Conseil des Services du District de
Manitoulin-Sudbury
District Services Board

210 boul Mead Blvd
Espanola, ON P5E 1R9
Telephone/Téléphone: (705) 862-7850
Fax/Télécopieur: (705) 862-7805
http://www.msdsb.net

Report To:	Program Planning Committee
From:	Michael MacIsaac Chief of EMS
Date:	February 27, 2013
Re:	Balanced Emergency Coverage (Standbys) - Issue Report

RECOMMENDATION

That the Program Planning Committee recommend approval of this report to the DSB Board and that staff be directed to proceed with the recommendations contained with the report.

REPORT

Purpose

This report will provide information on the statistical information gathered from an intensive review of current balanced emergency coverage provisions within our EMS Deployment Plan. From there this report will provide a guideline on how the EMS department should proceed in the very near future.

Background

The term “balanced emergency coverage” has been in use for as long as full time ambulance service providers have been around. The concept, as the name implies, revolves around a balanced approach to emergency coverage when ambulances are indisposed of, performing their duties. What typically occurs is a redeployment of vehicles in an attempt to capture the “greatest good” by placing vehicles on emergency coverage standbys (code 8’s).

History

When Land Ambulance Services were downloaded to the local levels of government in 2000, there was an added level of responsiveness sought. Where there were once multiple services in any given region there was now one larger service, with the ability to determine wide encompassing deployment. Under a larger more global system, balanced emergency coverage became the goal.

In the mid 2000's Ambulance providers become responsible under direction from the Ministry of Health & Long Term Care (MOHLTC) to provide the local Central Ambulance Communication Centres (CACC's) with local Deployment Plans. These Deployment Plans became the backbone of how the CACC's, who are legislatively responsible for the dispatching of ambulances, were to handle the deploying of the ambulance resources. The Manitoulin-Sudbury DSB EMS Deployment Plan has undergone many revisions since implementation in 2005 but the one item that remained was this concept of balanced emergency coverage. The way it works is that whenever an ambulance gets assigned a call for service, another ambulance will move to a half-way point in an attempt to split the difference and balance response times. Just because in theory the act of balancing coverage makes sense, it doesn't mean that analysis of its actual effectiveness shouldn't be done.

It is important here to again make note of the breakdown of what the ambulance dispatch codes represent.

Dispatch Priority	Definition	Example
Code 1	Deferrable	Sore foot for many days
Code 2	Scheduled	Patient transfer for bone density scan
Code 3	Prompt	Stable Bone Fracture
Code 4	Urgent	Chest Pain
Code 8	Emergency Standby	Fire/Police request, balanced coverage

