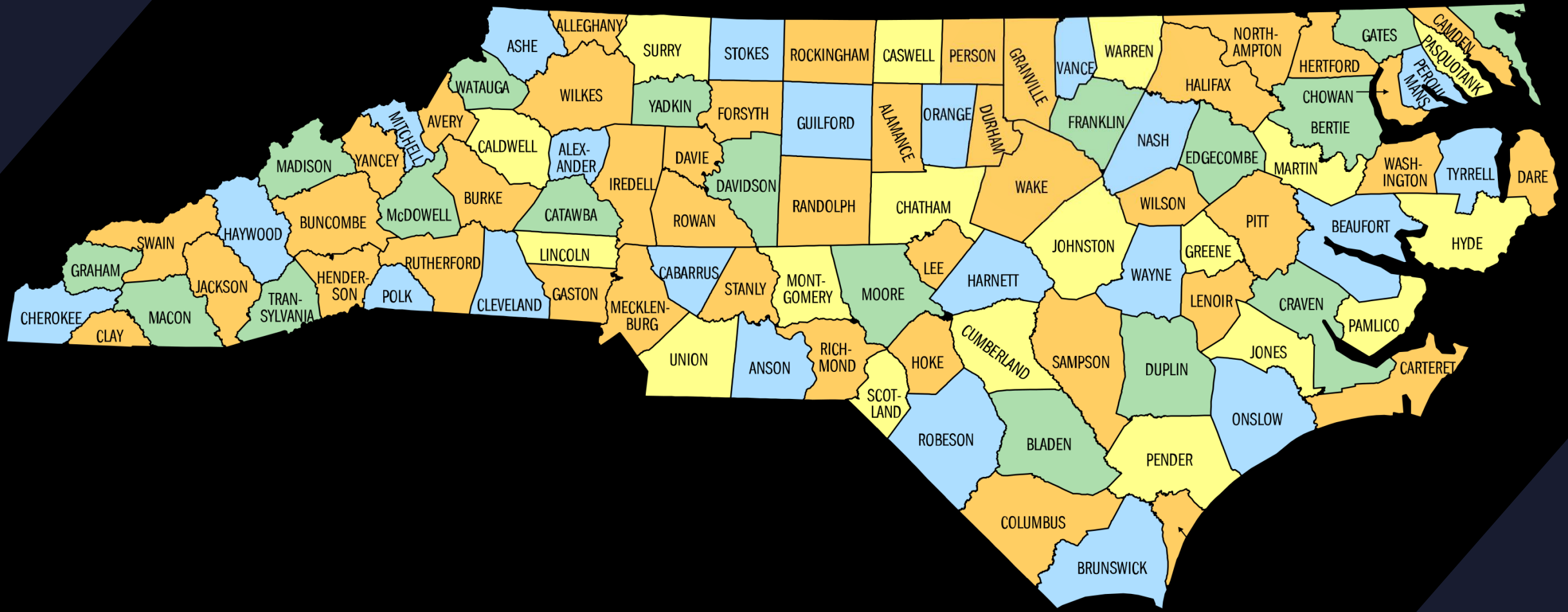
VANCE COUNTY EMS AMBULANCE DISTRIBUTION

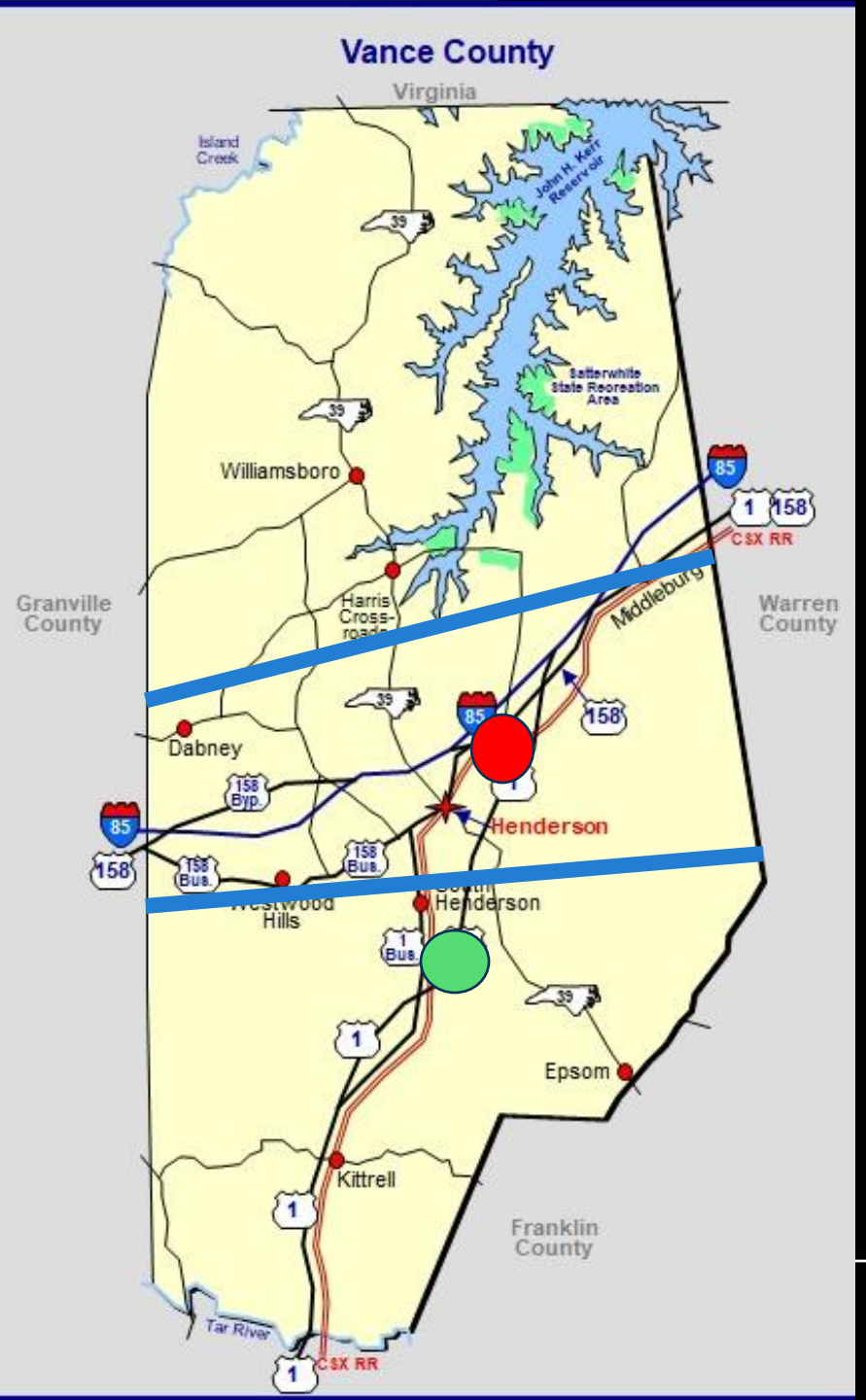
Contents

BIG PICTURE

Vance County EMS has 4 ambulances. Where do we put these trucks to best serve our population?


ASHE
ALLEGHANY
SURRY
STOKES
ROCKINGHAM
CASWELL
PERSON
GRANVILLE
VANCE
WARREN
NORTH-AMPTON
GATES
CAMDEN
PASQUOTANK
PERQUI-MANS
HERTFORD
HALIFAX
CHOWAN
BERTIE
WATAUGA
WILKES
YADKIN
FORSYTH
GUILFORD
ALAMANCE
ORANGE
DURHAM
FRANKLIN
NASH
EDGECOMBE
MARTIN
WASH-INGTON
TYRRELL
DARE
MITCHELL
AVERY
CALDWELL
ALEX-ANDER
DAVIE
IREDELL
DAVIDSON
RANDOLPH
CHATHAM
WAKE
WILSON
PITT
BEAUFORT
HYDE
MADISON
YANCEY
BURKE
CATAWBA
ROWAN
McDOWELL
BUNCOMBE
HAYWOOD
SWAIN
GRAHAM
