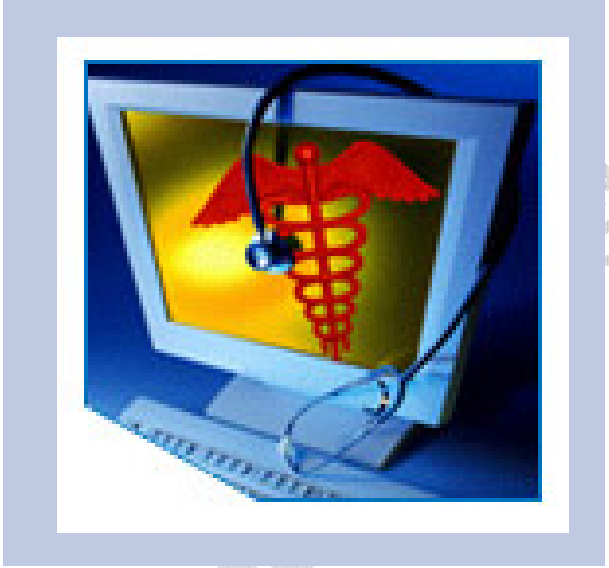
August 18, 2006
Version 1.0

HITSP Interoperability Specification: Resource Utilization Component

HITSP/ISC-47



Submitted to:

Healthcare Information Technology Standards Panel

Submitted by:

Biosurveillance Technical Committee

DOCUMENT CHANGE HISTORY

Version Number	Description of Change	Name of Author	Date Published
1.0	Final Draft	Biosurveillance Technical Committee	August 18, 2006

1.0 FOREWORD

Healthcare Information Technology Standards Panel (HITSP) is a multi-stakeholder coordinating body designed to provide the process within which affected parties can identify, select, and harmonize standards for communicating healthcare information throughout the healthcare spectrum. HITSP functions as a partnership of the public and private sectors and operates with a neutral and inclusive governance model administered by the American National Standards Institute. The goal of the Panel is to:

- Facilitate the development of harmonized interoperability specifications and information policies, including SDO work products (e.g. standards, technical reports). These policies, profiles and work products are essential for establishing privacy, security and interoperability among healthcare software applications.
- Coordinate, as appropriate, with other national, regional and international groups addressing healthcare informatics to ensure that the resulting standards are globally relevant.
- Be use-case driven, utilize information from stakeholders and base its decisions on industry needs.

The HITSP shall serve the public good by working to ensure that the combined work of various healthcare information standards organizations supports interoperability, accurate use, access, privacy and security of shared health information.

In order to advance the goal of expanding harmonized interoperability specifications and information policies, HITSP was tasked with developing interoperability specifications for three main use case “breakthroughs areas” in which specific, near term value to the health care consumer could be realized. The harmonized use case areas are:

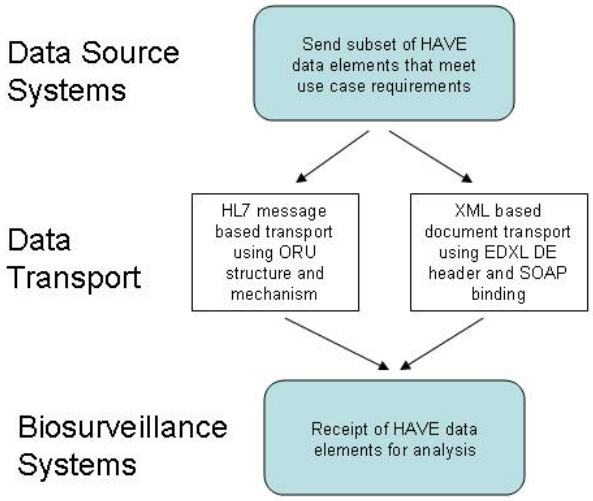
1.	Biosurveillance	Transmit essential ambulatory care and emergency department visit, utilization, and lab result data from electronically enabled health care delivery and public health systems in standardized and anonymized format to authorized Public Health Agencies with less than one day lag time.
2.	Consumer Empowerment	Allow consumers to establish and manage permissions access rights and informed consent for authorized and secure exchange, viewing, and querying of their linked patient registration summaries and medication histories between designated caregivers and other health professionals.
3.	Electronic Health Record	Allow ordering clinicians to electronically access laboratory results, and allow non-ordering authorized clinicians to electronically access historical and other laboratory results for clinical care.

The interoperability specification provides a detailed mapping of existing standards and specifications such as implementation guides, integration profiles to actions and actors that satisfy the requirements imposed by the relevant use cases. It identifies and constrains standards where necessary, and creates groupings of specific actions and actors to further describe the relevant contexts. Where gaps and overlaps are identified, the interoperability specification provides recommendations and a roadmap for corrections to be made.

2.0 INTRODUCTION

The Health Information Technology Standards Panel (HITSP) Biosurveillance Technical Committee (Bio TC) has identified a need for both data element definition and a messaging schema to support the exchange of information for reporting the utilization and availability of hospitals and health resources. The TC is informed by the harmonized biosurveillance use case provided by American Health Information Community (AHIC). The Bio TC is further informed with regard to the desirable set of data elements relevant to this purpose by the Biosurveillance Data Steering Committee (BDSC) which in turn reports to the Biosurveillance Work Group of the AHIC.

With regard to the messaging approach to support the exchange of hospital and health resource availability information, the Bio TC recommends that either of two acceptable specifications be utilized. The two specifications are the Emergency Data Exchange Language Distribution Element (EDXL-DE) version 1.0 for information exchange in an XML/SOAP/Web services environment, or the HL7 version 2.5 Observation Result Unsolicited (HL7 ORU) message constrained to transmit the Hospital Availability Exchange (HAVE) format dataset.



Need for Further Harmonization

In order to facilitate improvements in future healthcare utilization information interchange standards, the HITSP Bio TC recommends that OASIS and HL7 work collaboratively to develop a unified single interoperability specification that meets the needs of Biosurveillance and hospital and health resource availability messaging for all stakeholders.

This document addresses the data and messaging approach to be utilized to address the hospital and health resource utilization information exchange activities derived from the Use Case.

2.1 OVERVIEW

The Interoperability Specification focuses on a set of constrained standards for information interchange that address the core requirements of the Use Case described herein. It does not define all functions, constructs and standards necessary to implement a conforming system in a real world environment. In particular, an implementer must provide the technical infrastructure

and security framework necessary to support operations in accordance with law, regulation, best practices and business agreements.

Related Documents	Document Description	Document Name and Location
HITSP-IS-02	HITSP Biosurveillance Interoperability Specification	

2.2 AUDIENCE

The interoperability specification is designed to be used by analysts who need to understand the interoperability requirements for the described use case, and by implementers working to develop interoperable applications. Understanding and using the relevant interoperability set of specifications is a key requirement for establishing interoperability compliance.

2.3 TERMS AND DEFINITIONS

The definitions used for the purposes of this document can be found in the glossary. Refer to glossary in the appendix.

2.4 CONVENTIONS

This specification uses the following to convey the full descriptions and usage of standards:

UML sequence and activity diagrams

In these diagrams, the actors and transactions are highlighted within the framework of the specific scenario or context. The actors involved in the specified use-scenario or context are mapped out, and the interactions between each action and actor for a particular context, and the flow of data are provided through the use of arrows. Diagrams are named according to the section in which they reside, and will use the following naming convention:

Figure <section number>-<consecutive number for the diagram, e.g. 1, 2, 3, etc.>. <Short name/description of diagram>. For example, a diagram residing in section 3.1.3 showing the Actor Interactions for the Send Lab Results transaction package is named:

Figure 3.1.3-1. Send Lab Results Transaction Package

Tables

Tables are used to indicate standards categorizations, as well as dependencies and constraints between constructs. Tables are named according to the section in which they reside, and will use the following naming convention:

Table <section number>-<consecutive number for the table, e.g. 1, 2, 3, etc.>. <Short name/description of table>. For example, a table residing in section 2.7.1 showing the Dependencies between the transactions for the Send Lab Results transaction package is named:

Table 2.7.1-1. Send Lab Results Transaction Package dependencies

References

When references are made to another section within an Interoperability Specification a section number is used by itself. When references are made to other constructs that are related to the Interoperability Specification, such as Transaction Packages, Components or Composite Standards, the HITSP document short name and section number are displayed as follows:

<HITSP Document short name or Composite Standard Short Name>-<Volume Number>: <section number>

where:
<HITSP document short name> is a short designator for the construct (e.g. HITSP/ISTP-013)
<Composite Standard Short Name> is a short designator for the composite standard (e.g. IHE-ITI TF)
<Volume Number> is the applicable volume within the given composite standard (e.g. 1)
<section number> is the applicable section number (e.g. 3.1)

For example: HITSP/ISTP-013: 3.1 refers to Section 3.1 in the Interoperability Specification for a Transaction Package, IHE-ITI TF-2: 4.33 refers to Section 4.33 in volume 2 of the IHE IT Infrastructure Technical Framework.

Reproductions

Where large sections of composite standards or base standards are reproduced within a HITSP specification, the reproduced sections are cited with introductory text containing the reference information for the composite or base standard. In addition, the beginning and ending of the reproduced text are respectively shown using a beginning statement:

The text for the <composite or base standard name> specification begins here:

And an ending statement:

The text for the <composite or base standard name> ends here.

2.5 COMMENTS

To submit comments for this interoperability specification, please download the Comment Submission sheet from the HITSP site at www.hitsp.org and provide all relevant information, and then email the completed document to hitspcomments@ansi.org. Comments are consolidated periodically and sent to the Technical Committees for review.

2.6 COPYRIGHT PERMISSIONS

HL7 materials used in this document have been extracted from relevant copyrighted materials with permission of Health Level Seven (HL7). Copies of this standard may be purchased from the Health Level 7 website at www.hl7.org.

OASIS materials used in this document have been extracted from relevant copyrighted materials with permission of the Organization for the Advancement of Structured Information Standards (OASIS). Copies of this standard may be purchased from the Oasis website at www.oasis.org.

3.0 STANDARDS REFERENCES

It is HITSP's policy to only incorporate standards that have been approved according to the formal policy of the standards development organization that publishes the standard. HITSP interprets approval to include standards for trial use. The objective is to incorporate only standards that are managed within a formal life cycle process as defined by the SDO. In some cases, where we believe a not yet approved standard best meets the requirements of an Interoperability Specification, HITSP may provisionally select and conditionally use such standard subject to the following:

- The standard is approved by the time that the Interoperability Specification is released by HITSP.
- The standard approved is substantially the same as it was when provisionally used.

If either condition is not met at the date of the HITSP Interoperability Specification release, HITSP may continue to use the "standard" as it was in its provisional state until such time as HITSP can replace it with a more suitable artifact. In this circumstance, the SDO would have no responsibility to maintain or correct this artifact.

The Bio TC has selected standards first in accordance with HITSP Tier 1 and Tier 2 processes. The TC worked with USHIK to evaluate the metadata and repository for use in standards selection using demographic and encounter data as a test case. The results and the resource will be used in extension of this interoperability specification to additional domains and clinical data information exchange standards.

The Bio TC has selected standards with more options than might otherwise be defined between communication partners. As Biosurveillance is based upon secondary use of clinical data, the processes and data capture options are somewhat opportunistic, and associated data mining processes have more latitude in translation and data preparation processes. Since it is important to maximize the data sources to contribute data to the biosurveillance information system, information exchange selections include options for data capture from both legacy environments and emerging environments. Vocabulary, message, and content standards have been selected in

consideration of providing the most comprehensive, machine processable fulfillment of the data requirements provided by the AHIC Biosurveillance Data Steering Committee.

3.1 LIST OF BASE STANDARDS

Terminology Standards	
Standard	Description/Reason for selection/Reference
HAVE terminology	Description: HAVE specification contains terminology that is specific to utilization information and allows the communication of the status of a hospital and its resources to other emergency agencies, including bed capacity and availability, emergency department status, the available service coverage, and the status of a hospital's facility and operations. Reasoning: The Bio TC has identified the Hospital Availability Exchange (HAVE) dataset as being closely aligned with the data elements identified by the Biosurveillance Data Steering Committee. The HAVE specification is being proposed as an Organization for the Advancement of Structure Information Standards (OASIS) standard, but has not yet been fully reviewed and adopted. HAVE was derived from the results of the HAVBed project sponsored by the Agency for Health Resources and Quality. While it is anticipated that the HAVE specification will soon be approved by Oasis, and is likely to meet the requirements for reporting the data elements for hospitals and health resource availability identified by the BDSC, pending this formal approval the choice of a specific standard to represent these data elements remains a gap as defined in the HITSP policies. References
Information Interchange Standards	
Standard	Description/Reason for selection/Reference
HAVE Messaging Specification	Description: HAVE specification is an XML document that is specific to utilization information and allows the communication of the status of a hospital and its resources to other emergency agencies, including bed capacity and availability, emergency department status, the available service coverage, and the status of a hospital's facility and operations. Reasoning: The Bio TC has identified the Hospital Availability Exchange (HAVE) dataset as being closely aligned with the data elements identified by the Biosurveillance

	Data Steering Committee. The HAVE specification is being proposed as an Organization for the Advancement of Structure Information Standards (OASIS) standard, but has not yet been fully reviewed and adopted. HAVE was derived from the results of the HAVBed project sponsored by the Agency for Health Resources and Quality. While it is anticipated that the HAVE specification will soon be approved by Oasis, and is likely to meet the requirements for reporting the data elements for hospitals and health resource availability identified by the BDSC, pending this formal approval the choice of a specific standard to represent these data elements remains a gap as defined in the HITSP policies.
EDXL DE	Description: This Distribution Element DE specification describes a standard message distribution framework for data sharing among emergency information systems using the XML-based Emergency Data Exchange Language (EDXL). This format may be used over any data transmission system, including but not limited to the SOAP HTTP binding. The EDXL-DE was ratified as an Oasis standard in June, 2006. Reasoning: The Emergency Data Exchange Language (EDXL) is a suite of specific XML based standards intended as a suite of emergency data message types including resource queries and requests, situation status, message routing instructions and the like, needed in the context of cross-disciplinary, cross-jurisdictional communications related to emergency response. It is the result of a project of the Disaster Management eGov Initiative of the Department of Homeland Security (DHS) as a means to enhance XML based inter-agency emergency data communications. DHS partnered with industry members of the Emergency Interoperability Consortium (EIC) to bring the work to OASIS for advancement and standardization. Reference: http://www.oasis-open.org/committees/download.php/17227/EDXL-DE_Spec_v1.0.html
HL7 v2.5 ORU	Description: The HL7 version 2.5 Observation Result Unsolicited (HL7 ORU) message constrained to transmit the Resource Utilization Information. Reasoning: HL7 has a wide range of healthcare information interchange standards but has no standards specific to conveying healthcare utilization information. Hospital utilization information can be conveyed in an HL7 Observation Result message as general observations. In the HL7 ORU message each hospital utilization statistic becomes an observation. The HL7 ORU message has been implemented in existing biosurveillance systems. This approach accommodates the large installed base of health information technology systems that rely on HL7 messaging methods. Reference: See ANSI/HL7 V2.5-2003, Chapter 7, dated 06/26/2003
Context Standards	
Standard	Description/Reason for selection/Reference

None	
Security Standards	
Standard	Description/Reason for selection/Reference
None	
Identifier Standards	
Standard	Description/Reason for selection/Reference
None	
Functionality and Process/Process and Workflow Standards	
Standard	Description/Reason for selection/Reference
None	
Legislative Standards	
Standard	Description/Reason for selection/Reference
None	
Other Standards	
Standard	Description/Reason for selection/Reference
None	

3.2 LIST OF COMPOSITE STANDARDS

Composite Standard	Description	Relationships
None		

4.0 COMPONENT

4.1 CONTEXT OVERVIEW

Public health, EMS and or emergency management officials at local, state or national levels have a need to know the availability of hospital and other healthcare resources. The resource utilization information may be provided routinely or in response to a request.

4.1.1 CONTEXTUAL CONSTRAINTS

There are no contextual constraints as this data set does not include patient identifiable data.

4.1.2 TECHNICAL ACTORS

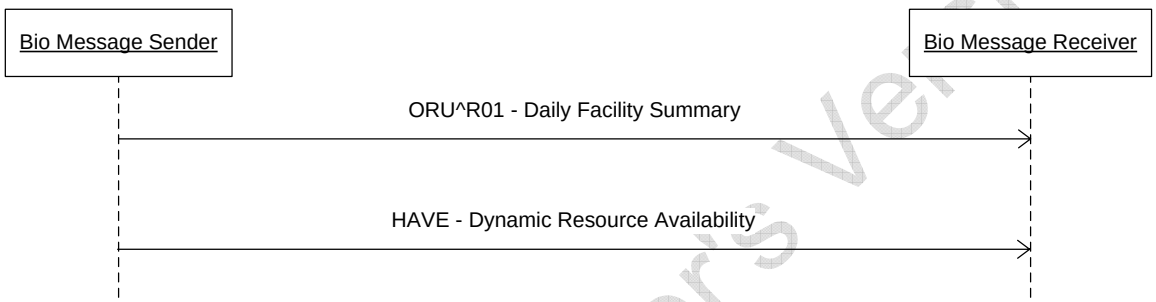
None

4.2 INFORMATION INTERCHANGE COMPONENTS: RULES FOR IMPLEMENTING

In order to implement the information interchange conforming to this Interoperability Specification and its constructs in a real world environment, the implementer must insure that the implementing systems operate within a secure infrastructure that insures the privacy, integrity and availability of

all personally identifiable health information as prescribed by the Health Insurance Portability and Accountability Act, all other applicable laws and regulations and terms of any contracts and agreements. The information interchange standards may also assume that certain information technology infrastructure and functions are in place. These assumptions collectively are the general pre-conditions for conforming to this Interoperability Specification and its constructs.

Specific preconditions for this scenario include:



4.2.1 PROCESS PRE-CONDITIONS

Data source systems exist and contain the required data.

4.2.1.1 PROCESS TRIGGERS

Some of the data elements identified in this document may be provided routinely from source systems to public health, and in other cases data elements may be provided in response to a request.

4.2.2 PROCESS POST-CONDITIONS

One or more ORU^R01 messages are prepared to pass either the Facility Summary information or the Dynamic Resource Utilization information as separate reports or the information may be on the same report.

4.2.2.1 PROCESS OUTPUTS

Biosurveillance resource availability data is formatted into a HL7 V2.5 ORU^R01 message structure. The message has an OBR-4 Universal Service Identifier for either “Facility Summary Report” or a “Dynamic Resource Availability Report”, since the triggers and scenarios for sending are different.

