

DC EMS Task Force

Best Practices Research



Conducted by

A B A R I S G R O U P

May 24, 2007

Government of the District of Columbia

Adrian M. Fenty, Mayor



EMS Systems Surveyed

System	Comparable Call Volumes	Comparable Geographic Size	Comparable Resident Population	Comparable Daytime Population	Mentioned as Best Practice by Task Force/Presenters ¹
Austin (Travis County), TX	✓		✓	✓	✓
Boston, MA	✓	✓	✓		✓
Fairfax, VA					✓
Houston, TX					✓
Memphis, TN	✓			✓	✓
Montgomery County, MD				✓	
Phoenix, AZ					✓
Pinellas County, FL ¹ (St. Petersburg/Clearwater)				✓	
Richmond, VA		✓			
San Diego, CA	✓				✓
Seattle, WA		✓	✓		✓

Notes: ¹ Louisville, KY recommended but has not yet responded.



What is “High-Performance” EMS?

- Rapid Response Times for Life Threatening Calls (8 minutes or less 90% of the time)
- Advanced Life Support (ALS/Paramedic) Care
- Strong Medical Direction (Full-Time/Active Medical Director)
- Assessment of some of the most common Clinical Performance Measures:
 - Pain Management
 - Customer Satisfaction
 - Trauma Management
 - Advanced Airway Management
 - Cardiac Arrest Data

EMS System Designs

- Each of the systems surveyed by the Task Force have one or more of the above components
- Keep in mind, however, that there are not necessarily national models for EMS System Design

“When you have seen one EMS System, you have seen one EMS System”

EMS Systems Surveyed

System	Resident Population	Daytime Population ²	Service Area (Square Miles)	Density		
				Urban	Suburban	Rural
Houston, TX	1,900,000	3,000,000	622	50%	35%	15%
Phoenix, AZ	1,470,000	2,200,000	540	90%	10%	
San Diego, CA	1,250,000	1,250,000	320	60%	39%	1%
Fairfax, VA	1,050,000	1,400,000	407	80%	20%	
Pinellas County, FL ¹	1,000,000	1,000,000	280	95%	5%	
Montgomery County, MD	960,000	960,000	497	38%	24%	38%
Memphis, TN	850,000	1,000,000	350	75%	25%	
Austin (Travis County), TX	825,000	1,100,000	1,100	20%	20%	60%
Boston, MA	590,000	1,200,000	49	100%		
Seattle, WA	585,000	1,500,000	83	50%	50%	
Washington DC	582,000	992,000	61	100%		
Richmond, VA	200,000	200,000	63	100%		

Notes: ¹ Winter population reaches 1,400,000

² Daytime population is estimated



EMS System Configuration

- All Systems Surveyed send Fire Department (FD) First-Response Units for Life Threatening Calls
- All Systems Surveyed use a Combination of Basic Life Support (BLS) & Advanced Life Support (ALS) Response Units (i.e. Tiered System), except Pinellas County (all ALS)
- All Systems Surveyed send the Closest Unit (BLS or ALS) & an ALS Ambulance to Life Threatening Calls
- Six systems use Fire Department Ambulances only
- Two systems use Third Service Ambulances only
- Two systems use Private Ambulances only
- Two systems use a Combination of Fire Department & Private Ambulances

EMS System Configuration

System	Fire Dept First Responders		Ambulance	
	Life Threatening Calls	Non-Life Threatening calls	Life Threatening Calls	Non-Life Threatening calls
Austin (Travis County), TX	BLS	BLS	3rd Service ALS	3rd Service ALS
Boston, MA	First Responders	None	3rd Service ALS	3rd Service BLS
Fairfax, VA	ALS	BLS	Fire ALS	Fire BLS
Houston, TX	BLS or ALS	BLS	Fire ALS	Fire BLS
Memphis, TN	ALS	BLS	Fire ALS	Fire BLS
Montgomery County, MD	BLS or ALS	BLS or ALS sent only if BLS ambulance response is extended	Fire ALS	Fire BLS
Phoenix, AZ	Closest unit & closest ALS	Closest unit	Fire ALS	Fire BLS
Pinellas County, FL	ALS	None	Private ALS	Private ALS
Richmond, VA	BLS	None	Private ALS	Private ALS
San Diego, CA	ALS	None	Fire/Private ALS	Fire/Private ALS
Seattle, WA	BLS	BLS	Fire ALS, can downgrade to Private BLS	No Initial dispatch
Washington DC	ALS	BLS or ALS	Fire ALS	Fire BLS or ALS



Fire/EMS Hiring Practices

- All of the systems described varying levels of hiring standards and processes consisting of a combination of written exams, oral interviews, and physical agility testing, as well as background checks
- Private services and 3rd services require EMT or Paramedic certification to apply for positions
- Most fire agencies do not require EMT certification to be hired and provide this training as part of their initial training academies, however Phoenix and San Diego require Basic EMT certification of all hires
- DC FEMS requires certification when hiring single role EMS providers; firefighters are required to achieve basic EMT certification as part of basic training

