

# Preliminary Findings

TCCOG - Emergency Medical Services Task Force  
14 November 2017



# Agenda

- **Summary of Project**
- **Call Data Findings**
- **Survey Overview/ Results**
- **Next Steps**
- **Proposed Solution Structure**



# Summary of Project

## Problem Definition:

Increasing call volumes and Emergency Medical Services demand with decreasing volunteer force and capability



# Call Data Findings

## Data Analysis Questions

- **What is the call volume by quantity/ type/ time?**
- **What are the most stressful times and locations?**
- **What impact does volunteerism have on reliability?**
- **What are some external factors?**
- **What is the impact of all of it?**

## Constants

- **Complete Data Set: January 2016 - September 2017**
- **One Year Period: October 2016 - September 2017**
- **Ambulance Companies**
- **Non-Ithaca vs. Ithaca**



# Call Volume by Quantity

| <b>Tompkins County Population and Call Volume</b>  |            |            |             |                 |              |
|--|------------|------------|-------------|-----------------|--------------|
|  | Population | Median Age | Pop over 65 | Number of Calls | Calls per 1k |
| Ulysses  | 5026       | 45.4       | 934         | 597             | 119          |
| Groton   | 6097       | 42.2       | 973         | 599             | 98           |
| Ithaca City and Town   | 50819      | 24.5       | 4172        | 4091            | 81           |
| Enfield  | 3614       | 45.4       | 475         | 270             | 75           |
| Newfield   | 5292       | 40.3       | 966         | 375             | 71           |
| Dryden   | 14840      | 41.4       | 1850        | 943             | 64           |
| Caroline   | 3358       | 43.9       | 446         | 213             | 63           |
| Lansing  | 11347      | 38.5       | 1686        | 675             | 59           |
| Danby  | 3462       | 47.9       | 770         | 132             | 38           |
| Tompkins County  | 103855     | 30.2       | 12272       | 7895            | 76           |
| <p><i>*Ithaca City and Ithaca Town combined for accuracy. Cayuga Heights included in Ithaca Town.</i></p> <p><i>*Population Source: 2015 American Community Survey</i></p> |            |            |             |                 |              |



# Call Volume by Type

| <i>Non-Ithaca</i> |       |            | <i>Ithaca</i>   |       |            |
|-------------------|-------|------------|-----------------|-------|------------|
| Nature            | Calls | Percentage | Nature          | Calls | Percentage |
| SICK PERSON       | 1049  | 14.77%     | FALLS           | 1137  | 17.13%     |
| FALLS             | 1033  | 14.55%     | SICK PERSON     | 850   | 12.81%     |
| BREATHING PROB    | 679   | 9.56%      | UNCONSCIOUS     | 621   | 9.36%      |
| CHEST PAIN        | 512   | 7.21%      | UNKNOWN PROBLEM | 536   | 8.08%      |
| PI ACCIDENT       | 472   | 6.65%      | BREATHING PROB  | 483   | 7.28%      |
| UNCONSCIOUS       | 457   | 6.44%      | CHEST PAIN      | 391   | 5.89%      |
| UNKNOWN PROBLEM   | 450   | 6.34%      | PSYCHIATRIC     | 376   | 5.67%      |
| PSYCHIATRIC       | 284   | 4.00%      | OVERDOSE        | 300   | 4.52%      |
| CONVULSIONS       | 259   | 3.65%      | PI ACCIDENT     | 292   | 4.40%      |
| ABDOMINAL         | 251   | 3.53%      | CONVULSIONS     | 289   | 4.36%      |



# Call Volume by Time

## Calls per Day: 11.13

- A. Basic Life Saving. "Cold" response time (Minor Fall, Abdominal Pain)- 27.75%
- B. Basic Life Saving. "Hot" response time (Serious Hemorrhage)- 23.36%
- C. Advanced Life Saving. "Cold" response time (Abnormal Breathing, Feinting) – 20.05%
- D. Advanced Life Saving. "Hot" response time (Not Breathing, Seizures)- 28.03%
- E. Confirmed cardiac arrest – Not Used
- O. Lift assist - .81%

## Demand

- For strictly call volume (quantity), the highest demand times are 1000-1100 and 1500-1600. The lowest demand period is 0200-0500.

