Ministry of Health and Long-Term Care
Ministry of Health Promotion

Emergency Medical Services
Technology Interoperability Framework
(EMSTIF)

Technology Roadmap Working Group Briefing

Public Safety Delivery
Health Services I&IT Cluster (May 2010)
Purpose

To provide an overview of the Emergency Medical Services Technology Interoperability Framework (EMSTIF) Project including;

- Project Objectives and Strategy
- Key Background Information and technical challenges
- EMSTIF Strategy & Approach
EMSTIF Project Objectives

The Emergency Medial Services Technology Interoperability Framework (EMSTIF) project, has the following key objectives;

Acquire and implement a Commercial Of The Shelf solution (COTS) which will serve as the platform framework through which to deliver three key business and technical requirements:

1. provide the Ministry, Emergency Health Services Branch (EHSB) and Emergency Medical Service Providers with the ability to view Ambulance fleet location and status throughout Ontario in real time

2. provide the ability and capability for bi-directional data sharing between a myriad of disparate systems (for example; Automatic Vehicle Location (AVL), the Ministry CAD to ePCR (electronic Patient Care Report ) / eACR (electronic Ambulance Call Report), the Ministry CAD to Mobile Data Terminal (MDT) and MDT-like devices, the Ministry CAD to other Agency CAD Vendor systems, etc.)

3. provide Central Ambulance Communications Centre (CACC) / Ambulance Communications Service (ACSs) with the ability to automatically and simultaneously notify Fire Services within Ontario (where required and per tiered response agreements), of the need to also respond to medical emergencies. This notification would be generated electronically from the Ministry’s Computer Aided Dispatch (CAD) system, which is also referred to as Ambulance Response Information System (or ARIS II)
Two Drivers (Modernization Strategy)

This project is being undertaken as part of the province wide ambulance dispatch modernization / improvement initiative that supports Ontario's ambulance dispatch program in compliance with legislated mandates.

1. **EMS Partners (AMEMSO, Municipalities & Allied Agencies)**
   - Extend CAD functionality via bi-directional data sharing capabilities to EMS Partners
     - Municipalities have a growing need for bi-directional data sharing (inc. updates) and communications between the ARISII CAD and technologies such as electronic Patient Care Records (ePCR's) / electronic Ambulance Call Reporting (eACR's), Automatic Vehicle Location (AVL) & Mobile Data Terminal like devices (MDTs)
     - Province wide real time view of all ambulance and crew to more effectively manage resources while improving pre-hospital care through out Ontario

2. **Ontario Fire Marshall (OFM)**
   - Automate Fire Service notification process (Tiered Response), so Fire Services within Ontario are alerted electronically once medical emergency events are created by Ambulance Dispatch Centers (ARIS II CAD)
     - Has been stated that “The fire service is not being used to its fullest potential in critical Emergency Medical situations”
       (ref. Ontario Association of Fire Chiefs & Ontario Professional Fire Fighters Association - March 2009)
     - “Breakdown typically occurs in dispatch. When fire and ambulance are not dispatched at the same time there is a delay between the first emergency call for help and fires response. As a result patient survivability suffers”
       (ref. Ontario Association of Fire Chiefs & Ontario Professional Fire Fighters Association - March 2009)
# Ambulance Service and Dispatch Models in Ontario

<table>
<thead>
<tr>
<th>Model 1:</th>
<th>Model 2:</th>
<th>Model 3:</th>
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<tr>
<td><strong>Single Dispatch Centre (CACC/ACS) with CAD &amp; Multiple EMS Operators</strong>&lt;br&gt;Standard Central Ambulance Communications Centre (CACC) (i.e. London)</td>
<td><strong>Single Dispatch Centre (CACC/ACS) with CAD &amp; Single EMS Operator</strong>&lt;br&gt;Niagara Ambulance Communications Service NACS), Pilot Project</td>
<td><strong>Single Dispatch Centre (CACC/ACS) without CAD (paper) &amp; Single EMS Operator</strong>&lt;br&gt;Paper based Ambulance Communications Service (i.e Muskoka)</td>
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<td>- Ministry operated centre&lt;br&gt;- Dispatches for 7 Upper Tier Municipalities, each having their own EMS operation, and 1 First Nations EMS operator&lt;br&gt;- CAD system is interfaced with 17 other identically configured centres allowing for the seamless electronic sharing of ambulance call information&lt;br&gt;- Other technologies referred to in the initial slides as requirements are not available at this, or the 17 other identically configured dispatch centres</td>
<td>- Evaluating effectiveness of locally-based dispatch services (could this configuration strengthen the delivery of pre-hospital emergency medical care in Ontario)&lt;br&gt;- One of the components of the pilot was to evaluate the benefits of integrating proven and/or emerging technologies within the ambulance dispatch centre (technologies piloted include; automated electronic fire notification; AVL; MDTs &amp; eACR/ePCR&lt;br&gt;- During the pilot period, none of the above-mentioned technologies have been adopted across other dispatch centres</td>
<td>- Muskoka ACS operates a 2 position manual dispatch service, recording ambulance call information on multi-part, paper-based forms known as AS5D&lt;br&gt;- Muskoka ACS dispatches for the local area of the Muskoka District. The District has contracted its EMS operations to a third party.&lt;br&gt;- The centre has no technologies related to a Computer Aided Dispatch (CAD), system</td>
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Principles (5 Principles of Ontario’s Ambulance System)

