an Advanced Life Support ambulance (ALS) is available.

#### 3.4.9.4.1.6 Check Any Closest Available Resource

Type: **Sub-process**

ID: **L4.12**

Role: **Dispatcher**

If the Dispatcher cannot find the closest available appropriate resource, s/he will check if any closest available resource is available to send to the event. If a resource is then identified, it is dispatched immediately to the event.

If the resource is not available, the Dispatcher needs to look for any other closest resource.

For example, for a P1 incident, if an Advanced Life Support ambulance (ALS) is not available, but an Intermediate Life Support ambulance (ILS) is nearby but not yet committed it can be dispatched.

#### **Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Check Closest Available Appropriate Resource	Check Any Closest Available Resource	If closest appropriate resource is not available then check any closest available resource.
<b><u>Sequence Flow</u></b> Source -> Destination	Check Any Closest Available Resource	Check Any Other Resource	If closest available resource is not available then check any other available resource.
<b><u>Sequence Flow</u></b> Source -> Destination	Check Any Closest Available Resource	End Event – Link	If closest available resource is available, it is dispatched to the event.
<b><u>Object Flow</u></b>	Dispatch Options	Check Closest	The Dispatcher will use the dispatch options available list generated by the



Connector	Source	Target	Notes
Source -> Destination	Available	Available Appropriate Resource	application to look for the closest available resource. It is the input to this process.

#### 3.4.9.4.1.7 Dispatch Options Available

Type: **Object**

This object is the input to the “Check Any Closest Available Resource” process. The Dispatcher receives a list of dispatch options available generated by the application. The Dispatcher uses the list to determine the other resource available to dispatch if the closest appropriate resource is not available. For instance for a Priority 1 patient, the list will specify if an ILS ambulance is available if an ALS is not. An ILS ambulance might be on its way to a P2 patient and asked to be redirected to the P1 event.

#### 3.4.9.4.1.8 Check Any Other Resource

Type: **Sub-process**

ID: **L4.13**

Role: **Dispatcher**

If the Dispatcher still cannot find a resource, s/he will check if for any other resource. But a resource MUST be identified and it will be dispatched immediately to the event.

In some cases, the Dispatcher might need to check with other 3<sup>rd</sup> party emergency services, or the fire department. Or even if an ILS ambulance is committed but has a P2 or P3 patient and there is still more space in the ambulance it can still be dispatched.

The Dispatcher continues to monitor the dispatch options available for more appropriate resource to become available.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Check Any Closest Available Resource	Check Any Other Resource	If closest available resource is not available then check any other available resource.
<b>Sequence Flow</b> Source -> Destination	Check Any Other Resource	End Event – Link	Other Resource will be dispatched to the event in the meantime.
<b>Object Flow</b> Source -> Destination	Dispatch Options Available	Check Closest Available Appropriate Resource	The Dispatcher will use the dispatch options available list generated by the application to look for the any other resource. It is the input to this process.

### 3.4.10 Dispatch Resource

Type: **Task**

ID: **L3.22**

Role: **Dispatcher or Application Assisted**

This is the task where the Dispatcher dispatches the resource to the event.



This task could be automated if the application automatically dispatches the resource instead of the Dispatcher doing so.

**Connections**

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Determine What To Dispatch	Dispatch Resource	Once the Dispatcher has determined what to dispatch, the resource is dispatched.
<b>Sequence Flow</b> Source -> Destination	Determine Auto-Dispatch Appropriate	Dispatch Resource	If the dispatch is automated, the application will automatically dispatch the resource if it is not an advanced booking.
<b>Sequence Flow</b> Source -> Destination	Dispatch Resource	Request Acknowledgement From Dispatched Resource	Once the dispatcher has dispatched the resources, s/he needs to get confirmation from the dispatched resource

**3.4.11 Request Acknowledgement from Dispatched Resource**

Type: **Task**

ID: **L3.23**

Role: **Dispatcher or Application assisted**

This is the task where the Dispatcher asks the resource to acknowledge receipt of dispatch instructions. This task could be automated whereby the application automatically request for acknowledgement once resource dispatched.

If the task is automated, the application will wait for a set time period for acknowledgement from the resource. If no acknowledgement is received, the application will force a Dispatcher to accept responsibility for the event (See L3.20) and manually perform the dispatch.

The Dispatcher can also escalate the event to the Supervisor if required.

**Connections**

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Dispatch Resource	Request Acknowledgement From Dispatched Resource	Once the dispatcher has dispatched the resources, s/he needs to get confirmation from the dispatched resource.
<b>Sequence Flow</b> Source -> Destination	Request Acknowledgement From Dispatched Resource	Acknowledgement Of Dispatch By Resource	When the Response Unit receives the acknowledgement request, it confirms acceptance.
<b>Sequence Flow</b> Source -> Destination	Request Acknowledgement	Accept Responsibility	If no response received to the Request for Acknowledgement, the application will force a Dispatcher to accept



Connector	Source	Target	Notes
	From Dispatched Resource		responsibility for the event.



### 3.4.12 Acknowledgement of Dispatch by Resource

Type: **Task**  
 ID: **L3.24**  
 Role: **Response Unit or Application assisted**

This is the task where the Response Unit acknowledges the dispatch. This task could be automated whereby the application automatically updates the received acknowledgement from dispatched resource. If the task is not automated, the Response Unit will send a message back to the Dispatcher to confirm acceptance and the Dispatcher must record that the resource is now “allocated”.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Request Acknowledgement From Dispatched Resource	Acknowledgement Of Dispatch By Resource	When the Response Unit receives the acknowledgement request, it confirms acceptance.
<b>Sequence Flow</b> Source -> Destination	Acknowledgement Of Dispatch By Resource	Intermediate Event - Message	A message is sent back to the Dispatcher to confirm acceptance of dispatch. If automated, the application will receive a notification.
<b>Sequence Flow</b> Source -> Destination	Acknowledgement Of Dispatch By Resource	Intermediate Event – Link	The Emergency/Non-Emergency process will start.

### 3.4.13 Allocate Booking to Transport

Type: **Sub-process**  
 ID: **L3.25**  
 Role: **Dispatcher or Application assisted**

When the application has generated the dispatch option available list and determines that the resource can be dispatched, there is a possibility that the event is in fact an advanced booking. For advanced booking, there is no need to dispatch the resource immediately as the Caller requires the resource at a specific time and place. This process can be automated or performed by the Dispatcher. The application or the Dispatcher can therefore use a further set of information to allocate the booking into a schedule. The information used for the advanced bookings are the Transporters’ information which is the information about the resource for instance the equipment available in the ambulance, the booking information which indicates the pick up and drop off date and time and the pre-planned Routes which determine the area and healthcare facilities that the transport will go to. Using this set of information, the application or the Dispatcher checks for a resource that meets the requirements and will allocate a slot for this booking for when this resource is available to meet the requirement.

By allocating an available slot, the application or the Dispatcher builds a schedule which is thereafter distributed to the resource for further action (see L2.10).



A round-trip is considered as two advanced bookings whereby the patients make a booking for the pick up and drop off to the healthcare facility and thereafter makes a second booking for the pick up and drop off from the healthcare facility.

A same day booking might not be considered an advanced booking as such, it will go through the usual dispatching process and the dispatcher or the application will dispatch a resource accordingly. The dispatched resource might be a resource committed to a pre-planned route already but which has enough capacity to accommodate the same day booking.

The Dispatcher can also escalate the event to the Supervisor if required.

**Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Determine Auto-Dispatch Appropriate	Allocate Booking To Transport	If the dispatch is automated, the application must also check for advanced booking as resources are not dispatched immediately for those.
<b><u>Sequence Flow</u></b> Source -> Destination	Allocate Booking To Transport	End Event	Once booking allocated, the event is ended until the resource receives the schedule for further action.
<b><u>Sequence Flow</u></b> Source -> Destination	Determine What To Dispatch	Allocate Booking To Transport	If advanced booking is received, the Dispatcher will either instruct application to process the advanced booking or s/he will do it themselves.
<b><u>Object Flow</u></b> Source -> Destination	Transporter Information	Allocate Booking To Transport	The transporter information is information about the vehicles and equipment that are available to transport patients. It is an input to the process.
<b><u>Object Flow</u></b> Source -> Destination	Booking Information	Allocate Booking To Transport	The Booking information is the information about the patient and what s/he requires. It is an input to the process.
<b><u>Object Flow</u></b> Source -> Destination	Pre Planned Routes	Allocate Booking To Transport	The routes for pick up and drop-off of patients are pre planned and the application will use this information to allocate the booking. It is an input to the process.
<b><u>Object Flow</u></b> Source -> Destination	Allocate Booking To Transport	Schedule	The schedule is created from all the bookings made by the patients and distributed to the resource accordingly. It is an output to the process.

**3.4.13.1 Booking Information**

Type: **Object**



This object is the input to the Allocate Booking to Transport sub-process. The booking information such as the mobility of the patient and pick up and drop-off location and time are used to determine what resource to dispatch.

### 3.4.13.2 Transporter Information

Type: **Object**

This object is the input to the Allocate Booking to Transport sub-process. The Transporter information will include vehicle type and equipment available on the vehicle. This information is essential to meet the requirements of the booking.

### 3.4.13.3 Pre-Planned Routes

Type: **Object**

This object is the input to the Allocate Booking to Transport sub-process. The route that the resource will follow on a given day or at a given time for instance to pick up and drop off patients is determined in advance. The schedule for a pre-planned route will be updated accordingly with a booking.

### 3.4.13.4 Schedule

Type: **Object**

This object is the output to the Allocate Booking to Transport sub-process. The schedule is created when the booking is allocated a slot for a given pre-planned route and a given resource. It is distributed to the resource at the beginning of their shift ([see L2.10 Issue Advance Booking Schedule](#)).

## 3.4.14 Handle Escalated Event

Type: **Sub-process with multiple instances**

ID: **L3.265**

Role: **Supervisor**

This is the process where the Supervisor handles the escalated events that came through to him/her. The Supervisor will use the Escalated Event information list to get information about the problematic calls.

### Connections

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Intermediate Event -Link Escalate	Handle Escalated Event	The event can be escalated by the Dispatcher to Supervisor if required.
<b><u>Object Flow</u></b> Source -> Destination	Handle Escalated Event	Escalated Event Information	The Escalated Event information will assist the Supervisor with information about the problematic events. It is an input to the process.

### 3.4.14.1 Escalated Call Information

Type: **Object**

This object is the input to the “Handle Escalated Event” process. The Supervisor uses a list of escalated events to get information about those events and take appropriate action.



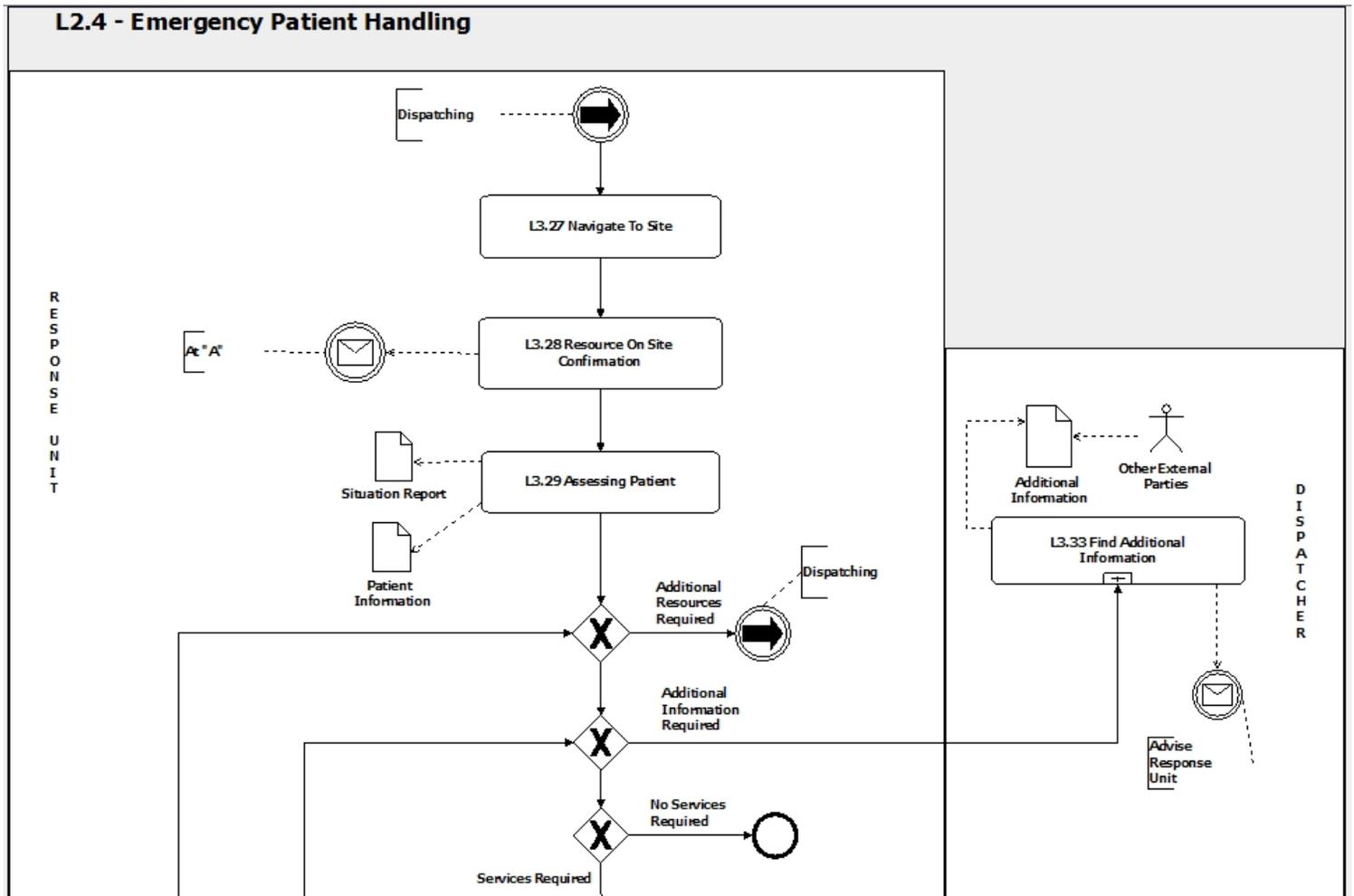
### 3.5 Emergency Patient Handling

Type: Sub-process with multiple instance

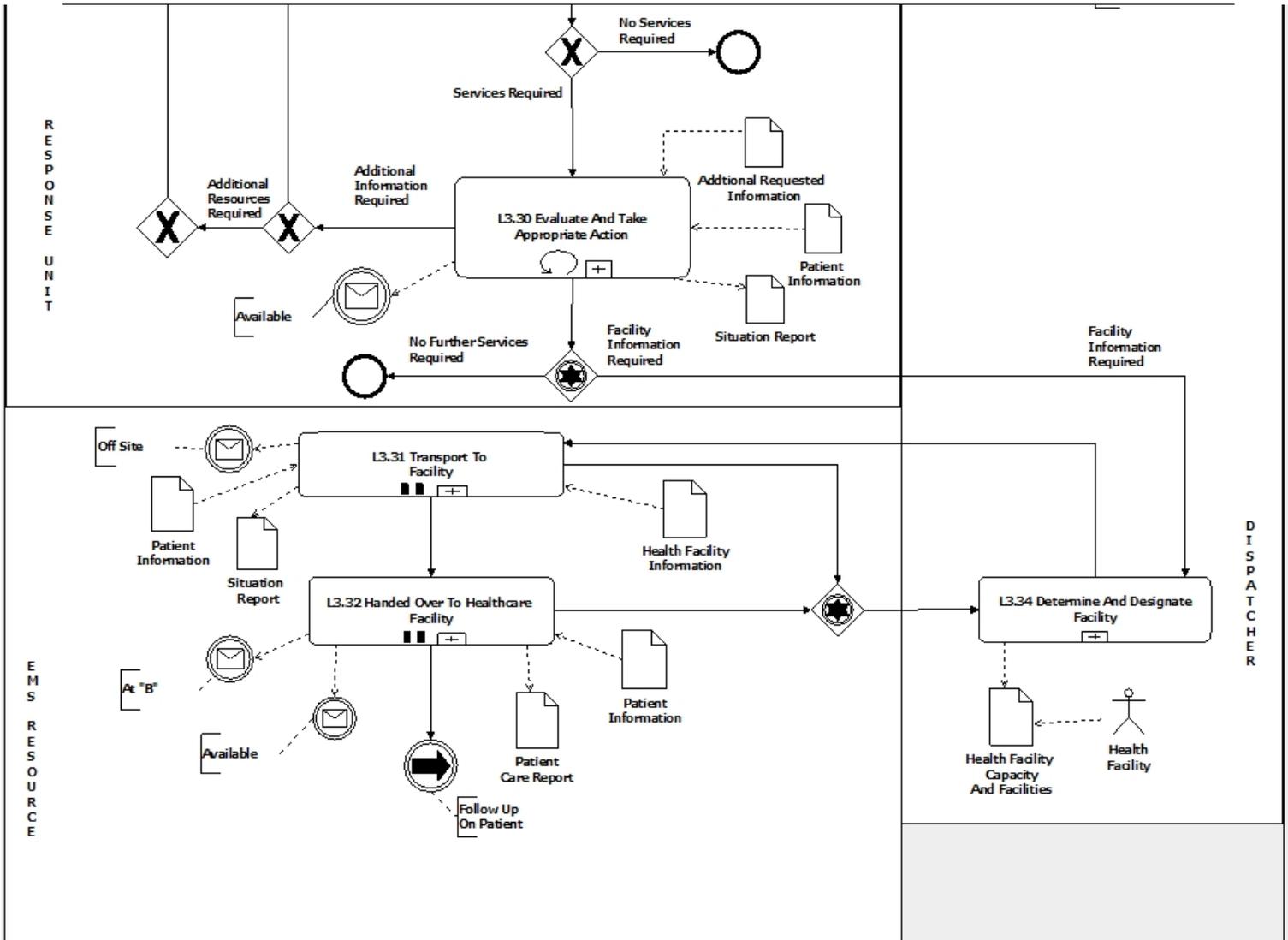
ID: L2.4

Emergency Patient Handling is one of the core sub-processes of the EMS emergency control centre operations. It is the process whereby the resource dispatched from the Dispatching sub-process proceeds to the event location and transports the patient to a healthcare facility if required. So at this point in the process they have acknowledged responsibility for the event. The process describes the interaction between the roles of Response Unit, the EMS Resource and the Dispatcher.

The process describes the handling of patient emergencies only, whereas the handling of non-emergency patients will be explained in Non-Emergency Patient Handling (See L2.5). The process activities are the same for both emergency and non-emergency but the context is different. Therefore the “story line” of the process will be described twice in describing firstly emergency and thereafter non-emergency patient situations.