4.2.3 DATA STRUCTURE

The Data transport message structures are described below in terms of HL7 Messaging Methodology.

4.2.4 DATA MAPPING

4.2.4.1 HL7 Messaging Methodology

HL7 Message Structure

The following message description portrays how the HL7 Unsolicited Observation message may be used to convey either the daily Facility Summary message or the Dynamic Resource Availability message.

The HL7 standard was written and published by the Health Level Seven. The text for the HL7 standard begins here:

TABLE 4.1 MESSAGE ATTRIBUTES	
Abbreviation	Definition
Segment	Three-character code for the segment and the abstract syntax (*i.e.*, the square and curly braces) • [XXX] Optional • { XXX } Repeating • XXX Required • [{ XXX }] Optional and Repeating Note that for Segment Groups there will not be a segment code present, but the square and curly braces will still be present. This column shows the HL7 repeats and optionality for the standard message. The Usage and Cardinality columns specify how PHIN constrains the message.
Name	Name of the Segment or Segment group element.
Usage	Usage of the field for PHIN. Indicates if the field is required, optional, or conditional in a segment. Legal values are: • R – Required. Must always be populated • O – Optional. May optionally be populated. • C – Conditional. Populated under specified conditions. • X – Not used for PHIN messaging. • B - Backward compatible. Kept for backward compatibility with previous versions of HL7.
Cardinality	Indicates the minimum and maximum number of times the element may appear. • [0..0] Element never present. • [0..1] Element may be omitted and it can have at most, one Occurrence. • [1..1] Element must have exactly one Occurrence. • [0..n] Element may be omitted or may repeat up to *n* times. • [1..n] Element must appear at least once, and may repeat up to *n* times. • [0..*] Element may be omitted or repeat for an unlimited number of times. • [1..*] Element must appear at least once, and may repeat unlimited number of times. • [m..n] Element must appear at least _*m*_ and at most, _*n*_ times.

TABLE 4.1 MESSAGE ATTRIBUTES	
Abbreviation	Definition
Section	Section indicates the part of this guide that describes the segment. Some segments are associated with multiple sections.

300

ABSTRACT MESSAGE SYNTAX ORU^R01 UNSOLICITED OBSERVATION MESSAGE				
Segment	Name	Usage	Cardinality	Note
	Header Begin			
MSH	Message Header	R	[1..1]	
[{SFT}]	Software Segment	X	[0..0]	
	Header End			
{	*PATIENT_RESULT Begin*	X	[0..0]	
[	*PATIENT Begin*	X	[0..0]	
PID	Patient Identification	X	[0..0]	This is not patient-level data.
[PD1]	Additional Demographics	X	[0..0]	
[{NTE}]	Notes and Comments for PID	X	[0..0]	
[{NK1}]	Next of Kin/Related Parties	X	[0..0]	
[	*VISIT Begin*			
PV1	Patient Visit	X	[0..0]	
[PV2]	Patient Visit – Additional Information	X	[0..0]	
]	*VISIT End*			
]	*PATIENT End*	X	[0..0]	
{	*ORDER_OBSERVATION Begin*	R	[1..*]	
[ORC]	Order Common	X	[0..0]	
OBR	Observation Request	R	[1..1]	Only 1 OBR segment per message expected.
[{NTE}]	Notes and Comments	X	[0..0]	
[{	*TIMING_QTY Begin*	X	[0..0]	
TQ1	Timing/Quantity	X	[0..0]	
[{TQ2}]	Timing/Quantity Order Sequence	X	[0..0]	
}]	*TIMING_QTY End*			
[CTD]	Contact Data	X	[0..0]	
[{	*OBSERVATION Begin*	R	[1..*]	
OBX	Observation Related to OBR	R	[1..1]	
{ [NTE] }	Notes and Comments	O	[0..*]	may be capturing observation notes on some of the dynamic reports
}]	*OBSERVATION End*			

ABSTRACT MESSAGE SYNTAX ORU^R01 UNSOLICITED OBSERVATION MESSAGE				
Segment	Name	Usage	Cardinality	Note
[{FT1}]	Financial Transaction	X	[0..0]	
[{CTI] }	Clinical Trial Identification	X	[0..0]	
[{	*SPECIMEN Begin*			
SPM	Specimen	X	[0..0]	
[{OBX }]	Observation Related to Specimen	X	[0..0]	
}]	*SPECIMEN End*			
}	*ORDER_OBSERVATION End*			
}	*PATIENT_RESULT End*	X	[0..0]	
[DSC]	Continuation Pointer	X	[0..0]	

4.2.4.2 HL7 Segment and Field Descriptions

This section contains descriptions of the segments used. Within each segment, the supported fields are briefly described. For more information on segments and fields, refer to the *HL7 Standard*.

Segment Attribute Table Abbreviations

The abbreviated terms and their definitions as used in the segment table headings, are as follows:

SEGMENT ATTRIBUTES	
Abbreviation	Definition
Seq	Sequence of the elements as they are numbered in the HL7 segment.
Len	Maximum length of the element. Length of an element is calculated using the following rules: • Field length = (Sum of all supported component lengths) + (component number of the last supported component) – 1. • Component length = (Sum of all supported sub-component lengths) + (sub-component number of the last supported component) – 1. Lengths should be considered recommendations, not absolutes. The receiver may truncate fields, components, and sub-components longer than the recommended length. The receiver should not fail to process a message simply because fields, components, or sub-components are too long.
DT	Data type used for HL7 element.
Usage	Usage of the field for Biosurveillance messaging. Indicates if the field is required, optional, or conditional in a segment. Legal values are: R – Required. A conforming sending application shall populate all "R" elements with a non-empty value. Conforming receiving application shall process (save/print/archive/etc.) or ignore the information conveyed by required elements. A conforming receiving application must not raise an error due to the presence of a required element, but may raise an error due to the absence of a required element. Any element designated as required in a standard HL7 message definition shall also be required RE – Required but may be Empty. The element may be missing from the message, but must be sent by the sending application if there is relevant data. A conforming sending application must be capable of providing all "RE" elements. If the conforming sending application knows the required values for the element, then it must send that element. If the conforming sending application does not know the required

SEGMENT ATTRIBUTES	
Abbreviation	Definition
	values, then that element will be omitted. Receiving applications will be expected to process (save/print/archive/etc.) or ignore data contained in the element, but must be able to successfully process the message if the element is omitted (no error message should be generated because the element is missing). O – Optional. Sending applications may populate this field, but they are not required to do so per the ELINCS specification. If the sending application populates the field, the value must conform to all specifications for the field in the HL7 v2.4 standard. Sending applications should not expect conformant receiving applications to process data sent in this field. Receiving applications may process data received in this field, but they are not required to do so per the ELINCS specification. Receiving applications should not expect the field to be populated by conformant sending applications. Sending and receiving systems may agree to use the optional elements, but such agreements are outside the purview of the ELINCS specification and have no bearing on the conformance of sending or receiving systems. C – Conditional. This usage has an associated condition predicate, which can be evaluated based on the values of other data elements in the same message. If the predicate is satisfied: A conformant sending application must always send the element. A conformant receiving application must process or ignore data in the element. It may raise an error if the element is not present. If the predicate is NOT satisfied: A conformant sending application must NOT send the element. A conformant receiving application must NOT raise an error if the condition predicate is false and the element is not present, though it may raise an error if the element IS present. X – Not supported. For conformant sending applications, the element will not be sent. Conformant receiving applications may ignore the element if it is sent, or may raise an application error.
Repeats	A Y indicates that the element may appear more than once in the field. A number indicates the maximum number of instances.
Value Set	Pre-coordinated tables used in Biosurveillance messages.
HL7 Element Name	HL7 descriptor of the element in the segment.
Description/Comments	Context and usage for the element.

MSH – Message Header Segment

The Message Header Segment (MSH) is necessary to support the functionality described in the Control/Query chapter of the *HL7 standard*. MSH is used to define the intent, source, destination, and some specifics of the syntax of a message. The message header is mandatory for every message.

MESSAGE HEADER SEGMENT (MSH)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/Comments
1	1	ST	R			Field Separator	Character to be used as the field separator for the rest of the message. The supported value is |, ASCII (124).
2	4	ST	R			Encoding Characters	Field that always contains the following four characters, in the same order: |^~\&|.
3	227	HD	R			Sending Application	Field used to uniquely identify the sending application for messaging purposes.

MESSAGE HEADER SEGMENT (MSH)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/Comments
3.1	20	IS	O			Namespace ID	Sending application short name may be included for readability.
3.2	199	ST	R			Universal ID	This may be an OID.
3.3	6	ID	R			Universal ID Type	If OID used as universal id, this field contains the literal value 'ISO'.
4	227	HD	R			Sending Facility	Unique identifier of the facility that sends the message.
4.1	20	IS	O			Namespace ID	Facility short name may be included for readability.
4.2	199	ST	R			Universal ID	This may be an OID.
4.3	6	ID	R			Universal ID Type	If OID used as universal id, this field contains the literal value 'ISO'.
5	227	HD	R			Receiving Application	Field used to uniquely identify the receiving application for messaging purposes.
5.1	20	IS	O			Namespace ID	Application short name may be included for readability.
5.2	199	ST	R			Universal ID	This may be an OID.
5.3	6	ID	R			Universal ID Type	If OID used as universal id, this field contains the literal value 'ISO'.
6	227	HD	R			Receiving Facility	Unique identifier of the facility that is to receive the message.
6.1	20	IS	O			Namespace ID	Facility short name may be included for readability.
6.2	199	ST	R			Universal ID	This may be an OID.
6.3	6	ID	R			Universal ID Type	If OID used as universal id, this field contains the literal value 'ISO'.
7	24	TS	R			Date/Time Of Message	Date/time the sending system created the message.
7.1	24	DTM	R			Time	YYYY[MM[DD[HH[MM[SS[.S[S[S[S]]]]]]]][+/-ZZZZ], where at least the first fourteen digits are used to specify to a precision of "second." The time zone (+/-ZZZZ) is represented as +/-HHMM offset from Coordinated Universal Time (UTC) (formerly Greenwich Mean Time [GMT]), where +0000 or -0000 both represent UTC (without offset). Note that if the time zone is not included, the time zone is understood to be the local time zone of the sender.
7.2		ID	X			Degree of Precision	
8	40	ST	X			Security	
9	15	MSG	R			Message Type	Field containing the message type, trigger event, and the message structure ID for the message. For the Resource Availability messages, the value in this field will reflect the use of the Unsolicited Result Message ORU^R01'.
9.1	3	ID	R			Message Code	Literal value: 'ORU'.

MESSAGE HEADER SEGMENT (MSH)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/Comments
9.2	3	ID	R			Trigger Event	Literal value: 'R01'.
9.3	7	ID	R			Message Structure	Literal value: 'ORU_R01'.
10	20	ST	R			Message Control ID	String that uniquely identifies the message instance from the sending application.
11	3	PT	R			Processing ID	Field that indicates the intent for processing the message, such as "Testing," "Development," or "Production."
11.1	1	ID	R			Processing ID	
11.2	1	ID	O			Processing Mode	Processing mode is understood to be "Current," if not explicitly sent in the message.
12	5	VID	R			Version ID	HL7 version number used to interpret format and content of the message.
12.1	5	ID	R			Version ID	Literal value: '2.5'.
12.2		CE	X			Internationalization Code	
12.3		CE	X			International Version ID	
13		NM	X			Sequence Number	
14		ST	X			Continuation Pointer	
15		ID	X			Accept Acknowledgment Type	
16		ID	X	[0..0]		Application Acknowledgment Type	
17	3	ID	X	[0..0]		Country Code	
18		ID	X			Character Set	Not supported.
19		CE	X			Principal Language Of Message	Not supported.
20		ID	X			Alternate Character Set Handling Scheme	Not supported.
21	411	EI	O			Message Profile Identifier	Field used to reference or assert adherence to a message profile. Message profiles contain detailed explanations of grammar, syntax, and usage for a particular message or set of messages.
21.1	199	ST	O			Entity Identifier	
21.2	4	IS	O			Namespace ID	
21.3	199	ST	O			Universal ID	
21.4	6	ID	O			Universal ID Type	

OBR – Observation Request Segment

320 In the reporting of clinical data, the OBR serves as the report header. It identifies the observation set represented by the following atomic observations. It includes the relevant ordering information when that applies. It contains many of the attributes that usually apply to all of the included observations.

OBSERVATION REQUEST SEGMENT (OBR)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/ Comments
1	4	SI	O			Set ID - OBR	
2	22	EI	R			Placer Order Number	The Standard describes this field as required for the result message when the ORC segment is not present. Literal Value: “”
3	22	EI	R			Filler Order Number	The Standard describes this field as required for the result message when the ORC segment is not present. Literal Value: “”
4	250	CE	R			Universal Service Identifier	Will be assigning a universal identifier to use as a report identifier. May need one for the Daily Facility Summary Report and one for the Dynamic Resource Availability Report.
5	2	ID	X			Priority – OBR	
6	26	TS	X			Requested Date/Time	
7	26	TS	R			Observation Date/Time	Relevant date/time for the information contained on the report.
8	26	TS	O			Observation End Date/Time	
9	20	CQ	O			Collection Volume	
10	250	XCN	O	Y		Collector Identifier	
11	1	ID	O		0065	Specimen Action Code	
12	250	CE	O			Danger Code	
13	300	ST	O			Relevant Clinical Information	
14	26	TS	B			Specimen Received Date/Time	
15	300	SPS	B			Specimen Source	
16	250	XCN	O	Y		Ordering Provider	
17	250	XTN	O	Y/2		Order Callback Phone Number	
18	60	ST	O			Placer Field 1	
19	60	ST	O			Placer Field 2	
20	60	ST	O			Filler Field 1	
21	60	ST	O			Filler Field 2	
22	26	TS	R			Results Rpt/Status Chng - Date/Time	This field specifies the date/time results reported or status changed. This field is used to indicate the date and time that the results are composed into a report and released, or that a status, as defined in *ORC-5-order status*, is entered or changed. (This is a results field that is required for the OBR in a result message.)
23	40	MOC	O			Charge to Practice	
24	10	ID	O		0074	Diagnostic Serv Sect ID	
25	1	ID	R		0123	Result Status	This field is required whenever the OBR is contained in a report message. Literal Value: ‘F’.

OBSERVATION REQUEST SEGMENT (OBR)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/ Comments
26	400	PRL	O			Parent Result	
27	200	TQ	B	Y		Quantity/Timing	
28	250	XCN	O	Y		Result Copies To	
29	200	EIP	O			Parent	
30	20	ID	O		0124	Transportation Mode	
31	250	CE	O	Y		Reason for Study	
32	200	NDL	O			Principal Result Interpreter	
33	200	NDL	O	Y		Assistant Result Interpreter	
34	200	NDL	O	Y		Technician	
35	200	NDL	O	Y		Transcriptionist	
36	26	TS	O			Scheduled Date/Time	
37	4	NM	O			Number of Sample Containers *	
38	250	CE	O	Y		Transport Logistics of Collected Sample	
39	250	CE	O	Y		Collector's Comment *	
40	250	CE	O			Transport Arrangement Responsibility	
41	30	ID	O		0224	Transport Arranged	
42	1	ID	O		0225	Escort Required	
43	250	CE	O	Y		Planned Patient Transport Comment	
44	250	CE	O	N	0088	Procedure Code	
45	250	CE	O	Y	0340	Procedure Code Modifier	
46	250	CE	O	Y	0411	Placer Supplemental Service Information	
47	250	CE	O	Y	0411	Filler Supplemental Service Information	
48	250	CWE	O	N	0476	Medically Necessary Duplicate Procedure Reason.	
2	IS	O	N	0507	01647	Result Handling	

325

OBX – Observation Result Segment

The Observation Result Segment (OBX) is used to convey observations in both ADT and result messages.

330

OBSERVATION/RESULT SEGMENT (OBX)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/ Comments
1	4	SI	O			Set ID – OBX	Field that contains the sequence number of the OBX, which increments up by one for each observation segment in the group.

OBSERVATION/RESULT SEGMENT (OBX)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/ Comments
2	2	ID	C		0125	Value Type	Format of the observation value expressed in OBX-5. The expected value types for this interface are ST, TX, TS, SN, or CE. See breakdown for each data type in OBX-5 below.
3	250	CE	R			Observation Identifier	Observations that may be captured with this component are assigned a LOINC code that is used to identify the observation being passed.
3.1	20	ST	R			Identifier	LOINC code.
3.2	199	ST	R			Text	LOINC Description.
3.3	20	ID	R			Name of Coding System	LOINC Code system identifier
3.4	20	ST	O			Alternate Identifier	Local Code.
3.5	199	ST	O			Alternate Text	Local Description.
3.6	20	ID	O			Name of Coding System	Local Coding System.
4	20	ST	C			Observation Sub-ID	
5	99999i	varies	C	Y1		Observation Value	The length and format of the Observation Value changes depending on the value in OBX-2 Value Type.
BREAKDOWN FOR ST (STRING) DATATYPE							
5.1	199	ST	R			String Data	String data is left-justified with trailing blanks optional. It may be any displayable (printable) ACSII characters (hexadecimal values between 20 and 7E, inclusive, or ASCII decimal values between 32 and 126), except the defined escape characters and defined delimiter characters.
BREAKDOWN FOR SN (STRUCTURED NUMERIC) DATATYPE							
5.1	2	ST	O			Comparator	Defined as greater than, less than, greater than or equal, less than or equal, equal, and not equal, respectively (= ">" or "<" or ">=" or "<=" or "=" or "<>". If this component is not valued, it is assumed to be equal ("="). This field is preferred over the use of the NM datatype which must often be passed as a string, since it may be a mixture of an operator character and numeric data.
5.2	15	NM	R			Num1	First number.
5.3	1	ST	O			Separator/Suffix	"-" or "+" or "/" or "." or ":".
5.4	15	NM	O			Num2	Second number.
BREAKDOWN FOR TS (TIMESTAMP) DATATYPE							

OBSERVATION/RESULT SEGMENT (OBX)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/ Comments
5.1	24	DTM	R			Time	YYYY[MM[DD[HH[MM[SS[.S[S[S[S]]]]]]]][+/-ZZZZ] where: the first four specify a precision of "year" the first six are used to specify a precision of "month" the first eight are used to specify a precision of "day" the first ten are used to specify a precision of "hour" the first twelve are used to specify a precision of "minute" the first fourteen are used to specify a precision of "second" the first sixteen are used to specify a precision of "one tenth of a second" the first nineteen are used to specify a precision of "one ten thousandths of a second." The time zone (+/-ZZZZ) is represented as +/-HHMM offset from Coordinated Universal Time (UTC) (formerly Greenwich Mean Time [GMT]), where +0000 or -0000 both represent UTC (without offset). Note that if the time zone is not included, the time zone defaults to that of the local time zone of the sender.
5.2	1	ID	X	0529		Degree of Precision	
BREAKDOWN FOR TX (TEXT) DATATYPE							
5.1	no limit	TX	R			Text Data	String data meant for user display (on a terminal or printer). Such data would not necessarily be left-justified, since leading spaces may contribute greatly to the clarity of the presentation to the user. Because this type of data is intended for display, it may contain certain escape character sequences designed to control the display. Escape sequence formatting is defined in Section 2.7 of the *HL7 2.5 Standard Use of Escape Sequences in Text Fields*. Leading spaces should be included. Trailing spaces should be removed.
6	250	CE	O			Units	Units of measure that put the observation value expressed in OBX-5 into context. Units are used for age, blood pressure and temperature observations, as well as the units of measure for quantitative laboratory results.
6.1	20	ST	R			Identifier	UCUM identifier
6.2	199	ST	R			Text	UCUM Description.
6.3	20	ID	R			Name of Coding System	UCUM Code system identifier
6.4	20	ST	O			Alternate Identifier	Local Code.

