

Whatcom County Emergency Medical Services

Advanced Life Support Unit Needs Analysis Recommendations to the EMS Oversight Board



Background: Whatcom County Emergency Medical Services (WCEMS) Strategic Plan (Funding Workgroup Plan) identified the potential for an additional Paramedic Unit to be positioned somewhere in the county in 2020. In addition, funds for the additional unit are programmed into the Levy budget at 1.8 million along with startup costs. While the plan set aside funding for this unit, the Strategic Plan also calls for an evaluation and discussion regarding the current deployment configuration of the Whatcom County Advanced Life Support Units.

Review strategic placement of units/ambulances in the county.

Confirm that current ambulance locations are appropriate considering population, geographic and demographic changes since the last review, about 6 years ago.

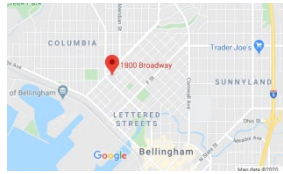
Analyze need for an additional (5th) ALS unit.

Whatcom County has 4 ALS units: 3 with the Bellingham Fire Department and 1 with Fire District 7. Recent discussions have indicated a potential need for a 5th unit in the system based on experience and response. Concurrent to this report we are collecting and analyzing the data to suggest the time in which that unit should be implemented.

To consider this evaluation Chris Hughes (BFD Data Analyst), Jeremy Morton (WCEMS Data Analyst) and Mike Price from Entrada/San Juan GIS began an analysis that funneled information from county land use GIS files, Image Trend EPCR and Versatarn CAD into a GIS/ARC modeling program that takes into consideration items such as road speeds, freeway access, fastest routes, railroad barriers, time of day, station locations and many more parameters. This team has also evaluated call data such as code green rates, call disposition as well as review of run cards for certain medical conditions along with geographical data with consideration for a 6 to 12 minute response time to the farthest reaches 90% of the time for ALS units. This fascinating work by the team I believe provides a good overview that leads to several recommendations for discussion by the Technical Advisory Committee (TAB) and the EMS Oversight Board (EOB).

From this initial data collection and GIS input, the team modeled the current system as a “base layer” to compare various options. Paramedic Units are located at Bellingham Fire Station 1 (Medic 1 & 2) Medic 10 is located at E. Smith and Northwest Ave and M45 is located at Enterprise and Grandview) In addition, the team had the opportunity to look at data generated after Medic 1 and 2 were moved to Stations 3 and 6 in response to the COVID19 pandemic. This was a safety consideration in that both Medics Units were housed at Station 1. This precaution created personnel distancing in case a firefighter/EMT or Paramedic were to become COVID positive essentially limiting spread among the two medic units and other station resources. These three months of data allowed for real time modeling of those station locations.

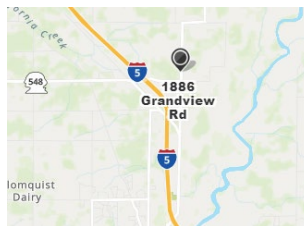
Current Medic Unit Locations Medic 1 and 2



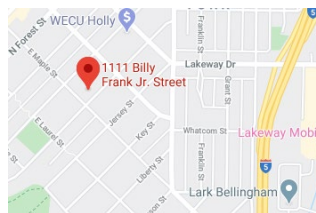
Medic 10 Location



Medic 45 Location



Station 3



Station 6



Historically, Medic 1 and 2 have been co-located at Fire Station 1. At the beginning of the COVID19 Response in March, M1 and M2 were moved from this location to Stations 3 and 6.

Unit modeling since that move have shown several efficiencies including better freeway access and better service to the north and east while still serving the downtown core quickly.

Discussion and Overview of Information

Recommendations to EMS Oversight Board

Initial modeling looked at the current four units to determine if call volume should be the primary indicator for additional units. While individual units are not overwhelmed it became apparent that both M1 and M2 carry the brunt of the call volume responding to the densest areas of the county, primarily within the Bellingham City Limits. Each unit runs approximately 1700 calls per year. (Average 4.6 calls per day) Both units have a cancellation (Code Green) rate of about 12%.

Interestingly, M10 and M45 run approximately 2300 calls per year each (Average 6.3 calls per day) however, M45 has a cancellation (Code Green) rate of about 36% and Medic 10 is cancelled about 56% of the time. Actual transports for Medic 10 are slightly less than M1 and M2 at about 1200 per year. M45 transported about 860 times in 2019.

- Can we equalize call volume between the current Medic Units?
- Call volume is different than “transport” rates.
- Will a reduction in cancelled calls decrease volume to equalize?
- Why are cancelled calls much higher for M10 and 45 as compared to M1 and M2?

