22 December 2014

Newfoundland and Labrador Medical Flight Service: Fixed Wing Aircraft, Staffing and Scheduled Multi-load Air Shuttles

Department of Health and Community Services
Government of Newfoundland and Labrador

FITCH & ASSOCIATES, LLC
2901 Williamsburg Terrace #G ▪ Platte City ▪ Missouri ▪ 64079
816.431.2600 ▪ www.fitchassoc.com

CONSULTANT FINAL REPORT

The Firm agrees that confidential information about the Client or its related entities will not be released, except as required by a court of competent jurisdiction, without the prior approval of the Client, unless that information is otherwise released as public information. The Client agrees that it shall not release nor allow its employees or agents to release any of the Firm's proprietary materials provided, or utilized during the process, without written permission.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Government of Newfoundland and Labrador Air Ambulance Program underwent a performance review by Fitch & Associates, LLC ("Consultant") for analysis in three key areas: replacement of the government-owned King Air 350; Medical Flight Service staffing for the St. John's and Happy Valley/Goose Bay aircraft; and an initial review of a multi-load air shuttle service for patients within the province.

The key findings of the review led to the following recommendations:

- Replace the retired government-owned King Air 350 (C-GNLA) with a new King Air 350 and, concurrently, expand pilot and engineer coverage to a second pilot on-call team each day and upgrade staffing with an engineer on duty each day of the week. These actions will improve Government Air Service (GAS) readiness to respond to Medical Flight Service requests, reduce the number of response delays/missed flights, and reduce use of the government-contracted air ambulance jet. To further improve readiness, GAS should evaluate its options under Transport Canada to modify the manufacturer's aircraft maintenance program into an approved progressive maintenance schedule, and concurrently develop an enhanced aircraft component and parts inventory system that anticipates scheduled and unscheduled events. The budget impact of new aircraft and staffing changes needs to be prospectively defined by GAS.
- For out of province transports only, the government should contract a jet aircraft that will reliably perform the flight from anywhere in the province to Toronto without refueling while the patient is on board.
- Medical Flight Specialist scheduling changes are needed to align staff coverage with transport demand. A modified schedule will provide the coverage in combination with on-duty and on-call hours. Staffing all coastal medivacs with two caregivers is included in the Happy Valley/Goose Bay medical flight team coverage plan. Medical Flight Specialist clinical skill capability must be standardized. Recruiting the needed number of Medical Flight Specialists for the Happy Valley/Goose Bay base will require a mix of local and transient professionals. Additional transport team efficiencies can be achieved through providing a dedicated non-transport vehicle at Deer Lake and Gander airports for the medical flight team.
- Analysis of the operational and cost efficacy of a Multi-Load Air Shuttle program to move a number of patients at one time from key locations throughout the province to health appointments in St. John's is hampered by inconsistencies in data availability, quality, and service integration across the key transport programs that are currently providing these patients with transportation resources.

1. OVERVIEW

The Government of Newfoundland and Labrador provides an Air Ambulance Program for the benefit of transporting its patients to health care services through the province, and at times, to special services that are located in Nova Scotia and Ontario. The Air Ambulance program is managed by the Department of Health and Community Services with delegated responsibilities to Eastern Health Authority for Medical Flight Service management, medical flight crew staffing, and Provincial Medical Office oversight; and with aviation services and operations managed by the Department of Transportation and Works, with delegated responsibilities to Government Air Services.

In November 2013, Fitch & Associates was contracted by the government to examine aircraft options for the Air Ambulance Program fixed wing fleet, review medical staff coverage in HVGB and outline the initial framework for an airplane shuttle service for on-stretcher patient transport to scheduled health care services. The review has been defined by the following key factors:

- Government Air Services (GSA) retired one of its government-owned King Air 350 aircraft due to age, and is in process of determining the replacement aircraft.
- The provincial air ambulance program has experienced a consistent, annual increase in the number of patient transports at higher transport volumes, which must be incorporated into the fleet planning.
- The air ambulance program requires access to an aircraft fleet that will provide maximum response availability on a 24/7 basis.
- Strategies are to be developed for airplane transport of non-stretcher dependent patients to their scheduled health care appointments/services when land transport is untimely and/or inaccessible

2. AIR AMBULANCE PROGRAM: FIXED WING OPERATIONS

The primary aircraft utilized for the Air Ambulance program are provided by the government of Newfoundland and Labrador, and are operated by Government Air Services. GAS manages the aircraft, provides the pilots, staffs the engineers to maintain the aircraft and serves as the flight dispatch center to coordinate and manage each air transport. GAS strives to achieve a state of readiness for aircraft response each day of the year. In FY 2012-2013, GAS completed 1,127 flights for the Air Ambulance Program, at a budgetary cost of $6.0 million.

The GAS air ambulance fleet is comprised of two King Air B300/350 (herein referred to as the King Air 350) aircraft, based at St. John's airport and in Happy Valley/Goose Bay (HVGB). A third King Air 350, recently retired, had served as a backup aircraft to either base during those periods when a primary King Air 350 is undergoing maintenance. This configuration had been designed to provide maximum mechanical readiness of two aircraft to respond to service requests. With the retirement of the third king Air, additional aircraft resources will be needed.

Each GAS aircraft is operated with a pilot and co-pilot who are on call and respond to the aircraft once a flight is approved. There is one team of pilots per aircraft available in a 24 hour period, which at times results in flight requests being unfilled due to no pilot staff available. The medical crew, however, has a team on duty to respond to flight requests 24 hours each day in St. John's and 12 hours each day in HVGB. Section 3 of this report outlines the Medical Flight Specialists staffing and coverage.

The government contracts with Provincial Airlines Limited (PAL) for jet aircraft resources primarily to complete long distance out of province transports, such as to Ontario and Nova Scotia. The PAL contracted jet has also been deployed as a backup aircraft. PAL provides an on-demand, medically configured Citation S550 jet staffed with two pilots to the Air Ambulance Program. The government pays a fixed monthly fee to PAL for the availability of the jet. Mileage, fuel, and other fees associated with each authorized flight are added to the monthly fee. In FY 2012-2013, PAL completed 137 transports on behalf of the province, costing $1.81 million.

The flight activation process begins with the requesting facility sending a completed pre-screen form to the Medical Flight Service at Eastern Health for approval. The Medical Flight Service categorizes patient acuity as Critical, Emergent, Urgent, Referred Care, and Wait Listed, based on the following definitions.[i]

- Critical (1) – Transport priority where the patient requires immediate transport to a higher level of care. The needs of this patient cannot be met by the requesting facility for any length of time.
- Emergent (2) – Transport priority where the patient requires transport to a higher level of care. The needs of the patient cannot be met by the requesting facility for any more than 12 hours.

- Urgent (3) – Transport priority where the patient requires transport to a higher level of care. The needs of the patient cannot be met by the requesting facility for any more than 24 hours.
- Referred Care (4) – Transport is required for a scheduled appointment and other means of transportation has been deemed inappropriate.
- Wait Listed (5) – Transport is required to bring a patient back to their home health board region and other means of transportation has been deemed inappropriate.

Once Medical Flight Services has approved the flight, GAS is notified. GAS then begins coordinating all aspects of the flight, including launch of the PAL jet, if it is a long distance flight specifically requested by Medical Flight Services, or if it is the only aircraft available. The coastal medivac in Labrador are not processed through the GAS dispatch center.

2.1 GAS Aircraft Replacement

The government-owned aircraft are aging, and the demand for FW air ambulance transport is trending to outpace GAS pilot and engineer staff availability.

The Newfoundland and Labrador medical airplane fleet, after the retirement of an owned King Air 350 (C-GNLA), is comprised of three King Air 350 series airplanes in dedicated medical configuration.

- King Air 350, registration C-GNLF, manufactured 2008, with 4,575 total time*
- King Air 350C, registration C-GNLO, manufactured 2010, with 2,250 total time*

**total aircraft time as of 30 November 2013*

All NL owned aircraft are equipped with the dual patient LifePort Stretcher System. Only C-GNLO has the wider cargo door (e.g., King Air 350C) to ease loading and unloading the patient on a stretcher. However, this specialized loading door has experienced unscheduled out of service time due to persistent minor maintenance-related repairs such as air leaks when pressurizing.

The manufacturer and Transport Canada provide guidelines and requirements for scheduled maintenance of aircraft. GAS has opted to follow the aircraft manufacturer's maintenance program, versus developing an approved maintenance schedule under Transport Canada. The manufacturer schedule typically requires less frequent, but longer periods out of service, whereas the approved maintenance schedule typically is designed for more frequent, but shorter periods out of service. Aircraft engines and each of the major components and parts have preset life cycles—and subsequently will have different inspection timelines. As maintenance events are primarily defined by use, rather than a calendar (subject to Transport Canada approval), the more an aircraft is flown, the more frequent the aircraft will be out of service for required scheduled maintenance events.

As aircraft age, the incidence of unscheduled maintenance increases, and the availability of components and parts can become more difficult. Each of these factors can contribute to aircraft being unavailable for flight.

There is also an aircraft-specific maintenance projection ratio that illustrates the expected number of maintenance hours per flight hour. The projected ratio for a used King Air 350 is 1.65 maintenance hours per flight hour (1.65:1), and a new King Air 350 is 0.97 maintenance hours per flight hour[ii] (.97:1).

2.1.1 Analysis

GAS aircraft NLA was among the first produced (serial #FL-26) when Beechcraft modified the King Air 300 to the B300 (marketed as a King Air 350). This particular aircraft, now retired, was reported as having the highest hours of any King Air 350 currently flying in the world. This aircraft was ultimately removed from flight operation because, outside normal inspections, Beechcraft had not yet developed inspection criteria for such "high-timed" aircraft and the significant difficulty in procuring parts. GAS has identified need to procure an immediate replacement aircraft to bring the fleet back to three aircraft.

GAS has asked Health and Community Services for input on the replacement aircraft. Specifically, GAS has queried as to whether a longer range GAS-operated aircraft would serve the Air Ambulance Program out of province transports, thus replacing the PAL jet for long distance transports. In addition to a replacement with another King Air 350, GAS identified the King Air 350ER (Extended Range) aircraft as an option.

The King Air 350ER is a variant of the King Air 350 that GAS currently operates. Notably, the King Air 350ER has a Maximum Takeoff Weight of 16,500 pounds, an increase of 1,500 pounds over the current King Air fleet. The increased Maximum Takeoff Weight allows for more fuel, and subsequently extends the aircraft range by an estimated 438 nautical miles. The extended range would support GAS operating flights into Toronto without needing to refuel while enroute.

A new King Air 350 (versus the King Air 350ER) as a replacement aircraft would provide nearly identical performance characteristics as the remaining two aircraft. The newer aircraft would add a more modernized suite of avionics, in addition to other technology upgrades.

