



Charlottesville-UVA-Albemarle County Emergency Communications Center



To: Regional ECC Calls For Service and Funding Model Review Committee

From: Josh Powell, ECC Management Analyst II

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Subject: Staff Report for January 15, 2021 Committee Meeting

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I. Introduction

This document presents preliminary findings in response to this Committee’s request on October 15, 2020 for (a) funding formula benchmarking and (b) analysis of ECC-processed calls for service as they relate to the funding formula.

A preliminary staff exploration of potential funding models is provided in Section III.



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II. Benchmarking

Overview

Benchmarking other regional Emergency Communications Centers/PSAPs, in Virginia and nationwide, has revealed that there is **no established industry standard funding model** for a regional center. Instead, we observed a wide range of cost allocation models. Simpler formulas included a fixed split (e.g. 50-50 between two participants), while more complex ones included three or more variables (e.g. calls for service, assessed valuations, population, and landline counts).

Example Findings

<p>Harrisonburg-Rockingham ECC Cost allocation: Fifty-fifty split between Harrisonburg City and Rockingham County.</p>	<p>Eastern Shore of Virginia 911 Cost allocation: Two-thirds & one-third split between Accomack & Northampton counties.</p>
<p>Martinsville & Henry County 911 Cost allocation: Based on formula set in original 1989 agreement, consisting of three factors: calls for service (CFS), population, and number of phone lines. Notes: Evaluating formula revision. Will likely remove phone line counts. Some CFS types excluded, including foot patrols.</p>	<p>New River Valley Emergency Communications Regional Authority Cost allocation: Even four-way split between Christiansburg, Blacksburg, Virginia Tech, and Montgomery County.</p>
<p>Galax/Twin County E-911 Cost allocation: Proportional to population of Carrol and Grayson Counties, and City of Galax.</p>	<p>South Sound 911 (Washington State) Cost allocation: Differs for law enforcement and fire, - <i>Law enforcement</i> (15 agencies): Total Calls for Service (CFS) for a two year period, less calls for traffic stops and calls for fire/medical aid where law enforcement was not dispatched - <i>Fire</i> (18 agencies): Ratio of total CFS for a two year period and assessed valuation (AV) of each fire protection district, at 70% CFS and 30% AV</p>

Beyond Benchmarking

Other potential inputs to a true cost allocation model, which we have considered but not found in use during our preliminary benchmarking, include:

- time on task (workflow analysis)
- radio talk time and/or subscriber units
- telephone talk time
- special event coverage
- number of system logins
- incident dispositions
- calls for service per capita
- public safety operational readiness

Staff have **not** evaluated such a model at this time, as creating and implementing such a formula would require at minimum a full workload assessment and the completion of ongoing technical/system upgrades, and likely also require outside consulting assistance.



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III. Discussion

1. Regardless of the funding mechanism chosen, staff recommend the Committee consider adding future cost allocation decisions to the ECC Management Board's responsibilities. With future changes not requiring addenda to the joint agreement, this would allow for more nimble response to demographic/service shifts in the communities served and/or operational changes from our partner agencies.
2. Some potential options for the funding formula are:
 - a. **No action.**
 - i. Benefits: The current formula represents, to some degree, the proportional usage of ECC services by our partner agencies. Additionally, unlike any of the potential revisions listed below, this would not require approval from the governing bodies of the three Participants (Charlottesville City Council, Albemarle Board of Supervisors, and UVA Board of Visitors).
 - ii. Limitations: Departmental operational differences and procedural changes would remain unaccounted for. This is illustrated, for instance, by UPD beginning to track Building Checks in CAD. While this has created some additional demand on ECC staff and systems, it is not equal to a hypothetical increase of Priority 1 police CFS, or a hypothetical increase in fire/rescue CFS; currently, all CFS are given the same weight for the purpose of cost allocation. Additionally, due to technological and reporting limitations of our current software system, a small subset of CFS for which units from multiple agencies are dispatched may be counted for either agency or both.
 - b. **Adopt a fixed allocation**, similar to the benchmarked centers of *Eastern Shore 911* and *Harrisonburg-Rockingham ECC*.
 - i. Benefits: A fixed allocation would be simple and predictable, therefore eliminating some of the budget variability currently seen year over year.
 - ii. Limitations: A basis for identifying the fixed allocation would still need to be determined. Additionally, this allocation may need to be updated over time as populations and services grow or change. (See discussion point one.)
 - c. **Exclude certain call types**, similar to the benchmarked centers of *Martinsville & Henry County 911* and *South Sound 911*.
 - i. Benefits: Easily implemented with our current system's reporting capabilities.
 - ii. Limitations: Unless also combined with a multi-year average, this would not eliminate variability in the Participant shares year over year. Additionally, as excluded call types would still require some ECC staff effort and systems usage, and baseline staffing requirements vary between partner agencies, the resulting allocation may not be proportionally representative unless also combined with some other variable.
 - d. **Implement a weighted formula**, similar to this Committee's previous discussion.
 - i. Benefits: Allows for a rough accounting of the aforementioned variation between CFS types.
 - ii. Limitations: Like the above option, this alone would not eliminate year-over-year variability in Participant shares. Additionally, no joint communications centers with such an implementation have been hereto identified for benchmarking purposes.
 - iii. Example: See section IV.



