

# **Mass Gatherings: One Small Step to Disaster**

**Jeff Ferguson, MD, NRP**

**Henrico County Division of Fire**

**VCU Health Emergency Medicine**



# Mass Gathering

- FEMA:
  - A non-routine activity that brings together a large number of people.
  - Emphasis is on the impact on the community's ability to respond to a large-scale event or the demand placed on response services.
  - Requires planning, preparedness, and mitigation efforts of local emergency response and public safety agencies
- WHO:
  - any occasion, either organized or spontaneous, that attracts sufficient numbers of people to strain the planning and response resources of the community, city or nation hosting the event



# **Mass Gathering**

**A mass gathering is a  
planned emergency**

# Goals of Mass Gathering Care

- **Evaluate and stabilize injury and illness** in individuals involved in the event consistent with the standard of care in the surrounding area.
- **Preserve the capacity of the local public health and acute medical care systems** to serve their local constituents, mitigating risks, reducing morbidity, and determine appropriate levels of resources and expertise dedicated to the event;
- **Optimally respond to extraordinary or catastrophic events**, through use of the incident command system for the management of MCIs.







> PLoS Curr. 2012 Feb 2;4:RRN1301. doi: 10.1371/currents.RRN1301.

## Disasters at mass gatherings: lessons from history

Lee Soomaroo<sup>1</sup>, Virginia Murray

- Areas of risk and mitigation planning to prevent loss of life:
  - Overcrowding/inadequate crowd management and control
  - Ticketed and controlled event access points
  - Robust fire safety, prevention, and response measures
  - Medical preparedness and emergency response planning
  - Emergency response



# Medical Oversight

- Knowledgeable in EMS, emergency medical conditions and treatment, and the inherent logistical and personnel limitations
- Set target performance metrics
  - Time to CPR, Time to defib, Time to transport, etc.
- Engaged at all levels
  - Event Leadership expectations, EM/EMS/LEO/FD/Hospital Leadership
- +/- On-site care
- “Medical Conscience”



# Medical Risk Assessment

- Type of event
- Expected attendance (number and demographics)
- Dates and duration
- Agencies involved
- Alcohol and drug policy
- Event history
- Local site map

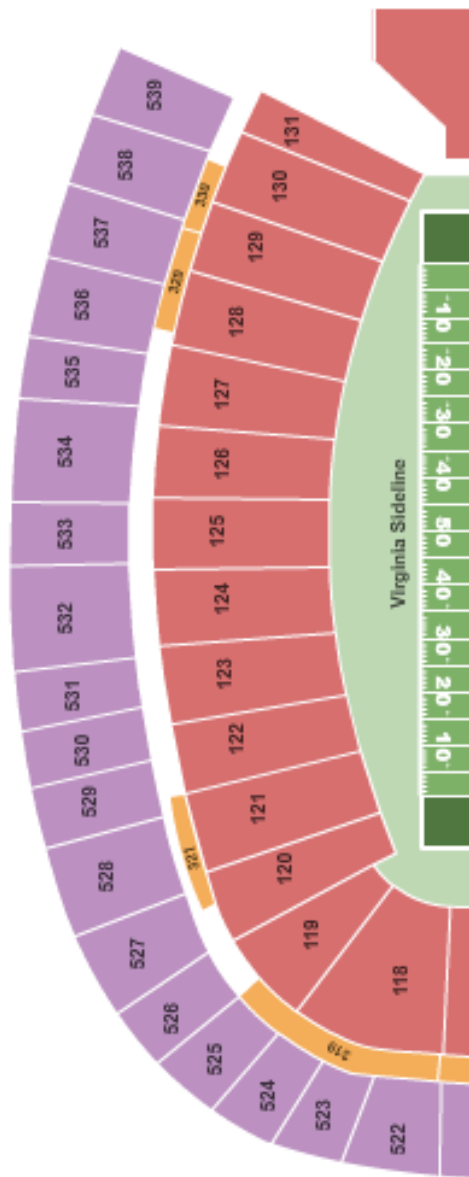


# Useful Metrics

- Medical usage rate (MUR) or patient presentation rate (PPR):  
Number of visits or patients 10,000
- Transport to Hospitals Rate (TTHR):  
Number of patients transported to hospitals per 10,000