(Continued on next page)



### 3.5.1 Dispatcher

Type: Lane

The Dispatcher is the role of the person who handles the event once the Call Handler has assigned the event to the dispatch desk. In some cases, the Call Handler and the Dispatcher can be the same person. Their role is to direct and control resources to and from an event as required. The Response Unit will liaise with the Dispatcher if more information or resources are required for an event.



### 3.5.2 Response Unit

Type: **Lane**

The Response Unit is the role of the team who responds to assist with the event that the Dispatcher has dispatched them to. Or it could be a unit from another service who is first on scene such as the fire department, SAPS or traffic. The Response Unit and EMS Resource can be the same resource and fulfil both roles.

### 3.5.3 EMS Resource

Type: **Lane**

The EMS Resource is the role of the METRO team who Provide the Medical Emergency Transport and Rescue services. The EMS Resource also fulfils the Response Unit role.

### 3.5.4 Navigate To Site

Type: **Task**

ID: **L3.27**

Role: **Response Unit**

This is the task where the response unit proceeds to the patient location once they have accepted the dispatch. They will rely on information from the Dispatcher to help navigate them by means of the quickest route. This could be application assisted navigation by GPS and taking into account any Environmental Conditions that could influence a most affective routing.

In some cases, the Response Unit might already be at the patient location if they came across the event. In this case they would act as a Caller and the Dispatcher as the Call Taker. The Response Unit will advised the Dispatcher and will ask to attend to the emergency patient in whatever capacity they can (See L3.20). This might include transporting the patient to a healthcare facility.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Dispatching	Navigate To Site	The Response Unit will proceed to the location of the event once dispatch instructions received.
<b>Sequence Flow</b> Source -> Destination	Navigate To Site	Resource On Site Confirmation	The Response Unit will send a confirmation back once at the location of the event.



### 3.5.5 Resource on Site Confirmation

Type: **Task**  
ID: **L3.28**  
Role: **Response Unit**

This is the task where the Response Unit communicates with the Dispatcher to confirm that they have arrived at the patient location i.e. at A or on scene.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Navigate To Site	Resource On Site Confirmation	The Response Unit will communicate its location to the Dispatcher once it arrives at the event.
<b>Sequence Flow</b> Source -> Destination	Resource On Site Confirmation	Assessing Patient	Once its location advised, the Response Unit start assessing the patient’s condition.
<b>Sequence Flow</b> Source -> Destination	Resource On Site Confirmation	Intermediate Event – Message	The Response Unit will send a message to the Dispatcher when they are at the event. The status of the resource is now no longer “allocated” but they are now “engaged”.

### 3.5.6 Assessing Patient

Type: **Task**  
ID: **L3.29**  
Role: **Response Unit**

This is the task where the Response Unit initially assesses the patient and gives a Situation Report to the Dispatcher. The Response Unit might not be an EMS resource at this stage as during the dispatching process, any other resource other than EMS resource can be dispatch if EMS resource not available. Or having been informed of the event they might be first on the scene. The main output of this task is known as the Situation Report (Sitrep). The rest of the description describes the information that the response unit should communicate back to dispatch as part of an initial assessment.

If no METRO services are required the EMS Resource will depart and the event will be terminated. In the case of a Patient Emergency if the Response Unit is ALS and it turns out that the event is not for an Emergency Patient then they might leave the scene if dispatched to a higher priority event. In this case the event does not terminate but another EMS Resource is dispatched to respond to the event.

The Triage tag will be given to the patient based on the status of the patient at the time they are found and it will uniquely identify him/her. The tag is a based on the Triage tag and includes a unique bar code to identify the patient and a colour. The colour identifies the status of the patient: Blue for terminal patient, Red for life threatening injuries, Yellow for non-life threatening and Green for minor injuries (Red and Yellow triaged patients require a stretcher for transportation). The tag enables the Response Unit to separate the patients during an incident and provide the necessary healthcare accordingly. The triage colour code is changed if the status of the patient changes. On scene this can be changed up or down but it



can only be changed up whilst the patient is in transport. Any change in patient condition MUST be communicated to the control centre.

The Response Unit also determines if additional resources or other emergency services or rescue services from non EMS services are required at the incident and liaise with the Dispatcher for their request. The Response Unit also determines if additional information is needed for instance contact the weather office or an expert on hazardous substances. If so, they will liaise with the Dispatcher accordingly. If the Response Unit is an EMS Resource they will receive the initial patient information (if any is available) from the Control Centre when they are dispatched or as soon as it is available. This information is also updated from the assessment.

### **Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Resource On Site Confirmation	Assessing Patient	Once on site has been advised, the Response Unit will give a Sitrep after assessing the situation. If the Response Unit is a qualified EMS Resource they will start assessing the patient's condition.
<b><u>Sequence Flow</u></b> Source -> Destination	Assessing Patient	Evaluate And Take Appropriate Action	If Response Unit determines that their services are required, and they are a qualified EMS Resource they will evaluate the patient and take appropriate action.
<b><u>Sequence Flow</u></b> Source -> Destination	Assessing Patient	End Event	Event ends if no METRO services required.
<b><u>Sequence Flow</u></b> Source -> Destination	Assessing Patient	Intermediate Event – Link	The Response Unit liaise with the Dispatcher if more resources required.
<b><u>Sequence Flow</u></b> Source -> Destination	Assessing Patient	Find Additional Information	The Response Unit liaise with the Dispatcher if more information required.
<b><u>Object Flow</u></b> Source -> Destination	Assessing Patient	Situation Report	The Response Unit will give a situation report back to the Dispatcher with updates on the event. It is an output to this task.
<b><u>Object Flow</u></b> Source -> Destination	Assessing Patient	Patient Information	The patient information is updated during this task. It is an output to the process.

### **3.5.6.1 Situation Report**

*Type:* **Object**

This object is the output to the Assessing Patient process. When the resources are on site, they provide feedback to the Dispatcher via a situation report. The report is constantly updated and the Dispatcher can



use it to determine if more resources are required. For instance, during an incident there might be a patient whose condition deteriorates and more equipment is then required on scene.

### 3.5.6.2 Patient Information

*Type:* **Object**

This object is the output to the Assessing Patient process. The information about the patient is updated now that the Response Unit is on the scene. The patient information is update with the Triage Tag information.

### 3.5.7 Evaluate and Take Appropriate Action

*Type:* **Looping Sub process**

*ID:* **L3.30**

*Role:* **Response Unit**

This is the process where the Response Unit needs to continuously assess the patient further and take necessary actions. For example if the patient situation gets worse and further equipment is required. Several resources might be performing this task simultaneously at an incident. The action that the Response Unit will take would be as per who they are. For example traffic will direct traffic or a rescue unit will start the rescue operation and a medical doctor or paramedic will do what they are qualified to do.

Once appropriate action taken, the Response Unit will determine if their services are required further. If services no longer required, it will depart and the event will be terminated.

The Response Unit keeps on updating the Dispatcher as to what the situation is (i.e. adding to the Situation Report). This will include possibly requesting additional resources or additional information from the Dispatcher. The Response Unit uses the additional information requested to take appropriate action. Or if a patient situation worsen more equipment might be required, for example a helicopter evacuation.

If the patient needs to be transported to a healthcare facility, the Response Unit contacts the Dispatcher so that s/he can direct them to which healthcare facility they should be transported. The Dispatcher will liaise with the healthcare facilities to determine availability of services and capacity and advise them of the arrival of patients.

The updated patient information can be used to advise the healthcare facility about that patient.

#### **Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Assessing Patient	Evaluate And Take Appropriate Action	If Response Unit determines that their services are required, they will continue to evaluate the situation or the patient and take the appropriate action that they are qualified to do.
<b><u>Sequence Flow</u></b> Source -> Destination	Evaluate And Take Appropriate Action	End Event	If no further services are required from the Response Unit, the event ends and the resource is available
<b><u>Sequence Flow</u></b>			



Connector	Source	Target	Notes
Source -> Destination	Evaluate And Take Appropriate Action	Intermediate Event - Message	The Response Unit advises the Dispatcher that it is available.
<b><u>Sequence Flow</u></b> Source -> Destination	Evaluate And Take Appropriate Action	Dispatching	If additional resources are required, the Response Unit liaise with the Dispatcher.
<b><u>Sequence Flow</u></b> Source -> Destination	Evaluate And Take Appropriate Action	Find Additional Information	If Response Unit needs additional information, it asks the Dispatcher to liaise with other external parties to get the information.
<b><u>Sequence Flow</u></b> Source -> Destination	Evaluate And Take Appropriate Action	Determine And Designate Healthcare Facility	If Response Unit needs to take the patient to a healthcare facility, they need to liaise with the Dispatcher for instruction as to where the patient can be taken to.
<b><u>Object Flow</u></b> Source -> Destination	Evaluate And Take Appropriate Action	Situation Report	The Response Unit will add to the situation report by reporting back to the Dispatcher with updates on the event and if any additional information or resources are required. It is an output to this process.
<b><u>Object Flow</u></b> Source -> Destination	Additional Requested Information	Evaluate And Take Appropriate Action	The Response Unit will use the additional requested information to help them to continue to evaluate and take appropriate actions. The additional requested information is an input to the process.
<b><u>Object Flow</u></b> Source -> Destination	Patient Information	Evaluate And Take Appropriate Action	The patient information from the initial assessment is used to take appropriate action. It is an input to the process. This is especially necessary if the initial assessment was made by a different Response Unit.

### 3.5.7.1 Situation Report

Type: **Object**

This object is the output to the Evaluate and Take Appropriate Action process. When the resources are on site, they provide feedback to the Dispatcher which is added to the initial situation report. The report is constantly updated and the Dispatcher can use it to determine if more resources are required. For instance, during an incident there might be a patient whose condition deteriorates and additional or different equipment is then required on scene.



### 3.5.7.2 Patient Information

Type: **Object**

This object is the input to the Evaluate and Take Appropriate Action process. The patient information is updated from the initial assessment (See L3.29) and is used to take appropriate action. For instance the initial assessment might have determined that the patient cannot be moved and Response Unit needs to take this situation into consideration.

### 3.5.7.3 Additional Requested Information

Type: **Object**

This object is the input to the Evaluate and Take Appropriate Action process. In some instances, the Response Unit might need additional information from external parties before they can take further action with a patient. For example from the fire department if there are fires in the area to determine the best route to travel, or from the weather centre if there are floods and resources from other districts might be required to help. This information is provided by the Dispatcher who liaises with those external parties if required (See L3.33).

### 3.5.8 Find Additional Information

Type: **Sub process**

ID: **L3.33**

Role: **Dispatcher**

This is the process where the Response Unit has requested additional information from external parties via the Dispatcher. The Dispatcher will liaise with those parties to obtain the information and send them to the Response Unit so they can take further action (See L3.30).

For example, knowing the environmental conditions is essential for Response Unit in case of emergency patients transport as the patient needs to be transported to a healthcare facility as soon as possible. In case of floods, traffic bottlenecks or fire this is not possible and Response Unit need to find the most suitable route.

Other examples would be for patients involved in incident where hazardous material was carried, the Response Unit might need to know how to handle the patient and prevent contamination of other patients.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Evaluate And Take Appropriate Action	Find Additional Information	If Response Unit needs additional information, it asks the Dispatcher to liaise with other external parties to get the information.
<b>Sequence Flow</b> Source -> Destination	Assessing Patient	Find Additional Information	The Response Unit liaise with the Dispatcher if more information required
<b>Sequence Flow</b> Source -> Destination	Find Additional Information	Intermediate Event – Message	The Dispatcher send feedback to the Response Unit with the additional information requested.
<b>Object Flow</b>	Find Additional	Additional	The External parties will provide the Dispatcher with the additional



Connector	Source	Target	Notes
Source -> Destination	Information	Information	information requested and this information will be passed on to the Response Unit. It is an output to this process.

### 3.5.8.1 Additional Information

*Type:* **Object**

This object is the input to the Find Additional Information process. In some instances, the Response Unit might need additional information from external parties before they can take further action with a patient. For example from the fire department if there are fires in the area to determine the best route to travel, or from the weather centre if there are floods and resources from other districts might be required to help. This information is provided by the Dispatcher who liaises with those external parties if required. The information is then passed on to the Response Unit to take appropriate action (See L3.30).

### 3.5.9 Determine and Designate Healthcare Facility

*Type:* **Sub process**

*ID:* **L3.33**

*Role:* **Dispatcher**

This is the process where the Dispatcher determines the appropriate healthcare facility if the patient needs to be transported to one. The EMS Resource asks the Dispatcher for a healthcare facility that has available services for treating the emergency patient. The patient's age, condition, location will determine what is required for the patient. For example the healthcare facility needs to have services to treat head trauma patients or have paediatric services.

The healthcare facilities will regularly provide information about the availability of their services. The dispatcher will use the information available to determine whether, for instance, the nearest healthcare facility might be too full to accept any more patients. The Dispatcher also needs to determine what the services offered by the healthcare facility are, such as bed status, helipad and services such as CT scan. The Dispatcher also needs to determine the location of the healthcare facility. For example in the districts where one healthcare facility serves the region, the healthcare facility might not be fully equipped and in some cases the most appropriate healthcare facility might be in Cape Town.

Once the Dispatcher has obtained the necessary information, the EMS resource will be advised to which healthcare facility to transport the patient.

This process was broken down further to a Level 3 diagram to describe the decision making process and to show how this could be automated but managed or application assisted and directed (See Level 3 Detail: Determine And Designate Healthcare Facility).

#### **Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Evaluate And Take Appropriate Action	Determine And Designate Healthcare Facility	If Response Unit needs to take the patient to a healthcare facility, it needs to liaise with the Dispatcher for the options.



Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Determine And Designate Healthcare Facility	Transport To Healthcare Facility	The Dispatcher will advise the EMS Resource as to which healthcare facility they can transport their patient to.
<b><u>Sequence Flow</u></b> Source -> Destination	Transport To Healthcare Facility	Determine And Designate Healthcare Facility	If the patient conditions changes or worsens and the services required of the healthcare facility are either no longer appropriate or available then the EMS response unit needs to liaise with the Dispatcher again so s/he can advise another healthcare facility.
<b><u>Sequence Flow</u></b> Source -> Destination	Handed Over To Healthcare Facility	Determine And Designate Healthcare Facility	If on arrival (in exceptional circumstances) the healthcare facility cannot take the patient or provide the required services when the EMS resource reaches the healthcare facility then the EMS Resource needs to liaise with the Dispatcher to find another healthcare facility.
<b><u>Object Flow</u></b> Source -> Destination	Determine And Designate Healthcare Facility	Healthcare Facility Capacity And Services	The Dispatcher needs to find out from healthcare facilities if they have enough capacity for more patients and what are the services that they offer according to the requirements of the Response Unit. The information obtained is an output to the process.

### 3.5.9.1 Healthcare Facility Capacity and Services

*Type:* **Object**

This object is the output to the Determine and Designate Healthcare Facility process. If the Response Unit needs to take patients to a healthcare facility, they need to liaise with the Dispatcher to get information about the healthcare facilities. The Dispatcher checks for the appropriate services required at the healthcare facilities and capacity based on the patient condition information obtained from Response Unit treating the emergency patient. The Dispatcher might also need to liaise with the healthcare facilities to get the information required by the Response Unit.

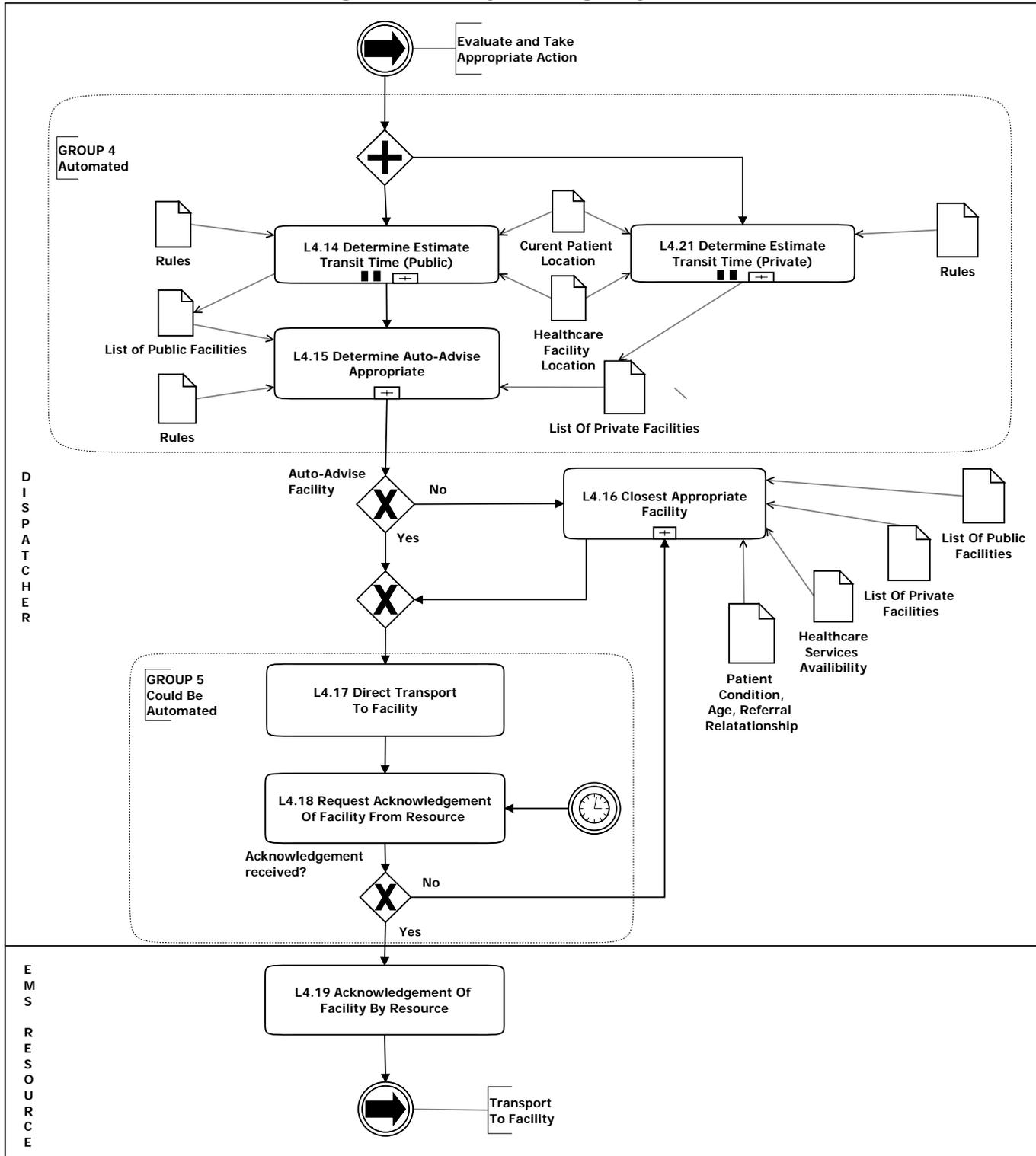
### 3.5.9.2 Level 3 Detail: Determine and Designate Healthcare Facility

This process was broken down further to a Level 3 diagram to describe the decision making process.