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IV. Hypothetical Weighted Call for Service Formula

Methodology

A list of all CFS types for which one or more unit was dispatched on behalf of any partner agency during calendar year 2020 was provided to both operational and technical staff at the ECC, who then scored each call type on a three point scale:

- Level 1** Typically, limited demand on ECC staff and/or system resources.
- Level 2** Typically, moderate/intermittent demand on ECC staff and/or system resources.
- Level 3** Typically, high/sustained demand on ECC staff and/or system resources.

Leveling Notes:

Baselines:

- All calls utilize varying degrees of incident management (PS Comms Officers) and operational oversight (PS Supervisors, Operations Managers)
- All calls utilize a subset of IT systems and resources (e.g. CAD, Mobile, NICE recording)
- Operational readiness (e.g. minimum staffing for seven separate phone/radio/dispatch positions with ability to scale)
- Radio utilization is *excluded*, with its budget being separate from the main ECC operational budget

Key Level Differences in Demand:

- Level of inter-agency coordination (internal and external)
- Full-time radio assignment (e.g. TAC channels)
- Phone system usage (911 vs. admin phones vs. no phone)
- Interface usage: Internal & External interfaces (each requiring support, maintenance, configuration)**
- CAD response configuration (e.g. multi-unit fire vs. single EMS)

** Fire/EMS call types trend toward Level 3 due to multiple toning, paging, station interfaces; cloud/external data (extra servers, SSH, etc.) - more support; more bandwidth, more VMs/resources.

Example

The rounded average of the two scores (operations and systems) provides a basis for weighting each CFS type. A detailed list of all call types and scores, along with representational call counts, are provided in *Appendix A*. A summary for calendar year 2020 is presented below.

Hypothetical Weighted Formula and Allocation*

	Weighted CFS	%
Charlottesville	43,945	31.64%
Albemarle	70,684	50.90%
UVA	24,250	17.46%
	138,879	100.00%

*Level 1 calls are weighted at **0.5**; level 2 calls are weighted at **1.0**; level 3 calls are weighted at **1.5**.

Current Unweighted Formula and Allocation**

	Unweighted CFS Count	
Charlottesville	46,062	27.39%
Albemarle	78,981	46.97%
UVA	43,120	25.64%
	168,163	100.00%

**For comparison purposes only. CFS numbers are preliminary and subject to further review.



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Summary Information

Overall Proportion of CFS by Level

Staff/System Demand	Percent of 2020 Total CFS
Level 1	51.30%
Level 2	32.23%
Level 3	16.47%
	100.00%

CFS Count by Level by Agency

	ACFR	CFD	ACPD	CPD	UPD
Level 1	29	15	32,953	15,025	38,242
Level 2	4,073	3,367	25,538	16,849	4,376
Level 3	10,106	6,936	6,282	3,870	502
	14,208	10,318	64,773	35,744	43,120



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Appendix A: CFS Level Scores by Type & Representative Call Counts (CY2020)