There are flight and medical operational issues associated with the King Air 350ER: the heavier weight of the aircraft with the larger fuel load may preclude it operating in and out of runways less than 5,105 feet; and, the additional fuel cells would replace the storage compartment behind each engine where the medical crew currently stores the patient stretcher system loading ramps. The medical cabin will require thoughtful re-configuration to assure that relocation of the loading system inside does not compromise clinical performance.

Runway length is a factor for consideration in aircraft selection. The runway at St. Andrews is the shortest in the province at 3,000 feet. The St. Anthony runway is 4,000 feet. The balance field runway length with full fuel required for the King Air 350 is 3,300 feet, while that of the King Air 350ER is 5,105 feet.

The final candidate aircraft for replacement of the aged King Air 350 is the Piaggio Avanti P180. Although this aircraft is within the King Air 350 series class, its performance profile presents a longer landing distance than the King Air 350ER, and a shorter flight distance than the current King Air 350 aircraft, thus eliminating it from any further consideration. Table 1 compares the key performance data from the three reviewed aircraft.

Table 1. Key Aircraft Performance Data

	King Air 350	King Air 350ER	Piaggio 180
Max Take Off Weight (lbs)	15,000	16,500	11,550
Usable Fuel at Max Weight	3,611	5,192	2,802
Range (N. Miles)	1,440	1,878	980
Balanced Field Length (ft)	3,300	5,105	3,100
Base Price (New) CAN	$ 6,370,000	$ 7,788,000	$ 6,425,000

The base price of new King Air 350ER is $1.418 million more than a new King Air 350. The published operating cost per hour which includes fuel, components, and parts is $1,396 (CAD) for the King Air 350ER and $1,378 (CAD) for the King Air 350. The cost variance is a direct result of the King Air 350ER burning slightly more fuel per hour due to its increased weight.

Weight of the aviation and medical crew, the patient, the carry on medical equipment, along with temperature, humidity, and wind are among the factors that define the amount of fuel that can be taken on when landing on shorter runways. The safe operation in and out requires careful management of all of these factors, as is GAS' practice.

Refueling with a patient on board was reported primarily with the PAL jet transports to Toronto but also with a small number of GAS flights. The need to refuel during the course of the flight can be a result of intentional lighter fuel loads to operate in and out of the shorter runways, though it also can occur during a long distance patient transfer that encounters un-forecast wind direction/speed or weather conditions.

2.1.2 Recommendations

Acquire a new King Air 350, without the extended range capacity.
Purchasing an aircraft of the same make and model that is currently operated by GAS will yield the highest operational and financial efficiency. Pilot and engineer training and certification can be focused on learning upgrades and changes versus learning entirely new aircraft systems and maintenance. The latter option adds various risks associated with switching between two different aircraft types. The inventory and tooling requirements of a new King Air should be incremental given the current items and equipment.

Other benefits of selecting the replacement aircraft from within the King Air 350 fleet is transference of the extensive experience GAS has with the King Air 350 flight operations, maintenance and inspection requirements, Manufacturer's Service Bulletins and Airworthiness Directives.

Operating a fleet of Beechcraft King Air 350s facilitates the Air Ambulance Program's aviation operations to be more cost efficient and enhances safety, as only one aircraft model would be required for pilot and maintenance staff currency and proficiency. However, even with a devoted fleet of King Air 350s, differences inside the cockpit exist because each aircraft in the fleet will have been purchased at a different stage of avionics and technology integration. Examples of differences among the three GAS King Air 350s include: avionics packages (e.g., Collins Pro Line 2 verse Collins Pro Line 21—the old style analog gauges verse digital glass cockpits), and the cargo door on aircraft C-GNLO.

The procurement process for the replacement aircraft should assure the specifications have been developed based on input from the pilots, engineers, and medical flight crew that have flown, maintained, and provided care in the current fleet.

Aircraft components and parts inventory must anticipate scheduled and unscheduled events.
GAS must improve its on-site inventory by implementing inventory procedures that are focused on reducing out of service time waiting for aircraft parts to be delivered. The new aircraft purchase should include an on-site parts package. GAS should also negotiate an ongoing consignment parts inventory that would support all the aircraft, with a guaranteed inventory level that is updated with the needed parts and components no less than seven days prior to a scheduled maintenance event.

The proposed inventory system will facilitate procuring and stocking components and parts in advance of any scheduled maintenance event and, further, ensuring the inventory includes those components and parts identified through historical trends as having premature lifecycle failures and/or needing unscheduled replacement.

Aircraft should not be refueled with a patient on board.
While the Canadian Aviation Regulations (CARs) are silent on "hot" refueling, it is not a best practice of medical flight program operations. A midpoint stop for refueling while a patient is receiving care onboard, particularly in a pressurized aircraft, can compromise the patient's condition, as well as introduce risk of an unintended refueling and/or maintenance event that would further delay, if not stop, the flight progress. The pilots must manage fuel loads to assure safe takeoff and landing given the operating airfield length available at the point of patient pick up and drop off, and have the needed amount of fuel on board to conduct uninterrupted long range flight segments while maintaining compliance with fuel reserve requirements.

2.2 Pilot and Engineer Staffing

Pilot duty and rest is defined by Transport Canada, under the Canadian Aviation Regulations (CARs) sections 700 and 703. The GAS pilots are classified under the CARs as "on call," meaning they have one hour to respond to a specific location—but are not required to be at that location unless preparing for an approved flight. For the GAS pilots, the regulations establish a maximum duty time of 14 hours with a required minimum rest of 8 hours to immediately follow (excluding travel to and from). Additionally, the pilots must be scheduled for "time free from duty" (e.g., the pilot is not engaged in any flight operations or related duties including on-call). This requires the pilots to be scheduled off duty for 36 consecutive hours within each 7 consecutive days, and 3 calendar days each 17 consecutive days.

GAS pilots are on call for 24 hour periods; however, the "clock" for their duty time does not start until they are called in for a flight or for any GAS-related business. In this regard, a pilot can begin a call day at 7:00 AM, but not start their duty time until the first flight comes in (e.g., at 2:00 PM). The pilot can then, under CARs, legally be on duty and conduct flights for the next 14 hours, or until 4:00 AM the following morning.

Engineers do not have regulated duty and rest requirements under the CARs. GAS schedules the engineers Monday through Friday from 8:00 AM to 4:00 PM, and they are on standby status during the weekends to respond to unscheduled aircraft maintenance events.

The Medical Flight Specialists are on duty and providing coverage 24/7 in St. John's, and currently 12/7 in HVGB (see Section 3 for medical staffing detail). GAS reports that flights originating in the latter 3 hours of the medical flight team shift in St. John's are held for the oncoming medical team to respond to avoid overtime. This then creates a challenge for the pilots, as they may have already started their 14 hour duty shift with an earlier flight—and therefore may time out before the delayed flight can be dispatched.

2.2.1 Analysis

Pilot coverage to staff the aircraft does not match the medical flight crew coverage and results in response gaps and/or lost flights. In these instances, the flight is often re-directed to the PAL jet.

During scheduled or unscheduled heavy maintenance events, GAS brings in engineers from the water bomber aircraft in to help shorten maintenance out of service time. This scheduling practice does not work well during water bomber operations, as the engineers normally reassigned to support air ambulance maintenance are tending full time to the water bomber aircraft. Air Ambulance related heavy maintenance that occurs during this time will subsequently be subject to protracted out of service time because of the limited additional engineer support.

2.2.2 Recommendations

Pilot and medical staff coverage must be aligned in the short term.
Consistency in staffing the medical flight team overlap shift in St. John's should help alleviate the practice of delaying flight dispatch. GAS and MFS should immediately report to HCS any flight that is held/delayed due to a pilot or a medical crew staffing reason. This QA occurrence report should then be reviewed quarterly by HCS, GAS and MFS for process improvement. Additionally, a policy should be set that allows the pilot duty day to take precedence over Medical Flight Service decisions to not incur overtime when a patient transport is pending. The cost of using the PAL jet in these instances of the pilot exhausting duty time when holding flights for the medical flight crew far exceeds the cost of the medical team overtime.

GAS should submit a weekly report to HCS that illustrates the key metrics of pilot duty time, medical flight crew delays in staffing flights, and engineer shortages so that appropriate planning can be made to mitigate factors that result in patient transport delays and/or higher cost. Additionally, GAS should be begin preparing its transport volume metrics and the target levels whereby additional pilot and engineering staff will be required in order to assure a 24/7 state of readiness to respond.

Increase pilot and engineer coverage to improve GAS aircraft readiness.
The air ambulance program readiness to reliably respond on a 24/7 basis requires adding a second on-call pilot team. The second on call pilot team could be scheduled for their 24 hour call to start 12 hours after the first team, thereby provide a "fresh" pilot team every 12 hours.

Aircraft engineer coverage should be extended to include staffing eight hours on Saturday and Sunday to facilitate having someone present, rather than responding on-call, to expedite completing scheduled and unscheduled maintenance on every day of the week. This will increase the number of engineers dedicated to the air ambulance program and subsequently, a larger pool of people that can be brought in to complete heavy maintenance in shorter out of service time.

The cost impact of new aircraft and staffing changes needs to be prospectively defined by GAS.
GAS currently estimates the annual cost of air ambulance program to $6 million. The costs are not broken out, therefore making it difficult to determine where operational improvements may be directly attributable. For example, the operating cost of the oldest King Air 350 has not been provided, making it difficult to quantify the savings of what is expected to be lower operating costs of the proposed replacement aircraft.

2.2 PAL Jet Utilization

The government contracts the PAL jet primarily to provide the longer distance transfers for patients requiring care outside of Newfoundland and Labrador. This aircraft is also deployed as a back up to respond to a flight if the GAS aircraft are out of service for maintenance, and on occasion as a third aircraft if a medical flight crew is available. GAS also notes there are times when the jet is specifically

requested by Medical Flight Services for flights within the province (including intra-island) with knowledge that there is a GAS aircraft available.

In FY 2012-13, the PAL jet completed 137 flights. In FY 2013 – 14 through 30 November, the PAL jet had been dispatched on 83 Air Ambulance Program flights.

2.2.1 Analysis

Detailed data on PAL jet utilization was created by the Consultant by entering the flight parameters from the GAS "Air Services – Air Ambulance Report" of all Air Ambulance flights into a data base for the period 14 April 2013 through 30 November 2013 (the first two weeks of April data was not located). This allowed for day by day observations of when flights were occurring, which aircraft were being deployed, the patient acuity level prescribed by PMO, and other key flight parameters. Data from FY 2012-13 did not include the same level of detail, thus eliminating the ability for cross comparisons.

During the period of 14 April – 30 November 2013, there were 83 PAL jet flights:

- 18 were destined outside the province,
- 19 were from Labrador to the Island, and
- 46 were intra-island flights.