**BPMN diagram: Determine and Designate Healthcare Facility (see next page).**



### L3.34 - Determine And Designate Facility (Emergency)





3.5.9.2.1 Group 4 – Automated

*Type:* **Group**

Group 4 is a grouping of three processes – Determine Estimated Transit Time (Private), Determine Estimated Transit Time (Public) and Determine Auto-Advise Appropriate – which are automated and performed by the application based on a set of predefined rules.

3.5.9.2.2 Group 5 - Could Be Automated

*Type:* **Group**

Group 5 is a grouping of 3 processes – Direct Transport to Healthcare Facility, Request Acknowledgement of Healthcare Facility from Resource and Acknowledgement of Healthcare Facility by Resource – which could be automated and performed by the application or performed by the Dispatcher and the EMS Resource.

3.5.9.2.3 Determine Estimate Transit Time (Private)

*Type:* **Sub-process with multiple instances**

*ID:* **L4.21**

*Role:* **Dispatcher (Application Assisted)**

In the case of an emergency it is not necessary that the Dispatcher has the patient’s medical aid information to determine estimated transit time between the current location of the patient and the location of the private healthcare facilities. By law all healthcare facilities with trauma units should be available to provide emergency services. Therefore this process runs in parallel with the Determine Estimate Transit time (Public) (see L4.14). The closest appropriate healthcare facility will be determined from the patient’s condition and other information.

The application will calculate the estimated times between the current patient location and the each private healthcare facility’s location and generate a list of private healthcare facilities. The list of private healthcare facilities will be sorted in order of most appropriate base on a set of predefined rules.

**Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Evaluate and Take Appropriate Action	Determine Estimate Transit Time (Private)	Once the Response Unit has evaluated the patient(s) and taken appropriate action they contact the Dispatcher to Determine and Designate Healthcare Facility. In parallel the first steps are to estimate the transit time patient current location and both the public and private healthcare facility locations.
<b><u>Object Flow</u></b> Source -> Destination	Current Patient Location	Determine Estimate Transit Time (Private)	The current patient location is important to establish the transit time between the patient location and the healthcare facility. For emergency patients the transit time is essential. It is an input to this process.
<b><u>Object Flow</u></b>			The healthcare facility location is



Connector	Source	Target	Notes
Source -> Destination	Healthcare Facility Location	Determine Estimate Transit Time (Private)	important to establish the transit time between the patient location and the healthcare facility. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Rules	Determine Estimate Transit Time (Private)	The rules are important for the application to determine which healthcare facilities are the most appropriate based on preferred information from the Patient if any and estimate transit time. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Determine Estimate Transit Time (Private)	List of Private Healthcare Facilities	The application will use all the input information to generate a list of private healthcare facilities listed in order of most appropriate. It is an output to this process.
<b><u>Sequence Flow</u></b> Source -> Destination	Determine Estimate Transit Time (Private)	Interim Message Event	Once the application has determined the estimate transit time between patient current location and healthcare facility location of appropriate private medical aid approved healthcare facilities available, and then this parallel part of the process ends by sending a message that it is complete.

### 3.5.9.2.3.1 Current Patient Location

**Type:** **Object**

This object is the input to the Determine Estimate Transit Time (Private) process. The current patient location is essential to determine which healthcare facility is the closest most appropriate. The Dispatcher will have information about the healthcare facility locations but needs to know where the patient is compared to the healthcare facility. For instance, the patient might be close to a healthcare facility that does not offer the required services.

### 3.5.9.2.3.2 Healthcare Facility Location

**Type:** **Object**

This object is the input to the Determine Estimate Transit Time (Private) process. The healthcare facility location is essential to determine the closest most appropriate. For instance, the private healthcare facility might have the required services but they are too far compared to the patient location.

### 3.5.9.2.3.3 Rules

**Type:** **Object**



---

This object is the input to the Determine Estimate Transit Time (Private) process. The rules are for the application to determine the closest most appropriate healthcare facilities. The condition of the patient will determine whether to use the closest preferred or not.



3.5.9.2.3.4 *List of Private Healthcare Facilities*

**Type:** Object

This object is the output to the Determine Estimate Transit Time (Private) process. The application will generate a list of most appropriate medical aid approved healthcare facilities with estimated transit times. This list can be used by the Dispatcher to direct transport to healthcare facility.

3.5.9.2.4 Determine Estimate Transit Time (Public)

**Type:** Sub-process with multiple instances

**ID:** L4.14

**Role:** Dispatcher (Application Assisted)

In parallel to private healthcare facilities (L4.21) the application will calculate the estimated times between the current patient location and the public healthcare facility locations and generate a list of public healthcare facilities. The list of public healthcare facilities will be sorted in order of most appropriate base on a set of predefined rules.

**Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Evaluate and take Appropriate Action	Determine Estimate Transit Time (Public)	Once the Response Unit has evaluated the patient(s) and taken appropriate action they contact the Dispatcher to Determine and Designate Healthcare Facility. In parallel the first steps are to estimate the transit time patient current location and both the public and private healthcare facility locations.
<b><u>Object Flow</u></b> Source -> Destination	Current Patient Location	Determine Estimate Transit Time (Public)	The current patient location is important to establish the transit time between the patient location and the healthcare facility. For emergency patients the transit time is essential. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Healthcare facility Location	Determine Estimate Transit Time (Public)	The healthcare facility location is important to establish the transit time between the patient location and the healthcare facility. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Rules	Determine Estimate Transit Time (Public)	The rules are important for the application to determine which healthcare facilities are the most appropriate based on information about the Patient and estimate transit time. It is an input to this process.
<b><u>Object Flow</u></b>			The application will use all the input



Connector	Source	Target	Notes
Source -> Destination	Determine Estimate Transit Time (Public)	List of Public Healthcare Facilities	information to generate a list of public healthcare facilities listed in order of most appropriate with estimated transit time. It is an output to this process.
<b><u>Sequence Flow</u></b> Source -> Destination	Determine Estimate Transit Time (Public)	Determine Auto-Advise Appropriate	Once the estimated transit times have been determined the application will determine if the transport can be directed to the healthcare facility automatically.

#### 3.5.9.2.4.1 Current Patient Location

*Type:* **Object**

This object is the input to the Determine Estimate Transit Time (Public) process. The current patient location is essential to determine which healthcare facility is the closest most appropriate. The Dispatcher will have information about the healthcare facility locations but needs to know where the patient is compared to the healthcare facility. For instance, the patient might be close to a healthcare facility that does not offer the required services.

#### 3.5.9.2.4.2 Healthcare Facility Location

*Type:* **Object**

This object is the input to the Determine Estimate Transit Time (Public) process. The healthcare facility location is essential to determine the closest most appropriate. For instance, the healthcare facility might have the required services but they are too far compared to the patient location.

#### 3.5.9.2.4.3 Rules

*Type:* **Object**

This object is the input to the Determine Estimate Transit Time (Public) process. The rules are for the application to determine the closest most appropriate healthcare facilities. The condition of the patient will determine whether to use the closest preferred or not.

#### 3.5.9.2.4.4 List of Public Healthcare Facilities

*Type:* **Object**

This object is the output to the Determine Estimate Transit Time (Public) process. The application will generate a list of most appropriate public healthcare facilities with estimate transit time. This list can be used by the Dispatcher to direct transport to healthcare facility.

#### 3.5.9.2.5 Determine Auto-Advise Appropriate

*Type:* **Sub-process**

*ID:* **L4.15**

*Role:* **Dispatcher (Application Assisted)**



Once the application has calculate the estimated transit time between the current patient location and the healthcare facilities and generated a list of public healthcare facilities and in parallel a list of private healthcare facilities if medical aid information was available, it will determine based on a set of rules whether to automatically advise the EMS resource of the most appropriate healthcare facility or let the Dispatcher perform this process using the lists generated. To be noted is that if the patient is a P1 then this step does not wait for the list of private healthcare facilities it will use what it has available.

The rules will normally include to auto-advise which healthcare facility for code “red” condition patients as those patients needs to get to the closest appropriate healthcare facility soonest.

If the application determines that auto-advise healthcare facility is suitable, it will automatically advise the EMS resource of the most appropriate healthcare facility to transport the patient based only on the list of public healthcare facilities generated. This is immediately communicated by the application to the response Unit. Both the Response Unit and the dispatcher can query the auto-advise and the Dispatcher can override it.

If the application determines that auto-advise healthcare facility is not suitable, the Dispatcher will select from the combined list of public and private healthcare facilities and carry on with the task of directing the transport to the healthcare facility.

**Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Determine Estimate Transit Time (Public)	Determine Auto-Advise Appropriate	The application will determine if the transport can be directed to the healthcare facility automatically.
<b><u>Sequence Flow</u></b> Source -> Destination	Determine Auto-Advise Appropriate	Closest Appropriate Healthcare Facility	If the application determines that it is not suitable to auto-advise the healthcare facility, the Dispatcher will need to select and advise the EMS resource of the closest appropriate healthcare facility.
<b><u>Sequence Flow</u></b> Source -> Destination	Determine Auto-Advise Appropriate	Direct Transport To Healthcare Facility	The application will automatically advise the resource where to transport the patient.
<b><u>Object Flow</u></b> Source -> Destination	List of Private Healthcare Facilities	Determine Auto-Advise Appropriate	The list of private healthcare facilities generated by the application will be used by the application to auto-advise the healthcare facility to transport the patient to. This will only be used if the Determine Estimate Transit Time (Private) has completed. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	List of Public Healthcare Facilities	Determine Auto-Advise Appropriate	The list of public healthcare facilities generated by the application will be used by the application to auto-advise the healthcare facility to transport the patient to. It is an input to this



Connector	Source	Target	Notes
			process.
<b><u>Object Flow</u></b> Source -> Destination	Rules	Determine Auto-Advise Appropriate	The application will use a set of rules to determine whether to auto-advise resource or not.

### 3.5.9.2.5.1 Rules

**Type:** **Object**

This object is the input to the Determine Auto-Advise Appropriate process. The rules are for the application to determine whether to auto-advise the EMS resource or not. Normally one rule would be to auto-advise healthcare facility for all colour code “red” condition patients that are not stable. The Dispatcher can use his discretion to override this and direct the transport from the selection provided.

### 3.5.9.2.5.2 List of Healthcare Facilities

**Type:** **Object**

This object is the input to the Determine Auto-Advise Appropriate process. The application will use the list of most appropriate public and private healthcare facilities if auto-advise if suitable. The EMS resource will be directed to the most appropriate healthcare facility determine by the application.

### 3.5.9.2.6 Closest Appropriate Healthcare Facility

**Type:** **Sub-process**

**ID:** **L4.16**

**Role:** **Dispatcher**

If the application determines that auto-advise healthcare facility is not suitable, the Dispatcher will have to perform this process.

The Dispatcher will use as input the list of public healthcare facilities generated by the application. If the patient is registered with a medical aid and a list of private healthcare facilities was generated by the application, this list will be used as input as well.

A set of requirements such as patient age, patient condition as well as healthcare facility availability, healthcare facility services such as helipad, CT scan services will also be used as input for the Dispatcher to determine the closest appropriate healthcare facility.

The Dispatcher will use the input information to determine the closest appropriate healthcare facility. For a priority 1 patient this will be the healthcare facility that has the required services for the patient and has the shortest transit time from the patient’s current location. In a case of a priority 1 patient, the closest appropriate healthcare facility might be a private only if the List of Private Healthcare Facilities transit times are available at the time a decision needs to be made. Otherwise it will be the closest public healthcare facility.

If the patient is stable and is registered with a medical aid, the Dispatcher can advise the EMS resource to take the patient to the preferred private healthcare facility if it is the closest preferred private healthcare facility.

The same will apply for a stable patient not registered with a medical aid whereby the patient has a preferred public healthcare facility. The Dispatcher can advise the EMS resource to take the patient to the preferred public healthcare facility if it is the closest preferred public healthcare facility.

**Connections**



Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Determine Auto-Advise Appropriate	Closest Appropriate Healthcare Facility	If the application determines that it is not suitable to auto-advise the healthcare facility, the Dispatcher will need to select and advise the EMS resource of the closest appropriate healthcare facility.
<b><u>Sequence Flow</u></b> Source -> Destination	Closest Appropriate Healthcare Facility	Direct Transport to Healthcare Facility	Once the Dispatcher has determined the closest appropriate healthcare facility, s/he will direct the transport to the healthcare facility.
<b><u>Object Flow</u></b> Source -> Destination	List of Public Healthcare Facilities	Closest Appropriate Healthcare Facility	The list of public healthcare facilities generated by the application will be used to determine the closest appropriate healthcare facility to transport the patient to. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	List of Private Healthcare Facilities	Closest Appropriate Healthcare Facility	The list of private healthcare facilities generated by the application will be used to determine the closest appropriate healthcare facility to transport the patient to. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Healthcare Service Availability	Closest Appropriate Healthcare Facility	The status of the healthcare facilities featured on the list of healthcare facilities generated by the application. The healthcare facility services availability will depend on Environmental Conditions in some cases. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Patient Condition, Age, Referral, Relationship	Closest Appropriate Healthcare Facility	The condition of the patient and the age of the patient will determine what are the services required at the healthcare facility where s/he will be transported. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Healthcare Facility Service	Closest Appropriate Healthcare Facility	The services offered at the healthcare facility will determine if it is the most appropriate one to use or not. It might be the closest but does not have the required services. It is an input to this process.

### 3.5.9.2.6.1 List of Private Healthcare Facilities



---

*Type:* **Object**

This object is the input to the Closest Appropriate Healthcare Facility process. The application will generate a list of most appropriate medical aid approved healthcare facilities. This list can be used by the Dispatcher to direct transport to healthcare facility.

*3.5.9.2.6.2 List of Public Healthcare Facilities*

*Type:* **Object**

This object is the input to the Closest Appropriate Healthcare Facility process. The Dispatcher will use the list of most appropriate public healthcare facilities generated by the application to decide where to direct transport.

*3.5.9.2.6.3 Patient Condition, Age, Referral Relationship*

*Type:* **Object**

This object is the input to the Closest Appropriate Healthcare Facility process. The condition and the age of the patient is the main factors to determine which healthcare facility may be used. For instance for children that are colour code “red” condition, the healthcare facility needs to have a paediatric unit. Also for trauma patients, the healthcare facility needs to accept trauma patients and have a trauma unit.



3.5.9.2.6.4 Healthcare Facility Services Availability

Type: **Object**

This object is the input to the Closest Appropriate Healthcare Facility process. Healthcare facility availability will determine if the Dispatcher can direct transport to this healthcare facility. For instance, in case of floods, the closest healthcare facility might not be reachable and will therefore be unavailable for priority 1 patient coming via a certain route. Also the closest appropriate healthcare facility might be closed as they are too full and cannot care for more patients.

3.5.9.2.6.5 Healthcare Facility Services

Type: **Object**

This object is the input to the Closest Appropriate Healthcare Facility process. Healthcare Facility Services is essential for the Dispatcher to direct transport to the appropriate healthcare facility. For instance, the bed status is important as the healthcare facility might not have enough capacity to care for a large no of patients in case of delta incidents. The services such as a CT scanner need to be known if the patient requires those services on admission. If the healthcare facility has a helipad this also important for instance in case of floods where patients might need to be transported via helicopter.

3.5.9.2.7 Direct Transport to Healthcare Facility

Type: **Task**

ID: **L4.17**

Role: **Dispatcher or Application Assisted**

This task is performed by the Dispatcher or the application.

Once the Dispatcher or the application has determined the closest appropriate healthcare facility, the information is communicated to the Transport so that the patient can be transported accordingly.

The information provided to the EMS resource will be the healthcare facility name and address as well as the GIS location so that the resource can be navigated there.

**Connections**

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Closest Appropriate Healthcare Facility	Direct Transport to Healthcare Facility	Once Dispatcher has determined the closest appropriate healthcare facility, s/he will direct the transport to the healthcare facility.
<b>Sequence Flow</b> Source -> Destination	Determine Auto-Advise Appropriate	Direct Transport To Healthcare Facility	The application will automatically advise the resource where to transport the patient.
<b>Sequence Flow</b> Source -> Destination	Direct Transport To Healthcare Facility	Request Acknowledgement of Healthcare Facility From Resource	Once transport direct to the appropriate healthcare facility, the resource will receive a request for acknowledgement.



3.5.9.2.8 Request Acknowledgement of Healthcare Facility from Resource

**Type:** Task

**ID:** **L4.18**

**Role:** **Dispatcher or Application Assisted**

This task is performed by the Dispatcher or the application.

Once the Dispatcher or the application has directed the transport accordingly, a request for acknowledgement is sent to the EMS resource to confirm receipt of healthcare facility information.

If the task is automated, the application will wait for a set time period for acknowledgement from the resource. If no acknowledgement received, the application will force a Dispatcher to select closest appropriate healthcare facility and liaise with the EMS resource (See L4.16).

The Dispatcher can also escalate the event to the Supervisor if acknowledgement from EMS resource not received.

**Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Direct Transport To Healthcare Facility	Request Acknowledgement of Healthcare Facility From Resource	Once transport direct to the appropriate healthcare facility, the resource will receive a request for acknowledgement.
<b><u>Sequence Flow</u></b> Source -> Destination	Request Acknowledgement of Healthcare Facility From Resource	Acknowledgement of Healthcare Facility By Resource	Once EMS Resource receives the acknowledgement request, they need to reply.
<b><u>Sequence Flow</u></b> Source -> Destination	Request Acknowledgement of Healthcare Facility From Resource	Intermediate Event – Time	If the task is automated, the application will wait for a set time period to receive the acknowledgement.

3.5.9.2.9 Acknowledgement of Healthcare Facility by Resource

**Type:** Task

**ID:** **L4.19**

**Role:** **Dispatcher or Application Assisted**

This is the task where the EMS Resource acknowledges the receipt of healthcare facility information. This task could be automated whereby the application automatically updates the received acknowledgement from EMS Resource.

If the task is not automated, the EMS Resource sends a message back to the Dispatcher to record the acceptance.



**Connections**

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Request Acknowledgement of Healthcare Facility From Resource	Acknowledgement of Healthcare Facility By Resource	Once EMS Resource receives the acknowledgement request, they need to reply.
<b>Sequence Flow</b> Source -> Destination	Acknowledgement of Healthcare Facility By Resource	Intermediate Event - Link	Once EMS resource has acknowledged the healthcare facility information it will transport the patient to the healthcare facility.

**3.5.10 Transport to Healthcare Facility**

**Type:** Sub process with multiple instances

**ID:** L3.31

**Role:** EMS Resource

This is the process where the EMS Resource will take the patient to a healthcare facility. The Dispatcher provides the EMS Resource with information about the healthcare facility capacity and services.

When advising the EMS Resource, the Dispatcher will also advise the healthcare facility of the arrival of patients. In transit the EMS resource keeps a record of the patient’s condition and could provide same to the healthcare facility, especially in the case where the patients condition changes. The healthcare facility is therefore warned of the arrival of emergency patients and can update their application accordingly.