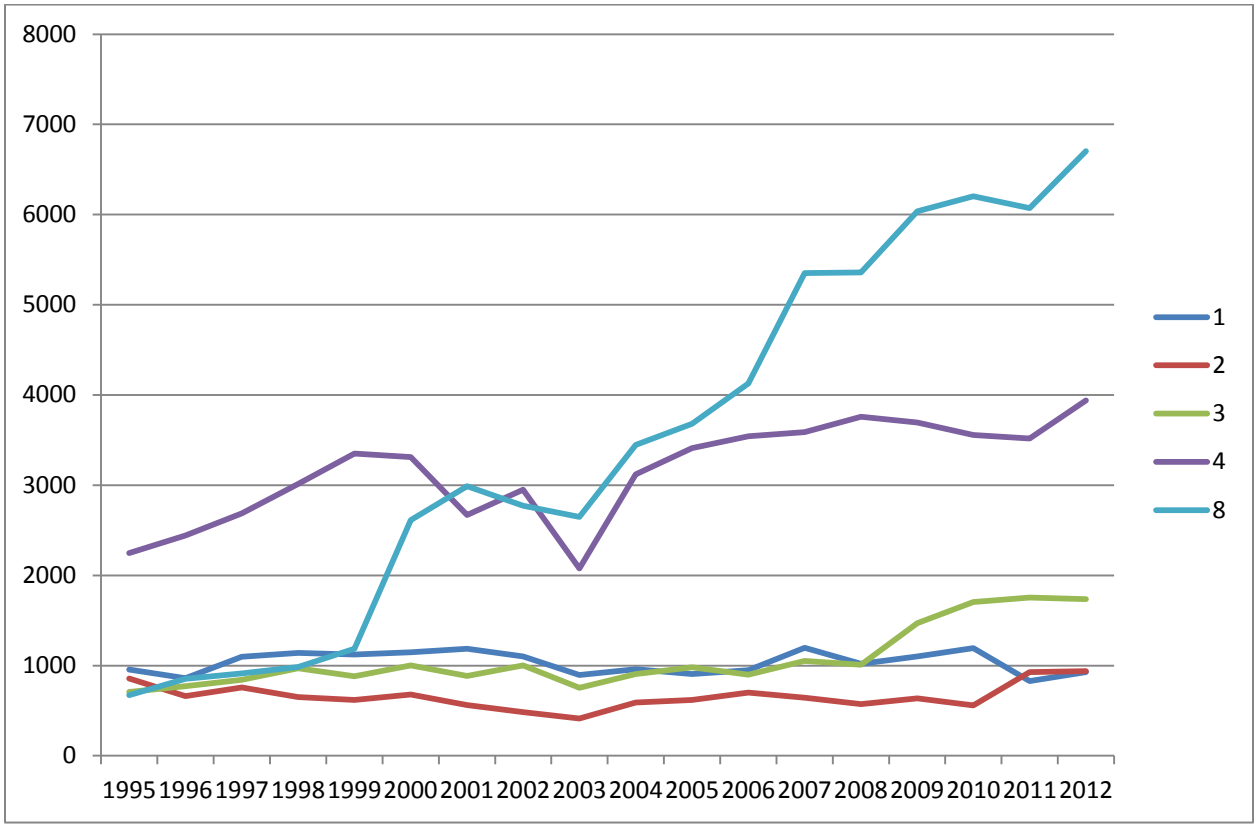
Current Issues

The current Deployment Plan has coverage statements for each of its 12 stations. In each and every case the moment one station receives a call for service, another station moves. Depending on the number of available resources that move may be minor or may actually involve moving right to the station that lost its coverage. In general, the standby locations have been developed trying to reach a half-way point. The following table reveals the current standby locations between our EMS Stations.

STATION	time	STANDBY LOCATION	time	STATION
Espanola	12 min	Webbwood	12 min	Massey
Little Current	15 min	Whitefish Falls	15 min	Espanola
Wikwemikong	15 min	Manitoulin East Airport	15 min	Little Current
Mindemoya	20 min	Gauthier's Rd and Hwy 6	20 min	Wikwemikong
Gore Bay	20 min	Spring Bay	12 min	Mindemoya
Little Current	15 min	Hwy 540 & Bidwell Rd. (Moore's Corner)	12 min	Mindemoya
Noëlville	15 min	Hwy 535 & Island Rd. (West Arm)	15 min	Hagar
Killarney	70 min	Alban	20 min	Noëlville
Chapleau	15 min	Chapleau Airport/Hwy 101 & Shawmere River (25 minutes unaccounted)	30 min	Foleyet
Foleyet	45 min	Hwy 144 & Hwy 101	45 min	Gogama

In most cases listed above the standby location is not within a community but rather on the side of a road or intersection. An example of this is the Moores Corner standby. When Little Current gets a call, the first option is to send Mindemoya to Hwy 540 & Bidwell Rd. The actual parking spot is on the side of Bidwell Rd. and this location has no buildup of population. When Mindemoya is on standby at this location they are roughly 12 minutes back to Mindemoya and 15 minutes to Little Current.

As has been reported in the past we are experiencing a steady increase in call volumes year on year. Reviewing the call volumes as displayed below over time, it becomes evident that the most drastic notable increase is in terms of Code 8 Standby calls.



A different way of reviewing the call volume stats is in relation to a percentage breakdown of our response types as noted in the following table.

YEAR	Priority of Call Going Out				
	1	2	3	4	8
1995	18%	16%	13%	41%	12%
1996	15%	12%	14%	44%	15%
1997	17%	12%	13%	43%	15%
1998	17%	10%	14%	45%	15%
1999	16%	9%	12%	47%	17%
2000	13%	8%	11%	38%	30%
2001	14%	7%	11%	32%	36%
2002	13%	6%	12%	35%	33%
2003	13%	6%	11%	31%	39%
2004	11%	7%	10%	35%	38%
2005	9%	6%	10%	36%	38%
2006	9%	7%	9%	35%	40%
2007	10%	5%	9%	30%	45%
2008	9%	5%	9%	32%	46%
2009	9%	5%	11%	29%	47%
2010	9%	4%	13%	27%	47%
2011	6%	7%	13%	27%	46%
2012	7%	7%	12%	27%	47%