Of the 65 flights the PAL jet was deployed for flights within the province:

- 16 instances, the PAL jet was the first aircraft dispatched;
- 38 times it was the second aircraft dispatched, likely due to unavailability of a second Air Ambulance aircraft and/or pilot; and
- 11 times it was deployed as a third aircraft (simultaneous demand) as both GAS Air Ambulances were engaged on patient flights.

Of note, the PAL jet was the first aircraft deployed on 11 of the 45 flights that were within Newfoundland (island).

Previous year data is not available giving dates and times to ascertain how PAL jets were used in first, second or third aircraft deployment positions.

In FY 2012-2013, PAL completed 137 transports on behalf of the province. This compares to 83 from 14 April 2013 through 30 November 2013. Based upon patient acuity categories, the distribution of flights to patient acuity is illustrated in Table 2.

Table 2. Patient acuity on PAL transports.

	FY 2012-13	FY 2013-14*
Critical	49%	51%
Emergent	18%	21%
Urgent	19%	13%
Referred	10%	8%
Wait Listed	4%	8%
* *14 April through 30 Nov 2013*		

The acuity categories of Urgent, Referred, and Wait Listed are likely mismatched for use of the PAL jet within the province, and particularly for intra-island movements. There may be peripheral circumstances as to the decisions leading to the PAL jet deployment for these categories; however, a process for reporting and monitoring these variances is not in effect. Table 3 illustrates the distribution of flights by patient acuity, and the overall average cost per flight.

Table 3. PAL average cost per flight.

PAL Flights	FY 2012-3	FY 2013-4*
Critical	67	40
Emergent	25	16
Urgent	26	10
Referred	14	6
Wait Listed	5	6
No category		5
	137	83
Avg. Cost per Flight	$ 13,139	$ 15,060
**14 April through 30 Nov 2013*		

The cost for the GAS-provided aircraft by patient acuity is illustrated below in Table 4.

Table 4. GAS average cost per flight.

GAS Flights	FY 2012-2013	FY 2013-4*
Critical	392	155
Emergent	281	120
Urgent	219	82
Referred	133	58
Wait List	102	48
No category		33
	1127	496
Avg. Cost per Flight	$ 5,324	$ 8,065

**14 April through 30 Nov 2013*

The monthly fixed cost for the PAL jet and the annual fixed cost for the GAS aircraft set the baseline of the average per flight cost. With a shorter period reporting in FY 2013 – 14, the cumulative fixed costs are spread across a lower number of flights, and contribute to the higher average per flight cost than in FY 2012-13.

The cost for the PAL jet in FY 2012-13 was $1.81 million, and for the period 1 April through 30 November, the government paid $1.25 million for medical flights on PAL.

Using the average cost per flight, the PAL jet and GAS flights are illustrated in Table 5, as distributed across patient acuity levels. The reporting period for this data is FY 2012-13.

Table 5. The cost of patient transports based on average cost per flight.

	GAS King Airs	PAL Jet
	FY 2012-3	FY 2012-3
	$ 6,000,000	$ 1,800,000
Critical	2,086,957	880,292
Emergent	1,496,007	328,467
Urgent	1,165,927	341,606
Referred	708,075	183,942
Wait Listed	543,034	65,693

2.2.2 Recommendations

Restrict jet service to out of province transports.
The cost is significantly higher for use of the PAL jet versus the GAS King Air aircraft for intra-province flights. The PAL jet may be appropriate as back up aircraft for HVGB. The shorter distances traveled intra-island nullifies the faster speed benefit of the jet, and it should not be engaged for these flights. GAS and MFS should immediately report to HCS any flight in which MFS requests a non-GAS aircraft (e.g. jet) for transports within the province when a GAS aircraft is available for response. This QA occurrence report should then be reviewed quarterly by HCS, GAS and MFS for process improvement.

Air ambulance jet service should reliably provide uninterrupted flight when the patient is on board from anywhere in the province to Toronto. Refueling, as noted previously, should not occur with a patient onboard. The government contracts for air ambulance jet services must include aircraft that will reliably (e.g. 100% of the time) complete the out of province patient transports into Toronto.

The replacement of the aged King Air 350 with a new aircraft and increasing pilot and engineer coverage should result in an immediate improvement in GAS aircraft readiness and availability. These factors, along with near exclusive use of the GAS aircraft for intra-provincial flights and focusing jet services for out of province flights, should lower demand for use of the jet. The government can then better evaluate the operational efficacy and cost benefit of contracting for dedicated jet service (e.g., a fixed monthly and lower per flight charge) as is the current arrangement, versus a preferred provider relationship with one or two air ambulance jet providers for an on-demand relationship (e.g., a higher per flight charge).

The reduced use of the PAL jet should not take effect until the new King Air is on line, and the GAS pilot and engineer staffing changes have been evaluated.

3. MEDICAL FLIGHT SERVICE STAFFING

An assessment of the Happy Valley/Goose Bay (HVGB) fixed wing air ambulance Medical Flight Service staffing was conducted. Issues and assumptions leading to this assessment include:

- The Province began staffing a Medical Flight Specialist team in HVGB in late July 2013 (22 July 2013).
- The medical flight team based in HVGB is budgeted for nine (9) Full Time Equivalents (FTEs), has seven (7) FTEs filled and is requesting a budget for twelve (12) FTEs.
- Current Medical Flight Specialist scheduling in HVGB does not allow for 24-hour coverage.
- Twelve FTEs are required for 24-hour coverage.
- Medical Flight Service managers are having difficulty in recruiting staff for the HVGB site based on a residency requirement.
- Medical Flight Specialists have stated that they are not subject to "Standby" and "Call-Back."
- Coastal mission staffing: Prior coastal missions have been staffed with one caregiver, yet Medical Flight Service and PMO require two caregivers for all air ambulance missions.
- The current staffing ratio of registered nurses (RN) and advanced care paramedics (ACP) in HVGB is not a one-to-one ratio. An RN-RN team doesn't provide a full complement of clinical skills for HVGB Medical Flight Service transports as only the ACP is allowed interventional skills (i.e., endotracheal intubation) that the RN is not.
- An expectation from the Labrador-Grenfell Health Authority that the HVGB Medical Flight Service team will provide all clinical staffing for Labrador "coastal" missions.[iii]
- Medical escort provided by sending facility (non- Medical Flight Service) personnel when the Medical Flight Service is unable to provide staff, may leave a small rural community without medical support for the duration of the mission including the return of the local healthcare professional (RN, MD).
- Transport logistics, specifically the airport to healthcare facility ground ambulance transfer of MFS crew on the non-patient leg, may overburden limited ground ambulance transport resources. These shuttles may require additional ground ambulance staff to call in, increasing staffing costs, or inhibit the local service to respond to emergency calls.
- Additional and continuing funding is required for non- Medical Flight Service medical escort standby and callback salaries to respond to critical and emergent requests when the Medical Flight Service is unavailable.

Data received from EHIS and GAS was assimilated, "cleaned" and collated by Fitch research staff for this study. Both databases are operated independently within NL and have not been internally validated.

3.1 Demand, Patient Acuity and Hours-on-Task

According to Medical Flight Service management, "the current air ambulance resources and staff are frequently challenged with simultaneous demands for high priority flights, resulting in delayed flights/responses or alternate medical teams being deployed from sending facilities which is often not ideal in respect of training in aviation transport, critical care transport, and the cost and staffing impacts on the local facility." Additionally, staffing the coastal transports was an unstated, undefined and unanticipated expectation for the HVGB Medical Flight Service team.

3.1.1 Analysis

According to Provincial Air Ambulance Program provided documentation from CY 2012, critical transports accounted for 35% (401 of 1154) of all provincial air ambulance transports. During the same calendar year, emergent transports comprised 25% (286), urgent 19% (214), referred care 13% (151), and wait-listed transports, 9% (100).

During this same period (CY 2012) Labrador-Grenfell Health Authority accounted for a total of 433 of the 1154 patients transports, of which 30% were critical, 29% emergent, 18% urgent, 21% referred and 2% wait listed.

There were 322 coastal transports in CY 2012 conducted by the Labrador-Grenfell Health Authority outside of the Provincial Air Ambulance Program. Patient acuity was not documented for coastal transports until the Medical Flight Service began staffing coastal transports on 22 July 2013. Since July 2013, coastal transports were coded 23% critical, 33% emergent, 27% urgent, 7% referred care and 10% wait listed (11 transports were not coded). Acuity data is attached in Annex A.

Patient transports by time of day were analyzed for peak and trough trends for the period 1 April 2012 through 31 October 2013 for all Medical Flight Service transports and then separately for Labrador-Grenfell only flights, and for MFS-staffed coastal flights for the period 22 July 2013 (inception) through 31 October 2013. The results are detailed in Annex B.

Ninety percent of all transports were started by the Medical Flight Service between 0800 hours and 2300 each day in this dataset. During a 24-hour period, 90% of the coastal transport subset began earlier at 0600 hours and ending at 2300 hours. The lowest numbers of transports occur between the hours of midnight to 0600 hours in the morning.

Demand, defined as transport requests, averages four flights per day for all Medical Flight Service transports.[iv] Coastal requests account for one in four of the average total daily demand.

From "crew received call" to "patient arrived hospital," average transport time for HVGB Medical Flight Service air ambulance is 4 hours, 32 minutes. The St. Johns medical flight team average transport time is four hours and 52 minutes in Medical Flight Service provided documentation.[v]

Air ambulance systems benchmark to "supply" a sufficient amount of resources (air medical crew, pilots and aircraft) to meet demand (a call for a patient transport) within a predefined target (e.g., 90% of the time). Currently the Medical Flight Service supplies 75% of its medical crew staff hours during the period of 90% of the call demand hours resulting in a resource mismatch. Further analysis of air medical staff production demonstrates the mismatch across all Provincial Medical Flight Service transports, as well as a specific disparity with HVGB supply (staffing) and demand, are illustrated in Annex C. Further complicating the ability to match supply and demand are two potentially non-controllable variables: simultaneous demand and high time-on-task. Simultaneous demand could not be fully analyzed given current data collection and database limitations.[vi]

The production model demonstrates the difficulty of providing sufficient staffing for critical and emergent call response in the current staffing model, especially during the daytime hours, and when the 0900-2100 shift in St. John's is not staffed. The St. John's "swing shift" team is utilized to cover day or night sick call, vacation leave or any other staff time off, resulting in intermittent uncovered shifts. Additionally each staff member has two scheduled "drop" shifts every 12-weeks according to the "YYT 12 FTE Master Schedule." In a 12-week schedule, a full time equivalent MFS works 40 shifts.

Peak daytime Medical Flight Service staffing (one team in HVGB, one team in St. John's and an intermittent third mid-day team[vii]) is insufficient for peak, daytime demand.