The EMS Resource can be performing multiple instance of this process if the vehicle used is carrying multiple patients from either the same event or multiple events.

The EMS Resource might find that the healthcare facility advised by the Dispatcher does not have the services required for the patient and the patient therefore needs to be transported to a different healthcare facility. In this case, the EMS Resource liaises with the Dispatcher to determine another healthcare facility. The Dispatcher will advise the new healthcare facility of the arrival of the patient and provide the patient information for the healthcare facility to update their application.

The patient’s condition might also deteriorate during the transport and a healthcare facility with different services might be required compared to the one initially advised by the Dispatcher.

During the transport the situation report is also updated. The EMS Resource will advise the Dispatcher that they have left the event location and transporting the patients to the healthcare facility.

**Connections**

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Determine And Designate Healthcare Facility	Transport To Healthcare Facility	The Dispatcher will advise the EMS Resource as to which healthcare facility they can transport their patient to.
<b>Sequence Flow</b>			If the healthcare facility cannot attend



Connector	Source	Target	Notes
Source -> Destination	Transport To Healthcare Facility	Determine And Designate Healthcare Facility	to the patient, the EMS response unit needs to liaise with the Dispatcher again so s/he can advise another healthcare facility.
<b><u>Sequence Flow</u></b> Source -> Destination	Transport To Healthcare Facility	Handed Over To Healthcare Facility	Once transported to the healthcare facility, the patient is handed over to the healthcare facility.
<b><u>Sequence Flow</u></b> Source -> Destination	Transport To Healthcare Facility	Intermediate Event – Message	The EMS resource advises the Dispatcher that it has left the location of the event to proceed to the healthcare facility.
<b><u>Object Flow</u></b> Source -> Destination	Healthcare Facility Information	Transport To Healthcare Facility	The Dispatcher provides the EMS resource with the information about the healthcare facility where the patient must be transported. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Patient Information	Transport To Healthcare Facility	The patient information is provided so that the Dispatcher can advise the healthcare facility of the patient that is coming in. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Transport To Healthcare Facility	Situation Report	The EMS resource provides a situation report to the Dispatcher regarding condition of the patient if it deteriorates and their location during the transport. It is an output to this process.

### 3.5.10.1 Healthcare Facility Information

*Type:* **Object**

This object is the input to the Transport to Healthcare Facility process. The Dispatcher will provide information to the EMS Resource regarding the healthcare facilities capacity and services suitable depending on their requirements. The EMS Resource need to know what the healthcare facility can offer as they might have a patient that requires specialised care. If the EMS resource is transporting several patients, they need to know if the healthcare facility has enough capacity to care for those patients.

### 3.5.10.2 Situation Report

*Type:* **Object**

This object is the output to the Transport to Healthcare Facility process. While the EMS resource is transporting the patient to the healthcare facility, it will advise the Dispatcher of their location and of the patient status if it deteriorates so that the Dispatcher can communicate same to the healthcare facility. For



---

instance, if the patient deteriorates, the healthcare facility will need to know so that they are prepared accordingly to receive the patient.



### 3.5.10.3 Patient Information

Type: **Object**

This object is the input to the Transport to Healthcare Facility process. The patient information is required so that it can be transferred to the healthcare facility where the patient is transported so that they can update their application can be updated. The information on the Triage tag will provide the clinical information about the patient.

### 3.5.11 Handed Over To Healthcare Facility

Type: **Sub process with multiple instances**

ID: **L3.32**

Role: **EMS Resource**

This is the process where the EMS Resource will hand over the patient to a healthcare facility.

The EMS Resource will advise the Dispatcher that they are at the healthcare facility to hand over the patients.

On arrival at the healthcare facility, they would have received the patient’s information from the Dispatcher and should be ready to receive the patient. Updated patient information is provided by the EMS resource to the healthcare facility on arrival.

If an arrival at the healthcare facility, the EMS resource is notified by the healthcare facility staff they cannot care for the patient, the EMS resource needs to liaise with the Dispatcher to find another healthcare facility that care attend to the patient. The Dispatcher will determine and designate another healthcare facility (See L3.34) and advise the EMS resource accordingly. The EMS resource will then transport the patient to the other healthcare facility.

The EMS resource will verify and confirm that patient information with the new healthcare facility and provide updated information about the clinical condition of the patient.

The EMS Resource will prepare a patient care report once the patient is handed over.

The EMS Resource can be performing multiple instances of this process if the vehicle used is carrying multiple patients from either the same incident or multiple incidents. Each patient’s record needs to be handed over to the healthcare facility separately not as one hand over.

The EMS Resource will advise the Dispatcher that they are available once hand over completed.

The EMS Resource will follow up on the patient’s record at a later stage (see L2.6 Follow up on Patient).

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Transport To Healthcare Facility	Handed Over To Healthcare Facility	Once transported to the healthcare facility, the patient is handed over.
<b>Sequence Flow</b> Source -> Destination	Handed Over To Healthcare Facility	Determine And Designate Healthcare Facility	If the healthcare facility cannot take the patient when the EMS resource arrives there, the EMS Resource needs to liaise with the Dispatcher to find another healthcare facility.
<b>Sequence Flow</b>	Handed Over To	Follow Up On	The EMS resource follows up on the patient at a later stage after dropping



Connector	Source	Target	Notes
Source -> Destination	Healthcare Facility	Patient	the patient off at the healthcare facility.
<b><u>Sequence Flow</u></b> Source -> Destination	Handed Over To Healthcare Facility	Intermediate Event –Message	The EMS resource advises the Dispatcher that it is at the healthcare facility.
<b><u>Sequence Flow</u></b> Source -> Destination	Handed Over To Healthcare Facility	Intermediate Event –Message	The EMS resource advises the Dispatcher that it is available once it leaves the healthcare facility.
<b><u>Object Flow</u></b> Source -> Destination	Patient Information	Handed Over To Healthcare Facility	The patient information is provided to the healthcare facility whilst the patient is transported to the healthcare facility so that they can update their application. Updated patient information is provided to the healthcare facility on arrival.
<b><u>Object Flow</u></b> Source -> Destination	Handed Over To Healthcare Facility	Patient Care Report	The healthcare facility will sign a receipt for the patient handed over. The EMS Resource will complete a Patient Care Report once patient handed over to healthcare facility.

### 3.5.11.1 Patient Information

Type: **Object**

This object is the input to the Handed over to Healthcare Facility process. The patient information is given to the healthcare facility so that they can update their application and be prepared to care for the patient immediately. At arrival, the EMS resource will verify and confirm the information received by the healthcare facility and provide them with updated clinical information about the patient.

### 3.5.11.2 Patient Care Report

Type: **Object**

This object is the output to the Handed over to Healthcare Facility process. The Patient Care Report is a document that always needs to be completed by the EMS Resource when a patient has been transported by an EMS resource to a healthcare facility. The Patient care report will provide information about the incident and the patient.



### 3.6 Non-Emergency Patient Handling

*Type:* **Sub-process with multiple instance**  
*ID:* **L2.5**

Non-Emergency Patient Handling is one of the core sub-processes of the EMS emergency control centre operations.

The process describes the interaction between the roles of the EMS Resource and the Dispatcher during the handling of non-emergency patient transport only. The handling of emergency patients is described in Emergency Patient Handling (See L2.4). The process activities are the same for both emergency and non-emergency but the context is different. The “story line” for the non-emergency patient situation is explained further.

Non-Emergency patients can be defined as

1. Priority 2 patients who have non life threatening injuries and do not need to go to a healthcare facility immediately. Their request can be attended to once an EMS resource is available.
2. Priority 3 patients who visit healthcare facilities on a regular basis for treatment or need to be transported to another healthcare facility for specific treatment. They therefore book the services of an EMS resource in advance. This service is called the HealthNET service whereby the patient is picked up and dropped off at a healthcare facility for treatment and usually picked up after the treatment. This service operates within the metropole and between the metropole and the districts. The advanced bookings can be made via the EMS emergency control centre or online or fax by a healthcare facility.
3. A patient that arrived to a healthcare centre as triage “red” condition patient from another district. After treatment, the patient needs to be transported back to his/her district after being discharged. These patients are normally still stretcher cases. A resource needs to be dispatched for the transport but the dispatch can be in addition to another dispatch that the resource is doing. For instance if a resource from George comes to Cape Town to drop off a patient, it can transport another patient back rather than leaving empty. This is service is called the TRANSMETRO service.

The dispatched EMS resource for non-emergency patients will follow a pre-planned route at regular time intervals with pick up and drop off points. It will use a schedule created from the advanced booking requests received (See L2.10) to identify the patients that must be picked up and the healthcare facilities it must proceed to. The EMS resource is able to pick up a Priority 2 patient if the patient is within proximity of the pre-planned route serviced (and normally not a stretcher case). The same applies for long distance out-patients whereby they can be transported back to their district during one of the pre-planned route trips if the EMS resource has capacity.

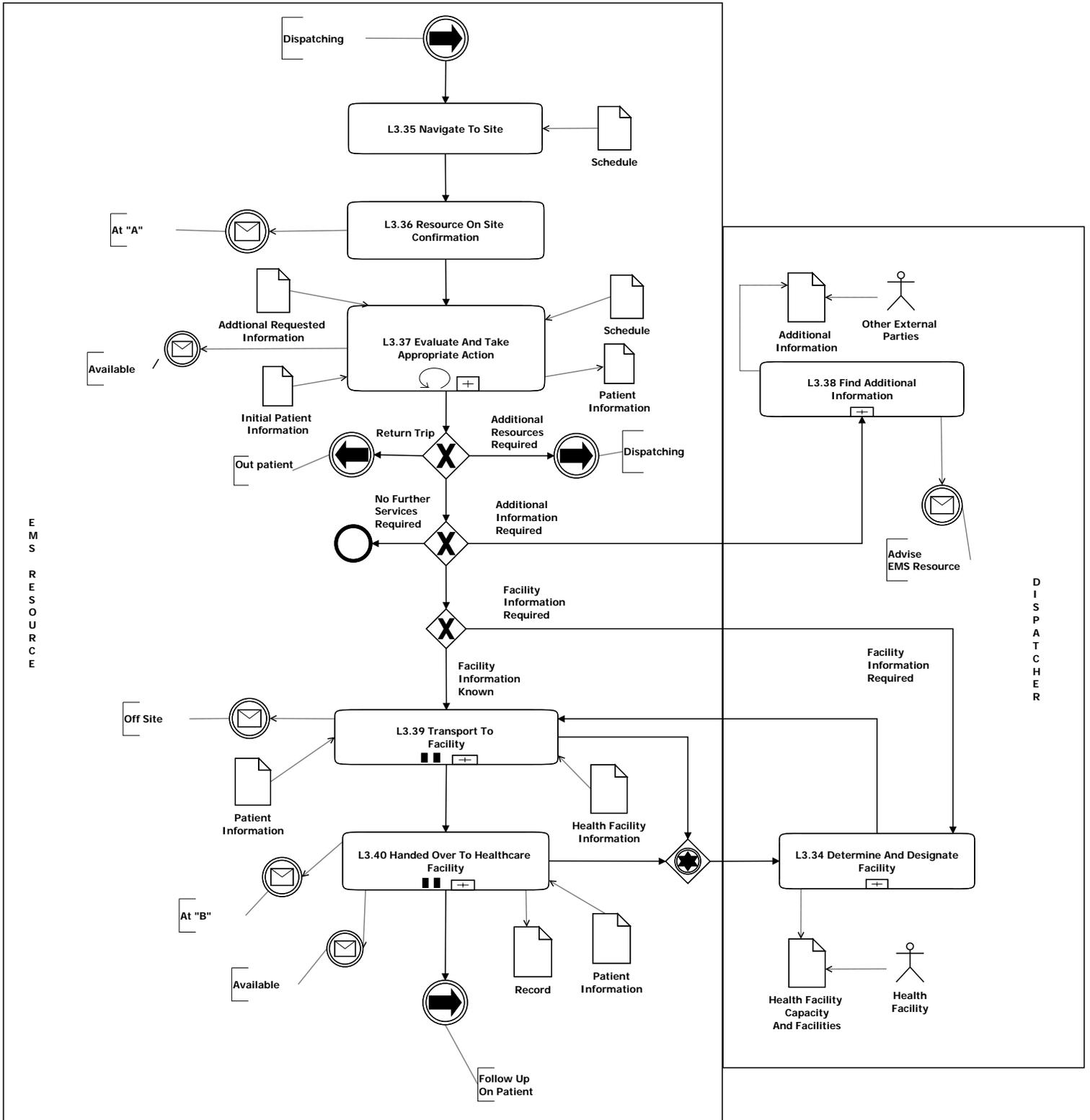
For patients that are not within proximity of pre-planned routes, an EMS resource is dispatched when they are available, for instance resource completes a Priority 1 call and is available for a lower priority call and can pick up the Priority 2 patient.

An EMS resource is scheduled for patients that require air transport as it will depend on the flight schedule of the patient.

**BPMN diagram: Non-Emergency Patient Handling**  
(See next page)



# L2.5 - Non-Emergency Patient Handling



EMS RESOURCE

DISPATCHER



### 3.6.1 Dispatcher

Type: **Lane**

The Dispatcher is the role of the person who handles the event once the Call Handler has assigned the event to the dispatch desk. In some cases, the Call Handler and the Dispatcher can be the same person. Their role is to direct and control resources to and from an event as required. The EMS Resource will liaise with the Dispatcher if more information or resources are required for an event.

### 3.6.2 EMS Resource

Type: **Lane**

The EMS Resource is the role of the METRO team who Provide the Medical Emergency Transport and Rescue services. In some cases, the EMS Resource might need the assistance of other services such as the fire department.

### 3.6.3 Navigate To Site

Type: **Task**

ID: **L3.27**

Role: **EMS Resource**

Once the EMS resource has accepted the dispatch, this is the task where they will proceed to the pick up points according to the schedule and the pre-planned route or to the location where the patient needs to be transported from. The EMS resource will rely on information from the Dispatcher to help navigate them by means of the quickest route if they are not following the pre-planned route. This could be application assisted navigation by GPS and taking into account any Environmental Conditions that could influence a most affective routing.

For return trips, the pick up point is the healthcare facility where the patients need to be picked up from to be transported back to their district or initial pick up point.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Dispatching	Navigate To Site	The EMS Resource will proceed to the location of the patient once dispatch instructions received.
<b>Sequence Flow</b> Source -> Destination	Navigate To Site	Resource On Site Confirmation	The EMS Unit will send a notification once at the location of the patient or at each pick up point.
<b>Object Flow</b> Source -> Destination	Schedule	Navigate To Site	The EMS Resource will use the schedule created from the advanced booking to identify the pick up points where the patients are waiting. It is an input to the process.

#### 3.6.3.1 Schedule

Type: **Object**



This object is the input to the Navigate to Site process. The schedule is created from the advanced bookings received and the pre-planned routes. The pre-planned routes include pick up points and pick up times. The bookings are put in available slots for a pick up point and a pick up time (see [L2-10 Issue Advance Booking Schedule](#)).

### 3.6.4 Resource on Site Confirmation

**Type:** Task  
**ID:** **L3.28**  
**Role:** **EMS Resource**

This is the task where the EMS Resource communicates with the Dispatcher to confirm that they have arrived at the patient location i.e. At “A”, or if they are servicing the pre-planned route that they have arrived at a pick up point.

**Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Navigate To Site	Resource On Site Confirmation	The EMS Resource will communicate its location to the Dispatcher once it arrives at the event.
<b><u>Sequence Flow</u></b> Source -> Destination	Resource On Site Confirmation	Evaluate And Take Appropriate Action	Once they have advised their location, the EMS starts assessing the patient’s condition or only picks up the patient for transport (in the case of HealthNET). They also record which patient is taken on board.
<b><u>Sequence Flow</u></b> Source -> Destination	Resource On Site Confirmation	Intermediate Event – Message	The EMS Resource will send a message to the Dispatcher when they are at the pick up point or at the patient location. The status of the resource is now no longer “allocated” but they are now “engaged”.

### 3.6.5 Evaluate and Take Appropriate Action

**Type:** Looping Sub process  
**ID:** **L3.37**  
**Role:** **EMS Resource**

This is the task where the EMS Resource evaluates the situation and takes appropriate action. For advance bookings and out patient transport, the initial patient information is minimal as the EMS resource is only picking up and dropping off the patient. The information includes patient name, contact details, pick up and drop off point. The patient might also be escorted by someone or have special mobility needs.

The EMS Resource needs to liaise with the Dispatcher if the patient is not at the pick up location.



For long distance transport, the EMS Resource also determines if additional information is needed for instance contact the traffic department due to road closure or current floods in the district where they are going to so they can advise the best route to follow. If so, they will liaise with the Dispatcher accordingly to get this information.

For EMS Resource dispatched to attend to a Priority 2 patient that is not scheduled, they will receive the initial patient information (if any available) from the Dispatcher. This information is also updated from the assessment.

The EMS Resource also determines if additional resources or other emergency services or rescue services from non EMS services are required at the patient location and liaise with the Dispatcher for their request. For instance, an obese patient might not be able to be removed from their home and the services of the fire department and other services might be required to create a passage to evacuate the patient.

If the situation of a patient worsens the EMS resource will update the Dispatcher who will in turn dispatch additional EMS resources with ALS capabilities to attend to the patient. The patient will then become an Emergency patient.

If the EMS resource is at the healthcare facility, they will pick up the out patient listed on the schedule to bring them back to their initial pick up point.

If no METRO services are required the EMS Resource will depart and the event will be terminated.

For advanced bookings and patients being transported back to their district's healthcare facility, the healthcare facility where they need to be dropped off is known and therefore the EMS resource does not need to contact the Dispatcher to get more information about healthcare facilities.

However for the patient that is not scheduled and needs to be transported to a healthcare facility, the EMS Resource contacts the Dispatcher so that s/he can provide directs to which healthcare facility they should be transported. The Dispatcher will liaise with the healthcare facilities to determine services and capacity and advise them of the arrival of patients.

The updated patient information can be used to advise the healthcare facility about that patient.

**Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Resource On Site Confirmation	Evaluate And Take Appropriate Action	Once its location advised, the EMS start assessing the patient's condition or only picks up the patient for transport.
<b><u>Sequence Flow</u></b> Source -> Destination	Evaluate And Take Appropriate Action	End Event	If no further services are required from the EMS Resource, the event ends and the resource is available.
<b><u>Sequence Flow</u></b> Source -> Destination	Evaluate And Take Appropriate Action	Intermediate Event - Message	The EMS Resource advises the Dispatcher that it is available.
<b><u>Sequence Flow</u></b> Source -> Destination	Evaluate And Take Appropriate Action	Intermediate Event - Return trip	The EMS resource picks up the patient after their treatment to bring them back to their district or initial pick up point.
<b><u>Sequence Flow</u></b> Source -> Destination	Evaluate And Take Appropriate Action	Intermediate Event - Dispatching	If additional resources are required, the Response Unit liaise with the



Connector	Source	Target	Notes
			Dispatcher.
<b><u>Sequence Flow</u></b> Source -> Destination	Evaluate And Take Appropriate Action	Find Additional Information	If EMS Resource needs additional information, it asks the Dispatcher to liaise with other external parties to get the information.
<b><u>Sequence Flow</u></b> Source -> Destination	Evaluate And Take Appropriate Action	Determine And Designate Healthcare Facility	If EMS Resource needs to take the patient to a healthcare facility, they need to liaise with the Dispatcher for instruction as to where the patient can be taken to.
<b><u>Sequence Flow</u></b> Source -> Destination	Evaluate And Take Appropriate Action	Transport To Healthcare Facility	The EMS Resource transports the patient to the healthcare facility.
<b><u>Object Flow</u></b> Source -> Destination	Schedule	Evaluate And Take Appropriate Action	The EMS Resource will use the schedule created from the advanced booking to identify patient and take appropriate action if the patients are not there. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Additional Requested Information	Evaluate And Take Appropriate Action	The EMS Resource will use the additional requested information to help them to continue to evaluate and take appropriate actions. The additional requested information is an input to the process.
<b><u>Object Flow</u></b> Source -> Destination	Initial Patient Information	Evaluate And Take Appropriate Action	The patient information from the initial assessment is used to take appropriate action. It is an input to the process. This is especially necessary if the initial assessment was made by a different Response Unit. This is not done in the case of HealthNET, they only pick-up the patients.
<b><u>Object Flow</u></b> Source -> Destination	Evaluate And Take Appropriate Action	Patient Information	The patient information is updated during the assessment. It is an output to this process

### 3.6.5.1 Initial Patient Information

*Type:* **Object**

This object is the input to the Evaluate and Take Appropriate Action process. The initial patient information is the initial information obtained from the Dispatcher either on the schedule if it is advanced bookings or when the resource is dispatched. It is used for the assessment of Priority 2 patients. For



---

instance the initial information might have determined that the patient is not able to walk and EMS Resource needs to take this situation into consideration.



### 3.6.5.2 Schedule

Type: **Object**

This object is the input to the Navigate to Site process. The schedule is created from the advanced bookings received and the pre-planned routes. The pre-planned routes include pick up points and pick up times. The bookings are put in available slots for a pick up point and a pick up time. A schedule is also available for patients that need to be transported by air.

### 3.6.5.3 Patient Information

Type: **Object**

This object is the output to the Evaluate and Take Appropriate Action process. The patient information is updated during the assessment and is used to take further appropriate action.

### 3.6.5.4 Additional Requested Information

Type: **Object**

This object is the input to the Evaluate and Take Appropriate Action process. In some instances, the EMS Resource might need additional information from external parties before they can take further action with a patient. For example from the fire department if there are fires in the area to determine the best route to travel, or from the weather centre if there are floods and they need to go to another district. This information is provided by the Dispatcher who liaises with those external parties if required (See L3.38).

## 3.6.6 Find Additional Information

Type: **Sub process**

ID: **L3.38**

Role: **Dispatcher**

This is the process where the EMS Resource has requested additional information from external parties via the Dispatcher. The Dispatcher will liaise with those parties to obtain the information and send them to the EMS Resource so they can take further action (See L3.37).

For example, knowing the environmental conditions is essential for EMS Resource when the patient needs to be transported to a healthcare facility in another district. In case of floods, traffic bottlenecks or fire this is not possible and EMS Resource need to find the most suitable route.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Evaluate And Take Appropriate Action	Find Additional Information	If EMS Resource needs additional information, it asks the Dispatcher to liaise with other external parties to get the information.
<b>Sequence Flow</b> Source -> Destination	Find Additional Information	Intermediate Event – Message	The Dispatcher send feedback to the EMS Resource with the additional information requested.
<b>Object Flow</b> Source -> Destination	Find Additional Information	Additional Information	The External parties will provide the Dispatcher with the additional information requested and this



Connector	Source	Target	Notes
			information will be passed on to the EMS Resource. It is an output to this process.

### 3.6.6.1 Additional Information

*Type:* **Object**

This object is the input to the Find Additional Information process. In some instances, the Response Unit might need additional information from external parties before they can take further action with a patient. For example from the fire department if there are fires in the area to determine the best route to travel, or from the weather centre if there are floods and other districts are not accessible. This information is provided by the Dispatcher who liaises with those external parties if required. The information is then passed on to the EMS Resource to take appropriate action (See L3.37).

### 3.6.7 Determine and Designate Healthcare Facility

*Type:* **Sub process**

*ID:* **L3.34**

*Role:* **Dispatcher**

This is the process where the Dispatcher determines the appropriate healthcare facility if the patient needs to be transported to one. The EMS Resource asks the Dispatcher for a healthcare facility that has available services for treating the emergency patient. The patient's age, condition, location will determine what is required for the patient. For example the healthcare facility needs to have services to treat head trauma patients or have paediatric services.

The healthcare facilities will regularly provide information about the availability of their services. The dispatcher will use the information available to determine whether, for instance, the nearest healthcare facility might be too full to accept any more patients. The Dispatcher also needs to determine what the services offered by the healthcare facility are such as CT scan and what the bed status is. The Dispatcher also needs to determine the location of the healthcare facility. For example in the districts where one healthcare facility serves the region, the healthcare facility might not be fully equipped and in some cases the most appropriate healthcare facility might be in Cape Town.

Once the Dispatcher has obtained the necessary information, the EMS resource will be advised to which healthcare facility to transport the patient.

This process was broken down further to a Level 3 diagram to describe the decision making process and to show how this could be automated but managed or application assisted and directed ([See Level 3 Detail: Determine And Designate Healthcare Facility](#)).

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Evaluate And Take Appropriate Action	Determine And Designate Healthcare Facility	If Response Unit needs to take the patient to a healthcare facility, it needs to liaise with the Dispatcher for the options.
<b>Sequence Flow</b>			The Dispatcher will advise the EMS



Connector	Source	Target	Notes
Source -> Destination	Determine And Designate Healthcare Facility	Transport To Healthcare Facility	Resource as to which healthcare facility they can transport their patient to.
<b><u>Sequence Flow</u></b> Source -> Destination	Transport To Healthcare Facility	Determine And Designate Healthcare Facility	If the patient conditions changes or worsens and the services required of the healthcare facility are either no longer appropriate or available then the EMS response unit needs to liaise with the Dispatcher again so s/he can advise another healthcare facility.
<b><u>Sequence Flow</u></b> Source -> Destination	Handed Over To Healthcare Facility	Determine And Designate Healthcare Facility	If on arrival (in exceptional circumstances) the healthcare facility cannot take the patient or provide the required services when the EMS resource reaches the healthcare facility then the EMS Resource needs to liaise with the Dispatcher to find another healthcare facility.
<b><u>Object Flow</u></b> Source -> Destination	Determine And Designate Healthcare Facility	Healthcare Facility Capacity And Services	The Dispatcher needs to find out from healthcare facilities if they have enough capacity for more patients and what are the services that they offer according to the requirements of the Response Unit. The information obtained is an output to the process.

### 3.6.7.1 Healthcare Facility Capacity and Services

*Type:* **Object**

This object is the output to the Determine and Designate Healthcare Facility process. If the Response Unit needs to take patients to a healthcare facility, they need to liaise with the Dispatcher to get information about the healthcare facilities. The Dispatcher checks for the appropriate services required at the healthcare facilities and capacity based on the patient condition information obtained from Response Unit treating the emergency patient. The Dispatcher might also need to liaise with the healthcare facilities to get the information required by the Response Unit.

### 3.6.7.2 Level 3 Detail: Determine and Designate Healthcare Facility

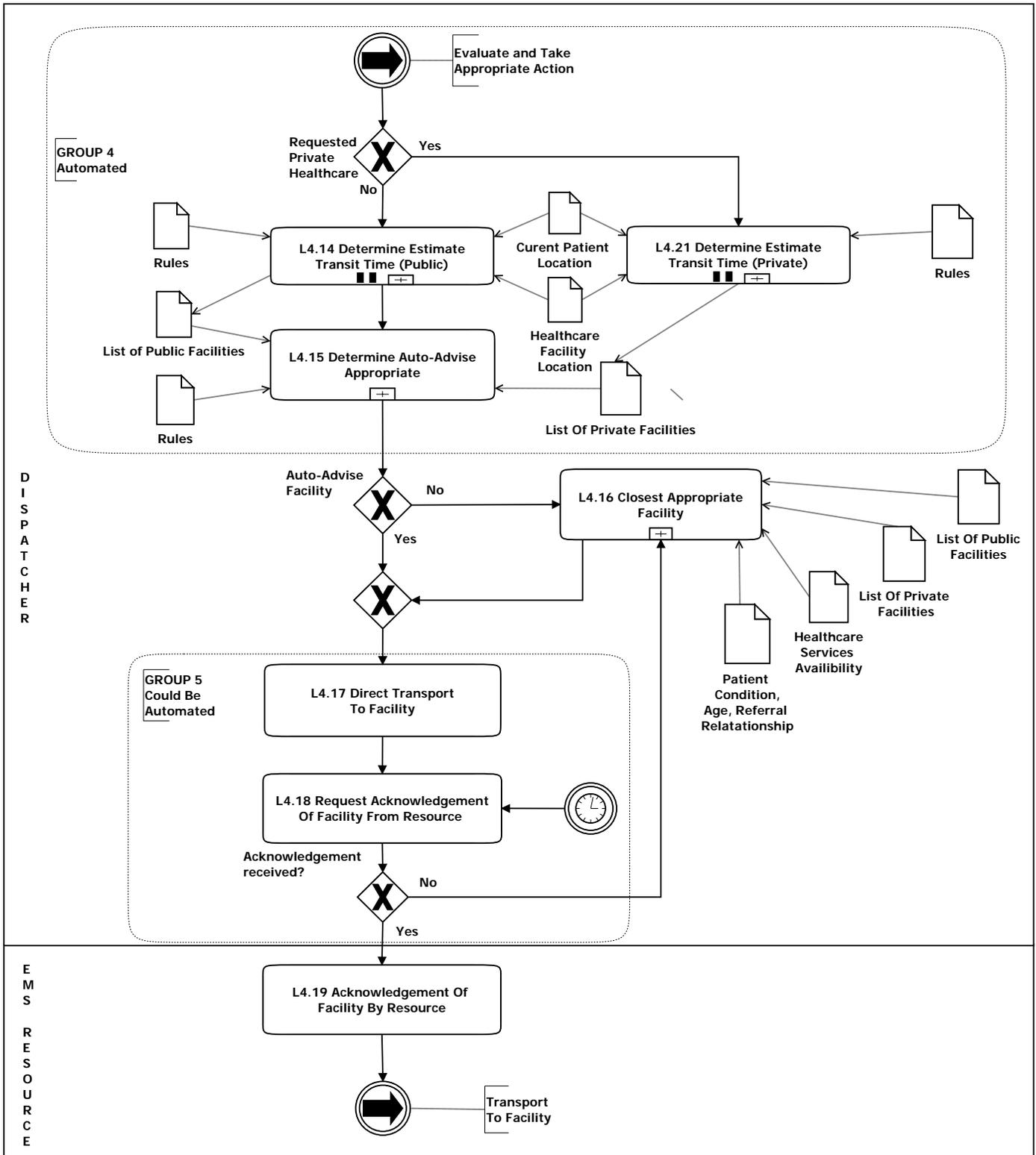
This process was broken down further to a Level 3 diagram to illustrate the decision making process.

#### **BPMN diagram: Determine and Designate Healthcare Facility**

(See next page)



### L3.34 - Determine And Designate Facility (Non Emergency)





3.6.7.2.1 Group 4 – Automated

Type: **Group**

Group 4 is a grouping of three processes – Determine Estimated Transit Time (Private), Determine Estimated Transit Time (Public) and Determine Auto-Advise Appropriate – which are automated and performed by the application based on a set of predefined rules.

3.6.7.2.2 Group 5 – Could Be Automated

Type: **Group**

Group 5 is a grouping of 3 processes – Direct Transport To Healthcare Facility, Request Acknowledgement Of Healthcare Facility From Resource and Acknowledgement Of Healthcare Facility By Resource – which could be automated and performed by the application or performed by the Dispatcher and the EMS Resource, based a set of predefined rules.

3.6.7.2.3 Determine Estimate Transit Time (Private)

Type: **Sub-process with multiple instances**

ID: **L4.21**

Role: **Dispatcher (Application Assisted)**

If the Call Handler obtains the medical aid information of the patient and has determined that the medical aid has approved private healthcare facilities that supply the services required based on the patient condition and information. Then this sub-process can be followed. If no medical aid approved private healthcare facility available, the patient cannot be taken to a private healthcare facility and will have to go to a public healthcare facility (See L4.14).

If there are medical aid approved healthcare facilities for the patient, the application will determine the estimate transit time between the patient’s current location and the healthcare facilities location and the patient might be sent to one of the private healthcare facilities listed if s/he is stable.

The application will calculate the estimated times between the current patient location and the each medical aid approved private healthcare facility location and generate a list of private healthcare facilities. The list of private healthcare facilities will be sorted in order of most appropriate base on a set of predefined rules.

The list of private healthcare facilities will then be used by the Dispatcher to direct transport to the healthcare facility.

**Connections**

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Evaluate and Take Appropriate Action	Determine Estimate Transit Time (Private)	Once the Response Unit has evaluated the patient(s) and taken appropriate action they contact the Dispatcher to Determine and Designate Healthcare Facility. If the patient has requested a private healthcare facility and if medical aid approved healthcare facilities are available, the application can estimate transit time between patient current location and healthcare facility location.



Connector	Source	Target	Notes
<b><u>Object Flow</u></b> Source -> Destination	Current Patient Location	Determine Estimate Transit Time (Private)	The current patient location is important to establish the transit time between the patient location and the healthcare facility. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Healthcare Facility Location	Determine Estimate Transit Time (Private)	The healthcare facility location is important to establish the transit time between the patient location and the healthcare facility. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Rules	Determine Estimate Transit Time (Private)	The rules are important for the application to determine which healthcare facilities are the most appropriate based on preferred information from the Patient if any and estimate transit time. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Determine Estimate Transit Time (Private)	List of Private Healthcare Facilities	The application will use all the input information to generate a list of private healthcare facilities listed in order of most appropriate. It is an output to this process.

### 3.6.7.2.3.1 Current Patient Location

Type: **Object**

This object is the input to the Determine Estimate Transit Time (Private) process. The current patient location is essential to determine which healthcare facility is the closest most appropriate. The Dispatcher will have information about the healthcare facility locations but needs to know where the patient is compared to the healthcare facility. For instance, the patient might be close to a healthcare facility that does not offer the required services.

### 3.6.7.2.3.2 Healthcare Facility Location

Type: **Object**

This object is the input to the Determine Estimate Transit Time (Private) process. The healthcare facility location is essential to determine the closest most appropriate. For instance, the private healthcare facility might have the required services but they are too far compared to the patient location.

### 3.6.7.2.3.3 Rules

Type: **Object**

This object is the input to the Determine Estimate Transit Time (Private) process. The rules are for the application to determine the closest most appropriate healthcare facilities. The condition of the patient will determine whether to use the closest preferred or not.



3.6.7.2.3.4 *List of Private Healthcare Facilities*

**Type:** Object

This object is the output to the Determine Estimate Transit Time (Private) process. The application will generate a list of most appropriate medical aid approved healthcare facilities. This list can be used by the Dispatcher to direct transport to healthcare facility.

3.6.7.2.4 Determine Estimate Transit Time (Public)

**Type:** Sub-process with multiple instances

**ID:** L4.14

**Role:** Dispatcher (Application Assisted)

The application will always determine estimated transit time between the current location of the patient and the location of the public healthcare facilities in case no medical aid information is available or if there is no appropriate private healthcare facility with the required services available or approved by the medical aid. The application will calculate the estimated times between the current patient location and each public healthcare facility location and generate a list of public healthcare facilities. The list of public healthcare facilities will be sorted in order of most appropriate base on a set of predefined rules.

The list of public healthcare facilities might be used by the Dispatcher to direct transport to healthcare facility if this is not a private patient or no private healthcare facility has the required services available.

**Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Evaluate and Take Appropriate Action	Determine Estimate Transit Time (Public)	Once the Response Unit has evaluated the patient(s) and taken appropriate action they contact the Dispatcher to Determine and Designate Healthcare Facility. When the information is requested about healthcare facilities, the application will first estimate transit time between patient current location and public healthcare facility locations. This is in case no medical aid information is available or if there is no appropriate private healthcare facility with the required services available or approved by the medical aid.
<b><u>Sequence Flow</u></b> Source -> Destination	Determine Estimate Transit Time (Public)	Determine Auto-Advise Appropriate	The application will determine if the transport can be directed to the healthcare facility automatically.
<b><u>Object Flow</u></b> Source -> Destination	Current Patient Location	Determine Estimate Transit Time (Public)	The current patient location is important to establish the transit time between the patient location and the healthcare facility. It is an input to this process.



Connector	Source	Target	Notes
<b><u>Object Flow</u></b> Source -> Destination	Healthcare Facility Location	Determine Estimate Transit Time (Public)	The healthcare facility location is important to establish the transit time between the patient location and the healthcare facility. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Rules	Determine Estimate Transit Time (Public)	The rules are important for the application to determine which healthcare facilities are the most appropriate based on preferred information from the Patient if any and estimate transit time. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Determine Estimate Transit Time (Public)	List of Public Healthcare Facilities	The application will use all the input information to generate a list of public healthcare facilities listed in order of most appropriate. It is an output to this process.

#### 3.6.7.2.4.1 Current Patient Location

*Type:* **Object**

This object is the input to the Determine Estimate Transit Time (Public) process. The current patient location is essential to determine which healthcare facility is the closest most appropriate. The Dispatcher will have information about the healthcare facility locations but needs to know where the patient is compared to the healthcare facility. For instance, the patient might be close to a healthcare facility that does not offer the required services.

#### 3.6.7.2.4.2 Healthcare Facility Location

*Type:* **Object**

This object is the input to the Determine Estimate Transit Time (Public) process. The healthcare facility location is essential to determine the closest most appropriate. For instance, the healthcare facility might have the required services but they are too far compared to the patient location.

#### 3.6.7.2.4.3 Rules

*Type:* **Object**

This object is the input to the Determine Estimate Transit Time (Public) process. The rules are for the application to determine the closest most appropriate healthcare facilities. The condition of the patient will determine whether to use the closest preferred or not. If the patient is stable but closest preferred and closest appropriate not available, any other public healthcare facility with reasonable transit time will be most appropriate.

#### 3.6.7.2.4.4 List of Public Healthcare Facilities

*Type:* **Object**



---

This object is the output to the Determine Estimate Transit Time (Public) process. The application will generate a list of most appropriate public healthcare facilities. This list can be used by the Dispatcher to direct transport to healthcare facility.



