Subject: Niagara Emergency Medical Services System Transformation Update 3

Report to: Public Health & Social Services Committee

Report date: Tuesday, November 10, 2020

Recommendations

1. That the following report pertaining to the recent changes made to the delivery of services provided by Niagara EMS **BE RECEIVED** for information.
2. That the dedicated resources required for the sustainment of the System Transformation **BE REFERRED** for consideration as part of the 2021 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 an affordable, sustainable, high quality and reliable EMS system for Niagara residents.
- Without system-wide changes to the delivery of EMS services, or a large infusion of resources, increased 911 calls and demand on ambulance services were forecast to continue to grow unsustainably.
- Council directed a new approach rather than the traditional model of continuously adding ambulance resources.
- In September 2019, staff implemented the final phase of its System Transformation Project that has used science and evidence to develop a mobile integrated health (MIH) model of service delivery that incorporates advanced clinical response plans to best meet the needs of Niagara through emergency response as well as alternate care pathways for persons not needing immediate EMS response.
- Since implementation, results include reduced call volumes, improved response times for critically ill patients, reduced patient transports to hospital, increased access to appropriate services for mental health, elderly falls and other specific cohorts such as palliative patients.
- The implementation of a MIH model of system design permitted an expedited response to COVID-19 focused services such as community testing and support.
- The transformation to a MIH model provides the best opportunity for the sustainment of an affordable, high quality and reliable EMS system for Niagara.

- The system transformation has contributed to the avoidance of an estimated $4.8M per year ($2.4M net) in operating costs for each of the past two years.
- Sustaining the system transformation program for long term success will require the addition of 6.75 net FTE (11.55 permanent less 4.8 temporary) with a net impact to the levy between $238,500 to $834,000 depending on the level of funding that is committed from the Ministry.
- With the addition of the recommended FTE positions, this represents a net cost avoidance of $1.56M (net annual cost avoidance of $2,400,000 less worse case levy impact of $834,000) on future operating budgets.

Financial Considerations

Core components of the System Transformation Project (i.e. emergency communication nurses) was funded in 2019 through the Ambulance Dispatch Reserve (PHD 06-2018) and in 2020 one time funding (i.e. reserves and expected provincial funding) was provided to continue the observation of the system changes (CSD 78-2019).

A key outcome of the System Transformation is cost avoidance. To date, data indicates that the outcome of the system changes that are now one-year post full implementation has offset as many as four 24-hour ambulances that otherwise may have been required to maintain the same level of service over the past three years. At an operating cost of approximately $1.2M gross ($600K net of provincial 50/50 funding) for each additional 24 hour ambulance per year, this equates to $4.8M in offset operating costs per year representing a $2.4M (net) avoidance to the Regional budget for each of the past two years. Not adding additional ambulances also eliminated the need to increase the fleet and related equipment, which equates to additional savings on the capital budget of approximately $1.2M, of which 90% would be eligible for Development Charge funding.

In addition to the avoidance of costs otherwise needed for direct salaries for increased ambulance staffing, the changes have also had a positive impact as they relate to staff working conditions and economical impacts such as decreased overtime and missed meal breaks that requires monetary compensation when paramedics are unable to take their entitled break periods.

Dedicated resources are required to continue the System Transformation into 2021 and onward. There are currently 4.8 temporary FTE positions that would need to be converted to permanent positions to continue the program. The annual gross cost for these positions is approximately $486,000. Funding of $43,000 would be recovered through the Land Ambulance funding formula applied by the Ministry of Health (MOH)

for one of these positions. It is also anticipated that 100% funding or $400,000 would be granted for 3.8 of these FTE's as part of the MOH's Ambulance Communications funding. This latter funding source is yet to be confirmed. If the funding is not realized additional opportunities may exist to fund these positions from alternate sources and will continue to be explored, however, ultimately this may require funding from the Regional levy with a best case scenario of $43,000 to worst of $443,000.

In addition to the conversion of the above 4.8 FTE's to sustain the current System Transformation model, an additional 6.75 new permanent FTE's would be required to continue sustaining this program. The annual gross cost of these resources is estimated at $782,000. It is anticipated that funding would be provided by the Ministry of Health for at least half this cost, likely more as some of these resources are expected to qualify for 100% funding as part of the MOH's Ambulance Communications funding. The impact on the Regional levy is a best case scenario of $195,500 to worst of $391,000. Further anticipated funding details will be provided as part of the 2021 operating budget.

