REPORT OF THE
VIRGINIA STATE CRIME COMMISSION

ENHANCED EMERGENCY TELECOMMUNICATIONS SYSTEMS

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

HOUSE DOCUMENT NO. 93

COMMONWEALTH OF VIRGINIA
RICHMOND
2000

COMMONWEALTH of VIRGINIA

VIRGINIA STATE CRIME COMMISSION

Senator Ken Stolle
Chairman

Rich Savage
Director

January 10, 2000

To: The Honorable James S. Gilmore, III
Members of the Virginia General Assembly

House Joint Resolution 215 agreed to by the 1998 General Assembly, directed the Virginia State Crime Commission to conduct a study on emergency telecommunications systems and to submit its findings and recommendations to the Governor and the Members of the 2000 Session of the General Assembly.

In fulfilling this directive, a study was conducted by the Virginia State Crime Commission in 1999. I have the honor of submitting herewith the study report.

Respectively submitted,

Kenneth W. Stolle
Chairman

KWS:sr

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Review of Enhanced Emergency Telecommunications Services in Virginia

January 2000

The Virginia State Crime Commission

"911" is the three digit telephone number that has been designated as the "Universal Emergency Number" for public use throughout the United States to request emergency assistance. It is intended as a nationwide telephone number giving the public direct access to a public safety answering point (PSAP) that will be responsible for taking the emergency call and dispatching emergency service personnel. The widely acknowledged advantages of a single, three-digit, nationally recognized emergency number include:

- It can be dialed quickly;
- It is easy to remember; and
- It is the same no matter where you are, or which public safety entity you need, i.e. police, fire, and/or ambulance.

There are currently two levels of emergency telecommunications service, basic and enhanced. *In its basic form*, PSAP attendants who receive a 911 call must gather all the necessary information about the nature and location of the emergency by questioning the caller. *In its enhanced form*, the emergency call is routed to the most appropriate PSAP, and in addition to the voice connection, the caller's telephone number and location, as well as which fire, police, and/or medical service is closest to the caller are transmitted to the PSAP. ***Enhanced 911 (E-911) emergency telecommunications systems permit more efficient and speedy response by emergency service personnel, thereby increasing the probability that lives and/or property will be saved.***

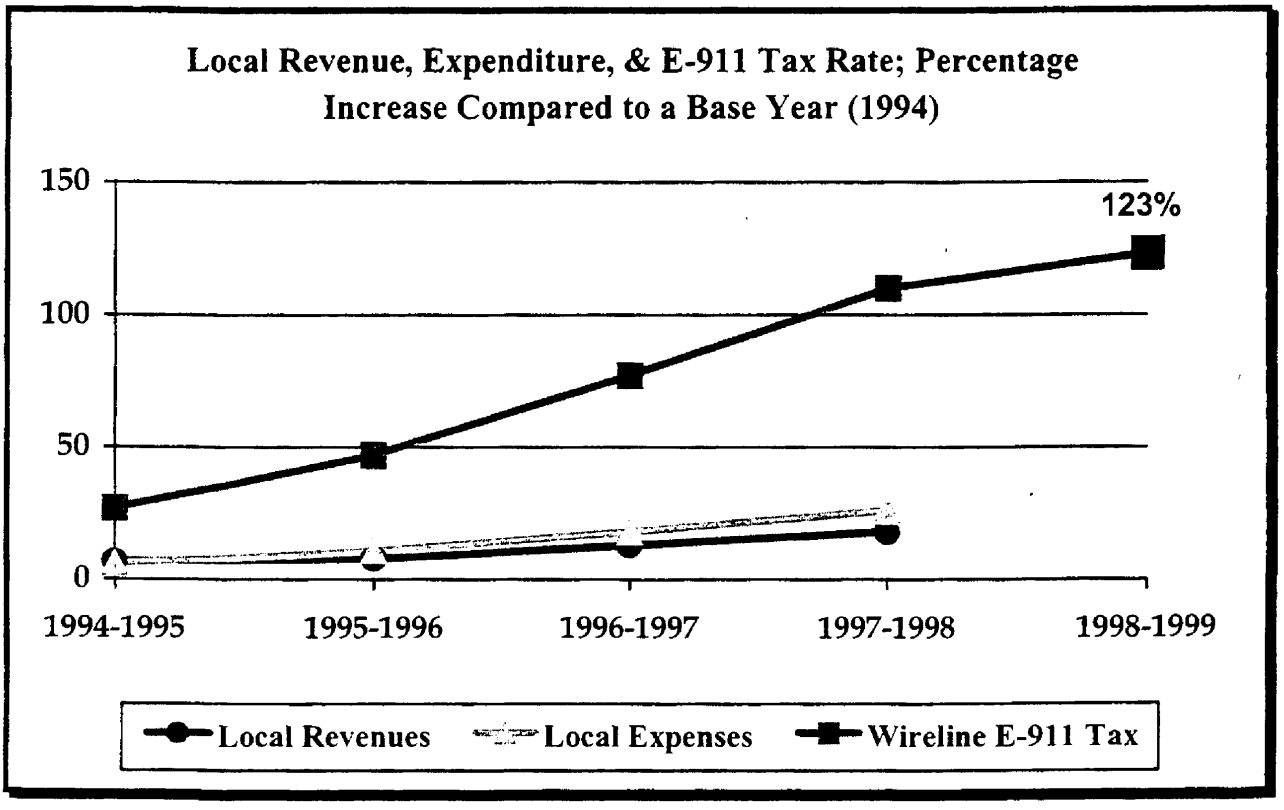
House Joint Resolution 215 (1998) directed the Virginia State Crime Commission to make recommendations for the most efficient and cost effective manner to first improve upon, and then manage and deliver, wireline and wireless E-911 services to Virginia's citizenry. Additionally, the Virginia General Assembly asked that the Crime Commission comment on ways to promote the use of #77 among citizens for non-emergency services. In response to this study mandate, the Crime Commission undertook a variety of research activities, including a literature review, structured interviews, and survey work, among other things.

The options for legislative consideration discussed below proceed from a basic assumption: that improved public safety remains an important objective of Virginia State and local governments. As Virginia prepares to face increasingly complex challenges in the area of emergency telecommunications generally, planning, communication, and coordination become increasingly critical. By endorsing the following options for legislative consideration, the Commonwealth will be able to more efficiently and effectively deliver enhanced emergency telecommunications services to the citizens of Virginia. Further, these moves will help to establish Virginia as ***the*** nationwide leader in the provision of these services.

WIRELINE & WIRELESS E-911 IN VIRGINIA

Wireline. In the Commonwealth of Virginia there are an estimated 150 PSAPs serving 135 local jurisdictions (cities and counties). 97% of Virginia's population (89% of the land area) is served by at least basic 911, and 95% of Virginia's population (77% of the land area) is served by wireline E-911.

In 1982, the Virginia General Assembly passed legislation creating the local tax for enhanced emergency telephone service, authorizing those Virginia localities "which established or will establish an ***E-911*** emergency telephone system," to impose a special tax on the consumers of the telephone service (*Code of Virginia*, § 58.1-3813, Subsection A). Local governments finance 911 services generally via this local tax, the consumer utility tax, and local government general fund revenues. Looking more closely at the wireline E-911 tax, assessed on each telephone line monthly, the local tax for enhanced emergency telephone service generated an estimated $67 million during fiscal year 1999, a 123% increase in local revenue generated from the local tax since fiscal year 1994 ($30 million). The average E-911 wireline tax rate in Virginia is $1.30 (***see maps below***). Compared to three national measures developed from a review of all 50 states' 911 laws, Virginia's wireline E-911 tax rate is .63-cents above the national average of .67-cents. ***Some jurisdictions (13) do levy a local tax for enhanced emergency telephone service but do not provide wireline E-911 services, whereas others (14) neither levy the tax nor provide the service.*** Most localities (56%) use their general fund to account for wireline E-911 financial activity and, as such, there is not always separate

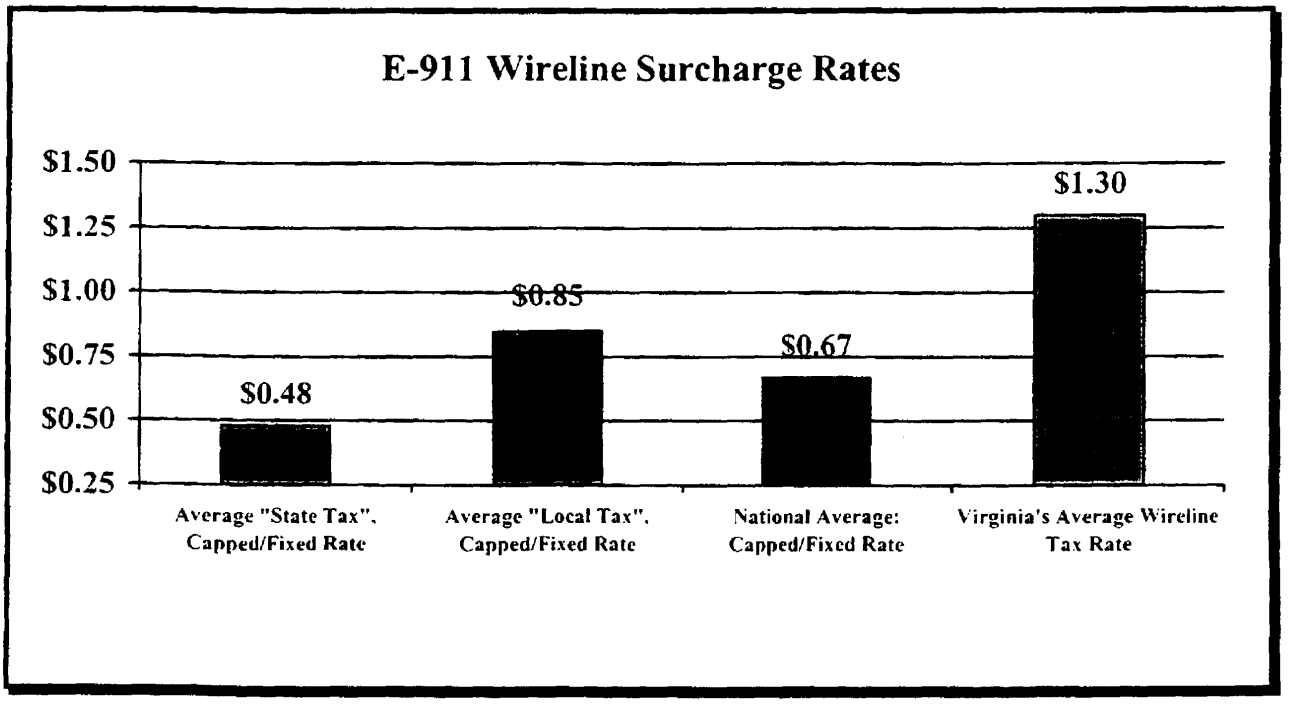


One of the individuals interviewed for this study said that because of its vague nature, Code of Virginia, § 58.1-3813 "encourages misinterpretation." This same interviewee commented: "That tax [wireline E-911] was enacted to help Virginia's PSAPs and local governments fund wireline E-911, and it has done that. But what ended up happening was the local governments figured just about anything qualified as an 'allowable expense' the way it's [Code of Virginia, § 58.1-3813] currently written, so they kept hiking that tax up and withdrawing other funding support. What ends up happening is soon you're using the E-911 tax to fund everything the PSAP does. That was never what that tax was supposed to do. I expected that tax to help [PSAPs] buy equipment and hire people to deliver E-911 services. Now it's viewed as just another general fund revenue source."

Fairfax County reported that it not only considers all PSAP dispatcher and call-taker expenses as recoverable under Code of Virginia, § 58.1-3813 (Fairfax County designated 108 employees as "Public Safety Communicators"), but also the salaries – or portions thereof - of 32 other public safety personnel positions, including 6 members of the police force and 4 "Fire Lieutenants."

budgeting and accounting processes for wireline E-911 service expenditures. The remaining localities (44%) make use of a special revenue fund (32%), or some other fund (12%).

Finally, note that expenditure activity reports provided to Virginia's APA per Item 9 2c (1999 Appropriations Act) by local governments show that, contrary to



Virginia's traditional public policy goals as currently constructed, *Code of Virginia*, § 58.1-3813 promotes inconsistencies in local government interpretations of what constitutes an "allowable" E-911 expense.

Looking more closely at the variability Code of Virginia, § 58.1-3813 encourages when it comes to determining an "allowable expense," some jurisdictions reported that they apply funds generated from the wireline E-911 tax to those expenses associated only with personnel services, contractual agreements, equipment purchases, and E-911 system upgrades/maintenance directly related to the provision of wireline E-911 services, while other localities included a variety of expenses they considered fundable by monies generated from the wireline E-911 tax. A brief list of those more "suspect" costs reported by Virginia's local jurisdictions follows:

Advertising	*Admin. Assistants*
Books	*Chairs*
Clerical Expenses	*Clothing/Uniforms*
Conventions	*Copy Machine*
Desks	*Dues*
Fax Machine	*Fixtures*
Furniture	*Gasoline/Diesel Fuel*
Janitorial Costs	*Miscellaneous*
Postage	*Laser Printer*
Printing Costs	*Report Binding*
Scanner	*Subscriptions*
Supplies	*Travel*
Office Equipment	
Non-Cash Achievement Awards	
Personal Computers	
Vehicle Replacement	

Wireless. The FCC regulates wireless telecommunications companies. In 1996 the FCC issued Docket Order 94-102 requiring all wireless carriers to provide wireless E-911 in two phases, if certain conditions were met. Subsequently, the FCC has revisited and revised these requirements, altering somewhat the specifics associated with Phase I and Phase II wireless E-911 location services, but leaving in tact the main thrust of the original order.

In 1998, the Virginia General Assembly passed legislation (the Wireless Enhanced Public Safety Telephone Service Act, *Code of Virginia*, §§ 56-484.8 to 56-484.11) creating a Wireless E-911 Service Board. The General Assembly also authorized wireless service providers to collect a monthly fee of .75-cents assessed upon each of their assigned telephone numbers. These moneys are deposited into a fund to provide full payment to PSAPs and wireless carriers of all "reasonable and direct" wireless E-911 costs.

In the Commonwealth of Virginia, there are an estimated 1.5 million wireless subscribers. Evidence collected shows that from January 1, 1998 through December 31, 1998, a reported 709,018 wireless 911 and wireless #77 calls were placed throughout the Commonwealth. Subscriber counts and emergency call volume numbers are expected to grow by at least 15% annually. Note that currently all wireless 911 service in the Commonwealth is basic 911, though twenty-two of Virginia's PSAPs have recently (August 1999) requested Phase I service from wireless service providers.

In fiscal year 1998, the Wireless E-911 Fund generated over $13 million. Assuming a 15% growth rate in wireless subscribership in Virginia during fiscal years 2000 (1.7 million subscribers), 2001 (2.0 million subscribers), and 2002 (2.3 million subscribers), Virginia's wireless E-911 tax will generate an estimated $15.3, $18.0, and

$20.7 million during those years, respectively. Total revenue, then, during this period should eclipse $65 million. Hypothetical cost estimates suggest that the estimated maximum cost range associated with implementing a statewide wireless E-911 system in Virginia over a five-year period is $97.1 to $145.7 million.

WIRELINE AND WIRELESS E-911 IN OTHER STATES

Wireline. Though wireline E-911 funding and cost recovery provisions across the states are variable, similarities do exist. Working from a review of all fifty states' wireline E-911 laws, Virginia is one of a minority of states in that *Code of Virginia*, § 58.1-3813:

- ***Does not*** either "establish a ceiling" or "set the rate" of the wireline E-911 tax. (*84% of states **do** either establish a wireline E-911 tax "ceiling" or levy a "fixed" rate wireline E-911 tax. Note here that 74% of states **do** allow for local collection and administration of their wireline E-911 tax, though of these states only Hawaii, Kentucky, North Carolina, Virginia, and West Virginia **do not** either establish a local wireline E-911 tax "ceiling" or "fixed" rate.)*

- ***Does not*** formally require either state or local oversight and accountability via the enabling statutory language. (*84% of states **do** promote oversight and accountability of those funds generated by their wireline E-911 tax via an audit procedure [administered either by the state or the locality], and/or mandating that those funds generated by the tax be deposited into "separate and distinct" accounts.*)

- ***Does*** allow these funds to be used for salaries of call takers, dispatchers, and E-911 coordinators/directors. (*70% of states **do not** allow funds generated from their wireline E-911 tax to be used for "salaries, or portions of salaries" of emergency call center employees.*)

Whereas other states establish clearly the primacy of public safety considerations, and then look to ensure that those funds designated for the provision of wireline E-911 services are spent appropriately, Virginia's enabling wireline E-911 legislation does comparatively little to encourage the development of those ideals deemed central by many other states to the successful implementation and future uninterrupted operation of their wireline E-911 systems and infrastructure. Virginia's enabling legislation, then, contributes greatly to the variability of Virginia's wireline E-911 tax rate, accounting measures, and spending practices, the fact that wireline 911 service delivery varies from jurisdiction to jurisdiction, and the current lack of inter-jurisdictional and inter-agency communication and cooperation, among other things.

Wireless. Virginia's Wireless Enhanced Public Safety Telephone Service Act (*Code of Virginia*, §§ 56-484.8 to 484.11) – similar to comparative legislation in 31other states – does do the following:

- Creates a Wireless E-911 Service Board. (*84% of states that have enacted wireless E-911 laws **do** create and empower some sort of wireless 911 board, department, or division.*)

- Establishes a fixed wireless E-911 cost recovery mechanism and designates who is eligible to receive cost recovery for the delivery of wireless E-911 services.

*(100% of those states that have enacted wireless E-911 laws **do** include a specific cost recovery mechanism. 94% of these states do either "cap" or "fix" their wireless E-911 tax rate.)*

- Requires oversight and accountability via a formal audit procedure. *(90% of states that have enacted wireless E-911 legislation **do** require oversight and accountability by way of a formalized audit procedure and/or mandating that those funds generated by the tax be deposited into a separate and distinct account.)*

Conversely, Virginia's wireless E-911 enabling legislation is different from that adopted by other states in that it ***does not*** do the following:

- Endow the Commonwealth's Wireless E-911 Board with extensive "fiduciary" and "policy-making" responsibilities. *(84% of those states with a wireless 911 board, department, or division **do** grant these bodies both fiduciary and policy-making – in terms of planning, coordination, and implementation of wireless E-911 service – responsibilities.)*

- Extend the opportunity of board membership beyond the PSAP/local government and telecommunications industry communities. *(69% of those states with a 911 board, department, or division **do** extend membership opportunities to a wide variety of interested parties, including law enforcement and emergency fire and rescue personnel, as well as technology experts and engineers, to name but a few.)*

- Provide for any staff support for Virginia's Wireless E-911 Service Board. *(62% of those states with a 911 board, department, or division **do** provide these entities with staff support. Many fund a "statewide 911 coordinator," and other staff from the moneys generated by their state's wireless E-911 tax.)*

Similar to Virginia's wireline E-911 enabling legislation, Virginia's wireless E-911 enabling legislation does little to promote "public safety" considerations. Further, Virginia's Wireless E-911 Service Board is hampered by its inability to thoroughly examine and consider wireless service provider and PSAP cost recovery estimates. Lacking the ability to adequately monitor trends and advances in on-point technology, and having no authority to propose a comprehensive plan for the acquisition, management, and use of the necessary Phase I and Phase II hardware and software components to implement wireless E-911 location technologies, Virginia's Board will be unable to deliver a focused, comprehensive approach to emergency telecommunications.

MANAGING AND PROMOTING EMERGENCY TELECOMMUNICATIONS SERVICES IN VIRGINIA

Too much of the emergency telecommunications service's activities of Virginia's PSAPs and local governments now occur with inadequate planning and coordination. The issues discussed in this report point to the need for a more focused approach to emergency telecommunications services, one that has clear leadership from the top and strong support from all associated parties. Recognizing the need to encourage the statewide coordination of those entities charged with delivering this important public safety service, *Code of Virginia*, § 58.1-3813, as well as *Code of Virginia*, §§ 56-484.8 to 56-484.11, needs to

be restructured. Specifically, the Wireless E-911 Service Board should be replaced with a Virginia Emergency Telecommunications Board. Staff support should be provided in the form of an Emergency Telecommunications Division, to be housed in Virginia's Department of Technology Planning. Further, the membership of the Board together with its powers, duties, and scope should be expanded, and the existing sunset clause attached to *Code of Virginia*, §§ 56-484.8 to 56-484.11 should be removed. These moves would augment the Board's ability to promulgate the necessary policy, planning, and standards support, and to better promote the integration of all of Virginia's PSAPs into a statewide, strategic emergency telecommunications services plan. In carrying out its responsibilities, the Board will need to remain flexible, acknowledging and keeping abreast both of the advances and/or changes in on-point technology and applicable federal law, as well as the sometimes very different needs of individual localities and PSAPs. The restructuring highlighted in the following options for legislative consideration can be the foundation for improved emergency telecommunications services for all of Virginia's PSAPs and public safety personnel, and improved public safety services for the citizens of Virginia.

Recommendation (1): The Virginia General Assembly may wish to consider amending Code of Virginia, §§ 56-484.8 to 56-484.11 by replacing the Wireless E-911 Service Board with the Virginia Emergency Telecommunications Board, and creating an Emergency Telecommunications Division within Virginia's Department of Technology Planning. The Virginia Emergency Telecommunications Board should be chaired by the Director of the Department of Technology Planning, and the Director of the Emergency Telecommunications Division – designated Virginia's Emergency Telecommunications Systems Coordinator - should be hired by the Board.

Recommendation (2): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider broadening the membership of the Virginia Emergency Telecommunications Board to include twelve members appointed by the Governor, including: one representing the Geographic Information Network Division, one representing the Virginia Department of Emergency Services, one representing the Virginia Department of Transportation, one representing the Virginia State Police, two local Public Safety Answering Point managers, one fire chief, one emergency medical services manager, one Sheriff, one Chief of Police, one who is employed by a local exchange telephone company providing E-911 service, and one representing CMRS providers authorized to do business in Virginia. The Director of the Department of Technology Planning shall serve as the Board's Chairman, and the Comptroller of the Commonwealth shall serve ex-officio as the Board's Treasurer.

Recommendation (3): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider clearly defining the role and responsibilities of

the Virginia Emergency Telecommunications Board and Emergency Telecommunications Division.

Recommendation (4): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider clearly defining the role and responsibilities of the Chairman of the Virginia Emergency Telecommunications Board, and Virginia's Emergency Telecommunications Systems Coordinator.

Recommendation (5): As part of the restructuring of the Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider requiring the Virginia Emergency Telecommunications Board to direct and approve a comprehensive, statewide, five-year strategic plan for implementing a statewide enhanced emergency telecommunications system (wireline and wireless); and to facilitate the drafting of similar strategic plans at the local and/or regional level.

Recommendation (6): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider requiring the Virginia Emergency Telecommunications Board to re-evaluate the statewide emergency telecommunications services strategic plan annually and either reaffirm or amend it as appropriate.

Recommendation (7): As part of the restructuring of the Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider requiring the Emergency Telecommunications Division to formulate, direct, and promulgate policies, standards, specifications, and guidelines for the effective development and deployment of a statewide enhanced emergency telecommunications system in the Commonwealth (wireline and wireless); to provide technical assistance to Virginia's PSAPs, as well as state and local police, fire and emergency medical service agencies; and to monitor and report on the implementation of a statewide enhanced emergency telecommunications system in the Commonwealth.

Recommendation (8): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, to ensure an effective system of oversight, the Virginia General Assembly may wish to consider requiring the Emergency Telecommunications Division to make an annual report to the Virginia State Crime Commission and the Public Safety Subcommittees of the House Appropriations and Senate Finance Committees of the Virginia General Assembly on the status of emergency telecommunications services in Virginia (wireline and wireless); and to conduct special or continuing studies as directed by the Virginia General Assembly.

Recommendation (9): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11 the Virginia General Assembly may wish to consider deleting the existing "July 1, 2002" sunset language.

FUNDING WIRELINE & WIRELESS E-911

Introduction. From a public policy perspective, emergency telecommunications

funding mechanisms should raise adequate revenue to pay for the delivery of enhanced emergency telecommunications services. Additionally, if tax revenues are dedicated to funding this service, then generally accepted tax principles, including equity, stability, economic neutrality, productivity, flexibility, and simplicity/efficiency should be present. The following discussion outlines a plan of action that the Virginia General Assembly could adopt to relate wireline and wireless E-911 costs to revenues. Additionally, the plan provides for interim funding mechanisms that – taken together - should raise adequate revenue to pay for those "reasonable" and "direct" costs associated with the delivery of enhanced emergency telecommunications services, and better promote those taxation principles listed above.

Another point that deserves mentioning, Crime Commission staff did review and consider a number of possible enhanced emergency telecommunications services funding options, including the idea of eliminating the wireline and wireless E-911 telecommunications taxes and replacing them with an annual appropriation from Virginia's General Fund. While on its face this course of action might appear viable, due to the current lack of available wireline and wireless E-911 cost data, there is no way to accurately discern the amount of General Fund monies needed to cover those costs associated with the delivery of wireline and/or wireless E-911. Additionally, the evidence collected over the course of this study shows that emergency telecommunications services require a stable and reliable source of funding. If funding fluctuates from year-to-year, so too will the level of emergency telecommunications services delivered to the Commonwealth's citizenry. Virginia's local PSAPs are ***the*** vital link between the citizenry and all of the Commonwealth's law enforcement and emergency service personnel. The price of delay, then, in delivering emergency telecommunications service to Virginia's citizenry may very will be the loss of life. Consequently, more than unwise, it would be reckless to go the route of a General Fund appropriation without first determining the costs associated with fully implementing and operating a statewide enhanced emergency telecommunications system, ***and*** guaranteeing that the amount of that appropriation will fluctuate in the future only in proportion to the costs associated with delivering enhanced emergency telecommunications services.

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Wireline. First, because of the high level of accountability that is required for dedicated tax revenues, funding and cost recovery oversight is necessary if the Virginia General Assembly is to allow tax monies to fund E-911 services. Recognizing

the accountability problems posed by the existing local option tax for enhanced emergency telephone service, and working from the review of all existing wireline E-911 enabling legislation, the most appropriate funding mechanism for emergency telecommunications services in Virginia is a state wireline E-911 tax. The wireline E-911 tax should continue to be based on the number of hard-wire access lines and collected monthly. These tax revenues should be collected by those local exchange companies doing business in the Commonwealth, forwarded to the Emergency Telecommunications Board, deposited into a separate and distinct account (the "Wireline E-911 Fund"), dedicated to those costs directly associated with the implementation and operation of wireline E-911 services, and disbursed accordingly. The enabling legislation should also require that the Wireline E-911 Fund be audited annually. Finally, as a secondary cost driver for the provision of wireline E-911 service, Virginia would be well served to apply the "reasonable" and "direct" cost recovery standard to those wireline telephone companies doing business in the Commonwealth. In this manner, equity, efficiency, economy, effectiveness, productivity, stability, and accountability would be better promoted, and the original thrust of *Code of Virginia* § 58.1-3813 would be recaptured. Further, more so than any other funding method, this action would ensure a ***stable*** and ***reliable*** funding source for the statewide deployment of enhanced emergency telecommunications services, thereby ensuring the uninterrupted delivery of this most important of public safety services to Virginia's citizenry.

Additionally, 35 states do not allow funds generated from their wireline E-911 tax to be used for salaries, or portions of salaries of emergency call center employees. In 1993, the Virginia General Assembly adopted amendments to *Code of Virginia* § 58.1-3813 that broadened the applicable use of revenues generated from the wireline E-911 tax to include "salaries or portion of salaries of dispatchers or call-takers." Subsequent amendments adopted in 1997 broadened the applicable use of these revenues further to include "salaries or portions of salaries" for the "directors or coordinator of the E-911 program" in counties "with a population of no less than 45,000 and no more than 47,000." Rather than transfer responsibility for all salaries of emergency call-takers and dispatchers back to Virginia's localities, a move that might adversely impact PSAP staffing levels, PSAPs should be able to recover personnel costs via a statewide wireline E-911 tax in direct proportion to the total number of wireline E-911 calls received.

Finally, for the purpose of compensating a telephone utility for accounting for and remitting the current local tax for enhanced emergency telephone service, *Code of Virginia*, § 58.1-3813 allows each telephone utility to reduce the collected amounts by three percent and retain such amounts to defray costs incurred in complying with *Code of Virginia*, § 58.1-3813. Recognizing that the more efficient structure proposed here will ease the administrative burdens of these local exchange carriers, the administrative fee to the wireline telephone companies for the cost of collecting and remitting the tax should be reduced.

Recommendation (10): The Virginia General Assembly may wish to consider amending Code of Virginia, § 58.1-3813 by replacing the local option tax for enhanced emergency telephone service with a statewide wireline E-911 surcharge; and to consider delaying the enactment of the statewide Wireline E-

911 surcharge until January 1, 2001. As determined by the Virginia Emergency Telecommunications Board, those monies generated from the wireline E-911 surcharge will be deposited into the Wireline E-911 Fund and utilized solely for all reasonable direct recurring and nonrecurring capital costs and operating expenses incurred by a public safety answering point in designing, upgrading, leasing, purchasing, programming, installing, testing, administering, delivering, or maintaining all necessary data, hardware, and software required to provide wireline E-911 service, direct personnel costs incurred in receiving and dispatching wireline E-911 calls only, and the salary of the public safety answering point director so long as the director has no duties other than the responsibility for the public safety answering point.

Recommendation (11): As part of the restructuring of Code of Virginia, § 58.1-3813, the Virginia General Assembly may wish to consider requiring that all local public safety answering points work with the Emergency Telecommunications Division to develop a standard system for maintaining accurate call volume counts and call processing (from phone answer to dispatch) times; and to develop a standard system for identifying and reporting wireline E-911 costs.

Recommendation (12): As part of the restructuring of Code of Virginia, § 58.1-3813, the Virginia General Assembly may wish to consider extending the "reasonable" and "direct" cost recovery standard currently applied to public safety answering points to wireline telephone companies.

Recommendation (13): As part of the restructuring of Code of Virginia, § 58.1-3813, the Virginia General Assembly may wish to consider requiring that the Auditor of Public Accounts, or his legally authorized representatives, annually audit the Wireline E-911 Fund in accordance with generally accepted auditing standards. The cost of such audit services shall be borne by the Wireline E-911 Fund. The Board shall furnish copies of such audit to the Governor and the Virginia General Assembly.

Recommendation (14): As part of the restructuring of Code of Virginia, § 58.1-3813, the Virginia General Assembly may wish to consider reducing the administrative fee due local exchange carriers for the cost of collecting and remitting the wireline E-911 tax to one percent of the total amount collected; and to consider delaying the reduction of this administrative fee until January 1, 2001.

Wireless. The wireless E-911 tax should continue to be based on the number of wireless customers whose billing address is within the Commonwealth and collected monthly. The tax revenues should be collected by those wireless service providers doing business in the Commonwealth, forwarded to the Emergency Telecommunications Board, deposited into a separate and distinct account (the "Wireless E-911 Fund"), dedicated to those costs directly associated with the implementation and operation of wireless E-911 services, and disbursed accordingly. The enabling legislation should continue to require that the Wireless E-911 Fund be audited annually. Like the proposed statewide wireline E-911 tax, more so than any other funding method, the action discussed here would ensure a stable and reliable funding

source for the statewide deployment of emergency telecommunications services, thereby ensuring the effective and efficient delivery of this most important of public safety services to Virginia's citizenry.

Additionally, in its current form the Wireless E-911 Service Board has found it difficult to get and evaluate wireless carrier cost recovery information. Recognizing that the Virginia Emergency Telecommunications Board needs to be able to verify wireless carrier costs before it can authorize reimbursement, Virginia will need to provide confidentiality protection for the wireless carrier proprietary data, balancing this need with the Board's duty to determine whether wireless service provider requests for cost recovery are reasonable and direct. Further, Virginia would be well-served to apply the "reasonable" and "direct" standard both to wireline telephone companies and those third-party vendors of Phase I and Phase II location technology.

Finally, for the purpose of compensating a wireless carrier for accounting for and remitting the current wireless E-911 tax, *Code of Virginia*, §§ 56-484.8 to 56-484.11 allows each telephone utility to reduce the collected amounts by three percent and retain such amounts to defray costs incurred in complying with *Code of Virginia*, §§ 56-484.8 to 56-484.11. Looking at those states that do authorize payment of an administrative fee to the wireless carriers for administrative costs, the rate ranges from a low of one percent to a high of three percent of the gross tax collected. Recognizing that the administrative burdens of local exchange carriers and wireless carriers will be roughly equal, the administrative fee to the wireless carriers for the cost of collecting and remitting the tax should be reduced.

Recommendation (15): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to require that the statewide wireless E-911 surcharge be forwarded to the Virginia Emergency Telecommunications Board. As determined by the Virginia Emergency Telecommunications Board, those monies generated from the wireless E-911 surcharge will be utilized solely for all reasonable direct recurring and nonrecurring capital costs and operating expenses incurred by a public safety answering point and wireless service provider in designing, upgrading, leasing, purchasing, programming, installing, testing, administering, delivering, or maintaining all necessary data, hardware, and software required to provide wireless E-911 service. Public safety answering points may further recover direct personnel costs incurred in receiving and dispatching wireless E-911 calls only.

Recommendation (16): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider requiring that all local public safety answering points work with the Emergency Telecommunications Division to develop a standard system for identifying and reporting wireless E-911 costs.

Recommendation (17): The Virginia General Assembly may wish to consider amending Virginia's Freedom of Information Act (FOIA) (Code of Virginia, § 2.1-340 et seq.) to provide very limited meeting and document FOIA exemption for the Wireless Carrier Cost Recovery Subcommittee of the Virginia Emergency Telecommunications Board,

and staff of the Emergency Telecommunications Division designated by that subcommittee.

Recommendation (18): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider extending the "reasonable" and "direct" cost recovery standard currently applied to public safety answering points and wireless service providers to wireline telephone companies and third-party vendors of wireless E-911 location technologies and/or solutions.

Recommendation (19): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider reducing the administrative fee due wireless carriers for the cost of collecting and remitting the wireless E-911 tax to one percent of the total amount collected.

Wireline and Wireless E-911 Tax Rates. Many parties will disagree on how to determine the state wireline and wireless E-911 tax rate. Some will say that these tax rates should be comparable to those rates levied nationally. Others will propose that these rates be based on an estimate of the total costs associated with actually implementing and operating wireline and wireless E-911 in the Commonwealth of Virginia. With both methods, the actual cost to implement and operate wireline and wireless E-911 services will not be known until the service is implemented and operating. The key difference is that if the tax rates are based on an estimate of actual costs, fiscal accountability and planning processes are greatly enhanced. By successfully relating costs to revenues, the Commonwealth of Virginia would take the lead nationwide, ***effectively*** and ***efficiently*** delivering this important public safety service to its citizens.

Unfortunately, current local government wireline E-911 accounting methods do not lend themselves to a strict breakdown of those costs directly associated with the delivery of wireline E-911 services per *Code of Virginia* § 58.1-3813. Similarly, the actual cost to implement and operate wireless E-911 services will not be known until those services are operational. Acknowledging that adequate funding is a critical element in ensuring timely wireline and wireless E-911 implementation, but that cost estimates associated with actually implementing and operating wireline and wireless E-911 that are specific to the Commonwealth of Virginia are not currently available, the following discussion outlines a plan of action that the Virginia General Assembly could adopt to obtain the necessary cost information while guaranteeing in the interim that a cost recovery mechanism is in place for Virginia's PSAPs (wireline and wireless E-911) and wireless carriers (wireless E-911).

Acknowledging that adequate funding is a critical element in ensuring timely wireline and wireless E-911 implementation, but that cost estimates associated with actually implementing and operating wireline and wireless E-911 that are specific to the Commonwealth of Virginia are not currently available, the following discussion outlines a plan of action that the Virginia General Assembly could adopt to obtain the necessary cost information while guaranteeing in the interim that a cost recovery mechanism is in place for Virginia's PSAPs (wireline and wireless E-911) and wireless carriers (wireless E-911).

Wireline. Working from national tax rate data, the Virginia General Assembly should impose a wireline E-911 tax in the 2000 session of the Virginia General Assembly at a rate of .75-cents per hard-wire access line per month. Data collected for this report indicates that if levied at this rate for a period of one year (FY 2000), the proposed wireline E-911 tax would generate roughly $45 million, only a ***.13% drop*** in total local government revenue ($14.9 billion), and almost one-half of the total amount of PSAP operating budgets (FY 1999) as reported to Virginia's APA. Note that national figures indicate that 20 to 30% of those calls received by a PSAP are 911 emergency calls. Relying on those cost recovery standards developed, distributed statewide, and adopted by Virginia's Wireless E-911 Service Board, the wireline E-911 tax rate proposed here should cover those Virginia PSAP costs associated with the processing of wireline E-911 emergency telephone calls placed by dialing the digits 911 (an estimated 20 to 30% of $102 million). Additionally, note that recent industry standards suggest that the number of hard-wire access lines – the unit on which it will be assessed – will continue to grow an estimated 5% annually. Also, implementing this proposed funding structure would result in an average tax cut of .79-cents per month in 94 of Virginia's 135 local jurisdictions (cities and counties). In those 20 local jurisdictions currently levying the existing local option tax at a rate lower than the proposed .75-cents, the average monthly increase would be .23-cents. Finally, 16 localities levy no E-911 tax - 14 of which do not provide wireline E-911 services to their citizens. The funding mechanism proposed here would result in an additional .75-cent/per month levy, though it would also promote the provision of wireline E-911 services in these jurisdictions. The remaining two jurisdictions either levy a percentage-based tax (Danville City), or no information concerning the existing tax rate was available (Middlesex County).

Simultaneously, the Virginia General Assembly should require the Virginia Emergency Telecommunications Board and Emergency Telecommunications Division to work with Virginia's PSAPs to determine estimated costs to fully implement and operate wireline E-911 in the Commonwealth. In developing this estimate, the Board and Division should work from the guidelines for reimbursable wireline E-911 costs adopted during the 2000 session of the Virginia General Assembly. The Board and Division should then determine an appropriate wireline E-911 tax rate based on the aggregated cost estimate and present this information to the Virginia General

Implementing the proposed .75-cent statewide wireline E-911 tax would result in an average tax cut of .79-cents per month in 94 of Virginia's 135 local jurisdictions (cities and counties). In those 20 local jurisdictions currently levying the existing local option tax at a rate lower than the proposed .75-cents, the average monthly increase would be .23-cents. Finally, 16 localities levy no E-911 tax - 14 of which do not provide wireline E-911 services to their citizens. The funding mechanism proposed here would result in an additional .75-cent/per month levy, though it would also promote the provision of wireline E-911 services in these jurisdictions. The remaining two jurisdictions either levy a percentage-based tax (Danville City), or no information concerning the existing tax rate was available (Middlesex County).

Assembly no later than December 1, 2001. The Virginia General Assembly should then set the tax rate during the 2002 session of the Virginia General Assembly based on the aggregated wireline E-911 cost estimate. The effective date of the new tax rate would be July 1, 2002. If the cost data is not forthcoming, then the .75-cent wireline E-911 tax adopted during the 2000 session of the Virginia General Assembly will remain in effect.

Recommendation (20): As part of the restructuring of Code of Virginia, § 58.1-3813, the Virginia General Assembly may wish to consider imposing a wireline E-911 tax at a rate of .75-cents per hard-wire access line per month; and to authorize the flexibility to change the rate once the estimated costs to fully implement and operate wireline E-911 in the Commonwealth become known.

Recommendation (21): As part of the restructuring of Code of Virginia, § 58.1-3813, the Virginia General Assembly may wish to consider requiring the Emergency Telecommunications Division to re-evaluate the wireline E-911 funding mechanism annually, and include in its annual report to the Virginia State Crime Commission and the Public Safety Subcommittees of the House Appropriations and Senate Finance Committees of the Virginia General Assembly a recommendation to either reaffirm the funding mechanism or amend it as appropriate.

Wireless. Working from national tax rate data, the Virginia General Assembly should continue the wireless E-911 tax at the already established rate of .75-cents per wireless customer, whose billing address is within the Commonwealth, per month. Working from industry standards suggesting an annual 15% growth rate in the number of wireless subscribers, levied at this rate the proposed wireless E-911 tax would generate roughly $15.3 million in fiscal year 2000, $18.0 million in fiscal year 2001, and $20.7 million in fiscal year 2002.

Simultaneously, the Virginia General Assembly should require the Virginia Emergency Telecommunications Board and Emergency Telecommunications Division to work with Virginia's PSAPs and those wireless service providers doing business in the Commonwealth to determine estimated costs to fully implement and operate wireless E-911 in Virginia. In developing this estimate, the Board and Division should work from the guidelines for reimbursable wireless E-911 costs adopted during the 2000 session of the Virginia General Assembly, and the wireless service provider plans for implementing wireless E-911 Phase II that must be submitted to the FCC by October 1, 2000. The Board and Division should then determine an appropriate wireless E-911 tax rate based on the aggregated cost estimate and present this information to the Virginia General Assembly no later than December 1, 2001. The Virginia General Assembly should then set the tax rate during the 2002 session of the Virginia General Assembly based on the aggregated wireless E-911 cost estimate. The effective date of the new tax rate would be July 1, 2002. If the cost data is not forthcoming, then the .75-cent wireless E-911 tax will remain in effect.

Recommendation (22): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to continue imposing a wireless E-911 tax at a rate of .75-cents per wireless customer whose billing address is within the Commonwealth; and to authorize the flexibility to change

*If set at the .75-cent rates discussed herein, the wireline E-911 tax and the wireless E-911 tax would generate together $60.3 million, $65.3 million, and $70.4 million during fiscal years 2000, 2001, and 2002, respectively. Accepting that roughly one-half of the wireless E-911 monies will go to wireless service providers, these totals represent only a .08%, .07%, and .04% drop in Fiscal Year 1999 in **total** local government revenue ($14.9 billion). At the same time, by implementing E-911 statewide, discriminating between 911 and #77 calls, and encouraging "economies of scale," call processing times – and with them PSAP personnel expenses and equipment and systems costs - will drop. Concurrently local government revenues should continue to increase (**66% over the last ten years**).*

the rate once the estimated costs to fully implement and operate wireless E-911 in the Commonwealth become known.

Recommendation (23): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider requiring the Emergency Telecommunications Division to re-evaluate the wireless E-911 funding mechanism annually, and include in its annual report to the Virginia State Crime Commission and the Public Safety Subcommittees of the House Appropriations and Senate Finance Committees of the Virginia General Assembly a recommendation to either reaffirm the funding mechanism or amend it as appropriate.

Conclusion. Finally, note that if set at the .75-cent rates discussed above, the wireline E-911 tax and the wireless E-911 tax would generate together $60.3 million during fiscal year 2000, $65.3 million during fiscal year 2001, and $70.4 million during fiscal year 2002, or more than two-thirds of the fiscal year 1999 ***total*** PSAP operating budgets. Those Virginia localities whose PSAPs are currently wireline E-911 compliant (108), if directed to begin taking wireless E-911 calls directly, could tap ***both*** the wireline and wireless E-911 funds to defray those costs associated with the delivery of these services.

NON-EMERGENCY #77, AND THE STATE POLICE & WIRELESS 911

Non-emergency *#77.* Introduced by the Virginia Department of State Police in 1996, #77 was implemented to create a standard State Police highway-related emergency number for the motoring public. Since that time, the Department has worked with wireless service providers, coordinated with localities, and installed signs along major thoroughfares to make the public aware that #77 is the number to call for the State Police.

Similar to other states, the Commonwealth of Virginia has invested in the development and deployment of two highway-related wireless emergency numbers intended to put the motoring public in contact with the State Police. In keeping with the thrust of the Wireless Communications and Public Safety Act of 1999 (which designated 911 as the universal emergency assistance number within the United States) and recognizing that certain non-emergency situations will arise in which the State Police should serve as the first point of contact for the motoring public, #77 should be maintained and designated as a non-emergency number. Further, the Commonwealth will need to undertake efforts to notify the public of the proper use of #77, and ensure that the wireless location technology advantages soon to be associated with wireless E-911 are available for #77. Accepting that an incident may occur during

which a wireless subscriber dials #77 during an emergency, and that wireless emergency location technology can dramatically reduce the associated emergency response time, public safety concerns require that Virginia take those steps necessary to ensure that any number a wireless caller might dial results in the same level of service delivery.

Recommendation (24): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider designating 911 as the Virginia emergency telephone number, and to designate #77 as the Department of State Police wireless non-emergency number.

Recommendation (25): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider designating the Department of State Police Regional Emergency Call Centers as public safety answering points, and to authorize the Department of State Police to receive monies collected and deposited into the Wireless E-911 Fund pursuant to the applicable PSAP cost recovery provisions, as determined by the Virginia Emergency Telecommunications Board.

Recommendation (26): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to authorize the Emergency Telecommunications Division to work with the Virginia Department of Transportation to coordinate the replacement of those road signs installed along Virginia's major thoroughfares that promote #77 as a wireless emergency number.

Recommendation (27): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to authorize the Emergency Telecommunications Division to develop a public education strategy to notify Virginia's citizenry of the proper use of #77, and to keep the citizenry abreast of future wireless 911 and #77 developments.

The State Police & Wireless 911. The Virginia Department of State Police continues to serve as the primary wireless 911 public safety answering point for those Virginia localities that currently do not take wireless E-911 calls directly. Item 461 2c (1999 Appropriations Act) reinforced this message, but also stated clearly that it is the intent of the Virginia General Assembly that wireless 911 calls be delivered directly by the wireless service provider to the appropriate local PSAP, thereby minimizing the need for call transfers whenever possible.

Data collected for this study strongly suggests that the transferring of emergency calls poses an unacceptable public safety risk. These emergency calls can be dropped, in which case the caller would need to place a second 911 call, and/or can be routed to the wrong local PSAP – in which case the call would need to be re-routed. Further, lacking Phase II location technology, call transferring places an unnecessary burden on the emergency caller, requiring them to explain their situation multiple times to receive emergency service. Immediate public safety issues, then, demand that those Virginia localities whose PSAPs are currently wireline E-911 compliant (108) be directed to begin taking wireless E-911 calls by a date certain.

At this time, local PSAPs in Northern Virginia, and the Charlottesville/Albemarle and Lynchburg areas are primary PSAPs, meaning that wireless 911 calls are routed directly to them by the wireless service provider. In the remainder of the Commonwealth, wireless 911 calls are forwarded to one of the 7 Virginia State Police Regional Emergency Call Centers. If the wireless 911 emergency call requires the response of public safety personnel either in addition to or in lieu of the Virginia State Police, the Regional Emergency Call Center attempts to transfer the wireless 911 call to the local PSAP jurisdictionally responsible for answering the 911 calls from the location the call originated.

Though public safety concerns will be best served by a statewide enhanced emergency telecommunications system, as a precursor to establishing such a system, immediate public safety issues demand that all Virginia localities whose PSAPs are capable of receiving wireless E-911 calls directly be required to do so by a date certain. Data collected for this study strongly suggests that the transferring of emergency calls poses an unacceptable public safety risk. These emergency calls can be dropped, in which case the caller would need to place a second 911 call, and/or can be routed to the wrong local PSAP – in which case the call would need to be re-routed. Further, lacking Phase II location technology, call transferring places an unnecessary burden on the emergency caller, requiring them to explain their situation multiple times to receive emergency service.