OBSERVATION/RESULT SEGMENT (OBX)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/ Comments
6.5	199	ST	O			Alternate Text	Local Description.
6.6	20	ID	O			Name of Coding System	Local Coding System.
7	60	ST	O			References Range	
8	5	IS	O	Y	0078	Abnormal Flags	
9	5	NM	O			Probability	
10	2	ID	O	Y	0080	Nature of Abnormal Test	
11	1	ID	R		0085	Observation Result Status	For purposes of this interface, literal value 'F' may be used to meet the mandatory use of this field.
12	26	TS	O			Effective Date of Reference Range	
13	20	ST	O			User Defined Access Checks	
14	26	TS	O			Date/Time of the Observation	Date/time the observation identified in OBX-3 was performed. (Not really necessary for the observation expressed on the report – see OBR-7 for relevant date/time).
15	250	CE	O			Producer's ID	
16	250	XCN	O	Y		Responsible Observer	
17	250	CE	O	Y		Observation Method	
18	22	EI	O	Y		Equipment Instance Identifier	
19	26	TS	O			Date/Time of the Analysis	

The text for the HL7 standard ends here.

4.2.5 MINIMUM DATA-SET

335 ***Base Facility Data Elements***

These are elements about the data source hospitals. The data may be collected as part of an implementation. These items rarely change, so they are not needed to be part of routine messaging, although the first three elements are collected as part of the HAVE data.

340

BASE FACILITY DATA ELEMENTS						
Data Element	Description	Source	Limit/Range / Vocabulary	Message Context	Data Type	Conditions for Use
Facility ID	The unique identifier of the sender.		CMM IDs			
Facility Name	Name of main facility under which this facility operates					
Facility Location	Address for the facility					

BASE FACILITY DATA ELEMENTS						
Data Element	Description	Source	Limit/Range / Vocabulary	Message Context	Data Type	Conditions for Use
Number of Licensed Beds	Total number of licensed beds					

Daily Facility Summary Report Elements

These data elements are expected to be available as part of the routine daily census reporting from ADT systems.

DAILY FACILITY SUMMARY REPORT ELEMENTS						
Data Element	Description	Source	Limit/Range / Vocabulary	HL7 Context	Data Type	Conditions for Use
Facility ID	The unique identifier of the sender.	Once daily routine census report	CMM IDs	MSH-4.2 Sending Facility Universal Identifier	ST	
Facility Name	Name of main facility under which this facility operates	Once daily routine census report		MSH-4.1 Sending Facility Namespace ID	IS	
Admissions	Number of patients admitted to the hospital in the last 24 hour reporting period	Once daily routine census report	Numeric	OBX Segment: OBX-2 = SN OBX-3 = Admissions^Admissions Past 24 hours ^TBD OBX-5= ^nn OBX-11 = 'F'	SN	
Discharges	Number of patients discharged from the hospital in the last 24 hour reporting period	Once daily routine census report	Numeric	OBX Segment: OBX-2 = SN OBX-3 = Discharges^Discharges Past 24 hours^TBD OBX-5= ^nn OBX-11 = 'F'	SN	
Deaths	Number of patient deaths in the last 24 hour reporting period	Once daily routine census report	Numeric	OBX Segment: OBX-2 = SN OBX-3 = Deaths^Deaths Past 24 hours^TBD OBX-5= ^nn OBX-11 = 'F'	SN	
Date/Time of Message	The date and time the message was sent.	Once daily routine census report	Time stamp	OBR-7 Observation Date/time	TS	Required for every report

345

Dynamic Resource Availability Report Elements

These data elements may be routinely collected or collected only in response to a query. The interval may vary among regions, and increase in frequency during a disaster or other situation.

DYNAMIC RESOURCE AVAILABILITY REPORT ELEMENTS						
Data Element	Description	Source	Limit/Range / Vocabulary	HL7 Context	Data Type	Conditions for Use
Hospital Facility Status	The status of the facility.	Resource Availability System	Open / Closed HAVE Values: Normal - No conditions exist that adversely affect the general operations of the facility. Compromised - General operations of the facility have been affected due to damage, operating on emergency backup systems, or facility contamination. Evacuating - Indicates that a hospital is in the process of a partial or full	OBX Segment: OBX-2 = CE OBX-3 = HospitalFacilityStatus^The status of the facility.^TBD OBX-5= "coded result" OBX-11 = 'F'	CE	Associated comment is passed as NTE segment(s)

DYNAMIC RESOURCE AVAILABILITY REPORT ELEMENTS						
Data Element	Description	Source	Limit/Range / Vocabulary	HL7 Context	Data Type	Conditions for Use
Hospital Clinical Status	The clinical status of the facility.	Resource Availability System	Open / Closed HAVE Values: Normal - Hospital clinical resources are operating within normal conditions. Level1 - Hospital clinical resources are operating at Level-1 surge conditions. Level2 - Hospital clinical resources are operating at Level-2 surge conditions. Full - Hospital clinical resources are exceeded and acceptable care cannot be provided to additional patients. Diversion or community surge response is required.	OBX-2 = CE OBX-3 = 'ClinicalStatus^ The clinical status of the facility^TBD' OBX-5= "coded result" OBX-11 = 'F'	CE	Associated comment is passed as NTE segment(s)
Hospital Resource Status - Staffing	The status of staffing.	Resource Availability System	Y/N w comment HAVE Values: Adequate - Meets the current needs. Insufficient – Current needs are not being met	OBX-2 = CE OBX-3 ='Staffing^The status of staffing. ^TBD' OBX-5= "coded result" OBX-11 = 'F'	CE	Associated comment is passed as NTE segment(s)
Hospital Resource Status -Facility Operations	The status of supplies necessary for facility operations.	Resource Availability System	Y/N w comment HAVE Values: Adequate - Meets the current needs. Insufficient – Current needs are not being met	OBX-2 = CE OBX-3 = 'FacilityOperations^The status of supplies necessary for facility operations. ^TBD' OBX-5= "coded result" OBX-11 = 'F'	CE	Associated comment is passed as NTE segment(s)

DYNAMIC RESOURCE AVAILABILITY REPORT ELEMENTS						
Data Element	Description	Source	Limit/Range / Vocabulary	HL7 Context	Data Type	Conditions for Use
Hospital Resource Status – Decon Capacity	The capacity for chemical/biological/radiological patient decontamination.	Resource Availability System	Y/N w comment HAVE Values: IInactive - Not being used, but available if needed OOpen - In use and able to accept additional patients FFull - In use at maximum capacity Exceeded - Needs exceed available capacity	OBX Segment: OBX-2 = CE OBX-3 = 'DeconCapacity ^LOINC DESC^LN' OBX-5= Y or N OBX-11 = 'F'	CE	Associated comment is passed as NTE segment(s)
Emergency Department Status - EMS Traffic Status	Ability of this emergency department to receive patients via emergency medical services.	Resource Availability System	Value must be one of: Normal - Accepting all EMS traffic Advisory - Experiencing specific resource limitations which may affect transport of some EMS traffic. Closed - Requesting re-route of EMS traffic to other facilities. NotApplicable - Not Applicable. This hospital does not have an emergency department.	OBX Segment: OBX-2 = CE OBX-3 = EMSTrafficStatus ^ Ability of this emergency department to receive patients via emergency medical services.^TBD OBX-5= « coded result » OBX-11 = 'F'		
Emergency Department Status - EMS Capacity	The number of each triage patient type the hospital can accept.	Resource Availability System	CapacityTriageRed count CapacityTriageYellow count CapacityTriageGreen count CapacityTriageBlack count	OBX Segment for each one: e.g., OBX-2 = SN OBX-3 = CapacityTriageRed ^^TBD OBX-5= ^nn OBX-11 = 'F'		associated comment is passed as NTE segment(s)
Emergency Department Status - EMS Census	The number of each triage patient type the hospital currently has.	Resource Availability System	CensusTriageRed count CensusTriageYellow count CensusTriageGreen count CensusTriageBlack count	OBX Segment for each one: e.g., OBX-2 = SN OBX-3 = CensusTriageRed^Number of Triage Red patients^TBD OBX-5= ^nn OBX-11 = 'F'		associated comment is passed as NTE segment(s)

DYNAMIC RESOURCE AVAILABILITY REPORT ELEMENTS						
Data Element	Description	Source	Limit/Range / Vocabulary	HL7 Context	Data Type	Conditions for Use
Emergency Department Status - EMS Offload Minutes	Indicator of offload times of ambulance capabilities. The time it takes to transfer care of a patient to hospital staff, thereby freeing the transport for assignment.	Resource Availability System		OBX Segment: OBX-2 = SN OBX-3 = EMSOffloadMinutes^EMS Offload Minutes^TBD OBX-5= ^nn OBX-11 = 'F'		
HospitalBedCapacityStatus -Available Adult ICU Beds	Number of physically available and staffed Adult ICU beds. These beds can support critically ill or injured patients, including ventilator support. category includes all major subtypes of ICU beds, including neuro, cardiac, trauma, or medical, with the exception that this category does not include burn ICU beds.	Resource Availability System	Numeric	OBX Segment: OBX-2 = SN OBX-3 = AdultICUAvailableCount^Capacity status for adult ICU bed type^TBD OBX-5= ^nn OBX-11 = 'F'	SN	
HospitalBedCapacityStatus -Available Adult General Beds	Number of physically available and staffed Adult General beds. These are also thought of as ward beds. These beds may or may not include cardiac telemetry capability.	Resource Availability System	Numeric	OBX Segment: OBX-2 = SN OBX-3 = MedicalSurgicalAvailableCount^ Capacity status for medical-surgical beds^TBD OBX-5= ^nn OBX-11 = 'F'	SN	
HospitalBedCapacityStatus -Available Burn Beds	These are thought of as burn ICU beds, either approved by the American Burn Association or self-designated. These beds are NOT to be included in other ICU bed counts.	Resource Availability System	Numeric	OBX Segment: OBX-2 = SN OBX-3 = BurnAvailableCount^Capacity Status for Burn ICU Beds^TBD OBX-5= ^nn OBX-11 = 'F'	SN	
HospitalBedCapacityStatus -Available Peds ICU Beds	Capacity status for pediatric ICU beds. This is similar to adult ICU beds, but for patients 17-years-old and younger.	Resource Availability System	Numeric	OBX-2 = SN OBX-3 = PediatricICUAvailableCount^Capacity Status for Pediatric ICU Beds^TBD OBX-5= ^nn OBX-11 = 'F'	SN	

DYNAMIC RESOURCE AVAILABILITY REPORT ELEMENTS						
Data Element	Description	Source	Limit/Range / Vocabulary	HL7 Context	Data Type	Conditions for Use
HospitalBedCapacityStatus -Available Peds General Beds	Capacity status for pediatrics beds. These are ward medical/surgical beds for patients 17-years-old and younger.	Resource Availability System	Numeric	OBX-2 = SN OBX-3 = PediatricAvailableCount^Capacity Status for Pediatric Beds^TBD OBX-5= ^nn OBX-11 = 'F'	SN	
HospitalBedCapacityStatus -Available Negative Pressure Rooms	Capacity status for negative airflow isolation beds. These provide respiratory isolation. NOTE: This value may represent available beds included in the counts of other types.	Resource Availability System	Numeric	OBX-2 = SN OBX-3 = NegativeFlowIsolationAvailableCount^ Capacity Status for Pediatric Beds^TBD OBX-5= ^nn OBX-11 = 'F'	SN	
HospitalBedCapacityStatus -Available Ventilators	Number of available ventilators.	Resource Availability System	Numeric	OBX-2 = SN OBX-3 = VentilatorAvailableCount^ Capacity Status for Ventilators OBX-5= ^nn OBX-11 = 'F'	SN	
Report Date/Time	Date/time the data on this report is relevant.	Resource Availability System	Time stamp	OBR-7 Observation Date/time	TS	Required

4.2.6 TERMINOLOGY COMPONENTS: RULES FOR IMPLEMENTING

The terminology should reflect that specified in the message descriptions provided in the Minimum Data Set section.

4.2.7 TERMINOLOGY CONSTRAINTS

See terminology constraints provided in the column labeled 'Limit/Range / Vocabulary' in the tables presented in section 4.2.4.3.

4.2.8 ADDITIONAL SPECIFICATIONS

This document utilizes the Draft HAVE Messaging Methodology. No additional constraint is applied to this draft standard by this interoperability specification. The HAVE specification is being proposed as an Organization for the Advancement of Structure Information Standards (OASIS) standard, but has not yet been fully reviewed and adopted. HAVE was derived from the results of the HAVBed project sponsored by the Agency for Health Resources and Quality. While it is anticipated that the HAVE specification will soon be approved by Oasis, and is likely to meet the requirements for reporting the data elements for hospitals and health resource availability

identified by the BDSC, pending this formal approval the choice of a specific standard to represent these data elements remains a gap as defined in the HITSP policies.

As the OASIS HAVE draft may change as a result of the balloting process, the current version of the draft standard which has been selected by the HITSP Bio TC is provided as an appendix to this document in section 6.5. Once there is an approved standard specification available, this TC will review the standard to assure that it is still a suitable implementation solution. At that time, the appendix replication of this document will be removed.

5.0 CONSTRAINTS FOR REUSE

There are no constraints for reuse of this component.

6.0 APPENDIX

The EDXL HAVE draft standard is included as appendix material in section 6.5 of this document.

6.1 HITSP HARMONIZATION FRAMEWORK

There are several constructs that are being used to define the interoperability specification, with each level providing more granularity to the standards applicable for fulfillment of the Use Case. The table below describes the current framework within which the interoperability specification is being built, the relationships between each construct, and further illustrative examples.

	CONSTRUCT	DEFINITION	EXAMPLE	RULES
1	Use Case Harmonization Request	Defines business/functional requirements and specifies the relevant context	ONC Harmonized ONC Harmonized EHR Use Case	
2	Interoperability Specification	Models the business/functional requirements, identifies technical/system requirements to meet the specified use-case, and then identifies how to use one or more standards to meet the use-case	HITSP EHR Interoperability Specification	Based on UML diagram to identify actors and actions Sets context Testable functional requirements Identifies transaction(s) or packages of transactions
3	Transaction Package	Defines how two or more transactions are used to support a stand-alone information exchange within a defined context between two or more systems	Record Locator Service, Entity Identification Service	Thin context and functional requirements Testable Based on analysis of like actors, context and content harmonized across the transactions May be fulfilled by one or more complex standards Expresses constraints on how the transactions are used together
4	Transaction	Logical grouping of actions, including necessary content and context, that must all succeed or fail as a group.	Query lab result, Send lab result	Fulfills all actions between two systems that meet one or more functional requirements Testable

	CONSTRUCT	DEFINITION	EXAMPLE	RULES
				Expresses constraints on how the components and/or standards are used together
5	Component	An atomic construct used to support an information interchange or to meet an infrastructure requirement (e.g., security, logging/audit)	Lab result message, Lab result context	Typically will use one "primary" standard and may have other "secondary" standards May express constraints on how the standards are used
6	Base Standard	A standard capable of fulfilling a discrete function within a single category produced and maintained by a single standards organization.	Messaging standard, Security standard, Code set.	Per HITSP definition the term "standard" refers to (and is not limited to): –Specifications –Implementation Guides –Code Sets –Terminologies –Integration Profiles
7	Composite Standard	Grouping of coordinated base standards, often from multiple standards organizations, maintained by a single organization. In HITSP, it can serve as a component, transaction or transaction package functional requirements.	Integration profiles Implementation guides Health transaction services	Per HITSP Definition

6.2 GLOSSARY

The HITSP glossary that spans all the Interoperability Specifications can be found in the following folder on the HITSP site:
http://publicaa.ansi.org/sites/apdl/Documents/Forms/AllItems.aspx?RootFolder=http%3a%2f%2fpublicaa%2eansi%2eorg%2fsites%2fapdl%2fDocuments%2fStandards%20Activities%2fHealthcare%20Informatics%20Technology%20Standards%20Panel

6.3 Prototype DAILY FACILITY SUMMARY Report PROTOTYPE

```
MSH|^~\&|ADT|^2.16.840.1.114222.4.1.150^ISO|^2.16.840.1.114222.4
   .3.2.3^ISO|^2.16.840.1.114222^ISO|20060802000500||ORU^R01^ORU
   _R01|20060802000800036|P|2.5<CR>
OBR|1|||TBA^DAILY FACILITY SUMMARY
   REPORT^CodingSystemIDTBD|||20060802000500|||||||||||||20060
   802000500|||F<CR>
OBX|1|SN|AAAAA^Admissions last 24
   hours^CodingSystemIDTBD||^22||||||F<CR>
OBX|2|SN|NNNNN^Discharges last 24
   hours^CodingSystemIDTBD||^19||||||F<CR>
OBX|3|SN|DDDDD^Deaths last 24
   hours^CodingSystemIDTBD||^4||||||F<CR>
```

6.4 DYNAMIC RESOURCE AVAILABILITY Report PROTOTYPE

```
MSH|^~\&||^2.16.840.1.114222.4.1.150^ISO|^2.16.840.1.114222.4.3.
   2.3^ISO|^2.16.840.1.114222^ISO|20060802000500||ORU^R01^ORU_R0
   1|200608002000100036|P|2.5<CR>
OBR|1|||TBA^DYNAMIC RESOURCE AVAILABILITY
   REPORT^CodingSystemIDTBD|||20060802000500|||||||||||||20060
   802000500|||F<CR>
OBX|1|IS|OPEN^Hospital Open?^CodingSystemIDTBD||Y||||||F<CR>
NTE|1||COMMENTS ABOUT HOSPITAL OPEN OBSERVATION<CR>
NTE|2||Can have numerous lines of comments if needed<CR>
OBX|2|IS|INFRASTRUCTURE^Significant Infrastructure Problems?^
   CodingSystemIDTBD||Y||||||F<CR>
NTE|1||Comments about infrastructure<CR>
OBX|3|IS|SUPPLY^Significant Supply Problems?^CodingSystemIDTBD
   ||N||||||F<CR>
OBX|4|IS|STAFF^Significant Staffing
   Problems?^CodingSystemIDTBD||Y||||||F<CR>
OBX|5|IS|DECON^Decontam
   Capability?^CodingSystemIDTBD||Y|||||F<CR>
NTE|1||Comments about Decontamination Status<CR>
OBX|6|SN|EDNumeric^Emergency Dept
   Capability?^CodingSystemIDTBD||^14||||||F<CR>
OBX|7|CE|EDCoded^Emergency Dept
   Capability?^CodingSystemIDTBD||Y^Yellow^CodingSystemIDTBA
   ||||||F<CR>
OBX|8|SN|ADULTICU^Available Adult ICU
   Beds^CodingSystemIDTBD||^12||||||F<CR>
OBX|9|SN|ADULTGEN^Available Adult General
   Beds^CodingSystemIDTBD||^29||||||F<CR>
OBX|10|SN|BURN^Available Burn
   Beds^CodingSystemIDTBD||^4||||||F<CR>
OBX|11|SN|PEDSICU^Available Peds ICU
   Beds^CodingSystemIDTBD||^6||||||F<CR>
OBX|12|SN|PEDSGEN^Available Peds General Beds^
   CodingSystemIDTBD||^19||||||F<CR>
OBX|13|SN|NEGPRESS^Available Negative Pressure
   Rooms^CodingSystemIDTBD||^1||||||F<CR>
OBX|14|SN|VENTILATORS^Available
   Ventilators^CodingSystemIDTBD||^26||||||F<CR>
```

6.5 Draft HAVE Messaging Methodology

This section of the HITSP Component is extracted from the OASIS Emergency Data Exchange Language (EDXL) Hospital AVailability Exchange (HAVE) Draft from August 2006. Formatting and section modifications have been made to the extracted section headings to conform to the HITSP formats. The reader is referred to source materials described on this page for further clarification. This section is provided as an extract rather than by reference due to the interim status of this pending standard. Once this is an approved standard, this appendix material will be removed, and the reader will be referred directly to the standard for this information.