Implementing these modifications on a permanent basis so that these system improvements can be sustained on an ongoing basis is a consideration for the 2021 operating budget. They will be evaluated by staff in concert with all other budget pressures and mitigation options inclusive of the use of assessment growth to fund the call volume/response impacts related to growth in Niagara.

Analysis

In September 2019, the final components of the System Transformation Project were implemented to further the change in service delivery of pre-hospital health services for Niagara. A summary of the changes follows.

Clinical Response Plan (CRP)

- approved by Council, the CRP underpins the service's Response Time Performance Plan (PHD-07 2019)
- assigns resources based on both clinical needs and in the time required
- reduced the use of lights and siren responses to 10% (previously 40%)
- reduced demand on municipal fire services response to medical calls
- decreased risk, improved work conditions and maximized resource effectiveness

Mobile Integrated Health (MIH)

- new model of system design and delivery utilizing a multi-disciplinary approach with other health professionals (mental health nurses, occupational therapists) and community partners working alongside paramedics for targeted real-time response to specific 911 health needs (mental health, elderly falls)
- this approach not only reduces the requirement for a fully staffed ambulance and transports to hospital, it is designed to improve healthcare options and decrease reliance on EMS for subsequent unscheduled healthcare needs.

Emergency Call Nurse (ECN)

- nurses embedded in the NEMS dispatch centre conducting secondary triage on low acuity 911 calls and developing alternate options for health/social care where appropriate
- 25% avoidance of ambulance response
- improved connections to community health and social service providers

These changes were implemented to stabilize system demand that, if left unchecked, would continue to deteriorate the performance of ambulance services creating poor outcomes with increased risk. As seen in Figure 1, the projected system demand would have been unsustainable if the system was left status quo. The changes made with the implementation of system transformation indicate ‘bending the curve’ and creating the best possible opportunity for the sustained delivery of quality, safe and affordable 911 mobile integrated health services.