JACKSON
TRAN-SYLVANIA
HENDER-SON
RUTHERFORD
POLK
CLEVELAND
LINCOLN
GASTON
CABARRUS
STANLY
MONT-GOMERY
MOORE
LEE
HARNETT
JOHNSTON
WAYNE
GREENE
LENOIR
CRAVEN
PAMLICO
CHEROKEE
CLAY
MACON
MECKLEN-BURG
UNION
ANSON
RICH-MOND
SCOT-LAND
HOKE
CUMBERLAND
SAMPSON
DUPLIN
JONES
CARTERET
ROBESON
BLADEN
PENDER
ONSLOW
COLUMBUS
BRUNSWICK

- Population of 45,000
- Landmarks
  - City of Henderson
  - Kerr Lake
  - Interstate 85
  - Route 1
  - Route 39



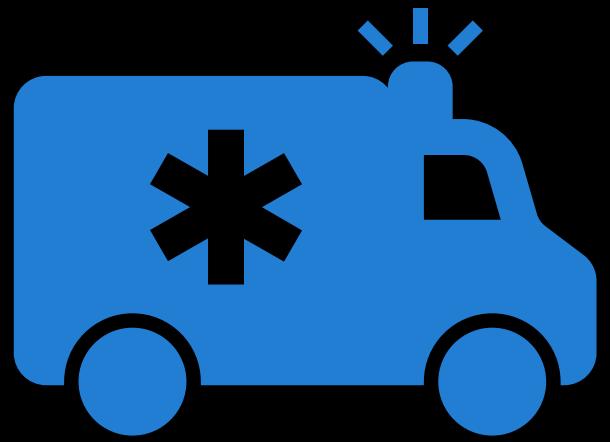
Vance County EMS 101

- County-based 911 agency
- 8,000 EMS calls per year
- North, South, Central districts
- 2 EMS stations
  - central station with 3 units
  - south station with 1 unit

So, what is wrong?