In reality, the Provincial Air Ambulance Program has three aircraft to staff, one in St. John's and two in HVGB, including the Twin Otter.

Off-peak, or nighttime staffing, is sufficient for current demand with the following caveats:

1. There is no dedicated process in place (i.e., standby and callback) to provide additional MFS crew for simultaneous requests. During the off-peak hours, a second mission may be delayed until the "night shift" crew completes its current mission, or until a second crew can be called in.
2. Of the CY 2012 coastal transports, 70 missions began between 2100 and 0900 hours, when no MFS would have been on duty in HVGB.
3. Coastal flights, requiring the use of the HVGB based Twin Otter aircraft, may further delay response as a HVGB non-scheduled, non-call crew is called in, or the St. John's crew flies to HVGB and changes aircraft. The frequency of these events is unknown.

3.1.2 Recommendations

Medical Flight Specialist staffing should align with transport demand.
St. John's should be consistently staffed 365 days per year, 24 hours a day, with a day 12-hour and a night 12-hour shift. The St. John's medical flight team should be in facility, not on call, and ready for any request. The shift change for all medical flight teams should be the same as pilot scheduled shift start-stop. Additionally all air ambulance shifts (e.g., pilots and medical teams) province-wide should

begin on a two-hour staggered start. For example, the HVGB pilots and medical team would begin at 0600 and St. John's at 0800 and 2000, etc. HVGB will require nighttime pilot coverage, likely on-call, to provide coastal twin otter service with the HVGB MFS on-call team. Staggered shift start limits the possibility of pilot staff duty time issues, and medical flight staff on overtime for transports.

Twenty-four hour coverage is needed, based on the transport demand in the coastal areas accessed from HVGB; however, the low-volume early morning hours may be most effectively and economically covered with standby and callback duty. As stated in Article 22 of the Collective Agreement ("Standby and Callback"), this staffing practice is permitted.

According to the Medical Flight Specialist Collective Agreement hours of work can be either an eight-hour shift or a 12-hour shift.[viii] Due to the average hours spent on transport, the 12-hour shift is the most compatible shift length.

With historical coastal requests beginning to increase at 0600 hours, a 12-hour daytime shift from 0600 to 1800 is optimal. A second 12-hour shift would provide peak volume staffing and allow coastal, twin otter coverage during peak demand hours, 1000 to 2200.

3.2 HVGB Medical Flight Specialist Scheduling

As of November 2013, HVGB was staffed with seven full-time Medical Flight Specialists, six RN's and one ACP. A day shift is covered from 0700-1900 hours seven days a week according to the "YYR 7 FTE Master Schedule." A 12-hour "swing shift," from 0900-2100 hours, or eight-hour 0900-1700 shift provide additional but intermittent, day time coverage. According to this schedule, there were 34 of 48 days with four Medical Flight Specialists on-duty and 14 of 48 days with three Medical Flight Specialists on duty, all scheduled during daytime hours, with no staff scheduled after 2100 hours. It is noted that an ACP was scheduled on duty for 26 of the 48 days represented by this schedule.

Missions should be staffed with a two-person medical team comprised of an RN and ACP, but with only one ACP in HVGB, this configuration cannot be reliably achieved. Staff and management report frequent ACP overtime to provide coverage and appropriate skill mix. Additionally, HVGB staff report RN-RN staffing has caused them to turn around during transport or cancel flights.

The premise for medical airplane coverage in Happy Valley Goose Bay is for on-duty staff for the GAS aircraft 24 hours each day and staffing for Coastal Flights to be 12 hours on-duty and 12 hours cross coverage from the GAS on-duty team. The Full-time Equivalent (FTE) requirement for Medical Flight Specialists (MFS) in Happy Valley Goose Bay (HVGB) to staff the aircraft under this premise is determined by two primary criteria:

1. Happy Valley Goose Bay will be staffed by a 2-person on-duty medical flight specialist team (RN-ACP) for three 12-hour shifts each day. Team One will work during daytime hours with a primary responsibility for Provincial missions, utilizing the NL King Air. Team Two will staff

daytime hours for Coastal missions using the LG Health contracted Caravan aircraft. The third team will cover nighttime hours with primary responsibility for Coastal missions with a secondary role in Provincial missions utilizing whichever aircraft is appropriate for the mission.

2. The MFS Manager provided the break out of hours for each FTE as illustrated in the table below. This results in each full time equivalent (FTE) Medical Flight Specialist being available for flight duty 1,280.5 hours per year.

Table 6. Annual Time Allocation per MFS FTE

Total hours scheduled per FTE	1,950 hours
Vacation/Annual	(187.5) hours
Statutory Holiday	(75) hours
Training	(88) hours
OT/Comp	(100) hours
Meals & Shifts not worked	(100) hours
Sick Leave	(81.5) hours
Other Leave	(37.5) hours

3.2.1 Analysis

Three staffing options for HVGB are detailed below.

To provide HVGB with 36 hours per day of staffed coverage, it will require 20.5 FTE's to provide full staffing. The calculation for this level of FTE's and the resulting coverage is summarized below:

1 – Three MFS teams on duty covering 12 hour shifts in HVGB

The goal is to provide Medical Flight Specialist (MFS) Team staffing for Happy Valley Goose Bay (HVGB) for the following 12 hour per day shifts:

- Day Shift – available for Provincial coverage
- Day Shift – available for Coastal coverage
- Night Shift – available for Provincial and Coastal (with preference for Coastal)

This scenario requires three teams (six people) working 12 hour shifts for a total of 72 hours of MFS staffing per day.

2 – Annual coverage requires a total of 26,280 staffed hours

- Annual coverage (365 days) of these three shifts, or 72 hours of MFS staffing each day, requires a total of 26,280 staff hours.

3 – One (1) MFS FTE provides 1,280.5 hours flight duty annually

- Based on information provided and confirmed by the MFS Manager, one (1) full-time Medical Flight Specialist provides 1,280.5 staff hours annually for flight duty.

4 – 20.5 FTE's are required.

- 26,280 hours that need to be covered annually divided by 1,280.5 annual flight hours allocated per FTE, equals 20.5 FTE's.

A "two-shift" FTE Calculation for HVGB would eliminate 12 hours of daytime coverage (Team Two) resulting in an FTE requirement of 13.6 Medical Flight Specialists:

1 – Two shifts on duty MFS teams covering 12 hour shifts in HVGB

- Day Shift – available for Provincial and Coastal
- Night Shift – available for Provincial and Coastal (with preference for Coastal)

This scenario requires two teams (four people) working 12 hour shifts for a total of 48 hours of MFS staffing per day.

2 – Annual coverage requires a total of 17,520-staffed hours

Annual coverage (365 days) of these two shifts, or 48 hours of MFS staffing each day, requires a total of 17,520 annual staff hours.

3 – One (1) MFS FTE provides 1,280.5 hours flight duty annually

Based on information provided and confirmed by the MFS Manager, one (1) full-time Medical Flight Specialist provides 1,280.5 staff hours annually for flight duty.

4 – 13.7 FTE's are required.

17,520 hours that need to be covered annually divided by 1,280.5 flight hours per FTE, equals 13.7 FTE's.

The Consultant notes that Eastern Health/MFS leadership has drafted a schedule template for two weeks on-duty and two weeks off-duty whereby this scenario will reliably provide one MFS team (RN-ACP) 24 hours a day 365 days a year (a day and night shift). An additional 12 hour "swing shift" is noted in this schedule. The "swing shift" in this scenario is utilized to cover day or night shift leave, illness or vacation thus it is transient (not guaranteed to be staffed 365 days per year). This "swing shift" substitution is essentially the St. John's staffing model.

A third staffing option illustrates use of MFS "stand by-call back" implemented with a 13.6 FTE staff. However, this option is contingent on Eastern Health obtaining staff acceptance and NL Association of Allied Health Professional (AAHP) approval for implementation of a "stand by-call back" schedule. The resulting coverage and FTE requirement is illustrated below.

1 – Two on duty MFS teams covering 12 hour shifts in HVGB with call back

- Day Shift – available for Provincial and Coastal
- Night Shift – available for Provincial and Coastal (with preference for Coastal)

This scenario requires two teams (four people) working 12 hour shifts for a total of 48 hours of MFS staffing per day.

2 – Annual coverage requires a total of 17,520-staffed hours

Annual coverage (365 days) of these two shifts, or 48 hours of MFS staffing each day, requires a total of 17,520 annual staff hours.

3 – One (1) MFS FTE provides 1,280.5 hours flight duty annually

Based on information provided and confirmed by the MFS Director, one (1) full-time Medical Flight Specialist provides 1,284.5 staff hours annually for flight duty.

4 – 13.7 FTE's are required plus "stand by and call back".

17,520 hours that need to be covered annually divided by 1,284.5 flight hours per FTE, equals 13.7 FTE's.

5 – Implement "Stand By – Call Back" to assure 2 teams are available during daytime hours.

Using the previous staffing scenario, stand by-call back would be activated when the transient "swing shift" is diverted to cover the permanent day or night shift. The night shift MFS would be placed on "stand by-call back" for 12-hours following the shift (daytime). Additionally the night shift team would be allowed sleep time during the night shift hours, preventing excessive fatigue if called back for a daytime transport.

The Consultant notes this option creates the most efficient and economic scenario however it is contingent on Eastern Health to obtain MFS staff and Association of Allied Health Professional (AAHP) approval.

3.2.2 Recommendations

HVGB requires at least 24 hours of dedicated MFS staffing.

Three options illustrated in the analysis above address baseline and additional coverage scenarios for the HVGB base—inclusive of Provincial and Coastal flights. Dedicated staffing 24 hours each day is the baseline; however, there is need to develop a cost efficient coverage solution for an additional 12 hours per day. Of the three options outlined, the standby – call back scenario yields the most efficiency and represents an appropriate baseline upon which to parallel volume growth and increased dedicated staffing. However, this model is dependent upon Eastern Health securing MFS staff and Association of Allied Health Professional (AAHP) approval.

Consider a two week on—two week off shift rotation for MFS in HVGB.

Many scheduling options are available with each of the FTE allotments. An operational schedule falls under the purview and undertaking of Eastern Heath with the MFS staff and AAHP. Given the remote location of this air medical base, and recruitment/retention challenges, a non-standard approach to the schedule is most likely to achieve success. One such option is a two weeks on, two weeks off schedule.

Common in the offshore industry, the two weeks on—two weeks off schedule rotates staff in a two week pattern. During a 12-week rotation, an individual FTE averages 40 hour work time per week. To staff the desired three shifts per day in HVGB, 20.5 FTEs are required.

Travel, housing and a per diem stipend may be required to support this staffing option. Employee approval would need to be secured with corresponding Collective Agreement modifications.