## Calls by Day of Week

- Minimal fluctuation (1 percentage point) weekday to weekday

## Calls by Month

- January to February decrease; February to March increase (*county wide*)
- *Month to month deviation*: Freeville, Etna, McLean, and Danby- 3 or less; Highest, Lansing (11.09), Groton (8.26), Dryden (10.02), and Ulysses (9.66)



# Call Volume- Ithaca

## Trends

- Type and volume variation from fluctuating population
- Calls by day of week fluctuation (average moving range: 2.31 calls) – Wednesday lowest, Saturday highest
- Increase in monthly calls from June to August.

| <i>Ithaca Total Calls per Day (One Year)</i> |                  |             |       |
|--|------------------|-------------|-------|
| # Calls in Day                               | # of Occurrences | Mean Calls  | 10.44 |
| 1-5  | 21               | Median Call | 10    |
| 6-10   | 172              | Max Calls   | 24    |
| 11-15  | 144              | Min Calls   | 4     |
| 16-20  | 24               |             |       |
| 21-25  | 3                |             |       |

## Key Findings

- The increase in call volume month to month is strictly the result of an increased population rather than specific behavior by the population (falls by month vs. above average call volume).
- Increased stress through high call volume has minimal impact on response times (45 occurrences of 4 concurrent calls, 7 occurrences of 5 concurrent calls over one year).