In those areas of the Commonwealth where the wireless infrastructure is sufficiently built out to allow for the directing of wireless 911 calls to the appropriate local PSAP, those local PSAPs that are wireline E-911 compliant can begin taking wireless E-911 calls (Phase 0) immediately. FCC requirements provide wireless carriers with a six month window within which to implement Phase I or Phase II wireless E-911 service after receiving a valid request for such service from a local PSAP. Recognizing the important public safety interest served by having those local PSAPs serving Virginia's localities receive wireless 911 calls directly, and acknowledging the fact that those PSAPs serving 27 of Virginia's localities are not yet wireline E-911 compliant, the Virginia General Assembly should first require that all local PSAPs currently wireline E-911 compliant and capable of receiving wireless E-911 calls directly begin answering wireless 911 calls originating in their jurisdictions no later than January 1, 2001, and that all other local PSAPs capable of receiving wireless E-911 calls directly begin receiving these calls directly no later than January 1, 2002. Concurrently, the Virginia General Assembly should require that all of Virginia's local PSAPs are wireline E-911 capable by January 1, 2002. In those areas of the Commonwealth where the wireless infrastructure is not sufficiently built out to allow for the directing of wireless 911 calls to the appropriate local PSAP, the Virginia Department of State Police should continue to serve as the primary PSAP, and have access to the Wireless E-911 Fund pursuant to the applicable PSAP cost recovery provisions, as determined by the Virginia Emergency Telecommunications Board.

Recommendation (28): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to require that on or before January 1, 2001, all PSAPs serving Virginia's local jurisdictions that are currently wireline E-911 compliant and capable of receiving wireless E-911

calls directly begin answering wireless 911 calls originating in their jurisdictions; to require that all other local PSAPs capable of receiving wireless E-911 calls directly begin answering wireless 911 calls originating in their jurisdictions no later than January 1, 2002; and to authorize the Virginia Emergency Telecommunications Board to lead this effort and to make transitional or start-up payments to these PSAPs as determined by the Virginia Emergency Telecommunications Board.

Recommendation (29): As part of the restructuring of Code of Virginia § 58.1-3813, the Virginia General Assembly may wish to require that on or before January 1, 2002, all PSAPs serving Virginia's local jurisdictions develop and deploy a wireline E-911 system; and to authorize the Virginia Emergency Telecommunications Board to lead this effort and to make transitional or start-up payments to these PSAPs as determined by the Virginia Emergency Telecommunications Board.

Recommendation (30): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider designating the Department of State Police Regional Emergency Call Centers as public safety answering points, and to authorize the Department of State Police to receive monies collected and deposited into the Wireless E-911 Fund to offset dispatch center operating costs incurred for answering wireless 911 telephone calls originating in localities for which the Department of State Police continues to serve as the PSAP for wireless 911 telephone calls, as determined by the Virginia Emergency Telecommunications Board.

CONCLUSION

Since their inception, the management of Virginia's emergency telecommunications systems has been characterized by a lack of coordinated leadership and direction. As Virginia prepares to face increasingly complex challenges in the area of enhanced emergency telecommunications, communication, coordination and planning will become increasingly critical. Lacking this coordination, we can expect systems development and deployment costs to increase, and the implementation of an end-to-end emergency telecommunications system in Virginia to be delayed. So as to reduce costs and better serve important public safety interests, then, the Commonwealth will need to endorse an emergency telecommunications management and funding strategy that ensures coordinated leadership and direction, as well as accountability and oversight. By creating a permanent advisory body, introducing the ideals of equity, efficiency, economy, effectiveness, productivity, stability, and accountability to the cost recovery provisions, and directly relating wireline and wireless E-911 systems costs to revenues, Virginia will be able to more efficiently serve the citizenry's public safety interests, both now and in the future. Taken together, these moves will help to establish Virginia as *the* nationwide leader in the provision of enhanced emergency telecommunications services.

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Introduction

CRIME COMMISSION REVIEW

Study Issues

House Joint Resolution 215 (1998) directed the Virginia State Crime Commission to study the wireline and wireless 911 and E-911 systems, the #77 service, and the effect of such calls on state and local public safety agencies. The General Assembly instructed the Crime Commission to consult with the Department of State Police, the State Corporation Commission, the Department of Emergency Services, and the Office of the Attorney General in conducting this study. The Crime Commission was to present its findings and recommendations to the Governor and the 2000 Session of the General Assembly.

HJR 215 focuses narrowly on a series of specific questions in directing the Crime Commission to address the issues catalogued below:

- Which jurisdictions in the Commonwealth do not have wireline and wireless E-911 services and what actions are necessary to provide such service in those jurisdictions;
- The impact of federal regulations in the Federal Communications Commission docket order 94-102 on localities;
- The impact of wireless 911 services on the Department of State Police;
- The management of wireless 911 calls in other states;
- The impact of the wireless 911 and E-911 systems on the wireline 911 and E-911 systems;
- The most efficient funding mechanisms for wireline and wireless 911 and E-911 systems;
- The extent to which common management of the wireline and wireless 911 and E-911 systems can maximize the economic and operational efficiencies of both systems; and
- The current volume of 911, E-911, #77, and wireless 911 calls in the Commonwealth and the projected volume through the year 2005.

Additionally, the study mandate calls upon the Crime Commission to develop recommendations that address the following topics:

- How to improve the 911 and E-911 systems, and ways to promote the use of #77 among citizens for nonemergency services;

- How to provide wireline and wireless E-911 services in jurisdictions that do not have such service;

- Ways to mitigate the economic impact on localities of complying with the Federal Communications Commission docket order 94-102;

- How to fund most efficiently the wireline and wireless 911 and E-911 systems;

- How to manage any increased responsibility that the Department of State Police may incur due to an increase in the volume of 911, E-911, and #77 calls.

Research Methods

In response to this study mandate, the Crime Commission undertook a variety of research activities. First, staff conducted a literature review. The study's conceptual framework and study questions guided this literature review. The purpose of this review was to refine the conceptual framework and enhance staff's knowledge of telecommunications issues generally, and wireline and wireless E-911 issues specifically. In the process, the literature review helped staff:

- Better plan and prepare for state comparison analyses, interviews, survey work, and site visits;

- Elaborate and refine the concepts and questions in the study mandate;

- Clarify the relationships among those concepts and questions; and

- Keep abreast of state and national trends in the field of inquiry.

Informed by the literature review, staff constructed a purposeful sample of states for comparison. The power of purposeful sampling lies in selecting information-rich cases for study in depth. Information rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the evaluation.[1] Though several different strategies for purposeful sampling exist, here staff employed *politically important case* sampling, and then combined *criterion* and *critical case* sampling strategies in an effort to further enhance the analysis conducted herein.

First, given their proximity to Virginia, staff deemed Maryland, North Carolina, South Carolina, and Tennessee as *politically important*. The logic of *criterion sampling* is to review and study those cases that meet some predetermined criterion of importance. Given the emphasis

[1] See Michael Quinn Patton (1987), *How to Use Qualitative Methods in Evaluation* (Sage Publications: Newbury Park), p. 52.

of HJR 215 on wireline 911 and wireless 911, and the related funding mechanisms, staff determined to select for examination only those states that - as of January 1999 – had enacted both wireline and wireless 911 legislation. This number (thirty-one) was made more manageable via *critical case sampling*. Summarizing, critical cases are those that are particularly important in the scheme of things. Here, those states that enacted a wireless 911 cost-recovery statute as of January 1999, and were repeatedly highlighted by on-point literature and designated by interviewees as being trendsetters in the field of inquiry included California, Connecticut, Indiana, Minnesota, and Texas.[2]

Another principal method of collecting information was conducting interviews. Regarding the interviews, the goal was to develop a sample composed of informed observers who could comment knowledgeably about wireline and wireless 911 and E-911 issues as witnessed from their particular vantage points. Most of the informants were chosen based on recommendations made by those individuals initially contacted and interviewed - persons who hold senior positions with the Virginia chapters of the Association of Public Safety Communications Officials (APCO) and the National Emergency Number Association (NENA), persons who hold senior positions with the national chapters of APCO and NENA, public safety officials in the comparison states highlighted above, and telecommunications industry representatives. The sample was further developed via a "snowballing" technique.[3]

As part of the review, the Virginia Chapter of the National Emergency Number Association agreed to share with Crime Commission staff information collected from a mail survey of all of Virginia's primary and secondary local Public Safety Answering Points (PSAPs). This survey probed for a variety of information, including PSAP wireline and wireless 911 call volume, and whether the PSAP collects an E-911 wireline tax. The overall objective of the survey was to collect information needed for a systematic assessment of the current volume of 911 calls placed in the Commonwealth, the projected volume of these calls through the year 2005, and other information germane to the study mandate. In an effort to supplement and verify some of the information provided in the surveys, staff used wireless 911 call transfer data compiled by the Virginia State Police, and did work closely with both wireline and wireless industry representatives. A copy of the survey form is included in **Appendix A**.

Pursuant to Item 9 2c (1999 Appropriations Act), a second mail survey of all of Virginia's local governments was constructed by Crime Commission staff and Virginia's Auditor of Public Accounts. This survey focused on wireline 911 generally, and how local governments administer and account for those funds generated by the local tax for enhanced emergency telephone service (*Code of Virginia*, § 58.1-3813). After collecting and assimilating the data

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[2] Given the complexity of the issues associated with wireline and wireless 911, and cognizant of the central role played by the 911 emergency number in the delivery of public safety and emergency medical services to the Commonwealth's citizenry, staff later determined to examine all fifty states. The goal of this effort was to acquire a more complete understanding of wireless 911 issues.

[3] For a further discussion of "snowball" sampling techniques, see Patrick Biernacki and Dan Waldorf (1981), "Snowball Sampling: Problems and Techniques of Chain Referral Sampling," *Sociological Methods and Research* 10: 141-163, and Michael Quinn Patton (1987), *How to Use Qualitative Methods in Evaluation* (Sage Publications: Newbury Park).

provided in the surveys, the Auditor of Public Accounts then conducted a follow-up study of forty randomly selected local jurisdictions. A copy of the survey form is included in **Appendix B**.

Finally, fieldwork for this study included visits to local call centers in Central Virginia, Northern Virginia, and Tidewater. Staff attended and spoke at APCO and NENA conferences, as well as a conference hosted by the Virginia Telecommunications Industry Association (VTIA). Finally, staff attended meetings of Virginia's Wireless E-911 Board.

Chapter 1: Background

Chapter 1 provides an historical context for the development and current status of wireline and wireless emergency 911 service in Virginia. This chapter consists of the following sections:

- Introduction
- Overview of the Development of 911 Generally
- Overview of Wireline 911 in Virginia
- Overview of the Wireless Telecommunications Industry
- The 1996 Federal Communications Commission Order
- 1998 Session of the Virginia General Assembly
- 1999 Session of the Virginia General Assembly
- Current Status of Wireline and Wireless 911 in Virginia
- Summary of Issues

INTRODUCTION [1]

When people want to report an emergency in the Commonwealth of Virginia, they either dial the emergency access number 911 or an established seven digit emergency number. Dialing this number from a telephone connected by wires (i.e., a *wireline* telephone) to the Public Switched Telephone Network (PSTN) will connect the caller to a 911 call answering center.[2] The 911 call answering center is known as a Public Safety Answering Point (PSAP).[3]

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[1] Much of the information in this chapter is drawn from the Federal Communication Commission's *Report and Order and Further Notice of Proposed Rulemaking*, 11 FCC RCD 18676 (1996) (*E-911 First Report and Order*), and *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems* (CC Docket No. 94-102, 1997). Other information relied upon include documents published by the National Emergency Number Association (NENA), and the Association of Public Safety Communications Officials (APCO) - especially the *National Emergency Number Association Master Glossary of 911 Terms* (NENA, March 1998), and the Cellular Telecommunications Industry Association (CTIA) - especially CTIA's *Semi-Annual Wireless Survey*. Kansas' *Performance Audit Report: Reviewing the 911 Emergency Phone System* (Legislative Division of Post Audit, August 1999), Minnesota's *Effective 911 Dispatching Identified* (Minnesota Office of the Legislative Auditor, April 1998), and Washington State's *Enhanced 911 Funding Study for Wireless Telecommunications in Washington State* (Washington State Department of Revenue, December 1998) were particularly helpful. Some of the information is drawn from interviews and site visits.

[2] A **Public Switched Telephone Network** (PSTN) is the network of equipment, lines, and controls assembled to establish communication paths between calling and called parties throughout the United States.

[3] A **Public Safety Answering Point** (PSAP) is a facility equipped and staffed to receive 911 calls. Primary PSAPs receive emergency calls directly. If the call is relayed or transferred, the next receiving PSAP is designated a Secondary PSAP.

If the PSAP has only a Basic 911 system, the 911 call taker must ask for the phone number and location of the caller because this information does not automatically display at the PSAP.[4] If the PSAP has an Enhanced 911 (E-911) system, this information automatically appears on the call taker's computer screen.[5] If the 911 call is from a wireless phone, the 911 call taker will currently not receive this information on the computer screen at the PSAP regardless of the type of wireline 911 system.

Throughout the report there are definitions that will help the reader understand the terminology used. The following definitions cover the most common terms used in this report.

Basic 911. An emergency telephone system which automatically connects 911 callers to the 911 call answering center, known as the Public Safety Answering Point (PSAP), for the purpose of reporting police, fire, medical, and other emergency situations. With Basic 911 service, the call taker asks the 911 caller for their phone number and location because this information does not display at the PSAP.

Enhanced 911 (E-911). An emergency telephone system that is capable of (1) sending a 911 call to the PSAP that serves the caller; (2) providing Automatic Number Identification (ANI); and (3) providing Automatic Location Identification (ALI). With E-911, the caller's phone number and address information automatically appears on the call taker's computer display at the PSAP. Currently E-911 service for wireless phones is in its formative stages. When it becomes available, the caller's phone number and location information will automatically appear at the call taker's computer display at the PSAP.

Automatic Number Identification (ANI). The automatic computer display at the PSAP of the telephone number of the phone being used to place the 911 call. This could be a wireline phone or – in the near future – a wireless handset.

Automatic Location Identification (ALI). The automatic computer display at the PSAP of the address of the wireline telephone subscriber or the location of the wireless handset or cell site location. ALI can also display associated emergency response information, such as fire, police, and medical services for the caller's area.

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[4] **Basic 911** is an emergency telephone system that automatically connects 911 callers to a designated PSAP. Call routing is determined by the originating **Central Office** - the Local Exchange Carrier (LEC) facility where access lines are connected to switching equipment for connection to the PSTN and, ultimately, the PSAP.

[5] **Enhanced 911** is an emergency telephone system which includes network switching, database, and Customer Premises Equipment (CPE) capable of providing **Selective Routing** (the routing of a 911 call to the proper PSAP based upon the location of the caller), **Selective Transfer** (the capability to transfer a 911 call to a response agency by operation of one of several buttons typically designated as police, fire, and emergency medical), **Fixed Transfer** (the capability of a PSAP attendant to transfer a 911 call to a predetermined location by activating a single button), **Automatic Number Identification - ANI** (the telephone number associated with the access line from which the emergency call originated), and **Automatic Location Identification - ALI** (the automatic display at the PSAP of the caller's telephone number, the address/location of the telephone and supplementary emergency services information).

Public Safety Answering Point (PSAP). A designated 911 call answering point. It is a facility equipped and staffed to receive 911 calls from a specific geographic area, which may be a city, county, or more than one county.

OVERVIEW OF THE DEVELOPMENT OF 911 GENERALLY

History

"911" is the three digit telephone number that has been designated as the "Universal Emergency Number" for public use throughout the United States to request emergency assistance. It is intended as a nationwide telephone number that gives the public direct access to a PSAP that will be responsible for taking the appropriate action. The widely acknowledged advantages of a single, three-digit, nationally recognized emergency number include:

- It can be dialed quickly;
- It is easy to remember; and
- It is the same no matter where you are, or which public safety entity you need, i.e. police, fire, and/or ambulance.

In the United States, the first catalyst for a nationwide emergency telephone number gained momentum in 1957 when the National Association of Fire Chiefs recommended use of a single number for reporting fires nationwide.

In 1967, the President's Commission on Law Enforcement and Administration of Justice recommended that a "single number should be established" nationwide for reporting emergency situations. The use of different telephone numbers for each type of emergency was determined to be contrary to the purpose of a single, universal number. Other Federal Government Agencies and various governmental officials also supported and encouraged the recommendation. As a result of the immense interest in this issue, the President's Commission on Civil Disorders turned to the Federal Communications Commission (FCC) for a solution.

In November of 1967, the FCC met with the American Telephone and Telegraph Company (AT&T) to find a means of establishing a universal emergency number that could be implemented quickly. In 1968, AT&T announced that it would establish the digits 911 as the emergency code throughout the United States.[6] Congress backed AT&T's proposal and passed legislation allowing use of only the numbers 911 when creating a single emergency calling service, thereby making 911 a standard emergency number nationwide. One month later, on February 16, 1968, Senator Rankin Fite completed the first 911 call to be made in the United States in Halleyville, Alabama.

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[6] The code 911 was chosen because it best fit the needs of all parties involved. First, and most important, it meets public requirements because it is brief, easily remembered, and can be dialed quickly. Second, because it is a unique number, never having been authorized as an office code, area code, or service code, it best meets the long range numbering plans and switching configurations of the telephone industry.

In March of 1973 the White House's Office of Telecommunications issued a national policy statement which recognized the benefits of 911, encouraged the nationwide adoption of 911, and provided for the establishment of a Federal Information Center to assist units of government in 911 planning and implementation. The intense interest in the concept of 911 can be attributed primarily to the recognition of characteristics of modern society, i.e., increased incidences of crimes, accidents, and medical emergencies, inadequacy of existing emergency reporting methods, and the continued growth and mobility of the population.

In the early 1970s, AT&T began the development of sophisticated features for 911 with a pilot program in Alameda County, California. The feature was "selective call routing." This pilot program supported the theory behind the Executive Office of Telecommunication's Policy. By the end of 1976, 911 was serving about 17% of the population of the United States. In 1979, approximately 26% of the population of the United States had 911 service, and nine states had enacted 911 legislation. At this time, 911 service was growing at the rate of seventy new systems per year.

By the year 1987, those figures had grown to indicate that 50% of the U.S. population had access to 911 emergency service numbers. In addition, Canada recognized the advantages of a single emergency number and chose to adopt 911 rather than use a different means of emergency reporting service, thus unifying the concept and giving 911 international stature.

As we come to the close of the 20th century, nearly 93% of the population and 50% of the geographical area of the United States has access to 911. 95% of that coverage is E-911.

How 911 Works

911 calls are typically routed by Local Exchange Carriers (LECs) to PSAPs staffed by professionals trained to assist callers in need of emergency assistance and to direct calls to police, fire, and health emergency response providers. [7]

In its basic form, PSAP attendants who receive a 911 call gather all the necessary information about the nature and location of the emergency by questioning the caller. Over the last decade, emergency service personnel have upgraded most 911 systems and PSAPs to E-911, which adds features that permit more efficient and speedy responses. When a wireline 911 call is placed in a region with E-911 capability, the telephone number of the phone used for the call is typically passed to the LEC central office. A database (commonly referred to as the Master Street Address Guide), usually maintained by the LEC, is then used to selectively route the call to the most appropriate PSAP. In addition, the caller's telephone number and location, as well as which fire, police, and/or medical service is closest to the caller are transmitted to the PSAP, based on LEC records.[8]

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[7] A **Local Exchange Carrier** (LEC) is a telecommunications carrier under the state/local Public Utilities Act that provides local exchange telecommunications services. Also known as Incumbent Local Exchange Carriers (ILECs), Alternate Local Exchange Carriers (ALECs), Competitive Local Exchange Carriers (CLECs), Competitive Access Providers (CAPs), Certified Local Exchange Carriers (CLECs), and Local Service Providers (LSPs).

By helping emergency services personnel do their jobs more quickly and efficiently E-911 increases the probability that lives and property will be saved. Illustrating:

- E-911 capability increases the likelihood of rapid response by emergency services personnel in situations where callers are disoriented, disabled, unable to speak, or do not know their location. In these situations, E-911 permits the immediate dispatch of emergency assistance to the address of the wireline phone.

- E-911 capability decreases the likelihood of errors in reporting the location of the emergency and in forwarding accurate information to emergency personnel.

- A call dispatcher at a PSAP with E-911 capability can also call back in the event the call is disconnected.

OVERVIEW OF WIRELINE 911 IN VIRGINIA

1982 Legislation

In 1982, the Virginia General Assembly passed legislation creating a local tax for enhanced emergency telephone service (**see Appendix C**).[9] In authorizing those Virginia localities "which established or will establish an enhanced 911 emergency telephone system," to impose a special tax on the consumers of the telephone service (*Code of Virginia*, § 58.1-3813, Subsection A), the General Assembly recognized the following:

- The wireline 911 system in Virginia is administered by local units of government;

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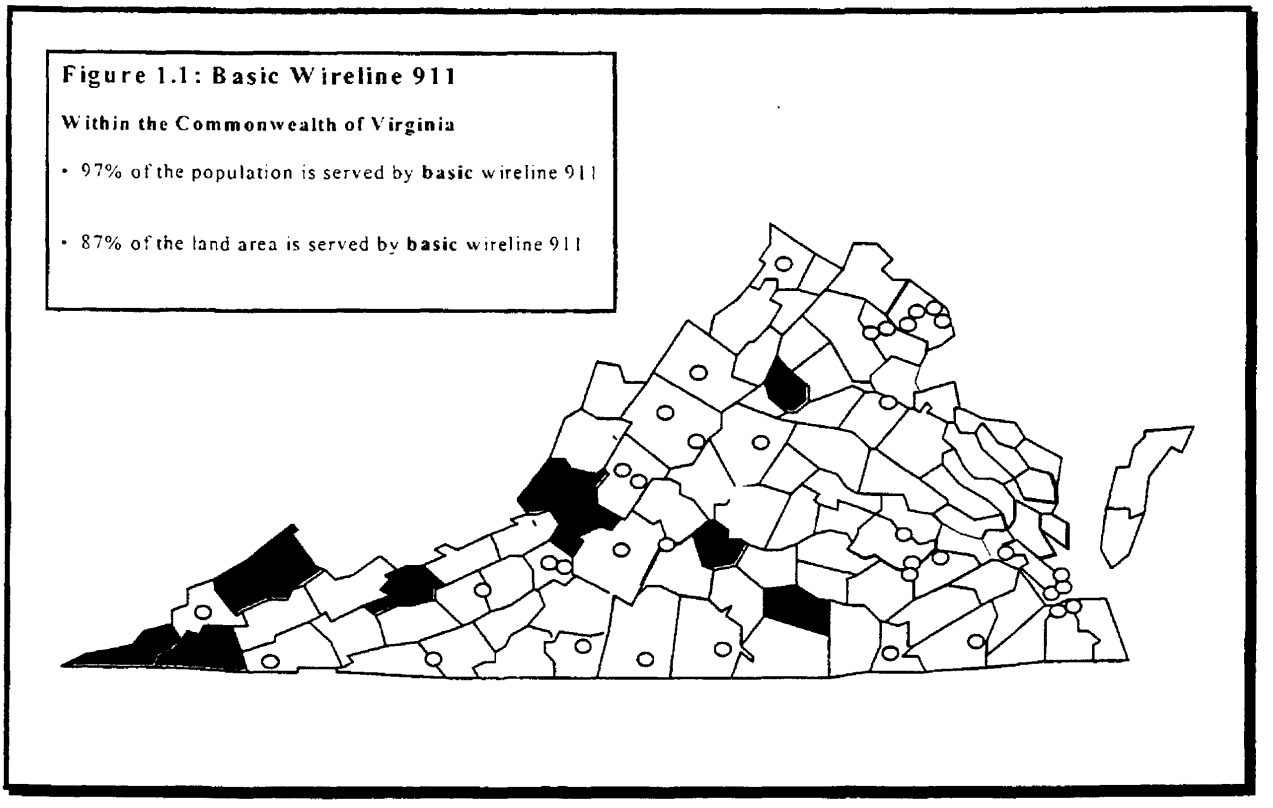
[8] The **E-911 database** has two parts. One is a database of customer phone numbers and street addresses. The other is a routing database. An **Emergency Service Number** (ESN) is assigned to a phone number. The ESN corresponds to the PSAP's jurisdictional boundaries. Through the routing database, it is known which emergency service responds to a particular phone number. This data is reported to be reusable, not easily disrupted, secure, unpublished information that has a high degree of accuracy.

[9] The language adopted during the 1982 session of the Virginia General Assembly was amended in 1984, 1993, 1995, and 1997. A summary of these amendments follows:

- **1984:** Whereas the 1982 language directed jurisdictions to "to repeal the tax when capital and installation costs have been fully recovered," amendments adopted in 1984 substituted the word "reduce" for "repeal," and broadened the applicable use of these revenues to include "recurring maintenance costs." The 1984 amendments also allowed for the compensation of LECs (at a rate of "3% of the amount of tax due") for "accounting for and remitting the tax."
- **1993:** Amendments adopted in 1993 broadened the applicable use of these revenues further to include "repair and system upgrade costs, and salaries of dispatchers or call-takers."
- **1995:** Afforded localities the option of exempting "from payment of the tax any subscriber to individual telephone service who resides in a nursing home or similar adult care facility."
- **1997:** Amendments adopted in 1997 broadened the applicable use of these revenues further to include "salaries or portions of salaries" for the "directors or coordinator of the E-911 program" in counties "with a population of no less than 45,000 and no more than 47,000."



- The effectiveness of wireline E-911 service depends on the ability of emergency communications to notify emergency service providers of the need to respond to a request for emergency assistance; and

- This effectiveness is in part affected by the availability of financial resources.

The particulars of this Section of the *Code of Virginia* - as amended – follow:

- First, this special tax is to be utilized "solely for the initial capital, installation and maintenance costs of the E-911 emergency telephone system...recurring maintenance, repair, and system upgrade costs, and salaries or portions of salaries of dispatchers or call-takers, and, in counties with a population of no less than 45,000 and no more than 47,000, of the director or coordinator of the E-911 program....which are directly attributable to the E-911 program." (*Code of Virginia*, § 58.1-3813, Subsection D)

- Second, it was expected that this special tax would be "reduced" over time. (*Code of Virginia*, § 58.1-3813, Subsection D)

- Finally, because the tax was to be collected and returned back to the locality by the telephone company serving the area, the legislation allowed for the compensation of the telephone company (*Code of Virginia*, § 58.1-3813, Subsection E). ("Such telephone utility shall be allowed three percent of the amount of tax due and accounted for in the form of a deduction in submitting the return and paying the amount due by it.")

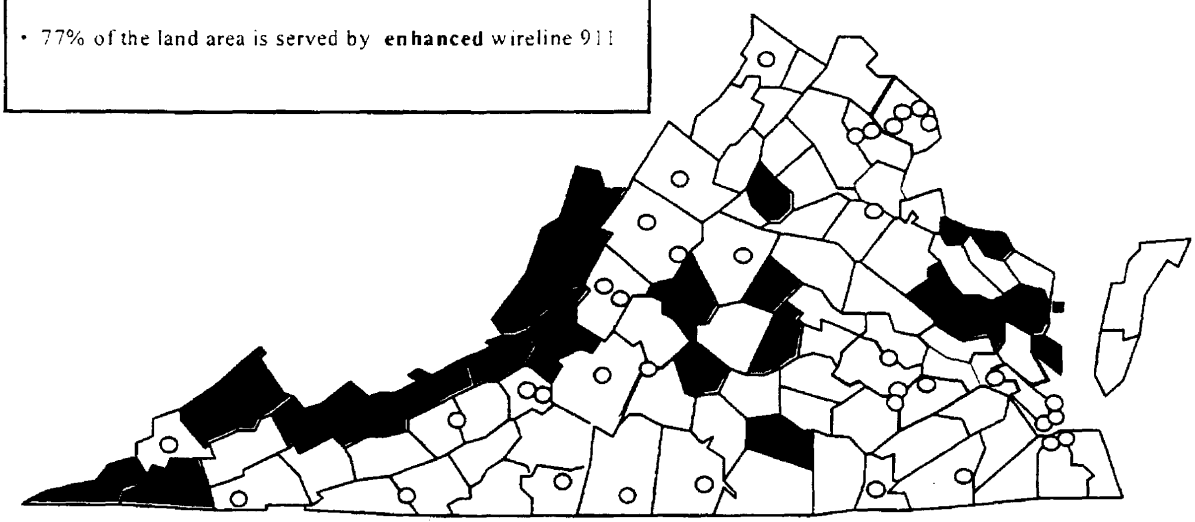
In 1999, the 135 local jurisdictions (cities and counties) in the Commonwealth were serviced by an estimated 150 primary and secondary PSAPs. 97% of Virginia's population (89% of the land area) was served by (at least) basic 911 (**see Figure 1.1 above**). 95% of Virginia's population (77% of the land area) was served by E-911 (see **Figure 1.2 below**).[10]

Local governments finance 911 services via the local tax for enhanced emergency telephone service discussed above. The average E-911 wireline tax in Virginia is $1.30.[11] Currently, an estimated twenty-two local telephone companies and roughly 5 million access lines service the Commonwealth.[12] Relying on local revenue data compiled by Virginia's Auditor of Public Accounts, the local tax for enhanced emergency telephone service generated an estimated $67 million during fiscal year 1999. This represented a 123% increase in local revenue generated from the local tax since fiscal year 1994 ($30 million).

Figure 1.2: Enhanced Wireline 911

Within the Commonwealth of Virginia

- 95% of the population is served by **enhanced** wireline 911
- 77% of the land area is served by **enhanced** wireline 911



[10] Information provided by the Virginia chapter of NENA. Population figures (1998 estimates) drawn from the University of Virginia's Weldon Cooper Center for Public Service.

[11] 911 tax and coverage service information compiled by Virginia's Auditor of Public Accounts pursuant to Item 9 2c (1999 Appropriations Act).

[12] Local telephone companies and access line information compiled by Virginia's State Corporation Commission. The lists were researched from November 1998 through January 1999 for the March 1999 edition of *Virginia Business*. An **access line** is the connection between a customer premises network interface and the LEC that provides access to the PSTN.

OVERVIEW OF THE WIRELESS TELECOMMUNICATIONS INDUSTRY

The concept of public wireless telephones using radio frequencies was developed in 1947. The first cellular system began operating in Chicago in 1983. From 1983 until 1992, there were two cellular telecommunications companies in each market and they provided the major wireless telecommunications service available to the public. In 1994, the wireless industry began to expand. Specialized Mobile Radio (SMR) licenses began implementing enhanced SMR systems to compete with cellular.[13] In 1995, Personal Communications Services (PCS) carriers started to provide wireless service to the public, enabling competition among multiple wireless providers in a given area.[14] As a result, the industry began to grow at a rapid rate. Growth was spurred further by the Telecommunications Act of 1996. In December 1983, there were an estimated 91,000 customers nationally. In 1998, the Cellular Telecommunications Industry Association (CTIA) estimated that there were almost 70 million wireless subscribers' nationwide **(see Table 1.1 below)**.[15] Additionally, wireless customers purchased over $33 billion in wireless

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[13] According to the *Federal Communications Commission's Wireless Telecommunications Bureau*, the **Specialized Mobile Radio** (SMR) service was first established by the Commission in 1979 to provide land mobile communications on a commercial (i.e., for profit) basis. A traditional SMR system consists of one or more base station transmitters, one or more antennas, and end user radio equipment that usually consists of a mobile radio unit either provided by the end user or obtained from the SMR operator for a fee. SMR end users may operate in either an "interconnected" mode or a "dispatch" mode. Interconnected mode interconnects mobile radio units with the PSTN. An end user may thus transmit a message with its mobile radio unit to the SMR base station. The call will then be routed to the local PSTN. This allows the mobile radio unit to function as a mobile telephone. Dispatch mode allows two-way, over the air, voice communications between two or more mobile units (e.g., between a car and a truck) or between mobile units and fixed units (e.g., between the end user's office and a truck). Typical SMR customers using dispatch communications include construction companies with several trucks at different jobs or on the road, with a dispatch operation in a central office. Today, the SMR industry has positioned itself alongside cellular and PCS as a provider of a broad range of wireless services.

SMR systems consist of two distinct types: conventional and trunked systems. A conventional system allows an end user the use of only one channel. If someone else is already using that end user's assigned channel, the end user must wait until the channel is available. In contrast, a trunked system combines channels and contains microprocessing capabilities that automatically search for an open channel. This search capability allows more users to be served at any one time. A majority of the current SMR systems are trunked systems.

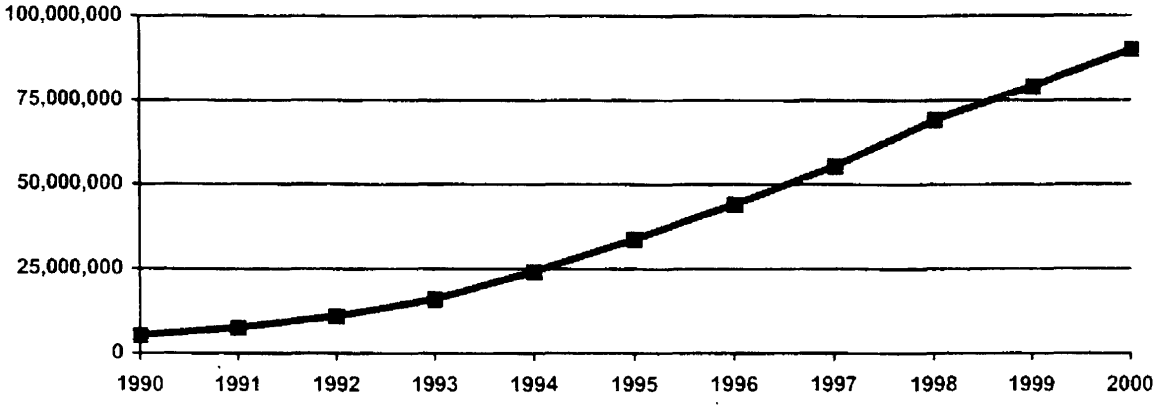
Although SMRs are primarily used for voice communications, systems are also being developed for data and facsimile services. Additionally, the development of a digital, rather than analog, SMR marketplace is allowing new features and services, such as two-way acknowledgment paging and inventory tracking, credit card authorization, automatic vehicle location, fleet management, remote database access, and voicemail. The growth of SMRs has been significant due to these new developments. Since 1984, SMR subscribers have grown from 240,000 units to more than two million units, and experts forecast continued growth through the turn of the century.

[14] **Personal Communications Services** (PCS) is a broad family of mobile or portable radio communications services that can include paging services, mobile order entry, and an array of in home services. Said to "free individuals from the constraints of the telephone wire and allow them to send and receive communications while away from their homes or offices," *Adams Telecom, Inc. v. FCC*, 38 F.3d 576, 579 (D.C. Cir. 1994), the PCS family is divided into two service categories: (1) narrowband (900 MHz) PCS, and (2) broadband.

[15] CTIA Semi-Annual Data Survey results, January 1999. CTIA's Semi-annual wireless industry survey develops industry-wide information drawn from operational member and non-member wireless service providers. It has been conducted since January 1985, originally as a cellular-only survey instrument, and has recently been designated as a survey instrument to include the new wireless service providers -- PCS and ESMR providers. No break-out of results specific to PCS or ESMR is available at this time.

Table 1.1: Wireless Subscribership: 1990 - 2000

Nationwide, the number of wireless subscriptions has grown at a rapid rate....



Note: 1999 & 2000 subscriberships are estimates based on industry expected 15 percent annual growth rates.

telecommunications services in 1998 (**see Table 1.2 below**), and placed almost 36 million wireless 911 distress calls (**see Table 1.3 below**).

The FCC regulates wireless telecommunications companies.[16] FCC authority over the wireless industry includes licensing, certain technical aspects of wireless service, timeframes in which service must be made available in given areas, and the provision of basic 911 and E-911 service. The FCC has the authority to preempt state laws or regulations that conflict with or prevent wireless telecommunications companies from meeting their federally mandated requirements. Federal law also prohibits states from regulating wireless telecommunications rates.

In the Commonwealth of Virginia, there are an estimated 1.5 million wireless subscribers.[17] Using the average telecommunications service expenditures per wireless customer

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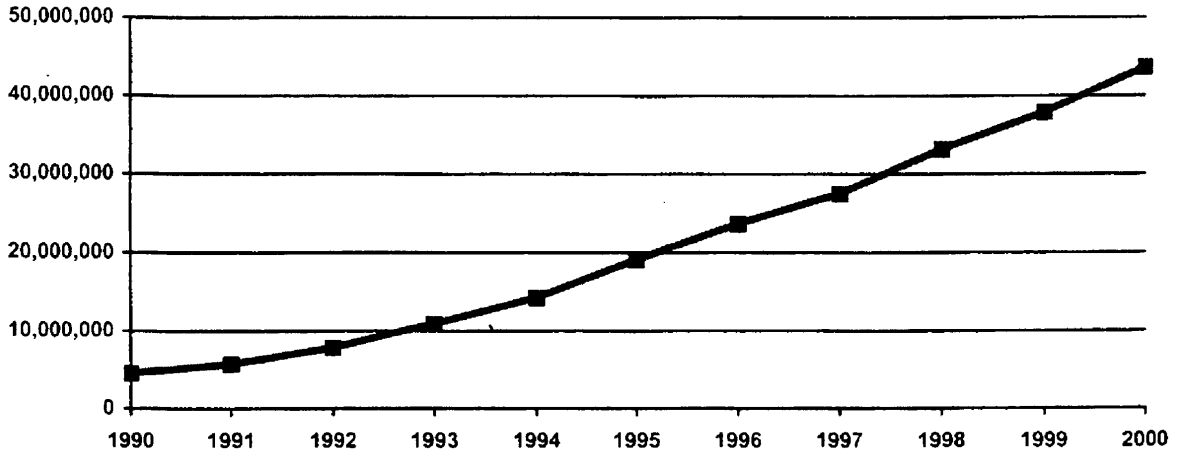
[16] The FCC issues licenses to the wireless companies to use specific radio frequency. The wireless companies occupy different portions of the radio spectrum. Cellular communications uses the 824 to 893 MegaHertz (MHz) frequencies. PCS uses the 1.8 to 1.9 GigaHertz (GHz) frequencies. SMR uses the 800 to 900 MHz frequencies.

[17] Estimated subscriber count as of July 1999. Arrived at by dividing the amount of funds expected to be generated by the wireless tax during fiscal year 1998 ($12 million to $14 million) by twelve (12), and then again by .75 (the rate of the wireless subscriber E-911 wireless tax). Relying on this measure is problematic. By linking specific subscriber information with those wireless service providers currently doing business in the Commonwealth, a more exact figure could be attained. Unfortunately, due to the proprietary nature of this information, staff was unable to discern via publicly available data the exact number of wireless telephone subscribers. Therefore, the 1.5 million figure represents staff's best estimate given accessible data.

Table 1.2: Annualized Wireless Revenues: 1990-2000 (in Thousands)

Nationwide, wireless customers purchased over $33 billion in services in 1998...



Note: 1999 & 2000 revenues are estimates based on 15 percent industry expected annual growth rates.

nationwide (roughly $470), we can estimate that gross revenues for wireless companies in the Commonwealth of Virginia totaled roughly $705 million in 1998. The aggregate number of wireless 911 calls received by the seven divisional Virginia State Police Regional Emergency Call Centers from January 1, 1998 through December 31, 1998, and those local PSAPs that currently receive wireless 911 calls directly – Division 2 and Division 7 (Northern Virginia), and the Charlottesville/Albemarle and Lynchburg areas – was a reported 709,018 (**see Figure 1.3 below**). This total does include #77 calls.[18]

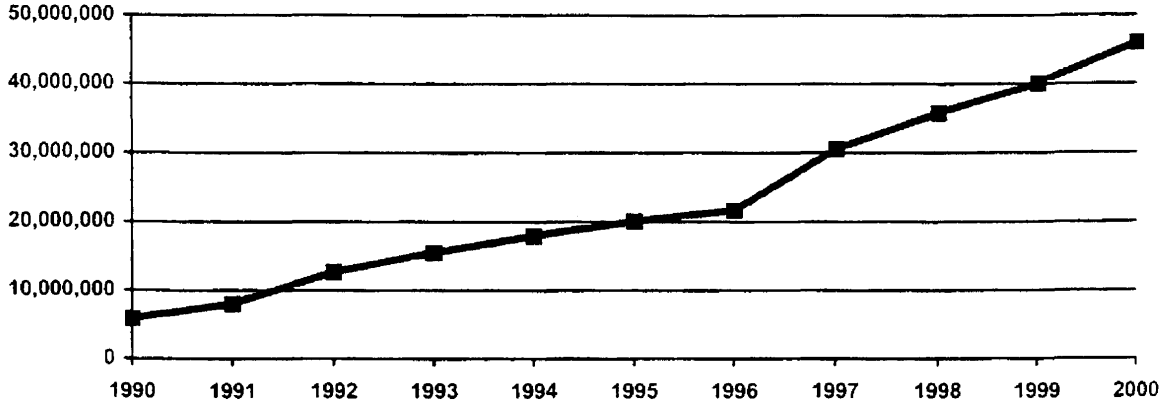
THE 1996 FEDERAL COMMUNICATIONS COMMISSION ORDER

In 1996 the Federal Communications Commission (FCC) sought to promote and improve the public safety applications of wireless technology. Recognizing that a significant reason many people purchased wireless telecommunications services was for safety and security, but that unlike wireline E-911 systems – which allow automatic number identification and automatic

[18] The Virginia State Police introduced #77 in 1996. According to the Virginia State Police, #77 was implemented for the following reasons: (1) to create a *highway related* emergency number for the motoring public; (2) to create a standard State Police emergency number statewide; (3) to reduce the number of wireless 911 calls that State Police Regional Emergency Call Centers must transfer to other agencies in order to obtain the service requested; and (4) to improve response time for public safety agencies in handling calls.

Table 1.3: Annualized Wireless 911 Distress Calls: 1990 - 2000

Nationwide, wireless customers placed almost 36 million 911 calls in 1998....



Note: 1999 & 2000 wireless 911 distress calls are estimates based on 15 percent industry expected annual growth rates.

location identification of wireline 911 calls - the phone number and the location of the caller cannot be displayed at the PSAPs for wireless calls, the FCC affirmed its commitment to the rapid implementation of technologies needed to ensure that wireless 911 callers receive the same location and call-back benefits of enhanced 911 systems that wireline callers currently receive. Consequently, that year the FCC issued Docket 94-102 which orders, among other things, that wireless companies must: (1) transmit all basic 911 calls to the appropriate PSAP from wireless handsets which transmit a code identification, without user identification; and (2) provide wireless E-911 service in two phases to any PSAP requesting it, providing certain prerequisites are met.[19]

Looking to remedy technical problems raised in the 1996 report, in December of 1997, the FCC adopted its *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, FCC Docket 94-102. Citing its mandate to "promote safety of life and property through the use of wire and radio communications," here the FCC reaffirmed its commitment to the rapid implementation of wireless E-911.[20]

In **Phase I** the wireless companies have to provide ANI and cell sector location to the PSAP.[21] Cell sector location identifies for the 911 call taker the location of the cell antenna

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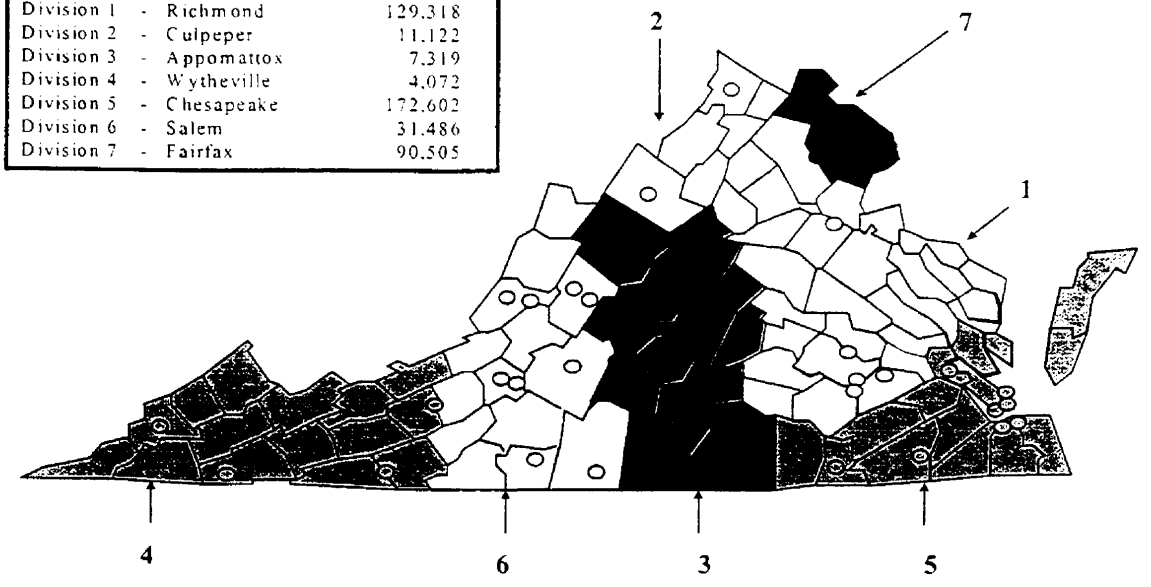
[19] See *Report and Order and Further Notice of Proposed Rulemaking*, 11 FCC RCD 18676 (1996) (*E-911 First Report and Order*).

[20] Subsequently, the FCC has revisited certain portions of FCC Docket Order 94-102. The more salient additions/changes to the Docket Order are discussed in Chapter 5 of this report.

Figure 1.3: Virginia Department of State Police: Regional Emergency Call Centers (1999)

Division 1	- Richmond	129,318
Division 2	- Culpeper	11,122
Division 3	- Appomattox	7,319
Division 4	- Wytheville	4,072
Division 5	- Chesapeake	172,602
Division 6	- Salem	31,486
Division 7	- Fairfax	90,505



through which the wireless 911 call is being transmitted or processed. Taken together, these capabilities are designed to allow the PSAP to call back the wireless phone placing the 911 call, and to assist the 911 call taker in determining the general area from which the wireless 911 call is being made.

Wireless companies were to have completed actions related to the provision of Phase I services by April 1, 1998. In setting this date the FCC, in December of 1997, did acknowledge that "it is not currently possible for carriers to provide reliable call back numbers for all wireless 911 calls, and it is unlikely that the capabilities can be developed, tested, and implemented prior to the scheduled April 1, 1998 implementation date."[22] Therefore, wireless carriers were permitted to request a waiver of the FCC Phase I rules.

> "If a carrier requests a waiver, it must show sufficient factual support that either (1) its network equipment is not capable of transmitting ANI and 'pseudo-ANI' and its equipment cannot be upgraded within the Phase I timetable; or (2) that the local exchange carrier (LEC) used by the covered carrier to transmit 911 calls to the PSAP does not have the capability of transmitting ANI and 'pseudo-ANI.' If a carrier requests a waiver of

[21] A **cell site** typically has one to three **cell sectors**. Each cell sector is an area geographically defined by the wireless company and served by one face of a cell antenna. Most wireless telephone companies typically assign each cell sector what is known as a Pseudo-ANI, or pANI, which is a 10-digit telephone number associated with a particular cell sector.

[22] FCC Docket 94-102, paragraph 109 (1997).

Phase I requirement because its own equipment requires upgrading, it must submit with its waiver request a deployment schedule for meeting the Phase I requirements."[23]

In **Phase II**, wireless carriers are required to have the capability to identify the latitude and longitude of a mobile unit making a 911 call within a radius of no more than 125 meters (roughly 410 feet) in 67 percent of all calls by October 1, 2001. Here, the FCC did not provide for a waiver process.