The EDXL/HAVE standard was written and published in 8/13/06 by the OASIS. The EDXL/HAVE composite standard is reproduced in this specification with specific written permission from EDXL/HAVE.

The document is included here to highlight the HITSP approaches to implementation, and to depict how EDXL/HAVE should work between the relevant actors and actions. The descriptions for each scenario were taken in their entirety from the publication, and therefore the same terms are used throughout this specification. These terms have the same meaning for purposes of this discussion. Any comments on the EDXL/HAVE specification may be submitted to OASIS, through the OASIS Web site. The text for the EDXL/HAVE specification begins here:

Emergency Data Exchange Language (EDXL)
Hospital AVailability Exchange (HAVE)

Draft, 13 August 2006

Artifact Identifier:

Location:

Current: docs.oasis-open.org/[tc-short-name] / [spec-id or profile-id] /latest
This Version: docs.oasis-open.org/[tc-short-name] / [spec-id or profile-id] /[version-id]
Previous Version: docs.oasis-open.org/[tc-short-name] / [spec-id or profile-id] /[version-id]

Artifact Type:

DRAFT

Technical Committee:

OASIS Emergency Management TC

Chair(s):

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Subject/Keywords

Hospital bed capacity, hospital status, emergency department report, hospital service coverage status, facility status, medical organization status, healthcare organization status, medical organization bed capacity, availability, hospital resources, healthcare organization resources.

Related work:

This specification is related to:

- EDXL-DE v1.0 - http://www.oasis-open.org/committees/emergency
  The EDXL Distribution Element (DE) specification describes a standard message distribution framework for data sharing among emergency information systems using the XML-based Emergency Data Exchange Language (EDXL). This format may be used over any data transmission system, including but not limited to the SOAP HTTP binding.

Abstract:

This Hospital AVailability Exchange (HAVE) describes a standard message for data sharing among emergency information systems using the XML-based Emergency Data Exchange Language (EDXL). This format may be used over any data transmission system, including but not limited to the SOAP HTTP binding.

Status:

This document is a draft for discussion and is not approved as a committee draft.

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6.5.1 Introduction

570

6.5.1.1 Overview

6.5.1.1.1 Purpose

575 HAVE is a draft XML specification that allows the communication of the status of a hospital, its services, and its resources. These include bed capacity and availability, emergency department status, available service coverage, and the status of a hospital's facility and operations.

580 6.5.1.1.2 History

In a disaster or emergency situation, there is a need for hospitals to be able to communicate with each other, and with other members of the emergency response community. The ability to exchange data in regard to hospitals' bed availability, status, services, and capacity
585 enables both hospitals and other emergency agencies to respond to emergencies and disaster situations with greater efficiency and speed. In particular, it will allow emergency dispatchers and managers to make sound logistics decisions - where to route victims, which hospitals have the ability to provide the needed service. Many hospitals have expressed the need for, and indeed are currently using, commercial or self-developed information
590 technology that allows them to publish this information to other hospitals in a region, as well as EOCs, 9-1-1 centers, and EMS responders via a Web-based tool.

Systems that are available today do not record or present data in a standardized format, creating a serious barrier to data sharing between hospitals and emergency response
595 groups. Without data standards, parties of various kids are unable to view data from hospitals in a state or region that use a different system – unless a specialized interface is developed. Alternatively, such officials must get special passwords and toggle between web pages to get a full picture. Other local emergency responders are unable to get the data imported into the emergency IT tools they use (e.g. a 9-1-1 computer-aided dispatch system
600 or an EOC consequence information management system). They too must get a pass word

and go to the appropriate web page. This is very inefficient. A uniform data standard will allow different applications and systems to communicate seamlessly.

6.5.1.1.3 Structure

The EDXL HAVE comprises of the following elements:

<HospitalStatus>

This is the overall top level container element for all the <Hospital> elements that may be present.

<Hospital>

This is the top level container element for each reporting organization. Each <Hospital> element has the following set of sub-elements.

<OrganizationInformation>

The <OrganizationInformation> element provides basic information about the name and location of the organization about which the status and availability is being reported.

<EmergencyDepartmentStatus>

The <EmergencyDepartmentStatus> element provides information on the ability of the emergency department of the organization to treat patients.

<HospitalBedCapacityStatus>

The <HospitalBedCapacityStatus> element provides information on the status and availability of the bed capacity of the organization. The bed capacity information for specific bed types can be reported.

<ServiceCoverageStatus>

The <ServiceCoverageStatus> element provides information on the availability of specialty service coverage. This includes both the necessary staff and facilities. Some of the services capabilities are broken down into subtypes. This is to allow organizations to designate subtypes, if available. Others can report just the higher level specialties.

<HospitalFacilityStatus>

The <HospitalFacilityStatus> element provides information on the status of the facility. This includes information on the EOC and the capacity of the facility.

<HospitalResourcesStatus>

The <HospitalResourcesStatus> element provides information on the status of operations and resources of the organization.

<LastUpdateTime>

The <LastUpdateTime> element provides information on the time that the information was last updated.

6.5.1.2 Terminology

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in [RFC2119].

AHA	American Hospital Association
EDXL	Emergency Data Exchange Language
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EMS	Emergency Medical Services
GJXDM	Global Justice XML Data Model
HAvBED	Hospital Bed Availability (HAvBED) Project
ICU	Intensive Care Unit
NIEM	National Information Exchange Model
OBGYN	Obstetrics and Gynecology

6.5.1.3 Normative References

[RFC2119] S. Bradner, Key words for use in RFCs to Indicate Requirement Levels, *http://www.ietf.org/rfc/rfc2119.txt*, IETF RFC 2119, March 1997.

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T. Bray, *Extensible Markup Language (XML) 1.0 (Third Edition)*, http://www.w3.org/TR/REC-xml/, W3C REC-XML-20040204, February 2004.

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Open Geospatial Consortium, OpenGIS® Geography Markup Language (GML) Encoding Specification (GML) Version 3.1.1, http://portal.opengeospatial.org/files/index.php?artifact_id=4700, 2004

[ISO DIS 19111]

Open Geospatial Consortium, Topic 2 - Spatial Referencing by Coordinates (Topic 2) (CRS Abstract Specification), https://portal.opengeospatial.org/files/?artifact_id=6716, Version 3, 2004.

6.5.1.4 Non-Normative References

EDXL HAVE Standard Requirements Specification

EDXL HAVE Standard Requirements Specification, http://www.oasis-open.org/apps/org/workgroup/emergency/document.php?document_id=16399, January 2006.

EDXL HAVE Requirements Supplement

EDXL HAVE Requirements Supplement, http://www.oasis-open.org/apps/org/workgroup/emergency/document.php?document_id=16400, January 2006.

Hospital Bed Availability Project

*National Hospital Available Beds for Emergencies and Disasters (HAvBED) System***.** Final report and appendixes. AHRQ Publication No. 05-0103, December 2005. Agency for Healthcare Research and Quality, Rockville, MD. http://www.ahrq.gov/research/havbed/

Hospital Bed Availability (HAvBED) Project – Definitions and Data Elements

Agency for Healthcare Research and Quality (AHRQ), http://www.ahrq.gov/research/havbed/definitions.htm

Statewide Hospital Status Information System Terminology and Data Collection Elements

Virginia Hospital & Healthcare Association (VHHA), http://www.oasis-open.org/apps/org/workgroup/emergency/download.php/18019/State%20IT%20terms%201-31-05.doc

Global Justice XML Data Model (GJXDM) Data Dictionary

Global, Office of Justice Programs, http://it.ojp.gov/topic.jsp?topic_id=43

EDXL Distribution Element (DE) Standard

EDXL Distribution Element (DE) Standard v1.0, http://www.oasis-open.org/apps/org/workgroup/emergency/download.php/17962/EDXL-DE_Spec_v1.0%2814%29.pdf, March 2006

EDXL Resource Messaging (RM) DRAFT

EDXL Resource Messaging (RM) Draft Requirements Specification, http://www.oasis-open.org/apps/org/workgroup/emergency/download.php/14310/EDXL_ResourceDraft_OASIS082005.doc

AHIC

American Health Information Community (AHIC), BioSurvellience Data Working Group, BioSurvellience Data Elements

6.5.2 Design Principles and Concepts

6.5.2.1 DESIGN PHILOSOPHY

The principles that guided the design of the HAVE include:

- Interoperability - The HAVE message should provide an interoperable mechanism to exchange healthcare organization information among different domains and among multiple systems
- Multi-Use Format – The HAVE message must be designed such that it can be used in everyday events, during mass disasters, and for incident preparedness.
- Flexibility – The design structure must be flexible such that it could be used by a broad range of applications and systems to report status and availability information

6.5.2.2 REQUIREMENTS FOR DESIGN

The Hospital AVailability Specification SHOULD:

The EDXL HAVE standard MUST:

1. Allow medical and healthcare organizations to communicate their status and availability information.
2. Be designed to allow its use by a wide variety of medical and healthcare organizations (including hospitals and nursing homes), along with other emergency response organizations (such as emergency management centers, public safety answering points, and dispatch centers).
3. Be able to be used as a payload or content element with the EDXL Distribution Element.
4. Allow the communication of status information of one or more organizations in a single exchange.
5. Allow the communication of the organization's status and availability information with regard to its facilities, operations, services, and resources.
6. Be designed to allow its use in normal operations, day-to-day emergencies and mass disasters.

6.5.2.3 EXAMPLE USAGE SCENARIOS

Use of HAVE during a mass disaster

A major disaster has occurred in a heavily populated city. A number of casualties are reported, and the Incident Commander (IC) needs to obtain a common operational picture on the status of the hospitals in the region, including the resources they can offer. The IC sends a message to the regional hospitals for an update on their status and bed availability information.

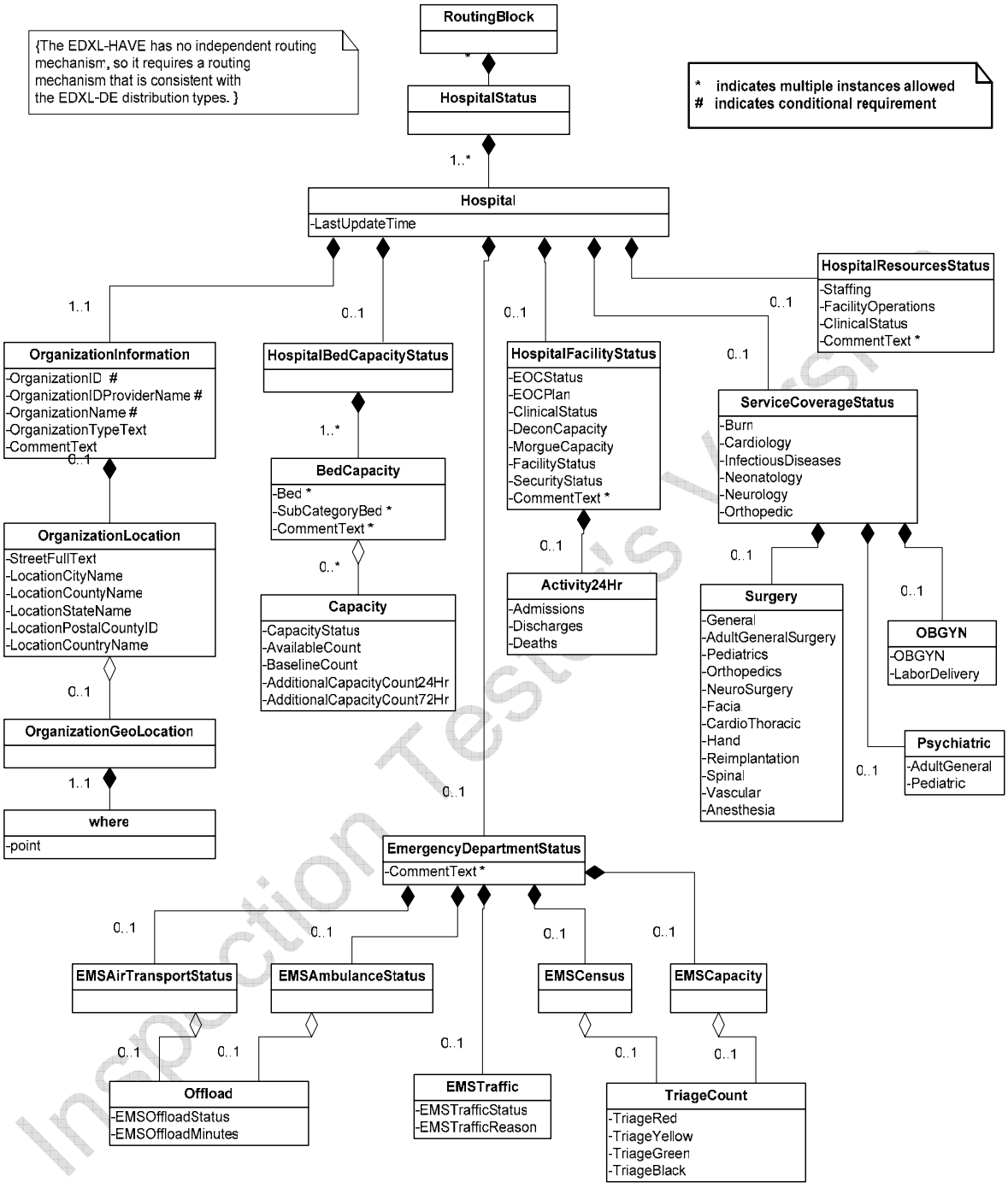
Hospitals receive this request, and use their respective systems to send HAVE messages. These messages contain the status of each hospital's emergency department, bed availability information, and the hospital's operations and facilities. These are accepted into the IC's Consequence Incident Management System (CIMS) tool, and similar tools used by other emergency response agencies (e.g. Computer-Aided Dispatch systems used in public safety answering points).

Use of HAVE during an everyday emergency

A car crash has occurred in a rural area resulting in two badly burned victims, according to on-scene public safety personnel. Before the EMS staff reaches the scene, EMS dispatch sends a request to nearby hospitals for a status of available burn services and burn beds.
A few hospitals respond to the request, and use the service coverage element in the HAVE message to specify the burn coverage available at their facilities. They in turn are able to assemble their burn teams in order to ensure that there is no delay in treatment. Based on the acquired information, the victims are taken to the nearest hospital with the required services.

