**Attachment 1: Calgary Fire Department Medical Service Delivery**

### History

The Calgary Fire Department (CFD) began providing first-aid treatment in the early 1950s and has continued to provide medical services to the citizens of Calgary. With increased responses to medical calls, in 1971, an emergency medical services Ambulance Division was amalgamated under CFD. Firefighters received training through SAIT's Emergency Medical Technical (EMT) Program, ensuring competently trained firefighters continued to provide a broad base of medical services to Calgarians including emergency resuscitation and first-aid treatment until the arrival of an ambulance with trained paramedics. The amalgamated service ended in 1983 when the Ambulance Division became a separate business, Calgary EMS, within The City. In April 2009, The Province of Alberta transitioned Calgary EMS to Alberta Health Services (AHS), which began assuming responsibility for the direct operation of ground ambulance service in Calgary.

### The CFD Medical Model and Relationship with AHS-EMS

The CFD co-responds to life-threatening, time-dependent emergency medical calls, motor vehicle collisions, and multi-casualty incidents. The CFD employs a complementary business model to AHS-EMS services, with the fire department providing basic critical medical services or Basic Life Support (BLS); and often arriving first. When EMS arrives, their staff have the ability to provide advanced life support (ALS) services before potentially transporting patients to the hospital.

Firefighters are trained to a fire medical responder standard based on identified competencies approved by The Province of Alberta. CFD's patient care includes a primary survey with initial critical interventions, including patient stabilization until AHS-EMS arrives. Responsibility for overseeing CFD's standard of care falls upon the CFD Medical Director, who periodically reviews protocols to ensure CFD's medical program adheres to current trends and accepted community practice. The CFD Medical Director is also a Medical Director with AHS/EMS, and provides assessment and feedback on CFD's medical program.

CFD regulates the responses through Calgary 9-1-1 using CFD protocols. These protocols firstly capture medical call types appropriate for CFD response and then ensure that for those call types the appropriate resources are identified and sent in a timely fashion to render medical treatment and increase the chance of patient survival. It is important to note that when a call is received, the resources are dispatched with the best information available from 9-1-1 but the emergency could be far more critical than originally anticipated. Essentially, seconds matter on every call.

## Emergency Medical Services, Alberta Health Services Model

The AHS-EMS range of services is complex. In addition to its core business of advanced pre-hospital medical care and transport services, the Calgary Zone EMS provides a Community Paramedic Program, a Community Health and Pre-hospital Support Program, and established evidence-based medical protocols that are provided to all patients.

The Alberta Emergency Health Services Act guides the governance and delivery of emergency medical services in the Province of Alberta. Ambulance service within Alberta is provided and governed by AHS and legislated by Alberta Health and Wellness, which sets and enforces

standards and required practices for Alberta emergency medical and ambulance services. Under the Health Professions Act, there are three levels of emergency medical service practitioners, with licensure of these practitioners through the Alberta College of Paramedics:

1) Emergency Medical Responder (EMR): Basic level of medical training
2) Primary Care Paramedic (PCP): Previously referred to as an Emergency Medical Technician (EMT): more comprehensive training that is comprised of an eight-month certificate program.
3) Advanced Care Paramedic (ACP): Previously referred to as an Emergency Medical Technologist Paramedic (EMT-P): the highest level for ground ambulance that requires two years of advanced training and practicum before being certified to work.

In Calgary, there are 46 ambulances in service at peak times with 26 operating at all times. They are housed out of 17 fire stations, in several urgent care facilities, and in district stations where multiple EMS crews and vehicles are situated. All ambulances can provide advanced life support.

**What Medical Services Does CFD Provide?**
Using data from 2017, Table 1 reflects the services CFD provides in advance of AHS-EMS arrival. Services can range from scene stabilization to critical services including defibrillation, Naloxone administration in response to an opioid overdose, or clearing an obstructed airway.

