Acuteness Astuteness: Another look at our dispatch metrics!

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The Plan

- Do you have a rationale for how you assign your first responders to calls?
- Are you sending first responders when you really need to?
- What are you going to do with all the money you save by not sending first responders?

…we sent everything we had HOT
In the beginning……
to every call

Along came….

- Scripted caller interrogation algorithm
- Allowed selective assignment of resources
- No longer sending everything to every call lights and sirens

Call Determinant

- Everyone follows the same algorithm to get to the determinant
- What YOU send is a local decision
- Allows comparison 911 calls across time and across systems around the world

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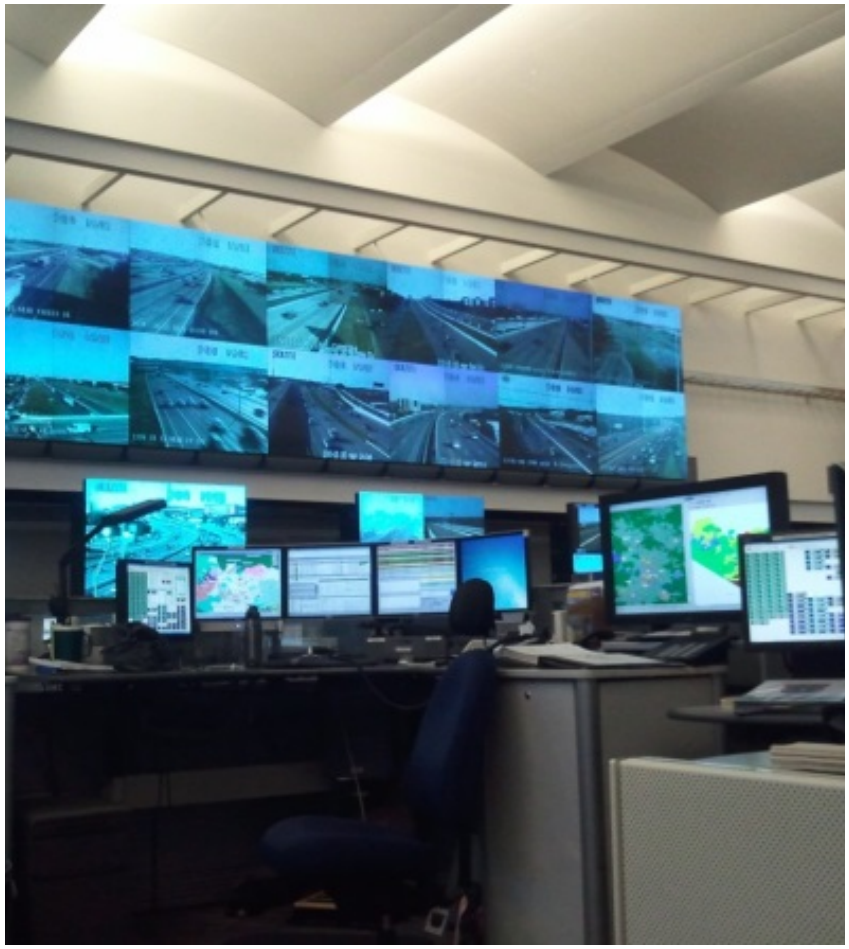
What's the right resource package?



- ATCEMS communications
- AFD assigned to all
  - Echo
  - Delta
  - Charlie
- Some Bravo (MVC)
- Roughly 62%

Question is: Who really needs us?

- Public Safety Commission asked us to evaluate our use of AFD resources for medical calls
- Suggested wholesale reduction in response to charlie level calls
- How do we know who really needs us?

Response in Other Systems

- Eagles Survey of estimated assignment of fire first response rates
- Significant variability in assignments
- No consistent rationale or process to decide when to assign a fire first responder

First Response Assignment

- Alameda County 100%
- Albuquerque 100%
  - P1-2 get 2 FD units
  - P3-5 get 1
- Atlanta no % given
  - All P1-P2
  - Some P3-P4
- Cleveland *50%*
  - All P1-P2
  - Some P3
  - Extended response
- Dallas 17% (APCO)
  - Major MVC, heart attack, stroke, unconscious
  - Extended response
- New Orleans *32%*
  - P1 most P2
  - Extended response
- NYC *20%*
  - Home grown process
- Portland 90% (APCO)
- SanDiego (88%)

Our Dispatch Project

- Began as systematic stepwise review
- EMD determinant linked to ePCR
  - physiologic parameters
  - interventions delivered
- A priori parameters defined for risk and data