<i>Call Type</i>	ACPD	UPD	CPD	ACFR	CFD	Total CFS	Level Score
<i>911 Hang Up</i>	367	168	281	7	4	827	2
<i>Abandoned Vehicle</i>	125	10	134			269	1
<i>Abdominal Pain</i>	3	2	6	276	245	532	3
<i>Abduction</i>	4		3			7	2
<i>Alarm PD</i>	2,004	158	1,031	14	4	3,211	3
<i>Alert 2 Class A</i>	1			1	1	3	2
<i>Alert 3</i>				1	1	2	2
<i>Allergic Reaction Amb</i>	2	1		22	15	40	3
<i>Allergic Reaction Tr</i>	2		1	78	52	133	3
<i>Animal Bite Amb</i>	9		4	9	10	32	3
<i>Animal Bite Tr</i>	7		4	6	6	23	3
<i>Animal Complaint/Investigation</i>	1,747	52	678	4		2,481	2
<i>Appliance Fire Contained Comm</i>				13	24	37	3
<i>Appliance Fire Contained Res</i>	1			16	8	25	3
<i>Assault PD</i>	178	75	159	6	11	429	1
<i>Assault w/ Weapon</i>	3	1	7		1	12	3
<i>Assist Agency</i>	1,219	1,075	751	637	1,046	4,728	2
<i>Assist Citizen</i>	1,533	451	1,480	8	2	3,474	1
<i>Back Pain</i>	1		4	118	121	244	2
<i>BE</i>	266	11	204			481	3
<i>Breathing Problems</i>	26	3	17	1,189	852	2,087	3
<i>Brush Fire</i>	14		3	240	48	305	3
<i>Building Check</i>	27	21,736	11	1		21,775	1
<i>Burns Amb</i>				2	1	3	3
<i>Burns Med</i>	1		1	2	2	6	3
<i>Cardiac Arrest</i>	153	2	82	179	124	540	3
<i>Chest Pain</i>	17	4	17	997	702	1,737	3
<i>Chimney Fire - Commercial</i>		2	1	1	4	8	3
<i>Chimney Fire - Residential</i>				20	5	25	3
<i>Choking Amb</i>				12	9	21	3
<i>Choking Med</i>				24	11	35	3
<i>Civil Problem</i>	175	3	125			303	1
<i>CO Alarm w/out Patient</i>			1	67	34	102	2
<i>CO Alarm w/Patient Amb</i>				1	4	5	3
<i>Cold Exposure Amb</i>	1		1		3	5	3
<i>Cold Exposure Med</i>				2		2	3
<i>Community Initiative</i>	96		20			116	1
<i>Diabetic Amb</i>	5		2	63	55	125	3
<i>Diabetic Tr</i>	3		2	133	94	232	3



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<i>DIP</i>	128	36	306	3	10	483	2
<i>Direct Traffic</i>	7		4			11	1
<i>Disabled Vehicle</i>	1,341	75	392	19	13	1,840	2
<i>Disorder</i>	1,873	125	2,062	9	13	4,082	2
<i>Disorder w/Weapon</i>	98	7	170	2	1	278	3
<i>DOA</i>	2		2	3	2	9	2
<i>Domestic</i>	496	7	313	4	1	821	2
<i>Domestic w/ Weapon</i>	13		7		1	21	3
<i>Drowning In Swimming Pool</i>	1			1		2	3
<i>Drowning Out of Water Med</i>				1		1	3
<i>Drowning Swift Water/Lake/Pond</i>	15		2	15	15	47	3
<i>Drug Investigation</i>	276	48	211	5	2	542	2
<i>Dumpster Fire</i>	1			7	4	12	2
<i>Electrical Injury Amb</i>					1	1	3
<i>Electrical Injury Med</i>		1			1	2	3
<i>Elevator Emerg w/out Patient</i>		1	1	23	42	67	2
<i>Elevator Emerg w/Patient</i>					2	2	3
<i>Escort/Transport</i>	14	48	17			79	2
<i>Extra Patrol</i>	24,981	7,382	7,352	4		39,719	1
<i>Eye Chemical Burn</i>	1	1	1	2	2	7	2
<i>Eye Injury</i>			1	6	3	10	2
<i>Fall Amb</i>	14	3	24	1,082	618	1,741	3
<i>Fall Tr</i>	8	1	2	333	159	503	3
<i>Fire Alarm</i>	14	20	5	1,010	430	1,479	3
<i>Fire Assist PD</i>	37	1	23	49	33	143	2
<i>Fire Service Call</i>	8		3	79	60	150	2
<i>Fire Threatening Comm Building</i>	1			10	12	23	3
<i>Fire Threatening Res</i>	4			13	10	27	3
<i>Follow Up Investigation</i>	1,644	128	1,137	4	2	2,915	1
<i>Foot Patrol</i>	384	7,675	430			8,489	1
<i>Forgery/Fraud</i>	741	18	337			1,096	2
<i>Gas Leak - Propane/LP/Etc.</i>	17	4	32	72	90	215	3
<i>Gunshot Wound 1 Patient</i>	15	4	15	9	12	55	3
<i>Gunshot Wound 2 Patients</i>	1		1	1	2	5	3
<i>Harassment</i>	352	24	274	1		651	1
<i>Hazmat 0</i>	7		6	19	17	49	2
<i>Hazmat 1</i>	4		1	10	9	24	3
<i>Hazmat 3</i>	5	3	6	19	19	52	3
<i>Hazmat Alarm</i>		1		2	2	5	3
<i>Heat Exposure Amb</i>	2		4	13	11	30	3
<i>Heat Exposure Med</i>				5	5	10	3
<i>Hemorrhage</i>			1	208	142	351	3