6.5.3 EDXL HOSPITAL AVAILABILITY EXCHANGE (HAVE) ELEMENT STRUCTURE (normative)

6.5.3.1 DOCUMENT OBJECT MODEL



825

6.5.3.2 DATA DICTIONARY

Element	**HospitalStatus**
Type	XML Structure
Usage	**REQUIRED**, MUST be used once and only once, top level container.
Definition	The top level container element for reporting status of any number of hospitals.
Comments	1. The EDXL-HAVE has no independent routing mechanism, so it requires a routing mechanism that is consistent with the EDXL-DE distribution types. 2. It must contain one or more <Hospital> elements.
Sub-elements	• Hospital
Used In	top level element

Element	**Hospital**
Type	XML Structure
Usage	**REQUIRED**, May Use Multiple; Must be used for each reporting hospital status.
Definition	The container element for reporting status of a hospital.
Comments	1. Multiple Instances of the <Hospital> element MAY occur within the <HospitalStatus> container element.
Sub-elements	• **OrganizationInformation** • EmergencyDepartmentStatus • HospitalBedCapacityStatus • ServiceCoverageStatus • HospitalFacilityStatus • HospitalResourcesStatus • LastUpdateTime
Used In	top level element

6.5.3.2.1 Organization Information

Element	**OrganizationInformation**

Type	XML Structure
Usage	**REQUIRED**, MUST be used once and only once, top level container
Definition	The container element for organization information elements.
Comments	1. The generic element Organization refers to the entity that is providing the data. 2. This generic name is used throughout this document. 3. Typically, this will include hospitals, nursing care centers, trauma centers etc.
Sub-elements	• OrganizationID • OrganizationIDProviderName • OrganizationName • OrganizationTypeText • OrganizationLocation • CommentText
Used In	top level element

Element	OrganizationID
Type	xsd:string
Usage	**CONDITIONAL**
Definition	An identifier of an organization based on the type of organization it is, e.g., for a school, this would be a school identifier, for a lien holder, this would be a lien holder identifier, for a court, this would be a court identifier. Definition Source: GJXDM.
Comments	1. Either the <OrganizationName> or the <OrganizationID> MUST be present. 2. For the purposes of this document, the OrganizationID is used to specify the identifier for the healthcare organization. 3. This is a unique identifier for the hospital.
Used In	**OrganizationInformation**
Element	OrganizationIDProviderName

Type	xsd:string
Usage	**CONDITIONAL**
Definition	The name of the provider that has provided the identification scheme. This could also be the name a particular identification list.
Comments	1. There are different identification schemes that provide unique identifiers to healthcare organizations. This element can be used to provide a reference to the classification/identification scheme that is being used. 2. If <OrganizationID> is used, <OrganizationIDProviderName> must be used. Example: American Hospital Association
Used In	**OrganizationInformation**

Element	OrganizationName
Type	xsd:string
Usage	**CONDITIONAL**
Definition	The name of the organization. Definition Source: GJXDM
Comments	1. Either the <OrganizationName> or the <OrganizationID> MUST be present. 2. If multiple branches of a hospital are present, the <OrganizationName> may include the location information as well. Example: ABC hospital at Fairfax and ABC hospital at Alexandria
Used In	**OrganizationInformation**

Element	OrganizationTypeText
Type	xsd:string
Usage	**OPTIONAL**
Definition	The general functional type of the organization. Definition Source: GJXDM
Comments	Example: Hospital, Nursing Center etc.
Used In	**OrganizationInformation**

835

Element	OrganizationLocation
Type	XML Structure
Usage	**OPTIONAL**
Definition	The container element for the specifying the location of the organization.
Comments	1. The location consists of the address and the geographic location (which is specified as a point). 2. The geographic coordinates specified in <Point> must match the address.
Sub-elements	• StreetFullText • LocationCityName • LocationCountyName • LocationStateName • LocationPostalCodeID • LocationCountryName • OrganizationGeoLocation
Used In	top level element

Element	StreetFullText
Type	xsd:string
Usage	**OPTIONAL**
Definition	A complete street reference, e.g., "123 Main Street NW". Definition Source: GJXDM
Comments	
Used In	OrganizationInformation/OrganizationLocation

Element	LocationCityName
Type	xsd:string

Usage	**OPTIONAL**
Definition	A name of a city or town. Definition Source: GJXDM
Comments	
Used In	OrganizationInformation/OrganizationLocation

Element	LocationCountyName
Type	xsd:string
Usage	**OPTIONAL**
Definition	A name of a county or parish Definition Source: GJXDM
Comments	
Used In	OrganizationInformation/OrganizationLocation

Element	LocationStateName
Type	xsd:string
Usage	**OPTIONAL**
Definition	A name of a state, commonwealth, province, or other subregion of a country Definition Source: GJXDM
Comments	
Used In	OrganizationInformation/OrganizationLocation

840

Element	LocationPostalCodeID
Type	xsd:integer
Usage	**OPTIONAL**
Definition	A zip code or postal code Definition Source: GJXDM
Comments	

Used In	OrganizationInformation/OrganizationLocation

Element	LocationCountryName
Type	xsd:integer
Usage	**OPTIONAL**
Definition	A name of a country Definition Source: GJXDM
Comments	
Used In	OrganizationInformation/OrganizationLocation

Element	OrganizationGeoLocation
Type	XML Structure
Usage	**OPTIONAL**
Definition	The container element for specifying the geo-coded address.
Comments	1. This specification uses the OASIS GML profile for specifying the geo-location and its attributes and MUST match the civil address. 2. It contains the geo-oasis:where element Note: See Appendix C
Sub-elements	• point
Used In	OrganizationInformation/OrganizationLocation

Element	Where
Type	XML Structure
Usage	**OPTIONAL**
Definition	Root property element of a geo-oasis GML instance
Comments	See Appendix C for note on OASIS GML profile.

Sub-elements/Attributes	• point • whereAttrGroup
Used In	OrganizationInformation/OrganizationLocation/OrganizationGeoLocation

Element	Point
Type	geo-oasis: SimplePositionType
Usage	**OPTIONAL**
Definition	Point property element containing a pair of coordinates representing latitude then longitude in the World Geodetic System 1984 [WGS84] coordinate reference system.
Comments	1. The geo-coded address of the civil location. 2. <OrganizationGeoLocation> <geo-oasis: where> <geo-oasis: point>45.256 -71.92></geo-oasis: point> </geo-oasis: where> </OrganziationGeoLocation> See Appendix C for note on OASIS GML profile.
Used In	OrganizationInformation/OrganizationLocation/OrganizationGeoLocation

845

6.5.3.2.2 Emergency Department Status

Element	**EmergencyDepartmentStatus**
Type	XML Structure
Usage	**REQUIRED**, MUST be used once and only once, top level container
Definition	The container of all of the elements related to the emergency department status.
Comments	It describes the ability of this emergency department to treat patients.

Sub-elements	• EMSTraffic • EMSCapacity • EMSCensus • EMSAmbulanceStatus • EMSAirTransportStatus • CommentText
Used In	top level element

850

Element	EMSTraffic
Type	XML Structure
Usage	**REQUIRED**, MUST be used once and only once, top level container
Definition	The container of all of the elements related to the status of operations of EMS traffic. It defines the ability of this emergency department to receive patients via emergency medical services.
Comments	
Sub-elements	• EMSTrafficStatus • EMSTrafficReason • CommentText
Used In	**EmergencyDepartmentStatus**

Element	EMSTrafficStatus
Type	xsd:string with restrictions
Usage	**OPTIONAL**
Definition	Identifies the status of EMS traffic operations.
Comments	Value must be one of: 1. Normal - Accepting all EMS traffic 2. Advisory - Experiencing specific resource limitations which may affect transport of some EMS traffic. 3. Closed - Requesting re-route of EMS traffic to other facilities. 4. NotApplicable - Not Applicable. This hospital does not have an

	emergency department.
Used In	EmergencyDepartmentStatus/EMSTraffic

Element	EMSTrafficReason
Type	xsd:string with restrictions
Usage	**OPTIONAL**
Definition	It is used to report the contributing factor to an EMSTraffic Status.
Comments	
Used In	EmergencyDepartmentStatus/EMSTraffic

855

Element	EMSCapacity
Type	XML Structure
Usage	**OPTIONAL**
Definition	The number of each triage patient type the hospital can accept.
Comments	
Sub-elements	• TriageCount
Used In	EmergencyDepartmentStatus

Element	EMSCensus
Type	XML Structure
Usage	**OPTIONAL**
Definition	The number of each triage patient type the overall hospital currently has.
Comments	
Sub-elements	• TriageCount
Used In	**EmergencyDepartmentStatus**

Element	TriageCount
Type	XML Structure
Usage	**OPTIONAL**
Definition	The number of each triage patient type the overall hospital currently has.
Comments	
Sub-elements	• TriageRed • TriageYellow • TriageGreen • TriageBlack
Used In	**EmergencyDepartmentStatus**

Element	TriageRed
Type	xsd:integer
Usage	**OPTIONAL**
Definition	Number of victims with immediate needs.
Comments	
Used In	EmergencyDepartmentStatus/EMSCapacity EmergencyDepartmentStatus/EMSCensus

860

Element	TriageYellow
Type	xsd:integer
Usage	**OPTIONAL**
Definition	Number of victims with delayed needs
Comments	
Used In	EmergencyDepartmentStatus/EMSCapacity EmergencyDepartmentStatus/EMSCensus

Element	TriageGreen

Type	xsd:integer
Usage	**OPTIONAL**
Definition	Number of victims with minor needs
Comments	
Used In	EmergencyDepartmentStatus/EMSCapacity EmergencyDepartmentStatus/EMSCensus

Element	TriageBlack
Type	xsd:integer
Usage	**OPTIONAL**
Definition	Number of deceased victims
Used In	EmergencyDepartmentStatus/EMSCapacity EmergencyDepartmentStatus/EMSCensus

Element	EMSAmbulanceStatus
Type	XML Structure
Usage	**OPTIONAL**
Definition	The container element to indicate the status and offload time for ambulance capabilities.
Comments	1. The time it takes to transfer care of a patient to hospital staff, thereby freeing the ambulance for assignment. 2. Select from Normal or Delayed and/or specify the average offload average offload time in minutes.
Sub-elements	• Offload • CommentText
Used In	EmergencyDepartmentStatus

Element	EMSAirTransportStatus
Type	XML Structure

Usage	**OPTIONAL**
Definition	The container element to indicate the status and offload time for ambulance capabilities.
Comments	1. The time it takes to transfer care of a patient to hospital staff, thereby freeing the ambulance for assignment. 2. Select from Normal or Delayed and/or specify the average offload average offload time in minutes.
Sub-elements	• Offload • CommentText
Used In	EmergencyDepartmentStatus

865

Element	Offload
Type	XML Structure
Usage	**OPTIONAL**
Definition	Indicator of offload times of ambulance capabilities. The time it takes to transfer care of a patient to hospital staff, thereby freeing the transport for assignment.
Sub-elements	• EMSOffloadStatus • EMSOffloadMinutes
Used In	EmergencyDepartmentStatus/EMSAmbulanceStatus EmergencyDepartmentStatus/EMSAirTransportStatus

Element	EMSOffloadStatus
Type	xsd: string with restrictions
Usage	**OPTIONAL**
Definition	Indicator of offload times of ambulance capabilities.
Comments	1. Values: • Normal – The time required to offload the patient is typical • Delayed – The time required to offload the patient is longer than

	typical.
Used In	EmergencyDepartmentStatus/EMSAmbulanceStatus EmergencyDepartmentStatus/EMSAirTransportStatus

Element	EMSOffloadMinutes
Type	xsd: integer with restrictions
Usage	**OPTIONAL**
Definition	Average offload time in minutes.
Comments	1. Value MUST be between 00-60.
Used In	EmergencyDepartmentStatus/EMSAmbulanceStatus EmergencyDepartmentStatus/EMSAirTransportStatus

870

6.5.3.2.3 HospitalBedCapacityStatus

Element	**HospitalBedCapacityStatus**
Type	XML Structure
Usage	**REQUIRED**, MUST be used once and only once, top level container
Definition	The container of all of the elements related to the hospital bed capacity and status.
Comments	1. For each of the bed types (AdultICU, MedicalSurgical, etc.), if needed, a collection of named sub-types can be provided. 2. The totals of sub-categories SHOULD equal the capacity data specified in the parent. Example, a hospital may sub-categorize Adult ICU beds into Surgery, Cardiac, General and Neuro.
Sub-elements	• BedCapacity
Used In	top level element

Element	**BedCapacity**
Type	XML Structure
Usage	**REQUIRED;** May use multiple
Definition	Container element to identify the number of available beds.
Comments	1. Each Bed Type and the sub-categories under it must be encapsulated by a <BedCapacity> element. 2. Multiple instances of <BedCapacity> elements are allowed.
Sub-elements	• Bed • SubCategoryBed • CommentText • Capacity
Used In	**HospitalBedCapacity**

875

Element	Bed
Type	xsd: string with restrictions
Usage	**OPTIONAL,** May use multiple
Definition	Enumerated list of available Bed Types.
Comments	1. Values: a. AdultICU - Capacity status for adult ICU bed type. i. These can support critically ill or injured patients, including ventilator support. ii. This category includes all major subtypes of ICU beds, including neuro, cardiac, trauma, or medical, with the exception that this category does not include burn ICU beds. b. MedicalSurgical - Capacity status for medical-surgical beds. i. These are also thought of as ward beds. ii. These beds may or may not include cardiac telemetry capability c. Burn - Capacity status for burn beds. i. These are thought of as burn ICU beds, either approved by the American Burn Association or self-designated. ii. These beds are NOT to be included in other ICU bed counts.

	d. PediatricICU i. Capacity status for pediatric ICU beds. This is similar to adult ICU beds, but for patients 17-years-old and younger. e. Pediatrics i. Capacity status for pediatrics beds. These are ward medical/surgical beds for patients 17-years-old and younger. f. Psychiatric i. Capacity status for psychiatric beds. These are ward beds on a closed/locked psychiatric unit or ward beds where a patient will be attended by a sitter. g. NegativeFlowIsolation i. Capacity status for negative airflow isolation beds. These provide respiratory isolation. NOTE: This value may represent available beds included in the counts of other types. h. OtherIsolation i. Capacity status for other isolation beds. These provide isolation where airflow is not a concern. NOTE: This value may represent available beds included in the counts of other types. i. OpeatingRooms i. Capacity status for operating rooms which are equipped staffed and could be made available for patient care in a short period of time. 2. Each bed type (AdultICU, MedicalSurgical, etc.) may optionally contain a collection of named sub-categories. 3. The totals of sub-categories should equal the capacity data specified in the parent. Example, a hospital may sub-categorize Adult ICU beds into Surgery, Cardiac, General and Neuro.
Used In	HospitalBedCapacity/BedCapacity

Element	SubCategoryBed
Type	xsd: string
Usage	**OPTIONAL,** May use multiple
Definition	The name of the sub-category bed type
Comments	1. Each bed type may have many one or more named sub-type categories. 2. The totals of each should add up to amounts specified in the parent bed capacity.
Used In	HospitalBedCapacity/BedCapacity

Element	Capacity
Type	xsd: string
Usage	**OPTIONAL,** May use multiple
Definition	Container element to define the capacity information of each specified bed type or sub category bed type.
Comments	
Sub-elements	• CapacityStatus • AvailableCount • BaselineCount • AdditionalCapacityCount24Hr • AdditionalCapacityCount72Hr
Used In	• HospitalBedCapacity/BedCapacity

Element	CapacityStatus
Type	xsd: string with restrictions
Usage	**OPTIONAL**
Definition	Indicator of status of bed type or sub-category bed type.
Comments	Values: 1. VacantAvailable – The type of bed is available. 2. NotAvailable – The type of bed is not available.
Used In	HospitalBedCapacity/BedCapacity/Capacity HospitalBedCapacity/BedCapacity/SubCategoryBedCapacity/Capacity

Element	AvailableCount
Type	xsd: integer
Usage	**OPTIONAL**
Definition	The number of vacant/available beds to which patients can be immediately transported.
Comments	1. These must include supporting space, equipment, medical material, ancillary and support services, and staff to operate under normal

	circumstances. 2. These beds are licensed, physically available and have staff on hand to attend to the patient who occupies the bed.
Used In	HospitalBedCapacity/BedCapacity/Capacity HospitalBedCapacity/BedCapacity/SubCategoryBedCapacity/Capacity

880

Element	BaselineCount
Type	xsd: integer
Usage	**OPTIONAL**
Definition	The maximum (baseline) number of beds in this category
Comments	
Used In	HospitalBedCapacity/BedCapacity/Capacity HospitalBedCapacity/BedCapacity/SubCategoryBedCapacity/Capacity

Element	AdditionalCapacityCount24Hr
Type	xsd: integer
Usage	**OPTIONAL**
Definition	Estimate of the beds, above the current number, that could be made vacant/available within 24 hours.
Comments	1. This includes institutional surge beds as well as beds made available by discharging or transferring patients.
Used In	HospitalBedCapacity/BedCapacity/Capacity HospitalBedCapacity/BedCapacity/SubCategoryBedCapacity/Capacity

Element	AdditionalCapacityCount72Hr
Type	xsd: integer
Usage	**OPTIONAL**
Definition	Estimate of the beds, above the current number, that could be made vacant/available within 72 hours.

Comments	1. This includes institutional surge beds as well as beds made available by discharging or transferring patients.
Used In	HospitalBedCapacity/BedCapacity/Capacity HospitalBedCapacity/BedCapacity/SubCategoryBedCapacity/Capacity

6.5.3.2.4 Service Coverage Status

885

Element	ServiceCoverageStatus
Type	XML Structure
Usage	**OPTIONAL**
Definition	The container element of all the elements of service coverage. This includes both the necessary staff and facilities. Indicator of the availability of specialty service coverage.
Comments	1. Some of the services capabilities are broken down into subtypes. This is to allow organizations to designate subtypes, if available. 2. If not, only the higher level specialties are reported.
Sub-elements	• Burn • Cardiology • InfectiousDiseases • Orthopedic • Neonatology • Neurology • OBGYN • Psychiatric • Surgery • CommentText
Used In	Top level element

Element	Burn
Type	AvailabilityStatus
Usage	**OPTIONAL**

Definition	The availability of burn center services.
Comments	1. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	**ServiceCoverageStatus**

Element	Cardiology
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	The availability of cardiology services.
Comments	1. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	**ServiceCoverageStatus**

Element	InfectiousDiseases
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	The availability of infectious diseases services.
Comments	1. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	**ServiceCoverageStatus**

Element	Neonatology
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	The availability of neonatology services.

Comments	1. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	**ServiceCoverageStatus**

890

Element	Neurology
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	The availability of neurology services. Values: • Available - This type of services is available. • NotAvailable - This type of services is not available.
Comments	
Used In	**ServiceCoverageStatus**

Element	Orthopedic
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	The availability of orthopedic services.
Comments	1. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	**ServiceCoverageStatus**

Element	OBGYN
Type	AvailabilityStatus; SUPERTYPE
Usage	**OPTIONAL**
Definition	The availability of OBGYN services.