An Underserved North District

- EMS response times to the north district are significantly delayed
- Call demand is quickly growing in the north district
- Greater travel distance puts stress on the entire EMS system



Delayed Emergent Response Time in the North

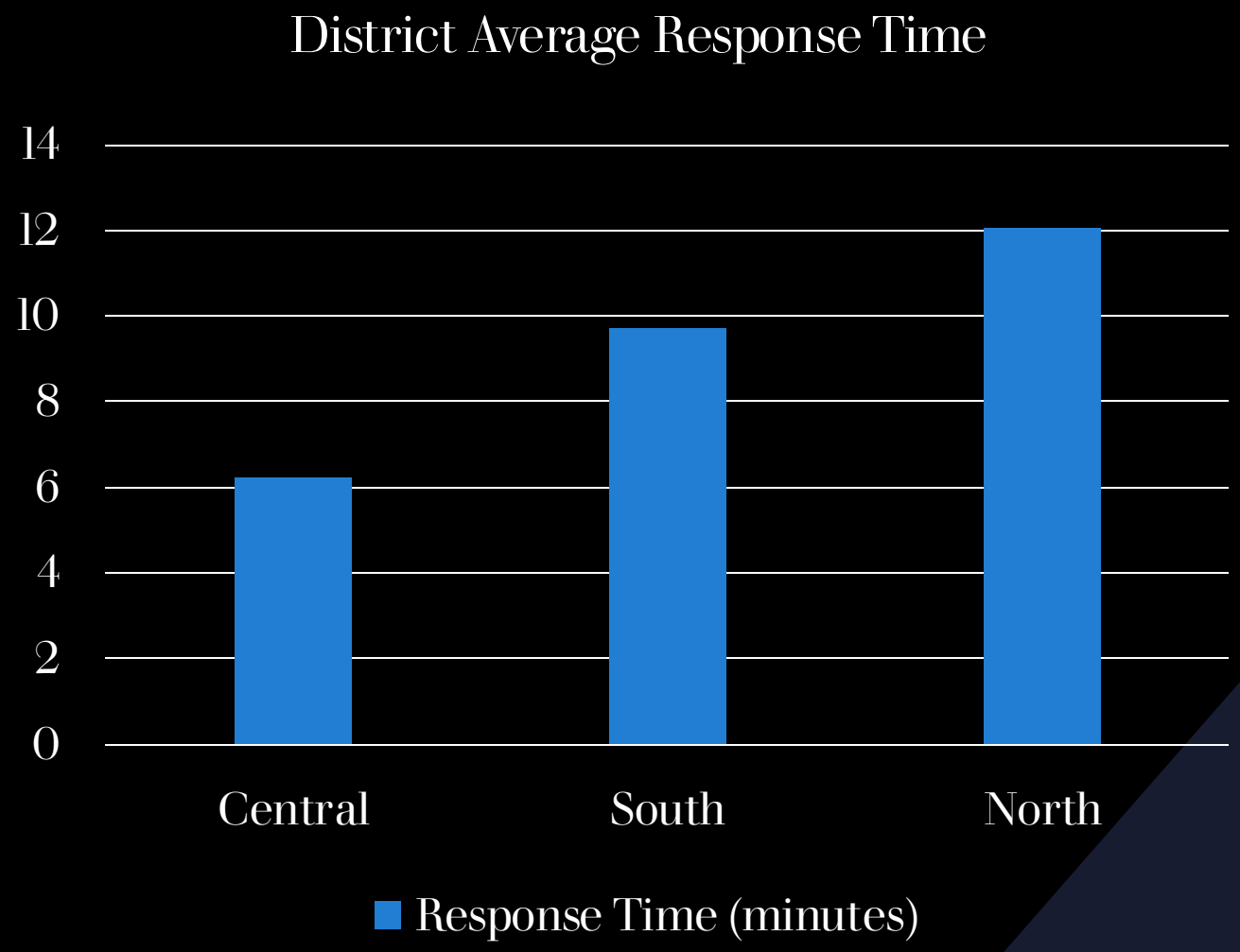
Averages

Central - 6:14

South - 9:43

North - 12:05

These are averages, north responses can take as long as 25 minutes!