Medical Flight Specialist staffing should align with transport location.
LG and coastal missions require 24-hour response from the combined resources of the NL Air Ambulance Program. During daylight hours both the St. John's team and King Air aircraft, with the HVGB team and King Air provide province wide coverage. It is recommended that nighttime provincial flights be triaged to the St. John's team, leaving the HVGB team for coastal request only. A swing shift staffed at HVGB, aligns with location and demand. Coastal medivacs, conducted in a HVGB twin otter, require a dedicated team during daytime hours and on-call coverage overnight.

3.3 Number of Caregivers Required for Coastal Medivac

Prior to Medical Flight Service staffing the HVGB air ambulance, 83% of coastal Medivacs were staffed with a single medical caregiver, as shown in Annex F.

3.3.1 Findings

Medical Flight Service staff report "down-coding" 25% of coastal requests from a higher acuity rating determined at the sending facility to lower category acuity, after Medical Flight Service staff conducted an on-site assessment of the patient. Despite this appropriate "down-coding" of acuity, 51% of coastal medevac missions during the period July 2013 through Oct 2013 remain "critical or emergent."

The 9th Edition (July 2012) Accreditation Standards of the Commission on Accreditation of Medical Transport System (CAMTS), Section 01.07.03 addresses Mission Types and Professional Licensure. This section states "critical care missions require an additional team member, for a minimum of 2 medical attendants (for example, but not limited to, RN/RN, RN/RT, RN/MD, RN/Paramedic (or alternative team composition), while a patient(s) is on board."

On-line research of other Canadian Provincial air medical service standards finds a two-caregiver minimum for transport with few exceptions.

3.3.2 Recommendations

All coastal medivacs should be staffed with two caregivers.
Optimal staffing for the coastal medivacs is achieved with two caregivers per patient according to Newfoundland –Labrador air ambulance historical acuity data, PMO requirements, and medical transport service standards.

3.4 Medical Flight Specialist Skill Mix

The HVGB team staffed with six RN and one ACP medical flight specialists does not provide the PMO required RN-ACP, 1-to-1 ratio of staff. A specifically cited skill, endotracheal intubation (ETI), can only be performed by an ACP; thus, any patient with a respiratory illness or injury or on a respiratory ventilator requires an ACP credentialed caregiver for transport.

3.4.1 Analysis

According to National Occupational Competency Profile for Paramedics, controlled or delegated medical acts in the ACP competency profile include advanced techniques to manage life-threatening problems affecting patient airway, breathing and circulation. ACPs may implement treatment measures that are invasive and/or pharmacological in nature.[ix] Under the ACP scope of practice, the medical director delegate's treatment measures including endotracheal intubation.

The Association of Registered Nurses of Newfoundland and Labrador (ARNNL) have developed Standards of Practice for Registered Nurses.[x] The ARNNL lists five levels of standards in the Nursing Pyramid; Standards of Practice for Registered Nurses, Specialty standards, Agency standards, Unit level standards and Client-specific practice.

> *Specialty or other standards define in more detail expectations specific to an area of practice, (e.g., critical care or mental health), or they may address components of practice such as documentation or medication administration. These standards complement the Standards of Practice for Registered Nurses and provide additional information on specific topics.*

The ARNNL Standards of Practice neither includes nor precludes treatment measures that are invasive and/or pharmacological in nature.

In discussion, Newfoundland and Labrador Provincial Medical Oversight (PMO) has stated it will not allow, delegate or support RNs to perform endotracheal intubations (ETI). In other Canadian provinces, RNs may be delegated the practice of ETI (i.e., Saskatchewan - Saskatoon Health Region (SHR) Special Nursing Procedures (SNPs) - Air Ambulance – RN Skill).

3.4.2 Recommendations

Medical Flight Specialist clinical skill capability must be standardized.
The Medical Flight Service must achieve RN-ACP staffing coverage to assure the ACP level of care on all critical and emergent flights, especially those with respiratory illness or injury, in the short term.

Long term, the PMO should establish a minimum level of training, experience and competency that does not create a disparate skill mix between all staff classified as "medical flight specialist," regardless of licensure or certification.

If Medical Flight Service skill standardization between RN and ACP cannot be established, RNs should be cross-trained as ACPs.

Additionally, advanced airway management by the Medical Flight Service should include an alternate airway management intervention (i.e., King Airway or Combitube) with continued emphasis on basic airway management skills.

3.5 Recruiting Difficulty for HVGB Medical Flight Service

The MFS staff assigned to HVGB are required by Labrador-Grenfell Health to establish domicile in the HVGB area. According to Medical Flight Service management, this is the greatest impediment to successful recruiting for the HVGB base.

3.5.1 Analysis

Anecdotal reports of Medical Flight Service HVGB job offers that were declined due to residency requirements could not be substantiated by client-provided documentation. However, there is consensus among individuals at Eastern Health, Medical Flight Service, and PMO that the HVGB domicile requirement adds to recruiting difficulties. The Labrador-Grenfell Health CEO expressed some willingness to compromise this requirement if it resulted in fully staffed medical flight team, along with better coastal mission coverage and a concurrent reduction in Labrador-Grenfell Health Authority non-MFS escort costs.

Staffing a remote location such as HVGB is challenging for most air ambulance services, and is often best accomplished by a balance of residential and transient, non-residential staff. The modified Kelly scheduling is compatible with a non-residency option.

3.5.2 Recommendations

Allow transient professionals to staff HVGB.
Housing is available at the HVGB Government Air Service (GAS) facility. Compensation parity between domiciled and transient staff should be established, potentially free housing for the transient group, and a small stipend or relocation bonus for the resident staff. This compensation should be consistent with other, similar positions within the area and the Collective Bargaining Agreement.

Further, PAL and Air Canada have daily flights in and out of HVGB, which may support a negotiated rate for transient Medical Flight Specialists travel.

3.6 Transport logistics (to/from airport)

Deer Lake and Gander air ambulance transports include reliance on ground services to transport the medical flight team from the airport to the facility to pick up the patient. This portion of the transport ties up an on-duty ground ambulance to shuttle the medical flight team and equipment to the facility.

3.6.1 Analysis

Data was limited in documenting the total ground ambulance "shuttle" time from the Deer Lake and Gander airports to the facility, but protracted wait times for the ambulance were reported. The time efficiencies gained for the MFS arrival to the patient's bedside through placement of a dedicated vehicle at St. Anthony's Airport serves as a basis for similar logistics at other commonly used airports that are a distance from sending health facilities.

3.6.2 Recommendations

Provide a dedicated non-transport vehicle at Deer Lake and Gander Airport for the medical flight team. Ground ambulance availability would be improved and medical flight team response from the airport shortened if the medical flight team has immediate access to a vehicle at the airport to drive to the sending facility for non-patient legs. The vehicle does not need to be fully specified and equipped as a ground ambulance for this purpose of relocating the medical flight team. Upon return to the airport, the ground ambulance transporting the medical flight team and patient to the airport could assign its second ambulance crew member to drive the medical flight team's vehicle and follow their ambulance back to the airport. The vehicle could be provided by the ambulance service, thus giving them the responsibility and accountability to assure it is always in a state of readiness for Medical Flight Service use. Locating a medical flight team transport vehicle at the Deer lake and Gander airports will improve response time to pick up the patient, return capacity to the ground ambulance service (by relieving the ground ambulance of the medical flight team transport to the patient), decrease the actual ambulance miles travelled by one-half, and potentially reduce costs for additional ground ambulance staff when called in for shuttles.

3.7 Community Impact of Non-MFS Nurse Escort Costs

The Labrador-Grenfell Health Authority expected that the HVGB medical flight team would lessen, if not eliminate, the need for local healthcare professional utilization (nurse escorts) especially for coastal flights. In addition to the cost, the additional downside of "escort" utilization is the local community impact when the caregiver serving as the escort is potentially the only local healthcare resource, is absent during transport.

3.7.1 Analysis

Thirty six facility escorts (non-MFS staff) were conducted July 22 through October 31, 2013 as illustrated in Annex F. The Labrador-Grenfell Health Authority reports escort costs of $51,037 for the period July-October 2013.[xi] While escort costs are down approximately 35% from the same period in 2012, the annualized expense is calculated to exceed $150,000.

3.7.2 Recommendations

Utilize the Medical Flight Service on all HVGB transports to reduce escort costs.
The Medical Flight Service team is best trained and equipped for transport of the ill and injured within Newfoundland and Labrador. Restructuring of Medical Flight Specialists scheduling and recruiting for the HVGB site may alleviate much of the additional escort costs for Labrador-Grenfell Health Authority, while preventing the unintended consequence of local healthcare service and resource disruption during escorts.

Medical Flight Service has requested an additional three FTEs to increase the total number of HVGB staff to 12.[xii] According to MFS data, the three additional FTEs will cost nearly $300,000, twice the projected cost of annual Labrador-Grenfell Health Authority non- Medical Flight Service escort personnel. A measured approach, of staffing a medical flight team swing shift in HVGB, implementing staff schedule changes and skill mix ratios in HVGB, is recommended as a first step. Following that, a reevaluation of Labrador-Grenfell Health Authority non- Medical Flight Service escort costs should be conducted. Medical Flight Service is currently budgeted nine FTEs for HVGB (1.9 FTEs over) and a 12-hour swing shift in St. John's. The current Medical Flight Service FTE allocation can be leveraged to cover a swing shift in HVGB by eliminating the St. John's swing shift and combining the HVGB 1.9 FTE surplus for a budget neutral result.

The Medical Flight Service, PMO and Labrador-Grenfell Health Authority leadership should develop and utilize a reporting and performance improvement process aimed at increasing the effectiveness and efficiency of Medical Flight Service availability and utilization.

3.8 Medical Flight Specialist Fatigue

Medical transportation requires a high level of mental and physical alertness to maintain operational and patient safety. Emergency services operate around the clock, and fatigue clearly poses a risk both to the public, the patient and emergency workers. Fatigue mitigation, or alertness management approaches are needed to address this issue within the EMS industry and specifically within MFS operations.

In addition to fatigue, multi-factorial risk assessment is becoming commonplace among air and some ground, medical transportation services. Included in these mission specific risk assessment tools are an evaluation of fatigue, duty shift, team experience/performance, workload, environmental conditions, nutrition and hydration.

Mission-by-mission risk assessment provides a quantitative and qualitative approach to addressing operational safety. Ongoing documentation can be the basis for quality and performance improvement, safety initiatives, employee scheduling and wellness, in addition to understanding and qualifying the scope and impact of fatigue.

3.8.1 Analysis

MFS fatigue was cited as a concern during this study. Anecdotal in nature, formal tracking and documentation of fatigue among MFS workers isn't currently collected.