Fire/EMS Hiring Practices

- Of the systems surveyed, each Fire or EMS Agency has the same hiring practices and standards for their employees
 - DC FEMS uses two separate sets of hiring practices and standards for their employees: one for single-role & one for multi-role personnel
- Of the systems surveyed, each Fire or EMS Agency employees work under the same work rules & labor contracts
 - DC FEMS has two sets of work rules and two different contracts: one for single-role and one for multi-role personnel
- Of the systems surveyed, each Fire or EMS Agency employs all uniformed or all civilian personnel for field work
 - DC FEMS has a mix of the two

Compensation

System	EMT	Paramedic	Cost of Living	Notes
Pinellas County, FL	\$25,444 - 27,989	\$35,746 - 39,321	69%	
Montgomery County, MD	\$37,000 starting	\$45,000 starting	100%	Cross-trained as firefighters
Austin, TX	\$40,000 - 58,000		92%	Cross-trained as firefighters
Boston, MA	\$42,325 - 51,495	\$55,696 - 67,763	112%	Add'l pay for shift differentials, hazardous duty, longevity, and special details
Memphis, TN	\$43,000 - 47,000	\$44,000 - 52,000	77%	
Fairfax, VA	\$47,000 starting	\$51,700 starting	100%	Cross-trained as firefighters, add'l pay for nights, liberal overtime, \$3/hour for ALS ambulance, and \$2/hour for ALS engine
Seattle, WA	\$57,288 - 71,017	\$65,881 - 81,670	115%	
Richmond, VA			76%	
San Diego, CA			90%	
Houston, TX	\$36,737 - 40,672	\$43,937 - 47,872	90%	Cross-trained as firefighters, add'l pay for a variety of other assignments
Phoenix, AZ	\$36,921 - 57,704	\$52,218 - 63,595	84%	
Washington DC	Civilian: \$38,386 - 48,124 Firefighter: \$44,301 - 78,682	Civilian: \$46,583 - 58,490 Firefighter: \$48,731 - 80,498	100%	These figures do not include overtime, night differential, and other payments that significantly affect the pay range of individual employees

Note: Cost of Living comes from www.cityrating.com, using the Washington Metro area as 100%.

EMS Training

- Initial EMT or Paramedic training includes a broad range of classroom & field internships
 - Boston gives 12 weeks of academy training and 15 weeks of field training to EMTs; newly promoted paramedics receive 80 hours of classroom training and then 14 weeks of field training
 - DC gives new hires 6 weeks of academy training and 4 to 10 weeks of preceptor evaluation in the field; reciprocity hires have 2 weeks of academy training on DC protocols and 4 to 12 weeks of preceptor evaluation and if certified have additional 10 to 16 assessment/evaluation period in the field
- Most of the EMS systems surveyed involve the Medical Director in reviewing or conducting training

- Many jurisdictions are transitioning to some form of online or web-based Continuing Education (CE) to supplement classroom training
- CE is provided by all Fire/EMS Agencies surveyed
- In-service training schedule varies from monthly to on-going
 - Monthly/6 weeks (Boston, Richmond, Seattle)
 - Quarterly (Austin, Fairfax, Houston, San Diego)
 - Semi-annual (Memphis)
 - On-going (Montgomery County, Phoenix, Pinellas County)
- Most jurisdictions provide training in-house, although Seattle paramedics are trained by the University of Washington

Performance Evaluations

- Evaluations consist of a standard annual performance review as well as a clinical performance appraisal (ranges from monthly to annually)
 - Austin, Houston & San Diego use Battalion or Field Medical Officers in the field to evaluate clinical performance; DC is moving toward similar system
 - Phoenix Medical Director evaluates clinical performance during monthly CE classes
- If clinical performance issues are identified, most best practice systems employ retraining and education before discipline to correct the issue(s)
- Retraining consists of a work plan being developed for the individual with a time frame for completing the assigned tasks or classes

Certification Review

- Approaches by regions studied:
 - Provide re-certification training as part of on-going annual education
 - Medical Director's office or staff oversee expiration dates
 - Scheduling software tracks certifications for personnel
- DC FEMS practice of daily card inspection vastly exceeds EMS systems studied and may be excessive in comparison

EMS Quality Improvement

- A full-time/active Medical Director's office was typical in best practice systems
- Electronic patient charting can simplify the QI process, although only a few systems are using it
 - Enhances data collection increasing the number of performance indicators that can be measures
 - Identifies trends in patient care
- Peer review -- using Paramedics to review their peers' treatment -- was also identified as an excellent tool
- **DC FEMS is implementing all three of these best practices**

Clinical Performance Indicators include:

