Subject: Niagara EMS System Transformation Update 2

Report to: Public Health & Social Services Committee

Report date: Tuesday, November 5, 2019

Recommendations

1. That Regional Council **RECEIVE FOR INFORMATION** the following report pertaining to the recent changes made to the delivery of services provided by Niagara EMS.
2. That the dedicated resources for the continuation of the System Transformation **BE REFERRED** for consideration as part of the 2020 budget process.

Key Facts

- From 2007 to 2016, Niagara was the municipality with the largest growth in EMS calls in Ontario at 55.6%, almost double the Provincial growth of 30%.
- Increased call volume growth resulted in Niagara EMS being challenged in its ability to provide sustainable response time reliability for Niagara residents while meeting Council's desire for taxpayer affordability.
- As well, increased 911 calls leading to ambulance transports coincided with and contributed towards increased hospital overcrowding and "hallway medicine" that has not well-served patients.
- These challenges were forecast to continue without a system-wide change to the delivery of services or a large infusion of resources. Council directed a new approach rather than continuously adding resources.
- Over an 18-month process, Niagara EMS has studied current 911 calls, studied the science and evidence around which calls need what resource and at what speed, identified alternate care pathways for persons not needing immediate response, and developed a mobile integrated health system in alignment with this science and evidence.
- On September 24, 2019, the final key system changes were initiated and the system is under observation to assess the impact of this major transformation.

Financial Considerations

The System Transformation Project has been funded in 2019 through the Ambulance Dispatch Reserve (PHD 06-2018). Early outcomes of the project has contributed to the offset of as many as three 24-hour ambulances that otherwise may have been required to maintain the same level of service the past 24 months. This equates to approximately $3M in offset costs to the Regional budget and 0.4% ($1.5 million) on the Regional levy. Staff continues to evaluate these changes as they relate to staff working conditions and

economical impact such as overtime and missed meal breaks. Sustainability to continue the assessment of the new service delivery model is a topic for deliberation to the 2020 operating budget.

Dedicated resources will be required in order to continue the System Transformation into 2020. The annual net operating impact for 2020 is estimated at $210,000 after requested provincial funding, which includes one permanent non-union FTE responsible for the ongoing management and optimization of the system transformation, as well as 3.8 temporary Emergency Communications Nurses, and funds to continue to externally contract allied health staff. A business case will be submitted for consideration through the 2020 budget approval process. The financial implication of these resources, if they are all approved, would be equivalent to 0.06% of the levy.

This potential financial implication should be considered in context of new budget commitments previously endorsed by Council and new budget pressures outlined by staff, as summarized in the following table presented to Budget Review Committee to illustrate the potential levy impact estimated for the 2020 budget.

	Council Report	Levy Amount (M$)	Levy Increase %
Previously identified reports			
Suicide Prevention Initiative	PHD 8-2019	0.200	0.05%
Waterfront Investment Program – Base funding	CSD 40-2019	1.000	0.27%
Smarter Niagara Incentive Program – Base funding	CSD 40-2019	0.600	0.16%
Brock LINC request for funding	ED 9-2019	1.500	0.41%
Niagara Regional Transit - phase in cost	PW 56-2019	4.754	1.30%
NRPS 2019 position hiring deferral	BRC-C 7-2019	0.706	0.19%
Long-Term Care Home Redevelopment capital funding	CSD 53-2019	5.620	1.54%
GO Project - Station Operations	CSD 17-2019	1.410	0.39%
Canadian Coalition for Municipalities Against Racism and Discrimination	CAO 14-2019	0.142	0.04%
EMS Central Hub capital funding	CSD 40-2019	0.390	0.11%
Potential request to-date		**$16.323**	**4.46%**

Analysis

As most recently discussed in PHD 07-2019, Niagara EMS call volume increases since 2011 have significantly deviated from historical trends, and have exceeded both staff and previous consultant predictions (Figure 1). In fact, from 2007 to 2016 Niagara was the municipality with the largest growth in EMS calls in Ontario, at 55.6% almost double the Provincial growth of 30% (MOHLTC 2018).