3.8.2 Recommendations

A fatigue/alertness management program

Although solutions must be individualized, many fatigue/alertness management programs share similar traits, including:

- A commitment from the highest levels of management to develop a culture that addresses the importance of fatigue and engages everyone in developing strategies to cope with it;
- The involvement of employees in developing shift schedules, since they well understand the rhythm of the work and how it affects them;
- Participation in mandatory education programs by management and employees, and often union representatives and family members who also have an effect on how employees manage fatigue;
- Data collection and evaluation of any changes to shift schedules or workplace organization to document any improvement; and
- The promotion of individual coping strategies such as improving diet, exercise, sleep habits and relaxation through classes, and printed and visual material in order to mitigate fatigue.

Mission-by-mission risk assessment

Air medical providers operate in a challenging and hazardous environment yet provide a valuable service to the community. In order to maintain a standard of safety, a system must be in place to help identify, assess, and manage risk. Risk assessment is defined as the concept of using decision making tools in order to assist flight crews to identify operational risks and benefits associated with flights. The risk management process can then be used to minimize hazards and help increase the safety of the crews, patients, and resources.

4. SCHEDULED MULTI-LOAD AIR SHUTTLES

An estimated 262,000 of Newfoundland and Labrador's 514,000 population live on the Avalon Peninsula and within a 1-2 hour ground drive to the tertiary and specialized health care services in St. John's. For the remaining population, road transportation, even under the best of weather conditions, can be quite lengthy to access the services in St. John's. For many, making the trip via private vehicle may be contraindicated and result in the use of road ambulances and the air ambulance service as their only passage to scheduled medical appointments in St. John's. This patient subgroup needs transportation services, but is not requiring transport medical care.

The Newfoundland and Labrador Ambulance Program is designed to move one patient at a time in nearly all situations, including the transport of some non-stretcher dependent patients to their scheduled medical appointments. This is accomplished at a relatively high system cost per single patient transport over long distances if the patient does not need medical care enroute. Additionally, the use of an ambulance for these purposes may leave communities without ambulance resources for extended periods. Appropriate medical screening would identify those patients who may be candidates for transport via vehicles that can accommodate a group of patients within a single trip.

4.1 Air Shuttle Transport Service Operations

Given the significant ground travel distances for some patients to their medical appointments in St. John's, examination of a scheduled, Multi-Load Air Shuttle (MLAS) has been undertaken. A scheduled MLAS carrying multiple routine patients would provide economic efficiency over single patient transports where Medical Flight Service (e.g., critical, lifesaving, urgent) level care is not required. The non-emergent, scheduled non-stretcher dependent patients currently transported in ground ambulances or private vehicles that are travelling over four hours one way would also be included.

By identifying MLAS "hubs" at key locations throughout the province, a scheduled air shuttle service can be developed around the points of pick up that would service the greater number of patients on any given day. The airplane would operate with daily service to and from St. John's. Medical assistance, but not care, would be available in-flight.

4.1.1 Analysis

An effective air shuttle transport service will require:

- Reliable air shuttle operations—on time and on the scheduled days, and the established route
- Health care provider pre-approval of patient for shuttle transport, in compliance with established patient screening criteria

- Centralized pre-scheduling of approved air shuttle service patients and ground transport to medical appointments
- Coordination of patient transport to and from the local shuttle hub
- Health facilities must complete the patient appointments within the scheduled time frame

Important parameters for operating the MLAS Service:

- The aircraft should be of a size that allows patients to reasonably stand, and easily board using steps with minimal to no assistance. Additionally it should be capable of up to 10 seated passengers in order to achieve the lowest cost per kilometre per passenger.
- The scheduling process may need to consider the medical condition should there be more people than seats.
- Multiple people traveling a long distance will not have the same treatment times. Part of the scheduling process should include coordinating those patients that would have similar appointment times to avoid long wait periods.
- Ground transportation coordination from the aircraft to the treating locations is straightforward; however, the return trips will be more challenging. With a set time for return departure, a determination whether the patients will wait at the treatment location or at the airport itself waiting for the departure time must be done in advance.
- If the aircraft is set to depart at a certain time, a procedure will need to be in place to attempt to locate those customers that have not returned.

The scheduling and coordination of the MLAS will be most efficiently completed if assigned to the Central Medical Dispatch Center. This center will have province wide knowledge of the location and movement of transport assets that support the MLAS, and will serve as an effective means for reliable data collection regarding MLAS performance.

A medical attendant should be available in the cabin; trained at the EMR level to provide emergency care should an unexpected medical event occur. In Newfoundland and Labrador, an EMR has successfully completed a recognized two-week training program (80 hours) and one week of on-the-job experience in emergency patient care and transportation. This program is offered on an "as needed" basis. In the Newfoundland and Labrador Ambulance Program, EMRs ideally work with a Primary Care Paramedic for initial patient assessments, delivery of safe and prudent care and in the patient's transport to the most appropriate health care facility.

The volume of transports needs to be sufficient so that a multi-patient unit can be used affordably. In many cases, there will a re-assignment of the patient from a single transport vehicle (e.g., ambulance, airplane or private vehicle) to the multi-load vehicle.

Patients subject to a ground transport drive of greater than four hours one way would be considered as candidates to use the MLS service. These are patients requiring minimal medical assistance while traveling.

Patients that would likely benefit from transport via the MLAS are among those currently being transported by Air Ambulance fixed wing that have low acuity, and patients within the Medical Transportation Assistance Program support for private vehicle use and flights. However, the data available for analysis of a multi-load population is limited in scope and depth, and requires a manual data pull. Key data points are missing or incomplete.

Table 8 illustrates the Air Ambulance program for patients that may be screened as candidates for the Multi-Load Service flights.

Table 7. GAS and PAL flights combined.

	FY 2012-2013	FY 2013-4*
Referred	147	64
Wait List	107	54
	254	118
*14 April through 30 Nov 2013		

The Medical Assistance Transportation Program (MATP) reports nearly 1,000 patients on the island being reimbursed for private vehicle use to transport to and from their scheduled medical appointments. These patients drove 5,556,532 kilometres of which the government reimbursed $591,323 for the qualifying 3,507,287 kilometres.

Ground ambulance data was also analyzed to identify potential candidates for the multi-load transport service. Data was limited in key metrics of day of week and time of day. Extrapolated from the FY 2012-13 data is 997 patients being transported out of Grandfalls-Windsor into St. Johns, 2,336 from Gander, and 58 from Corner Brook. The St. John's transfers back to the island health regions do not differentiate "returns" with any reliability—leaving it difficult to correlate the transfers in with the number of transfers out without potentially counting the same individuals twice.

Key data points that are needed, such as dates and times of current transports, patient origin by home location (versus regional health authority), and acuity levels or ambulance codes, are missing and/or only partially tracked.

An air shuttle service will require a minimum load factor to operate successfully. The data available for analysis does not appear to yield adequate load levels per transport.

4.2.2 Recommendations

Collection of key metrics is needed to evaluate the efficacy of a Multi-Load Air Shuttle program. Reliable data with efficient collection and recording is needed to identify an accurate number of patient candidates upon which to determine the return on investment of the MLAS program. Integrating the data collected from the current transportation services into an electronic data base that can be analyzed will be required. The key metrics to collect include date, patient origin, time of

patient pick up and drop off, reason for the transport, level of acuity/type of transport (e.g., emergency, routine, return) and destination.

The health care facilities scheduling the patient's appointments for tests, treatments, and/or medical follow up should also be a data source for information as to their patient's mobility status, and how their patients currently arrive if coming from a distance greater than a four-hour drive. This will aid in detecting those patients that are outside the MATP that are coming via private vehicle.

5. CONCLUSION

The Newfoundland and Labrador Air Ambulance Program is seeking to replace a fixed wing aircraft, improving medical flight team coverage In Happy Valley/Goose Bay, and examining alternative modes for assisting patients travel to their scheduled health care appointments that exceed a four-hour, one way drive.

Establishing the minimum set of operational data points that must be recorded and support for electronic data base integration are needed. Gaps in information, missing records, and the tedious process of manual data collection/analysis stymie planning and implementing of system improvements.

Replacing the government-owned King Air 350 with another King Air 350 for fleet standardization is recommended; and the use of jet aircraft should be limited to out of province transfers. This will reduce the use of the jet and provide a basis for analyzing contracting on demand versus the current contract for a dedicated jet.

Pilot staffing and medical flight crew staffing in St. John's and HVGB should be better aligned to assure optimal readiness to respond. Achieving an expanded Happy Valley Goose Bay staffing to 24-hour coverage will be expedited with relief of the residency requirement. Using a modified 24-hour shift that combines duty and stand-by hours will decrease the total number of people required for 24/7 coverage.

The Medical Flight Service is not consistently meeting its standard for staffing with RN-ACP coverage, and in the absence of hiring the needed number of ACPs, it should develop and implement an alternative for assuring the required skill set is available on every flight.

There is insufficient data to determine the efficacy of a Multi-Load Air Shuttle program. A common set of data fields and corresponding definitions (e.g., patient acuity), with an integrated data collection system among the Road Ambulance Program, Medical Assistance Transport Program, and Medical Flight Services is the needed next step.

REPORT WORKS CITED

[i] Eastern Health Authority Policy Name: Air Ambulance Authorization and Launch.
[ii] Aircraft Cost Evaluator, Conklin and de Decker, 2013.
[iii] "Coastal" missions are transports originating along the East and South Labrador coastline from areas accessible only by aircraft or boat, typically serviced by the HVGB based Twin Otter airplane.
[iv] Using the 2012 April – 2013 Provincial Air Ambulance actual (1154) and the same period coastal actual of 322 transports.
[v] YYT MFS PCR Data 2007-Nov 15 2013, rows 2199 to 4043 and YYR MFS PCR Data July 22 - Oct 30 2013, rows 3 to 144, utilizing column identified as "arrive destination hospital" minus column "crew mobile" for time-on-task. .
[vi] Wait Listed Transports (outbound) maybe combined with higher priority (inbound) transports skewing simultaneous demand analysis. Additionally urgent and referred transports may occur simultaneous with a critical or emergent request, where they are triaged to a later time.
[vii] St. John's mid-day team is not always staffed (insufficient personnel) or available (due to training) per MFS management.
[viii] Collective Agreement, The Association of Allied Health Professionals Newfoundland and Labrador, March 6, 2009. Article 19-Hours of Work, pg 25.
[ix] http://paramedic.ca/wp-content/uploads/2012/12/2011-10-31-Approved-NOCP-English-Master.pdf
[x] http://www.arnnl.ca Standards_of_Practice_for_Registered_Nurses_April_2013.pdf
[xi] Email communication, R. Snow, 16 Dec 2013.
[xii] Briefing Note # EH - 19, 2014-15 Budget Process, Title: Enhancement funding for Provincial air ambulance – Labrador Medical Flight Specialists (MFS)

ANNEX A

HCS Analysis of Unfilled Medical Flight Team Positions for HVGB

FITCH
& ASSOCIATES

BRIEFING NOTE

TO: Marilyn Thompson, Vice-President, Human Resources
Beverley Clarke, Vice-President

FROM: Debbie Molloy, Director, Human Resources Client Services
Gail Downing, Regional Director, Emergency and Paramedicine
Corey Banks, Division Manager, Regional ER Medical Services/EMS Chief

RE: ELIMINATION OF REMAINING FIVE MEDICAL FLIGHT SPECIALIST (MFS) POSITIONS IN HAPPY VALLEY-GOOSE BAY

DATE: March 21, 2013

Issue:

The Department of Health and Community Services has requested that Eastern Health consider elimination of the five remaining MFS positions and notify the department concerning the implications of this decision.