Source: Fire RMS/Firehub

| Table 1: CFD medical actions taken prior to AHS-EMS arrival | |
|---|---|
| • Primary survey | • C-Spine stabilization |
| • Peripheral capillary oxygen saturation readings | • Patient removal |
| • Pulse readings | • "C" collar applied |
| • Blood pressure readings | • Assist with EMS entry |
| • Oxygen administered | • Suction used |
| • Bag valve mask (BVM) used | • Irrigated injury |
| • Oropharyngeal Airway (OPA) inserted | • Child delivery |
| • Cardio pulmonary resuscitation performed | • Splint applied |
| • Nasal Naloxone | • Helmet removed |
| • Defibrillation | • Tourniquet applied |
| • Control bleeding | • Bystander/family support |

Table 2 below shows the medical incidents to which CFD was dispatched over the past five years, and provides insight into the diversity of calls that firefighters respond to. The responses include, for example, gunshot wounds, lacerations, overdoses, suicides and cardiac arrests. The table also reflects that the volume of medical calls to which CFD responds has increased by 19% since 2013.

| Table 2: Critical medical intervention, per dispatch code | | | | | | |
|---|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 | % change 13-17 |
| Breathing problems | 5,272 | 5,576 | 5,463 | 5,051 | 5,461 | 3.6% |
| Unconscious/fainting | 3,933 | 4,365 | 4,250 | 4,354 | 5,247 | 33.4% |
| Chest pain | 3,659 | 3,773 | 3,931 | 4,216 | 4,664 | 27.5% |
| Cardiac (respiratory) arrest/ death | 833 | 854 | 991 | 1,278 | 1,669 | 100.4% |
| Fall | 1,519 | 1,695 | 1,595 | 1,467 | 1,489 | -2.0% |
| Hemorrhage/lacerations | 1,362 | 1,490 | 1,412 | 1,373 | 1,482 | 8.8% |
| Convulsions/seizures | 1,338 | 1,278 | 1,265 | 1,191 | 1,155 | -13.7% |
| Overdose/ingestion | 284 | 305 | 361 | 516 | 963 | 239.1% |
| Heart problems/automated ICD | 635 | 647 | 638 | 599 | 554 | -12.8% |
| Psych./behavioral/suicide | 293 | 364 | 384 | 386 | 490 | 67.2% |
| Traumatic injuries (specific) | 347 | 334 | 329 | 329 | 341 | -1.7% |
| Allergic/medical reaction | 317 | 324 | 267 | 296 | 323 | 1.9% |
| Assault | 333 | 302 | 310 | 292 | 314 | -5.7% |
| Choking | 266 | 257 | 284 | 283 | 276 | 3.8% |
| Pregnancy/childbirth/miscarriage | 321 | 266 | 276 | 241 | 272 | -15.3% |
| Gunshot/penetrating trauma | 159 | 151 | 181 | 158 | 198 | 24.5% |
| Diabetic problems | 191 | 163 | 158 | 155 | 155 | -18.8% |
| Abdominal pain/problems | 133 | 138 | 135 | 118 | 151 | 13.5% |
| Traffic/transportation accident | 125 | 143 | 103 | 131 | 116 | -7.2% |
| Carbon monoxide inhalation | 23 | 26 | 15 | 26 | 88 | 282.6% |
| Stroke/cerebrovascular accident | 103 | 112 | 108 | 113 | 61 | -40.8% |
| Heat/cold exposure | 28 | 32 | 30 | 26 | 44 | 57.1% |
| Inaccessible/trapped non-vehicle | 6 | 6 | 4 | 4 | 14 | 133.3% |
| Other | 2,479 | 2,474 | 2,511 | 2,517 | 2,870 | 15.8% |
| Total | 23,959 | 25,075 | 25,001 | 25,120 | 28,397 | 18.5% |