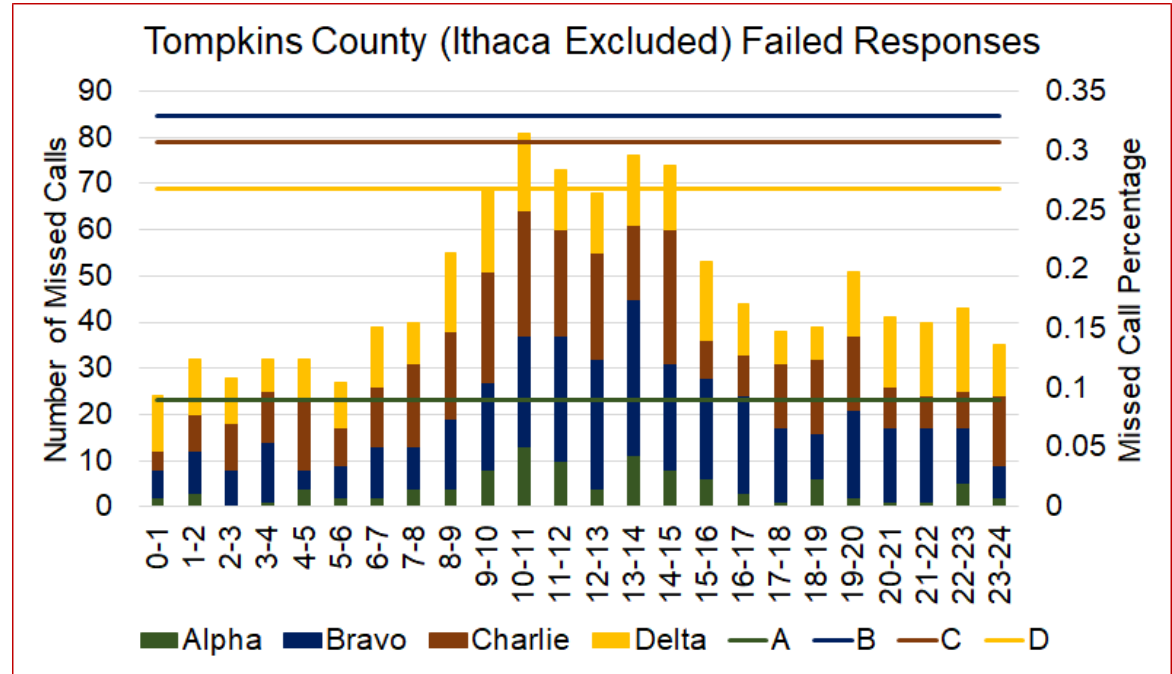




# Stressful Time/ Location

## Failed Response Rates

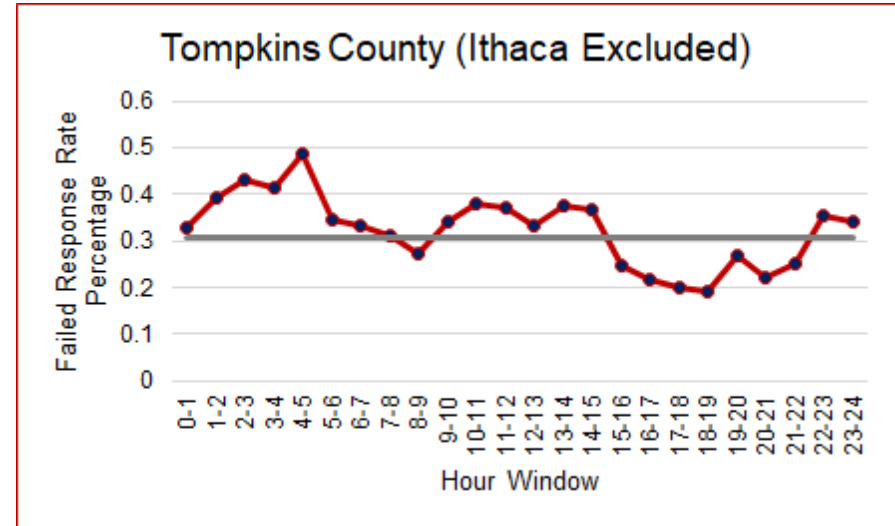
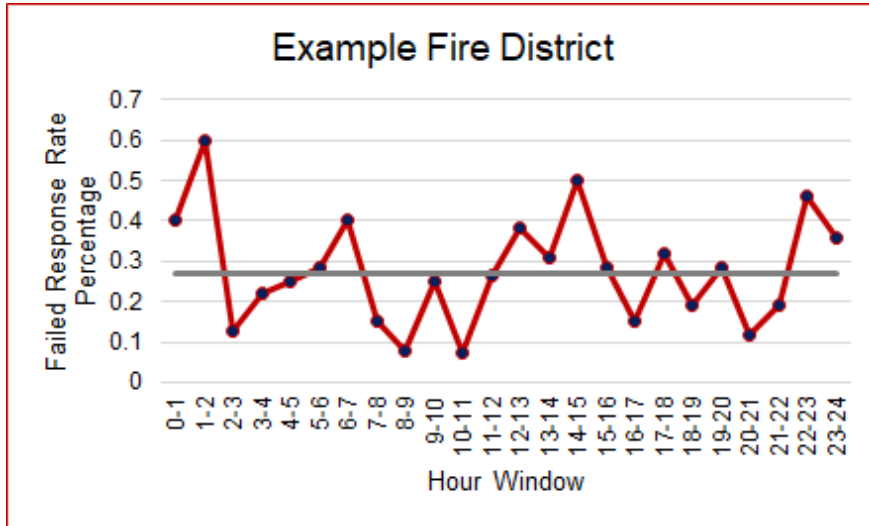
- Tompkins County: 7101 calls, 3689 activations, 1140 failed responses (31%)
- Cayuga Heights: 510 calls, 503 activations, 58 failed responses (11%)
- Lansing: 1141 calls, 900 activations, 438 failed responses (49%)
- Calls answered with highest regularity: “A” Determinant
- **Most Stress: Lansing - 0900-1600 (specifically 0900-1000)**



# Volunteerism and Reliability

## Process Reliability

- All fire districts show non-random systematic variation (volunteer availability)
- Most districts show significant shift from 0200-0400
- A few districts show upwards and downwards trending during normal work hours and at night
- Weekday variation: 27% (Saturday); 35% (Monday)