Comments	1. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available. 2. This services capability is broken down into the below subtypes. This is to allow organizations to designate subtypes, if available. 3. Others can report just the higher level specialties.
Sub-elements	• OBGYN • LaborDelivery
Used In	**ServiceCoverageStatus**

Element	OBGYN
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	The Sub-type element of the OBGYN services.
Comments	1. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	**ServiceCoverageStatus/OBGYN**

Element	LaborDelivery
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	Sub-type element of the OBGYN Services. Availability of Labor Delivery services.
Comments	1. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	**ServiceCoverageStatus/OBGYN**

895

Element	Psychiatric

Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	The availability of psychiatric services.
Comments	1. This services capability is broken down into the below subtypes. This is to allow organizations to designate subtypes, if available. 2. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available. 3. Others can report just the higher level specialties.
Sub-elements	• AdultGeneral • Pediatric
Used In	**ServiceCoverageStatus**

Element	AdultGeneral
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	Availability of Adult General Psychiatric services.
Comments	1. Sub-type element of the psychiatric services. 2. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	**ServiceCoverageStatus/Psychiatric**

Element	Pediatric
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	Availability of Pediatric Psychiatric services.
Comments	1. Sub-type element of the psychiatric services. 2. Values:

	a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	**ServiceCoverageStatus/Psychiatric**

Element	Surgery
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	The availability of general surgery services.
Comments	1. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available. 2. This services capability is broken down into the below subtypes. This is to allow organizations to designate subtypes, if available. 3. Others can report just the higher level specialty.
Sub-elements	• General • AdultGeneralSurgery • Pediatrics • Orthopedics • NeuroSurgery • Facial • CardioThoracic • Hand • Reimplantation • Spinal • Vascular • Anesthesia
Used In	**ServiceCoverageStatus**

900

Element	General
Type	AvailabilityStatus
Usage	**OPTIONAL**

Definition	The availability of general surgical services.
Comments	1. Sub-type element of the adult general services. 2. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	ServiceCoverageStatus/Surgery

Element	AdultGeneralSurgery
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	The availability of adult general services.
Comments	3. Sub-type element of the adult general services. 4. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	ServiceCoverageStatus/Surgery

Element	Pediatrics
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	The availability of Pediatrics general surgical services.
Comments	1. Sub-type element of pediatrics general surgical services. 2. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	ServiceCoverageStatus/Surgery

Element	Orthopedics
Type	AvailabilityStatus

Usage	**OPTIONAL**
Definition	The availability of Orthopedic surgical services.
Comments	1. Sub-type element of orthopedic surgical services. 2. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	ServiceCoverageStatus/Surgery

905

Element	NeuroSurgery
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	The availability of Neurosurgery services.
Comments	1. Sub-type element of neurosurgery services. 2. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	ServiceCoverageStatus/Surgery

Element	Facial
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	The availability of facial surgical services.
Comments	1. Sub-type element of facial surgery services. 2. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	ServiceCoverageStatus/Surgery

Element	CardioThoracic

Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	The availability of cardiothoracic surgical services.
Comments	1. Sub-type element of cardiothoracic services. 2. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	ServiceCoverageStatus/Surgery

Element	Hand
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	The availability of hand surgery services.
Comments	1. Sub-type element of hand surgery services. 2. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	**ServiceCoverageStatus/Surgery**

Element	Reimplantation
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	The availability of reimplantation surgical services.
Comments	1. Sub-type element of reimplantation surgical services. 2. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	ServiceCoverageStatus/Surgery

910

Element	Spinal
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	The availability of spinal surgical services.
Comments	1. Sub-type element of spinal surgical services. 2. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	ServiceCoverageStatus/Surgery

Element	Vascular
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	The availability of vascular surgical services.
Comments	1. Sub-type element of vascular surgery services. 2. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	ServiceCoverageStatus/Surgery

Element	Anesthesia
Type	AvailabilityStatus
Usage	**OPTIONAL**
Definition	The availability of anesthesia services.
Comments	1. Sub-type element of anesthesia services. 2. Values: a. Available - This type of services is available. b. NotAvailable - This type of services is not available.
Used In	ServiceCoverageStatus/Surgery

915 6.5.3.3 Hospital Facility Status

Element	**HospitalFacilityStatus**
Type	XML Structure
Usage	**REQUIRED**, MUST be used once and only once, top level container
Definition	The container of all of the elements related to the status of the facility.
Comments	
Sub-elements	• EOCStatus • EOCPlan • ClinicalStatus • DeconCapacity • MorgueCapacity • FacilityStatus • SecurityStatus • Activity24Hr • CommentText
Used In	top level element

Element	EOCStatus
Type	xsd: string with restrictions
Usage	**OPTIONAL**
Definition	Whether the Emergency Operations Center (EOC) is currently operating.
Comments	1. Values: a. Active. b. Inactive Note: Note the EOC is typically activated in disasters or other special situations, and this term is NOT intended to indicate whether the clinical emergency department is open for patient care.
Used In	**HospitalFacilityStatus**

Element	EOCPlan
Type	xsd: string with restrictions
Usage	**OPTIONAL**
Definition	Whether the hospital has activated its Emergency Operations Plan (EOP)
Comments	1. Values: a. Active b. Inactive
Used In	**HospitalFacilityStatus**

Element	ClinicalStatus
Type	xsd: string with restrictions
Usage	**OPTIONAL**
Definition	The clinical status of the facility.
Comments	1. Values: a. Normal - Hospital clinical resources are operating within normal conditions. b. Level1 - Hospital clinical resources are operating at Level-1 surge conditions. c. Level2 - Hospital clinical resources are operating at Level-2 surge conditions. d. Full - Hospital clinical resources are exceeded and acceptable care cannot be provided to additional patients. Diversion or community surge response is required.
Used In	**HospitalFacilityStatus**

920

Element	DeconCapacity
Type	xsd: string with restrictions
Usage	**OPTIONAL**
Definition	The capacity for chemical/biological/radiological patient decontamination.
Comments	1. Values:

	a. Inactive - Not being used, but available if needed b. Open - In use and able to accept additional patients c. Full - In use at maximum capacity d. Exceeded - Needs exceed available capacity
Used In	**HospitalFacilityStatus**

Element	MorgueCapacity
Type	xsd: string with restrictions
Usage	**OPTIONAL**
Definition	The status of the morgue capacity.
Comments	1. Values: a. Open - Space is available b. Full - All normal space is in use c. Exceeded - Storage needs exceed available space
Used In	**HospitalFacilityStatus**

Element	FacilityStatus
Type	xsd: string with restrictions
Usage	**OPTIONAL**
Definition	The status of the facility.
Comments	1. Values: a. Normal - No conditions exist that adversely affect the general operations of the facility. b. Compromised - General operations of the facility have been affected due to damage, operating on emergency backup systems, or facility contamination. c. Evacuating - Indicates that a hospital is in the process of a partial or full evacuation. d. Closed - Indicates that a hospital is no longer capable of providing services and only emergency services/restoration personnel may remain in the facility.
Used In	**HospitalFacilityStatus**

Element	SecurityStatus
Type	xsd: string with restrictions
Usage	**OPTIONAL**
Definition	The status of security procedures in the hospital.
Comments	1. Values: a. Normal - The hospital is operating under routine security procedures. b. Elevated - The hospital has activated increased security procedures (awareness, surveillance) due to a potential threat, or specific security related event i.e. increase in local threat level, VIP, bomb threat. c. RestrictedAccess - Based on security needs, the hospital has activated procedures to allow access to the facility through a reduced number of controlled entrances. d. Lockdown - Based on security needs, the hospital has activated procedures to control entry to the facility to authorized persons only. e. Quarantine - Based on a public health emergency, the entry and exit of the facility is controlled by public health officials
Used In	**HospitalFacilityStatus**

Element	Activity24Hr
Type	XML Structure
Usage	**OPTIONAL**
Definition	The container element for reporting activities in the last 24 hours.
Comments	1. The time is relative to the timestamp of the <LastUpdateTime> of the <Hospital> element.
Sub-elements	• Admissions • Discharges • Deaths
Used In	**HospitalFacilityStatus**

925

Element	Admissions

Type	xsd: integer
Usage	**OPTIONAL**
Definition	The number of admissions in the last 24 hours.
Comments	1. The time is relative to the timestamp of the <LastUpdateTime> of the <Hospital> element.
Used In	**HospitalFacilityStatus**

Element	Discharges
Type	xsd: integer
Usage	**OPTIONAL**
Definition	The number of discharges in the last 24 hours.
Comments	1. The time is relative to the timestamp of the <LastUpdateTime> of the <Hospital> element.
Used In	**HospitalFacilityStatus**

Element	Deaths
Type	xsd: integer
Usage	**OPTIONAL**
Definition	The number of deaths in the last 24 hours.
Comments	1. The time is relative to the timestamp of the <LastUpdateTime> of the <Hospital> element.
Used In	**HospitalFacilityStatus**

6.5.3.3.1 Hospital Resources Status

930

Element	**HospitalResourcesStatus**
Type	XML Structure
Usage	**REQUIRED**, MUST be used once and only once, top level container

Definition	The container for all the elements related to the operations of the facility.
Comments	
Sub-elements	• Staffing • FacilityOperations • ClinicalOperations • CommentText
Used In	top level element

Element	Staffing
Type	xsd: string with restrictions
Usage	**OPTIONAL**
Definition	The status of staffing.
Comments	1. Values: a. Adequate – Meets the current needs. b. Insufficient – Current needs are not being met
Used In	**HospitalResourcesStatus**

Element	FacilityOperations
Type	xsd: string with restrictions
Usage	**OPTIONAL**
Definition	The status of supplies necessary for facility operations.
Comments	1. Values: a. Adequate – Meets the current needs. b. Insufficient – Current needs are not being met.
Used In	**HospitalResourcesStatus**

Element	ClinicalOperations

Type	xsd: string with restrictions
Usage	**OPTIONAL**
Definition	The status of supplies necessary for clinical operations.
Comments	1. Values: a. Adequate – Meets the current needs b. Insufficient – Current needs are not being met
Used In	**HospitalResourcesStatus**

935

6.5.3.3.2 Supporting Elements

6.5.3.3.2.1 CommentText

Element	CommentText
Type	xsd:string
Usage	**OPTIONAL**
Definition	Open Comments field.
Comments	
Used In	• Hospital

940

6.5.3.3.2.2 AvailabilityStatus

Element	AvailabilityStatus
Type	xsd:string
Usage	**OPTIONAL**
Definition	Defines the enumerations of Availability Status.
Comments	VALUES: 1. Available 2. NotAvailable

Used In	Hospital/ServiceCoverageStatus

945

6.5.3.3.2.3 LastUpdateTime

Element	LastUpdateTime
Type	xsd:datetime
Usage	**REQUIRED**
Definition	The last time the information was updated.
Comments	Each Hospital must have a LastUpdateTime
Used In	Hospital

950

6.6 XML SCHEMA FOR THE EDXL Hospital AVailability Exchange (HAVE)

```
<?xml version="1.0"?>
<!-- edited with XMLSpy v2005 rel. 3 U (http://www.altova.com) by Sukumar Dwarkanath (private) -->
<schema xmlns:gml="http://www.opengis.net/gml" xmlns="http://www.w3.org/2001/XMLSchema"
xmlns:have="urn:oasis:names:tc:emergency:EDXL:HAVE:1.0" xmlns:geo-oasis="http://www.oasis-
org.org/geo-oasis/10" targetNamespace="http://www.w3.org/2001/XMLSchema"
elementFormDefault="unqualified" attributeFormDefault="unqualified">
        <import namespace="http://www.oasis-org.org/geo-oasis/10" schemaLocation="geo-oasis.xsd"/>
        <element name="HospitalStatus">
                <annotation>
                        <documentation>The top level container element for reporting status of any
number of hospitals. The EDXL-HAVE has no independent routing mechanism, so it requires a routing
mechanism that is consistent with the EDXL-DE distribution types. It must contain one or more Hospital
elements.
 </documentation>
                </annotation>
                <complexType>
                        <sequence>
                                <element name="Hospital" maxOccurs="unbounded">
                                        <annotation>
                                                <documentation>The container element for reporting
status of a hospital. Multiple Instances of the Hospital element MAY occur within the HospitalStatus
container element. </documentation>
                                        </annotation>
                                        <complexType>
                                                <sequence>
                                                        <element name="OrganizationInformation"
type="have:OrganizationInformation">
                                                                <annotation>
                                                                        <documentation>The
container element for organization information elements. The generic element Organization refers to the
entity that is providing the data. This generic name is used throughout this document. Typically, this will
include hospitals, nursing care centers, trauma centers etc.
</documentation>
                                                                </annotation>
                                                        </element>
                                                        <element
name="EmergencyDepartmentStatus" type="have:EmergencyDepartmentStatus" minOccurs="0">
                                                                <annotation>
                                                                        <documentation>Report
on the emergency department status for the organization.</documentation>
                                                                </annotation>
```

```
                                                </element>
                                                <element
name="HospitalBedCapacityStatus" type="have:HospitalBedCapacityStatus" minOccurs="0">
                                                        <annotation>
                                                                <documentation>The
hospital bed capacity for the organization.</documentation>
                                                        </annotation>
                                                </element>
                                                <element name="ServiceCoverageStatus"
type="have:ServiceCoverageStatus" minOccurs="0">
                                                        <annotation>
                                                                <documentation>The
physician service coverage status for the organization.</documentation>
                                                        </annotation>
                                                </element>
                                                <element name="HospitalFacilityStatus"
type="have:HospitalFacilityStatus" minOccurs="0">
                                                        <annotation>
                                                                <documentation>The
status of operations for the organization.</documentation>
                                                        </annotation>
                                                </element>
                                                <element name="HospitalResourcesStatus"
type="have:HospitalResourceStatus" minOccurs="0">
                                                        <annotation>
                                                                <documentation>The
status of resources for the organization.</documentation>
                                                        </annotation>
                                                </element>
                                                <element name="LastUpdateTime"
type="dateTime">
                                                        <annotation>
                                                                <documentation>The last
time the information was updated.</documentation>
                                                        </annotation>
                                                </element>
                                        </sequence>
                                </complexType>
                        </element>
                </sequence>
        </complexType>
</element>
<element name="CommentText" type="string">
```

```
                <annotation>
                        <documentation>One or more comments</documentation>
                </annotation>
        </element>
        <complexType name="OrganizationInformation">
                <annotation>
                        <documentation>The container element for organization information elements.
</documentation>
                </annotation>
                <sequence>
                        <element name="OrganizationID" type="string">
                                <annotation>
                                        <documentation>An identifier of an organization based on the
type of organization it is. In this case, it is used to specify the identifier for the healthcare organization.
</documentation>
                                </annotation>
                        </element>
                        <element name="OrganizationIDProviderName" minOccurs="0">
                                <annotation>
                                        <documentation>The name of the provider that has provided
the identification scheme. This could also be the name a particular identification list. </documentation>
                                </annotation>
                        </element>
                        <element name="OrganizationName" type="string">
                                <annotation>
                                        <documentation>The name of the organization. If multiple
branches of a hospital are present, the OrganizationName may include the location information as well.
</documentation>
                                </annotation>
                        </element>
                        <element name="OrganizationTypeText" type="string" minOccurs="0">
                                <annotation>
                                        <documentation>The general functional type of the
organization. Example: Hospital, Nursing Center etc.</documentation>
                                </annotation>
                        </element>
                        <element name="OrganizationLocation" minOccurs="0">
                                <annotation>
                                        <documentation>The container element for the specifying the
location of the organization. The location consists of the address and the geographic location (which is
specified as a point). The geographic coordinates specified in Point must match the
address.</documentation>
                                </annotation>
```

```
                    <complexType>
                        <sequence>
                            <element name="StreetFullText" type="string"
minOccurs="0">
                                <annotation>
                                    <documentation>A complete street
reference. For example, 123 Main Street NW.</documentation>
                                </annotation>
                            </element>
                            <element name="LocationCityName" type="string"
minOccurs="0">
                                <annotation>
                                    <documentation>A name of a city
or town.</documentation>
                                </annotation>
                            </element>
                            <element name="LocationCountryName"
type="string" minOccurs="0">
                                <annotation>
                                    <documentation>A name of a
country</documentation>
                                </annotation>
                            </element>
                            <element name="LocationStateName" type="string"
minOccurs="0">
                                <annotation>
                                    <documentation>A name of a state,
commonwealth, province, or other subregion of a country.</documentation>
                                </annotation>
                            </element>
                            <element name="LocationPostalCountyId"
type="string" minOccurs="0">
                                <annotation>
                                    <documentation>A zip code or
postal code.</documentation>
                                </annotation>
                            </element>
                            <element name="LocationCountyName"
type="string" minOccurs="0">
                                <annotation>
                                    <documentation>A name of a
county, parish, or vicinage.</documentation>
                                </annotation>
```

```
                                        </element>
                                        <element name="OrganizationGeoLocation"
type="have:OrganizationGeoLocation" minOccurs="0">
                                                <annotation>
                                                        <documentation>The container
element for specifying the geo-coded address. </documentation>
                                                </annotation>
                                        </element>
                                </sequence>
                        </complexType>
                </element>
                <element ref="have:CommentText" minOccurs="0"/>
        </sequence>
</complexType>
<complexType name="EmergencyDepartmentStatus">
        <annotation>
                <documentation> The container of all of the elements related to the emergency
department status. It describes the ability of this emergency department to treat patients.</documentation>
        </annotation>
        <sequence>
                <element name="EMSTraffic" minOccurs="0">
                        <annotation>
                                <documentation>Ability of this emergency department to
receive patients via emergency medical services.</documentation>
                        </annotation>
                        <complexType>
                                <sequence>
                                        <element name="EMSTrafficStatus"
minOccurs="0">
                                                <annotation>
                                                        <documentation>Identifies the
status of EMS traffic operations</documentation>
                                                </annotation>
                                                <simpleType>
                                                        <restriction base="string">
                                                                <enumeration
value="Normal">
                                                                        <annotation>

        <documentation>Accepting all EMS traffic.</documentation>
                                                                        </annotation>
                                                                </enumeration>
```