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<i>Hit and Run MVC</i>	468	84	481	6	5	1,044	2
<i>House Check/Business Check</i>	94					94	1
<i>Illegal Hunting</i>	20					20	2
<i>Industrial Acc Amb</i>	4		2	6	2	14	3
<i>Industrial Acc Entrap Lvl1</i>	1		2	1	3	7	3
<i>Industrial Acc Entrap Lvl2</i>	1			1		2	3
<i>Industrial Acc Entrap Lvl3</i>	1		1	1	2	5	3
<i>Industrial Acc Tr</i>	6			7		13	2
<i>Inhalation/CO Amb</i>				2	1	3	3
<i>Inhalation/CO Med</i>	1			1		2	3
<i>Injured Animal</i>	389	7	86			482	1
<i>Injured Person Amb</i>	129	8	140	258	311	846	3
<i>Injured Person Med</i>	3	1	3	9	11	27	3
<i>Injured Person Tr</i>	7	4	21	66	53	151	3
<i>Larceny</i>	1,161	132	942		1	2,236	2
<i>Lines Down</i>	4		3	10	8	25	2
<i>Lockout</i>	3	4	3	87	38	135	2
<i>Lost/Found Property</i>	268	190	399			857	1
<i>Loud Music/Noise Complaint</i>	749	19	835			1,603	1
<i>LZ</i>				3	1	4	3
<i>Medical Alarm</i>	4			132	82	218	2
<i>Medical Alarm Forced Entry</i>	59		18	114	85	276	3
<i>Meet</i>	24	6	43			73	1
<i>Mental Person</i>	533	50	454	14	18	1,069	2
<i>Mental Person w/Weapon</i>	21	1	7	1		30	3
<i>Miscellaneous Criminal</i>	907	63	557	5	1	1,533	2
<i>Miscellaneous Non Criminal</i>	328	78	276			682	1
<i>Missing/Runaway</i>	248	20	185	3		456	3
<i>Mutual Aid Request Fire</i>				53	1	54	3
<i>Mutual Aid Request Police</i>	8					8	3
<i>Mutual Aid Request Rescue</i>	1			113	2	116	2
<i>MVC Minor/Unknown Injuries F/R</i>	460	14	178	550	285	1,487	3
<i>MVC Minor/Unknown Injuries PD</i>	76	5	29	74	43	227	3
<i>MVC Motorcycle/ATV F/R</i>	19		9	20	13	61	3
<i>MVC Motorcycle/ATV PD</i>	2	2	2	3	2	11	2
<i>MVC No Injuries Fluids Down Fire</i>	179	7	71	203	75	535	3
<i>MVC No Injuries Fluids Down PD</i>	46	1	12	48	12	119	3
<i>MVC No Injuries No Hazard</i>	1,380	149	818	35	12	2,394	3
<i>MVC Past w/Injury</i>	5		2	17	9	33	2
<i>MVC Pedestrian Struck F/R</i>	27	6	26	26	36	121	3
<i>MVC Pedestrian Struck PD</i>	6	1	7	2	3	19	3
<i>MVC Sig Impact No Entrap F/R</i>	92	1	20	107	44	264	3