# Critical External Factors

| <i>Recurring Locations (Non-Ithaca: Oct '16- Sep '17)</i> |                 |                                      |                                   |
|---|-----------------|--------------------------------------|-----------------------------------|
| <b>Location Category</b>                                  | <b>Quantity</b> | <b>Percentage of Recurring Calls</b> | <b>Percentage of County Calls</b> |
| Addiction Center  | 160             | 7.11%                                | 3.92%                             |
| Personal Address  | 93              | 4.14%                                | 2.28%                             |
| Assisted Living   | 79              | 3.51%                                | 1.94%                             |
| Elderly Residential                                       | 46              | 2.05%                                | 1.13%                             |
| Health Center   | 25              | 1.11%                                | 0.61%                             |
| Business  | 14              | 0.62%                                | 0.34%                             |
| Education Center  | 14              | 0.62%                                | 0.34%                             |

## Recurring Locations

- 4081 EMS in one year; 2249 calls from recurring locations, 596 recurring locations
- Cayuga Addiction Recovery Center in Groton received 160 calls in the year period alone.
- Assisted living facilities not as taxing; however, two locations account for 1.94% of county calls
- Three of 11 high source volume locations in Town of Lansing
- Personal Residence shows greater stress on resources than assisted living facilities
- Psychiatric and Diabetic showed the highest percent increase at recurring locations



# What is the Impact?

## Response Times

- Faster response times for non-emergent calls and less serious incidents do not increase patient survivability
- Response times truly critical for cardiac arrest events and traumatic events (D and B determinants)
- Response times are good indication of overall “health” of the system (*many components*)
- NFPA Standards Career: 6.5 min BLS, Volunteer: 9 min Urban, 10 min Suburban, 14 min Rural, Remote  $\geq 8$  mi: None
- Ithaca: 7.26, Non-Ithaca: 11.17
- 16.98 minutes for D calls in Slaterville

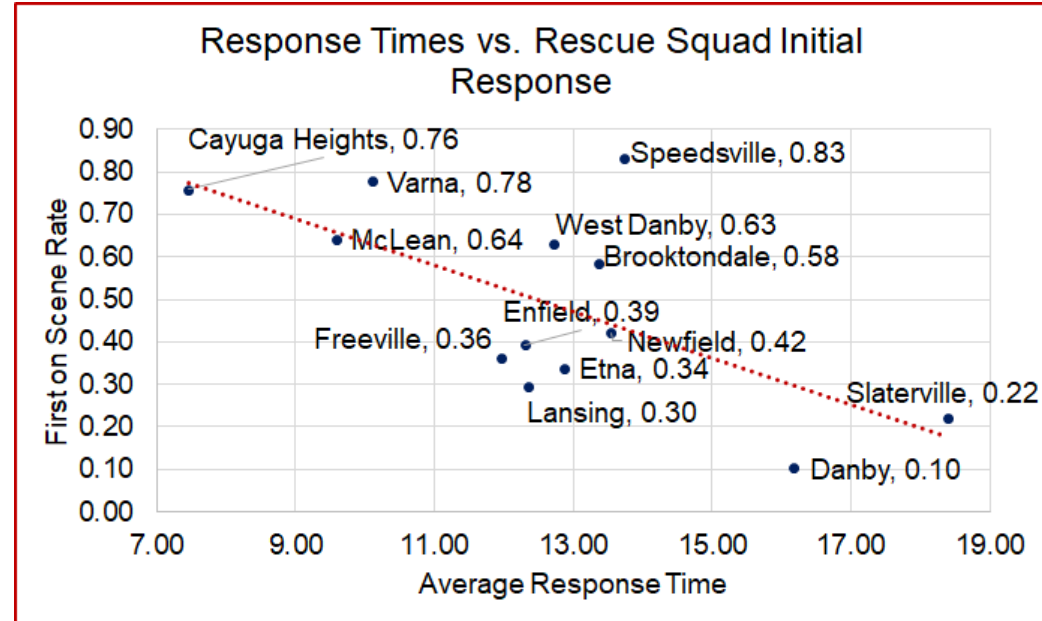
| <b>Average Response Time by Determinant (Minutes)</b> |       |       |       |       |       |       |
|---|-------|-------|-------|-------|-------|-------|
|   | AVG   | A     | B     | C     | D     | O     |
| Tompkins County (Ithaca City Excluded)                | 11.17 | 12.38 | 10.32 | 11.38 | 10.45 | 11.38 |
| Slaterville   | 18.38 | 21.75 | 14.25 | 19.01 | 16.98 | 20.32 |
| Danby   | 16.17 | 19.88 | 12.89 | 14.51 | 15.03 | 14.20 |
| Speedsville   | 13.73 | 9.80  | 23.38 | 15.42 | 14.90 |       |
| Newfield  | 13.53 | 16.89 | 11.88 | 13.52 | 12.30 | 13.31 |
| Brooktondale  | 13.36 | 15.29 | 13.33 | 13.28 | 12.00 | 10.30 |
| Etna  | 12.87 | 15.19 | 12.09 | 12.36 | 11.63 | 14.05 |
| West Danby  | 12.72 | 16.24 | 12.19 | 12.85 | 10.42 | 11.75 |
| Lansing   | 12.35 | 16.07 | 10.30 | 12.32 | 11.07 | 11.52 |
| Enfield   | 12.30 | 15.08 | 11.09 | 11.99 | 11.18 | 19.42 |
| Freeville   | 11.97 | 14.63 | 10.76 | 12.01 | 11.13 | 11.68 |
| Groton  | 11.11 | 11.67 | 10.89 | 11.71 | 10.39 | 9.36  |
| Trumansburg   | 10.40 | 10.41 | 10.60 | 10.72 | 9.99  | 9.92  |
| Varna   | 10.10 | 10.90 | 10.06 | 9.83  | 9.72  |       |
| McLean  | 9.58  | 9.24  | 9.90  | 10.54 | 9.09  | 6.35  |
| Dryden  | 8.39  | 8.67  | 8.28  | 8.79  | 7.83  | 10.75 |
| Cayuga Heights  | 7.45  | 8.10  | 7.40  | 7.17  | 6.76  | 8.37  |