Event descriptors	Characteristics associated with decreased resources	Characteristics associated with increased resources
Location footprint Venue	Single, fixed site (e.g., art festival) Event focused, enclosed with easy access (e.g., a sports stadium)	Multiple sites or site moving during event (e.g., a road race) Non-event focused, with access issues (e.g., a marathon through city streets)
Purpose	Celebratory (e.g., a seasonal sports championship competition or celebration)	Highly emotional focus (e.g., political protest)
Size	Small	Large
Participants	Screened attendees with similar health profiles to the general population (e.g., charity fund-raising cycle events)	Unscreened attendees with potential special needs (e.g., 1970s rock band concerts with elderly fans)
Duration	Short, or longer duration but with frequent breaks (e.g., America's Cup several-month sailing competition)	Long, with no breaks for participants to rest or access normal health care (e.g., endurance athletic events)
Timing	Slow onset, with adequate time for planning and modification if needed due to changing risk factors (e.g., political convention)	Rapid onset, little or no preplanning or ability to cancel event (e.g., unexpected win by sporting team with spontaneous community celebration)
Activities	Low stress, with ability to rest (e.g., street fair)	High stress for attendees (e.g., physical–warm weather event, or psychological–confrontation anticipated during event)
Capacity	Event venue at or below capacity (e.g., regular sporting event)	Event venue at or potentially exceeding capacity (e.g., civic celebration with unexpectedly high participation in a nonexpandable space)

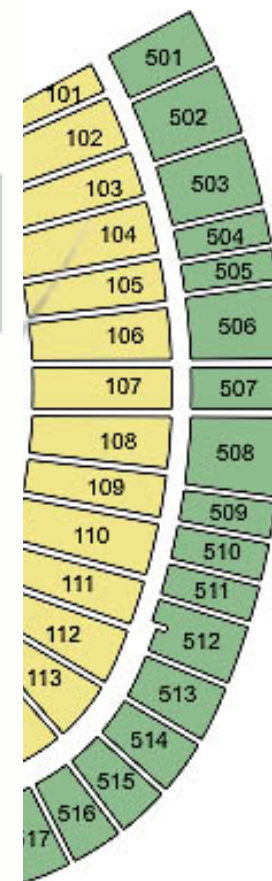


- - RED ZONE
- - GA FLOOR
- - UPPER 500'S
- - LOWER 100'S
- - LOGE 300'S
- - GA LAWN
- ♿ - ACCESSIBLE



Copyright 2009 Ticket Transaction

ia



- IntelliMap





Andrew G. Clem



# Medical Action Plan

- Develop contractual agreement for “medical action plan”
  - Delineate expectations and responsibilities including:
    - Liability coverage/insurance
    - Compensation for ALL staff
    - Medical equipment
    - Potable water +/- food

# Venue Reconnaissance

- Thorough inspection of event site
- Set clear boundaries of medical care sector
- Evaluate ingress/egress routes to all areas for patrons, medical staff, and transport vehicles
- Investigate regional EMS and hospital capabilities and location



# Bounded, Focused?



# Level of Care

- Balance IDEAL and POSSIBLE care based on community resources and financial constraints
- Cornerstone is to ensure CPR and early access to defibrillation
  - (EMS standards <4 and 8 min, ideal <5)









# Level of Care (cont'd)

- Standardized care protocols
  - Adherence to local protocols better
- Specialized protocols require advance training
  - IV hydration, treat and release, etc.



# Personnel

- Physicians
  - Necessary if:
    - On-site diagnostics
    - Large events
    - High-risk events
    - Limited transport
- APPs
- Nurses
- EMT/Medics