Source: Calgary 9-1-1 Computer Aided Dispatch (CAD) system

## Emergency Scene Relationship with CFD and AHS-EMS

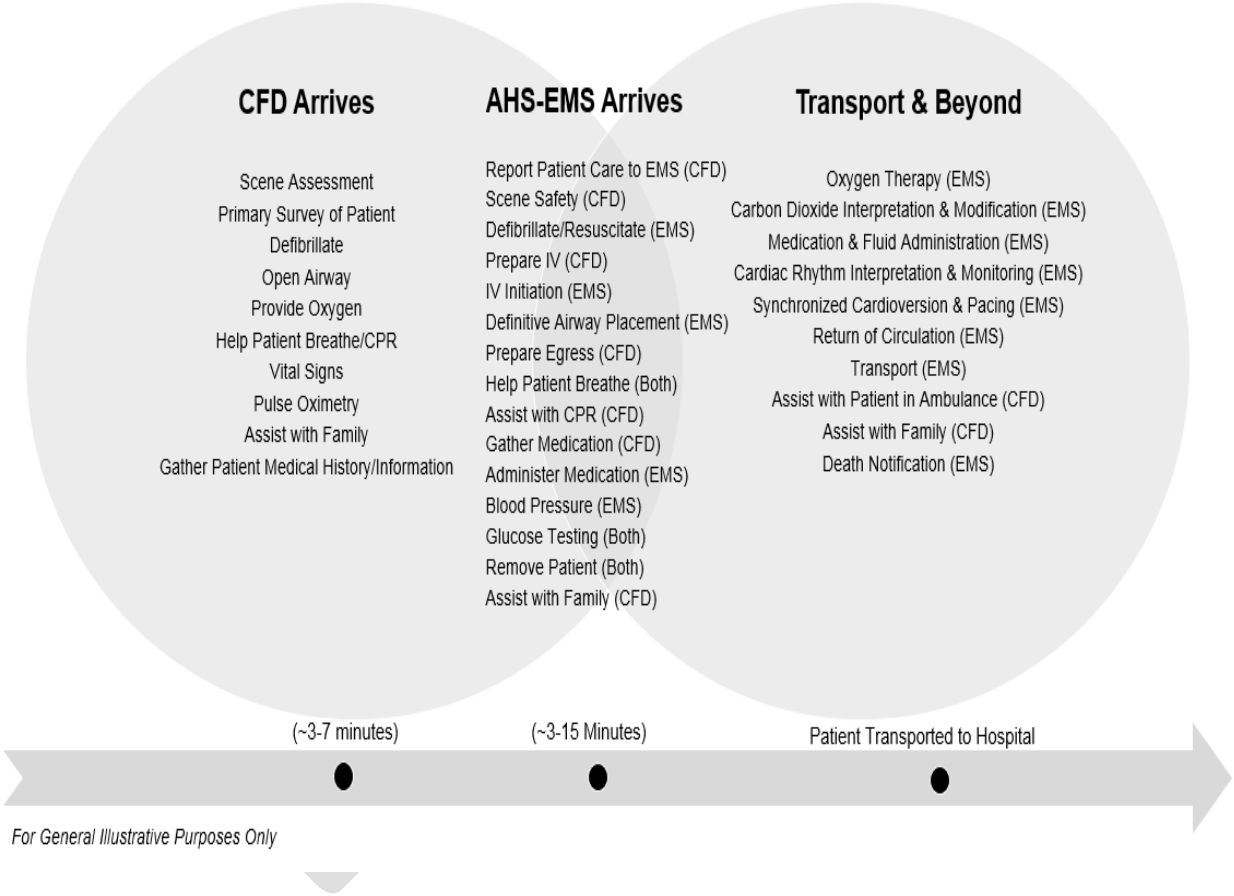
When it comes to critical medical interventions, firefighters play an important role in the chain of survival. The visual below represents the on-scene working relationship between CFD and AHS-EMS at a cardiac arrest, showing that CFD can typically arrive on scene between 5 and 7 minutes, while AHS-EMS can take as long as 10 minutes to arrive.

Upon arrival, firefighters are trained to perform a variety of medical intervention tasks critical to saving a patient's life prior to AHS-EMS arrival. When AHS-EMS arrives, firefighters often continue to work with AHS-EMS crews as they administer advanced life support to ensure patient stability and care. For the highest acuity calls firefighters also accompany AHS-EMS crews to the hospital during patient transport to ensure continuity of care right into the emergency room.

**Attachment 1: Calgary Fire Department and Alberta Health Services**
**Medical Service Delivery Models**

In several situations, including the cardiac example below, two people are not enough to complete the critical tasks of a medical scene and CFD firefighters support AHS-EMS in these circumstances to ensure the highest level of patient care. Where the CFD arrives first, they complete a scene assessment, then performs several tasks including defibrillation and attempt to resuscitate the patient. EMS will arrive shortly thereafter and take control of the scene and continue to resuscitate the patient with IV, medications and defibrillation, if necessary. Research shows that for every minute during a cardiac arrest, the chance of survival decreases by 7-10%, so at a 5 minute response time – the patient has a 50% chance of survival; and depending on the arrival times of the first responders, it could be the difference of life or death.