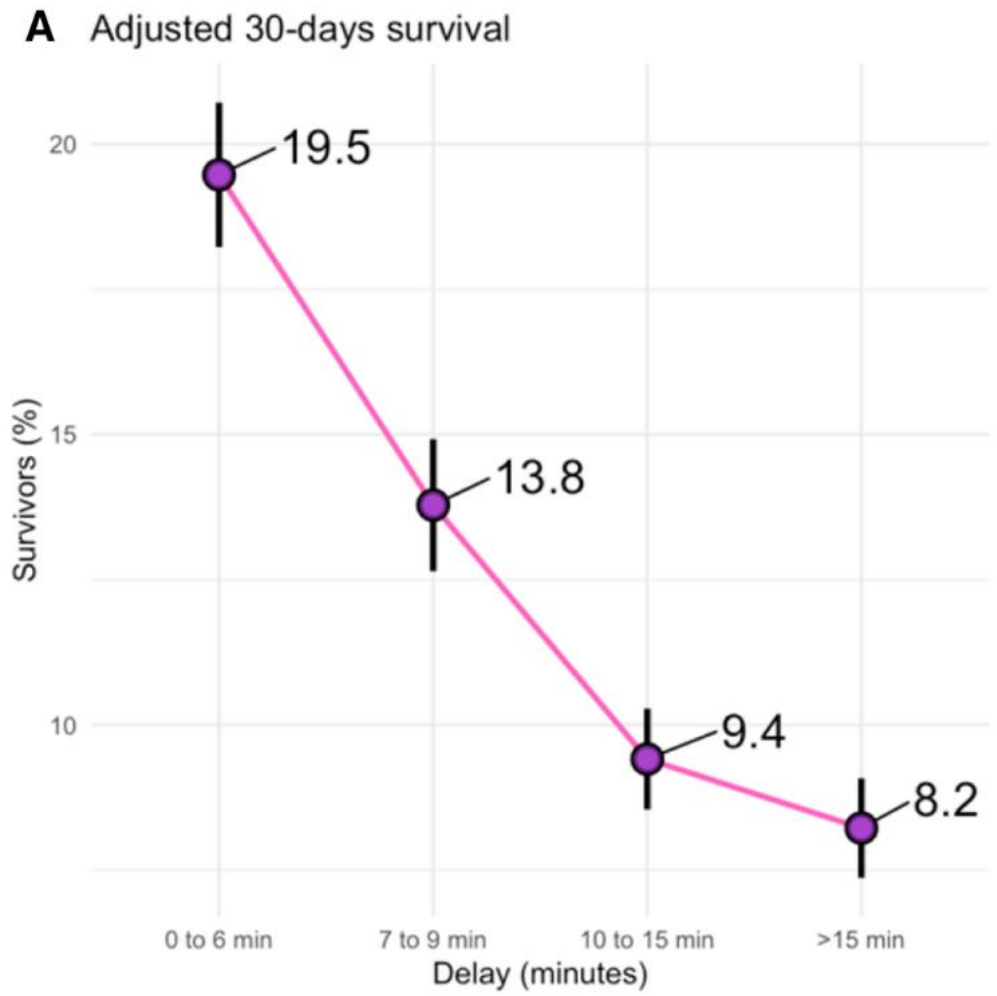


Data from 2019-2022

RESPONSE TIME MATTERS

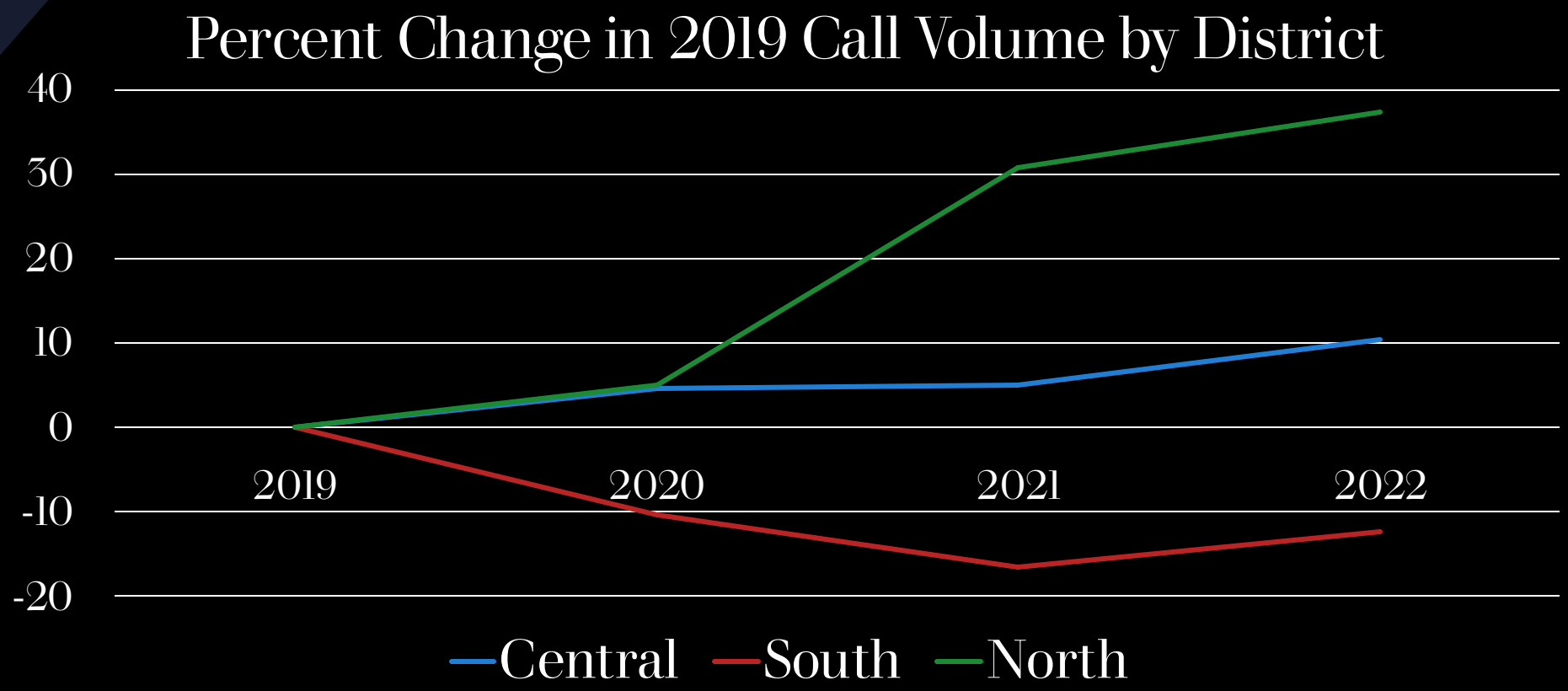
EMS response time has significant impact on cardiac arrest, penetrating trauma, brain injury, stroke, overdose, and many other emergencies