# What is the Importance?

## First Responder Type

- Cayuga Heights, where volunteers are first on the scene 76 percent of the time, their average response time is 7.45 minutes. In Danby, where rescue squads are first on the scene 10% of the time, the average response time is 15.03 minutes.
- Excluded from the analysis are Groton, Trumansburg, and Dryden as they have an extremely high ambulance first response rate.
- Response times vs. non-ambulance first response indicates a considerable relationship ( $R^2: 63%$  \*Speedsville Removed)



# Surveys

1. EMS Volunteer Survey
2. Stakeholder/TF Goal Weighting Survey
3. Fire District EMS Team Leader Survey



# EMS Volunteer Survey

- Designed for current and former EMS volunteers
- Goals:
  - Understand patterns of volunteerism in Tompkins County
  - Identify driving factors of volunteer retention
  - Identify factors limiting EMS volunteerism



# EMS Volunteer Survey

25 questions assessing:

- Volunteer agency culture and expectations
- Volunteer experience
- Reasons for leaving if applicable





# EMS Volunteer Demographics

| Age Range   | Count |
|-------------|-------|
| 17-24       | 20    |
| 25-34       | 6     |
| 35-44       | 8     |
| 45-54       | 12    |
| 55-62       | 6     |
| No response | 1     |

| Volunteer Agency | Count |
|------------------|-------|
| Cayuga Heights   | 11    |
| CUEMS            | 12    |
| Danby            | 1     |
| Dryden           | 4     |
| Groton           | 4     |
| Lansing          | 4     |
| Newfield         | 1     |
| Trumansburg      | 9     |
| Varna            | 1     |
| No response      | 3     |



# EMS Volunteer Survey Results

## Recruitment

- Internet searches
- Public advertisements
- Word-of-mouth

## Incentives

- Resources
- Schedule
- Continued training

## Barriers

- Certification and recertification
- Full-time work and schedule
- Family and children



# EMS Volunteer Survey Results

**Question: Please describe your primary reasons for leaving your volunteer agency.**

- **Culture and Leadership**
  - "I felt unwelcomed and underappreciated. I ran into one too many occurrences of unsafe operations. Bringing on dozens of college students, failing to provide sufficient trainings, and covering up mistakes really caused me to leave. Things need to change."
- **Stress**
  - "Very high stress, required to memorize large amounts of information, having to assume more responsibility than I am comfortable with, more-experienced EMS providers behaving rudely due to my inexperience."
- **Time**
  - "Unable to put in hours."