3.6.7.2.5 Determine Auto-Advise Appropriate

Type: **Sub-process**

ID: **L4.15**

Role: **Dispatcher (Application Assisted)**

Once the application has calculate the estimated transit time between the current patient location and the healthcare facilities, if medical aid information was available, and generated a list of public healthcare facilities and possibly a list of private healthcare facilities, it will then determine based on a set of rules whether to automatically advise the EMS resource of the healthcare facility or let the Dispatcher perform this process using the lists generated.

**Connections**

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Determine Estimate Transit Time (Public)	Determine Auto-Advise Appropriate	The application will determine if the transport can be directed to the healthcare facility automatically.
<b>Sequence Flow</b> Source -> Destination	Determine Auto-Advise Appropriate	Closest Appropriate Healthcare Facility	If the application determines that it is not suitable to auto-advise the healthcare facility, the Dispatcher will advise the EMS resource accordingly.
<b>Sequence Flow</b> Source -> Destination	Determine Auto-Advise Appropriate	Direct Transport To Healthcare Facility	The application will automatically advise the resource where to transport the patient.
<b>Object Flow</b> Source -> Destination	List of Healthcare Facilities	Determine Auto-Advise Appropriate	The list of public or possibly private healthcare facilities generated by the application will be used by the application to auto-advise the healthcare facility to transport the patient to. It is an input to this process.
<b>Object Flow</b> Source -> Destination	Rules	Determine Auto-Advise Appropriate	The application will use a set of rules to determine whether to auto-advise resource or not.

3.6.7.2.5.1 Rules

Type: **Object**

This object is the input to the Determine Auto-Advise Appropriate process. The rules are for the application to determine whether to auto-advise the EMS resource or not. The Dispatcher can use his discretion to override this and direct the transport from the selection provided.



3.6.7.2.5.2 *List of Healthcare Facilities*

**Type:** Object

This object is the input to the Determine Auto-Advise Appropriate process. The application will use the list of most appropriate public or possibly private healthcare facilities if auto-advise if suitable. The EMS resource will be directed to the most appropriate healthcare facility determine by the application.

3.6.7.2.6 *Closest Appropriate Healthcare Facility*

**Type:** Sub-process

**ID:** L4.16

**Role:** Dispatcher

If the application determines that auto-advise healthcare facility is not suitable, the Dispatcher will have to perform this process.

The Dispatcher will use as input the list of public healthcare facilities generated by the application. If the patient is registered with a medical aid and a list of private healthcare facilities was generated by the application, this list will also be used as input.

A set of requirements such as patient age, patient condition as well as healthcare facility services availability, healthcare facility services such as helipad, CT scan services will also be used as input for the Dispatcher to determine the closest appropriate healthcare facility. If the patient has a referral from a doctor to a given healthcare in case of a recurring medical condition, the Dispatcher will use this referral as one of the requirements.

If the patient is stable and is registered with a medical aid, the Dispatcher can advise the EMS resource to take the patient to the preferred private healthcare facility if it is the closest preferred private healthcare facility.

The same will apply for a stable patient not registered with a medical aid whereby the patient has a preferred public or private healthcare facility. The Dispatcher can advise the EMS resource to take the patient to the preferred public or private healthcare facility if it is the closest preferred healthcare facility.

**Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Determine Auto-Advise Appropriate	Closest Appropriate Healthcare Facility	If the application determines that it is not suitable to auto-advise the healthcare facility, the Dispatcher will advise the EMS resource accordingly.
<b><u>Sequence Flow</u></b> Source -> Destination	Closest Appropriate Healthcare Facility	Direct Transport to Healthcare Facility	Once Dispatcher as determined the closest appropriate healthcare facility, s/he will direct the transport to the healthcare facility.
<b><u>Object Flow</u></b> Source -> Destination	List of Public Healthcare Facilities	Closest Appropriate Healthcare Facility	The list of public healthcare facilities generated by the application will be used to determine the closest appropriate healthcare facility to transport the patient to. It is an input to this process.
<b><u>Object Flow</u></b>	List of Private	Closest Appropriate	The list of private healthcare facilities generated by the application will be



Connector	Source	Target	Notes
Source -> Destination	Healthcare Facilities	Healthcare Facility	used to determine the closest appropriate healthcare facility to transport the patient to. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Healthcare Facility Services Availability	Closest Appropriate Healthcare Facility	The status of the healthcare facilities featured on the list of healthcare facilities generated by the application. The healthcare facility services availability will depend on environmental conditions in some cases. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Patient Condition, Age, Referral, Relationship	Closest Appropriate Healthcare Facility	The condition of the patient and the age of the patient will determine what are the services required at the healthcare facility where s/he will be transported. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Healthcare Facility Service	Closest Appropriate Healthcare Facility	The services offered at the healthcare facility will determine if it is the most appropriate one to use or not. It might be the closest but does not have the required services. It is an input to this process.

#### 3.6.7.2.6.1 List of Private Healthcare Facilities

Type: **Object**

This object is the input to the Closest Appropriate Healthcare Facility process. The application will generate a list of most appropriate medical aid approved healthcare facilities. This list can be used by the Dispatcher to direct transport to healthcare facility.

#### 3.6.7.2.6.2 List of Public Healthcare Facilities

Type: **Object**

This object is the input to the Closest Appropriate Healthcare Facility process. The Dispatcher will use the list of most appropriate public healthcare facilities generated by the application to decide where to direct transport.

#### 3.6.7.2.6.3 Patient Condition, Age, Referral Relationship

Type: **Object**

This object is the input to the Closest Appropriate Healthcare Facility process. The condition and the age of the patient is the main factor to determine which healthcare facility may be used. For instance for priority 2 children, the healthcare facility needs to have a paediatric unit.

#### 3.6.7.2.6.4 Healthcare Facility Services Availability



**Type: Object**

This object is the input to the Closest Appropriate Healthcare Facility process. Healthcare facility availability will determine if the Dispatcher can direct transport to this healthcare facility. For instance, the healthcare facility might be too full and cannot accommodate the patient even if it is Priority 2 patient.

3.6.7.2.6.5 Healthcare Facility Services

**Type: Object**

This object is the input to the Closest Appropriate Healthcare Facility process. Healthcare facility Services is essential for the Dispatcher to direct transport to the appropriate healthcare facility. For instance, services such as CT scan need to be available if the patient requires those services on admission. If the healthcare facility has a helipad is also important for instance in case of floods where patients might need to be transported via helicopter.

3.6.7.2.7 Direct Transport To Healthcare Facility

**Type: Task**

**ID: L4.17**

**Role: Dispatcher or Application Assisted**

This task is performed by the Dispatcher or the application.

Once the Dispatcher or the application has determined the closest appropriate healthcare facility, the information is communicated to the Transport so that the patient can be transported accordingly.

The information provide to the EMS resource will be the healthcare facility name and address.

**Connections**

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Closest Appropriate Healthcare Facility	Direct Transport to Healthcare Facility	Once Dispatcher as determined the closest appropriate healthcare facility, s/he will direct the transport to the healthcare facility.
<b>Sequence Flow</b> Source -> Destination	Determine Auto-Advise Appropriate	Direct Transport To Healthcare Facility	The application will automatically advise the resource where to transport the patient.
<b>Sequence Flow</b> Source -> Destination	Direct Transport To Healthcare Facility	Request Acknowledgement of Healthcare Facility From Resource	Once transport direct to the appropriate healthcare facility, the resource will receive a request for acknowledgement.

3.6.7.2.8 Request Acknowledgement Of Healthcare Facility From Resource

**Type: Task**

**ID: L4.18**

**Role: Dispatcher or Application Assisted**

This task is performed by the Dispatcher or the application.

Once the Dispatcher or the application has directed the transport accordingly, a request for acknowledgement is sent to the EMS resource to confirm receipt of healthcare facility information.



If the task is automated, the application will wait for a set time period for acknowledgement from the resource. If no acknowledgement received, the application will force a Dispatcher to select closest appropriate healthcare facility and liaise with the EMS resource (See L4.16).

The Dispatcher can also escalate the event to the Supervisor if acknowledgement from EMS resource not received.

**Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Direct Transport To Healthcare Facility	Request Acknowledgement of Healthcare Facility From Resource	Once transport direct to the appropriate healthcare facility, the resource will receive a request for acknowledgement.
<b><u>Sequence Flow</u></b> Source -> Destination	Request Acknowledgement of Healthcare Facility From Resource	Acknowledgement of Healthcare Facility By Resource	Once EMS Resource receives the acknowledgement request, they need to reply.
<b><u>Sequence Flow</u></b> Source -> Destination	Request Acknowledgement of Healthcare Facility From Resource	Intermediate Event – Time	If the task is automated, the application will wait for a set time period to receive the acknowledgement.

3.6.7.2.9 Acknowledgement Of Healthcare Facility By Resource

**Type:** Task

**ID:** L4.19

**Role:** Dispatcher or Application Assisted

This is the task where the EMS Resource acknowledges the receipt of healthcare facility information. This task could be automated whereby the application automatically receives acknowledgement from EMS Resource.

If the task is not automated, the EMS Resource sends a message back to the Dispatcher to confirm acceptance.

**Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Request Acknowledgement of Healthcare Facility From Resource	Acknowledgement of Healthcare Facility By Resource	Once EMS Resource receives the acknowledgement request, they need to reply.
<b><u>Sequence Flow</u></b>			Once EMS resource has



Connector	Source	Target	Notes
Source -> Destination	Acknowledgement of Healthcare Facility By Resource	Intermediate Event - Link	acknowledged the healthcare facility information it will transport the patient to the healthcare facility.

### 3.6.8 Transport To Healthcare Facility

**Type:** Sub process with multiple instances

**ID:** L3.39

**Role:** EMS Resource

This is the process where the EMS Resource will take the patient to a healthcare facility. The Dispatcher provides the EMS Resource with a schedule for advanced booking so they know in advance at which healthcare facility they will drop off their patients. The Dispatcher will provide information about the healthcare facility capacity and services to the EMS Resource after liaising with the healthcare facility. When advising the EMS Resource, the Dispatcher will also advise the healthcare facility of the arrival of patients. The advance booking patients will have appointments for their treatment with the healthcare facility. But for patients that were picked up on a Priority 2 dispatch, the EMS resource has the patient information and could provide same to the Dispatcher to send to the healthcare facility. The healthcare facility is therefore warned of the arrival of patients and can update their application accordingly. The amount of information provided about the patient to the healthcare facility will depend upon the patient's condition. Minimum appropriate documentation is provided to the healthcare facility.

The EMS Resource can be performing multiple instance of this process if the vehicle used is carrying multiple patients for treatment.

The EMS Resource will advise the Dispatcher that they have left the event location and transporting the patients to the healthcare facility.

#### Connections

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Determine And Designate Healthcare Facility	Transport To Healthcare Facility	The Dispatcher will advise the EMS Resource as to which healthcare facility they can transport their patient to.
<b><u>Sequence Flow</u></b> Source -> Destination	Transport To Healthcare Facility	Determine And Designate Healthcare Facility	If the healthcare facility cannot attend to the patient, the EMS response unit needs to liaise with the Dispatcher again so s/he can advise another healthcare facility. The reason this was refused must be recorded.
<b><u>Sequence Flow</u></b> Source -> Destination	Transport To Healthcare Facility	Handed Over To Healthcare Facility	Once transported to the healthcare facility, the patient is handed over.
<b><u>Sequence Flow</u></b>			The EMS resource advises the



Connector	Source	Target	Notes
Source -> Destination	Transport To Healthcare Facility	Intermediate Event – Message	Dispatcher that it has left the location of the event to proceed to the healthcare facility.
<b><u>Object Flow</u></b> Source -> Destination	Healthcare Facility Information	Transport To Healthcare Facility	The Dispatcher provides the EMS resource with the information about the healthcare facility where the patient must be transported. It is an input to this process.
<b><u>Object Flow</u></b> Source -> Destination	Patient Information	Transport To Healthcare Facility	The patient information is provided so that the Dispatcher can advise the healthcare facility of the patient that is coming in. It is an input to this process.

### 3.6.8.1 Healthcare Facility Information

Type: **Object**

This object is the input to the Transport To Healthcare Facility process. The Dispatcher will provide information to the EMS Resource regarding the healthcare facilities capacity and services suitable depending on their requirements. The EMS Resource needs to know what the healthcare facility can offer as they might have a patient that requires specialised care. If the EMS resource is transporting several patients, they need to know if the healthcare facility has enough capacity to care for those patients.

### 3.6.8.2 Patient Information

Type: **Object**

This object is the input to the Transport To Healthcare Facility process. The patient information is required so that it can be transferred to the healthcare facility where the patient is transported so that they can update their application.

### 3.6.9 Handed Over To Healthcare Facility

Type: **Sub process with multiple instances**

ID: **L3.40**

Role: **EMS Resource**

This is the process where the EMS Resource will hand over the patient to a healthcare facility.

The EMS Resource will advise the Dispatcher that they are at the healthcare facility to hand over the patients.

For advance booking service patients, the EMS resource will just drop them at the healthcare facility for their treatment. No report is required or hand over of patient information.

For a patient that was picked up as result of a Priority 2 dispatch, the healthcare facility would have received the patient’s information from the Dispatcher and should be ready to receive the patient. Updated patient information is provided by the EMS resource to the healthcare facility on arrival.



If on arrival at the healthcare facility, the EMS resource is notified by the healthcare facility they no can't offer the services required by the patient, the EMS resource needs to liaise with the Dispatcher to find another healthcare facility that can attend to the patient. The Dispatcher will determine and designate another healthcare facility (See L3.34) and advise the EMS resource accordingly. The EMS resource will then transport the patient to the other healthcare facility.

The EMS resource will verify and confirm that patient information with the healthcare facility and provide updated information about the clinical condition of the patient and provide the healthcare facility with the referral from a medical practitioner if any.

For cases where the patient was transported by air from one district to another, the EMS Resource will prepare a report once the patient is handed over to the receiving parties in the other district.

The EMS Resource can be performing multiple instances of this process if the vehicle used is carrying multiple patients. Non advance booking patients need to be handed over to the healthcare facility separately not as one hand over.

The EMS Resource will advise the Dispatcher that they are available to be dispatched once hand over completed or that they are carrying with the schedule.

The EMS Resource could follow up on the patient at a later stage (see L2.6 Follow up on Patient).

**Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Transport To Healthcare Facility	Handed Over To Healthcare Facility	Once transported to the healthcare facility, the patient is handed over.
<b><u>Sequence Flow</u></b> Source -> Destination	Handed Over To Healthcare Facility	Determine And Designate Healthcare Facility	If the healthcare cannot take the patient when the EMS resource reaches the healthcare facility, the EMS Resource needs to liaise with the Dispatcher to find another healthcare facility.
<b><u>Sequence Flow</u></b> Source -> Destination	Handed Over To Healthcare Facility	Follow Up On Patient	The EMS resource follows up on the patient at a later stage after dropping the patient off at the healthcare facility.
<b><u>Sequence Flow</u></b> Source -> Destination	Handed Over To Healthcare Facility	Intermediate Event –Message	The EMS resource advises the Dispatcher that it is at the Healthcare facility.
<b><u>Sequence Flow</u></b> Source -> Destination	Handed Over To Healthcare Facility	Intermediate Event –Message	The EMS resource advises the Dispatcher that it is available or carrying on with the schedule once it leaves the healthcare facility.
<b><u>Object Flow</u></b> Source -> Destination	Patient Information	Handed Over To Healthcare Facility	The patient information is provided to the healthcare facility whilst the patient is transported to the healthcare facility so that they can update their application. Updated patient information is provided to the



Connector	Source	Target	Notes
			healthcare facility on arrival. This does not apply to Priority 2 patients.

### 3.6.9.1 Patient Information

*Type:* **Object**

This object is the input to the Handed over to Healthcare Facility process. The patient information is given to the healthcare facility so that they can update their application and be prepared to care for the patient. At arrival, the EMS resource will verify and confirm the information received by the healthcare facility and provide them with updated clinical information about the patient.



---

### 3.7 Resource Scheduling

*Type:* **Sub-process with multiple instance**

*ID:* **L2.8**

Resource Scheduling is an important sub-process that is performed in parallel with the EMS control centre operations. It is the process of managing the resources used by the EMS control centre for its daily operations; this includes managing the vehicles, the crews, the specialised medical equipment and consumables.

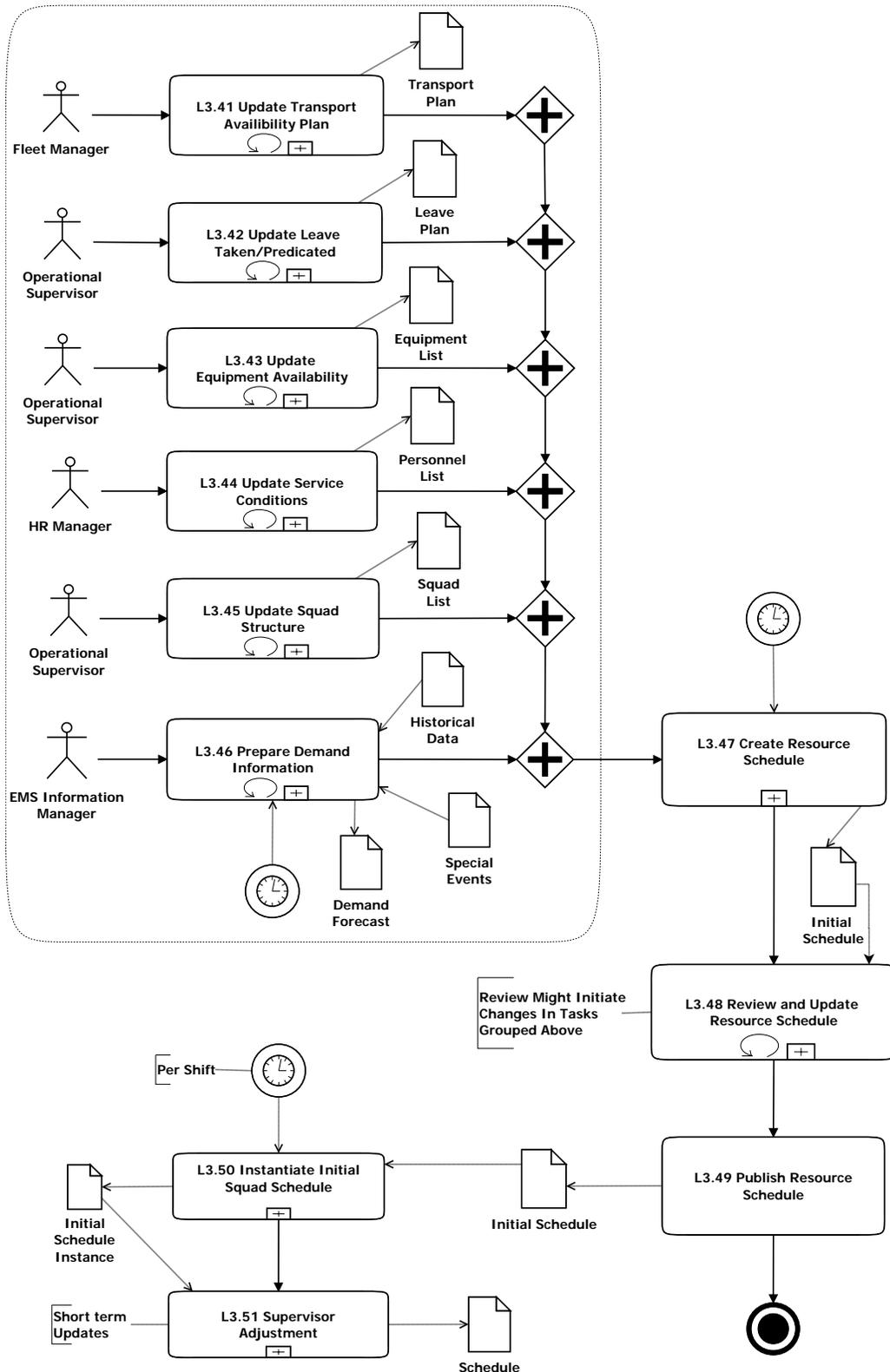
Whilst the vehicles in the metropole control centres are managed and scheduled by depots, the districts control centre have smaller numbers of vehicles which are managed at the control centre.