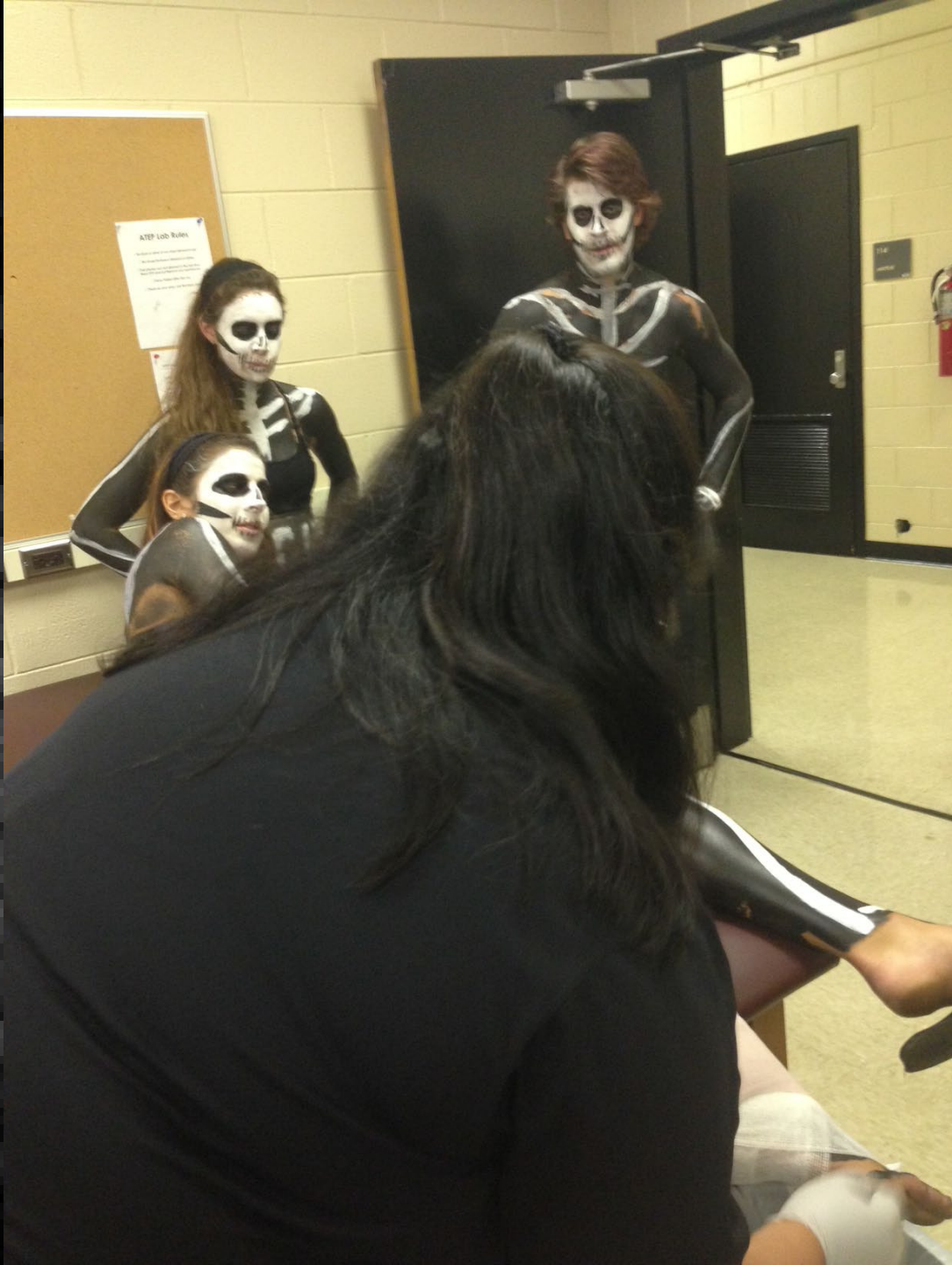


# Care Facilities

- On-Site Temporary
  - Trailer, tent, or other temporary shelter
- On-Site Fixed
  - Dedicated structure
- Off-Site
  - Local or regional hospitals







# Transportation

- Stretcher
  - Less than 5 minutes walk time
- Golf Cart/ATV
  - Fitted with stretcher
- Ambulance
- Non-Emergency transport