"In adopting the Phase II requirements, we found that the record supported the proposal made in the Consensus Agreement that the 5-year implementation schedule for ALI technology allowed adequate time to develop the currently available location technologies for various wireless systems."[24]

PHASE I: Within six months after being asked to do so, a wireless phone company must be able to transmit the following information to a local PSAP:

- The phone number of the wireless phone (so an emergency call taker can call that number back if the call is disconnected); and
- The location of the cell sector that received the phone's signal (so the emergency call taker can get a general sense of the caller's location).

PHASE II: A wireless phone company must be able to transmit the following information to a local PSAP by October 1, 2001:

- The location of the person making a wireless 911 call, by latitude and longitude, within 125 meters (about 400 feet) of the caller's actual location.

The FCC established the following prerequisites that must be met before a wireless service provider is required to provide either Phase I or Phase II E-911 wireless service:

- Wireless carriers must receive a request for E-911 service from a PSAP.
- The PSAP requesting the E-911 service must be capable of receiving and using the information provided by the wireless carrier.
- A mechanism for the recovery of costs relating to the provision of E-911 service must be in place.[25]

[23] FCC Docket 94-102, paragraph 91 (1997).

[24] FCC Docket 94-102, paragraph 120 (1997).

[25] Although some parties did contend that the FCC should clarify who would be eligible to recover their costs in implementing wireless E-911, the FCC declined. "We leave these issues to the state and local entities. We agree with the Joint Commentators that, absent failures of local agreement on funding mechanisms for the necessary

Additionally, if a wireless carrier receives a request for E-911 service less than 6 months before the scheduled implementation dates of Phase I (April 1, 1998) and Phase II (October 1, 2001), assuming the PSAP making the request is capable of receiving and utilizing the associated data elements, and that a mechanism for the recovery of related costs is in place, then the wireless carrier must comply with the Phase I and Phase II requirements within 6 months after the receipt of the notice specifying the request.[26] Generally, this language has been interpreted both by PSAPs and wireless carriers as providing wireless carriers with a six month window within which to implement wireless E-911 service after receiving a valid request for such service, regardless of when the request for wireless E-911 service is made.

Finally, though the FCC did conclude that state actions that are incompatible with FCC Docket 94-102 are subject to preemption, the Commission chose to address this matter on a case-by-case basis.[27] Further, the Commission decided not to exempt wireless carriers providing E-911 service from liability for certain acts by preempting state tort law.[28]

> "It is unnecessary to exempt providers of E-911 service from liability for certain negligent acts and to preempt state tort law. As we noted in the *E-911 First Report and Order*, states have particular interests in telecommunications and public safety matters, including operation of 911 emergency services. Although the Commission may preempt state regulation when preemption is necessary to protect a valid Federal regulatory objective, we believe it is premature and speculative for the Commission to establish a national standard of liability protection in the Order, 'displacing the jurisdiction of state courts over tort suits for negligence in installation, performance, provision, or maintenance of E-911 systems is not necessary to the inauguration of E-911 service.'"[29]

1998 SESSION OF THE VIRGINIA GENERAL ASSEMBLY

During the 1998 session of the Virginia General Assembly, Delegate Gladys B. Keating introduced House Bill 1331, the *Wireless Enhanced Public Safety Telephone Service Act.* This

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compatibility upgrades by PSAPs, wireless and wireline carriers, and radiolocation and equipment vendors, national prescriptions are not warranted" (FCC Docket 94-102, paragraph 146, 1997). Subsequently, the FCC did alter its stance as it relates to wireless carriers (see Chapter 5 below).

[26] FCC Docket 94-102, paragraph 11 (1996).

[27] FCC Docket 94-104, paragraph 105 (1996). The process for FCC preemption is as follows: A party petitions the FCC regarding the state law to be preempted. The FCC considers all comments and makes a decision. A party may ask for reconsideration of an adverse decision. Further reconsideration may be requested from the federal Court of Appeals and then from the United States Supreme Court. To date the FCC has not preempted any germane state laws.

[28] In August of 1999, the federal government passed the Wireless Communications and Public Safety Act of 1999. This legislation does provide wireless E-911 liability protection to wireless carriers, users of the service, and PSAPs. For a more complete discussion of this Act and its impact, see Chapter 5 of this report

[29] FCC Docket 94-102, paragraph 137 (1997).

legislation looked to provide the Commonwealth of Virginia with a cost recovery mechanism to implement FCC Docket Order 94-102.

As introduced, the legislation called for the creation of a *Wireless 911 Advisory Board.* This Board was to be staffed by five gubernatorial appointees (three wireless industry representatives, and two PSAP representatives). House Bill 1331 also instructed each wireless service provider to collect monthly a .50-cent state E-911 tax from each of its Virginia customers for deposit in a *Wireless E-911 Fund.*[30] After reducing the Fund by the amount needed to cover administration expenses, the Board was to designate 75% and 25% of these moneys to cover the costs incurred in complying with the requirements for E-911 systems of wireless service providers and PSAPs, respectively.

The General Assembly first amended and then passed House Bill 1331, creating a *Wireless E-911 Service Board* staffed by six gubernatorial appointees - two wireless and one wireline industry representatives, two PSAP representatives, and a county or municipality finance officer (see *Code of Virginia*, §§ 56-484.8 to 56-484.11). The Comptroller of the Commonwealth serves as the Board's seventh member and its Chairman. Wireless service providers collect a monthly fee of .75-cents assessed upon each of their assigned telephone numbers. These moneys are deposited into a fund to provide full payment to PSAPs of all "reasonable and direct" wireless E-911 PSAP costs and to wireless service providers of all "reasonable and direct" wireless E-911 wireless service provider costs.[31] For this purpose, PSAPs are to submit to the Board each year on or before October 1 their estimate of wireless E-911 PSAP costs they expect to incur during the next fiscal year. Similarly, each wireless service provider submits to the Board on or before December 31 of each year its estimate of wireless E-

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[30] **Wireless service providers** are often referred to as **CMRS providers**, meaning an entity authorized by the Federal Communications Commission to provide CMRS service within the Commonwealth of Virginia. **CMRS** means **commercial mobile radio service** as defined in Sections 3 (27) and 332 (d) of the Federal Telecommunications Act of 1996, 47 U.S.C. § 151 et seq., and the Omnibus Budget Reconciliation Act of 1993, Public Law 103-66, 107 U.S.C. § 312. The term includes the following:

(1) Services commonly referred to as wireless; and

(2) Services provided by a wireless real time two-way voice communication device, including radio-telephone communications used in:

(A) Cellular telephone service;

(B) Personal Communications Service; or

(C) The functional or competitive equivalent of a radio-telephone communications line used in:

(i) Cellular telephone service;

(ii) A personal communications service; or

(iii) A network radio access line.

[31] **Wireless E-911 PSAP costs** means all reasonable, direct, recurring, and nonrecurring capital costs and operating expenses incurred by a public service answering point in designing, upgrading, leasing, purchasing, programming, installing, testing, administering, delivering, or maintaining all necessary data, hardware, software and local exchange telephone service required to provide wireless E-911 service and direct personnel costs incurred in receiving and dispatching wireless E-911 calls.

Wireless E-911 CMRS costs means all reasonable, direct, recurring, and nonrecurring capital costs and operating expenses incurred by CMRS providers in designing, upgrading, leasing, purchasing, programming, installing, testing, administering, delivering, or maintaining all necessary data, hardware, software and local exchange telephone service required to provide wireless E-911 service.

911 costs that wireless carrier expects to incur during the next fiscal year. The Board then reviews these estimates and advises each PSAP and wireless service provider on or before the following March 1 whether its estimate qualifies for payment (**see Appendix D**). In addition to its approval of House Bill 1331, the General Assembly passed House Joint Resolution 215, directing the Virginia State Crime Commission to examine the wireline and wireless 911 and E-911 systems, the #77 service, and the effect of such calls on state and local public safety agencies.

1999 SESSION OF THE VIRGINIA GENERAL ASSEMBLY

The Virginia General Assembly in 1999 passed two budget amendments impacting wireline and wireless 911. First, Item 9 2c directed the Crime Commission, in cooperation with Virginia's Auditor of Public Accounts, to expand the scope of its study of emergency 911 communications to evaluate the assessment and utilization of the local tax for enhanced emergency telephone services.[32]

Second, the Virginia State Police - citing the increased volume of wireless 911 calls, the need to transfer most of these calls to the local PSAPs, and the potential for the caller to be inadvertently dropped during this process - backed item 461 2c (**see Appendix E**). Implicitly acknowledging the dangers associated with the current practice of transferring wireless 911 calls from State Police Regional Emergency Call Centers to local PSAPs, the Virginia General Assembly stated clearly that its' intent that wireless 911 calls be delivered directly by the wireless service provider to the appropriate local PSAP, thereby minimizing the need for call transfers whenever possible. This budget amendment also established a schedule for certain localities in the Central Virginia and Hampton Roads areas to begin receiving wireless 911 calls directly - now commonly referred to as **Phase 0** - and to be reimbursed for start-up expenses. In addition, this amendment provides for reimbursement of costs incurred by the Department of State Police in those areas where the State Police continues to serve as the primary public safety answering point for wireless 911 calls.

CURRENT STATUS OF WIRELINE AND WIRELESS 911 IN VIRGINIA

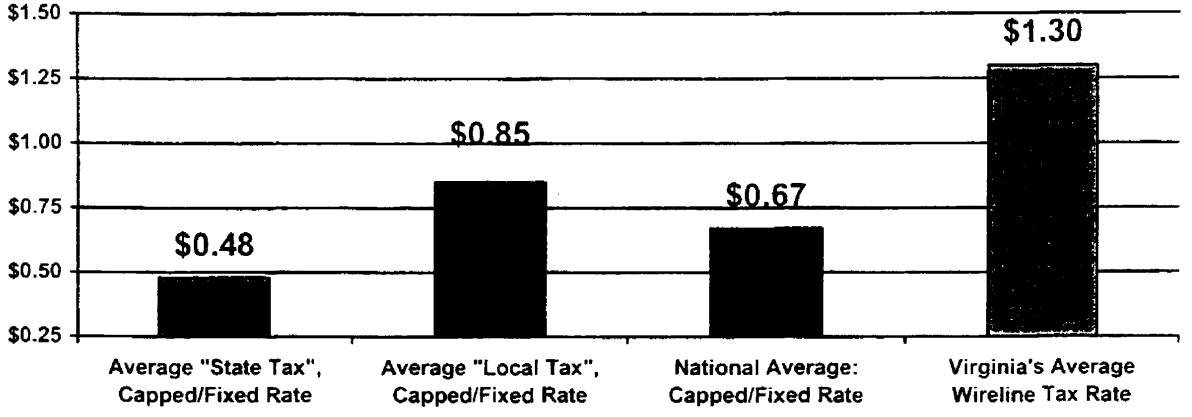
Wireline

The Wireline Rate. The Commonwealth's 136 local jurisdictions are serviced by an estimated 150 PSAPs. 97% of Virginia's population is served by basic 911, whereas 95% of Virginia's population is served by E-911. The average local tax for enhanced emergency

[32] Item 9 2c (1999) reads as follows: "The Crime Commission, in carrying out its study of emergency 911 services (pursuant to House Joint Resolution 215 of the 1998 General Assembly) shall study (i) the local tax for enhanced emergency telephone services as established in §58.1-3812 of the Code of Virginia; (ii) the extent to which the revenues generated by this tax have been utilized as required in §58.1-3813 D of the Code of Virginia; and (iii) the extent to which localities utilizing these funds are able to respond efficiently and effectively to the demand for E-911 service. Upon request by the Commission, the Auditor of Public Accounts shall provide financial information on the revenues received and disbursements made by localities providing E-911 services."

Table 1.4: E-911 Wireline Surcharge Rates

Compared to other states, Virginia's average E-911 wireline tax rate is high...



Note: **The above national average does not include those states that levy a tax based on a percentage formula, or those that mandate different rates based on (1) a jurisdiction's population; or (2) line use, i.e. business or residential.**

phone service is $1.30. Compared to three national measures developed from a review of all 50 states' 911 laws, Virginia's wireline E-911 tax rate is .63-cents above the national average of .67- cents, a number pulled from the 42 states that either "establish a ceiling" or "set the rate" for their wireline E-911 tax (**see Table 1.4 above**).

Once local jurisdictions fully recovered initial wireline E-911 capital and installation costs "to the level necessary to offset recurring maintenance, repair, and system upgrade costs, and salaries or portion of salaries of dispatchers or call-takers," localities are to ***reduce*** the local tax for enhanced emergency services (*Code of Virginia*, § 58.1-3813, Subsection D). The evidence collected shows that Virginia's wireline E-911 tax rate has increased 31% since Fiscal Year 1994, from an average of .99-cents in 1994, to $1.30 in 1999.[33] Further, evidence collected suggests that Virginia's local jurisdictions do raise the rate of the local tax for enhanced emergency telephone service so as to offset proportional decreases in funding of PSAPs from other local revenue sources. This practice does little to encourage localities to reduce the local tax for enhanced emergency telephone service.

E-911 Service Delivery & the Local Option Tax. As discussed above, the local tax for enhanced emergency telephone service (1982) is to be utilized "solely for the initial capital, installation and maintenance costs of the E-911 emergency telephone system." (*Code of Virginia*, § 58.1-3813, Subsection D). At this time, some jurisdictions levy a local tax for enhanced emer-

[33] This "average" initial rate is based on information provided by Virginia's Auditor of Public Accounts, pursuant to Item 9 2c (1999 Appropriations Act).

gency telephone service but do not provide wireline E-911 services. 911 tax and coverage service information indicates that these jurisdictions include the counties of Alleghany, Amherst, Botetourt, Essex, King William, Lunenburg, Middlesex, Nelson, Pulaski, Tazewell, and Westmoreland, and the city of Covington. These twelve jurisdictions have an average population of 15,807. The average local tax for enhanced emergency telephone service levied by these local jurisdictions is $1.39, .9-cents above the state average of $1.30, and .72-cents above the national "capped" average of .67-cents. On average, these jurisdictions have levied the tax for a period of four years. The number of years ranges from a low of one year to a high of seven years.[34]

Further, fourteen jurisdictions are not yet wireline E-911 compliant though they ***do not*** levy a wireline E-911 tax. 911 tax and coverage service information indicates that these jurisdictions include the counties of Appomattox, Bath, Bland, Buchanan, Craig, Dickenson, Fluvana, Highland, King and Queen, Lee, Madison, Mathews, and Scott, as well as the city of Clifton Forge. The counties of Bath, Craig, Fluvana, Highland, King and Queen, and Mathews, and the city of Clifton Forge provide basic 911service, whereas the counties of Appomattox, Bland, Buchanan, Dickenson, Lee, Madison, and Scott provide no 911 service.[35]

The Link Between Wireline & Wireless E-911 Systems. Note that a prerequisite established by the FCC that must be met before a wireless service provider is required to provide either Phase I or Phase II wireless E-911 service is that the PSAP requesting the wireless E-911 service must be capable of receiving and using the information provided by the wireless carrier. PSAPs then that are not wireline E-911 capable can not request wireless E-911 service from the wireless service provider serving their jurisdiction.[36]

Wireless

Wireless E-911 Call Transfers & Service Delivery. Wireline and wireless service providers, local PSAPs, and the Virginia State Police are currently examining how to provide wireless E-911 consistent with the FCC order. At this time, local PSAPs in Northern Virginia, as well as those PSAPs that serve the Charlottesville/Albemarle and Lynchburg areas are **primary PSAPs** - wireless 911 calls are routed directly to them by the wireless service provider. In the other areas of the Commonwealth, wireless 911 calls are forwarded to the appropriate Virginia State Police Regional Emergency Call Center **(see Figure 1.3 above)** by the wireless service provider. If the wireless 911 emergency call requires the response of public safety personnel either in addition to or in lieu of the Virginia State Police, the Regional Emergency Call Center

[34] Note that one of these jurisdictions (Bedford City) reports that will cut over to wireline E-911 during the fall of 1999. Eight of these jurisdictions (Alleghany, Botetourt, Essex, King William, Lunenburg, Nelson, and Westmorland County, and Covington City) report "tentative" cutover dates within the next year. One of these jurisdictions (Middlesex County) reports that their cutover date is still "a few years away," and one jurisdiction (Tazwell County) is awaiting the outcome of a pending SCC hearing concerning the tariff rates levied by their wireline telephone service provider. Crime Commission staff was unable to ascertain the wireline E-911 plans of Amherst and Pulaski County, and Falls Church City.

[35] The counties of Lousia and Russell provide wireline E-911 service, but do not levy a wireline E-911 tax.

[36] FCC Docket 94-102, paragraph 146 (1997).

then - based on the information provided by the caller - attempts to transfer the wireless 911 call to the local PSAP jurisdictionally responsible for answering the 911 calls from the location the call originated. Note that there are many dangers associated with the current practice of transferring wireless 911 calls from State Police Regional Emergency Call Centers to local PSAPs. Illustrating, these wireless emergency calls can be dropped, in which case the caller would need to place a second 911 call, and/or can be routed to the wrong local PSAP – in which case the call would need to be re-routed. Further, lacking Phase II location technology, call transferring places an unnecessary burden on the emergency caller, requiring them to explain their situation during a very stressful situation multiple times to receive emergency service.

Assuming here that the wireless emergency 911 call is routed to the appropriate local PSAP, if the reported emergency requires the response of Emergency Medical Technicians (EMT) and/or Fire and Rescue, the local PSAP will dispatch these units to the scene. Currently, the level of wireless 911 service provided both by the Virginia State Police and Virginia's local PSAPs is basic (the call taker asks the 911 caller for their phone number and location because this information does not display at the PSAP). Echoing the sentiments of the FCC, providing wireless 911 callers with the same location and call-back benefits of wireline E-911 systems best serves the citizenry's public safety interests.

Phase I Location Technology. At this time, wireless service providers are capable of providing Phase I service to Virginia's primary PSAPs capable of receiving and using Phase I information. With a cost recovery mechanism in place (the .75-cent/month wireless 911 tax), wireless service providers doing business in Virginia are mandated by the FCC order to provide Phase I service upon receiving a valid request from a PSAP capable of receiving and using Phase I information. As of August 1999, 22 localities, including those from Northern Virginia, the Charlottesville/Albemarle area, Lynchburg, and those jurisdictions designated in item 461 2c (the cities of Chesapeake, Hampton, Newport News, Norfolk, Richmond, Suffolk, and Virginia Beach, and the counties of Chesterfield and Henrico) have submitted wireless E-911 funding requests totaling $4.73 million (staffing: $2.84 million; premise equipment: $1.34 million; wireline company charges: $545,500) for Phase I service. Pursuant with Item 461 2c (1999), the Virginia Department of State Police requested funding in the amount of $375,648 for the 1999 – 2000 fiscal year. In September of 1999, wireless service providers submitted wireless E-911 cost recovery requests totaling $4.5 million for the establishment of Phase I service for those 22 local jurisdictions. Currently the "Wireless E-911 Fund" has a balance of over $13 million.

Phase II Location Technology. Phase II wireless location technology provides more specific information to the primary PSAP from the wireless service provider regarding the location the 911 call originated from. The primary difference between Phase I and Phase II is the degree of caller location accuracy. Phase I requires accuracy to the cell sector level, while Phase II - via latitude and longitude coordinates - requires accuracy within a specified distance depending on the technological solution (handset or network) chosen. Various types of location systems have been proposed for locating cellular telephones. The primary objective of Phase II location determination in a wireless 911 environment is to establish as closely as possible the location of the call origination, so that accurate call routing can be achieved and useful location information can be presented to the 911 call taker.

Neither wireless service providers nor Virginia's PSAP community are currently prepared to provide Phase II location technology. Looking first at the wireless service providers, unknowns concerning which of the competing Phase II location technologies will prevail, as well as the costs associated with implementing location identification are among the wireless industry's biggest concerns. Turning to Virginia's PSAPs, wireline E-911 calls are presented to PSAP call takers as textual information, providing them with a street address which the emergency dispatcher reads out to the police, fire, and/or medical crews. Location information for wireless calls will come in some form of latitude and longitude coordinates that require the graphic rather than textual display of location information. Since current PSAP workstations are not equipped to process this type of information, workstations will have to be upgraded to handle electronic mapping.[37]

SUMMARY OF ISSUES

Both the wireline and wireless telecommunications companies, and Virginia's 911 community agree that wireline and wireless E-911 service is important to public safety and they are working together to try to better serve the citizens of the Commonwealth. However, many issues remain unresolved, hindering the provision of wireline and wireless E-911 service to all of the Commonwealth's citizens.

Wireline

The following discussion acknowledges as paramount the fact that improved public safety remains an important objective of federal, state, and local governments, and that the public safety needs of Virginia's citizens will be best served by the rapid development and deployment of a statewide emergency telecommunications system.

First, evidence collected suggests that some jurisdictions do levy a local tax for enhanced emergency telephone service but do not provide wireline E-911 services. Second, the local tax for enhanced emergency services – rather than decreasing - has increased over time. Finally, PSAPs that are not wireline E-911 capable can not request wireless E-911 service from the wireless service provider serving their jurisdiction. Recognizing that improved public safety remains an important objective of federal, state, and local governments, and that the public safety needs of Virginia's citizens will be best served by the rapid development and deployment of a statewide emergency telecommunications system, there are differences of opinion concerning whether the local tax for enhanced emergency telephone service should remain a local option tax, and whether common management of wireline and wireless 911 systems can maximize economic and operational efficiencies, thereby facilitating the delivery of wireline and wireless E-911 services to all of the Commonwealth's citizens.

[37] Text v. graphics display of location information is a Phase II issue only. For Phase I, wireless service providers are telling PSAPs that they will be able to provide cell-site information in a text format that will not require any costly equipment upgrades.

Wireless

The spectacular growth in the number of wireless 911 calls placed in Virginia (both via 911 and #77) has exacerbated tensions between the wireline and wireless telecommunications companies, Virginia's local 911 community, and the Virginia Department of State Police. These tensions are exacerbated further by the fact that wireless location technologies are as much a business opportunity as they are a public service. As a result, there are differences of opinion concerning how best to provide wireless E-911 services in the Commonwealth. These differences touch upon every aspect of wireless E-911, including, but not limited to:

- How should wireless 911 calls be handled, i.e. who should be receiving directly wireless 911 calls;
- The future role of #77 and the Virginia State Police;
- The adequacy of the current funding mechanism to reimburse fully those charged by the FCC report and order with implementing wireless E-911;
- The schedule for providing Phase I and Phase II location technology, together with questions concerning the competing Phase II technologies;
- The possible competitive market applications of Phase II location technology, and whether these future applications should play a part in today's wireless E-911 cost recovery debates;
- The need to provide wireless service provider liability protection; and
- The current make-up - as well as the adequacy of the oversight and management capabilities - of the newly created Wireless E-911 Service Board.

CONCLUSION

Virginia State government and the Commonwealth's localities have the same ultimate goal, to deliver effectively and efficiently emergency telecommunications services to Virginia's citizenry. Unfortunately, to date a comprehensive report detailing emergency telecommunications services in Virginia has never been drafted. Acknowledging that the challenges posed are complex, this report attempts both to answer the questions posed by the study resolution, and to construct a time sensitive foundation for future efforts in this issue area. To that end, the following chapters of this report touch upon all of the issues introduced above in turn. Summarizing, **Chapter 2** provides a more detailed discussion of wireline and wireless E-911, one that examines more directly the technical and cost components associated with wireless E-911 Phase I and Phase II location technology. **Chapter 3** catalogues how other states fund and manage their emergency telecommunications systems. **Chapter 4** and **Chapter 5** focus on Virginia. *Chapter 4* investigates in more detail the questions surrounding wireline E-911 and the local tax for enhanced emergency telephone service. *Chapter 5* reviews the management, funding, and cost recovery issues associated with wireless E-911, and discusses how best to

promote the proper use of #77. **Chapter 6** summarizes the findings highlighted throughout the report, and presents options for legislative consideration. In the end, if the members of the Virginia General Assembly find that this effort adequately addresses the questions posed by HJR 215, and if those parties charged with working together to deliver this most important of public safety services to the Commonwealth's citizenry can recognize their world in what is written, then the goals of this effort will have been realized.

Chapter 2: Emergency Telecommunications Systems

Chapter 2 provides a more detailed discussion of wireline and wireless E-911 and examines more directly the possible technical solutions and costs associated with the delivery of Phase I and Phase II location technology. Due to the rapidly evolving nature of emergency telecommunications systems generally, this chapter is presented with the following caveat: it offers a time sensitive snapshot of these technical solutions and costs. Consequently, so as to serve better the future public safety interests of Virginia's citizenry, these issues will need to be regularly revisited. This chapter consists of the following sections:

- Current Wireline and Wireless 911 Service
- E-911 Service for Wireless Telecommunications
- Technical Solutions for Phase I and Phase II
- Upgrades to the Telecommunications Infrastructure
- Hypothetical Cost Analysis for Wireless E-911

CURRENT WIRELINE AND WIRELESS 911 SERVICE[1]

Introduction

Restating, to the public, 911 is the emergency telephone number they dial for fire, medical, and/or police emergency assistance. Callers use both wireline and wireless phones to access 911 service.

Technically, 911 is an emergency answering service. When the caller dials the digits 911 the call travels over the public telephone network to the LEC's switch. The switch recognizes the 911 digits and sends the call to a PSAP.

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[1] Much of the information in this chapter is drawn from Connecticut's *Report to the Public Safety and Public Health Committees* (Task Force to Study Enhanced 911 Telecommunications Service, February 1996), New Jersey's *Report on the New Jersey Wireless Enhanced 911 System Trial* (Department of Law and Public Safety, Division of State Police, June 1997), Texas' *Report to the Advisory Commission on State Emergency Communication* (Texas' Wireless Integration Project, May 1997), and Washington State's *Enhanced 911 Funding Study for Wireless Telecommunications in Washington State* (Washington State Department of Revenue, December 1998). Other information relied upon include the FCC's *Report and Order and Further Notice of Proposed Rulemaking*, 11 FCC RCD 18676 (1996) (*E-911 First Report and Order*), and *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems* (CC Docket No. 94-102, 1997), and documents published by NENA and APCO, as well as the wireless telecommunications industry. Some of the information is drawn from interviews and site visits.

Types of 911 Service

There are two types both of wireline and wireless 911 service - basic and enhanced. With Basic 911 service, all 911 calls go to the same PSAP in a particular area for the purpose of reporting police, fire, medical, and other emergency situations. With Basic 911 service, only the voice of the caller is provided. Therefore, the call taker must ask the 911 caller for their phone number and location, and then determine - based on the description provided by the caller - which police, fire, and emergency medical agencies need to respond to the caller's address. If the caller is unable to speak for any reason, or is not sure of their phone number and/or location, the call taker may not be able to provide assistance to the caller. As of June 1999, 97% of Virginia's population, and 89% of the land area is served by basic 911.

With basic 911, if the caller is either unable to speak, or is not sure of their phone number and/or location, the emergency call taker may not be able to provide assistance to the caller.

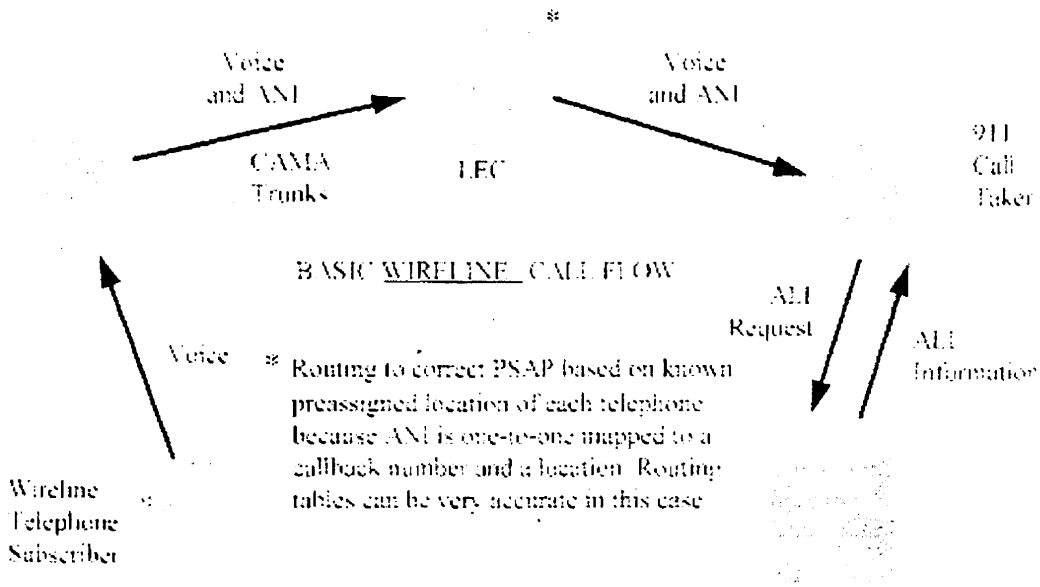
With enhanced 911 (currently only deployed in the Commonwealth via Virginia's wireline 911 system), the LEC switch routes the 911 call to the PSAP that serves the location of the caller. Routing both ANI (the display of the caller's phone number) and ALI (the display of the caller's location) information to the PSAP, the telephone subscriber's name, address, telephone number, and associated emergency response information is sent to a computer display at the call taker answering position at the PSAP and displayed textually. The emergency call taker then has the information needed to send help to those who are unable to speak, or are not sure of their phone number and/or location. As of June 1999, 95% of Virginia's population, (and 77% of the land area) is served by enhanced 911. As of August 1999, twenty-two (22) localities have submitted requests totaling $4.73 million to the current Wireless E-911 Service Board to implement Phase I service. Pursuant with Item 461 2c (1999), the Virginia Department of State Police Requested funding in the amount of $375,648 for the 1999 – 2000 fiscal year. In September of 1999, wireless service providers submitted cost recovery requests totaling $4.5 million for the establishment of Phase I service for those 22 local jurisdictions referenced above.

Currently, all wireless 911 service in the Commonwealth is basic 911. Some of Virginia's PSAPs have recently (August 1999) requested ANI service from wireless service providers.

The Delivery of Wireline and Wireless E-911 Service

Wireline E-911 calls travel over a network of landlines from the caller to the appropriate PSAP (**see Figure 2.1 below**). Wireless 911 calls travel via the wireless network to the wireline

Figure 2.1: Path of a Wireline E-911 Call



Note: Diagram drawn from BELLSOUTH's website: http://www.bellsouthcorp.com/issues/911/chart2.html

system and then to the PSAP (**see Figure 2.2 and Figure 2.3 below**). The major components[2] of the E-911 wireline system are:

The Public Switched Telephone Network (PSTN). The network of equipment, lines, and controls assembled to establish communication paths between calling and called parties throughout the United States.

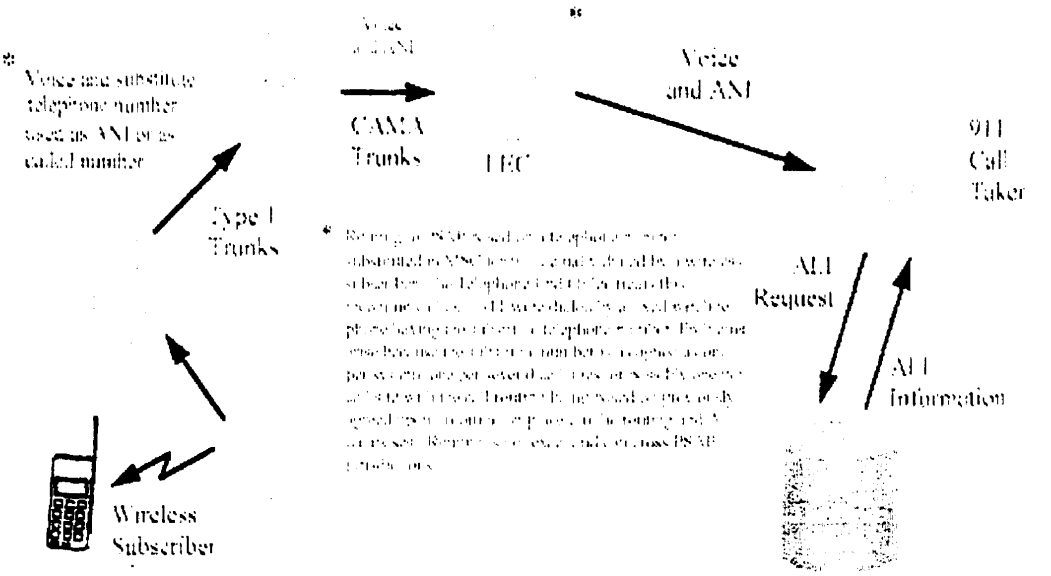
The Dedicated E-911 System. The network, database, and the specialized E-911 equipment at the PSAP that is required to display the E-911 caller's phone number, location, and associated emergency response information. The system includes **dedicated telephone trunks** (a trunk is a communication path between central office switches, or between the local telephone company's Central Office and the PSAP) that are used only for 911 calls.[3]

The E-911 Selective Router. This is a piece of equipment located at the wireline telephone company's **regional switch** (the regional switch – commonly referred to as the **tandem switch** – manages the call from one or more jurisdictions).[4] The selective router sends the E-911 call to

[2] Definitions drawn from NENA's *National Emergency Number Association Master Glossary of 911 Terms* (NENA, March 1998)

[3] **The Central Office** is the local telephone company facility (local exchange carrier) where access lines are connected to switching equipment for connection to the PSTN. Related, the **E-911 Control Office** provides the tandem switching of 911calls. It controls delivery of the 911 call to the PSAP and provides Selective Routing, Selective Transfer, Fixed Transfer, ANI and ALI.

Figure 2.2: Path of a Wireless E-911 Call - Number Substitution Call Routing



Note: Diagram drawn from BELLSOUTH's website: http://www.bellsouthcorp.com/issues/911/chart3.html

the proper PSAP based on the telephone number of the calling party, the location of the caller, and a routing code called an Emergency Services Number (ESN).[5] It controls delivery of the 911 call to the PSAP and provides Selective Routing, Selective Transfer, Fixed Transfer, ANI and ALI.

The E-911 Database. The database that houses the ANI and ALI records of wireline telephone subscribers. The information includes a database of street names and house number ranges, and the telephone customer's names, addresses, phone numbers, and emergency response information. The 911 database is maintained by the local telephone company.

The 911 Public Safety Answering Points (PSAPs). The facilities that are equipped and staffed to handle 911 calls at all times. A primary PSAP receives the call directly. A secondary PSAP only receives calls that have been transferred to them by the primary PSAP.

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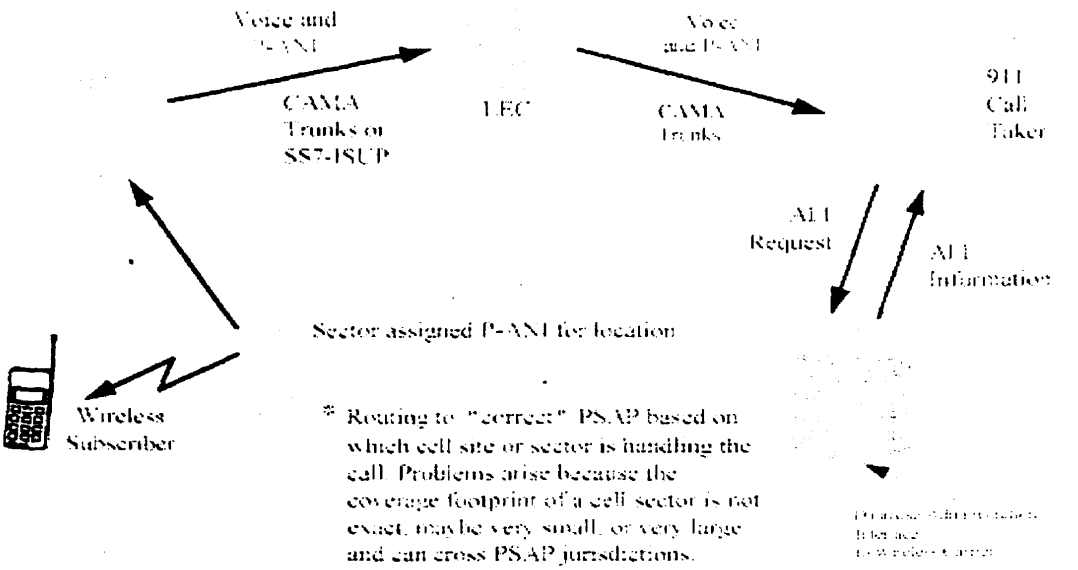
[4] For example, Bell Atlantic has two regional switches, one in Fairfax and one in Alexandria that manage calls for five Northern Virginia jurisdictions.

[5] An **Emergency Services Number (ESN)** is a three to five digit number representing a unique combination of emergency service agencies (Law Enforcement, Fire, and Emergency Medical Service) designated to serve a specific range of addresses within a particular geographical area, or **Emergency Service Zone (ESZ)**. The ESN facilitates selective routing and selective transfer, if required, to the appropriate PSAP and the dispatching of the proper service agency(s).

Figure 2.3: Path of a Wireless E-911 Call - P-ANI or Cell Sector Call Routing



Note: Diagram drawn from BELLSOUTH's website: http://www.bellsouthcorp.com/issues/911/chart4.html

How Does Wireline E-911 Service Work?

When a caller dials 911 from a wireline phone, the call travels over the PSTN just like any other call to the telephone company's Central Office. At the Central Office, the switching equipment recognizes the digits 911 and immediately transfers the call from the PSTN to dedicated 911 trunks that carry the call to the 911 selective router. At the 911 selective router, specialized software recognizes the 911 routing number associated with the caller's telephone number and routes the call along dedicated 911 trunks to the PSAP that serves the caller's geographic area. When the 911 call is received by the 911 equipment at the PSAP, the caller's phone number is automatically sent to the 911 database, which is maintained by the local telephone company providing 911 service to the PSAP. The caller's name, address, telephone number, and associated emergency response information is retrieved from the 911 database. The caller's information is sent to the PSAP over the data circuits to a display at the call taker answering position. The call taker then has the information needed to send help to people who are unable to speak or do not know their telephone number or location (**see Figure 2.1 above**).

How Does Wireless 911 Service Work?

Wireless 911 calls rely first on the network of radio frequencies, cell sites, equipment, and controls that are assembled to transport a wireless call from a wireless phone to the PSTN (**Wireless Telecommunications Network**). When a caller dials 911 from a wireless phone, the call travels via radio frequency to a cell site and then over telephone lines to a wireless switch. Based on the area it covers, each cell site is predetermined to route 911 calls to the PSAP that

provides 911 service for the majority of the area covered by the cell site. In Virginia, that would be one of the Virginia State Police Regional Emergency Call Centers or, in the case of Northern Virginia, Charlottesville/Albemarle, and Lynchburg, those local jurisdiction's primary PSAP.

There are a variety of methods being used to transport the 911 calls to PSAPs, two of which are summarized here. Looking first at **number substitution call routing**, here the **Mobile Switching Center (MSC)** - the wireless equivalent of a Central Office, which provides switching functions for wireless calls - recognizes the 911 digits and then substitutes a seven-digit number for the 911 digits actually dialed by the wireless subscriber, forwarding the voice and substitute number over the PSTN to the appropriate Central Office. The substitute number serves as the entry point for the wireless 911 call into the wireline E-911 system. When the call reaches the PSAP, there is no phone number, address, or other subscriber information provided. Therefore, the caller must be able to provide their phone number and location to the call taker at the PSAP before assistance can be provided (**see Figure 2.2 above**).

With **P-ANI or Cell Sector Call Routing** [6] - currently used in Northern Virginia – a Pseudo ANI is assigned to each individual cell sector. When the numbers 911 are dialed, the MSC recognizes the 911 digits and forwards the call through the selective router to the dedicated 911 trunk group that goes to the appropriate PSAP. By pre-defining the geographic coverage area of each antenna sector, and translating Pseudo ANIs to specific antenna sectors and PSAPs, cell sector location provides a 911 call taker with a general area that a 911 call originated from. Cell sector location though can cover several square miles of area. As with number substitution call routing, there is no phone number, address, or other subscriber information provided (**see Figure 2.3 above**).

E-911 SERVICE FOR WIRELESS TELECOMMUNICATIONS

The FCC issued Docket Order 94-102 in 1996, which focused on promoting the development of efficient and effective methods for reporting the location of calls placed from wireless phones. Docket Order 94-102 is to be implemented in two phases. In **Phase I**, the wireless companies are charged with delivering to the 911 system the caller's call-back telephone number and an additional number identifying the "cell" tower or antenna that relayed the 911 call.[7] Wireless carriers have six months after receiving a valid request for such service within which to implement Phase I location technology. Wireless carriers, wireline companies over whose telecommunications network the wireless call travels, and Virginia's state and local

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[6] **Cell sector** location is defined as identifying the specific antenna sector from which a 911 call originated. (**Cell site** location is defined as identifying the cellular antenna site from which a 911 call originated. These cell sites are typically divided into three or more discreet sectors.) A **Pseudo ANI** is a telephone number used to support the routing of wireless 911 calls. Also known as the routing number, it may identify the cell site, cell sector, or PSAP to which the 911 call should be routed.

[7] Location technology identified for Phase I is described as "fuzzy" because it does not pinpoint the locational source of the call. Rather, it allows identification of a radio-frequency coverage area for the **cellular antenna** (the wireless antenna site from which the 911 call originated) or **cellular sector** (the specific wireless antenna sector from which the 911 call originated) on which the call is received.

public safety agencies are working to solve those technical and deployment challenges posed by Phase I.

In **Phase II**, wireless carriers are "required to achieve the capability to identify the latitude and longitude of a mobile unit making a 911 call within a radius of no more than 125 meters (410 feet) in sixty-seven (67) percent of all cases."[8] This means that the actual location of the caller has to be determined, the data has to be sent through the Commonwealth's 911 system to the appropriate PSAP, and the latitude and longitude data have to be converted and displayed graphically. Phase II is the stage that represents the most widespread impact requiring the greatest investment for compliance. Recognizing the challenges posed by Phase II, those actors mentioned above have begun to examine the technical and deployment challenges posed by Phase II, including:

- **How best to *locate wireless callers* in terms of latitude and longitude.** Possible network-based solutions include Time Difference of Arrival (TDOA), Angle of Arrival (AOA), and RF Fingerprinting. Possible handset answers include cellular assisted and autonomous GPS handset solutions.[9]

- **How best to *generate accurate data* to describe that location.** Data for latitude, longitude, altitude, speed, and direction are necessary to physically locate a mobile caller. Data calculations may be skewed by a host of factors, including physical terrain and weather.

- **How best both to *transmit the location data* through the 911 network, and to *continually update that data* if the caller is moving.** Phase II location technology will require the movement of vast amounts of data through the 911 network to the PSAP, necessitating significant equipment upgrades to the current 911 system.

- **How best *to display the actual location of a mobile caller.*** Historically presented in a text format, in order for PSAP call takers and dispatchers to accurately communicate the position of a mobile caller (displayed as a latitude and longitude coordinate), *textual information displays* (that provides caller information in a textual format) will need to be replaced with *graphic information displays* (this feature provides graphic images to call takers and dispatchers with information and/or overlays that indicate the location or area a call originated). Base maps, then, that precisely reflect the caller's position and the area from which the call originated will need to be developed.

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[8] FCC Docket 94-102, paragraph 111 (1997). Differing from cell site and cell sector location technology called for in Phase I, Phase II location technology requires **specific coordinate location**, defined as determining the specific latitude and longitude (or X,Y) coordinates of the location where the 911 call originated. Note that this standard has been subsequently altered. Chapter 5 of this report contains a complete discussion of these changes.

[9] With **cellular network solutions**, location technology is added to the current cell sites to calculate a caller's latitude and longitude position. With the **handset based solutions**, latitude and longitude data from satellites orbiting the earth is received by a chip in the handset and sent to the PSAP. (The United States Department of Defense has a system of twenty-four (24) satellites that orbit the earth and continually send out location data. The raw data can be picked up by receivers and translated into location information. This system is called the Global Positioning System (GPS).)

TECHNICAL SOLUTIONS FOR PHASE I AND PHASE II

Phase I

In **Phase I** the wireless companies have to provide ANI (the 10-digit telephone number associated with the wireless handset placing the call) and cell sector location to the PSAP via a Pseudo-ANI, or pANI (the 10-digit telephone number associated with the particular cell sector).[10] Taken together, when transmitted to the appropriate PSAP, these twenty (20) numbers allow the PSAP both to call back the wireless phone placing the 911 call, and assist the 911 call taker in determining the general area from which the wireless 911 call is being made.

Today's wireline E-911 network utilizes **Centralized Automated Message Accounting** (CAMA), a multi-frequency signaling protocol capable of transmitting 8-digits for transport through the network. The 8-digit phone number is a combination of the wireline caller's 7-digit phone number with 1-digit added at the beginning of the phone number to represent the area code. For example, the phone number (804) 225-4534 might be represented in the current wireline 911 system by the following digits: 02254534. This is sufficient for wireline 911 calls but not for Phase I wireless 911 calls that require the transmittal of 20-digits.

Wireless carriers, wireline companies, private vendors, and Virginia's state and local public safety agencies have addressed the technical problems posed by the limitations of CAMA as it relates to Phase I wireless location requirements by developing two basic solutions. With **Call Path Associated Signaling** (CAS), the wireless handset call back number and cell sector identification number (20-digits), together with the caller's voice, are passed along the same path for delivery to the PSAP (**see Figure 2.4 below**). The ALI of the cell sector is retrieved using the cell sector identification information contained in the ALI database.[11] This solution does require up-front hardware and software upgrades to existing 911 equipment.[12]

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[10] Restating, cell sector location identifies for the 911 call taker the location of the cell antenna through which the wireless 911 call is being transmitted or processed.

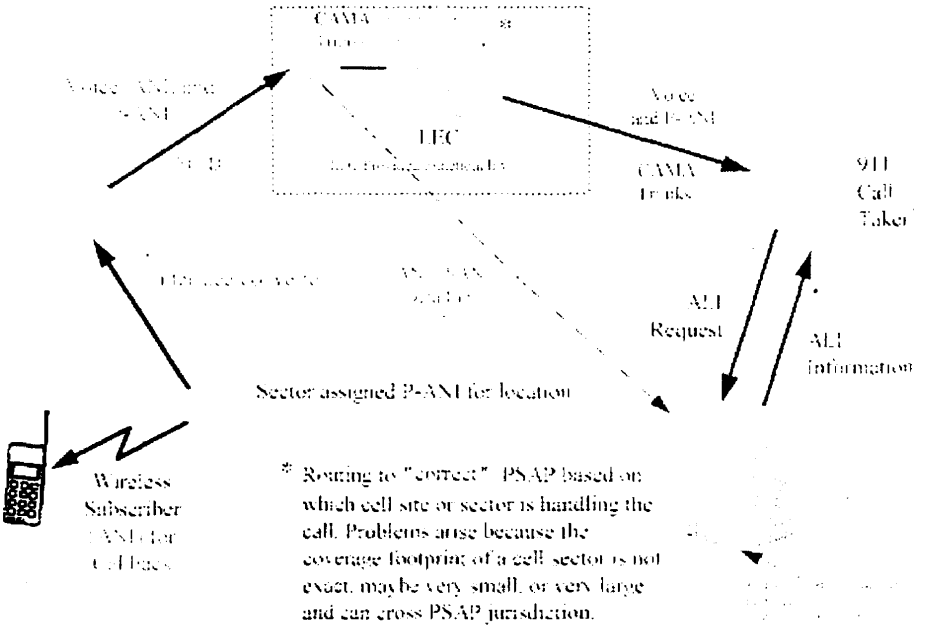
[11] The **ALI database** is the set of all ALI records residing on a particular computer system. This would be housed in the existing E-911 wireline database.

[12] The CAS solution must be provided or supported by the local wireline phone company. The reported advantage of CAS is that the call back number is sent with the caller's voice. As such, if the extraction via the ALI database of the cell sector location information fails, the PSAP has the caller as well as the call back number. To support the delivery both of 20-digits and voice along the same path, the wireline phone company can either: (1) upgrade their existing selective router; or (2) add an additional piece of special equipment in front of the existing selective router.