ACCESSIBILE:
- Land ambulance resources are available across the province
- Access to excellent pre-hospital emergency health care when needed
- Dispatch centers ensure rapid, **boundary-less ambulance response**

SEAMLESS:
- **Closest ambulance in time responds to emergencies, at any time, to/from any jurisdiction**
- Ambulance services are always available for response regardless of location or timing of calls
- Ambulance communication services ensure ambulance resources are dispatched to major incidents while continuing to ensure local ambulance needs are met

INTEGRATED:
- Major health care components are **interactive** and linked through purpose and function
- **Integrated through a network of dispatch centers**
- Patient transfers demonstrate integration of all major components of the province’s health care system – ambulance dispatch, ambulance services, hospital and medical services

RESPONSIVE
- Municipal ambulance services must remain responsive to the changing health care, demographic, socio-economic and medical needs in their area

ACCOUNTABLE
- Ambulance service operators are medically, operationally and financially accountable to provide service of the highest possible caliber
Current Business & Technology Model (High-level)

- EMS partners select their own technologies (i.e. ePCR/eACR, MDT’s, AVL)

- Current model can not leverage technology investments made by MOHLTC or EMS partners on a provincial scale - only within the geographic region of responsibility where implemented

- EMS fleet traveling outside of their primary CACCs/ACS are not visible on CACCs/ACS map as a visual reference

- EMS ePCR/eACR, MDT investments are not presently interfaced with CACCs/ACS nor would the present architecture allow for them to be leveraged outside of their primary CACCs/ACS geographic region
**Existing Interfaces (Dispatch Model 1 & Model 2)**

**Model 1**
Single Dispatch Centre (CACC/ACS) with CAD & Multiple EMS Operators
(e.g. London CACC – linked to 17 other dispatch centers throughout Ontario)

- Automatic Number Information/Automatic Location Information (ANI/ALI)
- Automatic Vehicle Locator
- Seamless (CAD to CAD)

**Model 2**
Single Dispatch Centre (CACC/ACS) with CAD & Single EMS Operator
NOT integrated with other dispatch centres throughout Ontario
(e.g. Niagara – piloting various technologies)

- Automatic Number Information/Automatic Location Information (ANI/ALI)
- Automatic Vehicle Locator
- Automatic Vehicle Locator
- Fire Notification (SCFD & NFD)
- Electronic Patient Care Record (ePCR)
- Mobile Data Terminal
- Bio-Surveillance
- AlphaNumeric Paging/SMTP Paging
Challenge in Scenario (Solution Today under Model 2)

- To achieve the three project objectives, each CACCs/ACS would require an exponential increase in infrastructure.
- This infrastructure model would have to be replicated at all CACCs/ACS throughout Ontario.
- Will require multiple Ministry CAD interfaces to multiple EMS-implemented technologies (i.e. multiple AVL, ePCR/eACR, MDT interfaces to multiple CAD interfaces).
- This model would become unsupportable and cost prohibitive.
- Adds excessive risk in the event of systems failure as the impact could have a knock on effect with other CACCs/ACS.
- Would require a longer design, procurement and implementation timeframe.
- Would require significant resource from other ministry clusters to approve and deliver the change (threat, risk, assessment, architecture, procurement etc.).
- Will not leverage a COTS solutions and would require extensive customization activity.
Future with EMSTIF (High-level)

- EMSTIF would deliver the three key business requirements through a single platform framework solution.
- Limit the CACCs/ACS infrastructure change and investment from multiple to a single interface to the Ministries CAD and as it relates to multiple EMS implemented technologies (i.e. multiple AVL, ePCR/eACR, MDT interfaces to single CAD interface).
- Can be delivered within a more manageable timeframe (as opposed to Model 2).
- Can be delivered using a COTS solution approach which is proven in other EMS jurisdictions.
- Is supportable with limited additional risk and as experienced within today’s model.
Future Interfaces with EMSTIF Model

Dispatch EMS TIF Model

Automatic Number Information/Automatic Location Information (ANI/ALI)

EMSTIF

Example Technology Interfaces
- Fire Notification
- AVL
- ePCR/eACR
- MDT
- Bio-Surveillance
- AlphaNumeric / SMTP Paging

Seamless (CAD to CAD)
Summary (Infrastructure Growth variance between today’s Model 2 and with EMSTIF Model)

Technical Solution Delivered Today with Model 2 (Allied Agency Notification, Real-time View and MDT)

Technical Solution Delivered with EMSTIF Model (Allied Agency Notification, Real-time View and MDT)
Strategy & Approach

Implement a single platform solution (COTS) with an architecture that provides;

- Application to application data sharing across different vendor platforms
- Ability to connect to and with the myriad of disparate Partner systems (Allied Agency technologies, CAD to CAD, eACR/ePCR, MDTs, AVL, LAN, WAN, Wireless, Radio etc)
- Single shared platform
- Capable of communication across multiple bandwidths (considerations; LAN, WAN, WiFi, Wireless, Satellite, Radio etc.)
- Scalable
- Supportable
- Secure (encryption)
- In line with the open systems principles (i.e. flexibility to support any data output standards)
- Allows for future technology adoption to become easier and quicker to implement (as Municipalities, EHS and MOHLTC require – either collectively or individually)
- Based around the 5 Principles of Ontario's Ambulance System (Accessible, Seamless, Integrated, Responsive & Accountable)