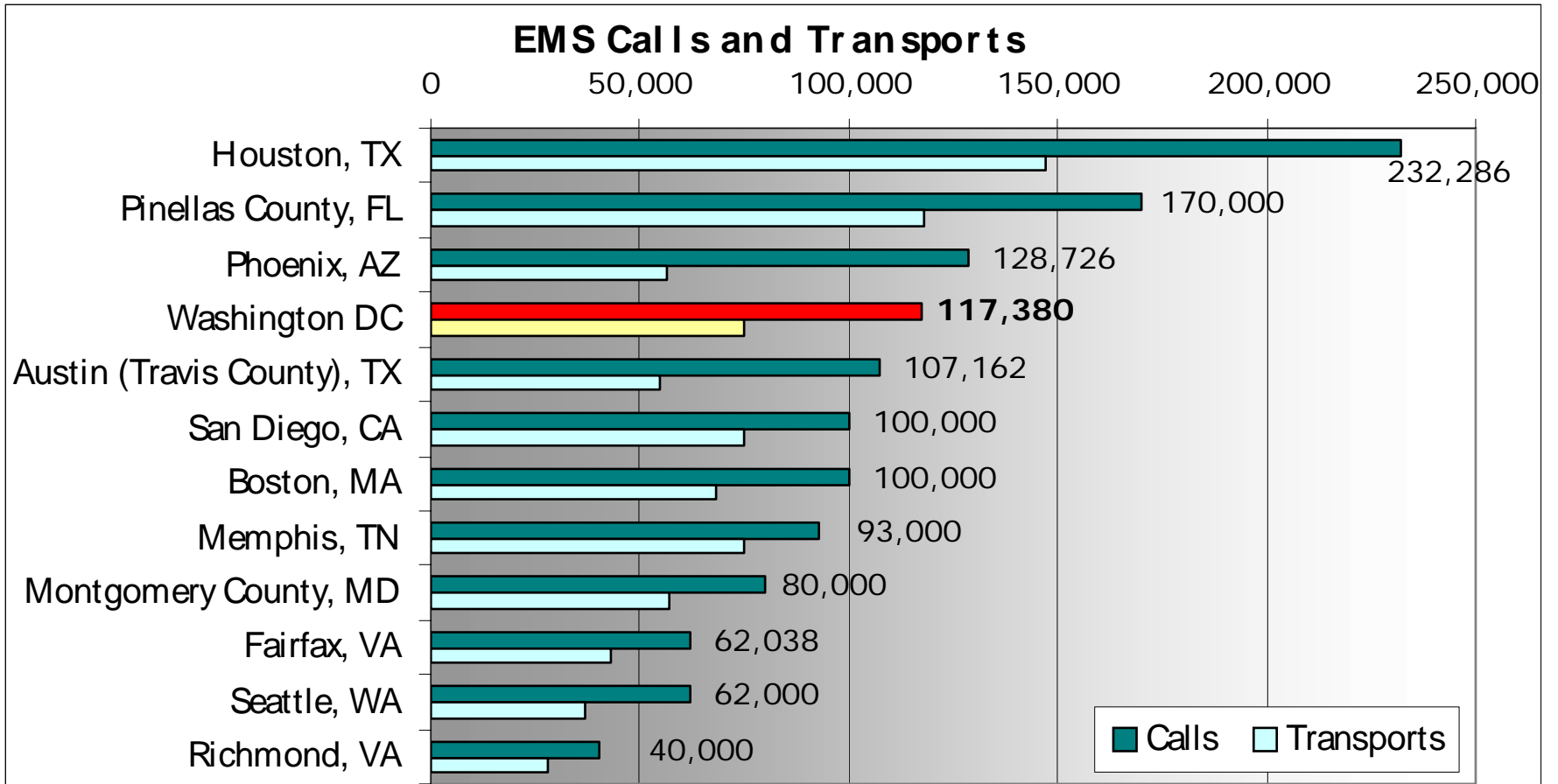
- Cardiac Arrest Survival Rates:
 - Pulse at Emergency Department
 - Discharged from Hospital
- Trauma management of 10 minutes or less on-scene & transport to appropriate level Trauma Center
- Customer Satisfaction Surveys

EMS Call Statistics

System	Calls	Transports	Dry Runs (non-transports)
Houston, TX	232,286	147,341	37%
Pinellas County, FL	170,000	118,000	31%
Phoenix, AZ	128,726	56,689	56%
Washington DC	117,380	75,186	36%
Austin (Travis County), TX	107,162	55,000	49%
San Diego, CA	100,000	75,000	25%
Boston, MA	100,000	68,000	32%
Memphis, TN	93,000	75,000	19%
Montgomery County, MD	80,000	56,800	29%
Fairfax, VA	62,038	43,333	30%
Seattle, WA	62,000	36,684	41%
Richmond, VA	40,000	28,000	30%