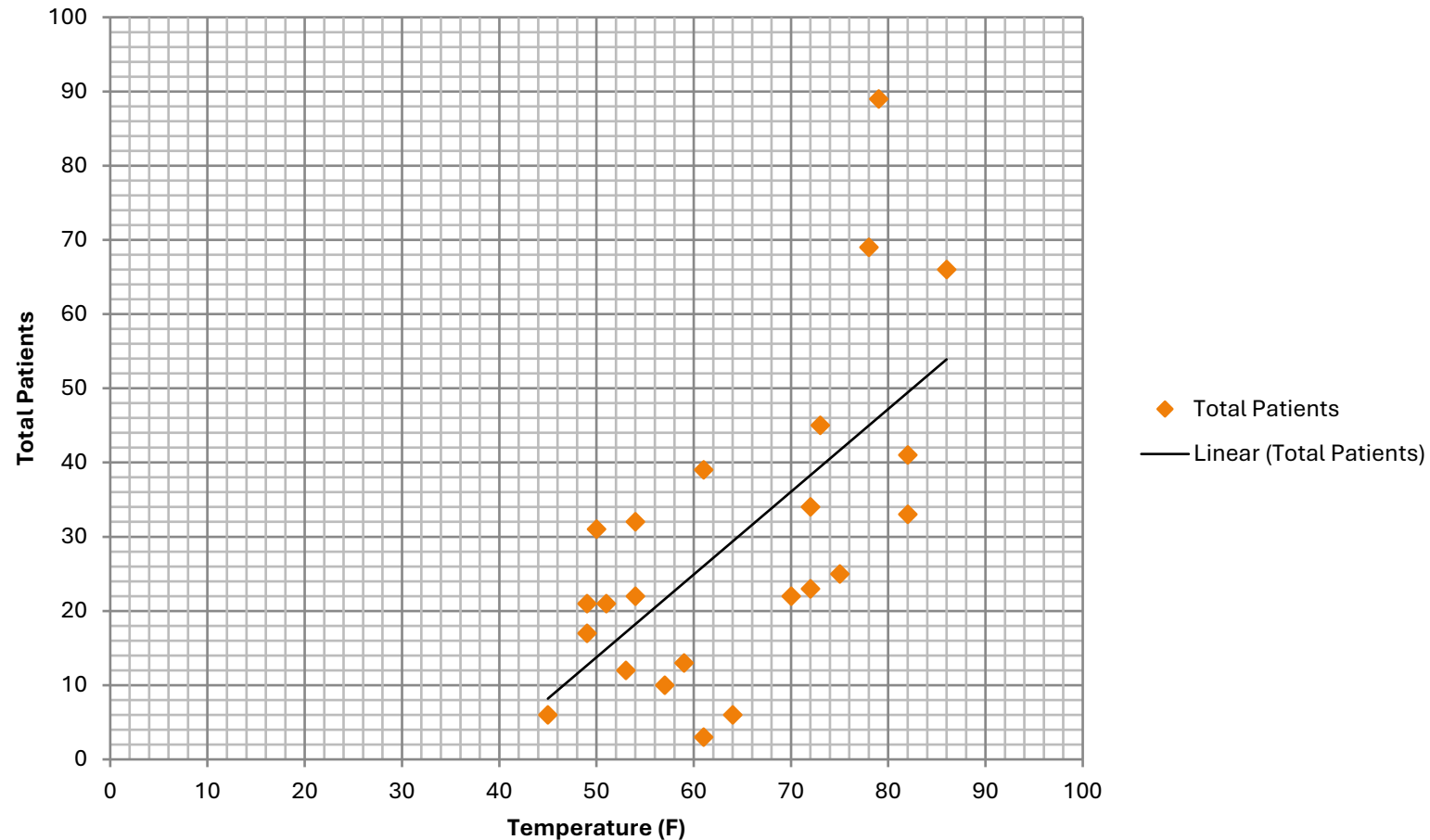
# Special Considerations

- Weather
  - Inclement weather plan
    - Evacuation route
    - Emergency shelter
- Heat
  - One of the top predictors of increased PPR
  - Heat plan
    - Increased water, shade/climate control areas





# ECU Football Data







## CONDITION ALERT SYSTEM

**EXTREME**

*EXTREME HEAT. Race may be canceled or halted. Runners are asked to walk or withdraw and follow instructions from race staff, volunteers, and first responders.*

**HIGH**

*EXTREME CAUTION. Runners are asked to slow to a walk or withdraw.*

**MODERATE**

*CAUTION. Runners are warned of heat and asked to slow down or withdraw.*

**LOW**

*GOOD CONDITIONS: Enjoy the day!*

**EXTREME**

*EXTREME COLD. Race may be canceled or halted. Seek shelter and follow instructions from race staff, volunteers, and first responders.*

*Course condition colors are based on the American College of Sports Medicine guidelines for WBGTs (wet bulb globe temperatures).*

*BEMA will monitor the WBGT at different course locations. Flag color will be determined by the lowest reading of the three temperatures. Aid stations will be notified and relay information on changing conditions throughout the event.*