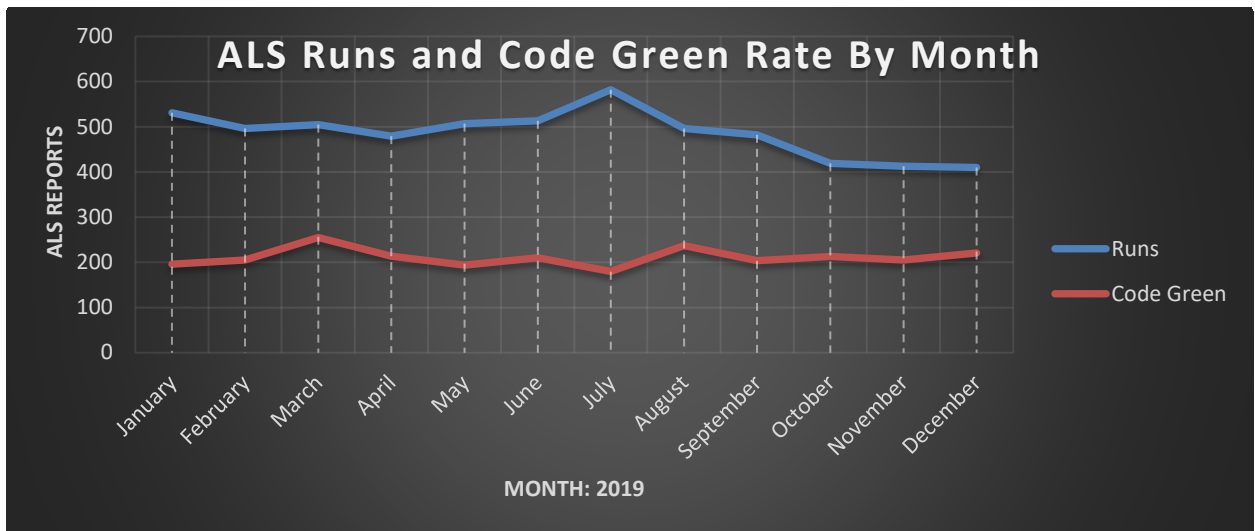
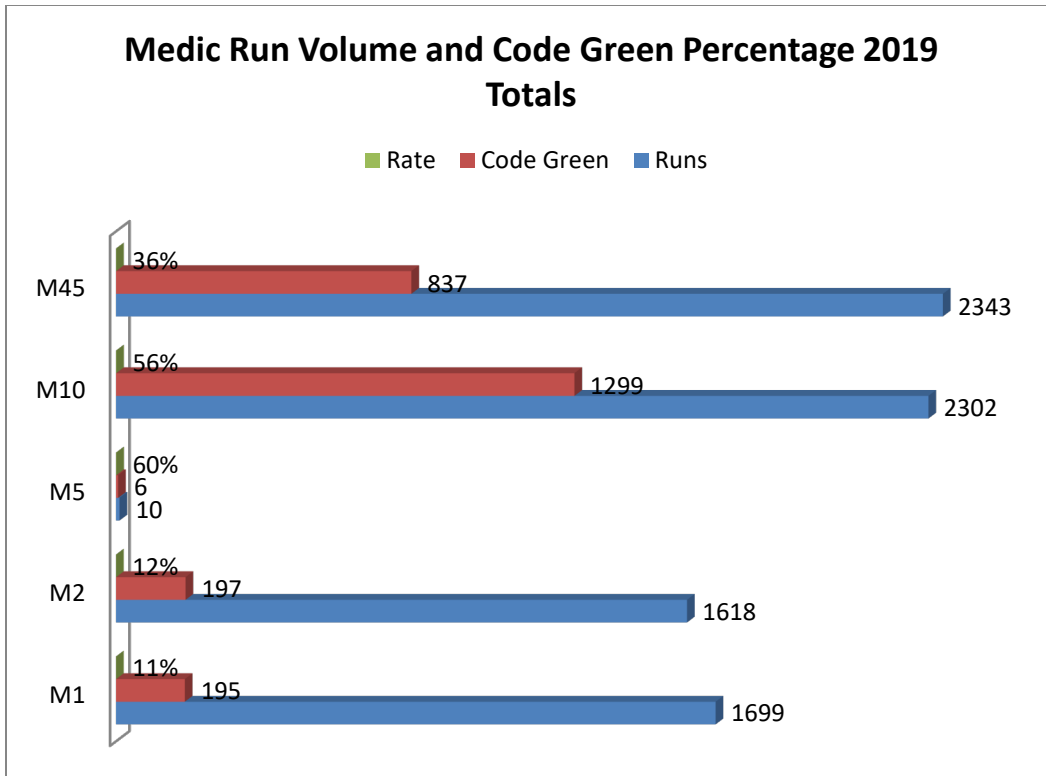
Team Discussion

Medics 1 and 2 have always run out of Station 1. While both units run an equal amount of calls they both share the same time travel distance, concentration and distribution of calls. The team agreed that since much of the Bellingham density has pushed to the north and east there should be improvements to the 6 minute response time in those areas.