EMS Call Statistics



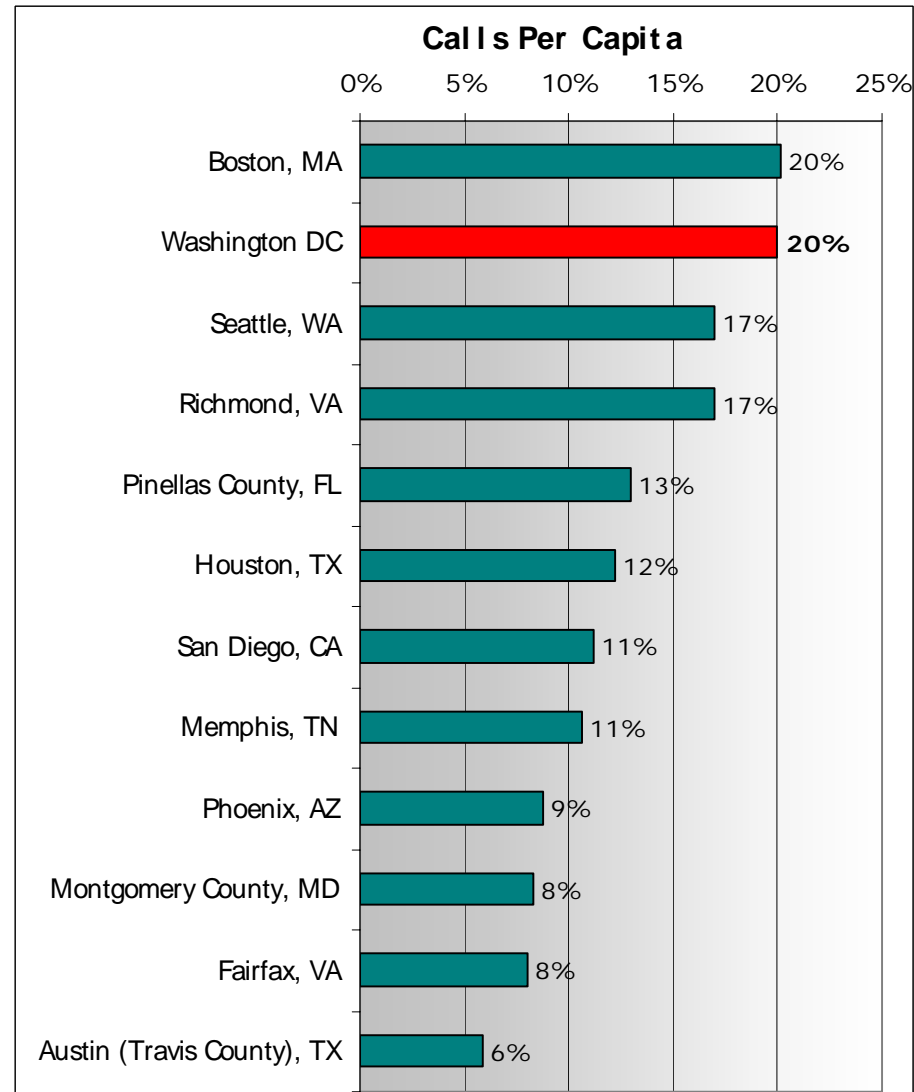
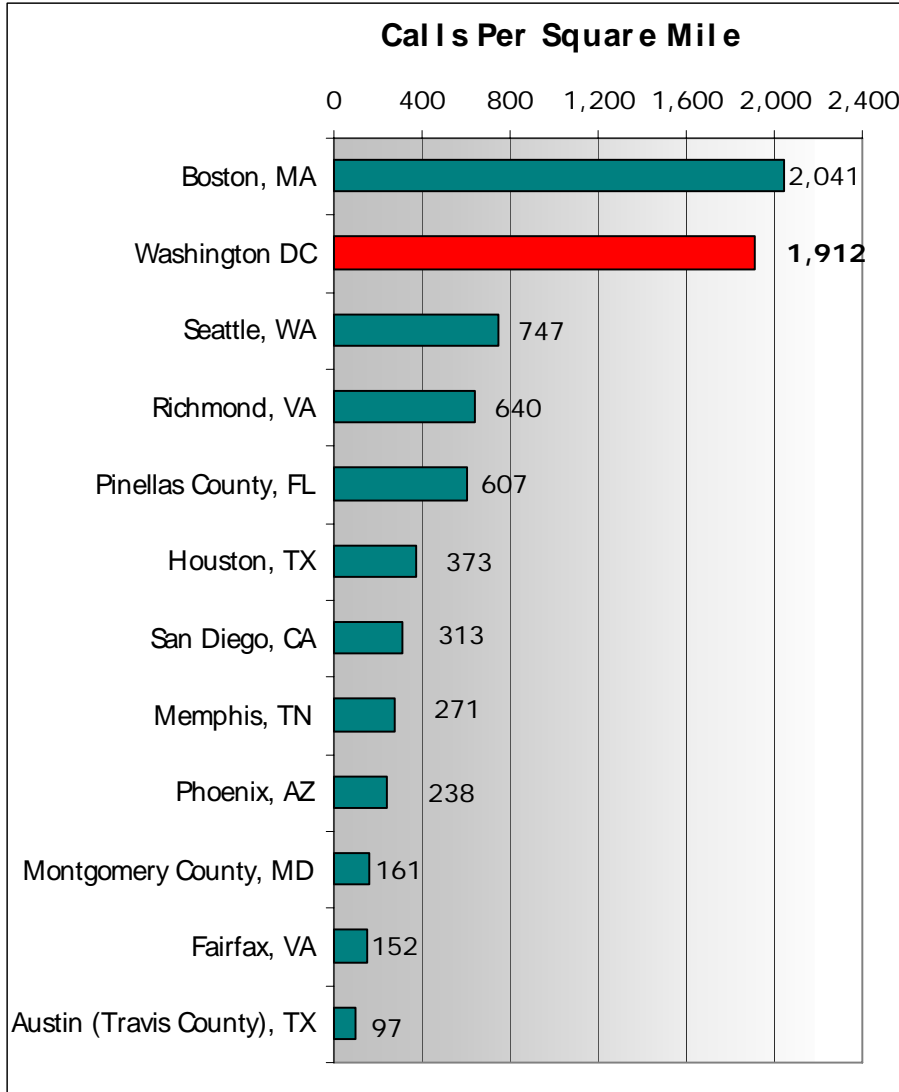
EMS Call Statistics: Per Mile & Per Capita