Cardiac Arrest



(Rawshani et al., 2020)

North District EMS Demand is Quickly Growing



Call volume county wide increased by 9% while north calls increased by 37%

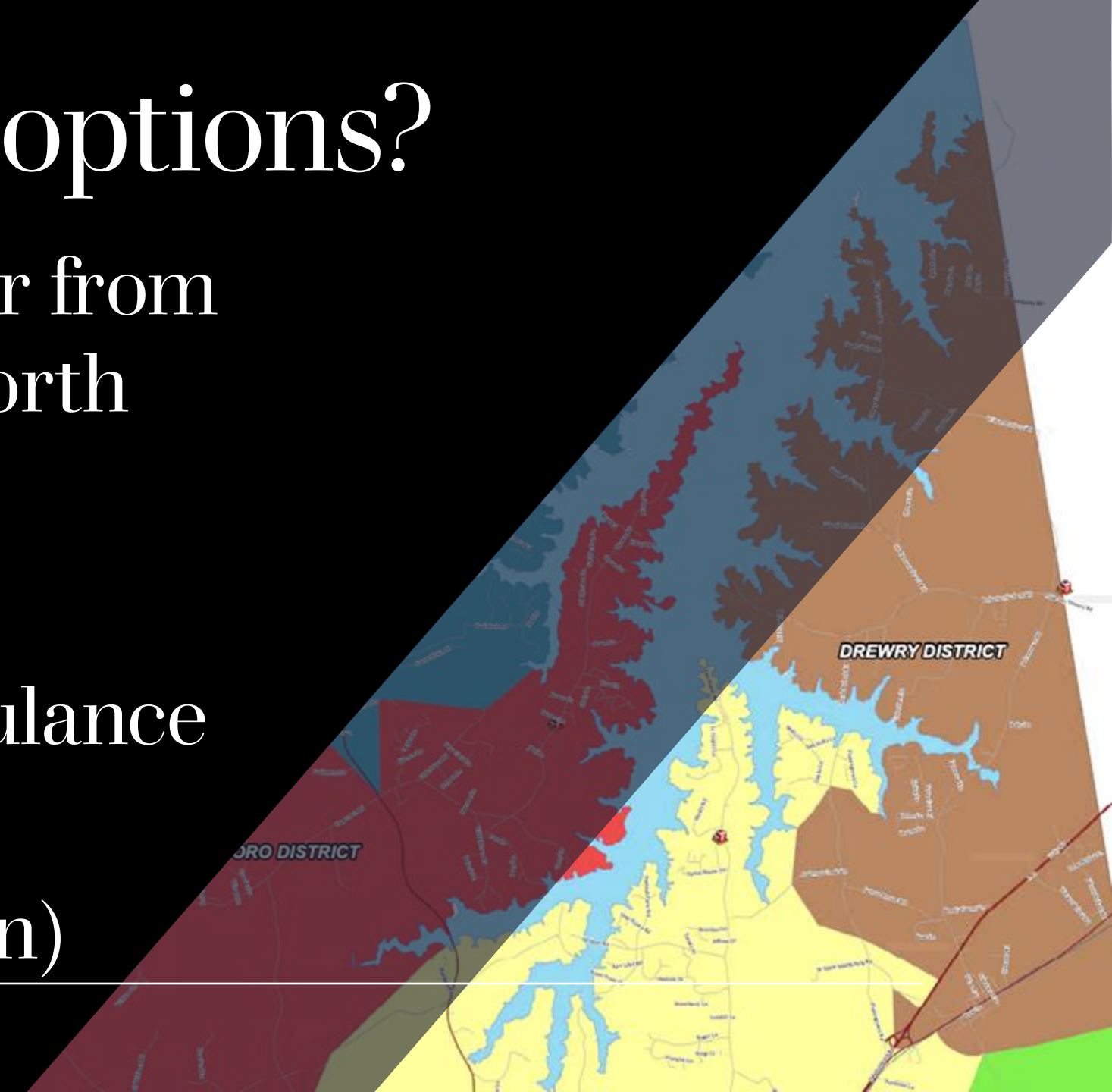
What are our options?