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MVC Sig Impact No Entrap PD	27	1	5	27	13	73	3
MVC w/Entrap F/R	120	1	16	135	56	328	3
MVC w/Entrap PD	23		4	22	11	60	3
New Call	18	1	7	1		27	1
OB/Pregnancy Amb	2		1	26	17	46	3
OB/Pregnancy Tr	2			15	9	26	3
Obvious Death	9		6	11	7	33	2
Ordinance Violations	77	8	252	1		338	1
Outdoor Smoke Investigation	1		2	104	32	139	2
Overdose Amb	26	12	64	50	129	281	3
Overdose Med	83	2	75	91	95	346	3
Panhandling	49	1	85			135	1
Parking Violation	174	137	897	2		1,210	1
Phone Message	1,100	223	862			2,185	1
Police Tow	1	1	155			157	2
Prowler	10		10			20	2
Psychiatric Amb	72	3	45	67	59	246	3
Psychiatric Med	2		2	2	4	10	3
Psychiatric Tr	10	2	11	10	14	47	3
Public Service	10		1	647	383	1,041	2
Robbery	3		15			18	2
Robbery w/Weapon	7	1	6			14	3
Seizure Amb	2		1	41	82	126	3
Seizure Med	9		15	245	272	541	3
Sex Offense	118	19	81		1	219	2
Sexual Assault/Rape Amb	9		6	6	5	26	3
Shooting/Stabbing	4	4	7	2	1	18	3
Shoplifting	171	2	140			313	2
Shots Fired	362	9	287			658	2
Sick Person Amb	56	2	58	1,187	1,104	2,407	2
Sick Person Tr	14	1	16	394	236	661	3
Smell of Fuel in Comm					2	2	3
Smell of Fuel in Res				1	2	3	3
Smell of Smoke/Electrical Comm	3	3		34	51	91	3
Smell of Smoke/Electrical Res				26	17	43	3
Smoke Detector Install			1	95	36	132	2
Smoke in Structure Comm	5	2	2	39	47	95	3
Smoke in Structure Res				27	13	40	3
Sparks from Outlet Comm				5	8	13	3
Sparks from Outlet Res				2	3	5	3
Spec RS Access Issue	13	2		17	14	46	3
Spec RS Vertical	2		2	3	3	10	3



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<i>Special Detail</i>	32	3				35	1
<i>Stabbing 1 Patient</i>	4		10	4	9	27	3
<i>Standby Emergency</i>	3		2	3	4	12	2
<i>Standby Routine</i>		1	3	12	74	90	2
<i>Stolen Vehicle/Unauthorized Use</i>	217	10	183			410	2
<i>Stroke Amb</i>	2		1	71	44	118	3
<i>Stroke Tr</i>	7		1	265	130	403	3
<i>Structure Fire - Comm</i>	15		20	25	33	93	3
<i>Structure Fire - Comm w/Entrap</i>	3		1	3	4	11	3
<i>Structure Fire - Res</i>	29		10	42	31	112	3
<i>Structure Fire - Res w/Entrap</i>	2		1	3	2	8	3
<i>Suspicious Activity</i>	2,978	741	2,582	11	8	6,320	2
<i>Suspicious Package FIRE</i>	11	9	6	11	15	52	2
<i>Suspicious Package PD</i>	6	6	15	6	17	50	2
<i>Traffic Hazard</i>	1,592	66	746	19	3	2,426	2
<i>Traffic Stop</i>	4,614	736	1,062	2	2	6,416	2
<i>Transformer Fire</i>	1	1	1	74	24	101	2
<i>Trash Fire</i>	1		1	12	10	24	2
<i>Tree Down</i>	230		4	313		547	2
<i>Tree Into Structure</i>	1		2	10	10	23	2
<i>Tree on Power Line</i>	2			50	13	65	2
<i>Trespassing</i>	637	135	705	3	4	1,484	2
<i>Unconscious Amb</i>	3		2	79	67	151	3
<i>Unconscious Med</i>	24	1	22	327	224	598	3
<i>Unknown Problem</i>	212	19	301	199	369	1,100	3
<i>Unusual Odor</i>				13	6	19	2
<i>Vandalism</i>	398	81	458	1	1	939	2
<i>VDOT/City Yard/Utility</i>	49	1	17			67	1
<i>Vehicle Fire</i>	28		16	88	32	164	3
<i>Vehicle Into Structure</i>	15	2	5	16	8	46	3
<i>Violation of Executive Order</i>	100	84	140	1		325	1
<i>Warrant Service</i>	1,955	498	1,978		3	4,434	2
<i>Water Hazard in Structure</i>				29	30	59	2
<i>Water Rescue Not Drowning</i>	6			8	6	20	3
<i>Welfare Check</i>	773	69	508	3	5	1,358	2

* All above call counts are based on the final event type in CAD and are otherwise unaudited for clerical errors.