<enumeration value="Advisory">
<annotation>
<documentation>Experiencing specific resource limitations which may affect transport of some EMS traffic.</documentation>
</annotation>
</enumeration>
<enumeration value="Closed">
<annotation>
<documentation>Requesting re-route of EMS traffic to other facilities.</documentation>
</annotation>
</enumeration>
<enumeration value="N/A">
<annotation>
<documentation>Not Applicable. This hospital does not have an emergency department.</documentation>
</annotation>
</enumeration>
</restriction>
</simpleType>
</element>
<element name="EMSTrafficReason" type="string" minOccurs="0">
<annotation>
<documentation>It is used to report the contributing factor to an EMSTraffic Status.</documentation>
</annotation>
</element>
<element ref="have:CommentText" minOccurs="0"/>
</sequence>
</complexType>
</element>
<element name="EMSCapacity" minOccurs="0">
<annotation>
<documentation>The number of each triage patient type the hospital can accept.</documentation>
</annotation>

```
                        <complexType>
                            <complexContent>
                                <extension base="have:TriageCount">
                                    <sequence>
                                        <element
ref="have:CommentText" minOccurs="0"/>
                                    </sequence>
                                </extension>
                            </complexContent>
                        </complexType>
                    </element>
                    <element name="EMSCensus" minOccurs="0">
                        <annotation>
                            <documentation>The number of each triage patient type the
hospital currently has.</documentation>
                        </annotation>
                        <complexType>
                            <complexContent>
                                <extension base="have:TriageCount">
                                    <sequence>
                                        <element
ref="have:CommentText" minOccurs="0"/>
                                    </sequence>
                                </extension>
                            </complexContent>
                        </complexType>
                    </element>
                    <element name="EMSAirTransportStatus" minOccurs="0">
                        <annotation>
                            <documentation>The container element to indicate the status
and offload time for ambulance capabilities.</documentation>
                        </annotation>
                        <complexType>
                            <complexContent>
                                <extension base="have:Offload">
                                    <sequence>
                                        <element
ref="have:CommentText" minOccurs="0"/>
                                    </sequence>
                                </extension>
                            </complexContent>
                        </complexType>
                    </element>
```

```
                    <element name="EMSAmbulanceStatus" minOccurs="0">
                        <annotation>
                            <documentation>The container element to indicate the status and offload time for air transport capabilities. </documentation>
                        </annotation>
                        <complexType>
                            <complexContent>
                                <extension base="have:Offload">
                                    <sequence>
                                        <element ref="have:CommentText" minOccurs="0"/>
                                    </sequence>
                                </extension>
                            </complexContent>
                        </complexType>
                    </element>
                </sequence>
            </complexType>
            <complexType name="HospitalBedCapacityStatus">
                <annotation>
                    <documentation>The container of all of the elements related to the hospital bed capacity and status. For each of the bed types (AdultICU, MedicalSurgical, etc.), if needed, a collection of named sub-types can be provided. The totals of sub-categories SHOULD equal the capacity data specified in the parent.
</documentation>
                </annotation>
                <sequence>
                    <element name="BedCapacity" maxOccurs="unbounded">
                        <annotation>
                            <documentation>Container element to identify the number of available beds. Each Bed Type and the sub-categories under it must be encapsulated by a BedCapacity element. Multiple instances of BedCapacity elements are allowed. For example, a hospital may sub-categorize Adult ICU beds into Surgery, Cardiac, General and Neuro.
</documentation>
                        </annotation>
                        <complexType>
                            <sequence>
                                <element name="Bed" block="restriction" minOccurs="0" maxOccurs="unbounded">
                                    <annotation>
                                        <documentation>Enumerated list of available Bed Types</documentation>
                                    </annotation>
```

```
                                        <simpleType>
                                            <restriction base="string">
                                                <enumeration
value="AdultICU">
                                                    <annotation>

        <documentation>These can support critically ill or injured patients, including ventilator support.
category includes all major subtypes of ICU beds, including neuro, cardiac, trauma, or medical, with the
exception that this category does not include burn ICU beds.
</documentation>
                                                    </annotation>
                                                </enumeration>
                                                <enumeration
value="MedicalSurgical">
                                                    <annotation>

        <documentation>These are also thought of as ward beds. These beds may or may not include
cardiac telemetry capability.
</documentation>
                                                    </annotation>
                                                </enumeration>
                                                <enumeration
value="Burn">
                                                    <annotation>

        <documentation>These are thought of as burn ICU beds, either approved by the American Burn
Association or self-designated. These beds are NOT to be included in other ICU bed counts.
</documentation>
                                                    </annotation>
                                                </enumeration>
                                                <enumeration
value="PediatricICU">
                                                    <annotation>

        <documentation>Capacity status for pediatric ICU beds. This is similar to adult ICU beds, but for
patients 17-years-old and younger.</documentation>
                                                    </annotation>
                                                </enumeration>
                                                <enumeration
value="Pediatrics">
                                                    <annotation>
```

<documentation>Capacity status for pediatrics beds. These are ward medical/surgical beds for patients 17-years-old and younger.</documentation>

</annotation>

</enumeration>

<enumeration value="Psychiatric">

<annotation>

<documentation>Capacity status for psychiatric beds. These are ward beds on a closed/locked psychiatric unit or ward beds where a patient will be attended by a sitter. </documentation>

</annotation>

</enumeration>

<enumeration value="NegativeFlowIsolation">

<annotation>

<documentation>Capacity status for negative airflow isolation beds. These provide respiratory isolation. NOTE: This value may represent available beds included in the counts of other types. </documentation>

</annotation>

</enumeration>

<enumeration value="OtherIsolation">

<annotation>

<documentation>Capacity status for other isolation beds. These provide isolation where airflow is not a concern. NOTE: This value may represent available beds included in the counts of other types. </documentation>

</annotation>

</enumeration>

<enumeration value="OperatingRooms">

<annotation>

<documentation>Capacity status for operating rooms which are equipped staffed and could be made available for patient care in a short period of time.</documentation>

</annotation>

</enumeration>

</restriction>

</simpleType>

</element>

```
                                        <element name="SubCategoryBed"
block="extension" minOccurs="0" maxOccurs="unbounded">
                                            <annotation>
                                                <documentation>The name of the
sub-category bed type. Each bed type (AdultICU, MedicalSurgical, etc.) may optionally contain a
collection of named sub-categories. The totals of sub-categories should equal the capacity data specified in
the parent. </documentation>
                                            </annotation>
                                        </element>
                                        <element name="Capacity" type="have:Capacity"
minOccurs="0">
                                            <annotation>
                                                <documentation>Container
element to define the capacity information of each specified bed type or sub category bed type.
</documentation>
                                            </annotation>
                                        </element>
                                        <element ref="have:CommentText" minOccurs="0"
maxOccurs="unbounded"/>
                                    </sequence>
                                </complexType>
                            </element>
                        </sequence>
                    </complexType>
                    <complexType name="ServiceCoverageStatus">
                        <annotation>
                            <documentation>Container element of all the elements of service coverage. This
includes both the necessary staff and facilities.  Indicator of the availability of specialty service
coverage.</documentation>
                        </annotation>
                        <sequence>
                            <element name="Burn" type="have:AvailabilityStatus" minOccurs="0">
                                <annotation>
                                    <documentation>The availability of Burn center services.
</documentation>
                                </annotation>
                            </element>
                            <element name="Cardiology" type="have:AvailabilityStatus" minOccurs="0">
                                <annotation>
                                    <documentation>The availability of Cardiology services.
</documentation>
                                </annotation>
                            </element>
```

```
                    <element name="InfectiousDisease" type="have:AvailabilityStatus"
minOccurs="0">
                        <annotation>
                            <documentation>The availability of Infectious Diseases.
</documentation>
                        </annotation>
                    </element>
                    <element name="Neonatology" type="have:AvailabilityStatus"
minOccurs="0">
                        <annotation>
                            <documentation>The availability of Neonatology services.
</documentation>
                        </annotation>
                    </element>
                    <element name="Neurology" type="have:AvailabilityStatus" minOccurs="0">
                        <annotation>
                            <documentation>The availability of Neurology services.
</documentation>
                        </annotation>
                    </element>
                    <element name="Orthopedic" type="have:AvailabilityStatus" minOccurs="0">
                        <annotation>
                            <documentation>The availability of Orthopedic services.
</documentation>
                        </annotation>
                    </element>
                    <element name="OBGYN" minOccurs="0">
                        <annotation>
                            <documentation>The availability of OBGYN services.
</documentation>
                        </annotation>
                        <complexType>
                            <sequence>
                                <element name="OBGYN"
type="have:AvailabilityStatus" minOccurs="0">
                                    <annotation>
                                        <documentation>The Sub-type
element of the OBGYN services.</documentation>
                                    </annotation>
                                </element>
                                <element name="LaborDelivery"
type="have:AvailabilityStatus" minOccurs="0">
                                    <annotation>
```

```
                                        <documentation>Sub-type element
of the OBGYN Services. Availability of Labor Delivery services. </documentation>
                                    </annotation>
                                </element>
                            </sequence>
                        </complexType>
                    </element>
                    <element name="Psychiatric" minOccurs="0">
                        <annotation>
                            <documentation>The availability of psychiatric services.
</documentation>
                        </annotation>
                        <complexType>
                            <sequence>
                                <element name="Pediatric" minOccurs="0">
                                    <annotation>
                                        <documentation>Availability of
Adult General Psychiatric services. </documentation>
                                    </annotation>
                                </element>
                                <element name="AdultGeneral" minOccurs="0">
                                    <annotation>
                                        <documentation>Availability of
Pediatric Psychiatric services. </documentation>
                                    </annotation>
                                </element>
                            </sequence>
                        </complexType>
                    </element>
                    <element name="Surgery" minOccurs="0">
                        <annotation>
                            <documentation>The availability of general surgery services.
</documentation>
                        </annotation>
                        <complexType>
                            <sequence>
                                <element name="General" minOccurs="0">
                                    <annotation>
                                        <documentation>The availability
of general surgical services.  </documentation>
                                    </annotation>
                                </element>
```

```
                                        <element name="AdultGeneralSugery"
minOccurs="0">
                                                <annotation>
                                                        <documentation>The availability
of adult general services.  </documentation>
                                                </annotation>
                                        </element>
                                        <element name="Pediatrics" minOccurs="0">
                                                <annotation>
                                                        <documentation>The availability
of Pediatrics general surgical services. </documentation>
                                                </annotation>
                                        </element>
                                        <element name="Orthopedics" minOccurs="0">
                                                <annotation>
                                                        <documentation>The availability
of Orthopedic surgical services.</documentation>
                                                </annotation>
                                        </element>
                                        <element name="Neurosurgery" minOccurs="0">
                                                <annotation>
                                                        <documentation>The availability
of Neurosurgery services. </documentation>
                                                </annotation>
                                        </element>
                                        <element name="Facial" minOccurs="0">
                                                <annotation>
                                                        <documentation>The availability
of facial surgical services. </documentation>
                                                </annotation>
                                        </element>
                                        <element name="CardioThoracic" minOccurs="0">
                                                <annotation>
                                                        <documentation>The availability
of cardiothoracic surgical services.</documentation>
                                                </annotation>
                                        </element>
                                        <element name="Hand" minOccurs="0">
                                                <annotation>
                                                        <documentation>The availability
of hand surgery services.</documentation>
                                                </annotation>
                                        </element>
```

```
                                        <element name="Reimplantation" minOccurs="0">
                                                <annotation>
                                                        <documentation>The availability
of reimplantation surgical services.  </documentation>
                                                </annotation>
                                        </element>
                                        <element name="Spinal" minOccurs="0">
                                                <annotation>
                                                        <documentation>The availability
of spinal surgical services.  </documentation>
                                                </annotation>
                                        </element>
                                        <element name="Vascular" minOccurs="0">
                                                <annotation>
                                                        <documentation>The availability
of vascular surgical services. </documentation>
                                                </annotation>
                                        </element>
                                        <element name="Anesthesia" minOccurs="0">
                                                <annotation>
                                                        <documentation>The availability
of anesthesia services. </documentation>
                                                </annotation>
                                        </element>
                                </sequence>
                        </complexType>
                </element>
                <element ref="have:CommentText" minOccurs="0"/>
        </sequence>
</complexType>
<complexType name="HospitalFacilityStatus">
        <annotation>
                <documentation>The container of all of the elements related to the status of the
facility.  </documentation>
        </annotation>
        <sequence>
                <element name="EOCStatus" minOccurs="0">
                        <annotation>
                                <documentation>Whether the EOC is currently
operating.</documentation>
                        </annotation>
                        <simpleType>
                                <restriction base="string">
```

```
                                        <enumeration value="Active"/>
                                        <enumeration value="Inactive"/>
                                    </restriction>
                                </simpleType>
                            </element>
                            <element name="EOCPlan" minOccurs="0">
                                <annotation>
                                    <documentation>Whether the EOC has activated its
Emergency Operations Plan (EOP).</documentation>
                                </annotation>
                                <simpleType>
                                    <restriction base="string">
                                        <enumeration value="Active"/>
                                        <enumeration value="Inactive"/>
                                    </restriction>
                                </simpleType>
                            </element>
                            <element name="ClinicalStatus" minOccurs="0">
                                <annotation>
                                    <documentation>The cliniical status of the facility.
</documentation>
                                </annotation>
                                <simpleType>
                                    <restriction base="string">
                                        <enumeration value="Normal">
                                            <annotation>
                                                <documentation>Hospital clinical
resources are operating within normal conditions.</documentation>
                                            </annotation>
                                        </enumeration>
                                        <enumeration value="Level-1">
                                            <annotation>
                                                <documentation>Hospital clinical
resources are operating at Level-1 surge conditions.</documentation>
                                            </annotation>
                                        </enumeration>
                                        <enumeration value="Level-2">
                                            <annotation>
                                                <documentation>Hospital clinical
resources are operating at Level-2 surge conditions.</documentation>
                                            </annotation>
                                        </enumeration>
                                        <enumeration value="Full">
```

```
                                        <annotation>
                                            <documentation>Hospital clinical
resources are exceeded and acceptable care cannot be
                                                provided to additional patients. Diversion or community surge response is
required.</documentation>
                                        </annotation>
                                    </enumeration>
                                </restriction>
                            </simpleType>
                        </element>
                        <element name="DeconCapacity" minOccurs="0">
                            <annotation>
                                <documentation>The capacity for
chemical/biological/radiological patient decontamination.</documentation>
                            </annotation>
                            <simpleType>
                                <restriction base="string">
                                    <enumeration value="Inactive">
                                        <annotation>
                                            <documentation>Not being used,
but available if needed.</documentation>
                                        </annotation>
                                    </enumeration>
                                    <enumeration value="Open">
                                        <annotation>
                                            <documentation>In use and able to
accept additional patients.</documentation>
                                        </annotation>
                                    </enumeration>
                                    <enumeration value="Full">
                                        <annotation>
                                            <documentation>In use at
maximum capacity.</documentation>
                                        </annotation>
                                    </enumeration>
                                    <enumeration value="Exceeded">
                                        <annotation>
                                            <documentation>Storage needs
exceed available space.</documentation>
                                        </annotation>
                                    </enumeration>
                                </restriction>
                            </simpleType>
```

```
                    </element>
                    <element name="MorgueCapacity" minOccurs="0">
                        <annotation>
                            <documentation>The status of the morgue capacity.
</documentation>
                        </annotation>
                        <simpleType>
                            <restriction base="string">
                                <enumeration value="Open">
                                    <annotation>
                                        <documentation>Space is
available.</documentation>
                                    </annotation>
                                </enumeration>
                                <enumeration value="Full">
                                    <annotation>
                                        <documentation>All normal space
is in use.</documentation>
                                    </annotation>
                                </enumeration>
                                <enumeration value="Exceeded">
                                    <annotation>
                                        <documentation>Storage needs
exceed available space.</documentation>
                                    </annotation>
                                </enumeration>
                            </restriction>
                        </simpleType>
                    </element>
                    <element name="FacilityStatus" minOccurs="0">
                        <annotation>
                            <documentation>The status of the facility.</documentation>
                        </annotation>
                        <simpleType>
                            <restriction base="string">
                                <enumeration value="Normal">
                                    <annotation>
                                        <documentation>No conditions
exist that adversely affect
                the general operations of the facility.</documentation>
                                    </annotation>
                                </enumeration>
                                <enumeration value="Compromised">
```

```
                                        <annotation>
                                            <documentation>General
operations of the facility have been
                affected due to damage, operating on emergency backup systems,
                or facility contamination.</documentation>
                                        </annotation>
                                    </enumeration>
                                    <enumeration value="Evacuating">
                                        <annotation>
                                            <documentation>Indicates that a
hospital is in the process
                of a partial or full evacuation.</documentation>
                                        </annotation>
                                    </enumeration>
                                    <enumeration value="Closed">
                                        <annotation>
                                            <documentation>Indicates that a
hospital is no longer capable
                of providing services and only emergency services/restoration
                personnel remain in the facility.</documentation>
                                        </annotation>
                                    </enumeration>
                                </restriction>
                            </simpleType>
                        </element>
                        <element name="SecurityStatus" minOccurs="0">
                            <annotation>
                                <documentation>The status of security procedures in the
hospital.</documentation>
                            </annotation>
                            <simpleType>
                                <restriction base="string">
                                    <enumeration value="Normal">
                                        <annotation>
                                            <documentation>The hospital is
operating under routine security
                procedures.</documentation>
                                        </annotation>
                                    </enumeration>
                                    <enumeration value="Elevated">
                                        <annotation>
                                            <documentation>The hospital has
activated increased security
```


```
                    procedures (awareness, surveillance) due to a potential threat,
                    or specific security related event i.e. increase in local threat
                    level, VIP, bomb threat.</documentation>
                                        </annotation>
                                    </enumeration>
                                    <enumeration value="RestrictedAccess">
                                        <annotation>
                                            <documentation>Based on security
needs, the hospital has
                    activated procedures to allow access to the facility through
                    a reduced number of controlled entrances.</documentation>
                                        </annotation>
                                    </enumeration>
                                    <enumeration value="Lockdown">
                                        <annotation>
                                            <documentation>Based on security
needs, the hospital has
                    activated procedures to control entry to the facility to
                    authorized persons only.</documentation>
                                        </annotation>
                                    </enumeration>
                                    <enumeration value="Quarantine">
                                        <annotation>
                                            <documentation>Based on a public
health emergency, the
                    entry and exit of the facility is controlled by public
                    health officials.</documentation>
                                        </annotation>
                                    </enumeration>
                                </restriction>
                            </simpleType>
                        </element>
                        <element name="Activity24Hr" minOccurs="0">
                            <annotation>
                                <documentation>The container element for reporting
activities in the last 24 hours.  </documentation>
                            </annotation>
                            <complexType>
                                <sequence>
                                    <element name="Admissions" minOccurs="0"/>
                                    <element name="Discharges" minOccurs="0"/>
                                    <element name="Deaths" minOccurs="0"/>
                                </sequence>
```

```
                    </complexType>
                </element>
                <element ref="have:CommentText" minOccurs="0"/>
            </sequence>
        </complexType>
        <complexType name="HospitalResourceStatus">
            <annotation>
                <documentation>The container for all the elements related to the operations of the facility.  </documentation>
            </annotation>
            <sequence>
                <element name="Staffing" minOccurs="0">
                    <annotation>
                        <documentation>The status of staffing.  </documentation>
                    </annotation>
                    <simpleType>
                        <restriction base="string">
                            <enumeration value="Adequate">
                                <annotation>
                                    <documentation>Meets the current needs.</documentation>
                                </annotation>
                            </enumeration>
                            <enumeration value="Insufficient">
                                <annotation>
                                    <documentation>Current needs not being met.</documentation>
                                </annotation>
                            </enumeration>
                        </restriction>
                    </simpleType>
                </element>
                <element name="FacilityOperations" minOccurs="0">
                    <annotation>
                        <documentation>The status of supplies necessary for facility operations.  </documentation>
                    </annotation>
                    <simpleType>
                        <restriction base="string">
                            <enumeration value="Adequate">
                                <annotation>
                                    <documentation>Meets the current needs.</documentation>
```

```
                                        </annotation>
                                    </enumeration>
                                    <enumeration value="Insufficient">
                                        <annotation>
                                            <documentation>Current needs not being met.</documentation>
                                        </annotation>
                                    </enumeration>
                                </restriction>
                            </simpleType>
                        </element>
                        <element name="ClinicalOperations" minOccurs="0">
                            <annotation>
                                <documentation>The status of supplies necessary for clinical operations. </documentation>
                            </annotation>
                            <simpleType>
                                <restriction base="string">
                                    <enumeration value="Adequate">
                                        <annotation>
                                            <documentation>Meets the current needs.</documentation>
                                        </annotation>
                                    </enumeration>
                                    <enumeration value="Insufficient">
                                        <annotation>
                                            <documentation>Current needs not being met.</documentation>
                                        </annotation>
                                    </enumeration>
                                </restriction>
                            </simpleType>
                        </element>
                        <element ref="have:CommentText" minOccurs="0"/>
                    </sequence>
                </complexType>
                <complexType name="TriageCount">
                    <annotation>
                        <documentation>The number of each triage patient type the overall hospital currently has.</documentation>
                    </annotation>
                    <sequence>
                        <element name="TriageRed" type="integer" minOccurs="0">
```

```
                    <annotation>
                        <documentation>Number of victims with immediate
needs.</documentation>
                    </annotation>
                </element>
                <element name="TriageYellow" type="integer" minOccurs="0">
                    <annotation>
                        <documentation>Number of victims with delayed
needs.</documentation>
                    </annotation>
                </element>
                <element name="TriageGreen" type="integer" minOccurs="0">
                    <annotation>
                        <documentation>Number of victims with minor
needs.</documentation>
                    </annotation>
                </element>
                <element name="TriageBlack" type="integer" minOccurs="0">
                    <annotation>
                        <documentation>Number of deceased
victims.</documentation>
                    </annotation>
                </element>
            </sequence>
        </complexType>
        <complexType name="Capacity">
            <annotation>
                <documentation>Top level complex schema type defining bed capacity counts
    given a specific type of bed.</documentation>
            </annotation>
            <sequence>
                <element name="CapacityStatus" minOccurs="0">
                    <annotation>
                        <documentation>Indicator of status of bed type or sub-
category bed type.  </documentation>
                    </annotation>
                    <simpleType>
                        <restriction base="string">
                            <enumeration value="Vacant/Available"/>
                            <enumeration value="NotAvailable"/>
                        </restriction>
                    </simpleType>
                </element>
```

```
                    <element name="AvailableCount" type="integer" minOccurs="0">
                        <annotation>
                            <documentation>The number of vacant/available beds to
which patients can be immediately transported.  These must include supporting space, equipment, medical
material, ancillary and support services and staff to operate under normal circumstances. These beds are
licensed, physically available and have staff on hand to attend to the patient who occupies the
bed.</documentation>
                        </annotation>
                    </element>
                    <element name="BaselineCount" type="integer" minOccurs="0">
                        <annotation>
                            <documentation>The maximum (baseline) number of beds in
this category.</documentation>
                        </annotation>
                    </element>
                    <element name="AdditionalCapacityCount24Hr" type="integer"
minOccurs="0">
                        <annotation>
                            <documentation>Estimate how many beds above the current
number could be made vacant/available within 24 hours. This includes institutional surge beds as well as
beds made available by discharging/transferring patients.</documentation>
                        </annotation>
                    </element>
                    <element name="AdditionalCapacityCount72Hr" type="integer"
minOccurs="0">
                        <annotation>
                            <documentation>Estimate how many beds above the current
number could be made vacant/available within 72 hours. This includes institutional surge beds as well as
beds made available by discharging/transferring patients.</documentation>
                        </annotation>
                    </element>
                </sequence>
            </complexType>
            <complexType name="Offload">
                <annotation>
                    <documentation>Indicator of offload times of ambulance capabilities.  The time
it takes to transfer care of a patient to hospital staff, thereby freeing the transport for assignment.
</documentation>
                </annotation>
                <sequence>
                    <element name="EMSOffloadStatus" minOccurs="0">
                        <annotation>
```

```
                                        <documentation>Indicator of offload times of ambulance
capabilities.  </documentation>
                                </annotation>
                                <simpleType>
                                        <restriction base="string">
                                                <enumeration value="Normal">
                                                        <annotation>
                                                                <documentation>The time required
to offload a patient is typical.</documentation>
                                                        </annotation>
                                                </enumeration>
                                                <enumeration value="Delayed">
                                                        <annotation>
                                                                <documentation>The time required
to offload a patient is longer than typical. </documentation>
                                                        </annotation>
                                                </enumeration>
                                        </restriction>
                                </simpleType>
                        </element>
                        <element name="EMSOffloadMinutes" type="integer" minOccurs="0">
                                <annotation>
                                        <documentation>Average offload time in
minutes.</documentation>
                                </annotation>
                        </element>
                </sequence>
        </complexType>
        <complexType name="OrganizationGeoLocation">
                <annotation>
                        <documentation>The container element for specifying the geo-coded address.
</documentation>
                </annotation>
                <complexContent>
                        <extension base="geo-oasis:SimplePositionType">
                                <sequence>
                                        <element ref="geo-oasis:where"/>
                                </sequence>
                        </extension>
                </complexContent>
        </complexType>
        <simpleType name="AvailabilityStatus">
                <annotation>
```

```
                    <documentation>Top level simple schema type defining enumeration
ofavailability status.</documentation>
                </annotation>
                <restriction base="string">
                    <enumeration value="Available"/>
                    <enumeration value="NotAvailable"/>
                </restriction>
            </simpleType>
</schema>
```