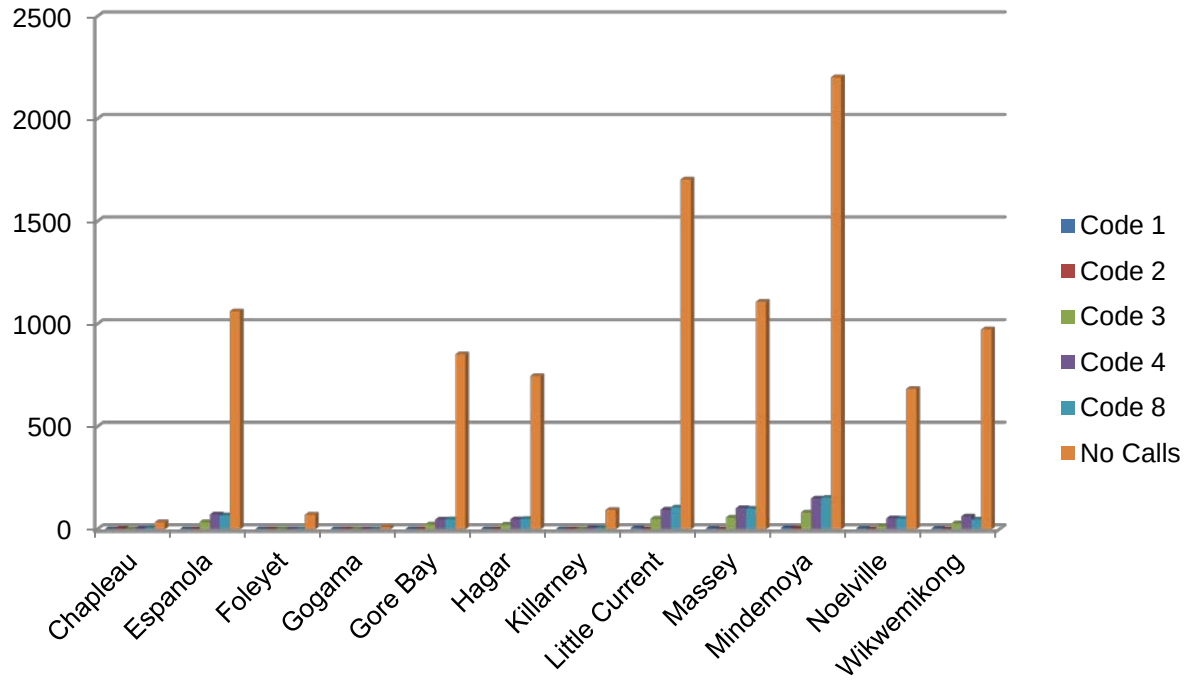
It is evident that not only are the number of Code 8 standby calls increasing year on year, but the overall percentage breakdown of Code 8 standby call volume is also proportionately increasing. After looking at the substantial increases and the fact that most Code 8 standbys occur in unpopulated areas, a further review was required on the effect these Code 8 standbys have on emergency responses.

So now it is understood that there is an increase number of code 8 standby calls and there is also a known increase in the number of Code 4 emergency calls. We can infer that an overwhelming majority of these Code 4 emergency calls are occurring in populated areas, however as discussed earlier, in opposition to this statement, a vast majority of our standbys occur in unpopulated areas. That is a truly inversely proportionate result. Continued statistical analysis further reveals some interesting facts.

Statistical Analysis

A review of call volume statistics was performed for a time period from January 1, 2011 to September 30, 2012. These 21 months were chosen as it was our desire to look at a period of greater than one full year and the most recent accurate stats that we had at time of comparison was to September 30, 2012.

The first review involved the overall results of the code 8 standby. The following chart depicts those results.



Of the 11,186 Code 8 standbys during this time period it can be stated that an extremely high number resulted in no activity. Overall 91% of those standbys resulted in going back to the home base having done nothing but remain on standby. That in any organization is a very high level of futility.

It is important to note the breakdown of the code 3's & 4's. They are the prompt and urgent type calls and are the ones that have the highest incidence of being a true medical emergency. Overall, the percentage of the time that the ambulance receives an urgent or emergency call while on standby is slightly over 8%.

From here, the calls while on standby can be further broken down as to whether the standby was effective or not. Again this is done using only Code 3 & Code 4 calls performed while on standby. The total number of Code 1 & Code 2 calls received from standby was 35 over this time period. One would suggest that a good standby would be one where a call occurred in the area that the ambulance was covering for. Conversely, a bad standby would be one where a call occurred that brought the ambulance back to their original community or any community that would have been better serviced by the ambulance remaining at their base. Essentially, a good standby would result in an improved response time and a bad standby would result in a decreased response time. The bad standby could be further defined as one where nothing happened but that will be added later.

The following table provides a breakdown of the good and bad standbys.