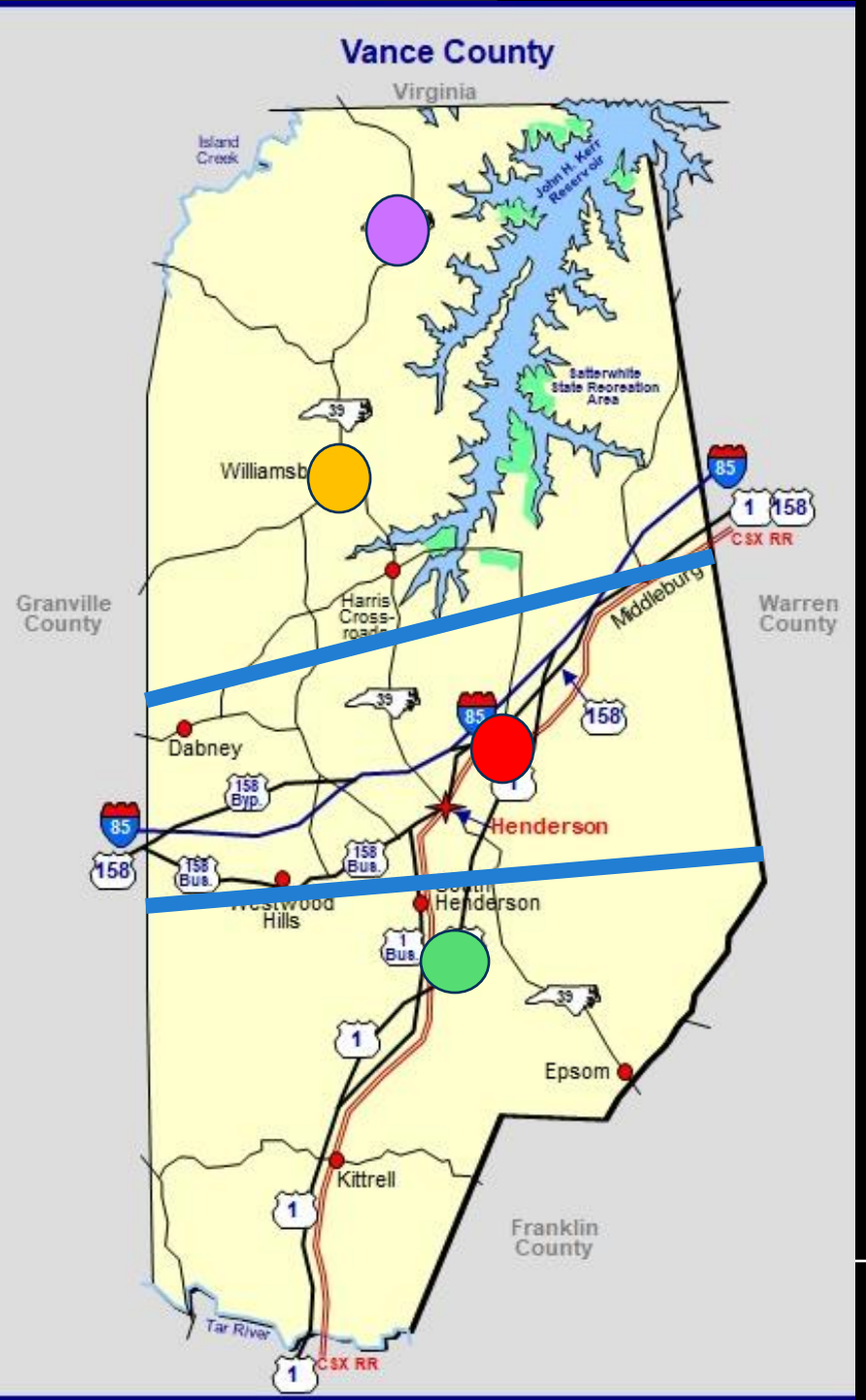
Move ambulance four from the south to the north district

or

Move a central ambulance up north

(1:2:1 distribution)