**Example: CFD Arrive First On-Scene of Cardiac Arrest - Emergency Scene Relationship**




*For General Illustrative Purposes Only*

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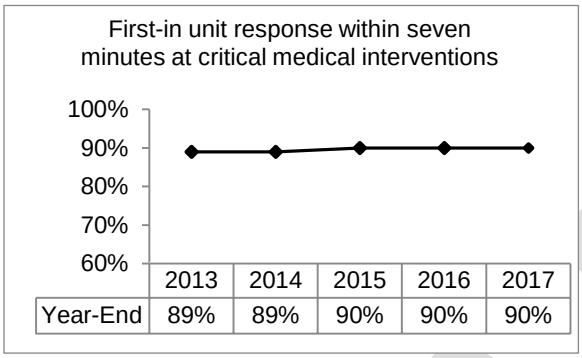
**Medical Service Delivery Models**

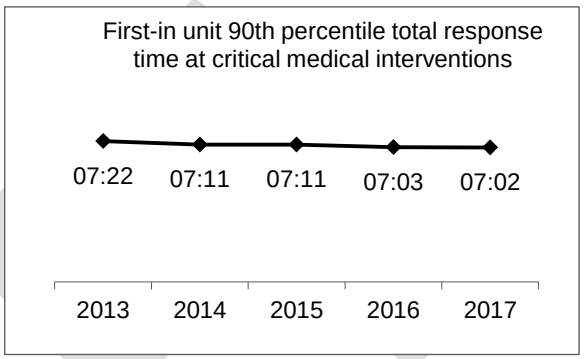
Response Time Performance

Calgary City Council's current target for responses to fire rescues and life-threatening medical incidents is for the first-in unit to arrive within 7 minutes, 90 per cent of the time.

In 2017, CFD met its total response time objective for first-in unit response at critical medical interventions 90 per cent of the time, with a 90th percentile time of seven minutes 2 seconds starting from when CFD gets notified to dispatch resources. The call handling portion is currently done by AHS which is not included in our reported response. Response time performance has been steadily improving since 2013, with the target currently being met.




| | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|
| Year-End | 89% | 89% | 90% | 90% | 90% |