- Goal: modification of first responder assignment without impact on patient safety

Time Sensitive Treatments

TABLE 2. High-Acuity Patient Characteristics Considered Unacceptable for Alpha Response

Need for ACLS intervention
- Administration of:
  - Antidysrhythmics (amiodarone, lidocaine, procainamide)
  - Epinephrine/vasopressin
  - Atropine
  - Adenosine
  - Cardizem
  - Calcium
- Electrical cardiac therapy
  - Transcutaneous pacing
  - Cardioversion
  - Defibrillation

Evidence of acute coronary syndrome
- Nitroglycerin for chest pain
- Morphine for chest pain
- STEMI

Evidence of respiratory distress
- Treatment for presumed CHF with any of the following:
  - nitroglycerin
  - furosemide
  - morphine
  - CPAP
- Treatment for presumed bronchospasm with any of the following:
  - albuterol
  - atrovent
  - methylprednisolone
  - magnesium sulfate
  - epinephrine
- Treatment for presumed allergic reaction with any of the following:
  - diphenhydramine
  - methylprednisolone
  - epinephrine
- Advanced airway management, including any of the following:
  - nasotracheal intubation
  - orotracheal intubation
  - placement of a laryngeal mask airway
  - use of surgical airway
  - use of bag-valve mask

Altered mental status
- Treatment for hypoglycemia requiring any of the following:
  - glucose administration
  - glucagon administration
- Treatment for presumed narcotic overdose:
  - naloxone
- Treatment for seizure activity requiring any of the following:
  - benzodiazepines
  - magnesium sulfate (presumed toxemia)

Stroke
- Paramedic evaluation based on Cincinnati Prehospital Stroke Scale

Abnormal vital signs
- SBP <90, Pulse >140, <50

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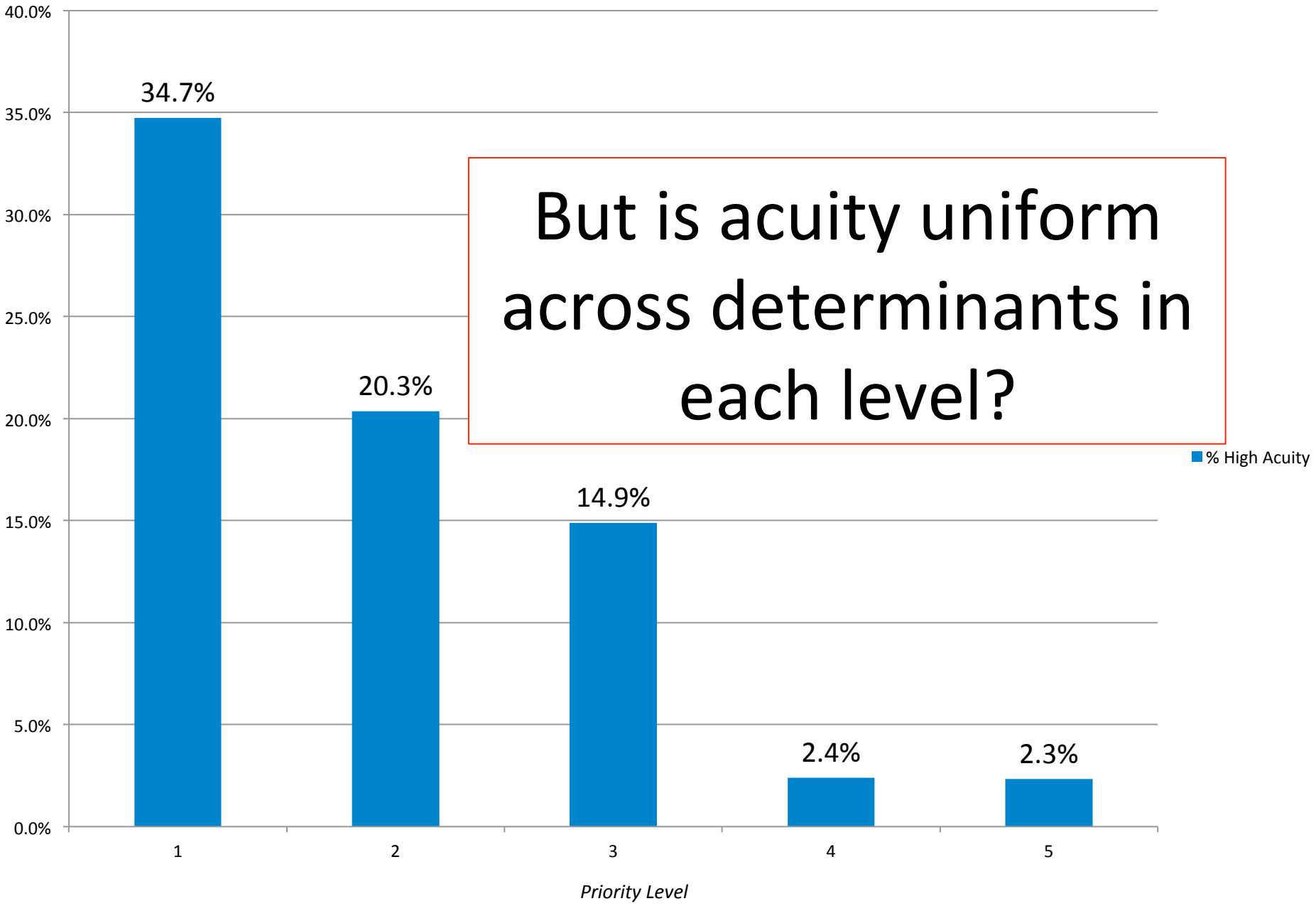
Review Process