System	Per Square Mile		Per Capita ¹	
	Calls	Transports	Calls	Transports
Boston, MA	2,041	1,388	17%	12%
Washington DC	1,912	1,225	20%	13%
Seattle, WA	747	438	11%	6%
Richmond, VA	640	448	20%	14%
Pinellas County, FL	607	421	17%	12%
Houston, TX	373	237	12%	8%
San Diego, CA	313	234	8%	6%
Memphis, TN	271	157	11%	6%
Phoenix, AZ	238	105	9%	4%
Montgomery County, MD	161	114	8%	6%
Fairfax, VA	152	106	6%	4%
Austin (Travis County), TX	97	50	13%	7%

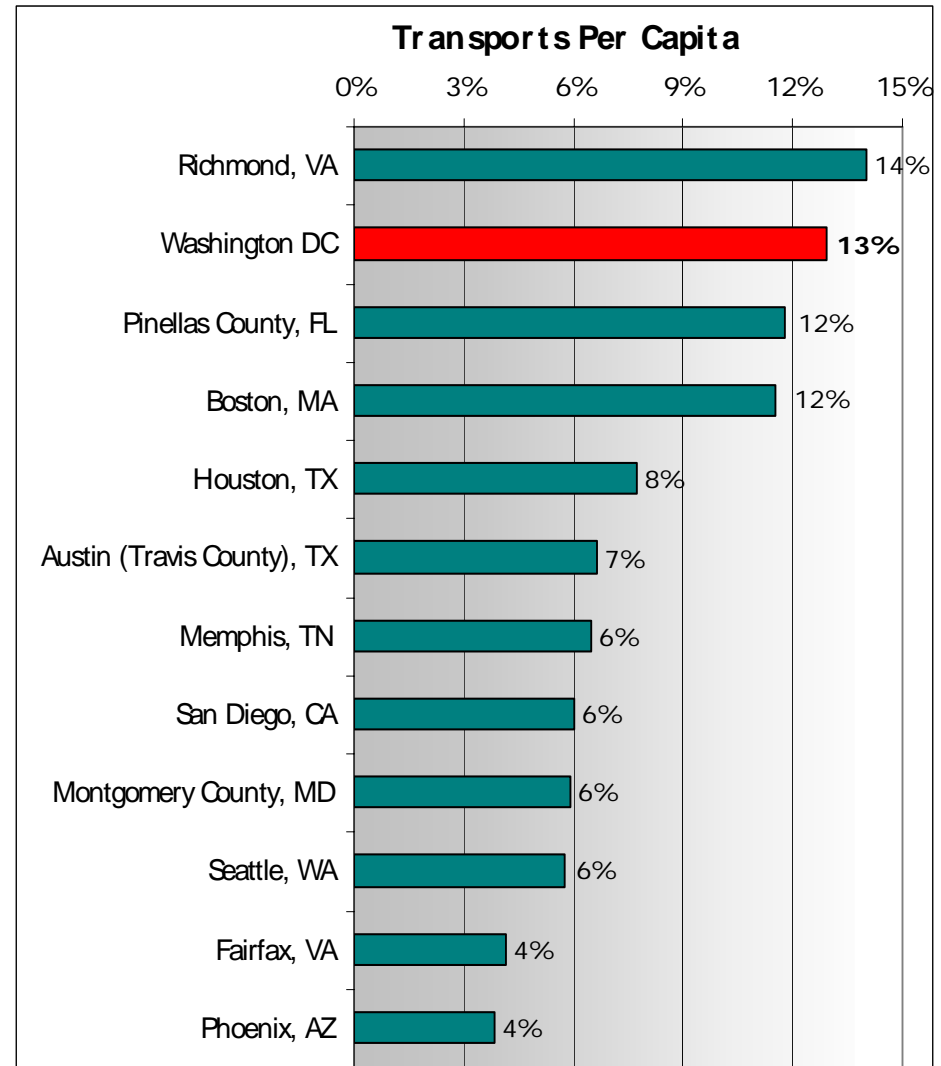
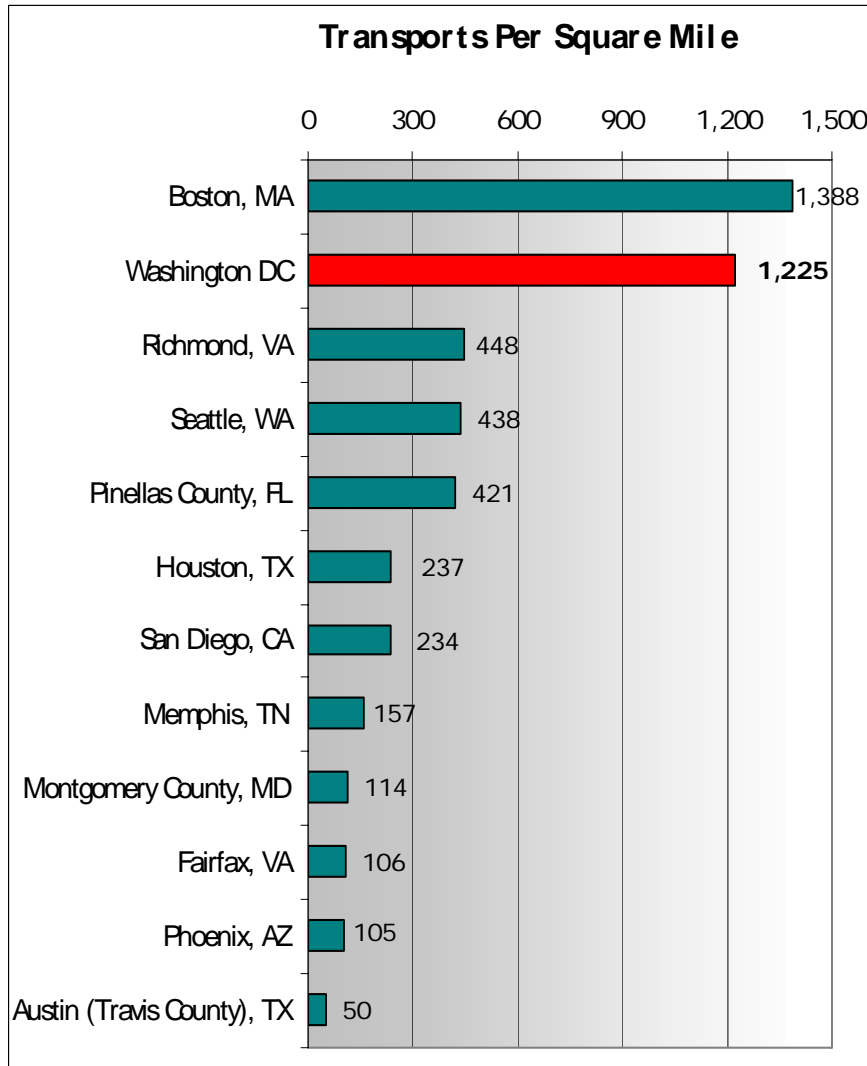
Notes: ¹ Per Capita based on resident population