Jan 1/11 to Sep 30/12	Total Code 8's	Good Standbys	Bad Standbys	Total Good & Bad	Plus Minus	% time get a call on Stby	% of Good Stby	% of Bad Stby
Chapleau	47	0	3	3	-3	6.4%	0.0%	6.4%
Espanola	1239	49	50	99	-1	8.0%	4.0%	4.0%
Foleyet	73	0	1	1	-1	1.4%	0.0%	1.4%
Gogama	11	0	0	0	0	0.0%	0.0%	0.0%
Gore Bay	974	45	24	69	21	7.1%	4.6%	2.5%
Hagar	869	51	17	68	34	7.8%	5.9%	2.0%
Killarney	109	3	4	7	-1	6.4%	2.8%	3.7%
Little Current	1966	99	41	140	58	7.1%	5.0%	2.1%
Massey	1374	76	81	157	-5	11.4%	5.5%	5.9%
Mindemoya	2600	152	71	223	81	8.6%	5.8%	2.7%
Noëlville	808	25	42	67	-17	8.3%	3.1%	5.2%
Wikwemikong	1116	29	58	87	-29	7.8%	2.6%	5.2%
Total	**11186**	**529**	**392**	**921**	**137**	**8.2%**	**4.7%**	**3.5%**

Looking at the plus minus stats, while the overall numbers show many more good standbys than bad, 8 out of 12 stations had results showing more bad standbys than good. Reviewing the overall percentage of the time that the ambulance gets a call resulting in an improved response time is 4.7%. The overall percentage of the time that the ambulance gets a call resulting in a worse response time is 3.5%. Finally, the overall percentage of the time that the ambulance does not get a call at all while on standby is 91.8%. The end result can be stated that there is a benefit in only 4.7% of the standby's. Such a small percentage begs the question of whether it is worth it or not.

One final and perhaps the most significant area of review is in regards to the MOHLTC legislated Response Time Standard Performance Plan. Up until 2013 legislated Ambulance response time plans were based upon a 90th percentile time for code 4 calls in 1996. The Manitoulin-Sudbury DSB mandated response time target was 23 minutes and 54 seconds. The percentile makeup of that plan allowed for an averaging of all code 4 calls. Basically, in plain English the old standard allowed for an averaged response time of nearly 24 minutes for only code 4 calls. The new response time standard is vastly different and focused much upon patient outcome. As such the time standards are highly aggressive and extremely tough to meet even with the best of deployment.

The first section of the new Response Time Standard calls for each EMS provider to set a target for percentage of the time that they will have a defibrillator to a patient in sudden cardiac arrest in 6 minutes. The second part of the response time plan requires a target percentage of the time a Paramedic will reach to patient categorized as a CTAS 1 within 8 minutes. These highly aggressive timeframes are extremely hard to maintain in a rural and remote environment. The previously noted timeframes to reach a community when on standby, in for the most part an unpopulated roadside location, is vastly greater than the first 2 components of the new response time standard. In other words there is no chance of achieving the response standard time criteria in any

percentage when we are at a standby location. When you factor the new response time standard in with the highly ineffective nature of the standby (only 4.7% of the time resulting in an improved response) it becomes highly evident that our current situation considering balanced emergency coverage is not very effective.

The New Balanced Emergency Coverage

The new coverage statements for our deployment will be defined differently based on our 3 separate and distinct areas much the same way as our current deployment plan is. Our intent is to proceed as follows:

Chapleau, Foleyet, Gogama

Based upon the overwhelming statistics showing that there is an absolute negative outcome by performing code 8 standbys, they will be eliminated in their entirety in the aforementioned areas. There will be provisions for exceptional circumstances.

Noëlville, Hagar, Killarney

The statistics show overwhelming evidence that the core area of response is in Noëlville. Understanding that Noëlville is a populated town, the primary focus will be to reinstate coverage for that area by having the Hagar Ambulance proceed to Noëlville when the Noëlville Ambulance gets a call that requires them to proceed to a hospital.

Due to the nature of the distance that Killarney takes to get to Hwy 69, and factoring in the remote location of the town, the Killarney ambulance will not be utilized for coverage. Additionally, due to the small amount of call volume in Killarney there will be no standby coverage for when Killarney is out.

The geographic location and the number of calls that the Hagar Ambulance performs in other communities will result in no standby coverage being provided for Hagar when they are out on a call. Coverage for areas of denser population will be provided primarily by neighbouring EMS. In reality, the current practice of having standby at West Arm results in close to the same response time to Markstay as would be achieved by an Ambulance from Greater Sudbury EMS and the same response time to Warren as an Ambulance from West Nipissing EMS.