- All P1 - P5 dispatches from FY2011-2014 are identified and linked the patient record
- Manual filter of:
  - Attended patients
  - DOS, no patient found
  - Data errors (ex HR <20)
  - Untriaged (RA, e-rule, etc)
- Remaining represent pool of calls evaluated by physiologic and time sensitive treatment criteria

% High Acuity By Call Priority



But is acuity uniform across determinants in each level?

Sample of alpha & bravo > 10%

				(E/D)	(C/Sum C)	(D/C)
Card Type	Total Data (C)	Filtered Data (D)	High Acuity (E)	Percent High Acuity	% of total	% after filter
Allergic reaction Pri 4	61	27	11	40.74%	0.21%	44.26%
Burn Pri 4	32	11	3	27.27%	0.11%	34.38%
Gunshot Wound Pri 4	20	10	2	20.00%	0.07%	50.00%
Seizure Pri 4	546	296	57	19.26%	1.84%	54.21%
Seizure Pri 5	1421	1410	236	16.74%	4.78%	99.23%
Choking Pri 5	173	172	28	16.28%	0.58%	99.42%

Remember this is a VERY conservative measure of acuity

“Never test the depths of the river with both feet.”

- Warren Buffet

Phase 1 – Proof of Concept

- Applied to some charlie level calls
- A priori values determined for:
  - Eligible to eliminate response < 3%
  - Potential to eliminate response 3-5%
  - Potential to increase response >5%
- Analysis:
  - Percent filtered
  - Subset analysis of call determinant
  - Sample size (n ≥ 500 calls)

We made it up!

This too!

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Then we thought….

If the goal of first response is to get someone there quickly…

What if the ambulance was already nearby?

Phase 2 - Near Unit Exception

- If EMS able to arrive quickly first response may not be needed
- Used EMS CAD to identify EMS response <5 min and eliminate FD response request
- Trial limited to some charlie call types as a feasibility trial
- Assessed for function of CAD logic and requests for additional assistance by EMS

Preliminary Results (2011-2014)

- No FD Response changes
  - 2,718 calls not assigned to AFD
- Priority 3 Near Unit Dispatch (April 2014)
  - AFD not dispatched: 672 incidents
  - AFD dispatched after EMS Arrival: 18 (2.8%)
    - AFD requested for patient movement: 10
    - AFD requested for support medical care: 8
- Changes saved a total of 3,372 AFD incidents

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Expansion of the Program

- Elimination of FD response
  - Sufficient data (n>500)
  - Increase acuity tolerance to 5%

- Near unit modifier
  - Identified determinants with intervention <15%
  - Reduces additional responses without increasing risk to patients

Impact of Changes

- If applied to the current database (3.5 yrs)
- **No Response** modifications would reduce responses by approximately 9,858
- **Near Unit** would result in 40,897 responses eligible for no AFD response

- Combined reduction of **14,501** calls/year

How much money do we save?

Lets take a look….