**= MISTING STATION**



**= COOLING STATION**



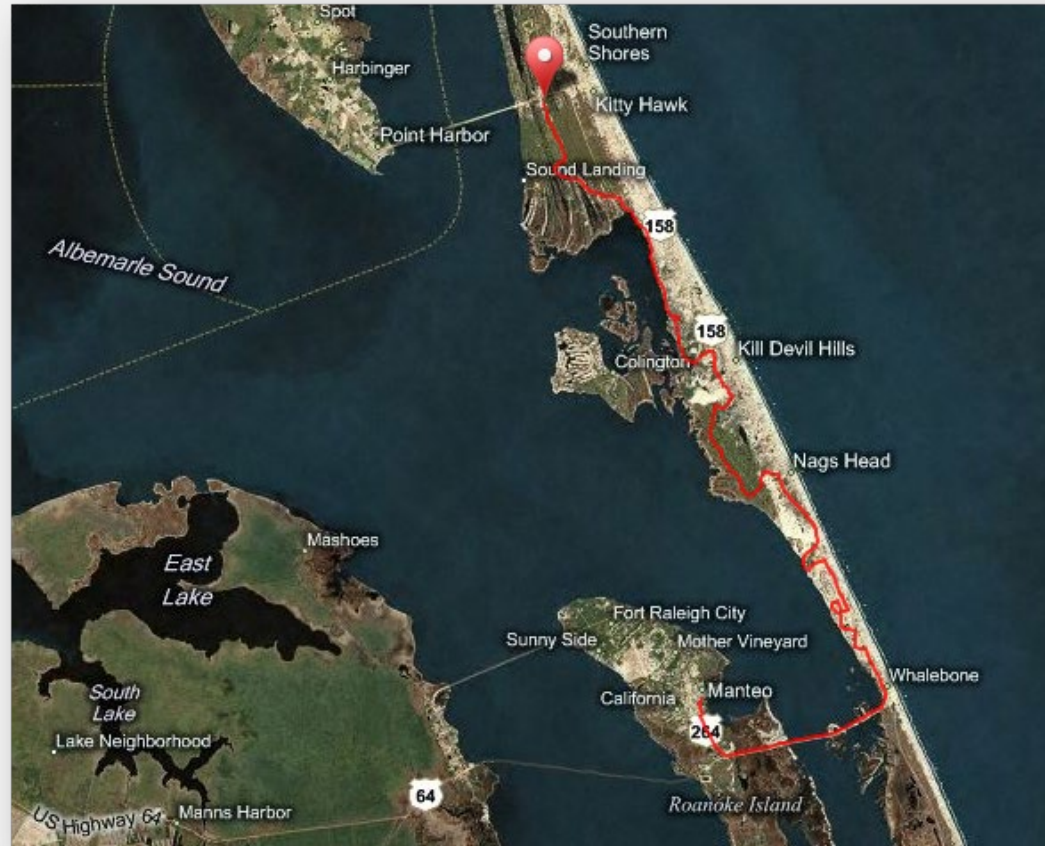
# Special Considerations

- Abused Substances:
  - Five “major” rock concerts (1996)
    - 48% of patients intoxicated
    - 30% of injuries



# Special Considerations

- Mobile events:



# Special Considerations

- Unbounded events





# Special Considerations

- VIPs:











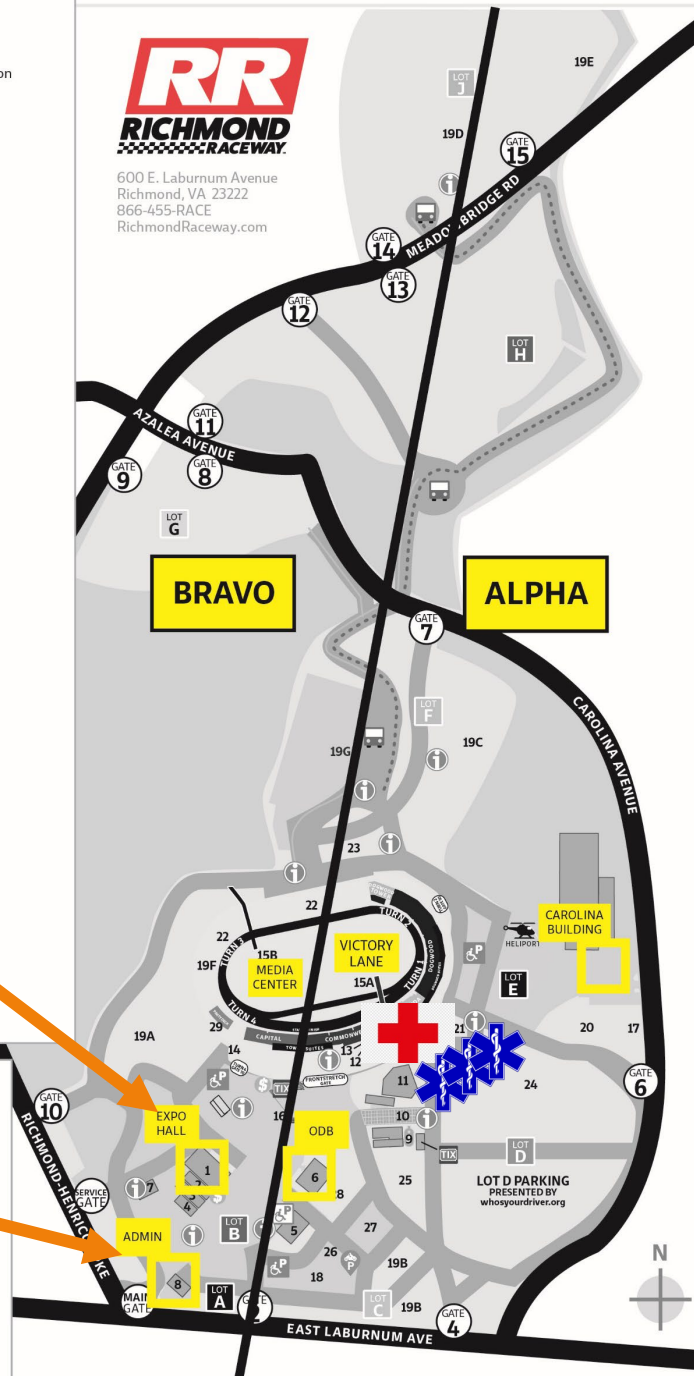


## FACILITY

1. Exhibition Hall / Corporate Hospitality Pavilion
2. Commonwealth Building
3. Henrico Hall
4. Colonial Building
5. Covered Arena
6. Old Dominion Building / 3-Wide Hospitality
7. Credentials
8. Ticket & Administration Offices
9. Horticulture Garden
10. Commonwealth Mall
11. Virginia Credit Union LIVE!
12. Front Porch Hospitality
13. TORQUE Club
14. Family Comfort Zone
- 15A. Eternal Fan Pedestrian Tunnel
- 15B. Vehicle Tunnel
16. Midway: Souvenirs / Concessions / Displays
17. TORQUE Club Parking
18. Charter Bus Parking
- 19A. GEICO Main RV Parking
- 19B. GEICO Laburnum RV Parking
- 19C. GEICO Lot F RV Parking
- 19D. GEICO Lot J RV Parking
- 19E. GEICO Lot J Tent Camping
- 19F. GEICO Turn 3 RV Parking
- 19G. GEICO Lot F Premium RV Parking
2. Group Tailgate Lot Parking
21. Media Parking
22. Motorcycle Hospitality
23. Henrico Parking
24. RICHMOND NATIONAL Parking
25. Lot P1 Parking
26. Lot P2 Parking
27. Lot P3 Parking
28. Toyota Owners Parking
29. Climax Corner Party Deck



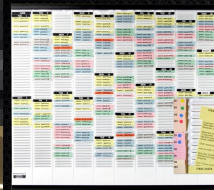
600 E. Laburnum Avenue  
Richmond, VA 23222  
866-455-RACE  
RichmondRaceway.com



- Ticket Booth & Will Call
- VCU Health Care Center
- Loading Area presented by whosyourdriver.org
- Tram Route
- ATM Machine
- Handicap Parking
- Overflow Handicap Parking
- Guest Services
- Pedestrian Walkway
- Motorcycle Parking