An upgrade to the existing selective router allows upgraded signaling to be supported which sends voice and data (20-digits) in the same path. The information is sent from the selective router directly to the PSAP on E-911 dedicated trunks. This solution does require upgrades to the PSAP equipment and to the signaling from the selective router to the PSAP.

The other CAS option is to add an additional piece of special equipment in front of the selective router. This special equipment converts the 20-digits to 8-digits, inserts the caller record in the form of 20-digits (10-digits for the callers number and 10-digits for the cell sector location) into the ALI database, and sends the 8-digit number and the voice to the PSAP over the dedicated 911 trunks. When the voice and 8-digit number reach the PSAP, 911

Figure 2.4: Call Associated Signaling (CAS)



Note: Diagram drawn from BELLSOUTH's website: http://www.bellsouthcorp.com/issues/911/chart6.html

The other solution – known as **Non-Call Path Association Signaling** (NCAS) – splits the data and voice, sending them in separate paths so that voice and data still reach the PSAP at the same time (**see Figure 2.5 below**). With NCAS only a unique cell sector identification number is passed along the voice path. The call back number is written to the ALI database in a record corresponding with the cell sector identification number. When the ALI record is retrieved by the PSAP, the wireless handset call back number and cell sector identification number are delivered simultaneously with the caller's voice. By sending voice and data along separate paths, this solution avoids extensive up-front hardware upgrades.[13]

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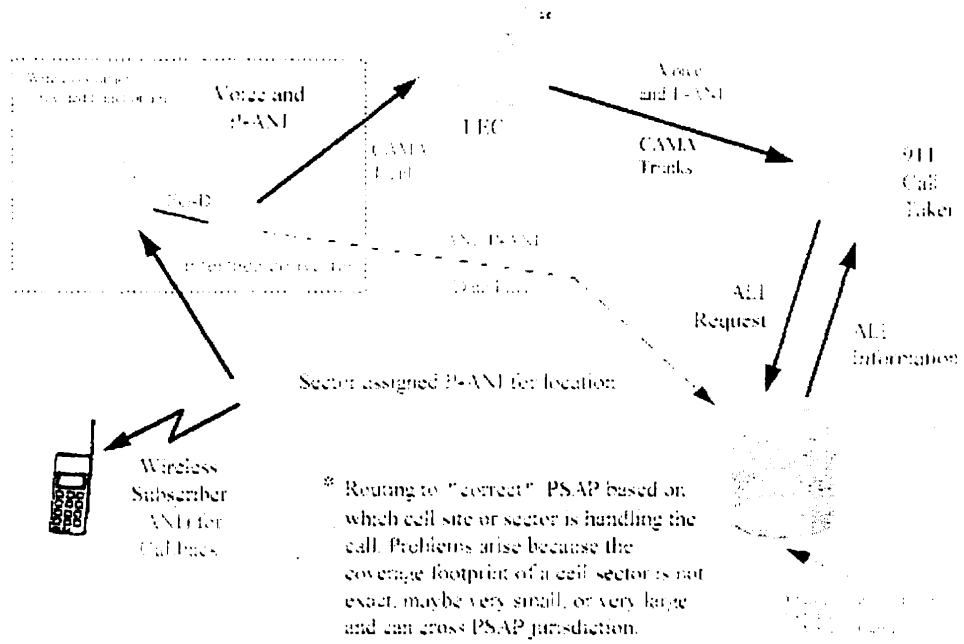
equipment recognizes the 8-digit number and queries the ALI database. The ALI database converts the 8-digit number that is sent from the PSAP into the original 10-digit cell sector number. Then it retrieves the caller's record that was inserted into the ALI database by matching the original and the converted 10-digit cell sector numbers.

[13] Wireless carriers typically contract with private vendors to provide the NCAS solution. With the NCAS solution, voice and data information are separated at the wireless carrier's switch. The wireless switch forwards the wireless handset's phone number and 10-digit cell sector number through a **Signaling System 7** (SS7) network – an inter-office signaling network separate from the voice path network utilizing high speed data transmission to accomplish call processing – to a **Service Control Point** (SCP). Based on the address of the cell sector where the call originated, SCP's database assigns an 8-digit number. The 8-digits serve as the routing digits that deliver the call to the most appropriate PSAP. The routing digits are then sent from the SCP back to the wireless switch where they are joined with the caller's voice and forwarded to the wireline E-911 network. The digits used for routing have been pre-provisioned to facilitate routing through the existing selective router to the appropriate PSAP. Simultaneously, the SCP updates the ALI database with the wireless handset phone number, cell sector location, and routing digits. When the voice and the routing digits reach the PSAP, the 911 equipment queries the ALI database. The caller's information is retrieved from the ALI database by matching the routing digits. The voice, the wireless handset call back number, and cell sector location then arrive at the call taker's position in the PSAP.

Figure 2.5: Non-Call Path Associated Signaling (NCAS)



Note: Diagram drawn from BELLSOUTH's website: http://www.bellsouthcorp.com/issues/911/chart5.html

While both the CAS and NCAS solutions do require 911 system upgrades, note that under either scenario, there are no new or additional technical or equipment components needed simply to send the wireless 911 caller's information from the E-911 database to the PSAP. Wireless caller information can be sent to the PSAP via the existing 911 trunks and circuits that link the E-911 database and the PSAP. Therefore, those Virginia localities that currently offer E-911 service for wireline phones can implement Phase I wireless service.

Phase II

In **Phase II**, wireless carriers are required to have the capability to identify the latitude and longitude of a mobile unit making a 911 call within a radius of no more than 125 meters (roughly 410 feet) in 67% of all calls by October 1, 2001.[14] Wireless carriers, wireline companies, private research and development companies, and private vendors are currently developing and testing cellular network solutions and handset-based solutions to Phase II. With the *network solutions*, location technology is added to the pre-existing cellular infrastructure to calculate a wireless caller's latitude and longitude. The technology works as long as the caller's wireless handset can access at least two cell sites. With the handset based solutions, latitude and longitude data from satellites orbiting the earth is received by a chip in the handset and sent to

[14] Note that this standard has been subsequently altered. Chapter 5 of this report contains a complete discussion of these changes.

the PSAP.[15] This technology works so long as the wireless handset can receive the satellite signal. Some handset technologies process the information in the handset and send data directly to the PSAP (*autonomous GPS handset solution*), while other handset technologies receive the raw location data in the handset, and then send the data to a central location for processing (*cellular assisted GPS handset solution*). Both network and handset solutions have been successfully tested,[16] and in some areas (including parts of Delaware, Indiana, New Jersey, Pennsylvania, and Texas) network solutions are already being deployed. Additionally, at least two major wireless phone manufacturers (Nokia and Ericsson) have announced that they will be building GPS technology into their phones in the near future.

Potential Network Solutions

Cellular network solutions add location technology to the cell tower sites and calculate the location information using triangulation methods. Summarizing, when the caller dials 911, the signal is picked up by two or more cell sites. Computer software then analyzes data from the cell sites using a particular method or hybrid of the following methods – time difference of arrival (TDOA) and angle of arrival (AOA). Signal attenuation is a related possible network solution, as is radiofrequency (RF) fingerprinting.[17]

Time Difference of Arrival (TDOA).[18] TDOA is a well known and the most commonly used technique for determining the locations of mobile devices. TDOA has been used since radar systems were first invented over 50 years ago and is used with GPS technology today.[19] It is well suited to estimating the location of wireless devices because it works with both brief transmissions, such as the reverse control channel, and with longer transmissions, such as the reverse voice channel. Further, the TDOA system is an overlay system that fits on the existing wireless network.[20] It requires no modifications to existing mobile devices, regardless of

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[15] The United States Department of Defense has a system of twenty-four (24) satellites, orbiting in six (6) planes oriented at 55 degrees to the equator. Each orbital plane contains four (4) satellites at an elevation of 20,200 kilometers above the earth. The twenty-four (24) satellites form the Department of Defense's **Navigation Satellite Timing and Ranging Global Positioning System** (NAVSTAR GPS). Though first and foremost a defense system, by using satellites and computers NAVSTAR GPS can measure positions anywhere on earth.

[16] Field trials have been conducted along a 350 square mile area on Interstate-95 in New Jersey, in metropolitan Houston, Texas, and in Washington State. For more information concerning the specifics of these tests, see New Jersey's *Report on the New Jersey Wireless Enhanced 911 System Trial* (Department of Law and Public Safety, Division of State Police, June 1997), Texas' *Report to the Advisory Commission on State Emergency Communication* (Texas' Wireless Integration Project, May 1997), and Washington State's *Enhanced 911 Funding Study for Wireless Telecommunications in Washington State* (Washington State Department of Revenue, December 1998). Note also that subsequent FCC rulings indicate the Commission's belief handset technologies should prove more accurate - in terms of the location identification information provided – than network-based solutions

[17] For a detailed discussion of signal attenuation and RF fingerprinting, see Louis A. Stilp's *Examining the Coming Revolution in Location Services* (Associated Group Incorporated, May 1998).

[18] Much of the information concerning TDOA is drawn from Cement Driscoll's *Wireless Caller Location Systems* (GPSWorld, November 1998).

[19] GPS receivers compute location by comparing the time of arrival of signals from multiple GPS satellites.

modulation protocol. Thus all existing analog and digital wireless telephones could be supported.[21]

TDOA computes the caller's location by measuring the differences between the arrival times of wireless phone transmissions at three or more individual base stations (**see Figure 2.6**). As shown in Figure 2.6, a caller standing exactly halfway between Base Station A and Base Station B is located somewhere on line L1. However, if one base station receives the signal before the other, the caller is located somewhere along the hyperbolic line made up of points for which the signal's TDOA at the two base stations would be the same. A third base station enables TDOA measurements that form another hyperbolic line, thus pinpointing the caller's location wherever the two hyperbolic lines intersect.

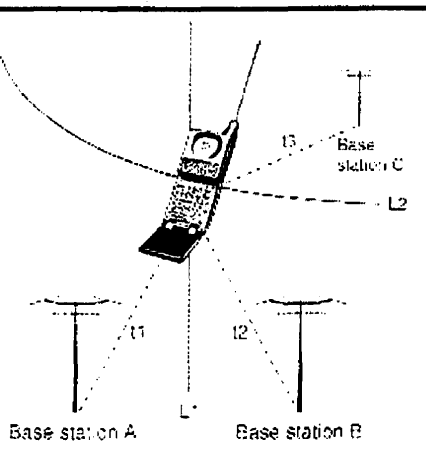

Figure 2.6: TDOA computes the caller's location by measuring the differences between the arrival times of wireless phone transmissions at individual cell towers.

The advantages to this method are that it can be applied to different wireless technologies and no modification to the wireless handset is required. Additionally, because antenna requirements are simple and unobtrusive, TDOA radio location receivers can be put in many locations, including areas without cell sites. This might be advantageous if one wanted to improve location estimates in a particular area and a regular cell site was not required or desired. This simpler configuration has the added benefit of lower implementation cost compared to other network based solutions.

The challenges with TDOA are that it is largely dependent on cell site configuration such as the exact cell location, antenna height, and radio channel allocations. It is also dependent on the number of radio location receiver sites.[22] Also, the accuracy of TDOA systems is affected when the radio signal bounces off objects along the path from the radio transmitter such as hills

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[20] As with other locating techniques, TDOA systems typically require the addition of new equipment at cell sites though existing antennae can be used in many cases. Where existing antennae are not available, simple whip antennae (i.e. the type of cellular antennae on most car windows) can be used.

[21] Because TDOA – and other network based solutions – rely exclusively on radio signals that are broadcast from the wireless phone to locate a caller, the location quality of the system generally follows the voice quality of the underlying wireless network. Consequently, as a wireless carrier expands and improves coverage in their network, the location system quality similarly improves. The quality of accuracy of a TDOA system then is proportional to the coverage area of TDOA radio location receiver sites, which in turn is largely dependent on the coverage provided by cell sites.

[22] At this time, research indicates that an urban core typically requires one (1) TDOA receiver site for every three (3) or four (4) cell sites. A rural area, with much larger cell coverage patterns, would typically require one (1) TDOA receiver per cell site.

and buildings (known as multipath), and the quality of the indoor coverage varies with the strength of the signal.

Angle of Arrival (AOA).[23] AOA is another well known technique for determining the locations of mobile devices. Like TDOA, AOA is an overlay system that fits on the existing wireless network.[24] Because it requires no modifications to existing mobile devices, all existing analog and digital wireless telephones could be supported.[25]

AOA works by using data from two or more cell sites to determine where a caller is located (**see Figure 2.7**). AOA systems use phased-array antennas – an arrangement of several antennae in a precise, fixed pattern – to compute the angle at which signals transmitted from a wireless phone arrive at the base station. The system then computes the caller's location using the actual position of two or more receiving cell sites and the signal's angle of arrival at these base stations. When angles of arrival are computed for several cell sites, the mobile unit's location can be estimated based on the point of intersection of projected lines drawn out from the cell sites at the angle from which the signal originated.

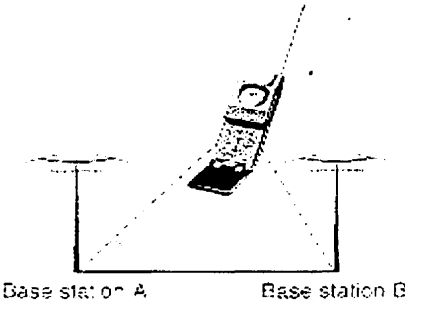

Figure 2.7: Using AOA techniques, the system calculates the caller's location by measuring the angle of arrival at which transmitted signals arrive at the base station.

The advantages to this method are that it applies to all mobile phones with no modifications to the handset required. A reported asset to AOA – as compared to TDOA – is its resistance to multipath effects which includes good indoor coverage. This finding though has been challenged by proponents of TDOA, who note that multipath reflections can "trick" an AOA antenna array into calculating an incorrect angle, thereby failing to correctly identify the location of the caller.

The challenges with AOA are that it dependent on additional antenna structures at existing cell sites, as well as cell site configuration. Also the accuracy of angle of arrival systems

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[23] Much of the information concerning TDOA is drawn from Cement Driscoll's *Wireless Caller Location Systems* (GPSWorld, November 1998).

[24] As with other locating techniques, TDOA systems typically require the addition of new equipment at cell sites though existing antennae can be used in many cases. Where existing antennae are not available, simple whip antennae (i.e. the type of cellular antennae on most car windows) can be used.

[25] Because TDOA – and other network based solutions – rely exclusively on radio signals that are broadcast from the wireless phone to locate a caller, the location quality of the system generally follows the voice quality of the underlying wireless network. Consequently, as a wireless carrier expands and improves coverage in their network, the location system quality similarly improves. The quality of accuracy of a TDOA system then is proportional to the coverage area of TDOA radio location receiver sites, which in turn is largely dependent on the coverage provided by cell sites.

is reduced as a mobile unit moves away from a cell site (the further the phone is away, the less accurate the system), and rural configurations of cell sites (tending to be adjacent to highways) is a poor configuration for AOA.

Potential Handset Solutions

FCC Docket 94-102 clearly requires that wireless carriers be able to locate any caller requesting emergency assistance through its network by a certain date. On the surface, this would appear to eliminate handset-based solutions, such as GPS, from consideration because it would be impossible to add GPS or other location system components to all phones operating on a network at the same time. Addressing this issue directly, the FCC indicated that it will consider proposals to *phase in* implementation of the location capability, especially if the proposal would help achieve the further improvements in capabilities, including higher accuracy, sought by public safety agencies and FCC.[26] This FCC ruling, then, does allow for the addition of GPS to new phones to meet Phase II requirements.[27]

Autonomous GPS Handset Solution. The autonomous GPS handset uses a complete GPS receiver and processor located in the wireless phone. This stand-alone device does not need any network connections to obtain and transmit location information. The advantage of this solution is that location information can be sent over the existing cellular network directly to the PSAP.

Cellular-Assisted GPS Handset Solution. The cellular-assisted GPS uses a GPS receiver in the handset to collect raw data from any one of the twenty-four (24) orbiting satellites. The raw data is then passed to equipment located at cell sites and then forwarded to other network equipment for further processing. This additional equipment computes and sends the latitude, longitude, and other location information data to other network equipment for transmission to the PSAP. The major advantage of the cellular-assisted GPS solution is that it reduces the time it takes to process the location data by relying on high-speed network-based computing.

UPGRADES TO THE TELECOMMUNICATIONS INFRASTRUCTURE

To fully implement wireless E-911, the existing E-911 network will need to be upgraded in order to process additional digital information associated with multiple area codes, number portability, and the transmission of additional E-911 related data. These upgrades tend to involve the adding of **technical components** – defined as a unique, identified part of the E-911 system that is necessary to deliver the 911 call and associated location information from the

[26] FCC Docket 94-102, paragraph 123 and 124 (1997). In a subsequent ruling, the FCC did alter its Phase II implementation requirements. See Chapter 5 of this report for a more complete discussion of this issue.

[27] This position would seem to qualify as a tacit endorsement of the idea that if a handset solution that relied on GIS location technologies were chosen, wireless telephone subscribers would be likely to replace their existing phones with GPS-equipped handsets over a two- to three-year period.

caller's telephone to the PSAP – to the current E-911 network.[28] Illustrating, when moving from a basic wireline 911 environment to a wireline E-911 environment, technical components are installed into the wireline phone system and PSAPs to perform additional functions, including but not limited to the following:

- Store and maintain the wireline telephone customers' phone numbers, addresses, and emergency response information in E-911 databases.

- Send the 911 caller's phone number, address, and emergency response information from the E-911 database to the PSAP.

- Display the caller's information on the computer screen when the call taker answers the phone.

Similarly, in order to provide Phase I and Phase II wireless E-911 service, technical components that perform additional functions will need to be added to the existing 911 network. Looking first at Phase I (sending wireless E-911 calls to the appropriate PSAP with the wireless caller's phone number and cell sector location), these functions include, but are not limited to, the following:

- Link the wireless switches to the existing E-911 network with dedicated trunk lines.

- Upgrade the wireless switch to direct emergency calls to the E-911 selective routers and send routing directions with the call so the selective router sends the calls to the appropriate PSAP.

- Send the E-911 caller's phone number and cell sector location to the wireless E-911 database.

- Create a wireless E-911 database.

- Send information from multiple wireless companies to the appropriate E-911 database.

Note that in providing Phase I service, there are no new or additional technical components needed to send the wireless 911 call and associated information from the E-911 database to the PSAP. Those PSAPs than that are currently wireline E-911 capable can implement Phase I wireless service.

Turning to Phase II service (sending the E-911 caller's location, in terms of longitude and latitude, to the PSAP), these functions include, but are not limited to, the following:

- Determine the 911 caller's location in terms of latitude and longitude.

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[28] This definition of "technical component" is drawn from the definition developed by a technical workgroup convened in Washington State to support the efforts of their Department of Revenue to identify what new and upgraded network equipment/components would be needed to implement Phase I and Phase II location technology.

- Send additional data for location identification to the PSAP along with the caller's phone number and emergency response information for that particular area.

- Route the emergency call to the appropriate PSAP.

- Display the location on the call taker's computer screen.

Note that in providing Phase II service, PSAPs will require new and/or additional equipment. Phase II requires PSAPs to replace their current computer hardware and software at the call taker positions and upgrade their **Computer Aided Dispatch** (CAD) equipment to display the location data and convert latitude and longitude to usable call response information.[29] Additionally, the conversion of the latitude and longitude data into useful location information requires highly accurate maps. Current county and city maps are – in large part – not accurate enough for the provision of Phase II location technology in accordance with the FCC mandate.

HYPOTHETICAL COST ANALYSIS FOR WIRELESS E-911

The FCC stipulated in Docket Number 94-102 that the Phase I and Phase II requirements imposed on the wireless carriers only applied if:

- Wireless carriers receive a request for E-911 service from a PSAP.

- The PSAP requesting the E-911 service is capable of receiving and using the information provided by the wireless carrier.

- A mechanism for the recovery of costs relating to the provision of E-911 service is in place.

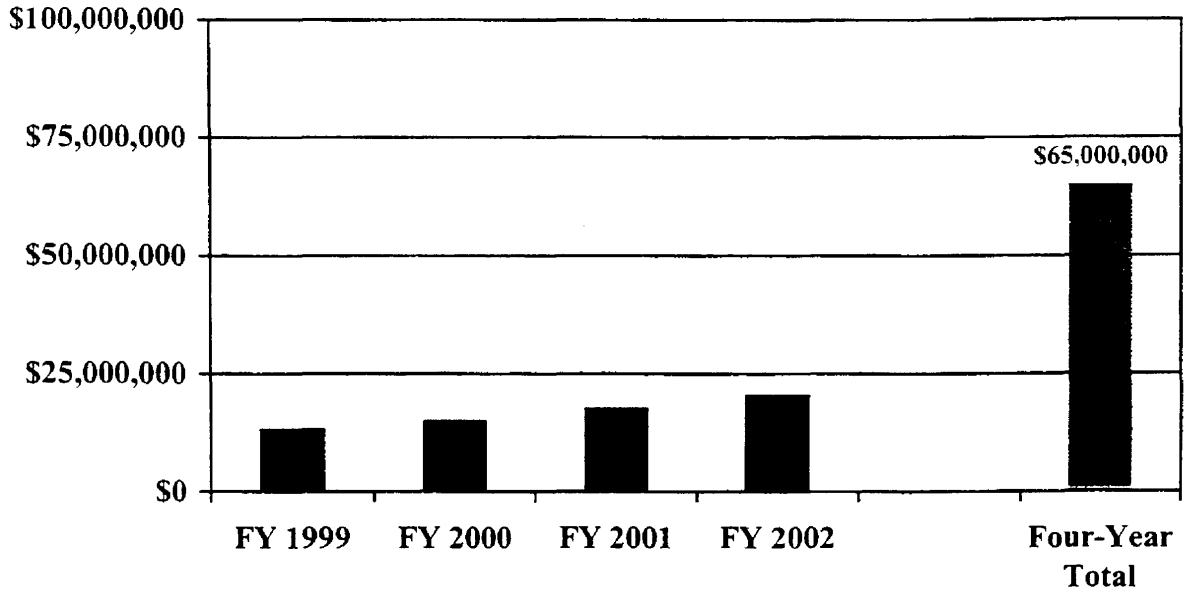
The FCC did not define cost recovery or prescribe a particular E-911 cost recovery methodology, finding no "adequate basis on [the] record for preemption of the various state and local funding mechanisms that are in place or under development, or for concluding that state and local cost recovery mechanisms will be discriminatory or inadequate."[30]

During the 1998 session of the Virginia General Assembly, the General Assembly first amended and then passed House Bill 1331, creating a Wireless E-911 Service Board. Wireless service providers collect a monthly fee of .75-cents (cost-recovery mechanism) assessed upon each of their assigned telephone numbers, and then forward these monies to the Wireless E-911 Service Board for deposit into a Wireless E-911 Fund. These monies are intended to provide full payment to PSAPs of all "reasonable and direct" wireless E-911 PSAP costs and to wireless ser-

[29] **Computer Aided Dispatch (CAD)** equipment is the computer based system that aids PSAP attendants by automating selected dispatching and record keeping activities.

[30] FCC Docket 94-102, paragraph 145 (1997).

Table 2.1: Estimated Moneys Generated Via Virginia's Wireless E-911 Surcharge, FY 1999 - FY 2002



vice providers of all "reasonable and direct" wireless E-911 wireless service provider costs.[31] This legislation is scheduled to sunset July 1, 2002.

Working from the estimated 1998 Virginia wireless subscribership count (1.5 million), the amount of funds expected to be generated by Virginia's Wireless E-911 tax during fiscal year 1999 is $13.5 million. Assuming a 15% growth rate in wireless subscribership in Virginia during fiscal year's 2000 (1.7 million wireless subscribers), 2001 (2.0 million wireless subscribers), and 2002 (2.3 million wireless subscribers), Virginia's Wireless E-911 tax will generate an estimated $15.3, $18.0, and $20.7 million during those years, respectively. Total revenue during this four-year period (July 1998 – June 2002) should eclipse $65 million (**see Table 2.1 above**).

One of the fundamental pieces of information that Virginia's General Assembly needs to know to determine whether the .75-cent wireless E-911 tax approved during the 1998 session of the Virginia General Assembly is a suitable tax rate for the provision of wireless E-911 service is an estimate of the total costs (both recurring and non-recurring) to implement and operate wireless E-911 in Commonwealth. Given that Virginia's Wireless Enhanced Public Safety Telephone Service Act did allow both PSAPs and wireless service providers to recover those "reasonable and direct" costs associated with the provision of wireless E-911 services, the *primary* total cost drivers for the provision of Phase I and Phase II wireless location technology are the PSAPs and the wireless service providers. Note also that because wireless calls

[31] *Code of Virginia*, § 56-484.8 through 56.484.11, *Wireless Enhanced Public Safety Telephone Service Act.*

eventually travel over wireline networks, and because wireless service providers may contract with other vendors to provide Phase I and/or Phase II wireless location services, the wireline companies and these vendors are *secondary* cost drivers for the provision of wireless E-911 services. Finally, staff time, the number of emergency service numbers that will eventually occupy the wireless E-911 database, and the number of highways, roads, driveways, or real property parcels that have to be adjusted for latitude and longitude Phase II mapping are *tertiary* cost drivers for the provision of Phase I and Phase II wireless location technology.

In 1999, the 136 local jurisdictions in the Commonwealth are serviced by an estimated 150 primary and secondary PSAPs.[32] Currently, the Commonwealth is serviced by an estimated twenty-two local telephone companies and roughly 5 million access lines. There are a reported twenty-five wireless and PCS companies that have licenses to operate in Virginia. There are two primary vendors that have contracts with wireless carriers to provide Phase I service – SCC and XYPOINT. There are also several Phase II vendors nationwide.

Overview of Phase I and Phase II Costs

To date, three states – Washington, Kansas, and Texas – have attempted to produce reliable estimates of total costs to implement and operate wireless E-911 service. Below, the efforts of Washington State's Department of Revenue, Kansas' Legislative Post Audit Committee, and Texas' Advisory Commission on State Emergency Communications are discussed. Thereafter, the lessons gleaned from this overview are applied to Virginia.

Washington State's Department of Revenue. In 1998, the Washington State Legislature directed its Department of Revenue (the Department) to conduct a study of the most cost-effective and efficient way to implement E-911 services for wireless phone users. The Department appointed a group of more than twenty officials representing the state, cities, counties, local and wireless phone companies, and equipment vendors, who met for more than a year. Their purpose was to examine the current 911 infrastructure in Washington State, identify the technology needed to implement E-911 under Phase I and Phase II, determine potential costs associated with the technology, and construct a cost-recovery system for wireless E-911.

Looking at the *primary* cost drivers – wireless carriers and PSAPs - wireless carriers agreed to try and help the Department develop a cost estimate, but expressed the following concerns:

- Phase I cost information is based on national cost estimates and it would be difficult to isolate Washington State costs.

- The national cost estimates capture economies of scale that may not be realized if Washington State costs are isolated.

[32] This number does not include the seven Regional State Police Emergency Call Centers.

- There are significant differences between carriers, and it may be difficult to get a true picture of costs in the aggregate.

- Cost information changes from year to year, and the information may be outdated within a short time.

- The third-party vendors may have confidentiality clauses in their contracts with the wireless companies that prevent the release of vendor cost information.

Having expressed these caveats, wireless carriers reported that to recover their non-recurring and recurring costs for Phase I service, they would need reimbursement ranging from no less than .20-cents per subscriber per month, to no more than .33-cents per subscriber per month. Note that the cost estimates differed between large carriers and smaller carriers, that smaller carriers reported that they needed to recoup their costs quickly, and that most of the wireless carriers indicated that the Phase I data was valid for no more than three years. The wireless carriers reported that they did not have any cost estimates for Phase II because of the unsettled questions surrounding Phase II location technology.

Washington State's PSAP community reported that their costs for Phase I will be a combination of the charges that wireless carriers bill the PSAPs for the service, and database administration costs. Given the uncertainties surrounding the wireless carrier costs detailed above, the Department heavily qualified their findings before concluding that total PSAP costs for implementing Phase I service over a four-year period would be $16.3 million, or roughly .22-cents per wireless subscriber per month.

Phase II PSAP costs include the wireless carrier charges for Phase II service, PSAP equipment replacement, and mapping. Acknowledging that the wireless carrier Phase II charges are not known at this time, the Department again qualified their findings before concluding that for implementing Phase II service over a five-year period total PSAP equipment replacement costs would be $51 million. The estimated cost to collect GPS data and produce GPS-corrected maps was $19 million. Note here that the Department did conclude that complete implementation of Phase II is not possible without a GPS-corrected map. Thereafter, the Department continued and stated the following:

> GPS-corrected maps will be used by more parties than the E-911 agencies. Costs should be shared. Until a plan is developed, it is difficult to determine the total costs and the portion 911 should bear. It is not known who will develop the map – localities, the state, or both. It is also not known what resources there are to coordinate the parties, complete a need assessment and cost analysis, and develop an implementation plan.[33]

Kansas' Legislative Post Audit Committee. In 1999, the Legislative Division (the Division) of Kansas' Legislative Post Audit Committee conducted a review of Kansas' 911 emergency phone systems. The inquiry was conducted in two parts. The Division first

[33] Washington State's *Enhanced 911 Funding Study for Wireless Telecommunications in Washington State* (Washington State Department of Revenue, December 1998), p. 4-16.

commented on the current status of the 911 system in Kansas, and then moved into a subsequent discussion focused on the following two questions:

- What will it cost to meet FCC requirements regarding wireless telephones, and what options exist for recovering those costs?

- Does the current structure of the 911 system result in inefficiencies, higher costs, or other problems for the citizens of Kansas?

Looking here at the Division's cost analysis, the report acknowledges that the FCC has issued regulations that promote the development of wireless E-911 services, and that these regulations set up a two-phase process (Phase I and Phase II) for implementing wireless E-911. Working from this foundation, the Division concluded that "the costs of implementing Phase I and Phase II will depend on the equipment currently in use and on the choices made in trying to meet the FCC's requirements."[34]

In an attempt to get a sense of the costs associated with the implementation of wireless E-911 services in Kansas, the Division conducted interviews with a variety of local public safety representatives, as well as wireline and wireless phone company officials. Their findings follow:

- Responses from local public safety representatives about estimated costs ranged from county officials who were only vaguely aware of the FCC requirements at all, to county officials who had begun talking with phone companies and were beginning to build up a reserve of tax monies in anticipation of significant future expenses. Still, no one had a clear idea of how the requirements would be implemented, or how much they would cost.

- Because 911 services are provided at the local level without any State oversight or administration, no central "authority" has begun compiling information about what it might cost to implement wireless E-911.

- Because the technology to implement wireless E-911 technology – especially Phase II – is still being developed and tested, both local public safety representatives and industry officials indicated that they have no basis for developing reasonable cost estimates at this time.

With this information in hand, the Division reported that it "could not determine what it might cost to provide E-911 services for wireless phone users."[35] Citing the uncertainty surrounding necessary equipment and computer software replacement/upgrades, as well as the choices local officials, wireline and wireless service providers, and third-party vendors will make concerning the implementation of wireless location technology, the Division concluded that

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[34] Kansas' *Performance Audit Report: Reviewing the 911 Emergency Phone System* (Legislative Division of Post Audit, August 1999), p. 4.

[35] Kansas' *Performance Audit Report: Reviewing the 911 Emergency Phone System* (Legislative Division of Post Audit, August 1999), p. 7.

"they have no basis for developing reasonable cost estimates at this time." Note here that the Division did expect that the "costs involved in implementing the FCC's orders in Kansas could be significantly higher if all parties involved don't work together to adopt common solutions." [36] Thereafter, the Division continued and stated the following:

> Several county officials we talked with told us they were uncertain of what they will need to do to implement Phase I and Phase II, or of how they will do it. They have not begun to talk with officials from the local [wireline] and wireless phone companies or from nearby [public safety] answering points, and may not be aware of the need to do so. To date, then, it appears that Kansas' response to these federal mandates is not being coordinated at the local level, where 911 services are provided and administered. Without such coordination, costs could be much higher in the future.

Texas Wireless Integration Project. In 1995, two Texas 911 districts partnered with the state's Advisory Commission on State Emergency Communications, along with a team of industry partners. Two years later, this team released the Wireless Integration Project report. This project focused most directly on evaluating existing, emerging, and future technology needs in an effort to encourage the rapid development and deployment of standards relating to wireless E-911. Additionally, the report did employ an economic model to estimate a tax rate to apply to each wireless subscriber per month to provide sufficient funds to fully implement wireless emergency caller location technology, including appropriate network, routing, geospatial database development and management, and PSAP modernization needs. In plain terms, the goal of the economic model was to provide insight and understanding to help address the 911 planner's primary dilemma: "How do we establish wireless E-911 services that are within our region's funding means, when no one can tell me what the services will cost?"[37]

Working from a variety of assumptions, the report did develop a five-year price tag for the deployment of Phase I (roughly $4.75 million for an area with a population of 1,000,000) and Phase II (roughly $9.75 million for an area with a population of 1,000,000) wireless location technology **(see Table 2.2 below)**. Given the caveats factored into the model, the report concluded that these cost estimates might be 30% to 50% too low, thereby providing a maximum cost range of $4.75 to $7.12 million for Phase I (over five years), and $9.75 and $14.62 million for Phase II (over five years). The report stated that the strategic planner is optimally looking to establish a funding mechanism that results in a zero balance over that same five-year period.

Taking the information contained in Table 2.2, we can provide a hypothetical estimate of the cost to implement wireless E-911 services on a statewide basis in Virginia over a five-year period.[38] Using 1998 Virginia population estimates developed by the University of Virginia's

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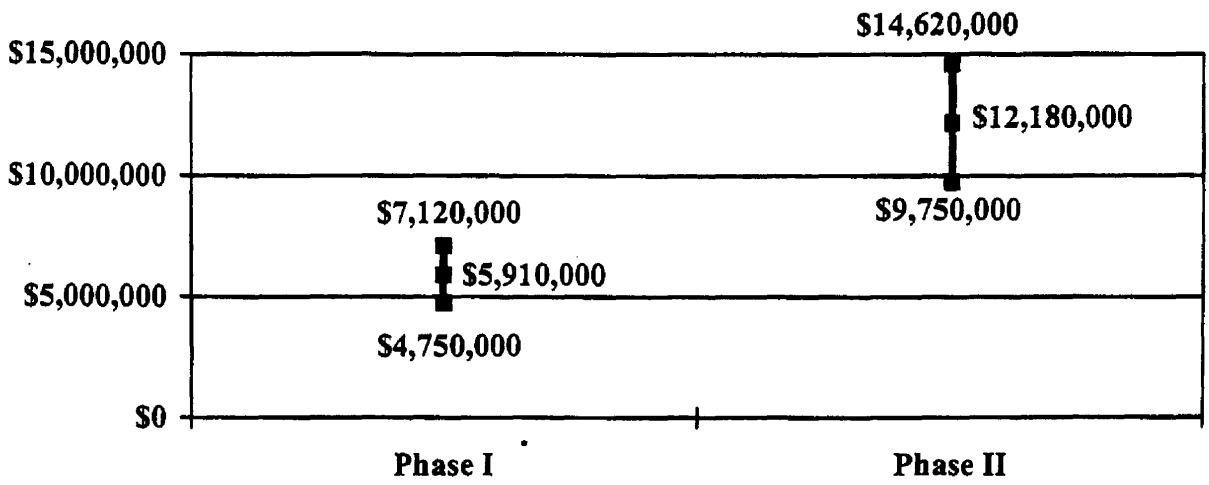
[36] Kansas' *Performance Audit Report: Reviewing the 911 Emergency Phone System* (Legislative Division of Post Audit, August 1999), p. 7.

[37] Texas' *Report to the Advisory Commission on State Emergency Communication* (Texas' Wireless Integration Project, May 1997), p. 68.

[38] Population figures (1998 estimates) drawn from the University of Virginia's Weldon Cooper Center for Public Service. The estimate provided is for illustrative purposes only. The Texas Wireless Integration Project's economic model includes assumptions that may or may not be directly applicable to the situation in Virginia. With

Table 2.2: Hypothetical High, Low, & Median Cost for the Deployment of Wireless Phase I and Phase II Location Technology

(Over a five-year period in an area with a population of 1,000,000)



Weldon Cooper Center for Public Service (6.7 million), we can multiply the cost estimates associated with the provision of wireless Phase I and Phase II location technology for an area with a population of 1,000,000 to arrive at a cost estimate to implement a statewide wireless E-911 in Virginia over a five-year period (**see Table 2.3 below**).[39]

After inserting Virginia's population, the maximum cost range associated with the model for Phase I wireless location technology is $31.8 to $47.7 million (over five years). For Phase II, the maximum cost range is $65.3 to $98.0 million. Combining Phase I and Phase II, the estimated maximum cost range associated with implementing a statewide wireless E-911 system over a five-year period in Virginia is $97.1 to $145.7 million. Levied over a four-year period, Virginia's Wireless E-911 tax is expected to generate roughly $65 million. For the sake of comparison, if levied over a five-year period, Virginia's wireless E-911 tax would generate approximately $92 million. Note here that the project acknowledged that in those instances where the amount of monies generated from the tax falls below the funds needed to implement in full wireless E-911, either the rate will need to be adjusted, or the imposition of the tax at the set rate will need to be extended beyond the five-year period so that balance can be achieved.[40]

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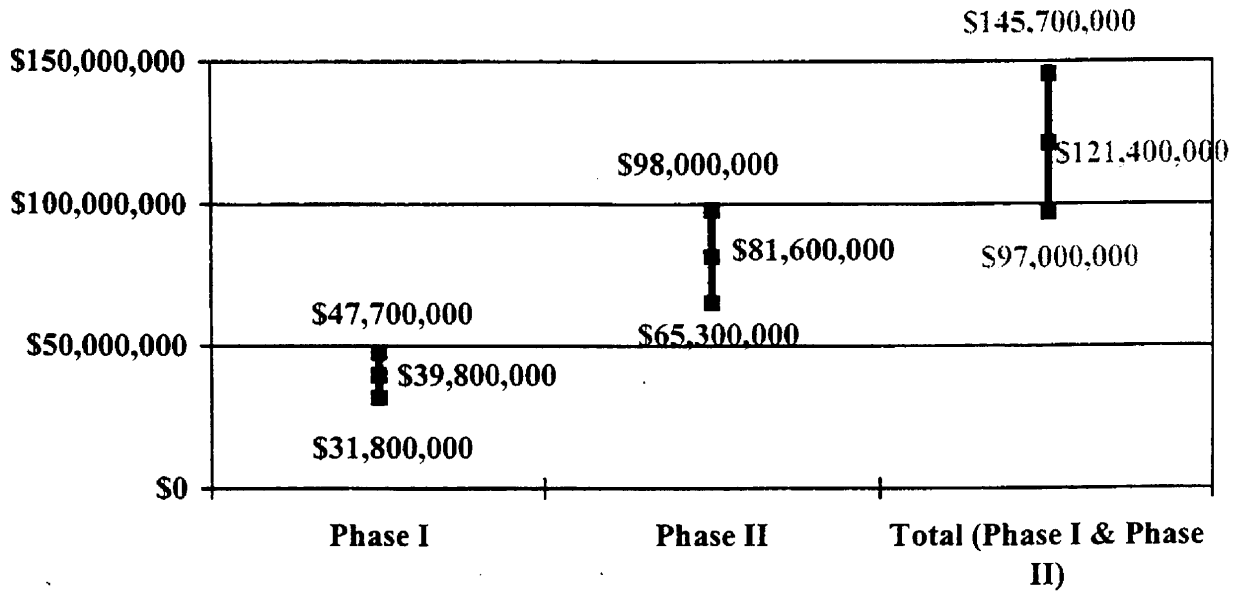
that in mind, the discussion included herein does shed some light on those costs associated with the implementation of wireless E-911 in the Commonwealth.

[39] Note that Virginia's enabling wireless E-911 legislation is scheduled to sunset July 1, 2002. As such, current Virginia State law funds wireless E-911 for only a four-year period (FY 1999 – FY 2002).

[40] Illustrating, if collection of Virginia's .75-cent tax was extended through 2004, the tax would generate roughly $152 million.

Table 2.3: Hypothetical High, Low, & Median Cost for the Deployment of Wireless Phase I and Phase II Location Technology in Virginia



Thereafter, the "service fee could be reduced to an 'operating' level that is reflective of the yearly costs to operate and maintain the [wireless E-911] network."[41] The report concluded this section with the following:

> Our analysis indicated that a service fee of around .75-cents per wireless subscriber per month would provide sufficient funds to implement vehicle location technology, including appropriate network, routing, geospatial database management, and other modernization needs. We expect that existing wireline service fees would continue to contribute to modernization programs targeted at addressing the 'non-wireless' market forces threatening the integrity of today's 911 service.

Lessons for Virginia

The efforts of Washington State's Department of Revenue, Kansas' Legislative Post Audit Committee, and Texas' Advisory Commission on State Emergency Communications to produce reliable estimates of total costs to implement and operate wireless E-911 service are instructive. Washington State's thoughtful attempt to attach specific costs to necessary hardware and software upgrades was undermined by a lack of available information, the time-sensitive nature of the data that was available, and an inability to gauge future decision-making processes.

[41] Texas' *Report to the Advisory Commission on State Emergency Communication* (Texas' Wireless Integration Project, May 1997), p. 80.

Similarly, Kansas' Legislative Post Audit Committee concluded that the lack of on-point, verifiable information – coupled with the fact that public safety officials were only vaguely aware of the FCC requirements at all – prevented the Audit Committee from arriving at a reliable estimate of the costs associated with the implementation of wireless E-911 services. Accepting the hurdles encountered in Washington State and Kansas as givens, Texas' research team constructed a well-designed – though perhaps time-sensitive – hypothetical engineering economic model to answer the question of "how much" for a wireless E-911 solution. The model's biggest weakness is its inability to predict either the decision-making process of, or the level of cooperation between, the participants involved in the implementation of such a system in a given state. That being said, this effort did result in the establishment of a theoretical economic baseline against which Virginia's wireless E-911 cost recovery mechanism can be compared.

So as to reduce costs and better serve important public safety interests, the Commonwealth will need to endorse an emergency telecommunications funding and management strategy that ensures coordinated leadership and direction, as well as accountability and oversight.

The results of these comparisons suggest that Virginia's .75-cent wireless E-911 tax, if extended beyond the current July 1, 2002 sunset date, should provide a stable revenue flow, allowing the Commonwealth to implement in full Phase I and Phase II wireless E-911 location technology over time. Note that this conclusion remains susceptible to those problems highlighted in the Washington State and Kansas reports, namely the lack of publicly accessible information, and an inability to forecast the future decisions and actions of the participants. What is clear, then, is that as Virginia prepares to face increasingly complex challenges in the area of emergency telecommunications generally, and wireless E-911 specifically, communication, coordination, and planning will become increasingly critical. Lacking this coordination, we can expect that wireless E-911 development and deployment costs will increase, and the implementation of an end-to-end emergency telecommunications system in Virginia will be delayed. So as to reduce costs and better serve important public safety interests, then, the Commonwealth will need to endorse an emergency telecommunications funding and management strategy that ensures coordinated leadership and direction, as well as accountability and oversight.

Chapter 3: Emergency Telecommunications Systems in Other States

Chapter 3 catalogues how other states fund and manage wireline and wireless E-911 services. For the purposes of this inquiry, first staff reviewed germane legislation in all fifty states. Thereafter, relying both on *politically important case* and *criterion* sampling strategies, staff focused more directly on California, Connecticut, Indiana, Maryland, Minnesota, North Carolina, South Carolina, Tennessee, and Texas. This chapter consists of the following sections:

- Funding Mechanisms & Cost Recovery for Wireline E-911
- Funding Mechanisms & Cost Recovery for Wireless E-911

FUNDING MECHANISMS & COST RECOVERY FOR WIRELINE E-911[1]

Generally. Though wireline E-911 funding and cost recovery provisions do vary from state to state, similarities do exist. Working from the review of all fifty states' wireline E-911 laws, staff determined the following:

- 84% of states **do** either establish a wireline E-911 tax "ceiling" or levy a "fixed" rate wireline E-911 tax.

- 84% of states **do** promote oversight and accountability of those funds generated by their wireline E-911 tax via an audit procedure (administered either by the state or the locality), and/or mandating that those funds generated by the tax be deposited into "separate and distinct" accounts.

- 70% of states **do not** allow funds generated from their wireline E-911 tax to be used for "salaries, or portions of salaries" of emergency call center employees.

- 74% of states **do** allow for local collection and administration of their wireline E-911 tax,[2] though only Hawaii, Kentucky, North Carolina, Virginia, and West Virginia **do not** either establish a local wireline E-911 tax "ceiling" or "fixed" rate.

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[1] Much of the information in this chapter is drawn from reviews of germane wireline and wireless emergency telecommunications legislation adopted in each of the fifty states. Some of the information is drawn from phone interviews. The author wishes to acknowledge XyPoint Corporation and Perkins Coie LLP for their development of a General 911 Resource Center dedicated to "the development and monitoring of state E9-1-1 laws and legislation with particular attention to the treatment of Commercial Mobile Radio Services (CMRS)." The primary purpose of the Center is to provide a "legislative resource to state legislators, public safety officials, and wireless carriers." This Resource Center contains links to all fifty states' 911 legislation, links that greatly facilitated Crime Commission staff efforts to examine in greater detail state legislation passed both prior and subsequent to the release of the FCCs Report and Order, Docket No. 94-102. Appendices F, G, and H are drawn from the information contained herein.

Note that Virginia is one of 8 states whose enabling legislation *does not* establish a wireline E-911 tax "ceiling" or levy a "fixed" rate wireline E-911 tax, and *does not* promote oversight and accountability of those funds generated by their wireline E-911 tax via an audit procedure, and/or mandating that those funds generated by the tax be deposited into "separate and distinct" accounts. Virginia is also one of 15 states that *does* allow funds generated from their wireline E-911 tax to be used for "salaries, or portions of salaries" of emergency call center employees.

Politically Important States. Turning to those states deemed politically important at the outset – Maryland, North Carolina, South Carolina, and Tennessee – North Carolina, South Carolina, and Tennessee levy and administer their wireline tax at the local level, whereas Maryland allows for the collection both of a state (.10-cents) and a local (.50-cents) tax. North Carolina's statute is most like Virginia's in that it neither sets nor caps the tax rate, and does not mandate an auditing procedure.[3] That being said, North Carolina does require that the monies be deposited into special local accounts (designated the "Emergency Telephone System Fund"), and explicitly states what monies from this Fund are – and are not – to be used for.[4]

The North Carolina NENA President, Jimmy Jones, said that the North Carolina legislature was "careful to make sure that they laid out what they thought the wireline tax should be used for – the 'allowable costs.'"

Maryland's Emergency Telephone System act covers both wireline and wireless E-911.[5] It created an "Emergency Number Systems Board," and charged it with establishing comprehensive, far-reaching planning guidelines, administering the state's "911 Trust Fund," and working with the Legislative Auditor to ensure that the moneys allocated to each local jurisdiction are used to enhance the state's E-911 system.[6] Further, any locality that plans to

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[2] This percentage includes four states - Maryland, New Mexico, South Dakota, and Washington - that employ dual local/state wireline E-911 tax structures.

[3] N.C. General Statute, Chapter 62A. Public Safety Telephone Service.