Calls Per Square Mile & Per Capita



Transports Per Square Mile & Per Capita



Daily Deployment

System	Max Units	Min Units	Avg Daily Unit Hours	Calls/ Unit Hour	System Status Mgmt
Pinellas County, FL ¹	45-50 ALS	12 ALS	662	0.70	Yes
Boston, MA ²	20 BLS 6 ALS	11 BLS 3 ALS	480	0.57	Minimal, dispatcher discretion
Seattle, WA ²	7 ALS 8 BLS	7 ALS 4 BLS	312	0.54	ALS is static, BLS is dynamic
Phoenix, AZ ²	20 BLS 13 ALS	16 BLS 5 ALS	648	0.54	Some static, some dynamic
San Diego, CA ²	29 ALS	21 ALS	600	0.46	Yes
Richmond, VA ¹	19 ALS	8 ALS	262	0.42	Yes
Austin (Travis County), TX ²	33 ALS	30 ALS	756	0.39	No
Washington DC	37.5 ALS & BLS	37.5 ALS & BLS	900	0.36	No
Houston, TX ²	54 BLS 22 ALS	54 BLS 22 ALS	1,824	0.35	No
Memphis, TN ²	33 ALS	33 ALS	792	0.32	No
Montgomery County, MD	24 BLS 18 ALS	22 BLS 18 ALS	984	0.22	No
Fairfax, VA ²	43 ALS	42 ALS	1,020	0.17	No