## What is a T-Card?

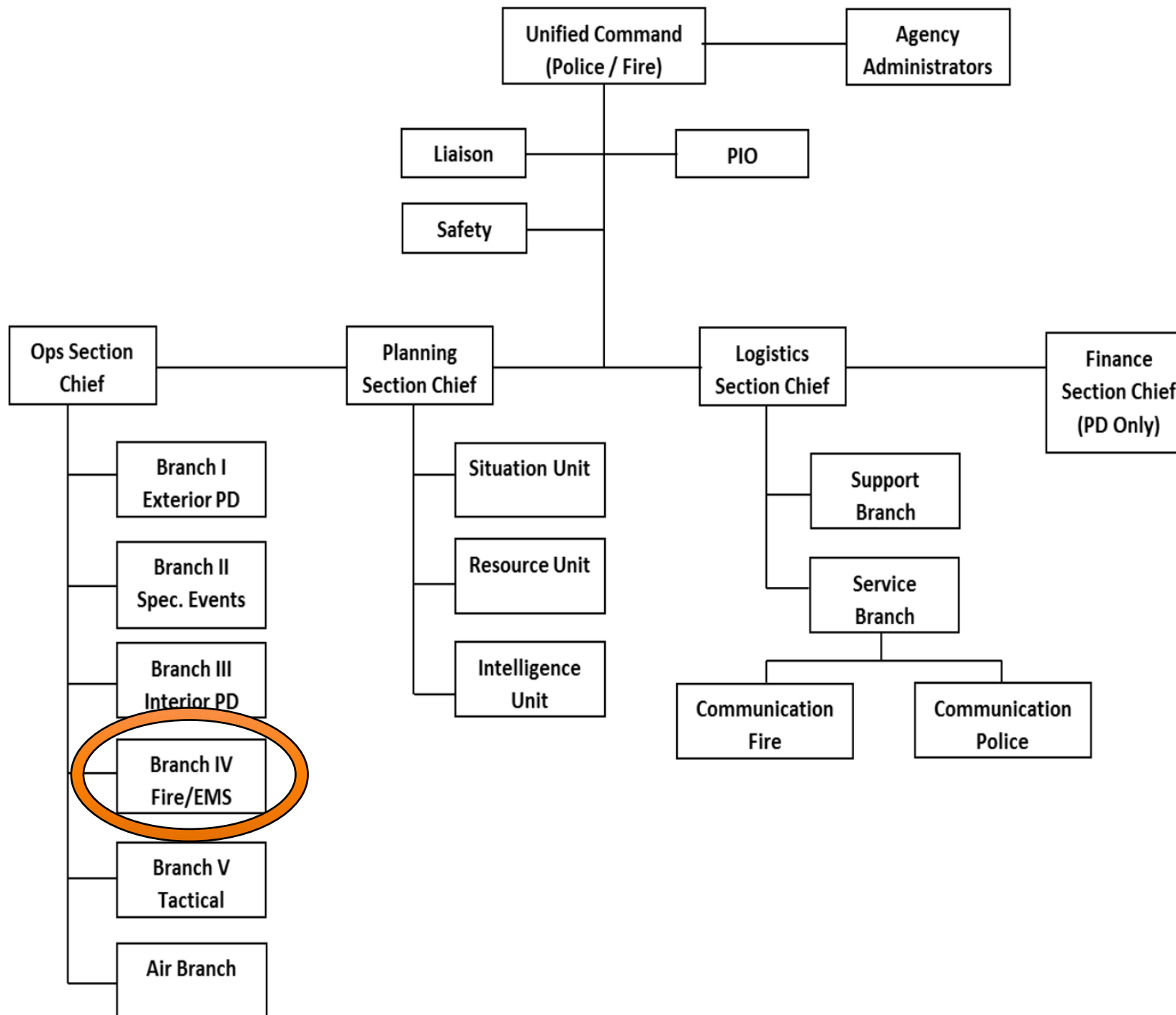
Learn more about the popular index tool



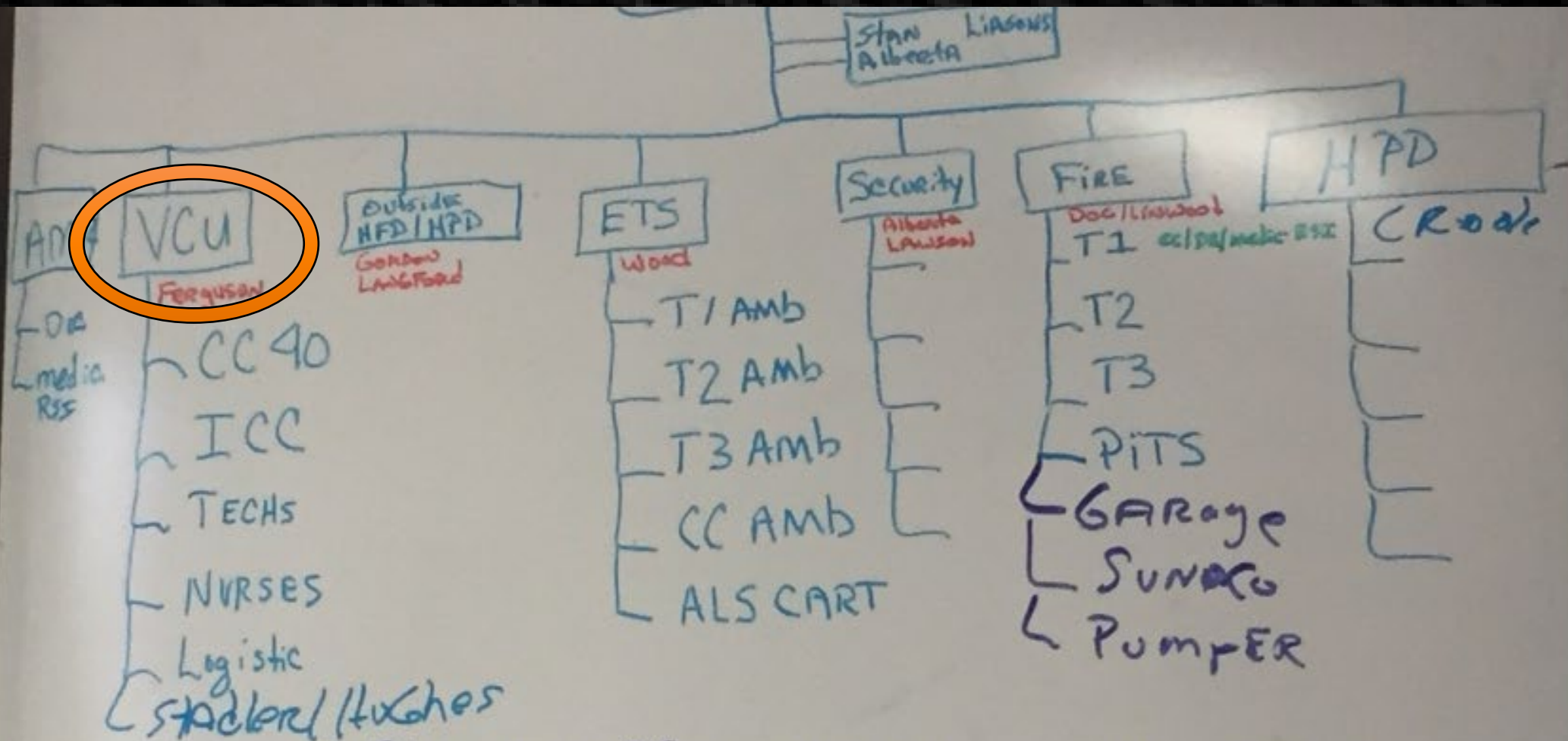












- ALL TRAFFIC as Always by TOWER
- Fire Truck MEDICS ANSWER to Crew Chief











+ III. CONTENTS OF MMU Kit		
1.	Acetaminophen 325 mg unit dose tab	#200
2.	Adenosine 3 mg / mL 2 mL vial	#10
3.	Albuterol 2.5 mg / 3 mL neb	#30
4.	Amiodarone 50 mg / mL 3 mL vial	#10
5.	Aspirin 81 mg chewable	#100
6.	Atropine 0.1 mg / <u>mL</u> 10 mL IV syringe	#10
7.	Bacitracin ointment packet	#144
8.	Calcium chloride 10% 10 mL syringe	#4
9.	Dermabond	#4
10.	Dextrose 50% 50 mL syringe	#6
11.	Dextrose 50% 50 mL vial	#2
12.	Diphenhydramine 50 mg vial	#6
13.	Dopamine 800 mg in 250 mL D5W premix	#2
14.	Epinephrine 0.1 mg / <u>mL</u> 10 mL IV syringe	#10
15.	Epinephrine 1 mg / mL <u>ampule</u> with filter needles	#10
16.	Epinephrine <u>1-1000</u> 30 mL vial	#4
17.	Etomidate 20 mg / 10 mL vial	#6
18.	Famotidine 10 mg / mL 2 mL vial	#6
19.	Fentanyl 50 mcg / mL 2 mL vial	#5
20.	Fluorescein strips	#40
21.	Glucagon 1 mg vial with diluent	#4
22.	Ibuprofen 200 mg unit dose tab	#200
23.	Ipratropium 0.5 mg / 2.5 mL neb	#30
24.	Ketamine 100 mg / mL 5 mL vial	#5
25.	Ketorolac 30 mg vial	#6
26.	Lidocaine 1% <u>10</u> mL	#15
27.	Magnesium sulfate 50% 2 mL vial	#6
28.	Methylprednisolone Sod Succ 1 gm vial	#4
29.	Metoprolol 1 mg / <u>mL</u> 5 mL vial	#4
30.	Midazolam 5 mg / 1 mL vial	#8