- 4 FF at avg $35/hr x24 hrs = **$3,360**/day
  - OR **$1,226,400**/year
- Engine $500k over 10 yrs = **$50,000**/yr
- Average variable costs:
  - 10k mi/yr @ $10/mi = **$100,000**
- Total cost per engine per year:

$1,376,400

So if we eliminate HALF the medical calls in our hypothetical cost model…

A staffed engine STILL costs:

$1,326,400 /yr

A MASSIVE savings of:

$50,000 or 3.6%

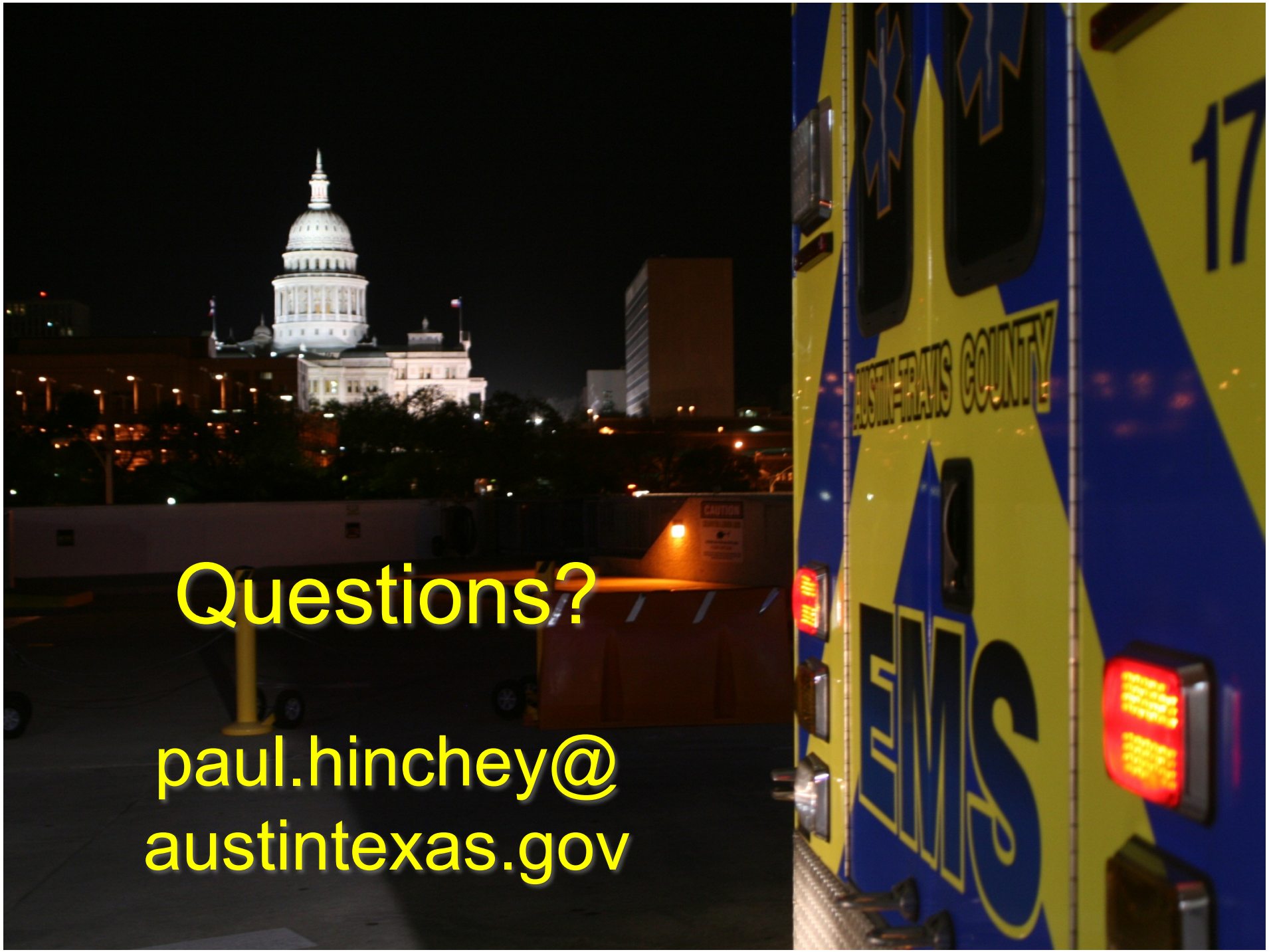
Fixed Costs

Value

- Do not look at resource assignment because of a cost savings!
  - Variable cost of running calls is small
- More appropriate use of resources:
  - Reduced risk to public
  - Opportunity cost of missed calls
  - Identification of call types with additional need

Take Away

- We're trying to find a reason why we assign first responders to certain calls
- Found some waste and unaddressed need we otherwise would have missed
- Getting closer to the right resource, to the right patient need, in the right amount of time.
- It ain't all about the money….



Questions?

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