# Client/TF Goal Weighting Survey

- Goals for the solution → “Wouldn’t it be great if...”
- Feedback on whether we’re working in the right direction, guide future focuses
- Leverage your hands-on knowledge of agency/district issues and approaches



# Client/TF Goal Weighting Survey

## Recruit Volunteers \*

|   | I don't know/<br>NA   | 0 (Ignore this<br>goal) | 1                     | 2                     | 3                     | 4                     | 5 (This is a<br>very important<br>goal) |
|---|-----------------------|-------------------------|-----------------------|-----------------------|-----------------------|-----------------------|---|
| Improve<br>recruitment<br>outreach                                | <input type="radio"/> | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>                   |
| Increase<br>accessibility of<br>certification<br>classes/ trainin | <input type="radio"/> | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>                   |



# Goal Weighting Sample Results

|                                   |      |                    |      |   |     |      |  |
|-----------------------------------|------|--------------------|------|---|-----|------|--|
| Engage/Develop/Recruit Volunteers | 0.25 | Recruit Volunteers | 0.34 | Improve recruitment outreach  | 0.5 |      |  |
|                                   |      |                    |      | Increase access to certification classes and training                           | 0.5 |      |  |
|                                   |      | Retain Volunteers  | 0.38 | Stabilize paid and volunteer staffing   |     | 0.24 |  |
|                                   |      |                    |      | Define and provide meaningful incentives for volunteer service                  |     | 0.18 |  |
|                                   |      |                    |      | Provide leadership training at service agencies                                 |     | 0.14 |  |
|                                   |      |                    |      | Address "cultural issues" at service agencies                                   |     | 0.22 |  |
|                                   |      |                    |      | Provide stream-lined options for volunteer recertification                      |     | 0.22 |  |
|                                   |      | Develop Volunteers | 0.28 | Provide continuing medical education classes consistent with National Standards |     |      |  |
|                                   |      |                    |      |   | 1   |      |  |



# Goal Weighting Results-

## High Level Goals

| Rank-order Preference |                                   |       |
|-----------------------|-----------------------------------|-------|
| 1                     | Optimize County Resources         | 0.276 |
| 2                     | Address acute demand failures     | 0.257 |
| 3                     | Recruit/Retain/Develop Volunteers | 0.247 |
| 4                     | Create a Shared Vision            | 0.22  |



# Goal Weighting Results

| <b>Rank-order (Optimize County Resources)</b> |  |       |
|---|--|-------|
| 1   | Make the EMS system reliable for the patient   | 0.37  |
| 2   | Optimize use of human capital, equipment in relation to response times                       | 0.365 |
| 3   | Begin process of understanding cost associated with non-emergency, or revenue negative calls | 0.275 |





# Goal Weighting Results

| <b>Rank-order (Address acute demand failures)</b> |   |       |
|---|---|-------|
| 1   | Increase dialogue with long-term care facilities                          | 0.135 |
| 2   | Reduce stress on emergency room and ambulances                            | 0.13  |
| 3   | Increase community-based solutions to respond to non-emergency situations | 0.12  |
| 4   | Address day-time shortages immediately                                    | 0.12  |



# Goal Weighting Results

| Rank-order Create a Shared Vision for all EMS... |   |       |
|--|---|-------|
| 1  | Respond with appropriate level of care            | 0.2   |
| 2  | Develop a regional response framework...          | 0.18  |
| 3  | Collaboratively generate shared understanding.... | 0.155 |