31.	Naloxone 2 mg syringe with nasal atomizer	#8
32.	Naproxen (Aleve)	#200
33.	NTG 0.4 mg sublingual tablets [25's]	#2
34.	NTG 2% ointment unit dose <u>packet</u> or #1 60g tube	#5
35.	Ondansetron 4 mg / 2 mL vial	#10
36.	Ondansetron 4 mg ODT Tablet	#20
37.	Oral glucose 15 gm single dose packet	#10
38.	Rocuronium bromide 50 mg / 5 mL vial	#6
39.	Sodium bicarbonate 8.4% 50 mL syringe	#4
40.	Sterile Water 10 mL	#6
41.	Tetracaine HCL 0.5% 4 mL	#12
42.	Vecuronium 10 mg vial	#6

**Also stock in kit:**

1 mL syringe** #10	10 mL syringe** #10	26G 5/8” needles #30	18G needles #20
3 mL Syringe ** #10	20 mL syringe #7	Filter Needles #20	
5 mL syringe #10	Alcohol swabs #100	<u>Tubex</u> holder #4	

I. CONTENTS OF RSI Kit		
1.	Etomidate 20 mg / 10 mL vial	#6
2.	Rocuronium 50 mg / 5 mL vials	#6
3.	Vecuronium 10 mg vial	#1
4.	Sodium Chloride 0.9% 10 mL vials	#1
5.	10 mL syringes with attached needle	#10
6.	“Medication Added” stickers	#10

Over the Counter Medication					
Medication	PAR	USED	RESTOCK	Expiration Date	RPH
TUMS (calcium carbonate) 500 mg chewable tablet	#150				
Pepto-Bismol (bismuth subsalicylate) 262 mg chewable table	#30				
Tylenol (acetaminophen) 325 mg tablet	#100				
Advil (ibuprofen) 200 mg tablet	#100				
Benadryl (diphenhydramine) 25 mg tablets	#20				
Claritin (loratadine) 10 mg tablet	#20				
Aspirin 81 mg chewable tablet	#20				
Naproxen (Aleve)	#100				



# Blindspots