Various repeating sub-process will run in parallel to provide input to create a schedule. The schedule will be reviewed and once approved it will be published. The initial schedule will be created a long term period but it can be amended in the short term when required. The initial schedule will be used as an input to the dispatching process.

**BPMN diagram: Resource Scheduling**

(See next page)

## L2.8 - Do Scheduling





### 3.7.1 Update Transport Availability Plan

Type: **Looping Sub-process**

ID: **L3.41**

Role: **Fleet Manager**

The fleet manager’s staff will regularly determine the EMS transports operational state and schedule regular maintenance. They will identify the ones that are due for maintenance and schedule that accordingly. The transports that are not booked for maintenance and are operational for a given shift will be marked as available on a transport plan. The transport plan will be updated regularly.

This process is done in parallel with:

- Update Leave Taken / Predicted
- Update Equipment Availability
- Update Service Conditions
- Update Squad Structure
- Prepare Demand Information

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Update Transport Availability Plan	Create Resource Schedule	The transport plan created by the fleet manager will be used for resource scheduling.
<b>Object Flow</b> Source -> Destination	Update Transport Availability Plan	Transport Plan	The Transport Plan is a list of all available transports that can be dispatched. It is an output to the process.

#### 3.7.1.1 Transport Plan

Type: **Object**

This object is the output to update transport availability plan process. It is a list of all transports that are available to be dispatched by a control centre.

### 3.7.2 Update Leave Taken/Predicated

Type: **Looping Sub-process**

ID: **L3.42**

Role: **Operational Supervisor**

The operational supervisor will regularly update the leave plan with operations EMS employee leave requests. This will include anticipated future leave for training or any other activities that would mean the EMS employee will not be available for duty.

This process is done in parallel with:

- Update Transport Availability Plan
- Update Equipment Availability
- Update Service Conditions



- Update Squad Structure
- Prepare Demand Information

**Connections**

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Update Leave Taken/Predicated Plan	Create Resource Schedule	The leave plan updated by the operational supervisor will be used for resource scheduling
<b>Object Flow</b> Source -> Destination	Update Leave Taken/Predicated Plan	Leave Plan	The Leave Plan is a list of the EMS operations employees approved leave days. It is an output to the process.

**3.7.2.1 Leave Plan**

Type: **Object**

This object is the output to update leave taken/predicated. It is a list of all the approved leave or other activities of the operations EMS employees that indicate when they are not available for duty.

**3.7.3 Update Equipment Availability**

Type: **Looping Sub-process**

ID: **L3.43**

Role: **Operational Supervisor**

The operational supervisor will determine the condition of the special medical equipment available and if they are operational. S/he will identify the ones that need to be maintained and book them accordingly. The special medical equipment that is not booked for maintenance and can be operational for a given shift will be marked as available on an equipment list. The equipment list will be updated regularly.

This process is done in parallel with:

- Update Transport Availability Plan
- Update Leave Taken / Predicted
- Update Service Conditions
- Update Squad Structure
- Prepare Demand Information

**Connections**

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Update Equipment Availability	Create Resource Schedule	The equipment list created by the operational supervisor will be used for resource scheduling.
<b>Object Flow</b> Source -> Destination	Update Equipment Availability	Equipment List	The Equipment List is a list of the special medical equipment can be assigned to a transport. It is an output to the process.



### 3.7.3.1 Equipment List

Type: **Object**

This object is the output to update equipment availability process. It is a list of all the special medical equipment that is operational and can be assigned to a transport.

### 3.7.4 Update Service Conditions

Type: **Looping Sub-process**

ID: **L3.44**

Role: **HR Manager**

The HR manager will regularly consult the labour law rules and update the EMS employees on their working conditions. The HR manager will keep a record of EMS personnel information and monitor the hours worked by the EMS employees to ensure that it is according to the service conditions for instance no of consecutive hours worked. The HR manager will update the personnel list regularly.

This process is done in parallel with:

- Update Transport Availability Plan
- Update Leave Taken / Predicted
- Update Equipment Availability
- Update Squad Structure
- Prepare Demand Information

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Update Service Conditions	Create Resource Schedule	The personnel list created by the HR manager will be used for resource scheduling.
<b>Object Flow</b> Source -> Destination	Update Service Conditions	Personnel List	The Personnel List is a list of the EMS operations employees and their condition of service. It is an output to the process.

### 3.7.4.1 Personnel List

Type: **Object**

This object is the output to update service conditions. It is a list of EMS operations employees together with their working conditions and hours worked.

### 3.7.5 Update Squad Structure

Type: **Looping Sub-process**

ID: **L3.45**

Role: **Operations Supervisor**

The operational supervisor will assign the available EMS operations employee to a squad. The squad will consist of squad leaders and squad members. The operational supervisor will update a squad list regularly if required for instance if employee unexpectedly becomes unavailable.



This process is done in parallel with:

- Update Transport Availability Plan
- Update Leave Taken / Predicted
- Update Equipment Availability
- Update Service Conditions
- Prepare Demand Information

**Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Update Squad Structure	Create Resource Schedule	The squad list created by the operational supervisor will be used for resource scheduling.
<b><u>Object Flow</u></b> Source -> Destination	Update Squad Structure	Squad List	The Squad List is a list of the EMS operations employees grouped into squads. It is an output to the process.

**3.7.5.1 Squad List**

Type: **Object**

This object is the output to update squad structure process. It is a list of EMS operations employees assigned to a squad together with their duties within that squad.



### 3.7.6 Prepare Demand Information

**Type:** Looping Sub-process  
**ID:** L3.46  
**Role:** EMS Information Manager

Historical data can be gathered from previous events so that the EMS information manager can analyse the trends for instance during the weekends and at the end of the month EMS is busier. Upcoming special events such as 2010 FIFA World cup and information received about those special events will also be used for planning. Some special events might have historical data that can be used for analysis else estimation will be used for the planning. A demand forecast document will be produced from this analysis to indicate what might be required from EMS services.

This process is time based and is performed in parallel with:

- Update Transport Availability Plan
- Update Leave Taken / Predicted
- Update Equipment Availability
- Update Service Conditions
- Update Squad Structure

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	EMS Information Manager	Prepare Demand Information	The EMS information manager will forecast the demand for EMS services based on historical data and special events information.
<b>Sequence Flow</b> Source -> Destination	Intermediate Event - Timed	Prepare Demand Information	The demand forecasting will be done at a scheduled time, annually or bi-annually for instance.
<b>Sequence Flow</b> Source -> Destination	Prepare Demand Information	Create Resource Schedule	The demand forecast prepared by the EMS information manager will be used for resource scheduling.
<b>Object Flow</b> Source -> Destination	Historical Data	Prepare Demand Information	Historical data from previous events will be used to forecast demand for EMS services. It is an input to the process.
<b>Object Flow</b> Source -> Destination	Special Events	Prepare Demand Information	Special events information will be used to forecast demand for EMS services. It is an input to the process.
<b>Object Flow</b> Source -> Destination	Prepare Demand Information	Demand Forecast	A document will be produced from the demand forecast exercise. It is an output to the process.

#### 3.7.6.1 Historical Data

**Type:** Object



This object is the input to prepare demand forecast process. It is information about historical events and incidents and EMS involvement in those. The information obtained is used for trend analysis and planning to assist in preparing the demand forecast document.

### 3.7.6.2 Special Events

Type: **Object**

This object is the input to prepare demand forecast process. Upcoming special events such a 2010 FIFA World Cup or the Argus Cycle tour needs to be considered when analysing and planning demand for EMS resources. Information such the magnitude and duration of the event needs to be known for planning the demand forecast document.

### 3.7.6.3 Demand Forecast

Type: **Object**

This object is the output to prepare demand forecast process. After analysing the historical data and special events requirements, a forecast of the demand is obtained for further planning.

## 3.7.7 Create Resource Schedule

Type: **Sub-process**

ID: **L3.47**

Role: **EMS Information Manager**

The EMS resource schedule will be determined by trying to match the supply of EMS resources with the anticipated demand. The supply is determined from the transport plan, the leave plan, the equipment list, the personnel list and the squad list. The demand for EMS resources will be obtained from the demand forecast information. The EMS information manager needs to meet the demand with the supply and create an initial schedule for the EMS resources.

If the supply cannot meet the demand, the EMS information manager needs to go back to the fleet manager, operational supervisor and HR manager so they can review their planning. For instance, overtime might be required or leave might need to be rescheduled.

The initial schedule is time based; it will be created as an annual forecast and subsequently updated on a weekly or monthly basis depending on the circumstances.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Update Transport Availability Plan	Create Resource Schedule	The transport plan created by the fleet manager will be used for resource scheduling.
<b>Sequence Flow</b> Source -> Destination	Update Leave Taken/Predicated Plan	Create Resource Schedule	The leave plan updated by the operational supervisor will be used for resource scheduling
<b>Sequence Flow</b> Source -> Destination	Update Equipment Availability	Create Resource Schedule	The equipment list created by the operational supervisor will be used for resource scheduling.
<b>Sequence Flow</b>			The personnel list created by the HR



Connector	Source	Target	Notes
Source -> Destination	Update Service Conditions	Create Resource Schedule	manager will be used for resource scheduling.
<b><u>Sequence Flow</u></b> Source -> Destination	Update Squad Structure	Create Resource Schedule	The squad list created by the operational supervisor will be used for resource scheduling.
<b><u>Sequence Flow</u></b> Source -> Destination	Prepare Demand Information	Create Resource Schedule	The demand forecast prepared by the EMS information manager will be used for resource scheduling.
<b><u>Sequence Flow</u></b> Source -> Destination	Intermediate Event - Timed	Create Resource Schedule	The initial schedule is time based and will be created annually or bi-annually for instance.
<b><u>Sequence Flow</u></b> Source -> Destination	Create Resource Schedule	Review and Update Resource Schedule	The initial schedule will be reviewed and updated if required.
<b><u>Object Flow</u></b> Source -> Destination	Create Resource Schedule	Initial Schedule	An initial schedule will be created when EMS information manager matches demand and supply. It is an output to the process.

### 3.7.7.1 Transport Plan

Type: **Object**

This object is an input to the create resource schedule process. It is a list of all transports that are available to be dispatched by a control centre.

### 3.7.7.2 Leave Plan

Type: **Object**

This object is an input to the create resource schedule process. It is a list of all the approved leave or other activities of the operations EMS employees that indicate when they are not available for duty.

### 3.7.7.3 Equipment List

Type: **Object**

This object is an input to the create resource schedule process. It is a list of all the special medical equipment that is operational and can be assigned to a transport.

### 3.7.7.4 Personnel List

Type: **Object**

This object is an input to the create resource schedule process. It is a list of EMS operations employees together with their working conditions and hours worked.

### 3.7.7.5 Squad List

Type: **Object**



This object is an input to the create resource schedule process. It is a list of EMS operations employees assigned to a squad together with their duties within that squad.

### 3.7.7.6 Demand Forecast

*Type:* **Object**

This object is an input to the create resource schedule process. After analysing the historical data and special events requirements, a forecast of the demand is obtained for resource scheduling.

### 3.7.7.7 Initial Schedule

*Type:* **Object**

This object is the output to create resource schedule process. A schedule will be created from the demand for EMS resources against the supply of EMS resources.

## 3.7.8 Review and Update Resource Schedule

*Type:* **Looping Sub-process**

*ID:* **L3.48**

*Role:* **EMS Information Manager**

The initial schedule will be distributed to all parties who provided information so that they can have an opportunity to review and advise changes. They will be able to check if the schedule fits into their planning. If a change is required, the parties involved might need to adjust their initial plans according to the schedule or the EMS information manager might need to review and create a new schedule.

### **Connections**

Connector	Source	Target	Notes
<b><u>Sequence Flow</u></b> Source -> Destination	Create Resource Schedule	Review and Update Resource Schedule	The initial schedule will be reviewed and updated if required.
<b><u>Sequence Flow</u></b> Source -> Destination	Review and Update Resource Schedule	Publish Resource Schedule	Once the initial schedule approved by all parties it can be published.
<b><u>Object Flow</u></b> Source -> Destination	Initial Schedule	Publish Resource Schedule	The initial schedule is distributed to all parties for review. It is an input to the process.

### 3.7.8.1 Initial Schedule

*Type:* **Object**

This object is the input to review and update resource schedule process. A schedule will be created from the demand for EMS resources against the supply of EMS resources and distributed to all parties for review.

## 3.7.9 Publish Resource Schedule

*Type:* **Task**



**ID:** L3.49  
**Role:** EMS Information Manager

Once all parties have approved the initial schedule, it will be published for all EMS employees to access.

**Connections**

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Review and Update Resource Schedule	Publish Resource Schedule	Once the initial schedule approved by all parties it can be published.
<b>Sequence Flow</b> Source -> Destination	Publish Resource Schedule	Intermediate Event – End	This process ends once the initial schedule is published.
<b>Object Flow</b> Source -> Destination	Publish Resource Schedule	Initial Schedule	The initial schedule is published when all parties have approved. It is an output to the process.

**3.7.9.1 Initial Schedule**

**Type:** Object

This object is the output to publish resource schedule process. A schedule will be created from the demand for EMS resources against the supply of EMS resources and distributed to all parties for review. Once it has been reviewed it is published.

**3.7.10 Instantiate Initial Squad Schedule**

**Type:** Sub-process

**ID:** L3.50

**Role:** Operational Supervisor

The operational supervisor will use initial schedule to extract information about a shift before it starts a few days before. This instance of the initial schedule will be used by the squad leader to monitor if all its resources are available for the shift.

**Connections**

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Intermediate Event – End	Instantiate Initial Squad Schedule	This process is time based and starts for instance a few days prior to a shift
<b>Sequence Flow</b> Source -> Destination	Instantiate Initial Squad Schedule	Supervisor Adjustment	The extract of the initial schedule can be adjusted by the supervisor
<b>Object Flow</b> Source -> Destination	Instantiate Initial Squad Schedule	Initial Schedule Instance	The initial schedule instance will provide information about a shift. It is an output to the process.



### 3.7.10.1 Initial Schedule Instance

Type: **Object**

This object is the output to the instantiate initial squad schedule process. This instance of the initial schedule will provide information about a shift and the supervisor can confirm with the squad leader if all squad members are available for the shift.

### 3.7.11 Supervisor Adjustment

Type: **Sub-process**

ID: **L3.51**

Role: **Operational Supervisor**

The operational supervisor will be able to make adjustments to the initial schedule instance if required. For instance if an EMS driver is not available for his/her shift, the squad leader will escalate the problem to the operational supervisor who can then adjust the instance of the schedule with another driver and produce a new schedule for that shift. The supervisor adjustments to the instance of the schedule are short term updates and once adjustment done the schedule for the shift is available.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Instantiate Initial Squad Schedule	Supervisor Adjustment	The extract of the initial schedule can be adjusted by the supervisor.
<b>Object Flow</b> Source -> Destination	Instantiate Initial Squad Schedule	Schedule	The schedule for a given shift will be created once the operational supervisor made the required changes. It is an output to the process.

### 3.7.11.1 Schedule

Type: **Object**

This object is the output to the supervisor adjustment process. The schedule for a shift is produced once the supervisor has completed the changes required to the resources.

## 3.8 Resource Tracking

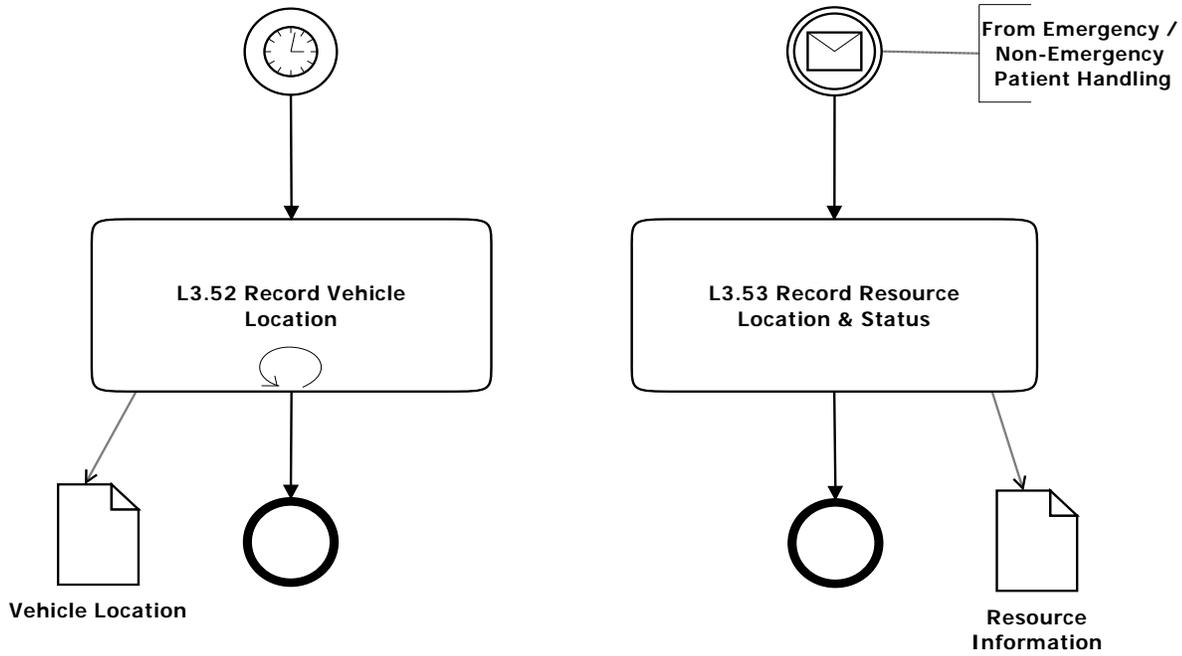
Type: **Repeating sub-process**

ID: **L2.9**

Resource tracking is the process of tracking the EMS resources available at the metropole control centres and the districts control centres. The vehicle location is tracked by means of a vehicle tracking device at regular time intervals. The EMS resource will be sending status information to the dispatcher as to their progress (see Emergency and Non-Emergency Patient Handling).