[4] N.C. General Statute, § 62 A-8. "Money from the Emergency Telephone System Fund shall be used only to pay for: (1) The lease, purchase, or maintenance of emergency telephone equipment, including necessary computer hardware, software, and database provisioning, addressing, and nonrecurring costs of establishing a 911 system, and (2) the rates associated with the service supplier's 911 service and other service supplier recurring charges. (b) The following expenses are not eligible for payment from the Fund: the lease or purchase of real estate, cosmetic remodeling of emergency dispatch centers, hiring, training, and compensating dispatchers, and the purchase of mobile communications vehicles, ambulances, fire engines, or other emergency vehicles." Jimmy Jones, interviewed by phone, October 28, 1998.

[5] Code of Maryland, Title 18, Subtitle 1. 911 Emergency Telephone System.

[6] Code of Maryland, Article 41, § 18-105 provides for the assessment of a .10-cent per month fee to be paid by "the subscribers to switched local exchange access service, wireless telephone service, or other 911-accessible service," and deposited into a "911 Trust Fund." It further allows the governing body of each jurisdiction to adopt "an additional charge not to exceed .50-cents per month to be applied to all current bills rendered for switched local exchange access service, wireless telephone service, or other 911-accessible service within that county." All monies

seek reimbursement for enhancing their 911 system must first obtain Board approval of their plan, as well as any third-party contractual relationships the jurisdiction would like to enter into. Walter J. Campbell - Maryland NENA President and 911 Coordinator for Ball Atlantic - said that Maryland recognized "that wireline and wireless 911 are interconnected By placing 911 planning and oversight under a Board – and staffing it with the expertise it needs – Maryland probably gets better, more coordinated policy, and probably saves money."[7]

Similar to Maryland, in South Carolina any local government that would like to impose a monthly 911 charge must first submit to the state's Division of Information Resource Management (DIRM) a 911 system plan for review and approval.[8] If approved, the maximum allowable recurring 911 charge is $1.00 for those localities with 1,000 to 40,999 access lines, .60-cents for those localities with 41,000 to 99,999 access lines, and .50-cents for those localities with more than 100,000 access lines. The statutory language states clearly that the "funding must be used to pay for the following enumerated items," and then makes clear what the "funding must not be used for."[9] Finally, the funds generated by the monthly 911 charge "must be included in the annual audit of the local government," and a copy of the report "must be forwarded to the state auditor's office....and sent to DIRM."[10]

Tennessee's statute empowers the legislative body of any local jurisdiction to create an emergency communications district, and to establish a board of directors to govern the affairs of that district.[11] The board of directors of any emergency communications district may levy an emergency telephone service charge in an amount not to exceed .65-cents per month for residential lines, and not to exceed $2.00 per month for business lines. Further, the statutory language requires each board to develop an annual budget and fiscal plan, and calls upon these boards to conduct annual audits of the funds generated by the emergency telephone service tax.

Additionally, if an emergency district's board of directors wants to increase the emergency telephone service charge, the question has to be submitted to the emergency district's citizenry.[12] If the chair of the board of directors conveys a "certified copy of the vote of the board to submit such a question to the people....not less than sixty (60) days before the date on

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generated from this levy are deposited into special "911 Trust Fund county accounts." These monies are then allocated back to Maryland's counties "in an amount sufficient to carry out the purposes of this subtitle," though reimbursements to counties shall be made "only to the extent that county funds were used to enhance the 911 system."

[7] Walter J. Campbell, interviewed by phone, November 3, 1998.

[8] Code of Laws of South Carolina, Title 23, Chapter 47. Public Safety Communications Center.

[9] Code of Laws of South Carolina, § 23-47-40. System Funding.

[10] Code of Laws of South Carolina, § 23-47-50. Subscriber Billing.

[11] Tennessee Code Annotated, Chapter 86. Emergency Communications.

[12] In providing an emergency district's board of directors with the ability to increase the emergency telephone service charge, Tennessee Code Annotated, § 7-86-108, Subsection (2)(A) states that "in no event shall the charge exceed one dollar fifty cents ($1.50) per month for residence-classification service users, and not to exceed three dollars ($3.00) per month for business-classification service users."

which a regular election is scheduled to be held,"[13] the following question may be submitted to the voters:

For the increase in emergency telephone service Charges _____ (here insert the amount(s))

Against the increase in emergency telephone service Charges _____ (here insert the amount(s))

By establishing the emergency districts, creating special boards of directors, placing a responsibility on these boards to keep close track of the money, and requiring that rate increases be subject to a vote of the people, Tennessee encouraged both the 911 service and fiscal responsibility.

Conclusion. Summarizing, North Carolina – similar to Virginia – allows for the local collection and administration of a wireline 911 tax, but goes further than the Commonwealth in earmarking these funds, and requiring that they be deposited into a separate account. The enabling wireline 911 legislation in the states of Maryland, South Carolina, and Tennessee all fix the wireline 911 rates, provide for an annual audit procedure, and explicitly state the acceptable uses of those moneys generated. As such, the types of reimbursable costs, the administration of cost recovery, and the verification of costs are all built into the enabling statutory legislation. In Maryland and South Carolina, localities must work closely with statewide 911 oversight bodies, bodies charged with establishing 911 guidelines and reviewing local 911 system plans and/or contracts, among other things. Tennessee uses emergency district boards of directors in much the same fashion, and obligates any locality that wants to raise the tax rate to submit the question to the voters. For a complete list of wireline E-911 laws, see **Appendix F**.[14]

Other Sampled States. California, Connecticut, Indiana, Minnesota, and Texas mirror the national wireline trends in that all five of these states either establish a wireline E-911 tax "ceiling," or "fix" the wireline E-911 tax rate, and do promote oversight and accountability of those funds generated by their wireline E-911 tax via an audit procedure, and/or mandating that those funds generated by the tax be deposited into "separate and distinct" accounts.[15] Additionally, only two of these states (Indiana and Texas) allow funds generated from their

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[13] Tennessee Code Annotated, § 7-86-108, Subsection B.

[14] **Appendix F**, current as of August 1999, includes columns devoted to the following:

- Current wireline E-911 tax rates;
- Whether the state has established an E-911 board, department or agency division at the state level;
- Whether the monies generated by the tax can be used for salaries of PSAP personnel; and
- Whether some sort of oversight function is built into the enabling legislation.

[15] See California Revenue and Tax Code, Part 20. Emergency Telephone Users Surcharge Law; Connecticut General Statutes, Title 28, Chapter 518a. Emergency Telecommunications; Indiana Code, Article 8, Chapter 16. Emergency Telephone System Fee; Minnesota Statutes, Chapter 403. Local Emergency Telephone Services; Texas Health and Safety Code Annotated, Title 9, Subtitle B, Chapter 771. State Administration of Emergency Communications; and Washington Revised Code, Title 38, Chapter 38.53. Emergency Management.

wireline E-911 tax to be used for "salaries, or portions of salaries" of emergency call center employees, and only one (Indiana) has not established a statewide 911 oversight body. The tax rates levied by these states ranges from a low of .8-cents to a high of .50-cents,[16] and are collected and administered locally in Indiana and Texas.[17] *100% of the population of each of these five states is served by at least basic 911 services.*

Texas' statute is unique in that it authorizes its Advisory Commission on State Emergency Communications (Commission) to levy a "911 equalization surcharge."[18] Recognizing that the monies generated from their local option, fixed .50-cent wireline E-911 tax might not cover in full the operating costs associated with implementing and maintaining a statewide wireline E-911 system, the statute calls for the Commission to collect and appropriate revenue received from the tax to Texas' regional 911 planning commissions. Rather than requiring monetary allocations to be equal across the regional 911 planning commissions, the statute calls upon the Commission to allocate the moneys in a manner geared towards implementing E-911 service statewide. Commenting on the equalization surcharge, Texas NENA President Ben Goodloe noted that "some small local jurisdictions simply do not have the tax base necessary to generate enough money to implement an E-911 system. To deal with that issue, Texas decided to go with the equalization surcharge. It's a good way to help bring those localities that otherwise would probably never be able to generate enough money to provide this public safety service up to speed."[19]

Also, in Minnesota, Connecticut, California, and Texas – similar to Maryland, South Carolina, and Tennessee – localities and/or PSAPs are required by statute to work with state level 911 oversight bodies. Minnesota calls upon all parties to cooperate in planning and implementing wireline 911 systems. Implementation plans and contracts, as well as any other binding agreements, need to be approved by the state's Department of Administration.[20] California's enabling legislation charges the state's Department of General Services (Communications Division) with taking the 911 oversight role a step further:[21]

> The Communications Division shall monitor all emergency telephone systems to ensure they comply with minimal operational and technical standards as establish by the Division [of General Services]. If any system does not comply the Communications Division shall notify in writing the public agency or agencies operating the system of its deficiencies. The public agency shall bring the system into compliance with the operational and technical standards within 60 days of notice by the [Communications]

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[16] This range does not include California or Indiana, both of which levy a percentage based tax.

[17] In Texas, the tax is collected and administered regionally.

[18] Texas Health and Safety Code Annotated, Title 9, Subtitle B, Chapter 771, § 771.072. Equalization Surcharge. Note also that Washington State utilizes a .20-cent equalization tax in much the same fashion.

[19] Ben Goodloe interviewed by phone November 6, 1998.

[20] Minnesota Statutes, § 403.8. Plans submitted; changes; waivers.

[21] California Revenue and Tax Code, Part 20, § 53115. Tentative and Final Plans by Agencies.

Division. Failure to comply within such time shall subject the public agency to action by the Attorney General."[22]

Whereas in Minnesota and California, existing state-level departments and/or agencies were charged with overseeing the implementation of a statewide E-911 system, Texas and Connecticut housed similar responsibilities in two newly created administrative bodies: Texas' Advisory Commission on State Emergency Communications, and Connecticut's Office of Statewide Emergency Telecommunications. Texas' legislation requests that all parties work with the Commission "to the fullest extent possible,"[23] and directs the state's regional 911 planning commissions to develop and submit regional 911 plans to the Commission for the purposes of cost recovery.[24] Connecticut' Office of Statewide Emergency Telecommunications is responsible for developing and maintaining a statewide emergency service telecommunications policy.[25] In connection with this responsibility, the office is required to do the following:

Regularly cited as a model state, Connecticut's George J. Pohorilak reports that Connecticut implemented wireline E-911 statewide in 1989. By enacting a statewide tax, and linking PSAP cost recovery to compliance with statewide 911 plans, "we have been able to foster some regional cooperation and benefit from economies of scale."

- Develop a statewide emergency service telecommunications plan;
- Administer a statewide Enhanced Emergency 911 program;
- Provide technical telecommunications assistance to state and local police, fire and emergency medical service agencies;
- Provide frequency coordination for different public safety agencies;
- Coordinate and assist in statewide planning for E-911 systems;
- Review and make recommendations concerning proposed legislation affecting emergency service telecommunications; and

[22] California Revenue and Tax Code, Part 20, § 53115, Subsection e.

[23] Texas Health and Safety Code Annotated, Title 9, Subtitle B, Chapter 771, § 771.052. Agency Cooperation.

[24] Texas Health and Safety Code Annotated, Title 9, Subtitle B, Chapter 771, § 771.056. Submission of Plan to Commission.

[25] Connecticut General Statutes, Title 28, Chapter 518a, § 28-24.

- Review and make recommendations to the General Assembly concerning emergency service telecommunications funding.

Regularly cited as a model state, the Office of Statewide Emergency Telecommunications' George J. Pohorilak reports that Connecticut implemented wireline E-911 statewide in 1989. Said Pohorilak, "by explicitly linking PSAP cost recovery to compliance with statewide planning guidelines and system requirements, we have been more successful moving Connecticut along as a state. We have been able to foster some regional cooperation and benefit from economies of scale."[26]

Conclusion. Taken as a whole, the five states reviewed in brief above have enacted enabling wireline E-911 legislation that is more comprehensive, explicit, and public safety focused than the comparable Virginia legislation. Working from the assumption that the citizenry's public safety interests are best served by a reliable, statewide E-911 system, and accepting that such a system is more likely to result when strategic planning, and inter-jurisdictional and inter-agency communication, coordination, and cooperation is the norm, these states enacted legislation centered around the following core ideas:

- Wireline E-911 is a critical public safety service;

- Having wireline E-911 available statewide is a public benefit; and

- Statewide wireline E-911 service should be delivered without risk of interruption resulting from a lack of planning, guidance, management, and/or expertise.

Establishing clearly the primacy of public safety considerations, these states also address system funding needs. In an effort both to assure that funds sufficient to support the initial purchase and subsequent maintenance of wireline E-911 equipment and services are raised, and that those funds are spent in a manner that reinforces efforts to develop a statewide emergency telecommunications system, these states tend to do the following:

- "Set" or "cap" their wireline E-911 tax rate;

- Require that those funds collected be deposited into a separate and distinct account;

- Earmark those funds generated by their wireline E-911 tax for specific cost recovery purposes;

- Provide for an annual audit procedure that goes above and beyond any standard auditing process that might already be in place.

While some of the provisions in other states may not be appropriate in Virginia, they illustrate the range of options available to the General Assembly. Summarizing, Virginia's

[26] George Pohorilak interviewed by phone November 6, 1998.

"Local Tax for Enhanced Emergency Telephone Service" (*Code of Virginia*, § 58.1-3813) does comparatively little to encourage either the development or subsequent acceptance of those ideas deemed central by the large majority of other states to the strategic and successful implementation and future uninterrupted operation of their E-911 systems and infrastructure. Focused almost solely on cost recovery for Virginia's local jurisdictions, the Commonwealth's enabling legislation mentions the phrase "public safety" only in the statute's definitional section. Further, it *does not* mandate that the wireline E-911 tax rate be "set" or "fixed," *does not* provide for any audit procedure, and *does not* require that funds generated by the tax be deposited into separate and distinct accounts. Virginia is also one of only a handful of states that allows these funds to be used for "salaries, or portions of salaries" of emergency call center employees. And finally, working from the assumption that Virginia's enabling legislation was originally adopted in an effort to help defray the costs associated with the implementation of wireline E-911 services, the fact that the legislation does not state explicitly what the moneys generated by the tax are – and are not – to be used for is highly problematic.

Virginia's "Local Tax for Enhanced Emergency Telephone Service" does little to encourage either the development or subsequent acceptance of those ideas deemed central by the large majority of other states to the successful implementation and future uninterrupted operation of their E-911 systems and infrastructure.

Taking the above as their cue, many of the interviewees for this piece criticized Virginia's failure to more thoroughly address public safety, strategic planning and coordination, and cost recovery concerns in its enabling legislation. These identified statutory shortcomings are said to contribute to the variability of Virginia's wireline E-911 tax rate, accounting measures, and local interpretation of "acceptable uses," the fact that the Commonwealth is not 100% wireline E-911 compliant, and the current lack of inter-jurisdictional and inter-agency communication and cooperation, among other things. Remembering that future wireless E-911 services will rely heavily on Virginia's wireline E-911 infrastructure, these deficiencies are troublesome.

FUNDING MECHANISMS & COST RECOVERY FOR WIRELESS E-911

Generally. Less variable than wireline E-911, wireless E-911 funding and cost recovery provisions are quite similar across states. Working from the review of the legislation adopted by the 31 states (62%) that enacted wireless E-911 laws as of January 1999, staff determined that Virginia's Wireless Enhanced Public Safety Telephone Service Act (*Code of Virginia*, §§ 56-484.8 to 484.11) – similar to comparative legislation in these 31 other states – does do the following:

- Creates a Wireless E-911 Service Board. (*84% of states that have enacted wireless E-911 laws **do** create and empower some sort of wireless 911 board, department, or division.*)

- Establishes a fixed wireless E-911 cost recovery mechanism and designates who is eligible to receive cost recovery for the delivery of wireless E-911 services. (*100% of those states that have enacted wireless E-911 laws **do** include a specific cost recovery mechanism. 94% of these states do either "cap" or "fix" their wireless E-911 tax rate.*)

- Requires oversight and accountability via a formal audit procedure. (*90% of states that have enacted wireless E-911 legislation **do** require oversight and accountability by way of a formalized audit procedure and/or mandating that those funds generated by the tax be deposited into a separate and distinct account.*)

Conversely, Virginia's wireless E-911 legislation is different from that adopted by other states in that it ***does not*** do the following:

- Endow the Commonwealth's Wireless E-911 Board with extensive "fiduciary" and "policy-making" responsibilities. (*84% of those states with a wireless 911 board, department, or division **do** grant these bodies both fiduciary and policy-making – in terms of planning, coordination, and implementation of wireless E-911 service – responsibilities.*)

- Extend the opportunity of board membership beyond the PSAP/local government and telecommunications industry communities. (*69% of those states with a 911 board, department, or division **do** extend membership opportunities to a wide variety of interested parties, including law enforcement and emergency fire and rescue personnel, as well as technology experts and engineers, to name but a few.*)

- Provide for any staff support for Virginia's Wireless E-911 Service Board. (*62% of those states with a 911 board, department, or division **do** provide these entities with staff support. Many fund a "statewide 911 coordinator," and other staff from the moneys generated by their state's wireless E-911 tax.)*

Politically Important States. Maryland, North Carolina, South Carolina, and Tennessee have all enacted wireless E-911 legislation.[27] Maryland and North Carolina levy a "fixed" rate wireless E-911 tax, while South Carolina opted for a levy not to exceed the average monthly wireline E-911 rate (currently .58-cents). Tennessee created an emergency communications board, charged it with levying a fixed statewide rate not to exceed $2.00, and required that the tax be ratified by a joint resolution of the General Assembly prior to implementation.

[27] Note that Maryland's Emergency Telephone System act covers both wireline and wireless E-911. For a more detailed discussion of the particulars, see the *Funding Mechanisms and Cost Recovery for Wireline E-911* section above.

North Carolina's statute is similar to Virginia's in that it does establish a Wireless 911 Board, sets a statewide .80-cent wireless E-911 service charge, and neither provides the Wireless E-911 Board with staff support, nor charges it with any policy-making responsibilities. But, recognizing the limitations posed by this lack of staff support, North Carolina's controlling statutory language does set out the specific cost recovery language summarized below. [28]

- Sixty percent (60%) of the funds in the wireless E-911 fund are to be used to reimburse CMRS providers.

- Forty percent (40%) of the funds in the wireless E-911 fund are to be used to make monthly distributions to eligible PSAPs. Fifty percent (50%) of this total shall be divided equally among the total number of eligible PSAPs in North Carolina, and the other fifty percent (50%) shall be divided pro rate among the eligible PSAPs based on the population served by the PSAP.

Additionally, the statute does require a biannual report to the Joint Legislative Commission on Governmental Operations, requires an annual audit, discusses the proprietary nature of the information involved, and does include a "limitation of liability" clause for operators of an E-911 system.[29]

South Carolina's statute establishes the CMRS Emergency Telephone Services Advisory Committee, charging it with assisting the state's Budget and Control Board in carrying out "its responsibilities in implementing a wireless enhanced 911 system consistent with FCC Docket 94-102."[30] Similar to North Carolina, South Carolina's controlling statutory language also sets out specific cost recovery language,[31] requiring the following:

- 39% be distributed directly to PSAPs based on call volume expenses;

- 57% be used to provide cost recovery to PSAPs and wireless service providers for expenses incurred in connection with compliance with the FCC requirements; and

- An amount not to exceed 2% of the monthly fees collected be used to compensate an independent auditor, and to cover other expenses incurred by the Committee in fulfilling its responsibilities.

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[28] N.C. General Statute, Chapter 62b-5. Public Safety Telephone Service.

[29] Code of Virginia, § 8.01-225, Section "C", provides similar liability protections, stating that "any provider of telecommunication service, as defined in § 58.1-3812, including mobile service, in this Commonwealth shall not be liable for any civil damages for any act or omission resulting from rendering such service with or without charge related to emergency calls unless such act or omission was the result of such service provider's gross negligence or willful misconduct. Any volunteer engaging in rescue or recovery work at a mine or any mine operator voluntarily providing personnel to engage in rescue or recovery work at a mine not owned or operated by such operator, shall not be liable for civil damages for acts or omissions resulting from the rendering of such rescue or recovery work in good faith unless such act or omission was the result of gross negligence or willful misconduct."

[30] Code of Laws of South Carolina, § 23-47-65, Section A.

[31] Code of Laws of South Carolina, § 23-47-65, Section C.

Similar to most states, South Carolina's statute makes clear that the monies generated by the wireless E-911 tax are earmarked for the delivery of a specific service. As such, these monies "are not general fund revenue of the State and must be kept by the State Treasurer in a fund separate and apart from the general fund."[32]

Tennessee's legislature, working from the premise that the establishment of a uniform emergency number to better serve the public safety interests of the citizenry is a matter of public interest and concern, created an Emergency Communications Board, approved the levy of a statewide wireless E-911 tax, and established the 911 Emergency Communications Fund. Recognizing the link between wireline and wireless E-911, the controlling language charges the Board with developing and implementing a plan for providing 911 service and wireless 911 service to all citizens of Tennessee. Additionally, if the Board finds that the anticipated revenues generated from Tennessee's wireline and wireless E-911 taxes are not adequate to achieve and maintain the established technical and operating standards, the Board is to study and report on other funding options for the provision of 911 services. John Garner, Chair of the Board, reports that with [911] system uniformity across Tennessee lacking, "one of the things the Board will be looking at is how to begin to bring some consistency to this area." Said Garner, "Our goal is to begin to move down the path of ensuring that a good deal of thought and planning are put into future upgrades and purchases of 911 systems equipment. Hopefully, we can better ensure compatibility across our emergency service districts."[33]

Conclusion. Looking briefly at the politically important states discussed above, the wireless E-911 funding mechanisms typically chosen include monthly taxes, taxes that are to be collected and deposited into a separate wireless E-911 account. In North Carolina and Maryland, the rate is fixed, South Carolina established an average rate that works off of the wireline E-911 rate, and Tennessee sets a maximum rate of $2.00. Here, as with the states examined below, none of these states said they arrived at the rate of the tax levied based on data on the actual costs to implement Phase I and Phase II wireless E-911 location services. Recognizing the dilemma posed by the lack of verifiable cost data, those interviewed for this study did report that they anticipated future changes in their state's tax rate.

Additionally, these statutes authorize the wireless carriers and the PSAPs to recover costs associated with delivering wireless E-911 services. They either list in their statute the types of reimbursable costs for wireless carriers and PSAPs, or empower a body authorized by the statute to determine the costs that are reimbursable. North Carolina's Wireless 911 Board, Maryland's Emergency Number Systems Board, South Carolina's CMRS Emergency Telephone Services Advisory Committee, and Tennessee's Emergency Communications Board are all charged with verifying the cost recovery estimates submitted by wireless service providers and PSAPs, and overseeing and administering monetary disbursements. Though North Carolina's Board exercises an oversight responsibility only, the others have rule making, management, reimbursement, and/or audit authority for wireless – and in the case of Maryland and Tennessee, wireline – E-911. The duties of these bodies may include, but are not limited to, the following:

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[32] Code of Laws of South Carolina, § 23-47-50, Section "F".

[33] John Garner interviewed by phone October 27, 1998.

- Reviewing the funding mechanism as needed;
- Reviewing and either approving or disapproving CMRS and PSAP reimbursement requests;
- Dispersing funds from the wireless E-911 account;
- Submitting annual reports – both financial and policy – to auditors and/or other review agencies and oversight bodies, or their state's legislature;
- Hiring and retaining staff support;
- Drafting comprehensive and strategic rules, plans, procedures, and guidelines; and
- Conducting additional studies and advising the state legislature on any current and future needs.

For a complete list of wireless E-911 laws, see **Appendix G**.[34] For a complete list of all wireless E-911 related activity, see **Appendix H**.[35]

Other Sampled States. California, Connecticut, Indiana, Minnesota, and Texas mirror the national wireless trends in that all five of these states have enacted wireless E-911 legislation that empowers a board, department, or agency division to oversee wireless E-911, establishes a wireless E-911 tax, and does promote oversight and accountability of those funds generated by their wireless E-911 tax.[36] Four of the five states (80%) extend the possibility of board membership to a wide variety of individuals, and four out of five states (80%) do grant these bodies both fiduciary and policy-making responsibilities. Additionally, each of the five states

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[34] **Appendix G**, current as of August 1999, includes columns devoted to the following:

- Current wireless E-911 tax rates;
- Whether the state has established an E-911 board, department or agency division at the state level;
- Whether the legislation mandates some sort of oversight function is built into the enabling legislation;
- Whether the legislation provides for staff support; and
- Whether in those states that have established an E-911 board, department or agency division at the state level that body is charged both with a fiduciary and policy-making function.

[35] **Appendix H**, current as of August 1999, includes columns devoted to the legislation, subject matter, and last action I those states that did consider wireless E-911 legislation during calendar year 1999.

[36] See California Revenue and Tax Code, Part 20. Emergency Telephone Users Surcharge Law; Connecticut General Statutes, Title 28, Chapter 518a. Emergency Telecommunications; Indiana Code, Article 8, Chapter 16. Emergency Telephone System Fee; Minnesota Statutes, Chapter 403. Local Emergency Telephone Services; Texas Health and Safety Code Annotated, Title 9, Subtitle B, Chapter 771. State Administration of Emergency Communications; and Washington Revised Code, Title 38, Chapter 38.53. Emergency Management.

(100%) provide specifically for staff support.[37]

> *"The costs for the Phase I implementation in Indiana indicate that the costs are higher in the rural areas than the urban areas, and higher for the smaller carriers than the larger companies."*
>
> *Ken Lowden, Indiana State E-911 Representative*

Similar to Tennessee, Texas' statute looks to encourage "units of local government and combinations of the units to develop and improve emergency communications procedures and facilities in a manner that makes possible the quick response to any person calling the telephone number 911 seeking police, fire, medical, rescue, and other emergency services."[38] To provide for ANI and ALI of wireless 911 calls, Texas' statute charges its Advisory Commission on State Emergency Communications (the same entity that oversee the delivery of wireline E-911 services) to impose a wireless E-911 tax at a rate of .50-cents per month.[39] The statute does set out specific cost recovery language, requiring that the Advisory Commission redistribute the funds collected back to each of Texas' regional planning commissions and emergency communications districts "in a portion that bears the same proportion to the total amount collected" by that commission and/or district. Wireless service provider cost recovery is restricted to "reasonable expenses for network facilities, including equipment, installation, maintenance, and associated implementation costs." Texas NENA President Ben Goodloe commented that though Texas' statute does allow "for a lot of discretion at the local level," that discretion is somewhat counterbalanced by the "efforts of the Advisory Commission to establish general guidelines both for wireline and wireless 911 systems." Though service delivery does "vary from jurisdiction to jurisdiction in Texas, the state is beginning to make progress in that area."[40]

Indiana's wireless E-911 statute is unique in that it sets the state's Emergency Wireless Enhanced 911 Fee at .65-cents, but then allows for the fee to be adjusted.[41]

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[37] Note that the 911 statutory language adopted in California, Connecticut, and Minnesota covers both wireline and wireless E-911. For a more detailed discussion of the particulars, see the *Funding Mechanisms and Cost Recovery for Wireline E-911* section above.

[38] Texas Health and Safety Code Annotated, Title 9, Subtitle B, Chapter 772, § 772.102. Purpose.

[39] Texas Health and Safety Code Annotated, Title 9, Subtitle B, Chapter 771, § 771.0711. Emergency Service Fee for Wireless Telecommunications Connections.

[40] Ben Goodloe interviewed by phone November 6, 1998.

[41] Indiana Code, Article 8, Chapter 16, § 36-8-16.5-26. Note to that California's statute – which covers both wireline and wireless E-911 services - allows for an adjustment of the tax rate (currently the tax is placed on all intrastate calls made on a wireless phone or over a hardwired phone line). The procedure for determining the annual surcharge (both for wireline and wireless) follows (California Revenue and Tax Code, Part 20, § 41030). "The Department of General Services shall determine annually, on or before September 1, a surcharge rate that it estimates will produce sufficient revenue to fund the current fiscal year's 911 costs. The surcharge rate shall be determined by dividing the costs the Department of general Services estimates for the current fiscal year of 911 plans....less the available balance in the State Emergency Telephone Number Account....by its estimate of the charges for intrastate telephone communications services to which the surcharges will apply for the period of

Indiana's Experience with CMRS Cost Recovery and Phase I Wireless E-911[42]

Looking to guarantee appropriate cost recovery decisions for wireless service providers, and aware of the proprietary nature of the information involved, Indiana's 11-member Wireless E-911 Advisory Board created a three member cost recovery committee to review the details of each wireless carrier's cost recovery plan and report to the Board. This helps to assure that the wireless carrier's proprietary information will be reviewed in a confidential manner and that the Board will have enough information to make a cost recovery decision.

Illustrating, the wireless carriers in Indiana submitted Phase I wireless E-911 implementation plans with full, certified, sworn statements and costs to the oversight board. The wireless costs were estimates because the local phone companies in Indiana did not provide costs to the wireless carriers for the local phone companies portion of the E-911 wireless service. The Board advised each wireless carrier that they must return in the first quarter of 1999 and present the Board with the true costs verified with invoices and that board will settle the differences.

The wireless carriers determine a cost recovery amount per subscriber that they submit to the Board, along with subscriber counts and actual costs, for reimbursement. To calculate the cost recovery amount, each wireless carrier divides the non-recurring and recurring costs by their subscriber count. To reduce the non-recurring costs at a faster rate, the Board has approved a higher cost recovery rate per subscriber.

The Indiana Board found that the cost recovery amount per subscriber was higher for the smaller wireless carriers. They will reimburse at a higher rate to assist the smaller carriers, but will not go over 125% of the .25-cent wireless carrier fee.

The Indiana Board has also found that the most significant cost driver for wireless Phase I service is the local wireline charges for connecting the wireless and wireline systems.

Resellers of wireless service and prepaid wireless phone cards are two revenue collection concerns of the Indiana Board. The resellers do not always collect and remit the fee and it is difficult to obtain information from the wireless carriers regarding the resellers. With the prepaid wireless phone cards, it is not clear who pays the .65-cent fee to the fund each month or how to ensure that the total amount due is collected over the number of months the prepaid phone card is used.

The [Wireless Enhanced 911 Advisory] Board may adjust the emergency wireless enhanced 911 fee....The Board shall assess the fees at rates that ensure full recovery over a reasonable period of time of costs incurred by CMRS providers and PSAPs to develop and maintain an enhanced wireless 911 system. The fees may not:

(1) Be raised or lowers more than one (1) time in a calendar year;
(2) Be raised more than seven cents ($0.07) by an adjustment; or
(3) Exceed one dollar ($1).per month for each telephone number.

November 1 of the current calendar year to October 31 of the next succeeding calendar year, but in no event shall such surcharge rate in any year be greater than three-quarters of 1 percent nor less than one-half of 1 percent."

[42] Drawn from Washington State's *Enhanced 911 Funding Study for Wireless Telecommunications in Washington State* (Washington State Department of Revenue, December 1998), p. 5-6.

Commenting in a report prepared by Washington State's Department of Revenue (see note below), Ken Lowden, Indiana State's E-911 representative, noted that Indiana's decision to allow for movement in the fee was based on the fact that no one could provide the state with accurate cost data for implementing a Phase I wireless E-911 location system. "That is why we based the [initial] rate for the fee on the cost recovery rate that the wireless carriers said they needed rather than actual costs." With Phase I implementation statewide currently underway in Indiana, Lowden reports the following:

> Now the wireless carriers have implemented Phase I systems and can line item the costs. If Indiana was to develop the fee now, [it] would base the rate on actual costs. The costs for the Phase I implementation in Indiana indicate that the costs are higher in the rural areas than the urban areas, and higher for the smaller carriers than the larger companies.

Note also that Indiana's statute is extremely specific when it comes to the management and oversight of the Wireless Emergency Telephone System Fund, as are those provisions focused on cost recovery.

Conclusion. Similar to other states, Virginia's "Wireless Enhanced Public Safety Telephone Service Act" (*Code of Virginia*, § 56-484.8 to 484.11) does create a Wireless E-911 Service Board, establishes a fixed wireless E-911 cost recovery mechanism and designates who is eligible to receive cost recovery for the delivery of wireless E-911 services, and requires oversight and accountability via a formal audit procedure.

But unlike many other states that have enacted wireless E-911 legislation, Virginia's Act does not endow the Commonwealth's Wireless E-911 Board with extensive "fiduciary" and "policy-making" responsibilities, extend the opportunity of board membership beyond the PSAP/local government and telecommunications industry communities, or provide for any staff support.

Turning to the five states reviewed here, note first that California, Connecticut, and Minnesota each addressed wireline and wireless E-911 jointly. Remembering that the delivery of wireless E-911 services depends heavily on the existing wireline E-911 infrastructure, in dealing with emergency telecommunications in toto, these states endorsed the view that a reliable, statewide E-911 system is more likely to result when inter-jurisdictional and inter-agency communication, coordination, and cooperation is the norm. Though the enabling statutory legislation in Texas and Indiana does treat wireline and wireless E-911 separately, Texas' Advisory Commission on State Emergency Communications does administer and oversee all of Texas State's 911 systems. Though it does not touch explicitly on wireline E-911, Indiana's Wireless Enhanced 911 Advisory Board – unlike Virginia's – is permitted to hire staff, and adjust the state's Emergency Wireless Enhanced 911 Fee.

Similar, then, to Virginia's "Local Tax for Enhanced Emergency Telephone Service" (*Code of Virginia*, § 58.1-3813), Virginia's wireless E-911 legislation fails to touch upon many of those ideas deemed central by other states to the successful implementation and future

uninterrupted operation of a statewide E-911 system. Focused on providing for wireless service provider and PSAP cost recovery, and the establishment of an oversight body and a cost recovery mechanism, Virginia's wireless E-911 legislation wholly ignores "public safety" considerations. Lacking the ability to develop and implement statewide guidelines to encourage the strategic development of E-911 systems, and having no staff support, Virginia's Wireless E-911 Board is unable to thoroughly examine and consider wireless service provider and PSAP cost recovery estimates either from a fiduciary or policy coordination standpoint. In its current form, then, Virginia's Wireless E-911 Board is ill-equipped to provide the leadership demanded of those emergency telecommunications boards, departments, and/or divisions operating in the states sampled here.

Finally, note that those states that are actively participating in the wireless E-911 discussion have recently raised many concerns related to the cost recovery aspect of wireless E-911. As summarized in the Washington State reported cited above, these concerns include, but are not limited to, the following.

- Different wireless carriers base their "final cost estimates" on different criteria;
- It is difficult to get proprietary information on the number of wireless subscribers and/or the actual costs associated with the delivery of wireless E-911 services from the wireless vendors.
- Wireline phone companies may look to pass costs through wireless service providers and/or PSAPs to state wireless boards, departments, and/or divisions for upgraded equipment that is part of the local phone company network and should not be charged to wireless E-911;
- Wireline phone companies may be "double-dipping," charging the wireless service providers and the PSAPs for the same cost item;
- The costs quoted by wireline phone companies for equipment and/or service that is directly related to the provision of wireless E-911are excessive, and keep going up;
- Resellers of wireless service do not always collect and remit the wireless E-911 tax, and it is difficult to obtain information from the wireless carriers regarding the resellers; and
- With prepaid wireless phone cards, it is not clear who pays the wireless E-911 tax to the designated board/body each month, or how to ensure that the total amount due is collected over the number of months the prepaid phone card is used.

Accepting that cost recovery issues have proven to be more complex than originally anticipated by the FCC, Virginia – similar to other states – will need to revisit and reconsider the issue of wireless E-911 cost recovery as it relates to proprietary information, as well as those parties and services not presently covered by wireless E-911 legislation.

Lessons For Virginia

Virginia's wireline and wireless E-911 enabling legislation does not compare favorably either with those statutes enacted by the states deemed politically important, or those statutes enacted by the states identified as trendsetters in the field of inquiry. By treating wireline and wireless E-911 as separate and distinct, not accounting for those public safety ideals deemed central by many other states, and not encouraging in any tangible way strategic planning and coordination, service delivery has and will continue to suffer. Further, Virginia's wireline E-911 legislation does little to encourage the high level of accountability that is required for dedicated tax revenues. Recognizing again as the paramount the public safety needs of Virginia's citizenry, and cognizant of the fact that this public safety interest needs to be served efficiently, a more focused approach to emergency telecommunications in Virginia is needed.

Chapter 4: Virginia's Wireline E-911 Tax

Chapter 4 investigates in more detail the questions surrounding wireline E-911 generally, and Virginia's wireline E-911 tax, specifically. This chapter consists of the following sections:

- The Current Status of Wireline E-911 Services in Virginia
- Virginia's Wireline E-911 Tax

THE CURRENT STATUS OF WIRELINE E-911 SERVICES IN VIRGINIA[1]

Generally. Wireline 911 calls travel over a network of landlines from the caller to the appropriate PSAP. The major components of the E-911 wireline system include the Public Switched Telephone Network (PSTN), the Dedicated E-911 System, (which includes dedicated telephone trunks), the E-911 Selective Router, the E-911 Database, and the 911 Public Safety Answering Points (PSAPs).[2]

When a caller dials 911 from a wireline phone in a jurisdiction equipped with a wireline E-911 system, the call travels over the PSTN just like any other call to the local telephone company's Central Office. At the Central Office, the switching equipment recognizes the digits 911 and immediately transfers the call from the PSTN to dedicated 911 trunks that carry the call to the 911 selective router. At the 911 selective router, specialized software recognizes the 911 routing number associated with the caller's telephone number and routes the call along dedicated 911 trunks to the PSAP that serves the caller's geographic area. When the 911 equipment at the PSAP receives the 911 call, the caller's phone number is automatically sent to the 911 database, which is maintained by the local telephone company providing 911 service to the PSAP. The caller's name, address, telephone number, and associated emergency response information is retrieved from the 911 database. The caller's information is sent to the PSAP over the data circuits to a display at the call taker answering position. The call taker then has the information

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[1] Item 9 2c (1999 Appropriations Act), which directed the Crime Commission, with assistance from Virginia's Auditor of Public Accounts, to expand the scope of its study of emergency 911 communications to evaluate the assessment and utilization of the local tax for enhanced emergency telephone services. To that end, a mail survey of all of Virginia's local governments was constructed by Crime Commission staff and Virginia's Auditor of Public Accounts. This survey focused on wireline 911 generally, and how local governments administer and account for those funds generated by the local tax for enhanced emergency telephone service (*Code of Virginia*, § 58.1-3813). After collecting and assimilating the data provided in the surveys, the Auditor of Public Accounts then conducted a follow-up study of forty randomly selected local jurisdictions. A copy of the survey form is included in **Appendix B**. Much of the information in this chapter is drawn from the information collected Pursuant to Item 9 2c, as well as other germane documents provided by Virginia's Finance Secretariat and Department of Planning and Budget, as well as the Auditor of Public Accounts.

[2] For a more complete discussion of these major components, see Chapter 2.

Localities Not Providing Wireline E-911 Service that Currently Collect the Wireline E-911 Tax

Cities (FY 99: $13,000)
Covington

Counties (FY 99: $1.54 million)

Alleghany	*Middlesex*
Amherst	*Nelson*
Botetourt	*Pulaski*
Essex	*Tazewell*
King William	*Westmoreland*
Lunenburg	

needed to send help to people who are unable to speak or do not know their telephone number or location. In 1999, the Commonwealth's 135 cities and counties are serviced by an estimated 150 primary and secondary PSAPs. 97% of Virginia's population (89% of the land area) is served by (at least) basic 911,[3] while 95% of Virginia's population (77% of the land area) is served by E-911).[4]

The Wireline Rate. The average wireline E-911 tax in Virginia is $1.30. Compared to three national measures developed from a review of all 50 states' 911 laws, Virginia's wireline E-911 tax rate is .63-cents above the national average of .67-cents, a number pulled from the 42 states that do either "establish a ceiling" or "set the rate" for their wireline E-911 tax.

The enabling legislation does call for a reduction of the wireline E-911 tax once local jurisdictions fully recover initial capital and installation costs "to the level necessary to offset recurring maintenance, repair, and system upgrade costs, and salaries or portion of salaries of dispatchers or call-takers" (*Code of Virginia*, § 58.1-3813, Subsection D). The evidence collected shows that after initially setting wireline E-911 tax rates at an estimated average level of .98-cents, [5] those rates have gradually increased over time. In fact, over the past six years Virginia's wireline E-911 tax rate has increased from an average of .99-cents in 1994 to $1.30 in 1999. This represents a 31% increase. For a complete list of Virginia's wireline E-911 tax rates from 1994 to 1999, see **Appendix I**.

As of September 1999, some jurisdictions do levy a local tax for enhanced emergency telephone service but do not provide wireline E-911 services. 911 tax and coverage service information indicates that these jurisdictions include the counties of Alleghany, Amherst, Bote-

[3] With basic 911 service (as opposed to wireline E-911 services), all 911 calls go to the same PSAP in a particular area for the purpose of reporting police, fire, medical, and other emergency situations. With Basic 911 service, only the voice of the caller is provided. Therefore, the call taker must ask the 911 caller for their phone number and location, and then determine - based on the description provided by the caller - which police, fire, and emergency medical agencies need to respond to the caller's address. If the caller is unable to speak for any reason, or is not sure of their phone number and/or location, the call taker may not be able to provide assistance to the caller. As of June 1999, 97% of Virginia's population, and 89% of the land area is served by basic 911.

[4] Information provided by the Virginia chapter of NENA. Population figures (1998 estimates) drawn from the University of Virginia's Weldon Cooper Center for Public Service.

[5] This "average" initial rate is based on information provided by Bell Atlantic, GTE, and Sprint, the three largest wireline service providers doing business in the Commonwealth. Note that this information did *not* include initial wireline E-911 tax rates for *all* Virginia localities. As such, this rate is an estimate.

*Localities Not Providing Wireline E-911 Service that Currently **Do** Not Collect a Wireline E-911 Tax*

Cities
Clifton Forge

Counties

Appomattox	*Bath*
Buchanan	*Bland*
Craig	*Dickenson*
Fluvanna	*Highland*
King & Queen	*Lee*
Madison	*Mathews*
Scott	

tourt, Essex, King William, Lunenburg, Middlesex, Nelson, Pulaski, Tazewell, and Westmoreland, and the city of Covington. These twelve jurisdictions have an average population of 15,807. The average local tax for enhanced emergency telephone service levied by these local jurisdictions is $1.39, .9-cents above the state average of $1.30, and .72-cents above the national "capped" average of .67-cents. On average, these jurisdictions have levied the tax for a period of four years. The number of years ranges from a low of one year to a high of seven years.[6]

Further, fourteen jurisdictions are not yet wireline E-911 compliant though they also *are not* levying a wireline E-911 tax. 911 tax and coverage service information indicates that these jurisdictions include the counties of Appomattox, Bath, Bland, Buchanan, Craig, Dickenson, Fluvana, Highland, King and Queen, Lee, Madison, Mathews, and Scott, as well as the city of Clifton Forge. The counties of Bath, Craig, Fluvana, Highland, King and Queen, and Mathews, and the city of Clifton Forge provide basic 911 service, whereas the counties of Appomattox, Bland, Buchanan, Dickenson, Lee, Madison, and Scott provide no 911 service.[7]

Conclusion. Currently, 26 of Virginia's 135 cities and counties (19%) do not have wireline E-911. Of these 26 localities, 12 levy a wireline E-911 tax, whereas 14 do not; and 13 provide basic wireline 911 service, whereas 13 provide no wireline 911 service. 8 of those 12 localities levying the tax but not providing the service report tentative wireline E-911 cutover dates within the next year. At this time, Crime Commission staff was unable to ascertain the scheduled wireline E-911 cutover dates for those other localities currently not wireline E-911 capable and not levying a wireline E-911 tax.

VIRGINA'S WIRLEINE E-911 TAX

Introduction

As part of the review conducted here, two surveys – one conducted by the Virginia Chap-

[6] Note that eight of these jurisdictions (Alleghany, Botetourt, Essex, King William, Lunenburg, Nelson, and Westmoreland County, and Covington City) report "tentative" wireline E-911 cutover dates within the next year. One of these jurisdictions (Middlesex County) reports that their cutover date is still "a few years away," and one jurisdiction (Tazewell County) is awaiting the outcome of a pending SCC hearing concerning the tariff rates levied by their wireline telephone service provider. Crime Commission staff was unable to ascertain the wireline E-911 plans of Amherst and Pulaski County.

[7] The counties of Lousia and Russell provide wireline E-911 service, but do not levy a wireline E-911 tax.

ter of the National Emergency Number Association (NENA), and one conducted by Virginia's Auditor of Public Accounts – were developed and mailed to Virginia's PSAPs and Virginia's local jurisdictions, respectively.

Questions focusing on average call processing time and the volume of wireline E-911 calls elicited low response rates. Working from the assumption that the volume of calls received and the average call-processing time should play a crucial role in determining PSAP staffing levels, and that PSAP staffing levels are the primary PSAP total operating budget driver, the under-reporting of this information is at best problematic.

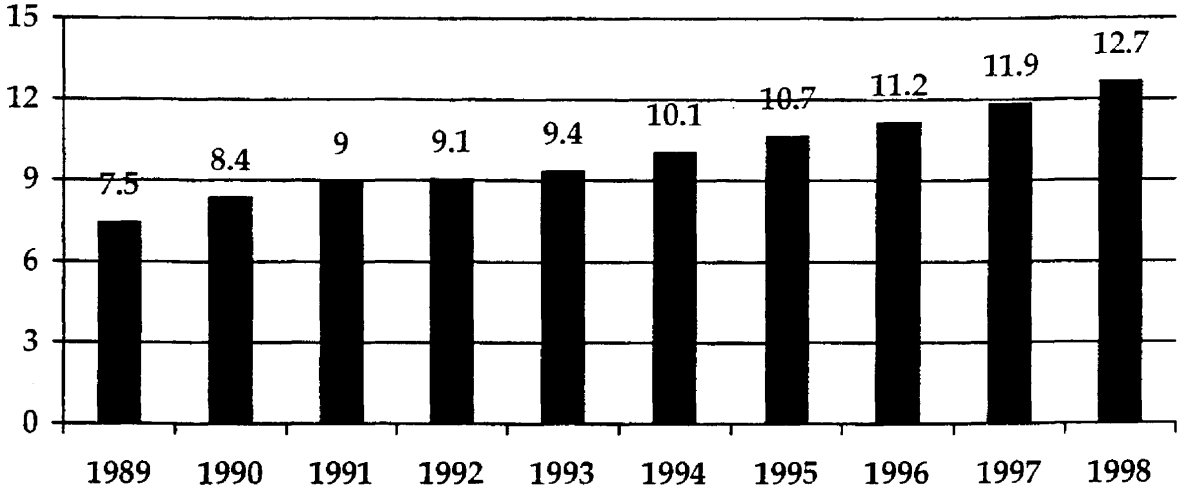
Summarizing, the Virginia Chapter of NENA agreed to share with Crime Commission staff information collected from a mail survey of all of Virginia's primary and secondary local PSAPs. This survey probed for a variety of information, including PSAP wireline and wireless 911 call volume, and whether the PSAP collects an E-911 wireline tax. The population of interest (Virginia's PSAP community) was drawn from information collected by the Virginia Chapter of NENA. Since the surveys were administered to all Virginia PSAPs, there is no sampling error associated with the responses to the questionnaire. Note that 67 PSAPs employing more than 1400 individuals did respond to the survey.

Unfortunately, many of the questions – especially those focused on providing data related to the PSAP's total operating budget, amount of the wireline E-911 surcharge, the total number of calls received, the number of emergency incidents to which law enforcement, fire, and emergency medical services responded, and the average call processing time (from phone answer to dispatch) – exhibit surprisingly low response rates. Given that survey reliability and validity is impacted by survey response rates, when discussed below, this information is provided for illustrative purposes only.