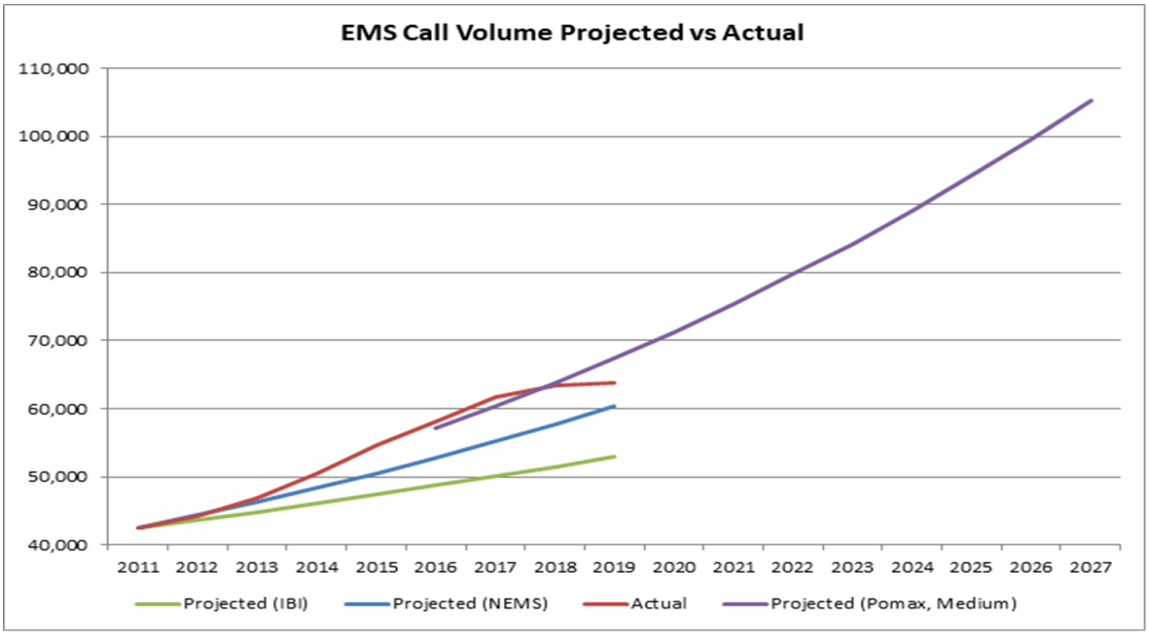

Figure 1 Call volume growth projections since 2011, comparing actual vs. NEMS vs consultant (IBI) predictions. Increase of 21,024 calls/year since 2011 represents a 49.7% increase in call volume. Resource increase during the same period was 25%.

It was apparent that conventional approaches to the delivery of unscheduled health care must be challenged to provide sustainable approaches to quality patient care.

In PHD 07-2019, staff outlined a number of measures that had been implemented as part of system change and introduced several more initiatives that were to be completed as part of an EMS System Transformation. On September 24, 2019, the last of the key initiatives was implemented. This included the launch of a new Clinical Response Plan (CRP) and the addition of the Emergency Communications Nurse System (ECNS). Each of these measures are described in more detail in Appendix 1.

As seen in Figure 1, changes made to the system in Q3-4 of 2018 and YTD 2019 has resulted in the “bending of the curve” of actual call volume. A detailed assessment of the data is being undertaken to better understand the impact of the changes and their relative contributions to this levelling of call volume. However a brief summary of early analysis is provided below.