Background:

In response to Government direction to establish an air ambulance flight team for Happy Valley-Goose Bay (HVGB), Eastern Health has been attempting to establish an air ambulance flight team consisting of twelve permanent full time medical flight specialists since June 2010. A 12 person team would provide 24/7 coverage in the community. On March 4, 2013 a seven person team began training. This smaller number will be able to provide a limited service, approximately 50% of the time.

There are approximately 1400-1500 patients transported per year throughout the province by the provincial air ambulance service utilizing multiple aircrafts (i.e.: Government planes, chartered and contracted planes, and contracted helicopters). The majority are flights between facilities in NL - primarily emergency/critical flights to St John's. More than 40% of those flights are medically deemed to be of a time-dependent nature (critical or emergent). Included in the total number of patients transported throughout the province, approximately 200 - 300 flights are conducted exclusively out of HVGB to retrieve patients on the Labrador coast in nursing clinics and isolated communities. These patients are transported back to HVGB for initial assessment and they will benefit from a professionally trained and dedicated MFS team in HVGB.

Of the overall air ambulance flight volume almost 40% originate from Labrador-Grenfell Health facilities. Employees currently working in Labrador-Grenfell Health facilities are already in demand within their institutions and are also currently required to perform air ambulance escort. This takes them away from their local facility and responsibilities at a high cost (over-time, travel, and relief), and at high risk (not appropriately trained for medical flight). This is not best practice, and poses risk with practitioners caring for patients in the aviation transport environment without the appropriate skills, knowledge, or equipment to do so.

Analysis:

The service in HVGB has not yet begun. The seven person team that has been recruited is currently in training which will not be completed until summer 2013. We are currently evaluating historic demand patterns to decide on peak time staffing patterns to be able to service the most flight requests as possible. This will likely be 12 hours per day x 7 days per week (exact hours to be confirmed) with some callback expected for high priority flights. Although initially this partial team will be able to provide 50% coverage, this capacity will be limited and eventually continuing a team with only seven members will reduce capacity well below 50%. This reduced capacity will result from leave of the seven crew team (i.e.; s/l, a/l, etc.), as well as, time out of Labrador and flight operations for continuing education and clinical skills exposure.

During periods of flight requests and unavailability of a MFS team the sending facilities will have to provide medical escorts. These escorts will be often provided at premium overtime rates and incur return travel expenses (i.e. hotels, rental cars, commercial flights, etc.). The provision of these medical escorts will likely introduce high risk with patient care and transport due to facility escorts not having air medical training and critical care transport expertise.

Elimination of the remaining five positions would mean that the service being provided would always be deficient. Although we would analyze demand patterns and schedule service during peak periods, emergency service by its nature is not always predictable so there would most certainly be gaps when the service was required but not available. Further, as noted above, we do expect some callback for high priority cases. As this is a new service that has not been experienced previously in HVGB, we can expect that a division of duties will happen over time between the Emergency Department staff in Labrador Grenfell health facilities. As a result the demand for the specialized service can be expected to increase. Without a commitment to increasing the service to the 24/7 standard callback and overtime could increase exponentially.

Without the remaining five MFS positions, the full skill mix required for a full MFS team operation would be incomplete. Currently we have 6 Registered Nurses (RNs) and 1 Advanced Care Paramedic (ACP). The other five ACP's are needed to provide the full skill mix considering transport of patients requiring advanced airway procedures and the skill set for emergency scene responses. Applications have been received and interviews are currently ongoing for the remaining five positions.

Recommendation:

Recruitment to continue for the five remaining positions to provide a complete MFS Team based in HVGB equivalent to the St John's Medical Flight Team.

Annex B: Shift Coverage Calculation

Required	
11,680	16 hours daily, 365 days annually, team of 2 per shift
11,680	**Worked hours required**
Available	
8	Medical Flight Specialists
15,600	Earned hours
-3,120	Less 20% leave vacation, sick leave, etc.
12,480	Worked hours
-750	Less 2.5 weeks training maximum each person
11,730	**Worked hours available**

Annex C: On-call Cost Calculation

Scenario 1 Maximum Annual Cost of Escorts Using On-call Coverage

A	"Critical", "Emergent", and "Urgent" flights originating in LGH at night (12:00 midnight to 8:00 AM)		35	Escorts
B	Average call duration estimated at six hours, two MFSs each escort		12	Hours
C	Total	AxB	420	Hours
D	Base hourly rate (HP 35 Step 7)		$37.02	
E	Overtime rate of 1.5	Dx1.5	$55.53	
F	Total Cost per hour (Benefits already paid in this scenario)	E	$55.53	
G	Total Estimated Overtime Cost	FxC	$23,323	
H	Stand-by cost annually $10 per shift times 365 shifts per year times 2 people per shift.		$7,300	
I	Total Estimated cost:	G+H	$30,623	

Scenario 2 Minimum Staffing Costs, Four Additional MFSs

A	Four FTEs		4
B	Annual Salary (HP 35 Step 7)		$72,189
C	Annual Cost per FTE (plus 20% benefits, relief not considered)	Bx1.2	$86,627
D	Total Estimated Cost	CxA	$346,507

Difference

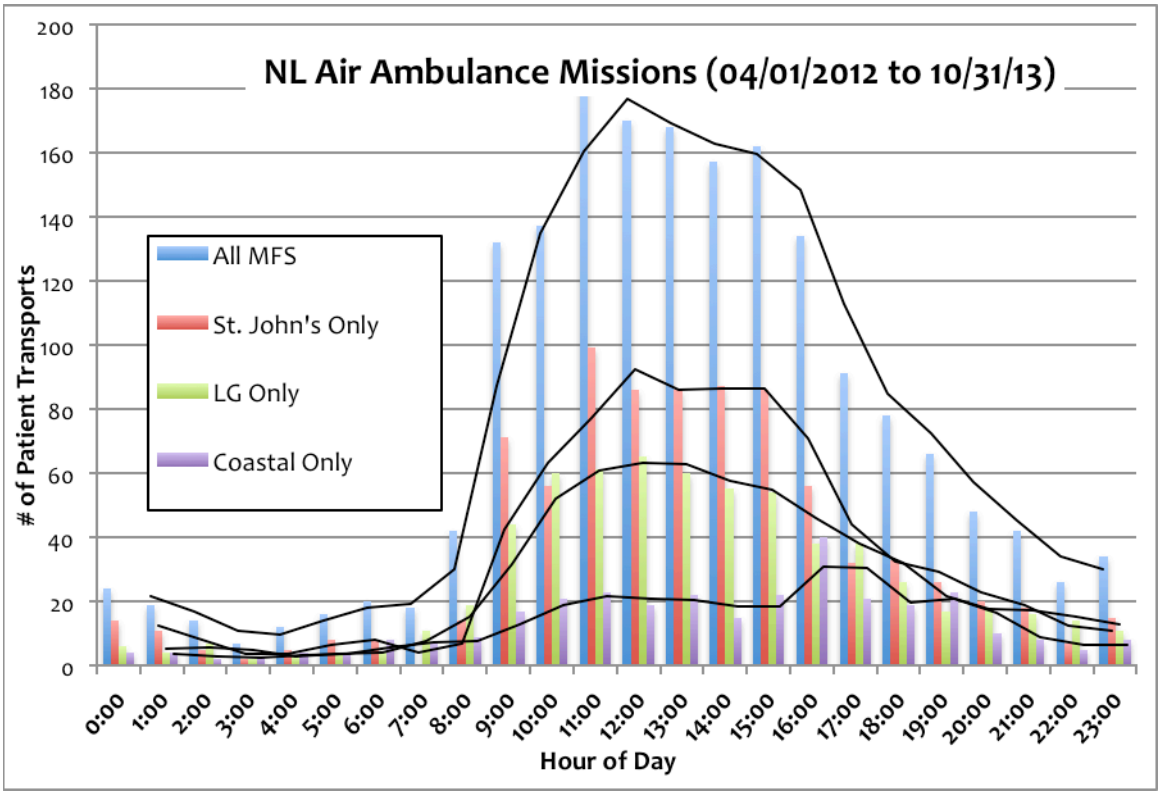
	Scenario 2 minus Scenario 1	**$315,884**

*Escort duty pay of $61 per flight per MFS would be paid for either scenario, $61 times 2 MFSs times 35 escorts per year = $4270 annually.

ANNEX B

Patient Transports by Time of Day

FITCH
& ASSOCIATES


NL Air Ambulance Missions (04/01/2012 to 10/31/13)
# of Patient Transports
Hour of Day
All MFS
St. John's Only
LG Only
Coastal Only
0
20
40
60
80
100
120
140
160
180
200
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00

ANNEX C

Medical Flight Service Production

FITCH
& ASSOCIATES

Medical Flight Service Production

Production Analysis–NL MFS (ALL)															
	Planned Unit Hours (single base)	Bases in Service	% Lost d/t Weather	Estimated Hours Lost d/t Weather		Estimated Hours lost d/t Maint.	Total Production Hours Available	Total Yearly Transports	Average Time on Task	Average Time on Task (ancillary duties)	Annual Production Hours (Transport Only)	Annual Production Hours (including ancillary duties)	Production Ratio (Transport Only)	Production Ratio (including ancillary duties)	Average Flights Per Day
23-07 (8 hour period of 24 hour day)	2920														
07-23 (16 hour period of 24 hour day)	5840								4.75	0.5					
Staffing Scenarios:															
23-07 (8-hr with 8 hours staff cover)	2920	1	0.0%	0	0.0%	0	2920	147	4.75	5.25	698	772	**0.24**	**0.26**	**0.4**
07-23 (16-hr with 28 hours staff cover)	11680	2	0.0%	0	0.0%	0	11680	1,328	4.75	5.25	6308	6972	**0.54**	**0.60**	**3.6**
07-23 (16 hour period with 40 hours staff cover)	17520	3	0.0%	0	0.0%	0	17520	1,328	4.75	5.25	6308	6972	**0.36**	**0.40**	**3.6**

Assumptions:
Baseline MFS staffing is 36 hours per day, increasing to 48 hours per day IF St. John's 11-23 crew is on-duty.
No "lost hours" due to weather or maintanence.
Average TOT is 4 hours and 45 minutes (ACTUAL-HVGB, **St J reported as 6 hours**)
Ancillary TOT is 30 minutes (ESTIMATED)

The production ratio for an air medical aircraft is expressed by the number of hours that the aircraft is actively involved in transport, divided by the number of hours the aircraft was available to respond. The aircraft is considered "in transport" from the time it accepts a patient mission until that mission has been completed and the aircraft is again available for the next response. Aircraft availability is measured by the number of hours the aircraft is staffed and prepared to respond, minus those hours in which the aircraft is out of service due to weather, maintenance, or commitment to a previous flight request.