Turning to the Auditor of Public Accounts' (APA) survey of Virginia's local governments, pursuant to Item 9 2c (1999 Appropriations Act), Crime Commission staff and Virginia's APA developed a survey to better determine local government wireline E-911 services tax rates, how local governments account for their wireline E-911 related financial activity, who receives and dispatches wireline E-911 calls, and to provide a summary of wireline E-911 revenues and expenses for fiscal years 1997, 1998, and 1999. Surveys were sent to all of Virginia's 40 cities and 95 counties, as well as 30 selected towns. Responses were received from 81% of the localities surveyed. The responding localities account for approximately 93% of estimated wireline E-911 taxes collected over the last three years.

Note that here, the question focusing on the number of calls received by Virginia's PSAPs generated a noteworthy response as it relates to wireline E-911 call record-keeping practices. Of the 134 local jurisdictions, one quarter (32) responded that their PSAP ***does not*** maintain call volume counts. 74 (55%) reported that their PSAP does maintain call volume counts, and 28 (21%) said the question was "not applicable." Some localities (23) did volunteer that their PSAP does have the records and/or system(s) to differentiate between wireline E-911

Table 4.1: Local Government Expenditures in Billions, 1989 to 1998



Source: Virginia's Auditor of Public Accounts, *Exhibit C, Comparative Report of Local Government Revenues and Expenditures (1998).*

calls and other administrative calls, though the survey did not specifically request this information.

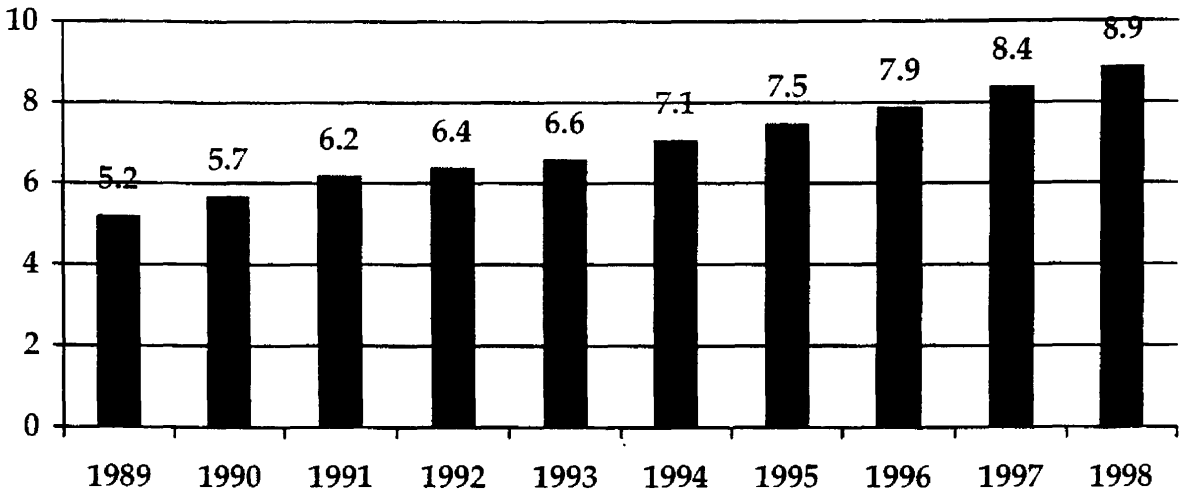
Before examining individual survey responses, note that the information gaps highlighted above related to average call processing time and the volume of wireline E-911 calls received are instructive. According to data collected by Virginia's APA, PSAP personnel costs made up approximately 50% of the total PSAP expenses reported by Virginia's cities and counties for fiscal years 1997, 1998, and 1999. Working from the assumption that the volume of calls received and the average call-processing time should play a crucial role in decisions concerning PSAP staffing levels, and recognizing that PSAP staffing levels are the primary PSAP total operating budget driver, the under-reporting of this information is at best problematic.

Summary of Local Government Revenues & Expenditures, and the Wireline E-911 Tax

The Wireline E-911 Tax. In fiscal year 1998, Virginia's local governments reported total expenditures of $12.7 billion, a 7% increase from fiscal year 1997, and a 22% increase since fiscal year 1994 (**see Table 4.1 above**). Concurrently, Virginia's localities collected $8.9 billion dollars in fiscal year 1998 from "own source" revenue (**see Table 4.2 below**), and received $6 billion in intergovernmental revenue (**see Table 4.3 below**).[8] Combining local "own

[8] Intergovernmental revenue includes payments from the state or federal government in lieu of property taxes for services such as police and fire protection, non-categorical and categorical aid, categorical shared expenses, and/or expenditures made on behalf of local governments. As such, intergovernmental revenue includes

Table 4.2: Local Revenues from Local Sources in Billions, 1989 to 1998



Source: Virginia's Auditor of Public Accounts, ***Exhibit B, Comparative Report of Local Government Revenues and Expenditures (1998).***

source" revenue with "intergovernmental revenue," this represents a 5% increase from fiscal year 1997, and a 18% increase since fiscal year 1994. On the whole, though local government expenditures have grown faster than local government revenues, Virginia's local governments do take in about as much as they spend.

Looking more closely at local government revenues from local sources, **Chart 4.1 below** illustrates the following major sources of Virginia local government general fund revenue: general property taxes (61%), other local taxes (23%), charges for services (9%), use of money and property (3%), miscellaneous revenue (2%), fines and forfeitures (1%), and permits, fees, and licenses (1%). Virginia's wireline E-911 tax qualifies as a portion (3%) of the "other local taxes" revenue source (**see Chart 4.2 below**).

In fiscal year 1999, Virginia's cities and counties generated an estimated $67 million via Virginia's wireline E-911 tax. This represents a 6% increase from fiscal year 1998, and a 123% increase since fiscal year 1994 (**see Table 4.4 and Table 4.5 below**). The reasons for the increase in revenue generated by the wireline E-911 include the following:

- E-911 tax increases (the average wireline E-911 tax rate has gone up 31% since 1994);

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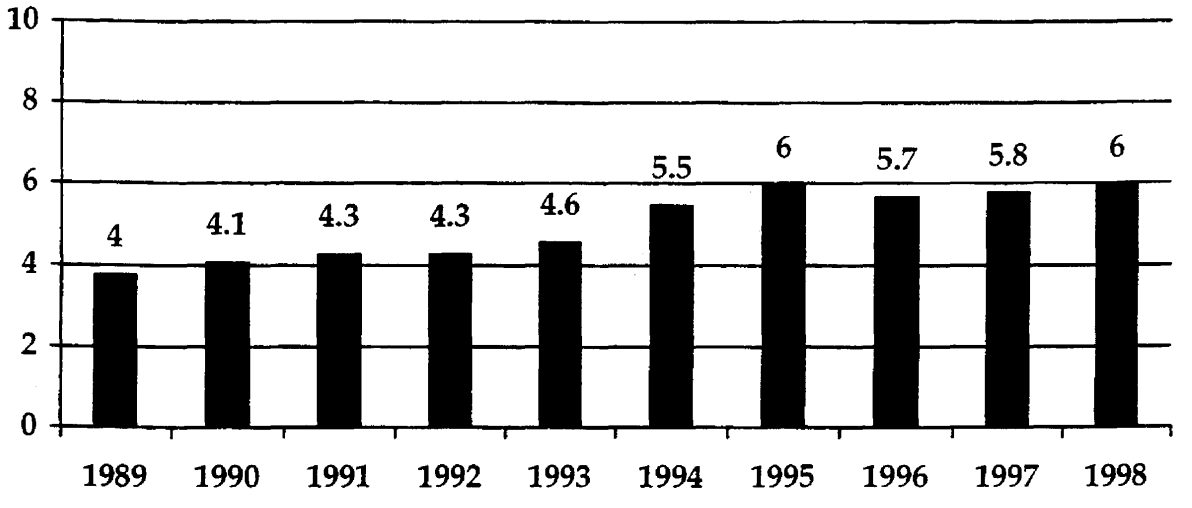
both moneys provided to Virginia's localities, as well as expenditures made on behalf of Virginia's localities by the state and federal government to support general government operations at the local level. In fiscal year 1998, of the $6 billion received in intergovernmental revenues, $.9 billion qualifies "expenditures made on behalf of local governments."

Table 4.3: Intergovernmental Revenue in Billions, 1989 to 1998



Source: Virginia's Auditor of Public Accounts, *Exhibit B-1, Comparative Report of Local Government Revenues and Expenditures (1998).*

- More localities assessing the tax (107 cities and counties levied the tax in 1994, as compared to 119 today); and

- More telephone lines.

Those 39 cities that levy a wireline E-911 tax accounted for $26 million (39%) of the fiscal year 1999 total, whereas the Commonwealth's 95 counties (80 of which levy a wireline E-911 tax) raised $41 million (61%). For a complete list of the revenues generated by the wireline E-911 tax since 1994, see **Appendix J**.

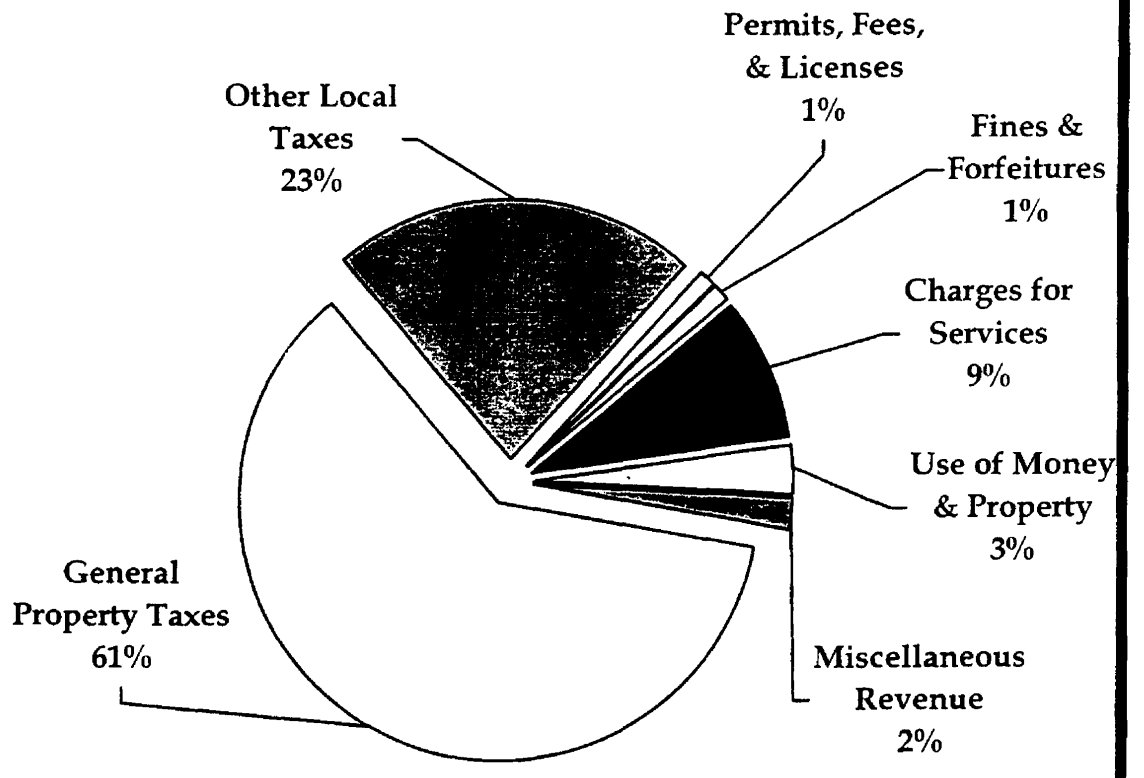
Expenditure Profile. The reporting of expenses pursuant to *Code of Virginia,* § 58.1-3813 raises several issues relative to the legislative intent of the use of wireline E-911 services taxes. *Code of Virginia*, § 58.1-3813 allows wireline E-911 taxes to fund the following:

- The initial capital, installation, and maintenance costs of the E-911 emergency telephone system;

- Recurring maintenance, repair, and system upgrade costs; and

- Salaries or portions of salaries of dispatchers or call takers, and – in some localities – the director or coordinator of that area's E-911 program.

Chart 4.1: FY 1998 Local Revenue Sources



From a public policy perspective, a wireline E-911 funding mechanism has to fund the public safety service deemed essential to the delivery of wireline E-911 services to the Commonwealth's citizenry. To insure that the funding mechanism meets well-recognized public policy goals, the generally accepted tax principles listed below should be present.

- **Equity.** Equity might be defined as the least advantaged localities should receive the greatest benefit (vertical equity), or that all taxpayers should be treated similarly (horizontal equity).

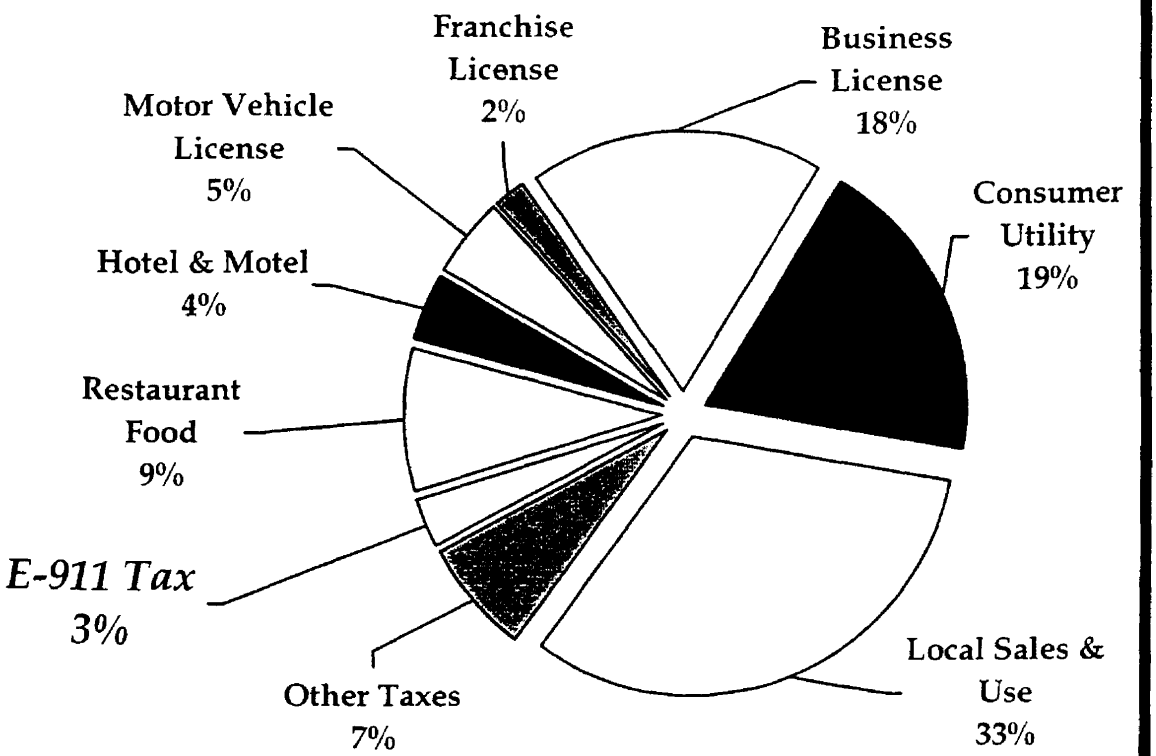
- **Stability.** Revenue collections should not fluctuate dramatically and receipts should be relatively easy to forecast.

- **Economic Neutrality.** The funding mechanism should have minimal influence on business decisions or consumer choices.

- **Productivity.** The funding mechanism should raise adequate revenue to pay for the service.

- **Flexibility.** Recognizing that there is a great deal of variation among the local jurisdictions and PSAPs across Virginia, the funding mechanism should permit the legis-

Chart 4.2: FY 1998 Sources of "Other" Local Revenue



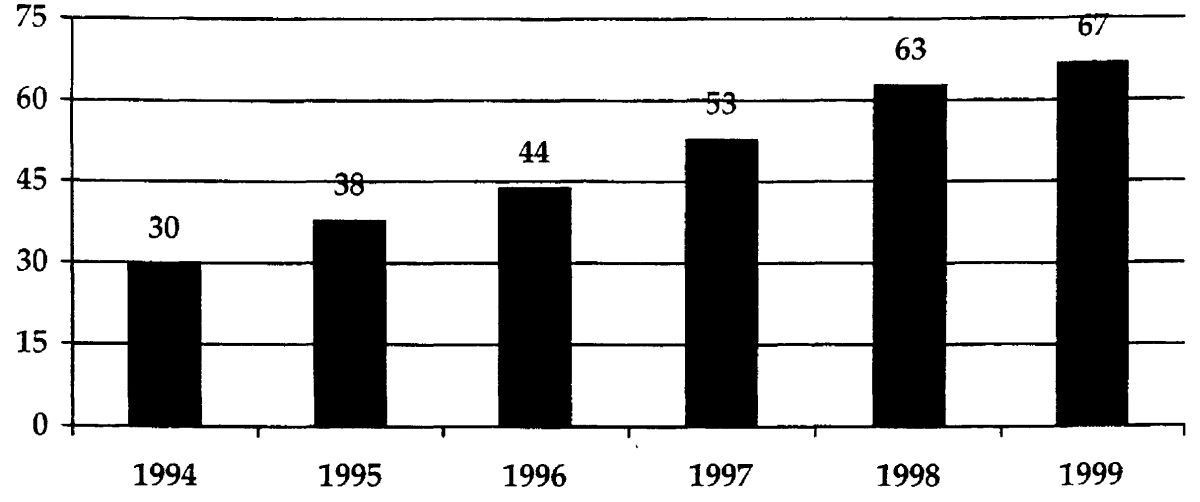
lature and/or local officials to respond to change and the need to pay for different expenditure levels.

- **Simplicity/Efficiency.** The tax should minimize taxpayers' administrative costs of compliance and governmental costs of collection.

Expenditure activity reports provided to Virginia's APA by local governments show that contrary to Virginia's traditional public policy goals - captured by the words equity, efficiency, economy, effectiveness, productivity, stability, and accountability – as currently constructed *Code of Virginia*, § 58.1-3813 promotes inconsistencies in local government interpretations of what constitutes an allowable E-911 expense. Summarizing the responses, the APA commented:

> In responding to our survey, some localities reported personnel service costs for all dispatchers and call-takers within a communication center, even though they handle administrative calls in addition to the 911 calls. Other localities reported a portion of the costs for dispatchers or call-takers depending on call activity or funding levels. Some localities considered all communication equipment and system upgrade costs as allowable even though these purchases provide both E-911 and other capabilities to the locality's communication operations. Certain localities charged other expenses they attributed to the E-911 services while other localities did not.

Table 4.4: Local Revenues Generated from the Wireline E-911 Tax in Millions, 1994 to 1999

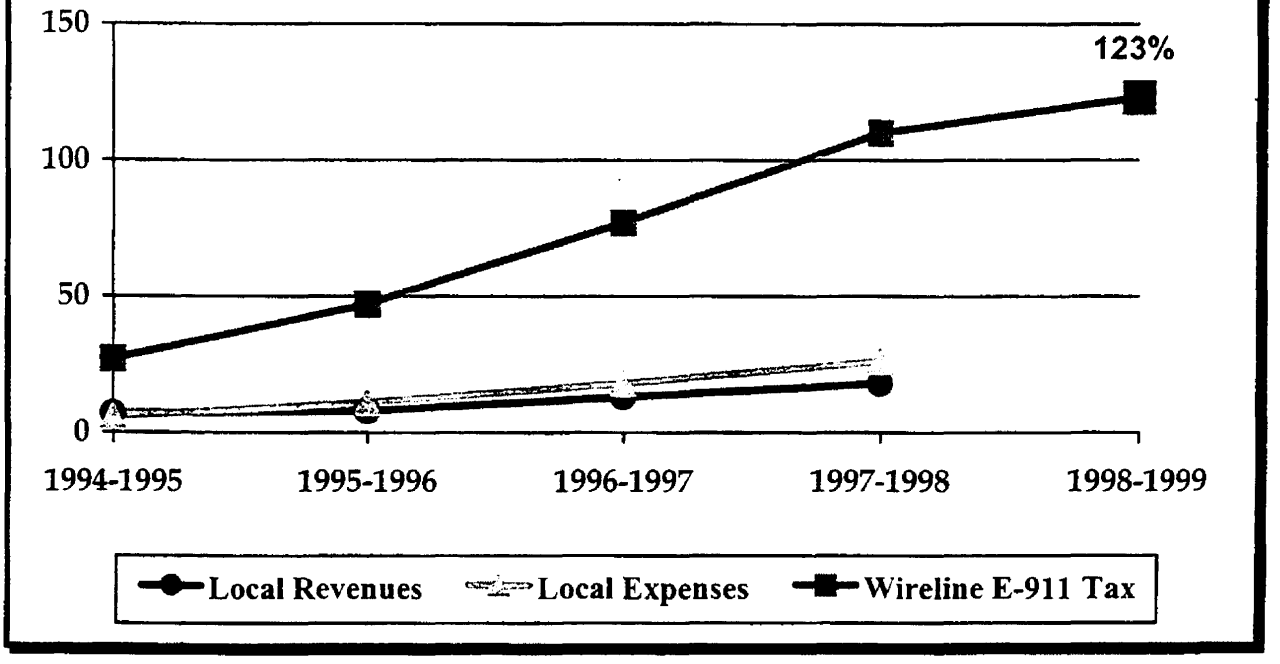


Fairfax County reported that it not only considers all PSAP dispatcher and call-taker expenses as recoverable under Code of Virginia, § 58.1-3813 (Fairfax County designated 108 employees as "Public Safety Communicators"), but also the salaries – or portions thereof - of 32 other public safety personnel positions, including 6 members of the police force and 4 "Fire Lieutenants."

Taking the APAs' comments in turn, many local jurisdictions did indicate that they consider all PSAP dispatcher and call-taker costs as recoverable under the existing statutory language even though the majority of the calls received by Virginia's PSAPs tend not to be 911 calls (**see discussion concerning call volume below**). Conversely, some jurisdictions indicated that they do look to determine the total amount of wireline E-911 calls received, thereafter designating a proportional amount of that dispatcher or call-takers salary that can be funded by monies generated from the wireline E-911. Still others arbitrarily designate a certain percentage of dispatcher and call-taker salaries that can be covered by the wireline E-911 tax.

Illustrating, Fairfax County not only considers all PSAP dispatcher and call-taker salaries as fundable pursuant to *Code of Virginia*, § 58.1-3813, but also the salaries (or portions thereof) of the following 32 public safety personnel:

Table 4.4: Local Revenue, Expenditure, & E-911 Tax Rate; Percentage Increase Compared to a Base Year (1994)



- One (1) Public Safety Communications Training Coordinator;
- Four (4) Public Safety Communications Squad Supervisors;
- Fifteen (15) Public Safety Communications Assistant Squad Supervisor;
- One (1) Business Analyst III (CAD System Manager);
- One (1) Geographic Information Systems (GIS) Special Analyst I;
- One (1) Police Sergeant;
- Five (5) Police Officers; and
- 25% of the salaries of four (4) Fire Lieutenants.

Communication equipment and system upgrade costs follow the same pattern. It would appear that some jurisdictions do attempt to discern and then fund only those costs associated with equipment and system upgrades necessary to deliver wireline E-911 services. On the other hand, other jurisdictions consider all telecommunications hardware and software equipment purchases - as well as any system upgrades - as fundable by the wireline E-911 tax regardless of the "directness" of their impact on the delivery of wireline E-911 services.

Finally, the APA notes that "certain localities charged other expenses they attributed to the E-911 services while other localities did not." **Figure 4.1 below** summarizes the revenue and expense reports provided by those localities that did respond to the APA survey. Note that when reviewing reported revenues and expenses, it would appear that wireline E-911 taxes only funded 72%, 70%, and 65% of the expenses associated with the delivery of wireline E-911 emergency

Figure 4.1: Summary of Revenues & "Total" Expenses for Localities Responding to the APA Survey

	1999	1998	1997
Revenues			
E-911 Taxes	$61,817,475	$60,423,192	$50,002,512
Interest	378,492	420,336	443,947
Other	6,749,965	7,053,386	6,457,803
Total Revenue	$68,945,932	$67,896,914	$56,904,262
Expenses			
Personnel	$44,895,544	$44,263,913	$40,126,911
Contractual	8,434,807	8,812,738	8,803,660
Supplies & Materials	1,527,480	1,980,747	2,103,813
Continuous Charges	5,627,647	5,324,677	4,561,973
Repairs/Maintenance	2,698,094	2,530,645	2,411,966
Equipment	10,380,900	3,480,607	2,143,894
System Upgrades	12,214,224	11,459,037	4,752,181
Other Capital	725,970	1,622,312	489,701
Other Expenses	7,903,898	6,155,318	4,099,427
Total Expenses	$94,408,564	$85,629,994	$69,493,526
Deficiency	$25,462,632 (27%)	$17,733,080 (21%)	$12,589,264 (18%)

Note: (1) These numbers include amounts provided by the eight (8) towns that did respond to the APA Survey.

(2) Tax revenues above do not include approximately $2,616,000 for localities not responding to the survey and approximately $3,632,000 for localities who responded but did not provide 1999 revenues.

(3) Expenditure numbers are representative of "total" PSAP operating budgets.

services in fiscal years 1997, 1998, and 1999, respectively. However, combining the information contained in the responses received with subsequent staff research efforts, it would appear that many localities did report the total expenses associated with the delivery of emergency telecommunications services. As such, the total revenues reported in Figure 4.1 above accurately reflect both the total amount of wireline E-911 taxes collected, and total PSAP expenses as reported to Virginia's APA. Note that by working from the APA estimated wireless E-911 tax revenues attributed to those Virginia localities that did not respond to the APA survey, and constructing a proportion of total revenues to total reported expenses, we can estimate total PSAP expenses (emergency and non-emergency) for all local jurisdictions of roughly $102 million. For a complete list of the revenues and expenses reported for the last three fiscal years, see **Appendix K**.

Looking more closely at the variability *Code of Virginia*, § 58.1-3813 encourages when it comes to determining an "allowable expense," some jurisdictions reported that they apply funds generated from the wireline E-911 tax to those expenses associated only with personnel services, contractual agreements, equipment purchases, and E-911 system upgrades/maintenance directly related to the provision of wireline E-911 services, while other localities included a variety of expenses they considered fundable by moneys generated from the wireline E-911 tax. A brief list of those more "suspect" costs reported by Virginia's local jurisdictions follows:

- Advertising
- Administrative Assistant/Secretary
- Books
- Chairs
- Clerical Expenses
- Clothing Apparel/Uniforms
- Conventions
- Copy Machine
- Desks
- Dues/Association Membership
- Fax Machine
- Fixtures
- Furniture
- Gasoline/Diesel Fuel
- Janitorial Costs
- Miscellaneous Expenditures
- Office Equipment
- Non-Cash Achievement Award(s)
- Personal Computers
- Postage
- Laser Printer
- Printing Costs
- Report Binding
- Scanner
- Subscriptions
- Supplies
- Travel
- Vehicle Replacement

One of the individuals interviewed for this study said that because of its vague nature, Code of Virginia, § 58.1-3813 "encourages misinterpretation." This same interviewee commented: "That tax [wireline E-911] was enacted to help Virginia's PSAPs and local governments fund wireline E-911, and it has done that. But what ended up happening was the local governments figured just about anything qualified as an 'allowable expense' the way its [Code of Virginia, § 58.1-3813] currently written, so they kept hiking that tax up and withdrawing other funding support. What ends up happening is soon you're using the E-911 tax to fund everything the PSAP does. That was never what that tax was supposed to do. I expected that tax to help [PSAPs] buy equipment and hire people to deliver E-911 services. Now it's viewed as just another [local government] general fund revenue source."

In sum, the statutory provisions contained in *Code of Virginia*, § 58.1-3813 directing Virginia's PSAPs and local governments as to the specific use(s) of the wireline E-911 tax are not only subject to possible misinterpretation, but may in fact encourage that misinterpretation. The evidence collected for this study suggests that local government officials tend to view the wireline E-911 tax as non-categorical in nature - earmarked to fund emergency telecommunications, but with few strings attached. As such, so long as the revenues raised in a particular locality do not exceed whatever that particular locality might define as their "total"

emergency telecommunications operating expenses, per *Code of Virginia*, § 58.1-3813 that locality is free to raise their wireline E-911 tax. Over the course of this study, local government representatives have stated that they agree with this viewpoint.

The key question, then, is whether the view expressed above comports with the intent of the Virginia General Assembly. Acknowledging that "the reporting of [wireline] E-911 expenses raises several issues relative to the legislative intent of the use of [wireline] E-911 services taxes," the APA posed the following germane question for consideration:

- Was the legislative intent of the statute (1) to fund all costs of operating a locality's communications center, (2) to fund all [wireline] E-911 communications costs, or (3) to fund some portion of these costs?

In 1982, the Virginia General Assembly passed legislation creating the local tax for enhanced emergency telephone service. In authorizing those Virginia localities "which established or will establish an enhanced 911 emergency telephone system," to impose a special tax on the consumers of the telephone service (*Code of Virginia*, § 58.1-3813, Subsection A), the General Assembly recognized the following:

- The wireline 911 system in Virginia is administered by local units of government;

- The effectiveness of wireline E-911 service depends on the ability of emergency communications to notify emergency service providers of the need to respond to a request for emergency assistance; and

- This effectiveness is in part affected by the availability of financial resources.

Subsequent to the establishment of this local option tax, the language adopted during the 1982 session of the Virginia General Assembly was amended. A summary of these amendments follows:

- **1984:** Whereas the 1982 language directed jurisdictions to "to ***repeal*** the tax when capital and installation costs have been fully recovered," amendments adopted in 1984 substituted the word "reduce" for "repeal," and broadened the applicable use of these revenues to include "recurring maintenance costs." The 1984 amendments also allowed for the compensation of LECs (at a rate of "3% of the amount of tax due") for "accounting for and remitting the tax."

- **1993:** Amendments adopted in 1993 broadened the applicable use of these revenues further to include "repair and system upgrade costs, and salaries of dispatchers or call-takers."

- **1995:** Afforded localities the option of exempting "from payment of the tax any subscriber to individual telephone service who resides in a nursing home or similar adult care facility."

- **1997:** Amendments adopted in 1997 broadened the applicable use of these revenues further to include "salaries or portions of salaries" for the "directors or coordinator of the E-911 program" in counties "with a population of no less than 45,000 and no more than 47,000."

Working back through these amendments, it is clear that the Virginia General Assembly authorized those Virginia localities ready to begin implementation of wireline E-911 services to impose a ***special*** tax on the consumers of the telephone service. The General Assembly defined an "E-911 system" as follows:

> An E-911 system means a telephone service which utilizes a computerized system to automatically route emergency telephone calls placed by dialing the digits 911 to the proper PSAP serving the jurisdiction from which the emergency telephone call was placed. An E-911 system includes selective routing of telephone calls, automatic telephone number identification, and automatic location identification.

The General Assembly then concluded, "Any such taxes imposed by this section shall be utilized ***solely*** for the initial capital installation costs of the E-911 emergency telephone system. The jurisdiction shall repeal such tax when capital and installation costs have been fully recovered."

The APA asked whether the "legislative intent of the statute [*Code of Virginia*, § 58.1-3813] was (1) to fund all costs of operating a locality's communications center, (2) to fund all [wireline] E-911 communications costs, or (3) to fund some portion of these costs?" Though subsequently amended to include recurring maintenance and systems upgrade costs "of the E-911 emergency telephone system," and salaries of call takers and coordinators of "E-911" programs, the thrust of *Code of Virginia*, § 58.1-3813 – similar to that wireline E-911 legislation adopted by each of the other 49 states – remains clear. *The local tax for enhanced emergency telephone system service was intended to fund all wireline E-911 communications costs, and not all costs associated with operating a locality's emergency communications center.*

Wireline E-911 Call Volume & Emergency Call-Processing Time. As discussed previously, both the Virginia NENA survey and the APA survey instrument resulted in low response rates concerning call volume and average emergency call processing time (from phone answer to dispatch). Consequently, the discussion below is provided for illustrative purposes only.

Restating, of the 134 local jurisdictions, one quarter (32) responded that their PSAP does not maintain call volume counts. 74 (55%) reported that their PSAP does maintain call volume counts, and 28 (21%) said the question was "not applicable." Some localities (23) did volunteer that their PSAP does have the records and/or system(s) to differentiate between wireline E-911 calls and other administrative calls, though the survey did not specifically request this information.

Turning to the survey conducted by the Virginia Chapter of NENA, note that PSAP call volume numbers do not appear to be readily available, and that the majority of calls received by PSAPs that did report call volume numbers were not 911 calls. Asked on the Virginia NENA

survey to provide 1998 call data concerning the total number of phone calls received, the total number of wireline 911 calls, and the total number of wireless 911 calls, only 38, 42, and 12 PSAPs, respectively, supplied these numbers. The total number of calls received by the 38 PSAPs that provided total call volume numbers was 5.2 million. The number of wireline 911 calls reported was 2.2 million (roughly 42%), whereas the number of wireless 911 calls reported by 12 PSAPs was 170,000 (roughly 4%).

Looking at emergency call-processing efficiency, asked on the Virginia NENA survey to provide the average emergency call-processing time – defined as "from phone answer to dispatch" – the answers fluctuated from a reported low of 40 seconds to a high of 4 minutes and 39 seconds. 39 PSAPs responded, resulting in an average response time of 1 minute and 36 seconds. Discarding the low and high response times, we arrive at a median of 1 minute and 32 seconds.

The information gaps highlighted above related to the volume of wireline E-911 calls received and the average call processing time are instructive. PSAP personnel costs made up $40.2 million (57%), $44.2 million (52%), and $44.9 million (48%) of the total PSAP expenses reported by Virginia's local jurisdictions for fiscal years 1997, 1998, and 1999, respectively. Working from the assumption that the volume of calls received and the average call-processing time should play a crucial role in decisions concerning PSAP staffing levels, and recognizing that PSAP staffing levels are the primary PSAP total operating budget driver, the under-reporting of this information is at best problematic.

Tax Administration Issues. According to the information provided to Virginia's APA, while Virginia's local jurisdictions use fund accounting to record their financial transactions, they use different funds to account for wireline E-911 revenues and expenditures. Most localities (56%) use their general fund to account for wireline E-911 financial activity, and as such there is not always a separate budgeting and accounting for wireline E-911 service expenditures. The remaining localities (44%) make use of a special revenue fund (32%), or some other fund (12%).

Note also that some localities reported that they are having some difficulty with wireline E-911 tax administration. For example, focusing on the imprecise nature of the tax, the City of Norfolk stated that "there are several variables in the equation that contribute to making precise annual cost recovery problematic. On the revenue side, it is difficult to project trends using data maintained by external entities [the number of hardwire access lines serving a particular jurisdiction]. We have observed continued growth in taxable line counts as reported by the traditional local telephone utility despite indications of population decline in the past several years." Varying county and city attorney opinions concerning what constitutes an "allowable expense" were also reported as contributing to tax administration difficulties.

Continuing, the City of Norfolk commented on *Code of Virginia*, § 58.1-3813, Section E, that allows each "telephone utility....[to keep] three percent of the amount of tax due and accounted for in the form of a deduction in submitting the return and paying the amount due by it." In their response to the APA survey, a Norfolk City Manager included the following comments:

When the State Code was modified several years ago to provide for additional recovery of staffing costs related to call taker/dispatcher positions, most localities such as Norfolk, that continually seek new revenue authority from the Commonwealth, increased their tax rates substantially. At that point, we suspect the three percent of the amount of the tax due that telephone utilities are authorized under *Code of Virginia*, § 58.1-3813, Section E to retain as compensation for accounting for and remitting the tax, became a significant source of funding for the telephone utilities. The three percent "commission" was originally negotiated to offset initial programming and start up costs at a time when total tax proceeds were significantly lower. With on-going collection and remittance costs for the telephone utilities minimal and with current tax levies much higher, we believe a reduction in this compensation rate is appropriate.

In 1994, for administering the wireline E-911 tax, local telephone companies collected roughly $900,000. By providing that same service in fiscal year 1999, local telephone companies collected over $2 million. During the course of this study, the local telephone service providers said they would consider reducing the percentage of the wireline E-911 tax kept by them for administering the tax and turning the moneys collected back to Virginia's localities.

CONCLUSION

The findings from the surveys conducted by the Virginia Chapter of NENA and the APA, together with the information contained in Chapter 3 related to wireline E-911 management, funding, and cost recovery issues provide some ideas for how better to promote wireline E-911 services generally, and manage wireline E-911 revenues and expenditures in Virginia, specifically.

Other states have passed enabling wireline E-911 legislation that is more comprehensive, explicit, accountable, and public safety focused than the comparable Virginia legislation. These states look not only to ensure that the cost recovery mechanism provided does encourage equity, efficiency, economy, effectiveness, productivity, stability, and accountability, but also to focus more attention on the citizenry's public safety interests, the needs (broadly defined) of the PSAP community, and the long-term planning for emergency telecommunications generally. Realizing that the same goal - the statewide delivery of emergency E-911 telecommunications services – is shared by Virginia's State and local governments, the next chapter focuses on how best to promote the public safety interest of the Commonwealth's citizenry as it relates to emergency E-911 telecommunications generally. Here, after carefully considering the wireline E-911 legislation adopted by other states and reviewing the survey information detailed above, at a minimum Virginia's enabling wireline E-911 statute ought to be reworked. The goal should be to draft a statute that is clear and unambiguous, incorporating the following components deemed "basic" by most other states, and essential to continuing Virginia's tradition of fiscal prudence and sound public management.

- An emergency telecommunications *advisory* (not a "command-and-control") body.
- An emergency telecommunications planning statement.

- An explicit statement concerning the purpose for which any funding mechanism is being imposed.

- The level of government administering the funding mechanism.

- The measure of the funding mechanism (that is the unit on which it will be assessed).

- The rate and the frequency at which the funding mechanism will be assessed.

- A separate and distinct account into which any revenues generated will be deposited.

- A specific statement concerning the eligible fundable items and how costs and expenditures will be verified.

- General administration provisions such as who will collect the funds, where that party will remit them, and at what rate that party will be reimbursed for their administrative costs. The authority both to increase the amount of the levy and to audit the governing bodies administering the funds, among other things.

Chapter 5: Wireless E-911 & Emergency Telecommunications in the Commonwealth

Chapter 5 reviews the management, funding, and cost recovery issues associated with E-911 services generally, and wireless E-911 specifically. Below recent germane actions taken by the federal government and their individual and collective impact on emergency telecommunications in the Commonwealth are examined. Thereafter, the current status of wireless E-911 services in Virginia is briefly re-examined, after which wireless E-911 funding and cost recovery issues are highlighted. Chapter 5 concludes with a discussion both of wireline and wireless E-911 in the context of pressing management issues. This chapter consists of the following sections:

- Federal Communications Commission Docket Order 94-102, and the Wireless Communications and Public Safety Act of 1999 (U.S. Senate Bill 800)
- Wireless E-911 in Virginia and Other States
- Managing Emergency Telecommunications in Virginia

FCC DOCKET ORDER 94-102 & THE WIRELESS COMMUNICATIONS AND PUBLIC SAFETY ACT OF 1999 (U.S. SENATE BILL 800)

The Original Docket Order. In 1996 the Federal Communications Commission (FCC) sought to promote and improve the public safety applications of wireless E-911 location technology. Recognizing that a significant reason many people purchase wireless telecommunications services is for safety and security, the FCC offered the following rational to justify the agency's involvement in this issue:[1]

- Mobile telephones have evolved over the last decade from a business tool or personal luxury installed primarily in automobiles, to a familiar, pocket-sized way to send and receive calls seemingly almost anywhere. One of the most compelling reasons why people purchase mobile phones is safety, especially in emergencies.

- Unfortunately, the advantages of [wireline] E-911 have not been available for wireless calls. Even in locations where wireline E-911 capability is in place, the attendant at a PSAP generally does not automatically receive information regarding the telephone number of a wireless phone, or, most importantly, its user's location. In response to these shortcomings, the public safety community has long sought to bring the benefits of [wireline] E-911 to wireless phone users.

Summarizing, unlike wireline E-911 systems - which allow for Automatic Number Identification (ANI) and Automatic Location Identification (ALI) - the phone number and the location of the caller cannot be displayed at the PSAPs for wireless calls. With FCC Docket

[1] Revision of the Commission's Rules (FCC Docket 94-102), paragraphs 8 - 10 (June 1999).

PHASE I:	***Within six months after being asked to do so, a wireless phone company must be able to transmit the following information to a local PSAP:***
	• ***The phone number of the wireless phone (so an emergency call taker can call that number back if the call is disconnected); and***
	• ***The location of the cell sector that received the phone's signal (so the emergency call taker can get a general sense of the caller's location).***
PHASE II:	***Unless it gets a waiver from the FCC, a wireless phone company must be able to transmit the following information to a local PSAP by October 1, 2001:***
	• ***The location of the person making a wireless 911 call, by latitude and longitude, within 125 meters (about 400 feet) of the caller's actual location.***

Order 94-102, the FCC affirmed its commitment to the rapid implementation of technologies needed to ensure that wireless 911 callers receive the same location and call-back benefits of enhanced 911 systems that wireline callers currently receive. All wireless service providers are now required to forward all wireless 911 calls they receive to PSAPs, without delays for validation or the blocking of calls from nonsubscribers. Additionally, wireless service providers are also required, among other things, to provide E-911 service in two phases (**see box above**) to any PSAP requesting it, providing certain prerequisites are met.[2]

Wireless 911 "Blank Spots." In the interim between the release of FCC Docket Order 94-102, and the drafting of this report, the FCC has revisited the original Docket Order a number of times. Highlighting some of the FCC's more salient comments, on June 9, 1999, the FCC focused its attention on gaps in the signal coverage provided by wireless carriers. Looking to improve wireless 911 call completion, especially in the nations rural and suburban areas, the FCC concluded that whenever a wireless 911 call is placed, the wireless service provider servicing that area must process that wireless 911 call and transfer it to the appropriate PSAP. Put another way, in order to reduce existing "coverage gaps," the FCC concluded that wireless 911 calls should be routed to another wireless carrier in cases where a wireless phone user is located in a "blank spot" for his or her preferred carrier, but where another wireless carrier has coverage.[3] The rationale for this decision follows:[4]

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[2] The FCC established the following prerequisites that must be met before a wireless service provider is required to provide either Phase I or Phase II E-911 wireless service:

- Wireless carriers must receive a request for E-911 service from a PSAP.
- The PSAP requesting the E-911 service must be capable of receiving and using the information provided by the wireless carrier.
- A mechanism for the recovery of costs relating to the provision of E-911 service must be in place.

[3]Looking here to better ensure the successful completion of significantly ore wireless 911 calls than occurs today, and thereby serve an important public safety concern, the thrust of the FCC's ruling is probably best expressed as follows: A wireless 911 call should be handled by whatever wireless system is available in the area of

- One reason access to emergency 911 systems is not always available for wireless handsets is that there are gaps in the signal coverage provided by wireless carriers. A wireless telephone user who happened to be located in a coverage gap or "blank spot" where his or her carrier's signal is inadequate may find it is not possible to establish and maintain adequate communications over the wireless system accessed by the handset.

- Coverage gaps may be even larger in rural areas and suburban areas and for portable, handheld phones. Analog cellular mobile phones, typically installed in vehicles, transmit signals at a maximum power level of 3.0 watts. Portable, handheld phones transmit a less powerful signal, a maximum of .6 watts. At this lower transmission power, a portable phone may not be able to complete a call at a location where a mobile phone can. In effect, the coverage gap is larger for portable phones. Urban core cells provide [an estimated] 90 percent coverage for both mobile and portable phones, suburban cells provide only 75 percent coverage for portable phones, and rural cells fall to 66 percent coverage. We recognize these figures are estimates, [and] that the situation is likely to be improving as carriers further develop their network infrastructures. Nevertheless, there is no serious dispute that coverage gaps do occur within cellular service areas.

- These 911 call completion difficulties represent a significant public safety problem. According to National Highway Traffic Safety Administration data, for example, rural areas are where emergency communications are most valuable and improvements are most needed. In 1996, motor vehicle crashes in rural areas accounted for 59 percent of total motor vehicle fatalities, 25,000 deaths a year. The fatality rate is also twice as high on rural interstate highways as on urban ones per miles driven, and rural crashes are more severe, and more likely to involve both multiple fatalities and severe vehicle damage. Overall, a person is as much as three times as likely to suffer a fatality in a rural crash.

- Further, when an accident happens, it generally takes much longer before help arrives in rural areas. Many rural accidents are single-vehicle and run-off-the-road crashes in remote areas, where it can take hours for someone to discover and report the accident. Such delays can play a major role in increasing crash fatalities and serious injuries. Nearly 70 percent of auto accident fatalities occur within two hours after a crash and, according to a conservative estimate, 1,200 lives are lost each year because of delay in discovering accidents.

- The failure to deliver 911 calls because of coverage gaps can contribute to tragic outcomes in these emergency situations. The record strongly indicates that one specific step the Commission can take in the interest of public safety is to improve wireless 911 call completion, especially in rural areas, and thus facilitate more efficient and rapid emergency response.

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need and, if there are multiple systems available, by the one that will provide the quickest and most reliable and accurate response.

[4] Revision of the Commission's Rules (FCC Docket 94-102), paragraphs 13 - 19 (June 1999).

Phase II Wireless E-911 Location Solutions, Timetable, and Accuracy. On September 15, 1999, the FCC revised those rules of FCC Docket Order 94-102 relating to Phase II location technology generally, and handset- and network-based Phase II wireless E-911 location solutions, specifically.[5]

Originally, the FCC required wireless carriers to have the capability to identify the latitude and longitude of a mobile unit making a 911 call within a radius of no more than 125 meters (roughly 410 feet) in 67 percent of all calls by October 1, 2001. Recognizing that when implementing handset-based solutions some form of phase-in of new or upgraded handsets is required, the FCC decided that because its original rules required that ALI be provided for all 911 calls in a requesting PSAP's area as of a fixed date, those rules only permitted network-based Phase II solutions. The FCC concluded further that the accuracy and reliability standard (125 meters 67 percent of the time) was unclear and unworkable. In order to address these issues, the FCC revised its rules to allow a phase-in both for handset- and network-based solutions, and revised the required levels of Phase II wireless E-911 accuracy. The language crafted by the FCC addressing these three issues follows.[6]

- **Phase-in for Network-Based Location Technology**

  Licensees subject to this section who employ a network-based location technology shall provide Phase II 911 enhanced service to at least 50 percent of their coverage area or 50 percent of their population beginning October 1, 2001, or within 6 months of a PSAP request, whichever is later; and to 100 percent of their coverage area or 100 percent of their population within 18 months of such a request or by October 1, 2002, whichever is later.

- **Phase-in for Handset-Based Location Technology**

  Licensees subject to this section who employ a handset-based location technology may phase in deployment of Phase II enhanced 911 service, subject to the following requirements:

  - Without respect to any PSAP request for deployment of Phase II 911 enhanced service, the licensee shall:
    (a) Begin selling and activating location-capable handsets no later than March 1, 2001;
    (b) Ensure that at least 50 percent of all new handsets activated are location-capable no later than October 1, 2001; and

[5] Note that handset-based wireless E-911 location technology is a method of providing the location of wireless 911 callers that requires the use of special location-determining hardware and/or software in a portable or mobile phone. Conversely, network-based wireless E-911 location technology is a method of providing the location of wireless 911 callers that employs hardware and/or software in the CMRS network and/or another fixed infrastructure, and does not require the use of special location-determining hardware and/or software in the caller's portable or mobile phone. (For a more complete discussion of possible Phase II solutions, see Chapter 2.)

[6] Revision of the Commission's Rules (FCC Docket 94-102), Appendix B (September 1999).