Call Volume Rate of Growth

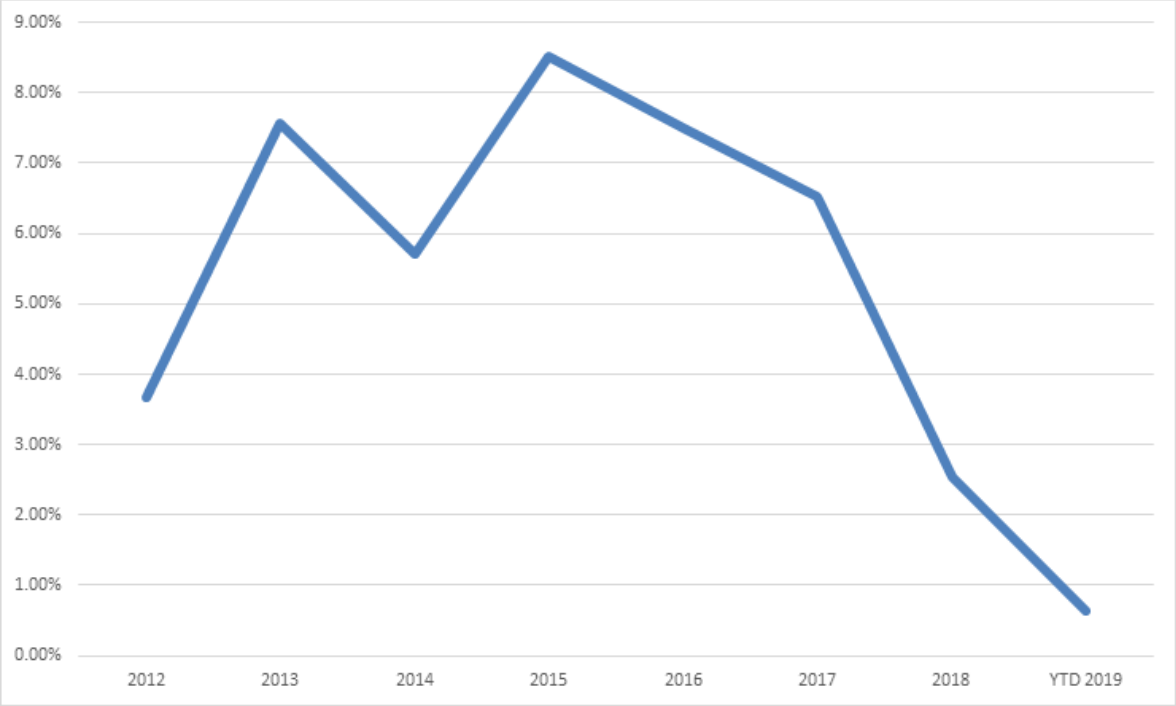

Figure 2 Call Volume changes 2012-present

System Transformation Changes

The implementation of the System Transformation Project commenced in Q1 2018 with Phase 1 of 3 that included policy changes to how the service responded to select calls. In particular, one such policy change related to responses to 911 'unknown' calls. These call-types occurred when there was no voice contact with a caller. The vast majority of these were a result of inadvertent calls, phone line issues, or were police-related matters. The improved management of these calls resulted in the avoidance of approximately 2.4% (1540) ambulance responses (as assessed in 2018).
In Q3 of 2018, Phase 2 of the system transformation was implemented that included the introduction of specialized teams consisting of paramedics and other health professionals such as mental nurses and occupational therapist. These teams target select responses such as mental health and addictions, falls and generally unwell patients where care that is more appropriate could be provided to better meet the needs of patients rather than the conventional method of transporting everyone to the emergency department. Detailed information on these teams are found in Appendix 1.
The implementation of these teams has led to a reduction in patients being conveyed to hospitals. Prior to system changes in 2018, the system experienced a five year average of 25.8% non-transport rate (this means responses where no patient was subsequently transported to a hospital with the patient's agreement). This percentage has been

positively affected (30%-transport rate in 2019) by the new MIH teams, who have responded to approximately 3000 incidents in 2019 and demonstrate a non-transport rate of 84%. This means that patients are receiving the proper health resource and being redirected to care that is more appropriate.

The final components in Phase 3 of system transformation were initiated on September 24, 2019. This included the implementation of the Clinical Response Plan (CRP) to meet the revised Response Time Performance Plan (RTPP) and the inclusion of the Emergency Communications Nurse System (ECNS). Details of each of these is included in Appendix 1. The addition of these two key components of system design are expected to further improve system performance. Niagara EMS continues to assess the impact on response times for the highest priority patients with the changes that have been implemented. Early data suggests a reduction in response times for the most critical patients, however additional data is required to draw statistically relevant conclusions. Targets for other patient acuities as identified in the new RTPP are also now being met. In addition, early data from the implementation of the ECN suggest positive ambulance response diversion and emergency department avoidance as expected. This has freed-up more ambulances to be available to achieve the improvements noted with respect to the RTPP.

With these last changes launched in less than 30 days at the time of this report, reliable outcome data is not yet available and more time is required to have statistically relevant information to make evidence informed conclusions. Statistics specific to early outcomes of these system changes will be provided to Committee at the time of presentation of this report with the caveat that this will be very preliminary data and as such, no decisions should be made at this time based on this information.