Notes: ¹ 9-1-1 and inter-facility units are combined

² estimated average daily unit hours based on minimum and maximum units



Daily Deployment

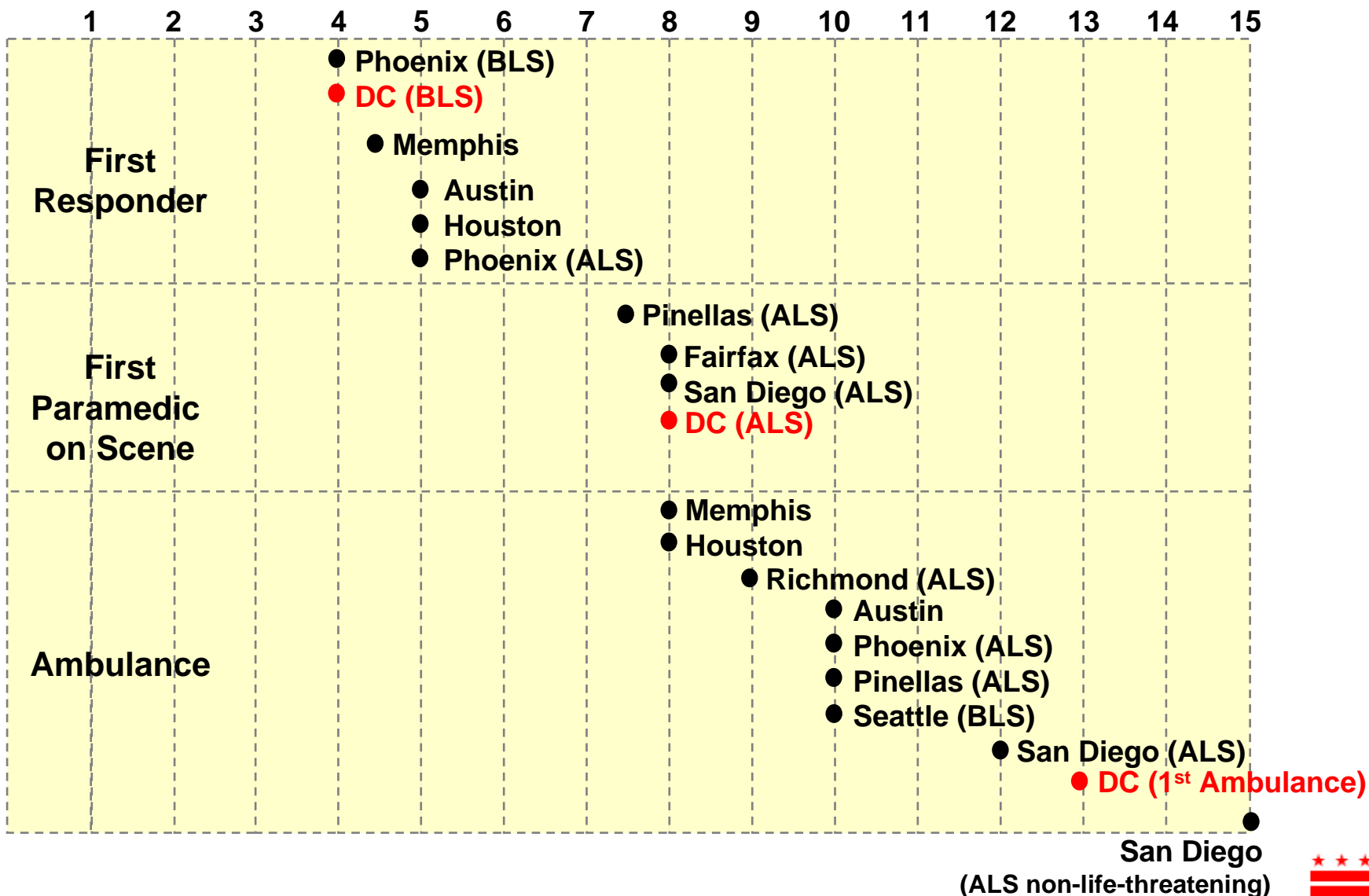
- Minimum Number of Ambulances: 8 – 76 (DC: 37.5)
- Maximum Number of Ambulances: 15 – 76 (DC: 37.5)
- Average Daily Unit Hours: 232 – 1,824 (DC: 900)
- Calls/Unit Hour: 0.17 – 0.70 (DC: 0.36)
- Static vs. Dynamic Deployment
 - Three systems use a combination (considered a best practice)
 - Six systems use static deployment
- Peak Staffing (considered a best practice)
 - Typically easier for 3rd service and private providers
 - Phoenix and San Diego Fire Departments, however, do have peak staffing units

Response Time Goals

- Response time goals are established from National Fire Protection Association (NFPA) 1710 Standard & Commission on Ambulance Accreditation Services (CAAS) Standards
 - NFPA – 4 minutes for BLS & 5 minutes for ALS personnel on-scene 90% of the time (measured from time the unit is notified)
 - CAAS – 8:59 minutes or less 90% of the time for the ambulance to be on-scene (measured from time address is received by dispatch)

Response Time Goals

Minutes at 90th percentile



Response Time Goals

- **DC FEMS Goals:**
- 1st Paramedic on-scene in 8 minutes or less (NFPA 1710 standard) & 13 minutes 90% of the time for ambulance on-scene. Currently *exceeding goal* with 91% for 1st Paramedic & 96% for 1st Ambulance on-scene
- DC plans to move to NFPA 1710 Standard of 4 minutes or less for BLS 90% of the time, which will put it in the most ambitious range of response time goals

Hospital Diversion

System	Level of Diversion	Receiving Hospitals	2006 Divert Hours	Notes
Austin (Travis County), TX	Minimal	10	Not Tracked	Austin/Travis County does not recognize divert, will close hospital to ambulances when long drop-off times occur
Richmond, VA	Minimal	7	Not Tracked	Drop times tracked, staying constant. Regional task force looking at issue
Seattle, WA	Minimal	8	Not Tracked	
Memphis, TN	Moderate	14	Not Tracked	No current diversion policy
Montgomery County, MD	Moderate	5	Not Tracked	EMS supervisors respond to hospitals with delays, hospitals placed on divert if keep ambulance longer than 30 minutes
San Diego, CA	Moderate	18	21,771	
Boston, MA	Major	11	2,588	Lowest since 2000, suspended diversion for Oct-06 and this summer
Fairfax, VA	Major	12	Not Tracked	20 minute drop time goal, can be up to 60
Houston, TX	Major	21	Not Tracked	Longer drop-off times
Phoenix, AZ	Major	28	Not Tracked	EMS & hospital task force created to address issue
Pinellas County, FL	Major	14	4,667	EMS supervisors respond to hospitals with delays, hospitals placed on divert if keep ambulance longer than 60 minutes or 2 for 30 minutes
Washington DC	Major	10		Average drop time 41.3 minutes, supervisor redirecting units at dispatch