(c) Ensure that at least 95 percent of all new digital handsets activated are location-capable no later than October 1, 2002.

- Once a PSAP request is received, the licensee shall, in the area served by the PSAP:
  (a) Within six months or by October 1, 2001, whichever is later:
    (i) Ensure that 100 percent of all new handsets activated are location-capable;
    (ii) Install any hardware and/or software in the CMRS network and/or other fixed infrastructure, as needed, to enable the provision of Phase II enhanced 911 service; and
    (iii) Begin delivering Phase II enhanced 911 service to the PSAP.
  (b) Within two years or by December 31, 2004, whichever is later, undertake reasonable efforts to achieve 100 percent penetration of location-capable handsets among its subscribers.

- **Phase II Accuracy**

Licensees subject to this section shall comply with the following standards for Phase II location accuracy and reliability.

- For network-based technologies: 100 meters for 67 percent of calls, 300 meters for 95 percent of the calls.
- For handset-based technologies: 50 meters for 67 percent of calls, 150 meters for 95 percent of calls.
- For the remaining 5 percent of calls, location attempts must be made and a location estimate for each call must be provided to the PSAP.

Recognizing that this new language requires wireless service providers to decide between either a handset- or network-based Phase II wireless E-911 location solution by March of 2001, and aware that other entities, including the Commission itself, PSAPs, providers of location technology, investors, manufacturers, local exchange carriers and others, could benefit from advanced notice of this decision, the FCC further required that wireless service providers submit their plans for implementing E-911 Phase II to the FCC by October 1, 2000.[7] Stating that "advance planning is essential" for the successful implementation of wireless E-911 Phase II location technologies, the FCC instituted this requirement to encourage planning efforts and discussions between wireless service providers and all other interested parties.

The Wireless Communications and Public Safety Act of 1999 (U.S. Senate Bill 800). Designed to promote and enhance public safety through the use of 911 as the universal emergency assistance number, and to encourage the construction and operation of a seamless, ubiquitous, and reliable wireless 911 network through intra- and inter-statewide coordination, the

[7] As stated in Appendix B (September 1999): "Licensees subject to this section shall report to the Commission their plans for implementing Phase II enhanced 911 service, including the location-determination technology they plan to employ and the procedure they intend to use to verify conformance with Phase II accuracy requirements, by October 1, 2000. Licensees are required to update these plans within thirty days of the adoption of any change. These reports and updates may be filed electronically in a manner to be designated by the Commission."

Wireless Communications and Public Safety Act of 1999 (the Act) works from the following premises.

- Americans have become accustomed to dialing 911when facing emergency situations.

- Many Americans subscribe to wireless telephone service as a supplement to, or replacement for, their wireline telephone service. Many of them do so for safety reasons, especially when traveling.

- Unfortunately, in many areas across the nation contacting safety services using a wireless telephone is not simply a matter of dialing 911. In fact, there are more than 20 different emergency wireless numbers across the United States.

- This lack of consistency hampers the usefulness of wireless telephones in sudden emergencies, and fosters confusion and uncertainty for those who need assistance.

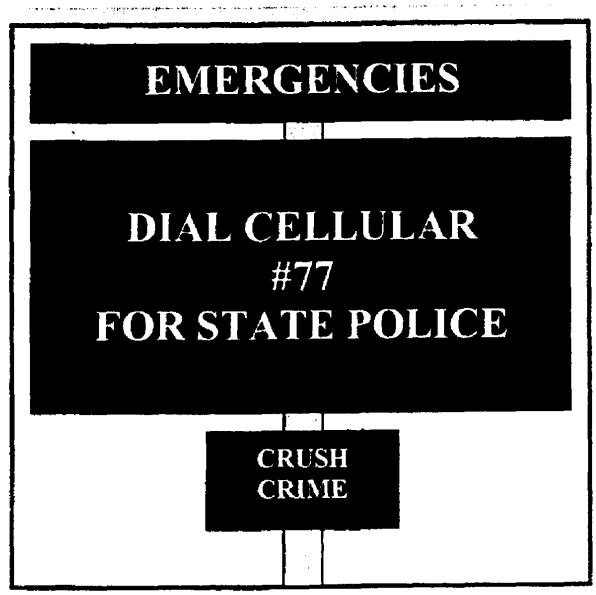
Eager to address the identified inconsistencies, and thereby expedite the development of a "ubiquitous, national, enhanced, emergency services network," the Act calls upon the FCC to designate 911 as the universal emergency telephone number for both wireline and wireless telephone service, and to encourage and support efforts by states to develop coordinated plans to implement wireless E-911. As part of this effort, the FCC is to "encourage each state to develop and implement coordinated statewide [E-911 systems and] deployment plans, through an entity designated by the governor."[8] Additionally, the Act confers upon providers and users of wireless 911 services liability protection,[9] and grants privacy protection for the call location information of users of wireless phones.

Note here that the impact of this Act on Virginia's #77 number is clear. Introduced by the Virginia State Police in 1996, #77 was implemented for the following reasons: (1) to create a highway- related emergency number for the motoring public; (2) to create a standard State Police emergency number statewide; (3) to reduce the number of wireless 911 calls that State Police

[8] Wireless Communications and Public Safety Act of 1999, Section 3, Subsection "b". As interpreted by the FCC, the Act provides that the FCC designate 911 as the universal emergency telephone number for both wireline and wireless telephone service, and includes provisions for transition periods and FCC action to encourage the development of state E-911 systems. (FCC. 18 November 1999. "FCC Acts to Remove Barriers Impeding Enhanced Wireless 911 Service.")

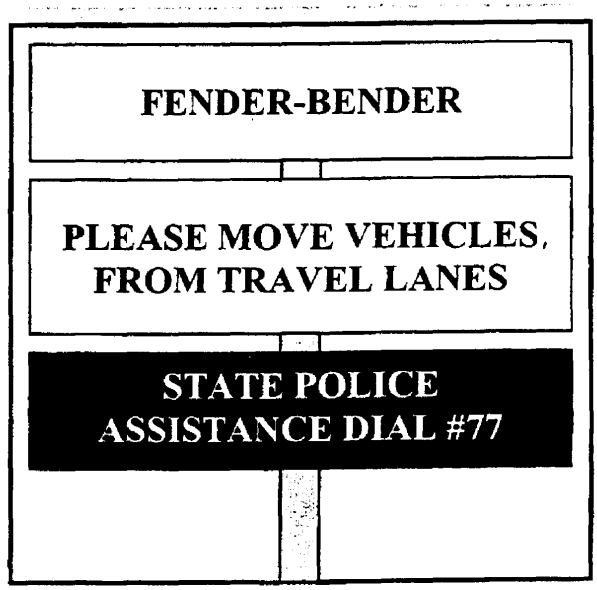
[9] *Code of Virginia*, § 8.01-225 (Persons rendering emergency care, obstetrical services exempt from liability), Subsection "C" provides the following liability protection for the Commonwealth's wireline emergency telecommunications service personnel. "Any provider of telecommunication service, as defined in § 58.1-3812, including mobile service, in this Commonwealth shall not be liable for any civil damages for any act or omission resulting from rendering such service with or without charge related to emergency calls unless such act or omission was the result of such service provider's gross negligence or willful misconduct. Any volunteer engaging in rescue or recovery work at a mine or any mine operator voluntarily providing personnel to engage in rescue or recovery work at a mine not owned or operated by such operator, shall not be liable for civil damages for acts or omissions resulting from the rendering of such rescue or recovery work in good faith unless such act or omission was the result of gross negligence or willful misconduct." Section 4 of the Wireless Communications and Public Safety Act of 1999 (Parity of Protection for Provision or Use of Wireless Service) extends liability protection to wireless service providers, persons using wireless 911 services, and PSAPs.

Regional Emergency Call Centers must transfer to other agencies in order to obtain the service requested; and (4) to improve response time for public safety agencies in handling calls. Since that time, the Department has worked with wireless service providers, coordinated with localities, and installed signs along major thoroughfares (**see example to the right**) to make the public aware that #77 is the number to call for the State Police.



Arguing that designating numbers other than 911 as an *emergency* number fosters inconsistency and hampers the usefulness of wireless telephones in sudden emergencies, thereby increasing response times for the delivery of emergency care, the U.S. Congress decided to designate 911 as the universal emergency number, and directed the FCC to provide appropriate transition periods for areas in which 911 is not either in use as an emergency telephone number, or is one of several emergency telephone numbers.[10] The designation applies to both wireline and wireless telephone service.

Similar to other states, the Commonwealth of Virginia has invested in the development and deployment of a highway-related wireless emergency number intended to put the motoring public in contact with the State Police. Recognizing that certain *non-emergency* situations will arise in which the State Police should serve as the first point of contact for the motoring public, and in keeping with the thrust of the recently passed Wireless Communications and Public Safety Act of 1999, #77 will need to be designated as a *non-emergency* number, and the Commonwealth will need to undertake efforts to notify the public of that designation. Some of the road signs already installed in the Metro-Richmond area and Northern Virginia (**see example to the right**) move the Commonwealth towards this goal. Note that in deciding to maintain both an emergency (911) and a non-emergency (#77) wireless number, the wireless location technology advantages soon to be associated with wireless E-911 should also be available for #77. Accepting that an emergency incident may occur during which a wireless subscriber dials #77, and that wireless emergency location technology can dramatically reduce the associated emergency response time, public safety concerns demand that Virginia take those steps necessary to ensure that any number a wireless caller might dial results in the same level of service delivery.



[10] Committee on Commerce, Science, and Transportation. 4 August 1999. "Report on the Wireless Communications and Public Safety Act of 1999."

Note also that the Virginia Department of State Police continues to serve as the primary wireless 911 public safety answering point for those Virginia localities that currently do not take wireless E-911 calls directly. Stating clearly that it is the intent of the Virginia General Assembly that wireless 911 calls be delivered directly by the wireless service provider to the appropriate local PSAP, thereby minimizing the need for call transfers whenever possible, Item 461 2c (1999 Appropriations Act) established a schedule for certain localities in the Central Virginia and Hampton Roads areas to begin receiving wireless 911 calls directly. In addition, this amendment provided for reimbursement of costs incurred by the Department of State Police in those areas where the State Police continues to serve as the primary public safety answering point for wireless 911 calls.

Though public safety concerns will be best served by an end-to-end enhanced emergency telecommunications system, as a precursor to establishing such a system, immediate public safety issues require that those Virginia localities whose PSAPs are currently wireline E-911 compliant (108) be directed to begin taking wireless E-911 calls by a date certain.

At this time, local PSAPs in Northern Virginia, as well as those PSAPs that serve the Charlottesville/Albemarle and Lynchburg areas are primary PSAPs, meaning that wireless 911 calls are routed directly to them by the wireless service provider. In the Commonwealth's other areas, wireless 911 calls are forwarded to one of the 7 Virginia State Police Regional Emergency Call Centers. If the wireless 911 emergency call requires the response of public safety personnel either in addition to or in lieu of the Virginia State Police, the Regional Emergency Call Center attempts to transfer the wireless 911 call to the local PSAP jurisdictionally responsible for answering the 911 calls from the location the call originated. Currently, the level of wireless 911 service provided both by the Virginia State Police and Virginia's local PSAPs is basic.

Though public safety concerns will be best served by an end-to-end enhanced emergency telecommunications system, as a precursor to establishing such a system, immediate public safety issues require that those Virginia localities whose PSAPs are currently wireline E-911 compliant (108) be directed to begin taking wireless E-911 calls by a date certain. Data collected for this study strongly suggests that the transferring of emergency calls from Regional Call Centers to a local PSAP poses an unacceptable public safety risk. These emergency calls can be dropped, and/or can be routed to the wrong local PSAP – in which case the call would need to be re-routed. Further, lacking Phase II location technology, call transferring places an unnecessary burden on the emergency caller, requiring the caller to explain their situation multiple times to receive emergency service.

In those areas of the Commonwealth where the wireless infrastructure is sufficiently built out to allow for the directing of wireless 911 calls to the appropriate local PSAP, those local PSAPs that are wireline E-911 compliant can begin taking wireless E-911 calls (Phase 0) immediately. FCC requirements provide wireless carriers with a six month window within which to implement Phase I or Phase II wireless E-911 service after receiving a valid request for such service from a local PSAP. Recognizing the important public safety interest served by

having those local PSAPs serving Virginia's localities receive wireless 911 calls directly, and acknowledging the fact that those PSAPs serving 27 of Virginia's localities are not yet wireline E-911 compliant, the Virginia General Assembly should first require that all local PSAPs currently wireline E-911 compliant and capable of receiving wireless E-911 calls directly begin answering wireless 911 calls originating in their jurisdictions by a certain date. Concurrently, the Virginia General Assembly should require that all of Virginia's local PSAPs are wireline E-911 capable by a certain date. In those areas of the Commonwealth where the wireless infrastructure is not sufficiently built out to allow for the directing of wireless 911 calls to the appropriate local PSAP, the Virginia Department of State Police should continue to serve as the primary PSAP, and have access to the Wireless E-911 Fund to offset continuing dispatch center operating costs.

Wireless E-911 Cost Recovery and Local Exchange Carriers. Finally, on November 18, 1999, the FCC revised its wireless E-911 rules as they relate to cost recovery. In an effort to promote the more rapid deployment of wireless E-911 location technologies, the FCC eliminated the prerequisite for carrier cost recovery, deciding that a cost recovery mechanism is not necessary to permit wireless service providers to recover their costs. The FCC stressed, however, that the revised rules do not disturb current state and local cost recovery schemes that are already working, noting that adequate funding of PSAPs is a critical element in ensuring timely wireless E-911 implementation.

One other point that deserves mentioning, the FCC decided also to comment upon the role played by wireline phone companies in the delivery of wireless E-911 services. Recognizing that Local Exchange Carriers (LECs) are important factors in achieving wireless E-911, and aware that the FCC has not imposed any special obligations on LECs to implement wireless E-911, the FCC made clear that it expects LECs – as key players in the delivery of wireless E-911 services – to act in a "prompt" and "fair" manner, and that the Commission does intend to monitor closely their activities. Summarizing its actions, the FCC stated the following:[11]

> The FCC noted the critical role played by incumbent Local Exchange Carriers (LECs) in the implementation of wireless E-911 service, by, for example, transmitting calls from the wireless carrier to the PSAP. While declining to adopt any new obligations, the FCC made clear that parties could bring complaints before the state public service commissions or the FCC if an incumbent LEC failed in the performance of any of its obligations. It also stated that parties could request consideration of such complaints under the Commission's "rocket-docket" procedures.

Summary. In adopting the wireless E-911 rules in 1996, the FCC sought both to improve the reliability of wireless 911 services and to provide the enhanced features generally available for wireline calls. Subsequently, the FCC has regularly revised its rules in an effort to keep pace with an ever-changing landscape, all the while maintaining as paramount the rapid, effective, and efficient deployment of wireless E-911 location technologies to the nation's citizenry. The FCC's efforts to deal with the issue of "blank spots," revise its phase-in timetable and accuracy standards, mandate that wireless service providers adopt and file with the Commission wireless E-911 implementation plans, and remove and/or keep abreast of other barriers to the nationwide

[11] FCC. 18 November 1999. "FCC Acts to Remove Barriers Impeding Enhanced Wireless 911 Service."

implementation of wireless E-911 location technologies are in keeping with the Commission's stated goal. Congress signified its support of the FCC's efforts with its recent decision to forcefully promote an end-to-end emergency telecommunications infrastructure so as to provide "an immediate and critical communications link" between the public and emergency services personnel. Note that lacking the ability to develop and implement statewide guidelines to encourage the strategic development of a statewide E-911 telecommunications infrastructure, Virginia's Wireless E-911 Board is ill-equipped to provide the leadership called for in these most recent federal government pronouncements. This shortcoming is addressed in more detail below.

WIRELESS E-911 IN VIRGINIA AND OTHER STATES

Introduction

Similar to other states, Virginia's *Wireless Enhanced Public Safety Telephone Service Act* (*Code of Virginia*, §§ 56-484.8 to 484.11) does create a Wireless E-911 Service Board, establishes a fixed wireless E-911 cost recovery mechanism and designates who is eligible to receive cost recovery for the delivery of wireless E-911 services, and requires oversight and accountability via a formal audit procedure.

But unlike most other states that have enacted wireless E-911 legislation, Virginia's Act does not endow the Commonwealth's Board with extensive "fiduciary" and "policy-making" responsibilities, extend the opportunity of board membership beyond the PSAP/local government and telecommunications industry communities, or provide for any staff support. Given the rapidly changing nature of emergency telecommunications systems generally, and wireline and wireless E-911 systems specifically, these shortcomings are problematic. Add to this Congress' and the FCC's call for the development of coordinated statewide E-911 deployment plans, and the subsequent implementation of an end-to-end emergency telecommunications infrastructure that encompasses both wireline and wireless E-911 systems, and the deficiencies of Virginia's statute become more glaring still. Below the current status of wireless E-911 services in Virginia is briefly re-examined, after which wireless E-911 funding and cost recovery issues are summarized. In the Chapter's subsequent section, both wireline and wireless E-911 are discussed in the context of pressing management issues.

Wireless E-911 Services in Virginia[12]

At this time, local PSAPs in Northern Virginia, as well as those PSAPs that serve the Charlottesville/Albemarle and Lynchburg areas are primary PSAPs, meaning that wireless 911 calls are routed directly to them by the wireless service provider. In the Commonwealth's other areas, wireless 911 calls are forwarded to one of the 7 Virginia State Police Regional Emergency Call Centers by the wireless service provider (**see Chapter 1; Figure 1.3**). Currently, the level of wireless 911 service provided both by the Virginia State Police and Virginia's local PSAPs is

[12] For a more complete discussion of the current status of wireless E-911 services in Virginia, see Chapters 1 and 2 above.

basic (the call taker asks the 911 caller for their phone number and location because this information does not display at the PSAP).

Phase I Location Technology. At this time, wireless service providers are capable of providing Phase I service to Virginia's primary PSAPs capable of receiving and using Phase I information. With a cost recovery mechanism in place (the .75-cent/month wireless 911 tax), wireless service providers doing business in Virginia are mandated by the FCC Docket Order to provide Phase I service upon receiving a valid request from a PSAP capable of receiving and using Phase I information (*Code of Virginia*, §§ 56-484.8 to 484.11). As of August 1999, twenty-two (22) localities have submitted requests totaling $4.73 million for Phase I service. Pursuant with Item 461 2c (1999 Appropriations Act), the Virginia Department of State Police Requested funding in the amount of $375,648 for the 1999 – 2000 fiscal year. In September of 1999, wireless service providers submitted cost recovery requests totaling $4.5 million for the establishment of Phase I service for those 22 local jurisdictions.

Phase II Location Technology. Phase II wireless location technology provides more specific information to the primary PSAP from the wireless service provider regarding the location the 911 call originated from. The primary difference between Phase I and Phase II is the degree of caller location accuracy. Phase I requires accuracy to the cell sector level, while Phase II - via latitude and longitude coordinates - requires accuracy within a specified distance depending on the technological solution (handset or network) chosen. The primary objective of Phase II location determination in a wireless 911 environment is to establish as closely as possible the location of the call origination, so that accurate call routing can be achieved and useful location information can be presented to the 911 call taker.

Neither wireless service providers nor Virginia's PSAP community are currently prepared to provide Phase II location technology. Concerns include, but are not limited to, which of the competing Phase II location technologies will prevail, as well as the costs associated with implementing location identification. Note that the FCC's recent decision to require wireless service providers to decide between either a handset- or network-based Phase II wireless E-911 location solution by March of 2001 will encourage and facilitate decision-making as it relates to wireless E-911 Phase II location technologies.

Wireless E-911 Funding and Cost Recovery[13]

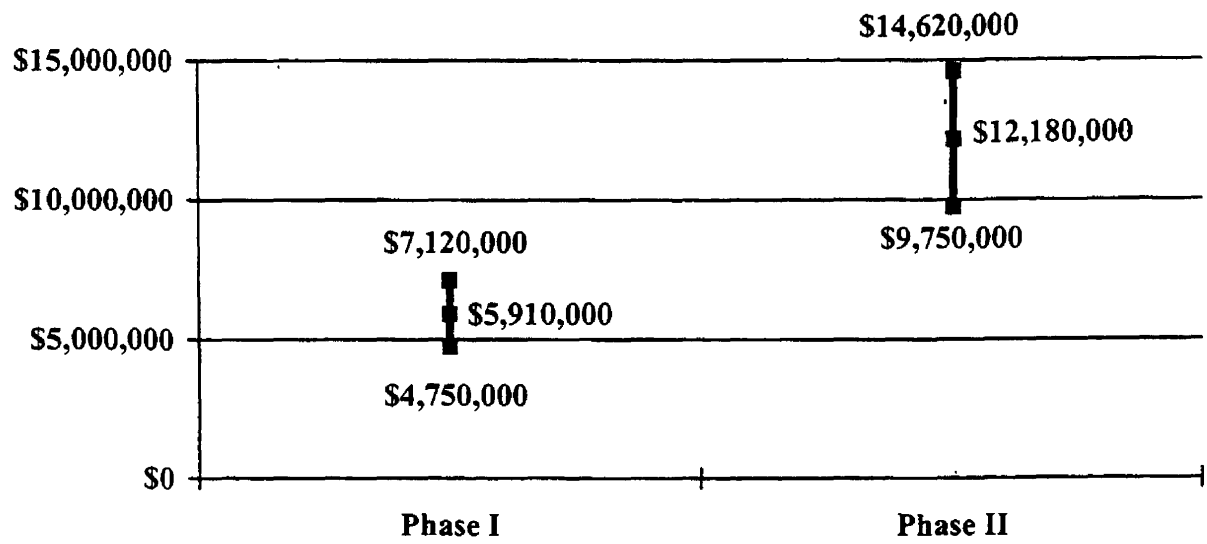
Wireless E-911 Funding. To date, three states – Washington, Kansas, and Texas – have attempted to produce reliable estimates of total costs to implement and operate wireless E-911 service. While Kansas' Legislative Post Audit Committee (1999) concluded that it "could not determine what it might cost to provide E-911 services for wireless phone users,"[14] Washington State's Department of Revenue (1998) arrived at Phase I and Phase II costs totaling roughly $90 million. Note that Washington State's estimate is specific to Washington State only, and that

[13] For a more complete discussion of wireless E-911 funding and cost recovery, see Chapters 1 and 2.

[14] Kansas' *Performance Audit Report: Reviewing the 911 Emergency Phone System* (Legislative Division of Post Audit, August 1999), p. 7.

Table 5.1: Hypothetical High, Low, & Median Cost for the Deployment of Wireless Phase I and Phase II Location Technology

(Over a five-year period in an area with a population of 1,000,000)



this estimate does not include those wireless service provider costs associated with the delivery of Phase I location technology.

Whereas Kansas and Washington State looked at costs related to the provision of wireless E-911 services in their particular states, in 1995 the Texas Wireless Integration Project developed an economic model to estimate a tax rate to apply to each wireless subscriber per month to provide sufficient funds to fully implement wireless emergency caller location technology, including appropriate network, routing, geospatial database development and management, and PSAP modernization needs. In plain terms, the goal of the economic model was to provide insight and understanding to help address the 911 planner's primary dilemma: "How do we establish wireless E-911 services that are within our region's funding means, when no one can tell me what the services will cost?"[15]

Working from a variety of assumptions, the report developed a five-year price tag for the deployment of Phase I (roughly $4.75 million for an area with a population of 1,000,000) and Phase II (roughly $9.75 million for an area with a population of 1,000,000) wireless location technology. Given the caveats factored into the model, the report concluded that these cost estimates might be 30% to 50% too low, thereby providing a maximum cost range of $4.75 to $7.12 million for Phase I (over five years), and $9.75 and $14.62 million for Phase II (over five

[15] Texas' *Report to the Advisory Commission on State Emergency Communication* (Texas' Wireless Integration Project, May 1997), p. 68.

years) for an area with a population of 1,000,000. **(To illustrate these numbers, Table 2.2 – designated here as Table 5.1 – is reproduced above.)**

Working from this information, we can construct a hypothetical estimate of the cost to implement wireless E-911 services on a statewide basis in Virginia over a five-year period.[16] Using 1998 Virginia population estimates developed by the University of Virginia's Weldon Cooper Center for Public Service (6.7 million), we can multiply the cost estimates associated with the provision of wireless Phase I and Phase II location technology for an area with a population of 1,000,000 to arrive at a cost estimate to implement Virginia in five-years a statewide wireless E-911 system. **(To illustrate these numbers, Table 2.3 – designated here as Table 5.2 – is reproduced below.)**

After inserting Virginia's population, the maximum cost range associated with the model for Phase I wireless location technology is $31.8 to $47.7 million (over five years). For Phase II, the maximum cost range is $65.3 to $98.0 million. Combining Phase I and Phase II, the estimated maximum cost range associated with implementing a statewide wireless E-911 system over a five-year period in Virginia is $97.1 to $145.7 million. Prior to sunsetting in July of 2002, Virginia's Wireless E-911 tax is expected to generate roughly $65 million over four years. For illustrative purposes, if this sunset date were extended by one year, Virginia's wireless E-911 tax, during this same five-year period used to construct the costs estimates above, would generate roughly $92 million.

The efforts of other states to produce reliable estimates of total costs to implement and operate wireless E-911 service suggest that Virginia's .75-cent wireless E-911 tax should provide a good portion of those funds needed to implement in full Phase I and Phase II wireless E-911 location technology. Note that this conclusion remains susceptible to the lack of publicly accessible information, and an inability to forecast the future decisions and actions of the participants, among other things. Recognizing these uncertainties, and therefore cognizant that the wireless E-911 funding mechanism may need to be adjusted over time, the state of Indiana incorporated into its authorizing legislation the following provision, thereby allowing the wireless E-911 tax rate to be revised – within a set range – annually.

> The [Wireless Enhanced 911 Advisory] Board may adjust the emergency wireless enhanced 911 fee....The Board shall assess the fees at rates that ensure full recovery over a reasonable period of time of costs incurred by CMRS providers and PSAPs to develop and maintain an enhanced wireless 911 system. The fees may not:
> (1) Be raised or lowers more than one (1) time in a calendar year;
> (2) Be raised more than seven cents ($0.07) by an adjustment; or
> (3) Exceed one dollar ($1) per month for each telephone number.

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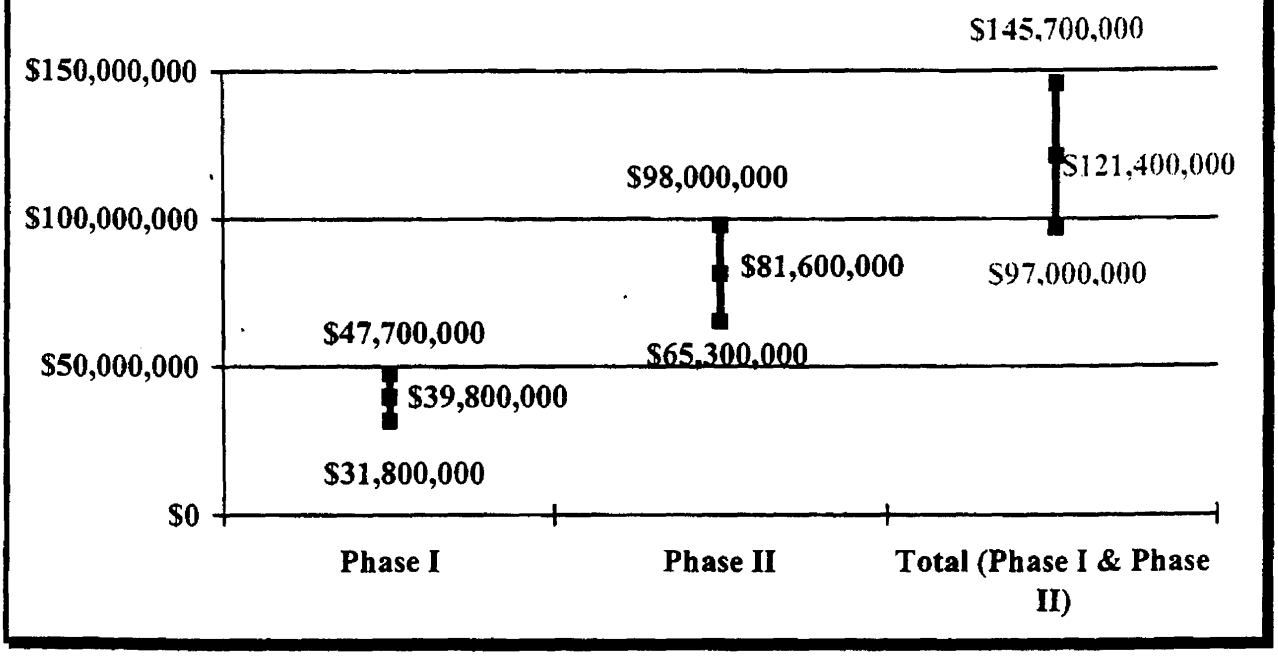
[16] Population figures (1998 estimates) drawn from the University of Virginia's Weldon Cooper Center for Public Service. The estimate provided is for illustrative purposes only. The Texas Wireless Integration Project's economic model includes assumptions that may or may not be directly applicable to the situation in Virginia. With that in mind, the discussion included herein does shed some light on those costs associated with the implementation of wireless E-911 in the Commonwealth.

Table 5.2: Hypothetical High, Low, & Median Cost for the Deployment of Wireless Phase I and Phase II Location Technology in Virginia



Wireless E-911 is central to the delivery of public safety services to the Commonwealth's citizenry. Recognizing that sufficient funding is critical to the successful implementation and subsequent maintenance of wireless E-911, Virginia's wireless E-911 statute ought to be reworked in an effort to ensure that the development and statewide deployment of wireless E-911 is adequately funded. Specifically, the July 1, 2002 sunset clause should be removed, while a mechanism for adjusting the wireless E-911 tax rate either down or up should be incorporated.

Wireless E-911 Cost Recovery. Each of those states that have passed wireless E-911 legislation do designate who is eligible to recover costs associated with the delivery of wireless E-911 services. Generally, this enabling legislation follows the FCC's lead, empowering both wireless service providers and PSAPs to recover those costs deemed "reasonable and direct." As discussed above, in its most recent ruling related to FCC Docket Order 94-102, the FCC revised its wireless E-911 rules as they relate to cost recovery, eliminating the prerequisite for carrier cost recovery. When making this ruling the FCC did stress that it did not expect that the revised rules would disturb current state and local cost recovery schemes that are already working.

According to Virginia's *Wireless Public Safety Telephone Services Act* (*Code of Virginia*, §§ 56-484.8 to 56-484.11), one of the functions of the Wireless E-911 Service Board is to distribute funds collected pursuant to the Act to PSAPs and wireless service providers to cover those "reasonable and direct" costs associated with implementing wireless E-911 services. To that end, the Board developed guidelines and associated formulas for determining the "reasonableness" and "directness" of the associated wireless E-911 costs. For Virginia's PSAPs, the Board needs to review and discuss primarily wireless 911 call volume totals, total 911 call

volume, total calls answered, necessary equipment/software upgrades, and PSAP personnel requirements. For those wireless service providers doing business in Virginia, the Board needs to review and discuss primarily wireless service provider subscriber counts (CMRS costs tend to be submitted to Boards on a "cost per subscriber basis," i.e. .25-cents per subscriber), and necessary equipment/software upgrades. But whereas that information submitted by Virginia's PSAPs are not deemed confidential and proprietary, wireless service provider information is. Because current Virginia law extends FOIA protection only to the Board's Chairman and staff designated by him, currently the Board as a whole cannot review those documents submitted by wireless service providers.[17] Consequently, the ability of the Board writ large – or even an

[17] Virginia's Freedom of Information Act (FOIA) (*Code of Virginia*, § 2.1-340 et seq.) establishes guidelines by which public bodies in Virginia distribute information and hold meetings. The legislative policy or intent of FOIA is "to insure the people of the Commonwealth [of Virginia] ready access to record in the custody of public officials and free entry to meetings of public bodies wherein the business of the people is being conducted" (*Code of Virginia*, § 2.1-340.1). According to FOIA, "Unless a public body or public official specifically elects to exercise an exemption (see discussion below) provided by" FOIA or elsewhere in the Code of Virginia "every meeting shall be open to the public and all public records shall be available for inspections and copying upon request" (*Code of Virginia*, § 2.1-340.1).

FOIA defines a public body to mean:

> ...any legislative body; any authority, board, bureau, commission, district or agency of the Commonwealth or of any political subdivision of the Commonwealth, including cities, towns, and counties; municipal councils, governing bodies of counties, school boards, and planning commissions; boards of visitors of public institutions of higher education; and other organizations, corporations or agencies in the Commonwealth supported wholly or principally by public funds. It shall include any committee or subcommittee of the public body created to perform delegated functions of the public body or to advise the public body. It shall not exclude any such committee or subcommittee because it has private sector or citizen members. Corporations organized by the Virginia Retirement System are "public bodies" for purposes of this chapter (*Code of Virginia*, § 2.1-341).

Accordingly, the Wireless E-911 Service Board, a public Board and political subdivision of Virginia, established pursuant to the Wireless Enhanced Public Safety Services Act is a public body for purposes of analyses under FOIA.

FOIA does contain blanket exemptions from its application for certain public bodies, however no such exemption exists for the Wireless E-911 Service Board (*Code of Virginia*, § 2.1-341.2). As such, the terms and conditions of FOIA apply to the Board. According to FOIA, all documents in custody of the Board must be made available to the public for copying and inspection unless such documents fall under one of the exemptions contained in *Code of Virginia*, § 2.1-342.01 or there is specific language elsewhere in the *Code of Virginia* that allows the Board to keep documents private and confidential. Furthermore, all meetings of the Board must be open to the public unless the Board meets for one of the enumerated purposes contained in *Code of Virginia*, § 2.1-343, or there is specific language elsewhere in the *Code of Virginia* allowing the Board to hold closed meetings. Sections 2.1-342.01 and 2.1-343 contain no exemptions for documents in the custody of, or meetings of, the Board, respectively. Therefore, lacking specific language elsewhere in the *Code of Virginia* allowing the Board to keep documents from public inspections and hold closed meetings, the Board can do neither.

The Wireless Enhanced Public Safety Services Act contains such specific language for the purposes of allowing the Chairman of the Board and specific staff to view certain documents confidentially (*Code of Virginia*, § 56-484.9, Subsection "D"). Therefore, according to FOIA and the rules of statutory construction, the Chairman of the Board can refuse to release documents in his custody to the public if such documents were provided by CMRS providers and designated confidential. The Act contains no language, however, allowing the Board to hold meetings that are closed to the public. Accordingly, while the Chairman of the Board and certain staff can view proprietary information, the Board can not meet privately to discuss it. Herein lies the dilemma.

appropriate subcommittee thereof – to determine whether wireless service provider requests for cost recovery are reasonable and direct prior to making payments to these providers is compromised. More plainly, on the one hand Virginia's Wireless Public Safety Telephone Services Act requires the Board to distribute funds to vendors only if those items funded are reasonably and directly related to providing wireless E-911 service. On the other hand, current Virginia law provides no means by which the Board can determine prior to that distribution of funds if those costs submitted by vendors are reasonably and directly related to the delivery of wireless E-911 service.

Both wireless service providers and PSAPs are eligible to recover costs for implementing Phase I and Phase II wireless E-911 location technology. Though a recent FCC ruling eliminated the need for wireless service provider cost recovery, Virginia's recent experiences with local exchange carriers would suggest that having wireless carriers recover wireless E-911 related costs via a state oversight Board is preferable to allowing these vendors to pass their costs along to such a Board through Virginia's PSAPs. Illustrating, in Virginia and elsewhere, wireline telephone company costs are passed through wireless carriers and the PSAP community to the designated wireless board, department, and/or division, and are not currently subject to the "reasonableness" and "directness" language that is applied to wireless carriers and PSAPs. This practice has proved troublesome both in the Commonwealth and in other states, giving rise to the following notable concerns:

- Wireline phone companies may look to pass costs through wireless service providers and/or PSAPs to state wireless boards, departments, and/or divisions for upgraded equipment that is part of the local phone company network and should not be charged to wireless E-911;

- Wireline phone companies may be "double-dipping," charging the wireless service providers and the PSAPs for the same cost item; and

- The costs quoted by wireline phone companies for equipment and/or service that is directly related to the provision of wireless E-911 are excessive, and keep going up.

Note also that one funding option for wireless carriers that has received some attention given the recent FCC ruling is known as "bill and keep." The idea is to have wireless carriers "bill" their own subscribers for the carrier's cost to provide wireless E-911 service, and then "keep" the revenues to pay for the related service costs. Due to varying subscriber counts and economy of scale concerns, this approach is not economically neutral and, as such, would most likely not provide the stable funding source needed to implement wireless E-911 services statewide.

Accepting that cost recovery issues have proven to be more complex than originally anticipated, Virginia will need to revisit and reconsider the issue of cost recovery as it relates to confidential and proprietary information, as well as the question of how to guarantee that all costs covered by the Board are "reasonable" and "direct." Specifically, there should be confidentiality protection for the wireless carrier proprietary data, though this protection needs to be balanced with the Board's duty to determine whether wireless service provider requests for

cost recovery are reasonable and direct. And taking the FCC's most recent statement concerning local exchange carriers as its cue, Virginia's enabling legislation should apply the "reasonable" and "direct" standard both to wireline telephone companies and those third-party vendors of Phase I and Phase II location technology.

MANAGING EMERGENCY TELECOMMUNICATIONS IN VIRGINIA

Introduction

Chapter 3 catalogued how other states fund and manage wireline and wireless E-911 services. Summarizing, the review of wireline and wireless legislation showed that, generally speaking, other states have enacted enabling legislation that is more comprehensive, explicit, and public safety focused than the comparable Virginia legislation. Working from the assumption that the citizenry's public safety interests are best served by a reliable, statewide E-911 system, and accepting that such a system is more likely to result when strategic planning, and inter-jurisdictional and inter-agency communication, coordination, and cooperation is the norm, many other states center their enabling wireline legislation around the following core ideas:

- Wireline E-911 is a critical public safety service;
- Having wireline E-911 available statewide is a public benefit; and
- Statewide wireline E-911 service should be delivered without risk of interruption resulting from a lack of planning, guidance, management, and/or expertise.

Taking the above as their cue, many of the interviewees for this piece criticized Virginia's failure to more thoroughly address public safety, strategic planning and coordination, and cost recovery concerns in its enabling legislation. These identified statutory shortcomings are said to contribute to the variability of Virginia's wireline E-911 tax rate, accounting measures, and local interpretation of "acceptable uses," the fact that the Commonwealth is not 100% wireline E-911 compliant, and the current lack of inter-jurisdictional and inter-agency communication and cooperation, among other things.

Similarly, Virginia's wireless E-911 legislation fails to touch upon many of those ideas deemed central by other states to the successful implementation and future uninterrupted operation of a statewide E-911 system and infrastructure. Focused on providing for wireless service provider and PSAP cost recovery, and the establishment of a fiscal oversight body and a cost recovery mechanism, Virginia's wireless E-911 legislation wholly ignores "public safety" considerations. Lacking the ability to develop and implement statewide guidelines to encourage the strategic development of a statewide E-911 telecommunications infrastructure, Virginia's Wireless E-911 Board is ill-equipped to provide the leadership called for in these most recent federal government pronouncements.

Looking to bring emergency telecommunications into the 21st century, Senator Conrad Burns (R – Montana), introduced for consideration into the 106th Congress the Wireless Communications and Public Safety Act of 1999. Designed to improve 911 service delivery generally, and wireless 911 services specifically, the Act designates 911 as the universal emergency number, promotes the use of new technologies to expedite the development of a "ubiquitous, national, and enhanced" emergency telecommunications services network, and calls upon the FCC to work with each state to develop and implement coordinated E-911 systems and deployment plans. In sum, both Congress and the FCC have now chosen to forcefully promote the creation of an end-to-end emergency telecommunications infrastructure so as to provide "an immediate and critical communications link" between the public and emergency services personnel. Recognizing that emerging technologies will play a critical role in the development of the called for end-to-end emergency communications infrastructure, below we briefly examine and discuss the role Virginia's Technology Secretariat will need to play if the Commonwealth is to lead the nation in constructing, operating, and managing a seamless and reliable statewide emergency telecommunications system.

JLARC's *Review of Information Technology in Virginia State Government* (1997)

In December of 1997, Virginia's Joint Legislative Audit and Review Commission (JLARC) released a report entitled *Review of Information Technology in Virginia State Government*. Recognizing that the information technology needs of the Commonwealth are very diverse, JLARC stated the following:

> The Commonwealth of Virginia should respond to these [information technology] needs with an appropriately flexible information technology strategy. This strategy should have enough direction to encourage a similar method for information technology service delivery across the many agencies, while affording the agencies necessary autonomy to fulfill their specific missions. Complicating this challenge is the nature of information technology which continues its relentless push toward "faster, better, smarter." The Commonwealth must attempt to maintain some degree of parity with the state of technology to benefit from such advances.[18]

Working from this foundation, JLARC went on to recommend a complete overhaul of the existing structure for information technology in Virginia State government. Citing a "critical lack of leadership in information technology, the structural separation of the planning and service functions, and the disconnection of agencies from the information technology policy process," JLARC called for "the abolishment of the existing information technology agencies; creation of a Chief Information Officer position with a staff to provide policy, planning, and standards support; creation of a new Department of Technology Services; and better integration of the

[18] JLARC's *Overview: Review of Information Technology in Virginia State Government* (December 1997), p. 3.

agency information technology units into technology policy and planning."[19] Asserting that "too much of the use of information technology in State government now occurs with inadequate planning and coordination," and that Virginia "has been slow to respond to changes in technology," JLARC concluded,

> The issues discussed in this report point to the need for a more focused approach to information technology – one that has clear leadership from the top, and strong support from all the agencies which must rely on technology on a daily basis. The restructuring proposed in this report, in combination with the other improvements recommended, can be the foundation for improved information technology services for State agencies, and improved government services for the citizens of Virginia.[20]

The Virginia General Assembly and Information Technology

Looking to act on JLARC's recommendations, during the 1998 session of the Virginia General Assembly, the legislature considered House Bill 279. This bill, sponsored by Delegate Jay W. Deboer, looked to create the position of Chief Information Officer (CIO) of the Commonwealth, and a Department of Technology Services (DTS). This was to be accomplished by abolishing and merging the Department of Information Technology (DIT) and the Council on Information Management (CIM). The CIO was to be appointed by the Governor. In addition to the proposed Department of Technology Services, the CIO was to assume responsibility for the Virginia Geographic Information Network Advisory Board[21] and the Virginia Public Broadcasting Board (both of which were then under the Secretary of Administration), and the Virginia Technology Infrastructure Fund[22] (administered at that time by CIM). The Virginia Geographic Information Network Division[23] and the Geographic Information Systems Fund[24] (at that time part of, and administered by, CIM) was to be transferred to the purview of the newly created Department of Technology Services.

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[19] JLARC's *Overview: Review of Information Technology in Virginia State Government* (December 1997), p. 21.

[20] JLARC's *Overview: Review of Information Technology in Virginia State Government* (December 1997), p. 33.

[21] Established via House Bill 1597 during the 1997 session of the Virginia General Assembly (*Code of Virginia*, Chapter 35.2, Article 8, Sections 2.1-563.36 through 2.1-563.41).

[22] Established via House Bill 1168 and Senate Bill 393 during the 1996 session of the Virginia General Assembly (*Code of Virginia*, Chapter 22.13, Sections 9-145.52 through 9-145.56).

[23] Established via House Bill 1597 during the 1997 session of the Virginia General Assembly (*Code of Virginia*, Chapter 35.2, Article 8, Sections 2.1-563.36 through 2.1-563.41).

[24] Established via House Bill 1597 during the 1997 session of the Virginia General Assembly (*Code of Virginia*, Chapter 35.2, Article 8, Sections 2.1-563.36 through 2.1-563.41).

The bill was assigned to the House Committee on General Laws where it was carried over to the 1999 session. While this bill was subsequently continued, many of its particulars were incorporated into legislation introduced during the 1999 session of the Virginia General Assembly. The passage of House Bill 1727, House Bill 2188, and Senate Bill 808 resulted in the creation of the Secretary of Technology/Virginia's "Chief Information Officer", the Council on Technology Services, the Chief Information Officer Advisory Board, and the Department of Technology Planning.

Secretary of Technology/Chief Information Officer. Though technically one office, the duties of the Secretary of Technology are contained under two separate *Code of Virginia* sections. Looking first at *Code of Virginia*, Chapter 5.11, § 2.1-51.44 through 2.1-51.46, the **Secretary of Technology** is to ensure the coordinated planning, practical acquisition, effective development, and efficient use of information technology resources and services to meet the needs of academia and government in the Commonwealth. The Secretary has the standard power and duties of other Cabinet Secretaries, including things like hiring and administering staff, holding accountable for their administrative, fiscal, and program activities those agencies under his supervision, making and entering into contracts and agreements, and accepting and administering grants.

As the Commonwealth's **Chief Information Officer**[25] (CIO) the Secretary is required to:

- Monitor trends and advances in information technology;
- Direct and approve a comprehensive, statewide, four-year planning process (to be updated annually); and
- Plan for the acquisition, management, and use of information technology.

Further, the Secretary's CIO duties involve overseeing the provision of assistance and guidance to state agencies and institutions of higher education in developing information technology plans and preparing budget requests for information technology. As CIO the Secretary is also required to review information technology plans that all state agencies and institutions of higher education must now prepare and submit to the Technology Secretariat. The CIO has the authority to approve and/or amend these plans upon review and recommendation by the newly created Department of Technology Planning. All state agencies and institutions of higher education are required to maintain information technology plans that have been approved by the CIO.

To give teeth to these powers and duties, the CIO is empowered to review budget requests for information technology from state agencies and institutions of higher education, and recommend budget priorities to the Department of Planning and Budget. This relationship with the Department of Planning and Budget gives the CIO a great deal of power in that state agencies and institutions of higher education are required to follow the policies and procedures developed by the CIO when making budget requests for information technology.

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[25] *Code of Virginia*, Chapter 5.11, Section 2.1-51.47.

Additionally, the CIO –in conjunction with the Department of Technology Planning – is to develop an approval process to ensure that all procurement of information technology conforms to the statewide information technology plan and/or to the individual plans of state agencies or institutions of higher education. In this capacity, the CIO is authorized to disapprove of technology procurement requests that do not conform to the statewide information technology plan and/or the individual plans of state agencies or institutions of higher education.

Another important function of the CIO is to formulate, direct, and promulgate policies, standards, specifications, and guidelines for the effective management of information technology in the Commonwealth. This includes the establishment of statewide standards for the efficient exchange of electronic information and technology between the state and local governments, and the public and private sectors in the Commonwealth. Additionally, the CIO is required to periodically perform a benchmarking analysis of data center and telecommunications resources and services of state agencies and institutions of higher education.

Council on Technology Services & Chief Information Officer Advisory Board. The provision of the services detailed above is to be aided by two advisory bodies, the **Council on Technology Services** (COTS), and the **Chief Information Officer Advisory Board** (the CIO Board). Created to advise and assist the Secretary of Technology/CIO in exercising the powers and performing the duties conferred upon him, COTS consists of 26 appointed members.[26] Staff of state agencies, institutions of higher education, and local governments, would represent this Council. The Secretary of Technology/CIO serves as the chairman of COTS.

Similar to COTS, the CIO Board was created to advise and assist the CIO on the proper planning, practical acquisition, effective development, and efficient use of information technology to serve the needs of state agencies and institutions of higher education.[27] Consisting of 12 appointed members, persons appointed to the CIO Board are to be selected for their knowledge of, background in, and/or experience with information technology in a private, for-profit or not-for-profit organization. No public employees are eligible for appointment to the CIO Board.