The formula used to determine production ratio is:

(Average production hours per flight) x (number of flights)
Total hours staffed for response – total hours out of service for weather & maintenance

Monitoring production is more effective than counting flights as production calculations take into account the total time consumed to complete the mission, as well as the length (miles traveled) of the mission. The more length (loaded miles), the more revenue (per mile) is generated.

Production performance becomes important when determining when to add, or remove staffed aircraft hours. An air asset is considered to be fully utilized when production ratios reach the .30-.35 level. It is at this point that a program may experience an increase in the number of missed flights due to simultaneous demand and should consider adding capacity to meet this demand.

ANNEX D

Estimated Annual Cost for 12-hour Standby & Callback

FITCH
& ASSOCIATES

Estimated Annual Cost for
12-hour Standby & Call Back (2100-0900)

Number of flights originating between 2100-0900 hours	70.00	
average call duration (hours)	4.75	
MFS Staff each mission	2.00	
TOTAL Hours	665.00	
Base hourly Rate (HP 35 Step 7)	$37.02	
OT rate	1.50	
Total Cost per Hour	$55.53	
Total Hours x Total Cost per Hour		**$36,927**
Days Standby	356.00	
Days Standby Statutory Holiday	9.00	
Standby Compensation ($10 per 8 hr)	$15.00	
Standby Compensation Holiday ($12.20 per 8 hr)	$18.30	
MFS Staff each mission	2.00	
Total Days Standby x Compensation		**$11,009**
Total Callback and Standby		**$47,937**

ANNEX E

HCS Coastal Medivacs Analysis

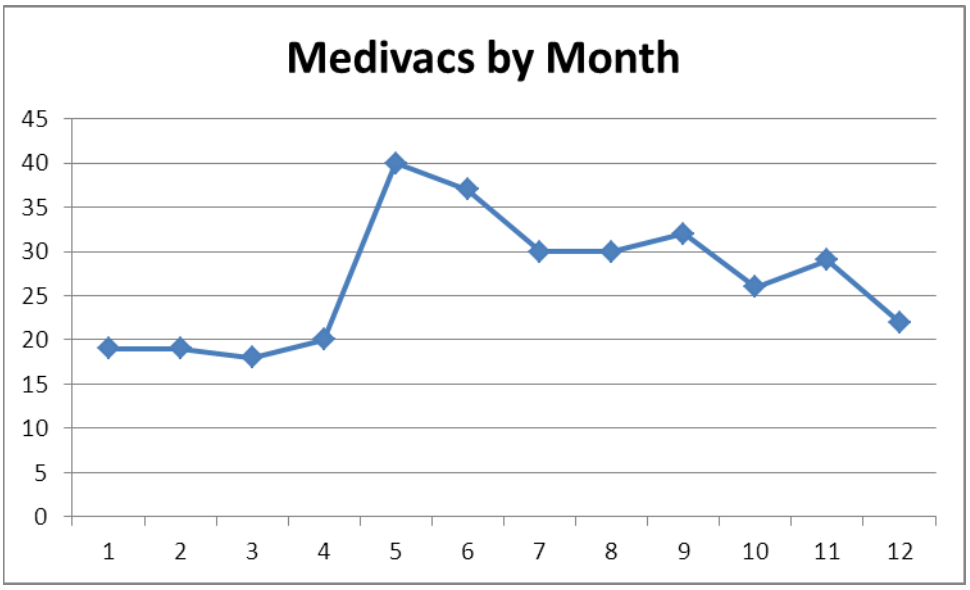
FITCH
A ASSOCIATES

HCS Coastal Medivacs Analysis

Medivac Data 2012/13
Labrador-Grenfell Health
Compiled by A. Wells 729 1890
andrewwells@gov.nl.ca
Revision May 15, 2013

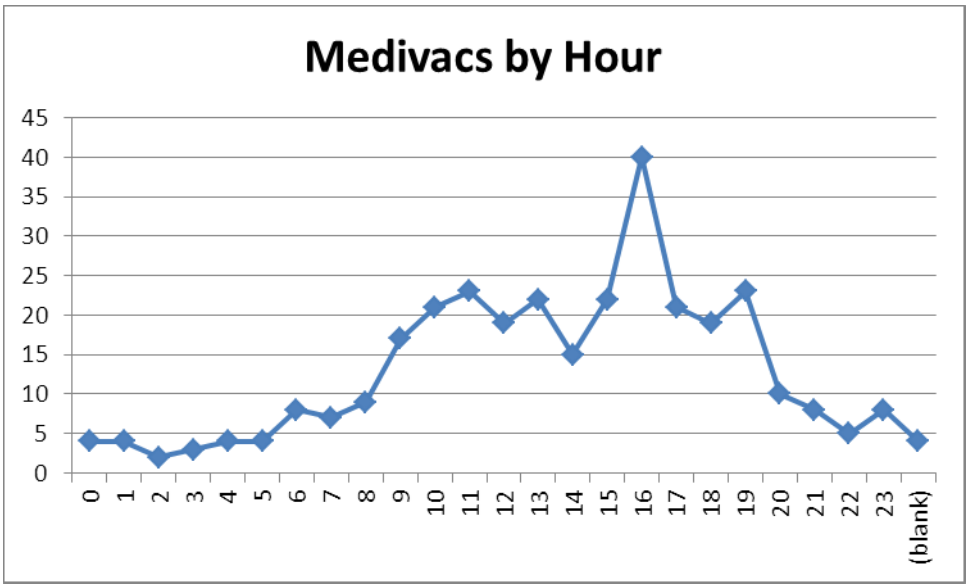
Medivacs by Month

Month	Volume
1	19
2	19
3	18
4	20
5	40
6	37
7	30
8	30
9	32
10	26
11	29
12	22
Total	**322**



Medivacs by Hour

Hour	Annual Volume
0	4
1	4
2	2
3	3
4	4
5	4
6	8
7	7
8	9
9	17
10	21
11	23
12	19
13	22
14	15
15	22
16	40
17	21
18	19
19	23
20	10
21	8
22	5
23	8
(blank)	4
Total	**322**


Medivacs by Hour
45
40
35
30
25
20
15
10
5
0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
(blank)

Medivacs by Origin and Destination

Destination >>	(blank)	Cartwright	Makkovik	Nain	Port Hope Simpson	Mary's Harbour	Forteau	Blanc Sablon	St. Anthony	Goose Bay	Total from Origin
Origin (below)											
Forteau									63		63
Nain										49	49
Hopedale										42	42
Natuashish				1						37	38
Mary's Harbour									22		22
St. Anthony		1			1	2	3	5		5	17
Cartwright										17	17
Port Hope Simpson									10		10
Makkovik										10	10
Labrador City									2	7	9
Charlottetown									10		10
Rigolet										8	8
St. Lewis							1		6		7
Goose Bay			1						5		6
Churchill Falls										4	4
Black Tickle										3	3
Blanc Sablon									3		3
Postville										3	3
No Transport-DOA	1										1
Total to Destination	**1**	**1**	**1**	**1**	**1**	**2**	**4**	**5**	**121**	**185**	**322**

Attendants and Patients

Patients >>	**1**	**2**	**3**	**Total**
Attendants (below)				
1	245	20	1	**266**
2	45	3	2	**50**
3	4	1		**5**
4	1			**1**
Total	**295**	**24**	**3**	**322**

ANNEX F

Air Ambulance Transports Performed by Facility Escorts

FITCH
& ASSOCIATES

Air Ambulance Transports performed by Facility Escorts between 7-22-2013 and 10-30-2013

Authorization #	Date	Time	Requesting Facility	Priority
HCC 9421	8/1/2013	11:00	James Paton	2
HCC9451	8/8/2013	13:45	Western Memorial	2
HCC 9373	7/24/2013	9:57	Charles Curtis Memorial	2
HCC9388	7/27/2013	6:02	Fogo	2
HCC9403	7/30/2013	3:04	Grand Falls	1
HCC 9473	8/20/2013	11:45	Charles Curtis Memorial	2
HCC9474	8/14/2013	11:54	Charles Curtis Memorial	2
HCC9493	8/20/2013	10:11	Charles Curtis Memorial	2
HCC9502	8/22/2013	20:35	Charles Curtis Memorial	Not recorded
HCC9511	8/26/2013	10:05	Dr. Charles Legrow	2
HCC 9541	9/1/2013	12:50	Melville	2
HCC 9546	9/2/2013	15:34	Capt. William Jackman	Waitlist
HCC9565	9/7/2013	15:00	Charles Curtis Memorial	2
HCC9575	9/9/2013	15:55	Western Memorial	2
HCC9578	9/10/2013	10:12	Labrador Health Centre	2
HCC9579	9/10/2013	11:18	Labrador Health Centre	2
HCC9580	9/10/2013	11:32	Charles Curtis Memorial	2
HCC9582	9/10/2013	14:07	Capt. William Jackman	2
HCC9583	9/10/2013	14:55	Sept Iles Quebec	2
HCC9584	9/10/2013	17:09	Labrador Health Centre	2
HCC9587	9/12/2013	14:48	Charles Curtis Memorial	2
HCC9605	9/16/2013	3:00	Charles Curtis Memorial	2
HCC9607	9/18/2013	9:06	Charles Curtis Memorial	2
HCC9639	9/24/2013	22:48	Charles Curtis Memorial	2
HCC9644	9/26/2013	14:27	Janeway	Waitlist
HCC9670	10/2/2013	16:15	James Paton	1
HCC9673	9/29/2013	14:10	Bush	1
HCC9687	10/8/2013	14:16	Charles Curtis Memorial	2
HCC9719	10/19/2013	14:42	Charles Curtis Memorial	2
HCC9731	10/20/2013	12:30	Charles Curtis Memorial	2
HCC9736	10/21/2013	14:54	Western Memorial	Waitlist
HCC9751	10/28/2013	19:10	Charles Curtis Memorial	2
HCC9752	10/28/2013	8:48	Harbour Breton	Not recorded
HCC9761	10/30/2013	12:10	Capt. William Jackman	1
HCC9762	10/30/2013	17:07	Dr. Charles Legrow	Not recorded

www.fitchassoc.com