Hospital Diversion

- Hospital Diversion is a major issue for 50% of the EMS systems surveyed, including DC FEMS
- Hospital Diversion results in longer drop-off times for ambulances
- Most have established a drop-off time goal of between 20 – 30 minutes (DC averages 41 minutes – 3/28/07 Report)
- Some of the EMS systems are using EMS supervisory staff to respond to the hospitals in an effort to get ambulances back in service
- Some of the EMS systems will “close” hospital EDs to ambulances
- Some EMS Systems are moving to not recognizing hospital diversion (Austin, Boston, Contra Costa, Detroit, Fresno, Las Vegas, Tucson)
- Some EMS systems have enacted legislation to limit diversion & hospital drop times (Las Vegas)

Demand Management

- Frequent EMS-users are often identified by Quality Improvement process, data analysis & field crews
- All of the systems surveyed do not routinely respond & transport nursing home patients unless an emergency exists
 - DC FEMS identified 10% of their transports as originating from 20 nursing homes/health care facilities; this is atypical
- Critical Care Transports are rarely done by the EMS systems surveyed, DC FEMS has a higher number of these requests

Demand Management

- The EMS systems surveyed are using a variety of programs to reduce responses to high frequency users
 - **Medical Director calls primary physician, county agencies, clinics, etc. to encourage intervention with patients before they call 9-1-1**
 - **San Diego Serial Inebriant Program**
 - **Richmond dispatch nurse triage (40 hours/week) cancels one call per day on average**
 - **Phoenix has four crisis response units using paid staff & volunteers**
 - **Houston has “Care Houston” program where team conducts public education on 911 in high use neighborhoods, i.e. Apartment complexes**
 - **San Francisco “Home Team” program**
 - **DC FEMS currently researching**

Budget & Billing Data

System	EMS/ Fire Budget	Per Resident Capita	Per Daytime Capita	EMS Budget	Per Resident Capita	Per Daytime Capita	Ambulance Fees	Notes	Resident Population	Daytime Population
Boston, MA	\$185M	\$ 314	\$ 154	\$38M	\$ 64	\$ 12	Bill for services		590,000	1,200,000
Washington DC	\$170M	\$ 292	\$ 168	Combined budget			Bill for services	Charges are lower than most other systems reviewed	582,000	1,012,540
Richmond, VA	\$51M	\$ 255	\$ 255	\$14M	\$ 70	\$ 70	71% from user fees, rest subsidy	AMR contractor gets \$9M	200,000	200,000
Seattle, WA	\$136M	\$ 232	\$ 91	\$11M	\$ 19	\$ 9	ALS- none, BLS- AMR bills for transports	Fire receives funds from EMS levy through general fund, ALS portion \$10.5M, Budget does not include AMR	585,000	1,500,000
Houston, TX	\$373M	\$ 196	\$ 124	Combined budget			Bill for services		1,900,000	3,000,000
Montgomery County, MD	\$178M	\$ 185	\$ 185	Combined budget			None	Funded through property taxes, 400 active volunteers offset personnel expenses (estimated savings \$8M)	960,000	960,000
San Diego, CA	\$220M	\$ 176	\$ 176	\$40M	\$ 32	\$ 11	Covers > 100% of \$40M	EMS Budget includes cost of FRALS equipment, any surplus funds split equally by Fire-Rural/Metro partnership	1,250,000	1,250,000
Phoenix, AZ	\$247M	\$ 168	\$ 112	\$14M	\$ 10	\$ 6	Bill for services, full service recovery model		1,470,000	2,200,000
Fairfax, VA	\$170M	\$ 162	\$ 121	Combined budget			Bill for services		1,050,000	1,400,000
Memphis, TN	\$129M	\$ 152	\$ 129	\$23M	\$ 27	\$ 14	Bill for services		850,000	1,000,000
Austin (Travis County), TX	\$96M	\$ 116	\$ 87	\$41M	\$ 50	\$ 13	Bill for services	Fire budget is City of Austin only	825,000	1,100,000
Pinellas County, FL ¹	not applicable			\$63M	\$ 63	\$ 10	Bill for services, covers 100% of EMS budget	\$26M for private amb.provider, \$29.4M for ALS first responder, \$5M Admin, \$1.3M Med Dir, \$0.5M Training, no fire budget available as served by 17 fire agencies	1,000,000	1,400,000

Notes: ¹Pinellas County winter population is 1,400,000

- Four of the systems surveyed use electronic Patient Care Reports (e-PCR), including DC FEMS, three are planning to use e-PCR and five use paper PCR
- Some of the systems surveyed are using Tele-staff software to manage scheduling and to track certifications and expirations

DC Fire & EMS Strengths

- Excellent locations of fire & EMS stations
- Rapid response times
 - 91% for 1st Paramedic on-scene
 - 96% for 1st Ambulance
- Active/full-time Medical Director
- Pending e-PCR implementation
- AED deployment program

DC Fire & EMS Challenges

- Two separate hiring practices
- Two separate sets of work rules – single- role & multi-role providers
- Two separate bargaining agreements – single-role & multi-role personnel
- Hospital drop-off times – averages 41 minutes
- Static deployment does not match dynamic population
- High number of inter-facility transports/critical care transfers
- Frequency of clinical evaluations
- Lack of field clinical supervision/support