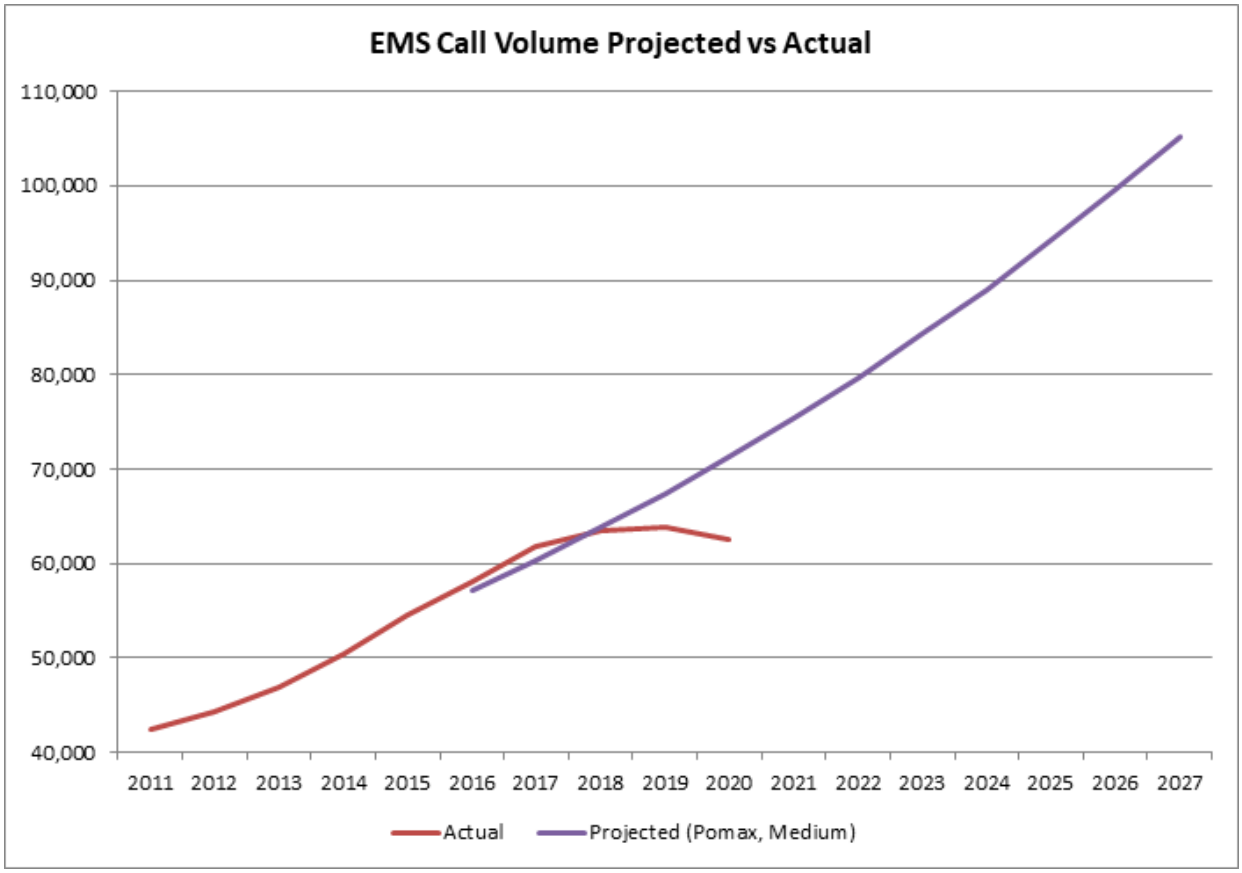

Figure 1. The negative growth in 2020 represents the first two months of the year (pre-COVID-19) as an annualized projection of -2%. Call volumes decreased by as much as 8% during the first 4 months of COVID-19 resulting in a YTD growth of -6.6%.

The above outcome is a result of a continued decrease in 911 call volume, a 1.2% decrease in 2019 in the number of patients transported to the hospital leading to a decrease in consumption time of ambulance resources and associated costs.

Relative to specific cohorts of patients including mental health and elderly falls, the impact of the system changes includes:

- 3.8% decrease in number of calls for falls in 2019 compared to the previous 2 years of increases of 9.4% and 14.2% respectively
- 6.3% decrease of transports to hospital for falls patients compared to the same time frame - meaning falls patients are receiving real time support resources to mitigate against future falls where hospitalization is required
- a decrease of 6.9% in transports of mental health patients to the emergency department despite an increase of 8.1% in the number of mental health related

calls - meaning these patients are accessing real time alternative, more appropriate health care through the MIH teams

- more than 3000 referrals to community health and social services as a result of the MIH teams

With respect to 911 call volume, 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). With the changes that have been implemented, Figure 2 provides data from comparator Ontario paramedic services to suggest that the change in Niagara is not a broad provincial phenomenon but rather supports that this is a result of the system changes in Niagara.