Espanola, Massey, Little Current, Mindemoya, Gore Bay, Wikwemikong

The responses of the above noted stations represent 79.7% of our overall call volumes. Being the largest area of usage obviously requires a little different consideration. Looking at the location of the 6 stations there are obvious parings which interestingly enough are closely related in call volume. The concept on balanced coverage for this area will involve creating 3 zones; Manitoulin West (Gore Bay/Mindemoya 4051 calls), Manitoulin East (Little Current/Wikwemikong 3776 calls), & North Shore (Espanola/Massey 3527 calls). The concept we wish to pursue is that we will only provide coverage when a zone is without either available resource.

The proposed changes as mentioned above were reviewed by and developed in part with the assistance of the Sudbury CACC. As the current organization responsible for deploying many our ambulance resources on the basis of our set deployment plan, we felt it important to involve them and their first-hand knowledge in developing such a important change to the way we provide coverage.

Advantages/Disadvantages

The advantages of redeveloping our deployment plan as listed above have been clearly identified. Currently by standing by in between communities we are attempting to do the best for the most but in fact we are providing a substandard service to all. In actuality there are many communities within our area and only 12 have Ambulances stationed within them. Those 12 Ambulance bases provide varying levels of on-site and on-call services on the basis of need and funding efficiency/ability. The reality of health care within the province of Ontario is that services are provided on the basis of need and available funding and some areas are underserviced. Surgeries are cancelled on a regular basis due to lack of bed availability and funded staffing. It is possible that patient morbidity and mortality is based upon these decisions. Decisions regarding Ambulance deployment and staffing often are based on reasonable factual evidence and again funding ability. We are funded to provide one ambulance for each community that has a station. When that resource is in use it would not be unreasonable to suggest that for that time period they must go without a timely response. By moving to a mid-way point we are hurting the community whose resource is being moved due to the lack of a resource in another, while also providing a substandard service to the community requiring coverage. While we are trying to save many for the sake of one, we are in fact not performing well for anyone.

The following tables provide a breakdown on chances of success considering both the current and new deployment strategies.

Current Standby Deployment	Chances of Success	
	Community sending Ambulance on Standby	Community receiving Ambulance on Standby
SCA > 6 minutes	**Never**	**Never**
CTAS 1 > 8 minutes	**Never**	**Never**
CTAS 2, 3, 4, 5 > 25 minutes	**Possible**	**Possible**

New Non-Standby Deployment	Chances of Success	
	Community keeping Ambulance at Station	Community receiving No Standby
SCA > 6 minutes	**Possible**	**Never**
CTAS 1 > 8 minutes	**Most Likely**	**Never**
CTAS 2, 3, 4, 5 > 25 minutes	**Definite**	**Never**

In the consideration of the new Response Time Standard under the new deployment model we will have 3 chances of success whereas under the old system we will have 2 chances. It must be noted that the 2 chances of success under the old system revolve around patients who are in far less critical condition and 2 of the 3 chances of success under the new system relate to critical patients who are those in greatest need of immediate care.

It must be understood that the new response time plan criteria were established with medical best practices in mind. The patient in cardiac arrest has a much less likely chance of resuscitation if the defibrillator after 6 minutes, and it has been determined that the CTAS 1 patient would best benefit from medical intervention within an 8 minute timeframe. Under the current standby deployment model in most cases we will never be able to meet these goals. By remaining in the communities we will increase the likelihood of achieving these goals half the time.

The disadvantage of implementing a new system such as this will be a prolonged response time should a second call come in a community whose ambulance is occupied. In most cases instead of a 15 minute response there will be a 30 minute response. Conversely, there is an advantage for the community who now has its resource remain within their area. The former 15 minute response time will now be in the range of 5-7 minutes thus giving a greater chance of meeting our response time commitment. Whereas on standby we would never meet our commitment, we now have the ability to meet it in at least 50% of the time.

Conclusion

The decision to shift focus within our Deployment Plan away from the traditional balanced emergency coverage approach and towards an approach giving us the greatest ability to meet the criteria established within the new response time plan is one that has been under review for some months now. This change has not been taken lightly and much consultation and analysis of statistics was completed in order to make the best educated decision. Making this change will have a negative effect on some emergency calls but maintaining the status quo is currently negatively affecting a far greater number of emergency calls. As mentioned earlier, the goal of a balanced approach is to try to do the best for the most, and through this review it has been found that that approach has resulted in an overall less effective service.

Once the deployment plan has been re-developed to include the new coverage system, it will be reviewed by the MOHLTC Emergency Health Services Branch, CACC and other appropriate stakeholders prior to implementation.