As a primary indicator, call volume was not felt to be the only indicator for an additional Paramedic Unit. GIS information also noticed in the downtown core many addresses that are frequent users of EMS. This accounts for call volume but not necessarily density unlike a large apartment complex or sub-division.

- *Programs to reduce frequent use facilities/addresses are in place and expected to achieve reductions.*
- *Shorter transport times for M1 and M2*
- *Longer transport times for M45 and M10 (This draws M1 and M2 to those areas)*
- *Medic 45 and M10 are frequently pulled into M1 and M2 areas*

Cancelled Calls (Also known as “code greens”) the team discussed the dynamics of code green rates which is about 47% for all units combined. This means that 47% of the ALS dispatches are cancelled before arriving. However, this is not equalized among the Medic Units as mentioned earlier. (M1 11% & M2 12%, M45 36% and M10 56%)



Teams discussed the many antidotal accounts and reasons for the higher code green rates for M10 and M45.

- Downtown units are cancelled less because they tend to arrive at the same time as other units. There is also the perception/idea that M1 and M2 transport more frequently for lesser acuity calls than M45 and M10.

- M1 and M2 may transport more frequently because of the shorter transport times. Especially when BLS arrives in a fire apparatus. Unknown what this “rate” is.. (Quicker to transport ALS than wait for BLS rig.)
- M10 has a high cancellation rate due to being called to M1 and M2 area frequently. Due to distance, M10 will be cancelled more often due to M1 and M2 becoming available or BLS crews have time to evaluate before cancelling.
- M45 has a similar dynamic with calls in the 4 minute range but are called into Bellingham less.

Dispatch Influences on Code Green Rate ALS and BLS dispatch decisions are driven by the Whatcom Medical Program Director employing Priority Based dispatching using ProQa dispatching software. Dispatch criteria have sensitivities for the types of calls Paramedics are dispatched. In early 2020, Div. Chief Dan McDermott began an evaluation of dispatch criteria to determine if dispatch protocols can be manipulated to decrease the code green rate for all units.

- Prospect looked at low acuity calls (Charlie Level) as compared to code green rates.
- WCEMS MPD compared patient outcomes to code green decisions by BLS.
- MPD recommends downgrading Charlie card to BLS

This general comparison identified the “sick/unknown” Charlie 26 run card which has a code green rate for Paramedics at about 90%. This run card alone had about 1000 ALS dispatches that turned into a code green about 90% of the time. It is believed that reducing this ALS response will proportionately reduce the Medic Unit code green rate. While code greens seem insignificant to the call volume, there is still a considerable amount of “out of service” time for transitions back to the primary area. There are also times where M45 or M10 are called to Acme or East County/South County, are minutes from arriving on scene and then are cancelled. Many of those responses can be attributed to the Charlie 26 run card.

Beginning June 1, the Charlie 26 card will be downgraded to a BLS response only. The team is eager to evaluate this data and compare these reductions. While reducing code greens are helpful to the system, the remaining response and transport data remains the same. Transports for all medic units remain the same. Lowering code green rates creates a higher unit reliability score. It is estimated this change may reduce ALS calls by as much as 1000 calls per-year which are disguised as “code greens”.

Reduction of Response Times Urban/Rural

Population and general county growth is pushing north and east. Cardiac Arrest and Trauma survival are dependent on response times and highly trained personnel. The addition of a Medic Unit located in the north region of Whatcom County could help the survival rates. Currently, WCEMS is operating in GIS Scenario 4. Efficiencies can be observed for the downtown units as compared to GIS Scenario 1 which was configuration up until March 2020.

Discussion Points from the current model.

- The move to Station 3 and 6 has noticed decreased response times as compared to Station 1. Freeway access is quicker both north and south for both units. What was normally a 10 minute response has become a 6 minute response in some areas. (See Scenario 1 vs Scenario 4)
- Medic 1 is quicker into the North Bellingham and Medic 2 has a better response to the south including the WWU campus. The downtown core remains unaffected by response times for M2. However 2 minutes longer for M1 if M2 is on a call and of course much longer if M10 or M45 responds downtown.
- Can Medic 10 move closer to Bellingham (provide more coverage north) to equalize M1 and M2 and provide closer backup to the density area. Provide better coverage on Hwy 542 and growth area.