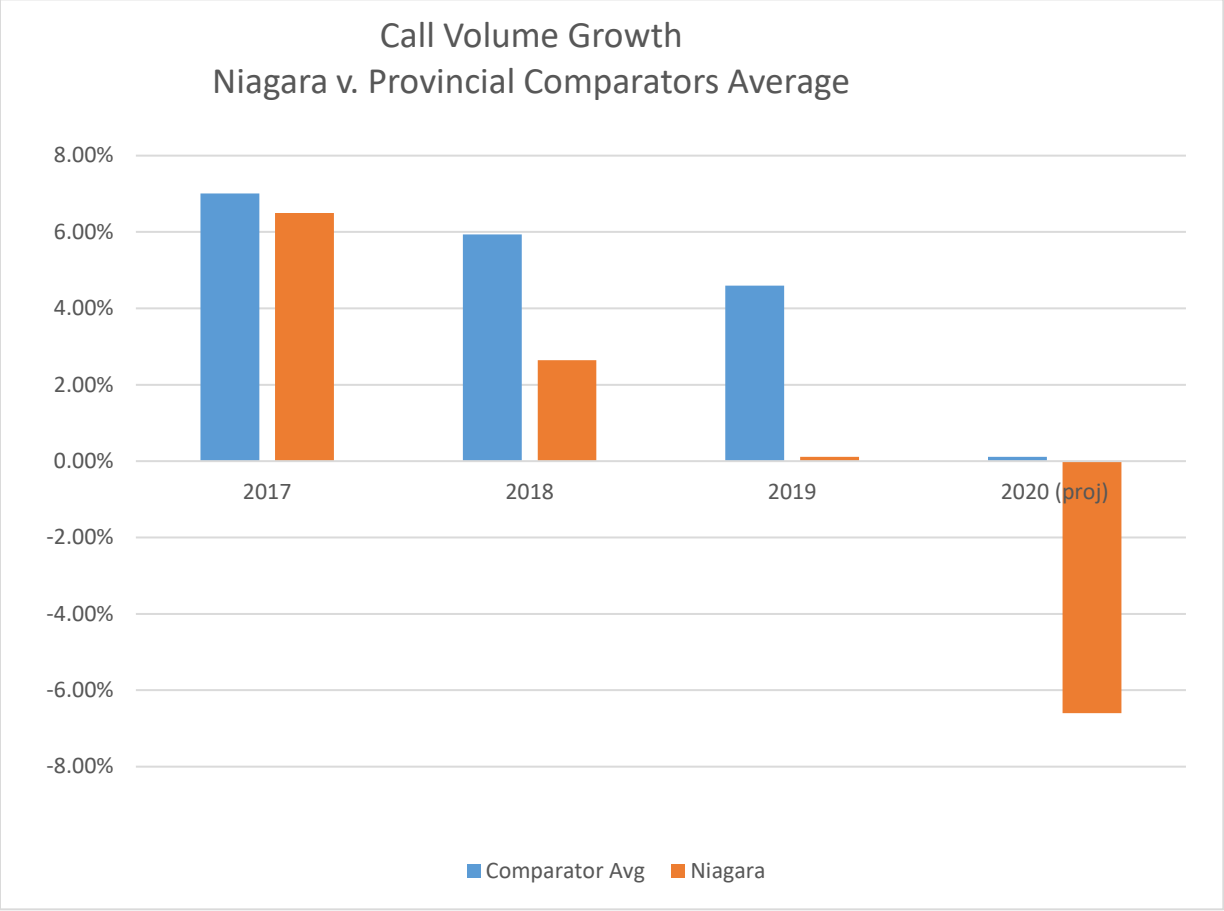

Figure 2 The negative growth represented in 2020 for the provincial comparators includes the decrease in call volumes inclusive of the effects of COVID-19. In absence of COVID-19 impact on call volume, Niagara would have a projected increase of -2%.

The comparator services referenced in Figure 2 added additional ambulances to meet the continued call demand at an average of 1.48 ambulances each year, equivalent of

$1.8M per year. Had Niagara opted to do nothing and allow the system to continue status quo, a similar situation to what the comparator municipalities experienced is likely to have occurred in Niagara, which would have required increasing the number of ambulances as detailed in Table 1.

Table 33: Ambulance and Paramedic Requirement Models - 10-year Time Frame

Paramedic Enhancements Levels	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Totals
Low Growth Model 3.6% - Ambulances	2		1			1		1		1		1	7
Paramedic FTE	21.6		10.8			10.8		10.8		10.8		10.8	75.6
Supervisors		1.4		1.4		1.4			1.4		1.4		7
Emergency Response Units		1		1		1			1		1		5
Medium Growth Model 5.7% - Ambulances	2		1		1	1		2	1	1	1	1	11
Paramedic FTE	21.6		10.8		10.8	10.8		21.6	10.8	10.8	10.8	10.8	118.8
Supervisors		1.4		1.4		2.8		1.4	1.4		1.4		9.8
Emergency Response Units		1		1		2		1	1		2		8
High Growth Model 8.5% - Ambulances	2	1	1	1	1	1	2	2	1	2	2	2	18
Paramedic FTE	21.6	10.8	10.8	10.8	10.8	10.8	21.6	21.6	10.8	21.6	21.6	21.6	194.4
Supervisors		1.4		1.4		1.4		2.8		2.8		2.8	12.6
Emergency Response Units		1		1		1		2		2		2	9
Patient Based Model Ambulances	2					1					1		4
Paramedic FTE	21.6					10.8					10.8		43.2
Supervisors		1.4					1.4				1.4		4.2
Emergency Response Units		1					1				1		3

Table 1: POMAX recommended increase in front line staffing based on projected growth models.