Summary

While data analysis (including an economic evaluation conducted with the Centre for Healthcare Economics and Policy Analysis at McMaster University) of the impact of these changes is ongoing, early outcomes affirm that the efforts undertaken within the System Transformation Project are having the anticipated effect of ‘bending the curve’ of significant EMS volume growth while benefitting patients with care more targeted to their true needs.

Alternatives Reviewed

In its current state, based on external recommended ratios of ambulance resources and call volume, the system is short three ambulances and one supervisor (PHD 05-2017) as well as a number of communications personnel. This does not include other factors such as offload delays and is based on call volume growth only. Previous Councils have endorsed staff recommendations not simply to follow traditional EMS service models but actively to look for innovative ways to deliver mobile health services that are not only

more efficient but also better meet the needs of patients. In absence of making these transformational changes, growth of system demand would have continued and consideration would have to be made for the addition of traditional resources (more staffed ambulances) to meet this pressure, or providing longer response times for Niagara residents experiencing emergencies.

Relationship to Council Strategic Priorities

The System Transformation Project supports Council Strategic Priorities of fostering Healthy and Vibrant Communities through the delivery of quality, affordable and accessible MIH services. In addition, this model contributes to a Sustainable and Engaging Government with a high quality, efficient, fiscally sustainable and coordinated core delivery of MIH services that is possible only through enhanced communication, partnerships and collaborations with the community. The outcomes of an integrated health system promotes improved opportunities for Healthy and Vibrant Communities and contributes to less institutionalized care and more aging at home supports. The new model of service delivery fosters engagement and collaborative planning to provide an integrated health service for Niagara communities.

Other Pertinent Reports

PHD 17- 2014 - EMS System Performance Sustainability
PHD 17- 2015 - EMS System Performance Sustainability
PHD 05- 2016 - Niagara EMS Master Plan
PHD 08- 2016 - Master Plan Award of RFP
PHD 19- 2016 - Niagara EMS Mobile Integrated Health Community Paramedic Update
PHD 21- 2016 - 2016 Update to EMS System Performance Sustainability
PHD 05-2017 - Niagara Emergency Medical Services Pomax Master Plan Review
PHD 17-2017 - Niagara Emergency Medical Services System Design Changes
PHD 19-2017 - NEMS Resource Investment
PHD 07-2019 – Response Time Performance Plan
Presentation to PHSSC August 6, 2019 – System Transformation Update

Prepared by:
Kevin Smith
Chief, Niagara Emergency Medical Services & Director, Emergency Services

Recommended by:
M. Mustafa Hirji, MD, MPH, FRCPC
Medical Officer of Health & Commissioner (Acting)
Public Health & Emergency Services

Submitted by:
Ron Tripp, P.Eng.
Acting Chief Administrative Officer

Appendices

Appendix 1 Response Time Performance Plan

This report was prepared by Kevin Smith, Chief, Niagara Emergency Medical Services & Director, Emergency Services and reviewed by Michael Leckey, Program Financial Specialist.

Appendix 1

Response Time Performance Plan

The *Ambulance Act* Ontario Regulation 257/00 states under Section 23:

> *(2) No later than October 1 in each year after 2011, every upper-tier municipality and every delivery agent responsible under the Act for ensuring the proper provision of land ambulance services shall establish, for land ambulance service operators selected by the upper-tier municipality or delivery agent in accordance with the Act, a performance plan for the next calendar year respecting response times. O. Reg. 267/08, s. 1 (2); O. Reg. 368/10, s. 1 (1).*
> *(3) An upper-tier municipality or delivery agent to which subsection (2) applies shall ensure that the plan established under that subsection sets response time targets for responses to notices respecting patients categorized as Canadian Triage Acuity Scale ("CTAS") 1, 2, 3, 4 and 5, and that such targets are set for each land ambulance service operator selected by the upper-tier municipality or delivery agent in accordance with the Act. O. Reg. 267/08, s. 1 (2).*
> *(4) An upper-tier municipality or delivery agent to which subsection (2) applies shall ensure that throughout the year the plan established under that subsection is continuously maintained, enforced and evaluated and, where necessary, updated, whether in whole or in part. O. Reg. 267/08, s. 1 (2).*