Medic 10 and Medic 45 have significantly longer response times, especially to the rural areas of the county as a percentage of their volume. Areas like Pt Roberts and Lummi Island represents a small amount of volume that can tie-up a Medic Unit for a couple of hours. Certain Search and Rescue calls and responses to the Mt. Baker Ski area and the back country can also keep units out of service for hours. When M45 or M10 is out of service, areas such as Everson, Lynden, Kendall, Sumas and Blaine will see extended response time when responding from downtown. BLS units often rendezvous with Medic Units in an effort to get patients closer to the hospital to save time and lives.

- Can unit reliability be increased? Whatcom County does not have reliable mutual aid like other counties. Skagit, Snohomish, King Counties have well developed mutual aid agreements where Medic Units regularly work across county lines as part of the “closest unit to the call” idea. Those counties have close contiguous borders where dense communities share resources.
- The rural areas have higher risk but lower frequency of calls. Calls tend to be more complicated and patients tend to be more critical due lack of health care challenges. A fifth Medic unit could help the Community Paramedic Program.
- Whatcom County has no mutual aid from the north. Skagit County closest Medic Unit is approximately 20 minutes from downtown Bellingham. The Skagit Medic unit rarely responds into Whatcom County due to geography and distance.
- Placing a Medic Unit in the northern region would improve reliability for Bellingham and reduce response times. Responses to Everson, Sumas and areas north of Kendall and Peaceful valley will see quicker response times from a Unit near Lynden.
- A fifth unit will have fewer calls than other units and Paramedic Skills may become diluted. However, all Medic Units will see individual unit reduction in calls. This could provide more time for training. Paramedics should respond to confirmed structure fires for firefighter safety and victim resuscitation in support of county and city fire departments.

GIS Work Team Recommendation

The development team, Jeremy Morton, Mike Price and Chris Hughes brought the GIS work to the Technical Advisory Committee at the May meeting. The TAB selected Jeremy Morton, Chris Hughes, Dean Crosswhite, Ben Boyko, Scott Ryckman, Dan McDermott and Mike Hilley to synthesize this information and bring back recommendations.

Preferred Option 1 – Scenario 14 supports the goal of reducing call volume for M1 and M2 and decreased travel time for Medic 10 when responding to the central Bellingham areas. Medic 10 provides better coverage to the Cordova region and Mt. Baker in the winter from the Britton Loop Station. Medic 45 at Station 41 provides optimal coverage to the Lummi Reservation and will gain call volume where M1 and M2 previously responded. A Medic unit at Station 75 or 70 will provide quicker service to the Everson, Sumas and Kendall areas (Peaceful Valley). Call volume for the north unit will be significantly slower than the other Medic Units however it does create capacity for the reasons noted. This also locates M45 and M10 at a Fire Station with upgrades to living quarters along with other efficiencies. (Consider a 12-Hour Unit)

Option 2 – Scenario 4 leaves all Medic units at their current locations and adds one Medic Unit at either Station 75, 72 or 70. This scenario will capture a certain amount of calls in the Lynden area however; this scenario does not relieve the call volume for M1 and M2 and it does not achieve a response time under the 10.5 travel interval for other areas. Time travel remains the same but adds more reliability for the rural units; this scenario does not increase time travel reliability for the Bellingham density. This scenario creates longer response times for the Lummi Reservation, particularly on the south end as well as access to Lummi Island for ALS calls from Station 3 and 6. The north Medic Unit will not see a large amount of call volume. (Consider a 12-hour Unit)

Option 3 – Scenario 2 is the current scenario. While scenario 1 has been the deployment model up until March 2020, the efficiencies and safety with this configuration have demonstrated the rationale for a permanent move to Station 3 and 6. This is mostly because of the COVID19 safety created by the distancing of Paramedic Units. WCEMS anticipates this deployment (Station 3 and 6) will be a permanent situation. The Lummi Tribal Community would see increased response times to the south and west in this configuration.

- Medic Unit Funds could be used for alternative programs such as placing either a Senior Paramedic or Supervisor in the north (Lynden) that can respond and provide early interventions and triage for the rural areas while waiting to rendezvous with a medic unit.
- The Lummi Tribal Community has expressed interest in a co-responder model for SUD and Mental Health responses.
- Place a fourth Community Paramedic in the Lynden area for dual role response. Use local EMT's to expand Community Health while available for ALS emergencies.

Final Considerations and Comments

This analysis attempts to provide data for this initiative balanced with considerations from the various stakeholders of the EMS system. Call volume alone does not indicate a need for an additional Paramedic Unit. General estimates predict that an additional Paramedic unit will have a low transport rate (less than 500 transports) as compared to other units. However, all stakeholders agree that an additional Paramedic Unit has been a general expectation since the reorganization of the EMS system and the successful passage of the EMS Levy. This analysis is a response to that evaluation requested in the Strategic Plan. The Teams have provided their top 3 Options for consideration by the TAB and EOB.