6.7 EDXL-HAVE EXAMPLE

```
<?xml version="1.0" encoding="UTF-8"?>
<EDXLDistribution xmlns="urn:oasis:names:tc:emergency:EDXL:DE:1.0:">
        <distributionID>edxl_d1</distributionID>
        <senderID>XMl2005</senderID>
        <dateTimeSent>2005-11-15T16:53:00-05:00</dateTimeSent>
        <distributionStatus>Test</distributionStatus>
        <distributionType>Report</distributionType>
        <keyword>
            <valueListurn>http://www.niem.gov/EventTypeList</valueListurn>
            <value>Pandemic Flu</value>
        </keyword>
        <targetArea>
            <polygon>
                33.4745,-112.1174 33.4745,-112.0238 33.4238,-112.0238 33.4238,-112.1174
                33.4745,-112.1174
            </polygon>
        </targetArea>
        <contentObject>
            <contentDescription>HAVE message reporting bed capacities</contentDescription>
            <xmlContent>
                <embeddedXMLContent>
                    <have:HospitalStatus
xmlns="urn:oasis:names:ec:emergency:have:1.0:">
                        <Hospital>
                            <OrganizationInformation>

        <OrganizationID>XXX1234</OrganizationID>

        <OrganizationIDProviderName>AHA</OrganizationIDProviderName>
        <OrganizationName>ABC Hospital</OrganizationName>
        <OrganizationTypeText>Hospital</OrganizationTypeText>
```

```
<OrganizationLocation>
        <StreetFullText>123 Main Street</StreetFullText>
        <LocationCityName>Fairfax</LocationCityName>
        <LocationCountryName>USA</LocationCountryName>
        <LocationStateName>Virginia</LocationStateName>
</OrganizationLocation>
</OrganizationInformation>
                                        <EmergencyDepartmentStatus>
                                                <EMSTraffic>

<EMSTrafficStatus>Normal</EMSTrafficStatus>
                                                </EMSTraffic>
                                                <EMSCapacity>
                                                        <TriageRed>40</TriageRed>

<TriageYellow>40</TriageYellow>
                                                        <TriageGreen>40</TriageGreen>
                                                        <TriageBlack>40</TriageBlack>
                                                </EMSCapacity>
                                                <EMSCensus>
                                                        <TriageRed>20</TriageRed>

<TriageYellow>20</TriageYellow>
                                                        <TriageGreen>20</TriageGreen>
                                                        <TriageBlack>20</TriageBlack>
                                                </EMSCensus>
                                                <EMSAirTransportStatus>

<EMSOffloadStatus>Normal</EMSOffloadStatus>

<EMSOffloadMinutes>30</EMSOffloadMinutes>
                                                </EMSAirTransportStatus>
                                                <EMSAmbulanceStatus>

<EMSOffloadStatus>Normal</EMSOffloadStatus>

<EMSOffloadMinutes>20</EMSOffloadMinutes>
                                                </EMSAmbulanceStatus>
                                        </EmergencyDepartmentStatus>
                                        <HospitalBedCapacityStatus>
                                                <BedCapacity>
                                                        <Bed>AdultICU</Bed>
                                                        <Capacity>
```

```
<CapacityStatus>Vacant/Available</CapacityStatus>

<AvailableCount>10</AvailableCount>

<BaselineCount>30</BaselineCount>

<AdditionalCapacityCount24Hr>5</AdditionalCapacityCount24Hr>

<AdditionalCapacityCount72Hr>5</AdditionalCapacityCount72Hr>
                                                    </Capacity>
                                                </BedCapacity>
                                            </HospitalBedCapacityStatus>
                                            <ServiceCoverageStatus>
                                                <Burn>Available</Burn>
                                                <Cardiology>Available</Cardiology>
<InfectiousDisease>Available</InfectiousDisease>
                                                <Neonatology>Available</Neonatology>
                                                <Neurology>Available</Neurology>
                                                <Orthopedic>Available</Orthopedic>
                                                <OBGYN>
                                                    <OBGYN>Available</OBGYN>

<LaborDelivery>Available</LaborDelivery>
                                                </OBGYN>
                                                <Surgery>
                                                    <General> Available</General>
                                                    <AdultGeneralSugery/>
                                                    <Pediatrics/>
                                                    <Orthopedics/>
                                                    <Neurosurgery/>
                                                    <Facial/>
                                                    <CardioThoracic/>
                                                    <Hand/>
                                                    <Reimplantation/>
                                                    <Spinal/>
                                                    <Vascular/>
                                                    <Anesthesia/>
                                                </Surgery>

<have:CommentText>String</have:CommentText>
                                            </ServiceCoverageStatus>
```

```
                                        <HospitalFacilityStatus>
                                                <EOCStatus>Active</EOCStatus>
                                                <EOCPlan>Active</EOCPlan>
                                                <ClinicalStatus>Normal</ClinicalStatus>

        <DeconCapacity>Inactive</DeconCapacity>

        <MorgueCapacity>Open</MorgueCapacity>
                                                <FacilityStatus>Normal</FacilityStatus>
                                                <SecurityStatus>Normal</SecurityStatus>
                                                <Activity24Hr>
                                                        <Admissions/>
                                                        <Discharges/>
                                                        <Deaths/>
                                                </Activity24Hr>

        <have:CommentText>String</have:CommentText>
                                        </HospitalFacilityStatus>
                                        <HospitalResourcesStatus>
                                                <Staffing>Adequate</Staffing>

        <FacilityOperations>Adequate</FacilityOperations>

        <ClinicalOperations>Adequate</ClinicalOperations>
                                        </HospitalResourcesStatus>
                                        <LastUpdateTime>2001-12-
17T09:30:47.0Z</LastUpdateTime>
                                </Hospital>
                        </have:HospitalStatus>
                </embeddedXMLContent>
        </xmlContent>
    </contentObject>
</EDXLDistribution>
```

6.8 OASIS GML Profile Note

Documentation for geo-oasis elements used in EDXL-HAVE

Element	SimplePositionType
Type	geo-oasis: doubleList extension

Usage	**OPTIONAL**
Definition	Extended doubleList with the addition of geo-oasis where attributes

Element	doubleList
Type	xsd: double
Usage	**OPTIONAL**
Definition	XML List based on XML Schema double type, identical to gml:doubleList. An element of this type contains a space-separated list of double values

Groups

Element	whereAttrGroup
Type	XML Structure
Usage	**OPTIONAL**
Definition	Optional additional parameters for a geo-oasis location property
Sub-elements/attributes	• featureTypeTag • relationshipTag • elev • floor • radius

Element	featureTypeTag
Type	xsd:NCName
Usage	**OPTIONAL**
Definition	attribute of the <where> element indicating the type of geographic entity is being referred to. Default is “location”
Used In	whereAttrGroup

Element	relationshipTag
Type	xsd:NCName

Usage	**OPTIONAL**
Definition	Attribute of the <where> element indicating how geo-tagged content is related to the represented location. Default is “isLocatedAt”
Used In	whereAttrrGroup

Element	elev
Type	xsd:double
Usage	**OPTIONAL**
Definition	Attribute of the <where> element indicating a GPS-measured elevation in meters (e.g. WGS84 geoid height)
Used In	whereAttrGroup

Element	floor
Type	xsd: double
Usage	**OPTIONAL**
Definition	Attribute of the <where> element indicating elevation by building floor.
Used In	whereAttrGroup

Element	radius
Type	xsd: double
Usage	**OPTIONAL**
Definition	Attribute of the <where> indicating size in meters of a radius or buffer being indicated around the geometry (e.g. radius of circular area around a point geometry.
Used In	whereAttrGroup

GEO-OASIS SCHEMA

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:geo-oasis="http://www.oasis-open.org/geo-oasis/10" xmlns:gml="http://www.opengis.net/gml" targetNamespace="http://www.oasis-org.org/geo-oasis/10" elementFormDefault="qualified" version="1.0">
<xs:import namespace="http://www.opengis.net/gml" schemaLocation="geo-oasis.xsd"/>
<xs:element name="where">
        <xs:annotation>
                <xs:documentation>Root property element of a geo-oasis GML instance</xs:documentation>
                 <xs:documentation>Container for optional geo-oasis attributes</xs:documentation>
         </xs:annotation>
         <xs:complexType>
                <xs:choice>
                        <xs:element ref="gml:Point"/>
                        <xs:element ref="gml:LineString"/>
                        <xs:element ref="gml:Polygon"/>
                        <xs:element ref="gml:Envelope"/>
                </xs:choice>
                <xs:attributeGroup ref="geo-oasis:whereAttrGroup"/>
        </xs:complexType>
</xs:element>
<xs:element name="point" type="geo-oasis:SimplePositionType">
        <xs:annotation>
                <xs:documentation>Point property element containing a pair of coordinates representing latitude then longitude in the WGS84 coordinate reference system
                </xs:documentation>
                <xs:documentation>This geo-oasis Simple element maps completely onto the where + gml:Point combination of geo-oasis GML
                </xs:documentation>
        </xs:annotation>
</xs:element>

<xs:element name="line" type="geo-oasis:SimplePositionType">
        <xs:annotation>
                <xs:documentation>
                        Line property element containing a list of pairs of coordinates representing latitude then longitude in the WGS84 coordinate reference system
                </xs:documentation>
                <xs:documentation>
                        This geo-oasis Simple element maps completely onto the where + gml:LineString combination of geo-oasis GML
                </xs:documentation>
        </xs:annotation>
</xs:element>
```

```
<xs:element name="polygon" type="geo-oasis:SimplePositionType">
        <xs:annotation>
                <xs:documentation>
                        Closed ring property element containing a list of pairs of coordinates (first pair
                        and last pair identical) representing latitude then longitude in the WGS84
                        coordinate reference system
                </xs:documentation>
                <xs:documentation>
                        This geo-oasis Simple element maps completely onto the where + gml:Polygon
                        combination of geo-oasis GML
                </xs:documentation>
                </xs:annotation>
        </xs:element>

<xs:element name="box" type="geo-oasis:SimplePositionType">
        <xs:annotation>
                <xs:documentation>
                        Rectangular envelope property element containing two pairs of coordinates
                        (lower left envelope corner, upper right envelope corner) representing latitude
                        then longitude in the WGS84 coordinate reference system
                </xs:documentation>
                <xs:documentation>
                        This geo-oasis Simple element maps completely onto the where + gml:Envelope
                        combination of geo-oasis GML
                </xs:documentation>
        </xs:annotation>
</xs:element>
        <!-- ================================================ -->
<xs:complexType name="SimplePositionType">
        <xs:complexContent>
                <xs:annotation>
                        <xs:documentation>
                                Extended doubleList with the addition of geo-oasis where attributes
                        </xs:documentation>
                </xs:annotation>
                <xs:extension base="geo-oasis:doubleList">
                        <xs:attributeGroup ref="geo-oasis:whereAttrGroup"/>
                </xs:extension>
        </xs:complexContent>
</xs:complexType>
        <!-- ================================================ -->
        <xs:simpleType name="doubleList">
```

```
            <xs:annotation>
                <xs:documentation>XML List based on XML Schema double type, identical to gml:doubleList.  An element of this type contains a space-separated list of double values</xs:documentation>
            </xs:annotation>
            <xs:list itemType="xs:double"/>
        </xs:simpleType>
        <!-- ================================================= -->
        <xs:attributeGroup name="whereAttrGroup">
            <xs:annotation>
                <xs:documentation>Optional additional parameters for a geo-oasis location property </xs:documentation>
            </xs:annotation>
            <xs:attribute name="featuretypetag" type="xs:NCName" use="optional">
                <xs:annotation>
                    <xs:documentation>Optional where attribute indicating the type of geographic entity is being referred to. Default is &amp;quot;location&amp;quot;</xs:documentation>
                </xs:annotation>
            </xs:attribute>
            <xs:attribute name="relationshiptag" type="xs:NCName" use="optional">
                <xs:annotation>
                    <xs:documentation>Optional where attribute indicating how geotagged content is related to the represented location. Default is &amp;quot;isLocatedAt&amp;quot;</xs:documentation>
                </xs:annotation>
            </xs:attribute>
            <xs:attribute name="elev" type="xs:double" use="optional">
                <xs:annotation>
                    <xs:documentation>Optional where attribute indicating a GPS-measured elevation in meters (e.g. WGS84 geoid height)</xs:documentation>
                </xs:annotation>
            </xs:attribute>
            <xs:attribute name="floor" type="xs:double" use="optional">
                <xs:annotation>
                    <xs:documentation>Optional where attribute indicating elevation by building floor</xs:documentation>
                </xs:annotation>
            </xs:attribute>
            <xs:attribute name="radius" type="xs:double" use="optional">
                <xs:annotation>
                    <xs:documentation>Optional where attribute indicating size in meters of a radius or buffer being indicated around the geometry (e.g. radius of circular area around a point geometry </xs:documentation>
                </xs:annotation>
```

```
            </xs:attribute>
        </xs:attributeGroup>
        <!-- ================================================ -->
</xs:schema>
```

The text for the EXDL/HAVE standard ends here.