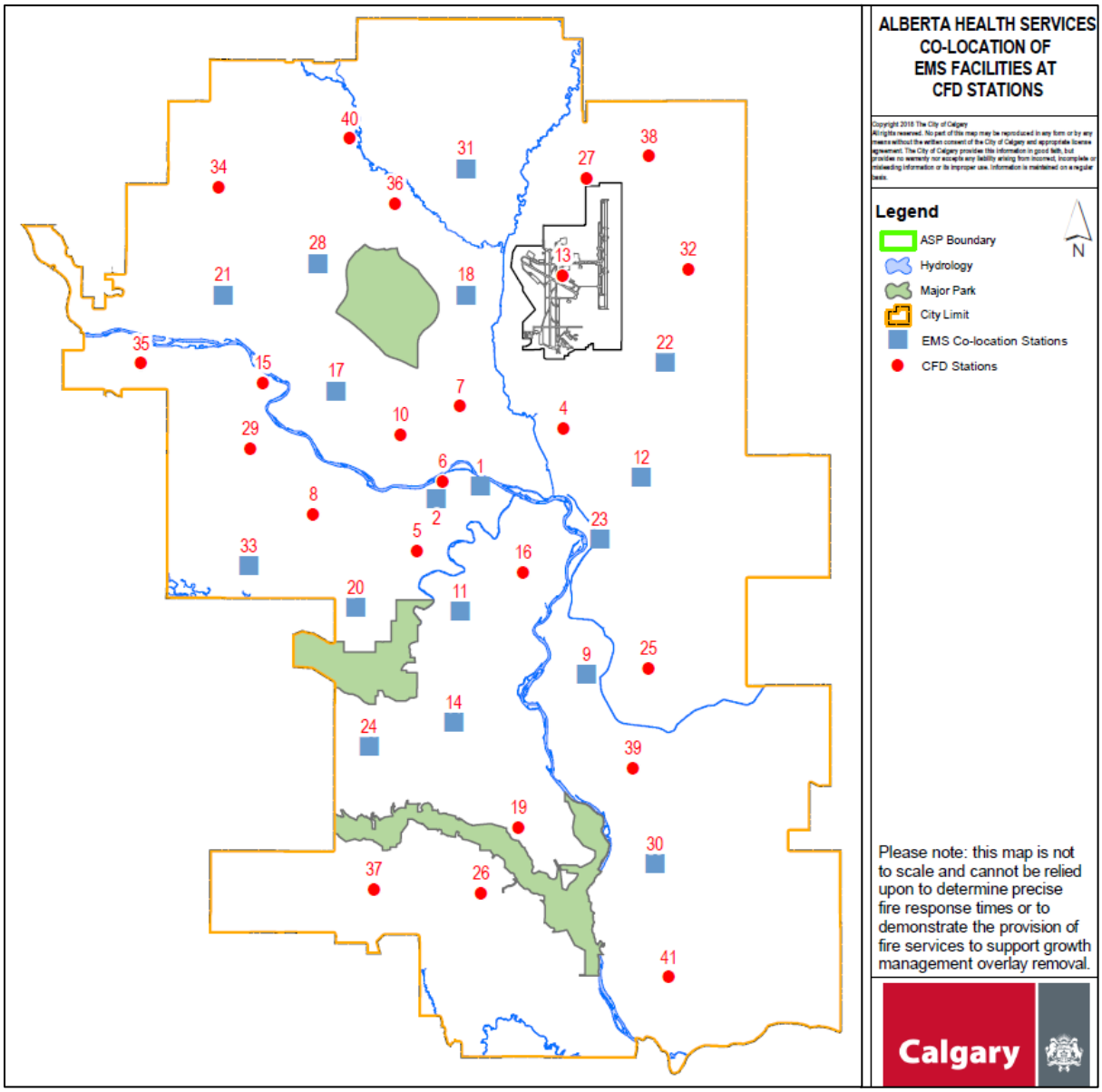



When responding to critical medical interventions, firefighters often arrive before AHS-EMS to initiate and render medical treatment. In 2017, firefighters arrived on scene and made patient contact before the arrival of AHS-EMS almost 40 per cent of the time, an increase of more than seven per cent over the previous two years, and spent an average of 13 minutes 40 seconds total time on scene, close to two minutes longer than the average time spent on scene in 2016.

**Attachment 1: Calgary Fire Department and Alberta Health Services**
**Medical Service Delivery Models**

AHS-EMS Co-Locations

CFD and AHS-EMS are co-located at 17 of the 40 emergency response fire stations in Calgary. While AHS-EMS also has some ambulance response locations that are not co-located with CFD, the following map shows where CFD stations are located, and which stations also house AHS-EMS resources. As the map shows, CFD has a greater distribution of physical stations across the City, and this assists with CFD's ability to respond quickly.



## AHS-EMS Performance

Prior to the transition of EMS dispatch and ground ambulance service to AHS, Calgary EMS designed its system of having a service target to arrive at critical life-threatening emergency calls (named "Delta" and "Echo" calls) within 7 minutes 59 seconds, 90 per cent of the time. In 2007, through its Service Targets Report to Calgary Council (CPS2008-67), Calgary EMS reported 78 per cent compliance against its service target, with an average time (including all types of calls) of 7 minutes 3 seconds.

In July 2008, Calgary EMS provided a progress update on the development of its service level and response performance benchmarks which concluded that:

- The City of Calgary EMS achieves a higher compliance to this service target when compared to other EMS systems, but is not meeting the target.
- There is minimal evidence to support or refute the appropriateness of the present critical life-threatening service target.
- The City of Calgary EMS should retain the 7 minute 59 second or less service target to critical life-threatening emergencies until further evidence is available describing the risk of changing this target.
- The City of Calgary EMS should continue implementing key initiatives to sustain present service targets and maintain excellent service to citizens.