North Station Options

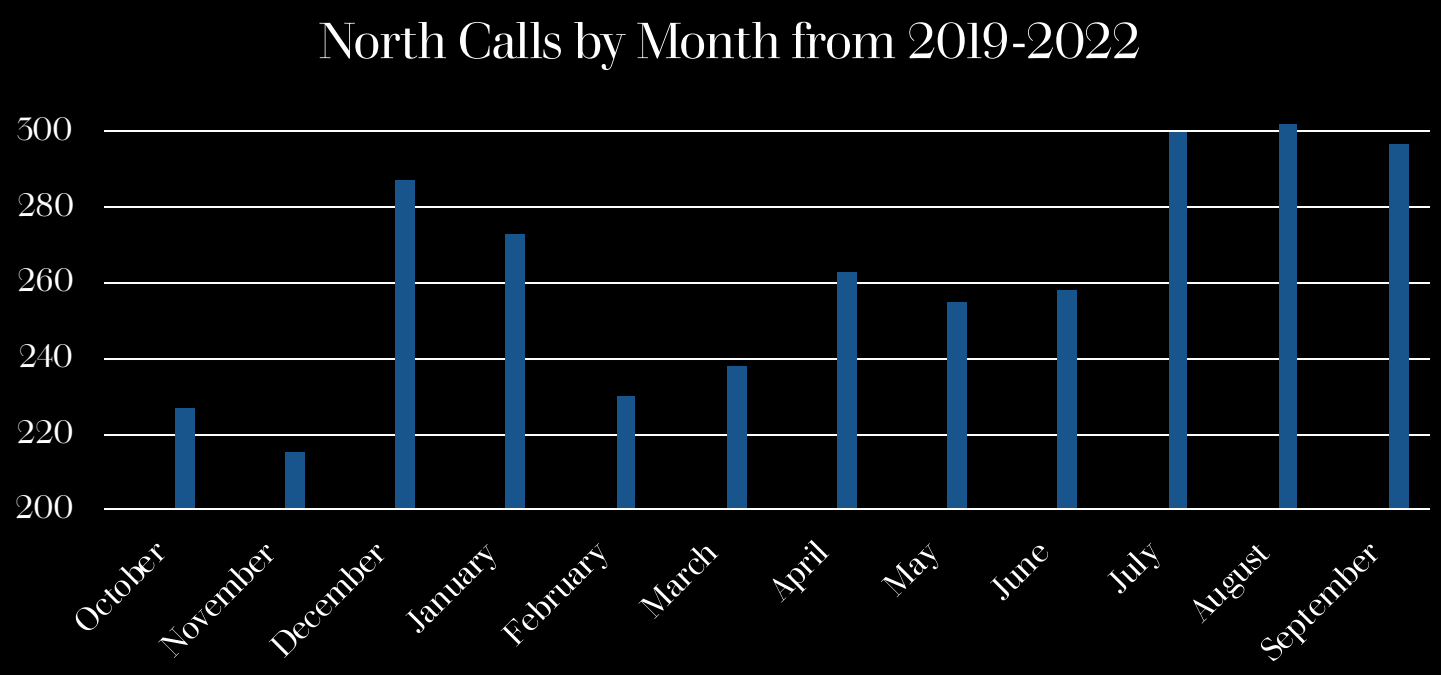
- Central station
- South station
- North option 1
- North option 2