As first reported in PHD 27-2016, using the forecast shown in Table 1, Niagara's growth, if assumed to be the medium model, would have required the addition of four 24 hour ambulances for an estimated cost of $4.8M per year ($2.4M net of provincial funding) with a further ambulance to be added in the 2021 operating budget for an additional $1.2M ($600K net on 2021 levy).

It should be noted that the model labeled in Table 1 as "Patient Based Model Ambulances" best describes the MIH model of system design, highlighting the reduction in the number of additional ambulances required compared to the status quo growth models.

The reduced volumes and avoidance of $6M in additional resources is in contrast to the realities of other municipalities who have seen continual increase in call volumes and presumably patient transports to hospital.

Despite the decrease in call volumes and patients transported to local emergency departments, Niagara hospitals continue to be challenged with timely transfer of care of patients from paramedics to hospital staff resulting in lengthy offload delay times. The St. Catharines Site of Niagara Health has been of particular concern having one of the highest rates of offload times provincially. The continued loss of EMS resources to hospital delays has hampered the system in advancing to meet response time

standards. It is worthy to note that during the height of the first wave of the COVID-19 pandemic, 911 call volumes decreased by as much as 9% and with hospitals scaling back on services during this period, offload delays were virtually eliminated. During this period, improvements in response times was observed, further suggesting a correlation of offload delays and EMS response times. Work continues with Niagara Health to improve transfer of care performance to ensure availability of emergency resources to respond to the community.

The delivery of a mobile integrated health model of service provides opportunities for cost efficiencies as high as 64%. An independent economic analysis of the NEMS MIH model was led by Dr. Feng Xie, Health Economics Professor at McMaster University's Department of Health Research Methods, Evidence and Impact (HEI). The findings identified that

- MIH results in 50% fewer transports to ED for similar patient type
- traditional ambulance mean costs per minute of delivered service were estimated at $1.865
- MIH mean costs per minute of delivered service were estimated at $0.679
- this is 64% lower cost than traditional ambulance delivery model for same patient cohort

Professor Xie has stated "This service model could be a promising and viable solution to meeting acute healthcare needs in the community, while significantly improving the efficient use of healthcare resources".

The cost of delivery in the MIH model is significantly lower, creating opportunities to invest further in sustaining this approach through the reallocation of existing resources and the strengthening of key areas of system delivery. To sustain these transformational changes and establish MIH as the stable (not temporary) model of service delivery for Niagara EMS, dedicated resources will be required for the ongoing delivery, management and optimization of the system.

The accomplishments recognized to this point have been realized through the realignment of existing human resources including frontline staff, logistics support, IT, training, management and administration to refocus efforts towards research, design, construct and implementation of this new system. The efforts of all staff are to be commended. However, sustainment of this refocusing is posing challenges as other key areas of the business have been realized as being under resourced or not permanently resourced. If Niagara is to continue in this new model of Mobile Integrated Health,

investments must still be made to ensure system sustainability for the foreseeable future.

Recognizing and appreciating the significant budget pressures for 2021, Niagara EMS will be submitting business cases for consideration as part of the 2021 operating budget process to ensure operational and fiscal sustainability in the delivery of this new model.

Alternatives Reviewed

Previous Councils have endorsed staff recommendations and instructed staff not to simply follow traditional EMS service models but to actively look for innovative ways to deliver mobile health services that are not only more efficient but also better meet the needs of Niagara residents who call 911. Without these transformational changes, system demand would likely have continued to grow at the previously forecasted rates 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. The cost avoidance of $2.4M per year on the Regional tax levy would not have been realized and continuous investments of this magnitude would be likely for future budget years. In contrast, the investment of the recommended FTE’s provide a net cost avoidance of $1.56M.

Staff continue to participate in the development of the Niagara-Ontario Health Team of which Niagara EMS is to be a central agency in the enhanced coordination of the delivery of unscheduled and specialized health services such as mental health. The development and implementation of NEMS MIH model of service delivery aligns itself with the intentions of the provincial OHT restructuring and future opportunities for the pooling and provision of resources are likely to occur.

Relationship to Council Strategic Priorities

The System Transformation Project was a priority item for consultation with the Minister of Health during the 2020 Association of Municipalities of Ontario Conference. It further 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. An integrated health system promotes improved opportunities for Healthy and Vibrant Communities and contributes to reduced 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
PHD 20-2019 - System Transformation Update 2
PHD 08-2020 - Occupational Therapists Request

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