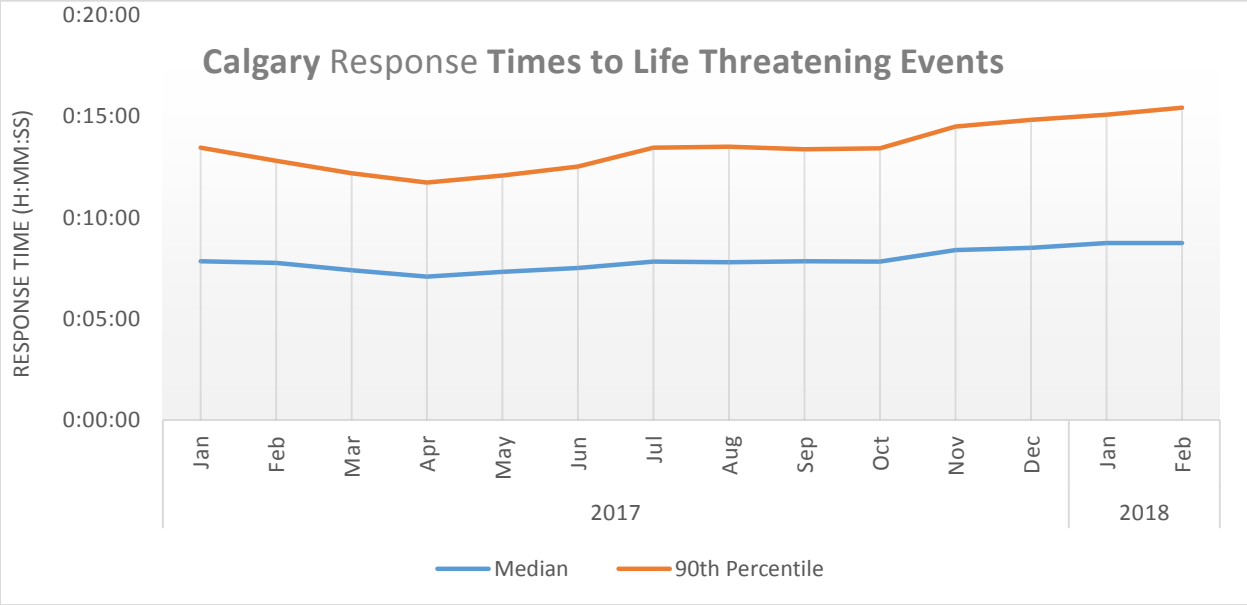
Calgary EMS was to report back to Council in September 2009 on its service level and response performance benchmarks. As AHS had taken over responsibility of ground ambulance services in April 2009, Calgary EMS reported that its performance measures would no longer be reported to Calgary City Council. Following the transition of ground ambulance service, AHS set a response time benchmark of arriving within 12 minutes 90 per cent of the time within the province's urban areas, and has set longer targets (15 minutes to 75 minutes) for areas outside the province's larger centres.

AHS-EMS Calgary Zone responded to over 169,500 events from January 2017 to February 2018, including 92,179 delta and echo emergency events.

Similar to the deployment of CFD resources to life-threatening, time-dependent emergency medical calls (Delta and Echo), AHS-EMS dispatch categorizes calls according to the severity of the patient's condition in order to dispatch the appropriate medical aid (calls are triaged into levels in order of increasing urgency – Alpha, Bravo, Charlie, Delta and Echo).