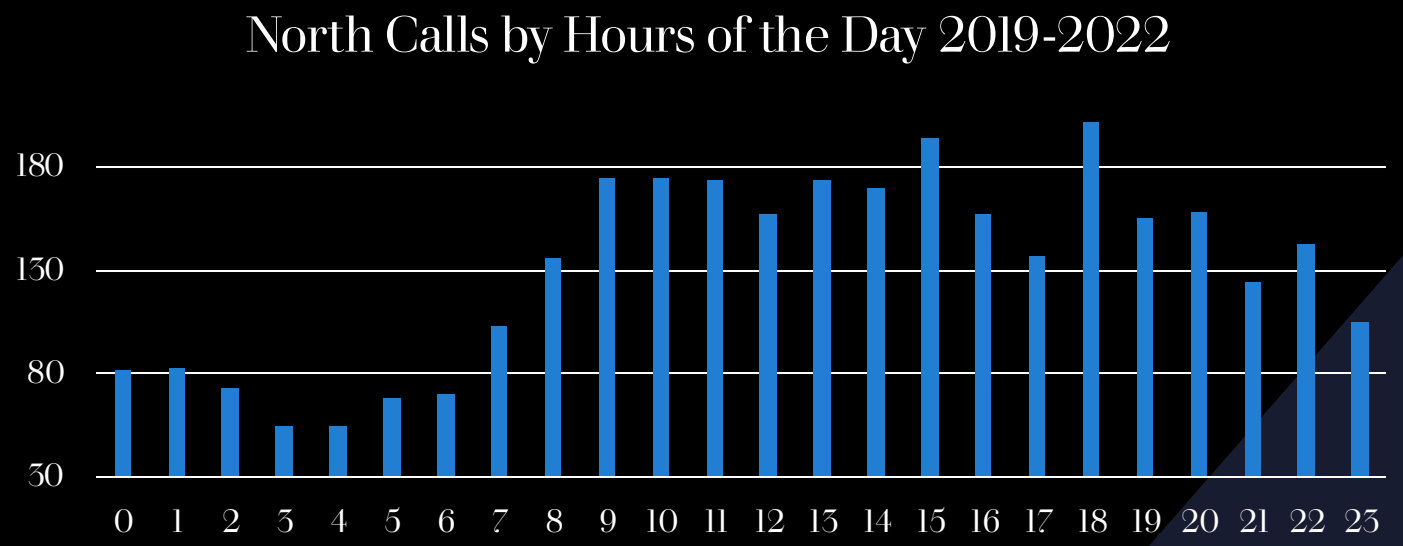
What do I hope you will be able to tell us?

1. Which north station would result in faster response times?
2. Would it be better to move the south truck up north or a central truck up north?
3. How much benefit does having that north station offer? Is it even worth it?

Predictable Call Fluctuations

A peak-load truck could be utilized by season to maximize coverage and minimize unused resources





The Data

- Originates from EMS provider written charts
- Each row is a chart
- HIPAA protected data so you will be working with a mock dataset
- Methods you deliver will be applied to the real dataset and used to inform policy

INDEX	CALL GRID	DISPATCH PRIORITY	REF GPS LAT	REF GPS LON	BASE NAME	UNIT	UNIT GPS	DISPATCHED	ENROUTE	ARRIVE	LEAVE REF	ARRIVE REC	CLEAR
1	2 Central	Non Emergency	36.33	-78.402	Company 9	Medic 2	36.345055,-78.390426	1/1/01 00:04	1/1/01 00:04	1/1/01 00:09			1/1/01 00:29
2	2 Central	Emergency	36.317	-78.36	Company 9	Medic 1	36.345055,-78.390426	1/1/01 01:19	1/1/01 01:20	1/1/01 01:32	1/1/01 01:37	1/1/01 01:50	1/1/01 01:59
3	2 Central	Emergency	36.341	-78.413	Company 9	Medic 6	36.345055,-78.390426	1/1/01 02:07	1/1/01 02:08	1/1/01 02:11	1/1/01 02:40	1/1/01 03:01	1/1/01 04:02
4	1 North	Emergency	36.482	-78.423	Company 9	Medic 2	36.345055,-78.390426	1/1/01 02:26	1/1/01 02:27	1/1/01 02:44	1/1/01 03:04		1/1/01 03:04
5	2 Central	Emergency	36.358	-78.457	Company 9	Medic 1	36.345055,-78.390426	1/1/01 02:30	1/1/01 02:31	1/1/01 02:48	1/1/01 03:06		1/1/01 03:06
6	2 Central	Emergency	36.331	-78.41	Company 1	Medic 3	36.276142,-78.401741	1/1/01 02:41	1/1/01 02:41	1/1/01 02:52	1/1/01 03:15	1/1/01 03:32	1/1/01 04:06
7	2 Central	Emergency	36.331	-78.449	Company 9	Medic 6	36.345055,-78.390426	1/1/01 04:19	1/1/01 04:19	1/1/01 04:25	1/1/01 04:37	1/1/01 04:55	1/1/01 06:31
8	3 South	Emergency	36.289	-78.437	Company 1	Medic 3	36.276142,-78.401741	1/1/01 06:03	1/1/01 06:04	1/1/01 06:16	1/1/01 06:37	1/1/01 06:45	1/1/01 07:10
9	2 Central	Non Emergency	36.321	-78.394	Company 9	Medic 2	36.345055,-78.390426	1/1/01 06:49	1/1/01 06:50	1/1/01 06:57	1/1/01 07:08	1/1/01 07:19	1/1/01 07:32
10	2 Central	Emergency	36.323	-78.417	Company 9	Medic 1	36.345055,-78.390426	1/1/01 08:16	1/1/01 08:16				1/1/01 08:20

Odd things you may encounter

- Out of order units
- Multiples lines for the same call = multiple patients

How might you approach this question?

- Google Maps API to estimate response and transport times
- Assumptions can be applied to simplify
  - Units always responding from their home station
  - No traffic

Questions?