Revised Land Ambulance Response Time Performance Plan (PHD 07-2019)

CTAS	Target time*	% of target**
Sudden Cardiac Arrest	6	50
1	8	80
2	15	90
3	30	90
4	60	90
5	120	90

Response Time Reliability

Currently, Niagara EMS responds to approximately 41% of all 911 incidents with lights and siren, as potential 'time-critical' responses. Lights & siren responses could be significantly reduced by a more evidence-based response that limits lights and siren/time critical responses to those call types where clinical science shows that outcomes depend on speed of response. This would preserve resources for true life threatening/time sensitive emergencies. Some modelling in European EMS systems suggests that the true need for lights & sirens response, based on medical literature studying the impact of time on patient outcomes, may be as low as 10% of responses. This change in response urgency could impact up to 20,000 calls (up to 30% of EMS

call volume based on 2018 figures), that are currently classified as time-critical, allowing greater flexibility of resources to ensure adequate resources to address those calls identified as time dependant. British Columbia Emergency Health Services has also recently moved to a clinical response plan in 2018.

Clinical Response Plan (CRP)

Over the course of 2018, Niagara EMS, working under the guidance of our Medical Director, has completed significant work with internal staff, local medical experts representing a number of specialties, and university researchers to develop changes to the Niagara EMS response plan based on evidence of outcomes linked to timeliness of response. Academic assistance was especially helpful with conducting reviews of current medical literature as well as the completion and analysis of a public consultation survey over the summer/fall months. This survey validated that the public is receptive to a system that will better meet their needs through a variety of healthcare pathways. The result of this work is a response plan that is focused on time where time is critically important, and is focused on appropriate patient-centred resources and carefully targeted patient care where this is more important than time.

Emergency Communication Nurse System (ECNS)

The Omega Study was undertaken by Niagara EMS (2011-2016) to explore the safety and efficacy of implementing an Emergency Communication Nurse (ECN) within the Niagara Ambulance Communications Centre (dispatch) to conduct secondary triage for select low acuity 911 calls. These are patients calling 911 for non-emergent unscheduled health care needs. Utilizing an internationally recognized and validated algorithm to further triage these patients, the objective of the study was to identify those callers whose health needs may be met by providing advice on the 911 call or recommending alternate, more appropriate medical care thereby eliminating the need for an ambulance response. The study identified specific call/patient types that could be managed without undue risk using means other than an ambulance response. Successful implementation of ECNS is part of the comprehensive Clinical Response Plan and is complemented with the integration of the new Mobile Integrated Health (MIH) teams to realize full benefit.

Mobile Integrated Health

Three main categories of calls that EMS respond to and that are escalating in volumes are; mental health and addictions, elderly falls and generally unwell. To address these specific cohort of patients Niagara EMS has introduced three specialty teams; Mental

Health & Addictions Response Team (MHART), Falls Intervention Team (FIT) and Coordinated Assessment Response Unit (CARE)

MHART

- comprised of a paramedic, a mental health nurse and a social worker;
- nurses are provided in-kind through a partnership with Niagara Health as well as the Welland McMaster Family Health Team;
- the Social Worker provided in-kind through a partnership with Quest Community Health Centre;
- team responds to low acuity patients in psychological distress and attempt to align them with community resources rather than transport to an emergency department;
- team also responds to active overdose calls as well as follow-up with post-overdose patients to encourage addiction treatment and referral to community resources.

FIT

- comprised of a paramedic and an occupational therapist (OT);
- the OT's are provided through a secondment partnership with Hotel Dieu Shaver Hospital;
- team responds to low acuity calls where someone has fallen or requires a 'lift assist', to determine injury from the fall and to implement a falls prevention strategy in real-time with referrals to community programs to reduce incidents of secondary falls;
- team will also work with local long-term care facilities to decrease incidents of EMS responses to these facilities for residential falls.

CARE

- comprised of a paramedic and a health system navigator;
- navigator provided by the HNHB LHIN as a dedicated resource to provide remote system navigation;
- this unit responds to low acuity calls where the patient is 'unwell' or has specific health concerns triaged as possibly not needing hospitalization and where primary care or community services may meet their needs.