<u>AHS-EMS Response Time to Life Threatening Events</u>

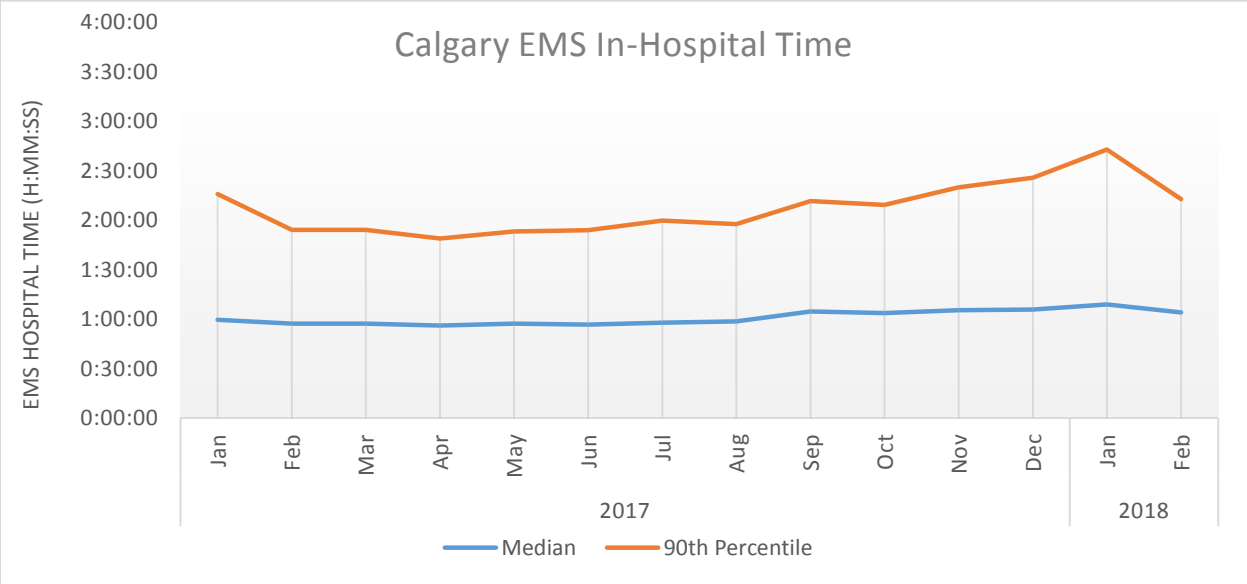
The AHS-EMS response time benchmark is the time elapsed from when a 9-1-1 call is received at an EMS dispatch centre until the first EMS unit arrives on scene. The figure below shows Calgary AHS-EMS response time performance for life-threatening events for the period from January 2017 to February 2018. As of February 2018, AHS-EMS is currently arriving at 90$^{th}$ percentile life-threatening Delta and Echo events in over 15 minutes. AHS-EMS 50$^{th}$ percentile performance is ranging between 7 and 8 minutes; or 1 in every 2 times, AHS-EMS will arrive in between 7 and 8 minutes.




Source: AHS-EMS 2017 Annual Report Presentation (2018)

## Calgary EMS In-Hospital Time

The figure below shows the time elapsed from when an AHS-EMS ambulance arrives at an emergency department until that ambulance is available to respond to another call. As shown, ambulances have been spending an increasing amount of time at hospitals for transported patients, with in-hospital time ranging from 2 hours to 2 hours 45 minutes waiting in an emergency department in January 2018 at 90$^{th}$ percentile. At 50$^{th}$ percentile, the time is approximately 1 hour.




Source: AHS-EMS 2017 Annual Report Presentation (2018)

## Continuous Improvements to the CFD Business Model

CFD refines its service delivery model based on evolving characteristics of the community. To do so, CFD assesses its performance and reviews call types to ensure that Calgarians receive appropriate service. Current and future enhancements to the medical service delivery model include:

### Medical Response Units

In 2015, CFD evaluated high demand medical call volume areas in the city, and through Calgary City Council's Innovation Fund, CFD received funds to purchase and pilot two medical Response Units (MRUs) in the highest medical call volume areas. The MRUs were dedicated to responding only to medical calls, staffed by 2 firefighters. The pilot concluded that the MRUs created positive impacts to patient outcomes and improved response time performance to an extent that warranted the permanency of the pilot MRUs. CFD has continued to evaluate its medical response workloads to identify the optimal location of additional MRUs, resulting in a third MRU being placed into service in December 2017. Ongoing analysis will be conducted to determine if further MRUs will be required.

### Continual Review of Medical Response Dispatch

CFD and AHS-EMS will continue to meet semi-annually to review call definitions to ensure that CFD is being dispatched to the appropriate calls and that necessary emergency medical services are being provided to Calgarians. The review involves a joint working group with both CFD and AHS-EMS staff, where over 800 call types are reviewed, ensuring that the right resources are dispatched from Calgary 9-1-1.

### Medical First Response Program

AHS has a responsibility to ensure patient care is delivered safely and is committed to ensuring responders are trained, prepared and supported to deliver that care. AHS and Alberta Health, in collaboration with an expert advisory panel developed a provincial model for Medical First Response. The goals are:

•Build provincial standards for MFR service delivery;

•Support the people and agencies providing MFR; and

•Promote safe patient care with medical oversight and patient care guidelines.

To date, the Calgary Fire Department has not officially signed a Medical First Response agreement with Alberta Health Services, and is still exploring costs and benefits of signing up. CFD has confirmed that The City is not precluded from seeking reimbursement for medical first response services should an MFR agreement be executed. Additionally, committing to the MFR program will have little impact on the current operation of medical response services.