## L2.9 - Resource Tracking





### 3.8.1 Record Vehicle Location

Type: **Repeating sub-process**  
ID: **L3.52**

The vehicle location is tracked by means of a vehicle tracking device at regular intervals. Real time tracking of vehicles will be used to ensure that the information viewed by the dispatcher is current.

#### Connections

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Intermediate Event – Timed	Record Vehicle Location	Regular update of each vehicle location is required.
<b>Sequence Flow</b> Source -> Destination	Record Vehicle Location	End Event	The process is a repetitive task and ends once all vehicles location has been recorded during the interval. With Real time processing another instance of the process will be running to provide real time update of the vehicle location..
<b>Object Flow</b> Source -> Destination	Record Vehicle Location	Vehicle Location	The vehicle location is recorded during this process and reflected on a map for visual display. It is an output to the process.

#### 3.8.1.1 Vehicle Location

Type: **Object**

This object is the output to the record vehicle location process. The vehicle location will be visible on a map so that the dispatchers are aware of the position of each vehicle.

### 3.8.2 Record Resource Location And Status

Type: **Task**  
ID: **L3.53**

The EMS resources are tracked by means of tracking devices at regular intervals. In addition to real time tracking of resources, the EMS resource will advise the dispatcher of their status.

The statuses are:

- “Ready for Service” – when the EMS resource informs the dispatch that they are ready to start their shift;
- “Dispatch Acknowledged” – when the EMS resource acknowledges a dispatch assigned them;
- “At A” – once they arrive at the site of the event;
- “Off site” – once they leave the site of the event, sometimes with a patient;
- “At B” – once they arrive at a healthcare facility
- “Available” – once they are available to be dispatched to another event.



For instance in the Emergency and Non-emergency patient handling sub-process, in L3.28 the EMS resources will advise that they are at the incident and status will be “At A”. Once the patient is loaded in the vehicle and the vehicle leaves the incident scene, the EMS resource will report to the dispatcher that their status is “Off Site”. When they reach the healthcare facility, the dispatcher will be advised that the resource is “At B”. Once the patient has been offloaded the dispatcher will be advised that the EMS resource status is “Available” and they can be dispatched to the next event.

The resource information is updated with the EMS resource location and status.

**Connections**

Connector	Source	Target	Notes
<b>Sequence Flow</b> Source -> Destination	Intermediate Event – Message	Record Resource Location And Status	The dispatcher will receive a notification regarding the EMS resource status.
<b>Sequence Flow</b> Source -> Destination	Record Resource Location And Status	End Event	The process is completed once the resource information has been updated.
<b>Object Flow</b> Source -> Destination	Record Resource Location And Status	Resource Information	The dispatcher will update completed the resource once the resource information with the location and status received from EMS resource. It is an output to the process.

**3.8.2.1 Resource Information**

Type: **Object**

This object is the output to the record resource location and status process. The term resource information means the information about all EMS resources. An EMS resource is a “unit” that could be composed of a form of Transport and/or specialised medical equipment and the personnel that operated them. The transport is typically the ambulances, response cars, rescue unit, helicopters and airplanes. The status and location of those resources will be updated in the resource information.

## Annexure A – BPMN v1.2

The notation used in this report is Business Process Modelling Notation (BPMN) version 1.2. It is a standard for business process modelling currently maintained by the Object Management Group (OMG). See Annexure A for a full list diagrammatic shapes that are used in BPMN v1.2 [1]. In addition also see the "wikipedia" explanation of what BPMN is

[http://en.wikipedia.org/wiki/Business\\_Process\\_Modeling\\_Notation](http://en.wikipedia.org/wiki/Business_Process_Modeling_Notation)

This is a wall chart that explains BPMN v1.2 notation. Herewith a PDF file attachment that can be printed as an A3 wall chart. See reference [1] for details.

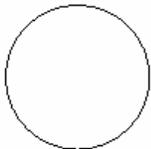


C:\Documents and Settings\Administrato

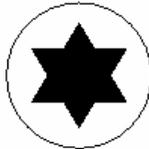
Here is an explanation of most of the diagrammatic shapes typically used in this report.

### Event

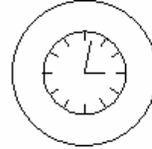
An Event is something that happens. They either “catch” something that happens or “throw” something i.e. initiating something. The diagram depicting an event is a circle with a narrow circle line depicting a Start event. Double line circles are Intermediate events. Thick line circles are End events. The design of the contents of the circle relays the type of event e.g. “multiple”, “timer”, “rule”, “link”, “terminate”.



**Start Event**



**Start Event - Multiple**



**Start Event - Timer**



**Start Event - Rule**



**Intermediate Event - Link**



**End Event - Terminate**

### *Start event*

This event is a “catch” at the start of a process



### ***End event***

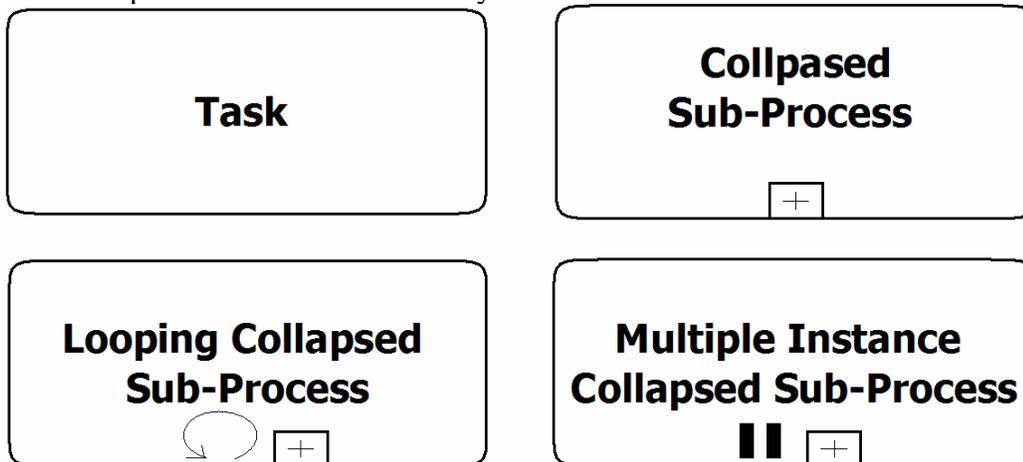
This event is a “throw” at the end of a process being either an “error”, “abort” or “terminate” event.

### ***Intermediate event***

This event is something that happens between the start and end events and can be a “catch” or “throw” event.

### ***Activity***

An activity describes what must be done. They can also have specific characteristics like “looping” or be for “multiple instances” of the activity.



### ***Task***

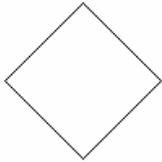
A task is cannot be broken down to a further level of process detail without needing to describe a business rule or steps in a procedure (this would be done using a different diagramming notation).

### ***Sub-process***

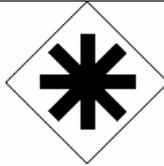
A sub-process hides lower levels of process detail. They have a self-contained start and end events, and sequence flows.

### ***Gateway***

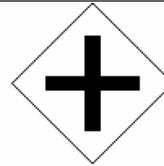
A gateway to denote forking and merging of process sequence flow paths depending on the conditions expressed. They are also augmented by specific characteristics for example to denote “complex” or “parallel” process sequence flows.



**"And"  
Connector**



**Complex  
Connector**



**Parallel  
Connector**

---

## Connecting objects

Flow objects are connected to each other using connecting objects.



**Sequence Flow**



**Object Flow**

### *Sequence Flow*

A Sequence Flow is represented with a solid line and arrowhead and shows in which order the activities will be performed

### *Object Flow*

An Object Flow is represented with a dashed line and an arrowhead at the end. It shows what objects are used by or result from activities.

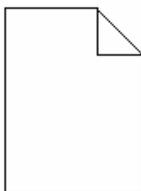
### *Lane*

Lanes or “swim lanes” are used to indicate the role that performs the activities, which produce or use the data objects, that “catch” or “throw” the events and that control the flow of the process within that lane.

---

## Data Objects

Data Objects indicate which data is required or produced in an activity.



**Object**



## Annexure B – Case and Incident Types

This section gives the sample case type and incident type lists. The case types are per a sample list of questions to determine the case type as well as the priority of the patient emergency. The incident type list is a sample of the Cape Town metropole inclusive of Paarl and Stellenbosch. It is split into special service and multiple casually incidents and delta incidents.

### Case Type List

CASE TYPE	QUESTION	REPLY		DEFAULT PRIORITY	AND
		TICK ONE	BLOCK		
ASSAULTS	SEMI CONSCIOUS OR UNCONSCIOUS	YES	NO	1	STOP
	BREATHING DIFFICULTY	YES	NO	1	STOP
	SEVERE BLEEDING	YES	NO	1	STOP
	FITS CONVULSIONS	YES	NO	1	STOP
MATERNITY	BABY BORN	YES	NO	1	STOP
	LABOUR	YES	NO	1	STOP
	SEVERE BLEEDING	YES	NO	1	STOP
	PAIN	YES	NO	1	STOP
	FITS CONVULSIONS	YES	NO	1	STOP
COLLAPSE SUDDEN ILLNESS	SEMI CONSCIOUS OR UNCONSCIOUS	YES	NO	1	STOP
	BREATHING DIFFICULTY	YES	NO	1	STOP
	SEVERE BLEEDING	YES	NO	1	STOP
	VOMITING CONTINUOUS	YES	NO	1	STOP
	PAIN	YES	NO	1	STOP
	FITS CONVULSIONS	YES	NO	1	STOP
HEART COMPLAINT	CHEST PAIN	YES	NO	1	STOP
	BREATHING DIFFICULTY	YES	NO	1	STOP
	FIRST ATTACK	YES	NO	1	STOP
	LEGS SWOLLEN	YES	NO	1	STOP
DIABETICS	SEMI CONSCIOUS OR UNCONSCIOUS	YES	NO	1	STOP
	BREATHING DIFFICULTY	YES	NO	1	STOP
	ON INSULIN	YES	NO	1	STOP
CASULTY	SEMI CONSCIOUS OR	YES	NO	1	STOP



CASE TYPE	QUESTION	REPLY TICK ONE BLOCK		DEFAULT PRIORITY	AND
	UNCONSCIOUS				
	BREATHING DIFFICULTY	YES	NO	1	STOP
	SEVERE BLEEDING	YES	NO	1	STOP
	TRAPPED	YES	NO	1	STOP
ASTHMA	BREATHING DIFFICULTY	YES	NO	1	STOP
	ON MEDICATION	YES	NO	1	STOP
BREATHING DIFFICULTY	FIRST TIME?	YES	NO	1	STOP
	BREATHING DIFFICULTY	YES	NO	1	STOP
	CHEST PAIN	YES	NO	1	STOP
	COUGHING	YES	NO	1	STOP
BITES & STINGS	SEMI CONSCIOUS OR UNCONSCIOUS	YES	NO	1	STOP
	BREATHING DIFFICULTY	YES	NO	1	STOP
	SWELLING	YES	NO	1	STOP
	SNAKE	YES	NO	1	STOP
	SPIDER	YES	NO	1	STOP
POISONING & OVERDOSE	SEMI CONSCIOUS OR UNCONSCIOUS	YES	NO	1	STOP
	BREATHING DIFFICULTY	YES	NO	1	STOP
	VOMITING - CONTINUOUS	YES	NO	1	STOP
	POISONOUS SUBSTANCE	YES	NO	1	STOP
HAEMORRHAGE	SEMI CONSCIOUS OR UNCONSCIOUS	YES	NO	1	STOP
	BREATHING DIFFICULTY	YES	NO	1	STOP
	SEVERE BLEEDING	YES	NO	1	STOP
STROKE	SEMI CONSCIOUS OR UNCONSCIOUS	YES	NO	1	STOP
	BREATHING DIFFICULTY	YES	NO	1	STOP
FITS, SEIZURES, EPILEPSY	STILL FITTING	YES	NO	1	STOP
	BREATHING DIFFICULTY	YES	NO	1	STOP
	FIRST TIME	YES	NO	1	STOP



CASE TYPE	QUESTION	REPLY TICK ONE BLOCK		DEFAULT PRIORITY	AND
		YES	NO		
	OTHER DISEASES	YES	NO	1	STOP
UNKNOWN	SEMI CONSCIOUS OR UNCONSCIOUS	YES	NO	1	STOP
	BREATHING DIFFICULTY	YES	NO	1	STOP
	SEVERE BLEEDING	YES	NO	1	STOP
	VOMITING CONTINUOUS	YES	NO	1	STOP
SPORTS INJURIES	SEMI CONSCIOUS OR UNCONSCIOUS	YES	NO	1	STOP
	BREATHING DIFFICULTY	YES	NO	1	STOP
	SEVERE BLEEDING	YES	NO	1	STOP
	NECK / BACK	YES	NO	1	STOP
All YES replies will default to priority 1. If NO PRIORITY 1 in a particular case then screen defaults to:					
CAN PATIENT WALK	NO	DEFAULT TO PRIORITY 2			
	YES	DEFAULT TO PRIORITY 3			



## ***Incident Type Lists***

### **1A Special Service and Multiple Casualty incidents**

- 1) MVA – no persons trapped
- 2) MVA – persons trapped
- 3) MVA Heavy Vehicle rescue
- 4) MVA Multiple Casualties
- 5) MVA bus incident
- 6) MVA freeway incidents
- 7) MVA level Crossings
- 8) MVA Hazmat incident
- 9) Wilderness search and rescue
- 10) Swift Water rescue
- 11) Fresh water drowning
- 12) Sea water drowning
- 13) Air Sea rescue
- 14) Diving accidents
- 15) Urban search and rescue
- 16) Rail incidents
- 17) Aviation incidents - Para gliders
- 18) Aviation incidents – Light aircraft and Micro lights
- 19) High Angle incidents
- 20) Industrial incidents
- 21) Fire incidents – informal settlements
- 22) Building Fires
- 23) Mountain Fires
- 24) Security incidents – Code Calls
- 25) Extreme weather incidents
- 26) Multiple Special Service incidents
- 27) METRO Control discretion
- 28) Skymed primary responses
- 29) Ship at Sea – medical advice
- 30) Infectious disease transport
- 31) Medical Waste incidents
- 32) Huguenot Tunnel incidents
- 33) Food poisoning
- 34) Recovery incidents

### **1B Mass Casualty (DELTA) Incidents**

- 1) Major Passenger / Commuter Train Accident
- 2) Fire Storm in Informal Settlements
- 3) Passenger aircraft accident at OR within 10 km of CT International Airport
- 4) Koeberg Radiation Emergency – Site Alert or Site Emergency



- 5) Koeberg Radiation Emergency – General Emergencies
- 6) Factory Blast explosion (or gas) (Hazchem)
- 7) Road tanker explosion (or gas) (Hazchem)
- 8) Major or multiple building collapse
- 9) Cultural / Sports Venue incident
- 10) Tanker explosion harbour
- 11) Cruise ship incident in harbour
- 12) Hotel fire / blast
- 13) Huguenot Tunnel accident – see special incident A32
- 14) Rail Hazchem incident
- 15) Extreme weather incident - see Delta 7 or Delta 21
- 16) Bus laded off-road incident – see special incident A5
- 17) Cable Car major accident
- 18) Poisonous gas leakage
- 19) Airport Terminal major incident
- 20) Ship ashore
- 21) Major mountain fires
- 22) Major unprecedented flooding
- 23) Earthquake road disruption
- 24) Major Hospital incident
- 25) Old Age home major incident
- 26) Correctional Services Fire / place of Safety – see Delta Incident 31
- 27) Transport accident – nuclear fuel
- 28) Infectious Disease outbreak
- 29) Explosion / explosions in public place – terrorist OR unknown
- 30) WSAR incident exceeding 6 persons – see Special Incident A9
- 31) combination OR unspecified incident
- 32) Nuclear waste transport incident – see Delta Incident 26
- 33) Terrorist Chemical or biological incident

*(end of list)*



---

## Annexure C – Links to Process Diagrams

All process diagram files that are in this report should be found in the same “folder” as this report. They have been created using open source drawing tool, Dia v0.97, see <http://live.gnome.org/Dia> .

Here follows “hyperlinks” to both the \*.dia diagram files and \*.emf picture files.

- L1.1 EMS Operational Process Overview
  - [L1.1 To-Be EMS Operational Process Overview v0.4.dia](#)
  - [pic L1.1 To-Be EMS Operational Process Overview v0.4.emf](#)
- L2.1 Call Handling
  - [L2.1 To-Be Call Handling v0.12.dia](#)
  - [pic L2.1 To-Be Call Handling v0.12.emf](#)
- L3.4 Verify Caller and Establish Event
  - [L3.4 To-Be Verify Caller And Establish Event v0.6.dia](#)
  - [pic L3.4 To-Be Verify Caller And Establish Event v0.6.emf](#)
- L2.2 Incident Handling
  - [L2.2 To-Be Incident Handling v0.4.dia](#)
  - [pic L2.2 To-Be Incident Handling v0.4.emf](#)
- L2.3 Dispatching
  - [L2.3 To-Be Dispatching v0.9.dia](#)
  - [pic L2.3 To-Be Dispatching v0.9.emf](#)
- L3.21 Determine What To Dispatch
  - [L3.21 To-Be Determine What To Dispatch v0.3.dia](#)
  - [pic L3.21 To-Be Determine What To Dispatch v0.3.emf](#)
- L2.4 Emergency Patient Handling
  - [L2.4 Emergency Patient Handling v0.4.dia](#)
  - [pic L2.4 Emergency Patient Handling v0.4.emf](#)
- L3.34 Determine And Designate Facility
  - [L3.34 To-Be Determine And Designate Facility Emergency v0.8.dia](#)
  - [pic L3.34 To-Be Determine And Designate Facility Emergency v0.8.emf](#)
- L2.5 Non-Emergency Patient Handling
  - [L2.5 Non-Emergency Patient Handling v0.4.dia](#)
  - [pic L2.5 Non-Emergency Patient Handling v0.4.emf](#)
- L3.34 Determine And Designate Facility
  - [L3.34 To-Be Determine And Designate Facility Non Emergency v0.8.dia](#)
  - [pic L3.34 To-Be Determine And Designate Facility Non Emergency v0.8.emf](#)
- L2.8 Resource Scheduling
  - [L2.8 To-Be Resource Scheduling v0.2.dia](#)
  - [pic L2.8 To-Be Resource Scheduling v0.2.emf](#)
- L2.9 Resource Tracking
  - [L2.9 To-Be Resource Tracking v0.1.dia](#)
  - [pic L2.9 To-Be Resource Tracking v0.1.emf](#)