# Goal Weighting Results

| Rank-order Retain Volunteers |   |      |
|------------------------------|---|------|
| 1                            | Stabilize paid and volunteer staffing             | 0.24 |
| 2                            | Provide stream-lined options for re-certification | 0.22 |
| 3                            | Address "cultural issues" at agencies             | 0.22 |
| 4                            | Define and provide meaningful incentives          | 0.18 |

| Rank-order Recruit Volunteers |   |     |
|-------------------------------|---|-----|
| 1                             | Improve outreach                                | 0.5 |
| 2                             | All agencies and departments participate in CQI | 0.5 |



# Responder Team Chief Survey

## Survey Goals

### Information Gaps

- Volunteer Numbers/ Demographics
- Resources Available

### Perspective

- Organization Strengths/ Weaknesses
- Barriers
- Stressful times/ location

### Quality Assurance Program

## Findings

### 10 respondents

- Considerable overlap in organizations
- Large organizations (60: Ambulance CO/ 30: Rescue)
- Average Age: ~35
- New Volunteers: ~3
- Time: <15 minutes for all calls
- Type: Mixture

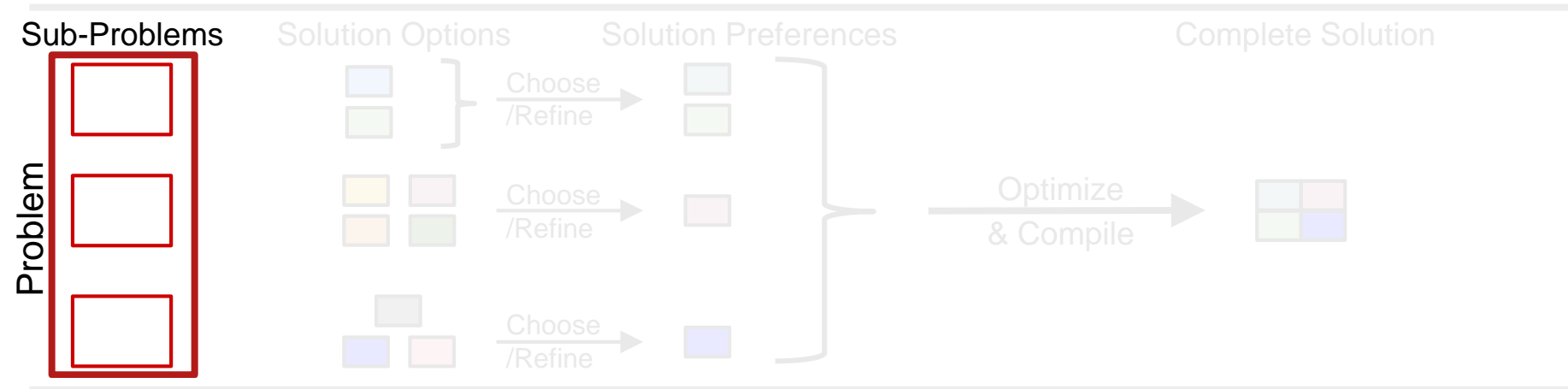


# Next Steps

- Identify any remaining gaps in data
- Write up proposed solutions, weighted by stakeholder priorities



# Proposed Solution Structure



# Sample Proposed Solution Components

| <b>High Call Volume</b>  | <b>Low Volunteer Pool</b>  | <b>Lack of predictability</b>   | <b>Suboptimal Resource Usage</b>                  |
|--|--|---|---|
| Reach out to assisted living facilities for call reduction   | CU EMS declined applicants   | Shared Vision - <i>standards, MOU, mutual aid</i>   | Have variable assets provide status ahead of time |
| Public campaign for appropriate 911 calls  | Provide leadership classes for chiefs, captains, etc.  | Personnel Status reports  | Engine 99/County Battalion                        |
| Community Paramedicine ( <i>allows paramedics to make determinations of need and/or treat at scene</i> ) | Provide streamlined recertification options ( <i>online, national standards, county instructor</i> ) | Quality Assurance Program ( <i>Follow-up for performance metrics, trajectories for volunteers and calls, feedback</i> ) | Start-of-shift geographic relocation              |



# Questions/Comments/Concerns