Department of Technology Planning. The **Department of Technology Planning** is the administrative arm of the Secretary of Technology/CIO.[28] Headed by a Director and supervised by the Secretary of Technology/CIO, generally, the Department is charged with the following:

- Employing necessary personnel;
- Making and entering into contracts and agreements, and accepting and administering grants; and

[26] *Code of Virginia*, Chapter 5.11, Section 2.1-51.48.

[27] *Code of Virginia*, Chapter 5.11, Section 2.1-51.49.

[28] *Code of Virginia*, Chapter 35.2, Article 7.1, Section 2.1-563.35:1 through 2.1-563.35:3.

- Prescribing rules and regulations necessary or incidental to the performance of required duties and/or responsibilities.

Concerning the planning, budgeting, acquiring, using, disposing, managing, and administering of information technology specifically, the Department has the following responsibilities:

- Monitoring trends and advances in information technology;

- Developing a comprehensive, statewide, four-year planning process, together with a plan for the acquisition, management, and use of information technology;

- Planning and forecasting future needs for information technology;

- Conducting studies and surveys of organizational structures and best management practices of information technology systems and procedures;

- Assisting the Secretary of Technology/CIO in the development of statewide policies affecting technology at all levels of government, in the business sector, and among the general citizenry;

- Providing state agencies and institutions of higher education with information and guidelines in the development of information management plans and the preparation of budget requests for information technology which are consistent with the policies and procedures developed by the Secretary of Technology/CIO, in consultation with the Department of Planning and Budget;

- Reviewing information management plans submitted by agencies and institutions of higher education to the Secretary of Technology/CIO, and recommending to the Secretary of Technology/CIO the approval of such plans and any amendments thereto;

- Monitoring the implementation of information management plans and periodically reporting its findings to the Secretary of Technology/CIO;

- Developing and promulgating policies, standards, and guidelines for managing information technology in the Commonwealth;

- Reviewing agency and institution budget requests for information technology, and recommending to the Secretary of Technology/CIO budget request priorities for consideration by the Department of Planning and Budget;

- Directing the compilation and maintenance of an inventory of information technology, including, but not limited to, personnel, facilities, equipment, goods, and contracts for services;

- Developing an approval process to ensure that all information technology procurements conform to the statewide information management plan and the information management plans of agencies and institutions of higher education; and

- Developing statewide standards for the efficient exchange of electronic information and technology, including infrastructure, between the public and private sectors in the Commonwealth.

Virginia Technology Infrastructure Fund. The Secretary of Technology/CIO is required to oversee the **Virginia Technology Infrastructure Fund** (the Technology Fund). Recognizing a need to reinvest savings that accrue from increased usage of technology into new and emerging technologies, the Technology Fund is to be used exclusively for telecommunications and information technology projects that benefit state government as a whole, and that serve more than one state agency or institution of higher education. More specifically, the Secretary of Technology/CIO, with advice from the newly created Council on Technology Services and the Department of Technology Planning, is to prepare a plan that identifies those projects in which the Technology Fund will participate. This plan is to be consistent with the Secretary of Technology/CIO's statewide information technology plan. Projects that appear to have the greatest benefit to state government as a whole are to receive the highest priority in the plan.

Contributions to the fund consist of savings that accrue to the Commonwealth's agencies and instrumentalities from reductions in the following:

- Local or long-distance telecommunications service charges; and

- Computer services rates charged by the Department of Information Technology, not to exceed $200,000 in each fiscal year.[29]

Additionally, interest earned on the Technology Fund is credited to the Technology Fund, the Technology Fund it is permanent and nonreverting, and any unexpended balance in the Technology Fund at the end of the biennium is not to be transferred to the general fund of the state treasury.[30]

Geographic Information Network Division, Virginia Geographic Information Network Advisory Board, & the GIS Fund. Within the Department of Technology Planning is the **Geographic Information Network Division** (The Division). The Division (established by

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[29] However, for institutions of higher education, the savings shall consist only of savings in general fund dollars that accrue to such institutions from the reduction in such charges or rates.

[30] Looking at administration of the Technology Fund, when charges for local or long-distance telecommunications services or rates for computer services are reduced by the Department of Information Technology, vendors, or state agencies or instrumentalities, the calculated savings data by fund source for each affected state agency or instrumentality is to be provided to the Department of Planning and Budget. In accordance with its authority to do so in the general appropriations act, the Department of Planning and Budget then administratively reduces each affected agency's or instrumentality's appropriation and transfers the agreed-upon savings to the Technology Fund.

House Bill 1597 during the 1997 session of the Virginia General Assembly) is charged with fostering the creative utilization of geographic information and oversees the development of a catalog of Geographic Information Systems (GIS) data available in the Commonwealth. A coordinator who reports to the Director of the Department of Technology and Planning heads the Division. The Division is free to establish charges and fees for the use or sale of products and/or services provided by the Division, and to construct ad hoc committees or project teams to investigate related technology or technical issues. Additionally, the Division is required to:

- Oversee the development of and recommend to the Department of Technology and Planning the promulgation of policies and guidelines required to support state and local government exchange, acquisition, storage, use, sharing and distribution of geographic or base map data and related technologies;

- Foster the development of a coordinated comprehensive system for providing ready access to electronic state government geographic data products for individuals, businesses, and other entities;

- Initiate and manage projects or conduct procurement activities relating to the development or acquisition of geographic data and/or statewide base map data;

- Plan for and coordinate the development or procurement of priority geographic base map data;

- Develop, maintain, and provide, in the most cost-effective manner, access to the catalog of Virginia geographic data and governmental geographic data users;

- Provide, upon request, advice and guidance on all agreements and contracts from all branches of state government for geographic data acquisition and design and the installation and maintenance of geographic information systems;

- Compile a data catalog consisting of descriptions of GIS coverages maintained by individual state and local government agencies;

- Identify and collect information and technical requirements to assist the Department of Technology Planning in setting priorities for the development of state digital geographic data and base maps that meet the needs of state agencies, institutions of higher education, and local governments;

- Provide services, geographic data products and access to the repository at rates established by the Division; and

- Ensure the compliance of those policies, standards, and guidelines adopted developed by the Department of Technology Planning required to support and govern the security of state and local government exchange, acquisition, storage, use, sharing, and distribution of geographic or base map data and related technologies.

In fulfilling this mandate, the Division is aided by an advisory body, the **Virginia Geographic Information Network Advisory Board** (GIS Board). Created to advise and assist the Geographic Information Network Division, the GIS Board consists of 17 appointed members, and is governed by a chairman and vice-chairman elected from their body.

Finally, there is in the state treasury a special, nonreverting fund known as the **GIS Fund**. All moneys collected via the provision of products and/or services by the Geographic Information Network Division are paid into the state treasury and credited to the GIS Fund. Interest earned on moneys in the GIS Fund remains in the GIS Fund and is credited to it. Any moneys remaining in the GIS Fund – including interest - at the end of the fiscal year remain in the GIS Fund.

Emergency Communications & the Technology Secretariat

Since their inception, the management of Virginia's emergency telecommunications systems has been characterized by a lack of coordinated leadership and direction. As a result, these systems exemplify the "chaos model" of information technology management highlighted in the December 1997 JLARC report, with individual PSAPs and local jurisdictions moving in many different directions. This should be a major point of concern, given that Virginia's PSAPs are ***the*** public safety communications hub, and rely on a vast array of technological components to provide immediate and critical communications links between the citizens of the Commonwealth and Virginia's emergency services community.

Wireline E-911. Looking first at wireline 911 and E-911, though statutory provisions do vary from state to state, similarities do exist. For example, North Carolina – similar to Virginia – allows for the local collection and administration of a wireline E-911 tax, but goes further than the Commonwealth in earmarking these funds, and requiring that they be deposited into a separate account. The enabling wireline 911 legislation in the states of Maryland, South Carolina, and Tennessee all fix the wireline E-911 tax rates, provide for an annual audit procedure, and explicitly state the acceptable uses of those moneys generated. (Virginia's wireline legislation does none of the above.) As such, the types of reimbursable costs, the administration of cost recovery, and the verification of costs are all built into the enabling statutory legislation. In Maryland and South Carolina, localities work with statewide 911 oversight and planning bodies, bodies charged with establishing 911 guidelines, reviewing local 911 system plans and/or contracts, and "developing and promoting statewide" 911 plans, among other things.[31] Maryland's National Emergency Number Association (NENA) President Walter J. Campbell said that his state recognized "that wireline and wireless 911 are interconnected. By placing 911 planning, coordination, and oversight under a Board – and staffing it with the expertise it needs - Maryland probably gets better, more coordinated policy, and probably saves money."

[31] Tennessee uses emergency district boards of directors in much the same fashion, and obligates any locality that wants to raise the tax rate to submit the question to the voters.

Drawing a comparison, Virginia is one of only 8 states that neither "caps" or "sets the rate" of the wireline E-911 tax, nor promotes oversight and accountability of those funds generated by their wireline E-911 tax via an audit procedure, and/or mandating that those funds generated by the tax be deposited into "separate and distinct" accounts. As a result, Virginia's average wireline E-911 tax rate is $1.30, .63-cents above the national average of .67-cents, a number gleaned from the 42 states that do either "establish a ceiling" or "set the rate" for their wireline E-911 tax. Additionally, there is widespread confusion on the part of PSAPs and local governments concerning what the moneys generated from the wireline E-911 tax can – and can not – be used for, and wireline 911 service delivery is inconsistent from jurisdiction to jurisdiction. Further, PSAPs and/or local jurisdictions enter into long-term contracts for the purchase of equipment, software, and/or services without the benefit of any statewide guidelines or standards, or state-level assistance. This latter issue is compounded by the uneven distribution of technical expertise among individual PSAPs and local governments, and the existing lack of inter-jurisdictional coordination and communication.

The management of Virginia's emergency telecommunications systems has been characterized by a lack of coordinated leadership and direction. As a result, these systems exemplify the "chaos model" often associated with information technology, with individual PSAPs and local jurisdictions moving in many different directions. This should be a major point of concern, given that Virginia's PSAPs are ***the*** *public safety communications hub, and rely on a vast array of technological components to provide immediate and critical communications links between the citizens of the Commonwealth and Virginia's emergency services community.*

Wireless E-911. Turning to wireless 911 and E-911, to date thirty-one (31) states have passed wireless E-911 legislation. Cognizant of the requirements of FCC Docket Order 94-102, most states have created an emergency communications board, established a wireless E-911 cost recovery mechanism, designated who is eligible to receive cost recovery for the delivery of wireless E-911 services (generally PSAPs and wireless service providers), and do require fiscal oversight and accountability via annual audits. Additionally, many of these statutes require the emergency communications board to develop and provide to the PSAPs and local governments information and guidelines for operating 911 systems generally, and implementing Phase I and Phase II wireless E-911 location technology. Some states further empower these boards to withhold funding from those PSAPs and/or local governments for failing to produce 911 systems management plans that are consistent with the policies and procedures promulgated by the emergency communications board.

Virginia's wireless E-911 enabling legislation differs from its contemporaries. Summarizing, though Virginia's Wireless E-911 Service Board has been charged with overseeing the funding and development of a statewide wireless E-911 network, the Board is ill-equipped to successfully tackle this responsibility. Virginia's enabling legislation does not empower the Commonwealth's Board to promulgate policies, standards, and guidelines for

implementing Phase I and Phase II wireless E-911 location technology, nor does it provide the Board with any staff support. Additionally, the Board's membership is extremely limited. The lack of staff support and broad representation hampers the Board's ability to adequately review cost estimates submitted to it by PSAPs and wireless service providers, among other things. Further, the Board has little to no ability in its current form to develop either a strategic plan for the delivery of wireline and wireless 911 services, or to even develop standards for the development and implementation of such a plan by another body. Lacking the ability to adequately monitor trends and advances in on-point technology (and therefore unable to forecast future needs), having no authority to propose a comprehensive plan for the acquisition, management, and use of the necessary Phase I and Phase II hardware and software components, and not explicitly authorized either to develop germane information and guidelines, or review and comment upon those developed elsewhere, Virginia's Board will be unable to deliver the more focused approach to emergency telecommunications called for by the U.S. Congress and the FCC.

Bringing It All Together

Too much of the emergency telecommunications service's activities of Virginia's PSAPs and local governments now occur with inadequate planning and coordination. Lacking leadership and direction, Virginia has been slow to implement wireline E-911 statewide, and has not been quick to embrace the federal government's call for the rapid delivery of wireless E-911 services. The life-saving advantage of being able to know accurately and quickly the location of emergency is obvious. Less obviously, emergency telecommunications location technology also allows PSAPs and emergency response teams to operate more efficiently. By immediately routing the emergency call to the local PSAP serving that jurisdiction, these calls arrive at the appropriate PSAP more quickly. Further, with the location information displayed, the emergency call dispatcher need not question the caller about his or her location. Finally, these location technologies can help PSAPs better deal with sudden bursts of calls, which often occur after incidents such as highway accidents. Knowing the location of the incoming calls, the PSAP can better distinguish redundant calls about a particular accident from calls concerning a different emergency.[32]

The issues discussed throughout this report point to the need for a more focused approach to emergency telecommunications services, one that has clear leadership from the top, and strong support from all associated parties. Recognizing the need to encourage the statewide coordination of those entities charged with delivering emergency telecommunications services, and given the critical nature of information technology to the rapid development and deployment of a statewide emergency telecommunications services network, *Code of Virginia* § 58.1-3813, as well as *Code of Virginia*, §§ 56-484.8 to 56-484.11, in combination with the other improvements recommended throughout this report and in the next chapter, needs to be restructured. Specifically, the Wireless E-911 Service Board should be replaced with both an Emergency Telecommunications Services Board as well as an Emergency Telecommunications Services Division, to be housed in Virginia's Department of Technology Planning. Further, the membership of the Board together with its powers and duties should be expanded. These moves

[32] Revision of the Commission's Rules (FCC Docket 94-102), paragraph 2 (September 1999).

would augment its ability to promulgate the necessary policy, planning, and standards support, and to better promote the integration of all of Virginia's PSAPs into a statewide, strategic emergency telecommunications services plan. In carrying out its responsibilities, the Board will need to remain flexible, acknowledging and keeping abreast both of the advances and/or changes in on-point technology and applicable federal law, as well as the sometimes very different needs of individual localities and PSAPs. The restructuring highlighted here can be the foundation for improved emergency telecommunications services for all of Virginia's PSAPs and public safety personnel, and improved public safety services for the citizens of Virginia.

Chapter 6: Findings & Options for Legislative Consideration

House Joint Resolution 215 (1998), directed the Virginia State Crime Commission to make recommendations for the most efficient and cost effective manner to first improve upon, and then manage and deliver wireline and wireless E-911 services to Virginia's citizenry. Additionally, the Virginia General Assembly asked that the Crime Commission comment on ways to promote the use of #77 among citizens for non-emergency services. Chapter 6 summarizes the findings from the previous chapters, and presents options for legislative consideration. This chapter addresses the following:

- Wireline and Wireless E-911 in Virginia
- Wireline and Wireless E-911 in Other States
- Managing, Promoting, and Funding Emergency Telecommunications Services in Virginia
- Non-Emergency #77, and the State Police & Wireless 911

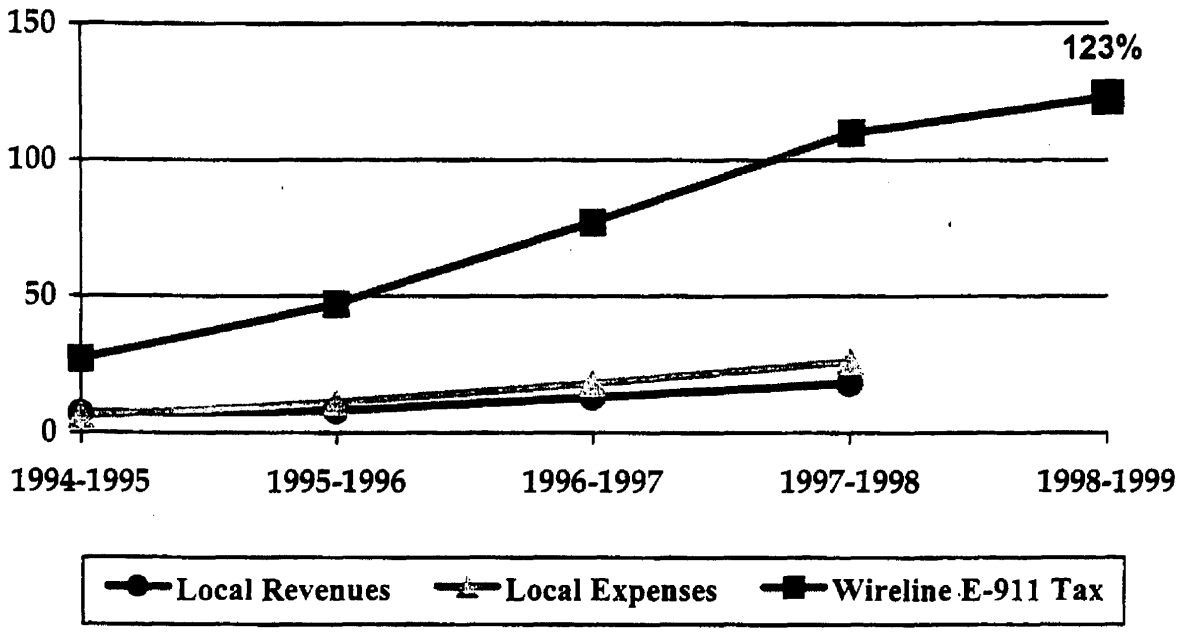
WIRELINE AND WIRELESS E-911 IN VIRGINIA

Wireline. In the Commonwealth of Virginia there are an estimated 150 PSAPs serving 135 local jurisdictions (cities and counties). 97% of Virginia's population (89% of the land area) is served by (at least) basic 911. 95% of Virginia's population (77% of the land area) is served by E-911.

In 1982, the Virginia General Assembly passed legislation creating the local tax for enhanced emergency telephone service, authorizing those Virginia localities "which established or will establish an ***E-911*** emergency telephone system," to impose a special tax on the consumers of the telephone service (*Code of Virginia*, § 58.1-3813, Subsection A). Local governments finance 911 services generally via this local tax, the consumer utility tax, and local government general fund revenues. Looking more closely at the wireline E-911 tax, the average rate of the E-911 wireline tax in Virginia is $1.30. Compared to three national measures developed from a review of all 50 states' 911 laws, Virginia's wireline E-911 tax rate is .63-cents above the national average of .67-cents, a number pulled from the 42 states that do either "establish a ceiling" or "set the rate" for their wireline E-911 tax. Some jurisdictions (13) do levy a local tax for enhanced emergency telephone service but do not provide wireline E-911 services, whereas others (14) neither levy the tax nor provide the service. Most localities (56%) use their general fund to account for wireline E-911 financial activity, and as such there is not always a separate budgeting and accounting for wireline E-911 service expenditures. The remaining localities (44%) make use of a special revenue fund (32%), or some other fund (12%).

Additionally, the Commonwealth is serviced by an estimated twenty-two local telephone companies and roughly 5 million access lines. Assessed on each telephone line monthly, the local tax for enhanced emergency telephone service generated an estimated $67 million during

Table 6.1: Local Revenue, Expenditure, & E-911 Tax Rate; Percentage Increase Compared to a Base Year (1994)



fiscal year 1999, a 123% increase in local revenue generated from the local tax since fiscal year 1994 ($30 million). (**To illustrate these numbers, Table 4.4 – designated here as Table 6.1 – is reproduced above.**) Over the last three fiscal years, the wireline E-911 tax has generated over two-thirds of the ***total*** operating budgets of the Commonwealth's local emergency call centers.

Working from the evidence collected, wireline 911/E-911 calls appear to represent a little less than one-half of total PSAP call volume. The development of accurate PSAP call volume numbers is hampered by the fact that roughly 25% of Virginia's localities reported that the PSAP serving their jurisdiction does not maintain call volume counts. (An additional 21% responded that the question was "not applicable.")

Wireless. The FCC regulates wireless telecommunications companies. FCC authority over the wireless industry includes licensing, certain technical aspects of wireless service, timeframes in which service must be made available in given areas, and the provision of basic 911 and E-911 service. The FCC has the authority to preempt state laws or regulations that conflict with or prevent wireless telecommunications companies from meeting their federally mandated requirements.

In 1996 the FCC issued Docket Order 94-102 requiring all wireless carriers to provide wireless E-911 in two phases, if certain conditions were met. Subsequently, the FCC has revisited and revised these requirements, altering somewhat the specifics associated with Phase I and Phase II wireless E-911 location services, but leaving in tact the main thrust of the original order. That being said, some noteworthy changes/additions to the original FCC order follow.

- The FCC now requires that a wireless 911 call be handled by whatever wireless system is available in the area of need.

- Wireless carriers must now submit plans for implementing E-911 Phase II to the FCC by October 1, 2000.

- The FCC eliminated the prerequisite for carrier cost recovery, deciding that a cost recovery mechanism is not necessary to permit wireless service providers to recover their costs.

In 1998, the Virginia General Assembly passed legislation (the Wireless Enhanced Public Safety Telephone Service Act, *Code of Virginia*, §§ 56-484.8 to 56-484.11) creating a Wireless E-911 Service Board. The General Assembly also authorized wireless service providers to collect a monthly fee of .75-cents assessed upon each of their assigned telephone numbers. These moneys are deposited into a fund to provide full payment to PSAPs of all "reasonable and direct" wireless E-911 PSAP costs and to wireless service providers of all "reasonable and direct" wireless E-911 wireless service provider costs associated with the provision of wireless E-911 location technology.

In October of 1999, the President signed U.S. Senate Bill 800, The Wireless Communications and Public Safety Act of 1999. Designed to promote and enhance public safety through the use of 911 as the universal emergency assistance number, and to encourage the construction and operation of a seamless, ubiquitous, and reliable emergency telecommunications network through intra- and inter-statewide coordination, this Act directs the FCC to designate 911 as the universal emergency telephone number for both wireline and wireless telephone service, and to encourage and support efforts by states to develop coordinated plans to implement wireless E-911. As part of this effort, the FCC is to "encourage each state to develop and implement coordinated statewide [E-911 systems and] deployment plans, through an entity designated by the governor." Additionally, the Act confers upon providers and users of wireless 911 services liability protection, and grants privacy protection for the call location information of users of wireless phones.

In the Commonwealth of Virginia, there are an estimated 1.5 million wireless subscribers. The aggregate number of wireless 911 calls received by the seven divisional Virginia State Police Regional Emergency Call Centers from January 1, 1998 through December 31, 1998, and those local PSAPs that currently receive wireless 911 calls directly – Division 2 and Division 7 (Northern Virginia), and the Charlottesville/Albemarle and Lynchburg areas – was a reported 709,018. This total does include #77 calls. Working from nationwide data collected by the Cellular Telecommunications Industry Association (CTIA), subscriber counts and emergency call volume numbers are expected to grow by at least 15% annually.

In fiscal year 1998, the Wireless E-911 Fund (created by the Wireless Enhanced Public Safety Telephone Service Act) generated over $13 million. Assuming a 15% growth rate in wireless subscribership in Virginia during fiscal years 2000 (1.7 million subscribers), 2001 (2.0 million subscribers), and 2002 (2.3 million subscribers), Virginia's wireless E-911 tax will generate an estimated $15.3, $18.0, and $20.7 million during those years, respectively. Total

revenue, then, during this period should eclipse $65 million. In Chapter 2, hypothetical cost estimates for the deployment statewide of Phase I and Phase II wireless E-911 location technology were developed. After inserting Virginia's population, the maximum cost range associated with the model for Phase I wireless location technology is $31.8 to $47.7 million (over five years). For Phase II, the maximum cost range is $65.3 to $98.0 million over this same five-year period. Combining Phase I and Phase II, the estimated maximum cost range associated with implementing a statewide wireless E-911 system over a five-year period in Virginia is $97.1 to $145.7 million. Prior to sunsetting in July of 2002, Virginia's Wireless E-911 tax is expected to generate roughly $65 million over four years. For purposes of comparison, if this sunset date were extended by one year, Virginia's wireless E-911 tax would generate roughly $92 million.

Having established the Wireless E-911 Fund, wireless service providers doing business in Virginia are now required to provide Phase I service upon receiving a valid request from a PSAP capable of receiving and using Phase I information. As of August 1999, twenty-two (22) localities have submitted requests totaling $4.73 million for Phase I service. Pursuant with Item 461 2c (1999 Appropriations Act), the Virginia Department of State Police Requested funding in the amount of $375,648 for fiscal year 2000. In September of 1999, wireless service providers submitted cost recovery requests totaling $4.5 million for the establishment of Phase I service for those 22 local jurisdictions.

Phase II wireless location technology provides more specific information to the primary PSAP from the wireless service provider regarding the location the 911 call originated from. Neither wireless service providers nor Virginia's PSAP community are currently prepared to provide Phase II location technology.

WIRELINE AND WIRELESS E-911 IN OTHER STATES

Wireline. Though wireline E-911 funding and cost recovery provisions across the states are variable, similarities do exist. Working from a review of all fifty states' wireline E-911 laws, Virginia is one of a minority of states in that *Code of Virginia*, § 58.1-3813:

- ***Does not*** either "establish a ceiling" or "set the rate" of the wireline E-911 tax. (*84% of states **do** either establish a wireline E-911 tax "ceiling" or levy a "fixed" rate wireline E-911 tax. Note here that 74% of states **do** allow for local collection and administration of their wireline E-911 tax, though of these states only Hawaii, Kentucky, North Carolina, Virginia, and West Virginia **do not** either establish a local wireline E-911 tax "ceiling" or "fixed" rate.)*

- ***Does not*** formally require either state or local oversight and accountability via the enabling statutory language. (*84% of states **do** promote oversight and accountability of those funds generated by their wireline E-911 tax via an audit procedure [dministered either by the state or the locality], and/or mandating that those funds generated by the tax be deposited into "separate and distinct" accounts.*)

- ***Does*** allow these funds to be used for salaries of call takers, dispatchers, and E-911 coordinators/directors. (*70% of states **do not** allow funds generated from their wireline E-911 tax to be used for "salaries, or portions of salaries" of emergency call center employees.*)

Looking more closely at 9 sampled states (California, Connecticut, Indiana, Maryland, Minnesota, North Carolina, South Carolina, Tennessee, and Texas), save for North Carolina, the enabling wireline E-911 legislation adopted by these states is more comprehensive, explicit, and public safety focused than the comparable Virginia legislation. Summarizing, these states worked from the assumption that a reliable statewide wireline E-911 system is more likely to result when strategic planning, and inter-jurisdictional and inter-agency communication, coordination, and cooperation is the norm. Choosing to focus on public safety first, each of those states designated as being trendsetters in the field of inquiry (California, Connecticut, Indiana, Minnesota, and Texas) provides at least basic wireline 911 coverage to 100% of their population.

Establishing clearly the primacy of public safety considerations, these states also address system funding needs. Looking to ensure that funds sufficient to support the initial purchase and subsequent maintenance of wireline E-911 equipment and services are raised, and that those funds are spent appropriately, these states "set" or "cap" the tax rate, require that the funds generated be deposited into a separate and distinct account, earmark those funds for specific cost recovery purposes, and provide for an annual audit procedure. (North Carolina's statute does not "set" or "cap" the rate, though it does require that the monies be deposited into special local accounts, and explicitly states what moneys from this Fund are – and are not – to be used for.) Looking again at those five trend-setting states, three (60%) levy a statewide wireline E-911 tax, and four (80%) require their PSAPs to work closely with statewide oversight bodies. California's Department of General Services (Communications Division), Connecticut's Office of Statewide Emergency Telecommunications, Minnesota's Department of Administration, and Texas' Advisory Commission on State Emergency Communications are all charged – to varying degrees – with both fiduciary and policy-making responsibilities.

Virginia's wireline E-911 tax does comparatively little to encourage either the development or subsequent acceptance of those public safety ideals deemed central by many other states to the strategic and successful implementation and future uninterrupted operation of their E-911 systems and infrastructure. Taking this as their cue, many of the interviewees for this piece highlighted as problematic Virginia's failure to more thoroughly address public safety, strategic planning and coordination, and cost recovery concerns in its enabling legislation. These identified statutory shortcomings are said to contribute to the variability of Virginia's wireline E-911 tax rate, accounting measures, and spending practices, the fact that wireline 911 service delivery varies from jurisdiction to jurisdiction, and the current lack of inter-jurisdictional and inter-agency communication and cooperation, among other things.

Wireless. Less variable than wireline E-911, wireless E-911 enabling legislation is quite similar across states. Working from the review of the legislation adopted by the 31 states (62%) that have enacted wireless E-911 laws, staff determined that Virginia's Wireless Enhanced

Public Safety Telephone Service Act (*Code of Virginia*, § 56-484.8 to 484.11) – similar to comparative legislation in these other states – does do the following:

- Creates a Wireless E-911 Service Board. (*84% of states that have enacted wireless E-911 laws **do** create and empower some sort of wireless 911 board, department, or division.*)

- Establishes a fixed wireless E-911 cost recovery mechanism and designates who is eligible to receive cost recovery for the delivery of wireless E-911 services. (*100% of those states that have enacted wireless E-911 laws **do** include a specific cost recovery mechanism. 94% of these states do either "cap" or "fix" their wireless E-911 tax rate.*)

- Requires oversight and accountability via a formal audit procedure. (*90% of states that have enacted wireless E-911 legislation **do** require oversight and accountability by way of a formalized audit procedure and/or mandating that those funds generated by the tax be deposited into a separate and distinct account.*)

Conversely, Virginia's wireless E-911 enabling legislation is different from that adopted by other states in that it ***does not*** do the following:

- Endow the Commonwealth's Wireless E-911 Board with extensive "fiduciary" and "policy-making" responsibilities. (*84% of those states with a wireless 911 board, department, or division **do** grant these bodies both fiduciary and policy-making – in terms of planning, coordination, and implementation of wireless E-911 service - responsibilities.*)

- Extend the opportunity of board membership beyond the PSAP/local government and telecommunications industry communities. (*69% of those states with a 911 board, department, or division **do** extend membership opportunities to a wide variety of interested parties, including law enforcement and emergency fire and rescue personnel, as well as technology experts and engineers, to name but a few.*)

- Provide for any staff support for Virginia's Wireless E-911 Service Board. (*62% of those states with a 911 board, department, or division **do** provide these entities with staff support. Many fund a "statewide 911 coordinator," and other staff from the moneys generated by their state's wireless E-911 tax.)*

Looking more closely at the 9 sampled states, 5 of the 9 (California, Connecticut, Maryland, Minnesota, and Tennessee) explicitly address wireline and wireless E-911 jointly, while Indiana, South Carolina and Texas - though less explicit – do encourage the statewide development and deployment of emergency telecommunications systems generally. Looking at the five trend-setting states, four of the five (80%) extend the possibility of board membership to a wide variety of individuals, and four out of five (80%) do grant these bodies extensive fiduciary and policy-making responsibilities. Additionally, each of these five states (100%) provide specifically for staff support. Remembering that the delivery of wireless E-911 services depends heavily on the existing wireline E-911 infrastructure, in dealing with emergency

telecommunications writ large, these states endorsed the view that a statewide E-911 system is more likely to result when inter-jurisdictional and inter-agency communication, coordination, and cooperation is the norm.

Similar to Virginia's wireline E-911 enabling legislation, Virginia's wireless E-911 enabling legislation fails to touch upon many of those ideas deemed central by other states to the successful implementation and future uninterrupted operation of a statewide E-911 system and infrastructure. Wholly ignoring "public safety" considerations, Virginia Wireless E-911 Service Board lacks the ability to develop any statewide guidelines to encourage the strategic development of E-911 systems. Virginia's Board is further hampered by its inability to thoroughly examine and consider wireless service provider and PSAP cost recovery estimates. Lacking the ability to adequately monitor trends and advances in on-point technology (and therefore unable to forecast future needs), having no authority to propose a comprehensive plan for the acquisition, management, and use of the necessary Phase I and Phase II hardware and software components, and not explicitly authorized either to develop germane information and guidelines, or review and comment upon those developed elsewhere, in its present form, Virginia's Board will be unable to deliver the more focused approach to emergency telecommunications called for by the U.S. Congress and the FCC.

MANAGING, PROMOTING, & FUNDING EMERGENCY TELECOMMUNICATIONS SERVICES IN VIRGINIA

When it comes to emergency telecommunications, Virginia State government and the Commonwealth's localities have the same ultimate goal: Effectively and efficiently delivering this most important of public safety services to Virginia's citizenry. As Virginia prepares to face increasingly complex challenges in the area of emergency telecommunications generally, communication, coordination, and planning become increasingly critical. Recognizing these challenges, other states have enacted enabling wireline and wireless E-911 legislation that not only provides for the necessary cost recovery for PSAPs and wireless carriers, but also promotes communication between parties, focuses more attention on the citizenry's public safety interests, and guarantees long-term planning. In today's rapidly changing economic, demographic, and technical climate, it is critical that state and local governments work together to accomplish common goals. The following discussion acknowledges as paramount the fact that improved public safety remains an important objective of federal, state, and local governments, and that the public safety needs of Virginia's citizens will be well served by the rapid development and deployment of a statewide emergency telecommunications system.

Managing & Promoting Wireline and Wireless E-911 in Virginia

Since their inception, the management of Virginia's emergency telecommunications systems has been characterized by a lack of coordinated leadership and direction. As a result, these systems exemplify the "chaos model" of information technology management highlighted in the December 1997 JLARC report discussed in Chapter 5. This is a major point of concern, given that Virginia's PSAPs are ***the*** public safety communications hub, and rely on a vast array

of technological components to provide immediate and critical communications links between the citizens of the Commonwealth and Virginia's emergency services community.

Throughout this report, continual reference has been made to the link between wireline and wireless E-911 emergency telecommunications systems. Wireline E-911 calls travel over a network of landlines from the caller to the appropriate PSAP, whereas wireless E-911 calls travel over the wireless network and then onto the existing wireline system before arriving at the designated PSAP. To fully implement wireless E-911 (both Phase I and Phase II), the existing wireline E-911 network will require significant hardware and software upgrades in order to process the additional information associated with the provision wireless E-911 location technology. Summarizing, though Phase I location technology does not require many technical upgrades and/or components (for those PSAPs that are wireline E-911 capable), Phase II requires that PSAPs replace a good amount of their current computer hardware and software at the call taker positions and upgrade their CAD equipment to display location data and convert latitude and longitude to usable call response information. Additionally, the conversion of the latitude and longitude data into useful location information requires highly accurate, GPS-corrected maps. Current Virginia county and city maps are – in large part – not accurate enough for the provision of Phase II location technology in accordance with the FCC mandate.

Recognizing the link between wireline and wireless E-911 systems, many states now blur the distinctions between the two, choosing instead to focus on the provision of enhanced statewide emergency telecommunications. To that end, applicable state statutes create statewide emergency telecommunications systems oversight bodies, charging these bodies with developing and promoting statewide emergency telecommunications services plans, and ensuring that local efforts are consonant with those statewide guidelines, among other things.

Too much of the emergency telecommunications service's activities of Virginia's PSAPs and local governments now occur with inadequate planning and coordination. The issues discussed throughout this report point to the need for a more focused approach to emergency telecommunications services, one that has clear leadership from the top, and strong support from all associated parties. Recognizing the need to encourage the statewide coordination of those entities charged with delivering this important public safety service, and given the critical nature of information technology to the rapid development and deployment of the statewide network called for by the federal government, *Code of Virginia*, § 58.1-3813, as well as *Code of Virginia*, §§ 56-484.8 to 56-484.11 needs to be restructured. Specifically, the Wireless E-911 Service Board should be replaced with a Virginia Emergency Telecommunications Board. Staff support should be provided in the form of an Emergency Telecommunications Division, to be housed in Virginia's Department of Technology Planning. Further, the membership of the Board together with its powers, duties, and scope should be expanded, and the existing sunset clause attached to *Code of Virginia*, §§ 56-484.8 to 56-484.11 should be removed. These moves would augment the Board's ability to promulgate the necessary policy, planning, and standards support, and to better promote the integration of all of Virginia's PSAPs into a statewide, strategic emergency telecommunications services plan. In carrying out its responsibilities, the Board will need to remain flexible, acknowledging and keeping abreast both of the advances and/or changes in on-point technology and applicable federal law, as well as the sometimes very different needs of individual localities and PSAPs. The restructuring highlighted in the following options for

legislative consideration can be the foundation for improved emergency telecommunications services for all of Virginia's PSAPs and public safety personnel, and improved public safety services for the citizens of Virginia.

Recommendation (1): The Virginia General Assembly may wish to consider amending Code of Virginia, §§ 56-484.8 to 56-484.11 by replacing the Wireless E-911 Service Board with the Virginia Emergency Telecommunications Board, and creating an Emergency Telecommunications Division within Virginia's Department of Technology Planning. The Virginia Emergency Telecommunications Board should be chaired by the Director of the Department of Technology Planning, and the Director of the Emergency Telecommunications Division – designated Virginia's Emergency Telecommunications Systems Coordinator – should be hired by the Board.

Recommendation (2): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider broadening the membership of the Virginia Emergency Telecommunications Board to include twelve members appointed by the Governor, including: one representing the Geographic Information Network Division, one representing the Virginia Department of Emergency Services, one representing the Virginia Department of Transportation, one representing the Virginia State Police, two local Public Safety Answering Point managers, one fire chief, one emergency medical services manager, one Sheriff, one Chief of Police, one who is employed by a local exchange telephone company providing E-911 service, and one representing CMRS providers authorized to do business in Virginia. The Director of the Department of Technology Planning shall serve as the Board's Chairman, and the Comptroller of the Commonwealth shall serve ex-officio as the Board's Treasurer.

Recommendation (3): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider clearly defining the role and responsibilities of the Virginia Emergency Telecommunications Board and Emergency Telecommunications Division.

Recommendation (4): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider clearly defining the role and responsibilities of the Chairman of the Virginia Emergency Telecommunications Board, and Virginia's Emergency Telecommunications Systems Coordinator.

Recommendation (5): As part of the restructuring of the Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider requiring the Virginia Emergency Telecommunications Board to direct and approve a comprehensive, statewide, five-year strategic plan for implementing a statewide enhanced emergency telecommunications system (wireline and wireless); and to facilitate the drafting of similar strategic plans at the local and/or regional level.

Recommendation (6): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider requiring the Virginia Emergency Telecommunications Board to re-evaluate the statewide emergency telecommunications services strategic plan annually and either reaffirm or amend it as appropriate.

Recommendation (7): As part of the restructuring of the Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider requiring the Emergency Telecommunications Division to formulate, direct, and promulgate policies, standards, specifications, and guidelines for the effective development and deployment of a statewide enhanced emergency telecommunications system in the Commonwealth (wireline and wireless); to provide technical assistance to Virginia's PSAPs, as well as state and local police, fire and emergency medical service agencies; and to monitor and report on the implementation of a statewide enhanced emergency telecommunications system in the Commonwealth.

Recommendation (8): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, to ensure an effective system of oversight, the Virginia General Assembly may wish to consider requiring the Emergency Telecommunications Division to make an annual report to the Virginia State Crime Commission and the Public Safety Subcommittees of the House Appropriations and Senate Finance Committees of the Virginia General Assembly on the status of emergency telecommunications services in Virginia (wireline and wireless); and to conduct special or continuing studies as directed by the Virginia General Assembly.

Recommendation (9): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11 the Virginia General Assembly may wish to consider deleting the existing "July 1, 2002" sunset language.

Funding Wireline and Wireless E-911

Introduction. From a public policy perspective, emergency telecommunications funding mechanisms should raise adequate revenue to pay for the delivery of enhanced emergency telecommunications services. Additionally, if tax revenues are dedicated to funding this service, then generally accepted tax principles, including equity, stability, economic neutrality, productivity, flexibility, and simplicity/efficiency should be present. The following discussion outlines a plan of action that the Virginia General Assembly could adopt to relate wireline and wireless E-911 costs to revenues. Additionally, the plan provides for interim funding mechanisms that – taken together – should raise adequate revenue to pay for those "reasonable" and "direct" costs associated with the delivery of enhanced emergency telecommunications services, and better promote those taxation principles listed above.

Another point that deserves mentioning, Crime Commission staff did review and consider a number of possible enhanced emergency telecommunications services funding options, including the idea of eliminating the wireline and wireless E-911 telecommunications taxes and

replacing them with an annual appropriation from Virginia's General Fund. While on its face this course of action might appear viable, due to the current lack of available wireline and wireless E-911 cost data, there is no way to accurately discern the amount of General Fund monies needed to cover those costs associated with the delivery of wireline and/or wireless E-911. Additionally, the evidence collected over the course of this study shows that emergency telecommunications services require a stable and reliable source of funding. If funding fluctuates from year-to-year, so to will the level of emergency telecommunications services delivered to the Commonwealth's citizenry. Virginia's local PSAPs are ***the*** vital link between the citizenry and all of the Commonwealth's law enforcement and emergency services personnel. The price of delay, then, in delivering emergency telecommunications service to Virginia's citizenry may very will be the loss of life. Consequently, more than unwise, it would be reckless to go the route of a General Fund appropriation without first determining the costs associated with fully implementing and operating a statewide enhanced emergency telecommunications system, ***and*** guaranteeing that the amount of that appropriation will fluctuate in the future only in proportion to the costs associated with delivering enhanced emergency telecommunications services.

*Virginia's local PSAPs are **the** vital link between the citizenry and all of the Commonwealth's law enforcement and emergency service personnel. The price of delay, then, in delivering emergency telecommunications service to Virginia's citizenry may very will be the loss of life. Consequently, more than unwise, it would be reckless to go the route of a General Fund appropriation without first determining the costs associated with fully implementing and operating a statewide enhanced emergency telecommunications system, **and** guaranteeing that the amount of that appropriation will fluctuate in the future only in proportion to the costs associated with delivering enhanced emergency telecommunications services.*

Wireline. First, because of the high level of accountability that is required for dedicated tax revenues, funding and cost recovery oversight is necessary if the Virginia General Assembly is to allow tax monies to fund E-911 services. Taking those findings detailed in Chapter 4, and combining these with the lessons gleaned from the review of the actions of other states generally, and those states designated as trendsetters in the field of inquiry specifically, the most appropriate funding mechanism for emergency telecommunications services are a state wireline and wireless E-911 tax. Focusing here on wireline, the wireline E-911 tax should continue to be based on the number of hard-wire access lines and collected monthly. These tax revenues should be collected by those local exchange companies doing business in the Commonwealth, forwarded to the Emergency Telecommunications Board, deposited into a separate and distinct account (the "Wireline E-911 Fund"), dedicated to those costs directly associated with the implementation and operation of wireline E-911 services, and disbursed accordingly. The enabling legislation should also require that the Wireline E-911 Fund be audited annually. Finally, as a secondary cost driver for the provision of wireline E-911 service, Virginia would be well served to apply the "reasonable" and "direct" cost recovery standard to those wireline

telephone companies doing business in the Commonwealth. In this manner, equity, efficiency, economy, effectiveness, public participation, and accountability would be better promoted, and the original thrust of *Code of Virginia,* § 58.1-3813 would be recaptured. Further, more so than any other funding method, this action would ensure a stable and reliable funding source for the statewide deployment of enhanced emergency telecommunications services, thereby ensuring the uninterrupted delivery of this most important of public safety services to Virginia's citizenry.

Note here that PSAP personnel costs made up approximately 50% of the total PSAP expenses reported by Virginia's cities and counties for fiscal years 1997, 1998, and 1999. Unfortunately, both the Virginia NENA survey and the APA survey instruments resulted in low response rates concerning call volume and average emergency call processing time (from phone answer to dispatch). Working from the assumption that the volume of calls received and the average call-processing time should play a crucial role in decisions concerning PSAP staffing levels, and recognizing that PSAP staffing levels are a primary PSAP budget driver, the under-reporting of this information is problematic.

35 states do not allow funds generated from their wireline E-911 tax to be used for salaries, or portions of salaries of emergency call center employees. In 1993, the Virginia General Assembly adopted amendments to *Code of Virginia,* § 58.1-3813 that broadened the applicable use of revenues generated from the wireline E-911 tax to include "salaries or portion of salaries of dispatchers or call-takers." Subsequent amendments adopted in 1997 broadened the applicable use of these revenues further to include "salaries or portions of salaries" for the "directors or coordinator of the E-911 program" in counties "with a population of no less than 45,000 and no more than 47,000." Rather than transfer responsibility for all salaries of emergency call-takers and dispatchers back to Virginia's localities, a move that might adversely impact PSAP staffing levels, PSAPs should be able to recover personnel costs via a statewide wireline E-911 tax in direct proportion to the total number of wireline E-911 calls received.

Finally, for the purpose of compensating a telephone utility for accounting for and remitting the current local tax for enhanced emergency telephone service, *Code of Virginia,* § 58.1-3813 allows each telephone utility to reduce the collected amounts by three percent and retain such amounts to defray costs incurred in complying with *Code of Virginia,* § 58.1-3813. Recognizing that the more efficient structure proposed here will ease the administrative burdens of these local exchange carriers, the administrative fee to the wireline telephone companies for the cost of collecting and remitting the tax should be reduced.

Recommendation (10): The Virginia General Assembly may wish to consider amending Code of Virginia, § 58.1-3813 by replacing the local option tax for enhanced emergency telephone service with a statewide wireline E-911 surcharge; and to consider delaying the enactment of the statewide wireline E-911 surcharge until January 1, 2001. As determined by the Virginia Emergency Telecommunications Board, those monies generated from the wireline E-911 surcharge will be deposited into the Wireline E-911 Fund and utilized solely for all reasonable direct recurring and nonrecurring capital costs and operating expenses incurred by a public safety answering point in designing, upgrading, leasing, purchasing,

programming, installing, testing, administering, delivering, or maintaining all necessary data, hardware, and software required to provide wireline E-911 service, direct personnel costs incurred in receiving and dispatching wireline E-911 calls only, and the salary of the public safety answering point director so long as the director has no duties other than the responsibility for the public safety answering point.

Recommendation (11): As part of the restructuring of Code of Virginia, § 58.1-3813, the Virginia General Assembly may wish to consider requiring that all local public safety answering points work with the Emergency Telecommunications Division to develop a standard system for maintaining accurate call volume counts and call processing (from phone answer to dispatch) times; and to develop a standard system for identifying and reporting wireline E-911 costs.

Recommendation (12): As part of the restructuring of Code of Virginia, § 58.1-3813, the Virginia General Assembly may wish to consider extending the "reasonable" and "direct" cost recovery standard currently applied to public safety answering points to wireline telephone companies.

Recommendation (13): As part of the restructuring of Code of Virginia, § 58.1-3813, the Virginia General Assembly may wish to consider requiring that the Auditor of Public Accounts, or his legally authorized representatives, annually audit the Wireline E-911 Fund in accordance with generally accepted auditing standards. The cost of such audit services shall be borne by the Wireline E-911 Fund. The Board shall furnish copies of such audit to the Governor and the Virginia General Assembly.

Recommendation (14): As part of the restructuring of Code of Virginia, § 58.1-3813, the Virginia General Assembly may wish to consider reducing the administrative fee due local exchange carriers for the cost of collecting and remitting the wireline E-911 tax to one percent of the total amount collected; and to consider delaying the reduction of this administrative fee until January 1, 2001.

Wireless. Turning here to wireless, the wireless E-911 tax should continue to be based on the number of wireless customers whose billing address is within the Commonwealth and collected monthly. The tax revenues should be collected by those wireless service providers doing business in the Commonwealth, forwarded to the Emergency Telecommunications Board, deposited into a separate and distinct account (the "Wireless E-911 Fund"), dedicated to those costs directly associated with the implementation and operation of wireless E-911 services, and disbursed accordingly. The enabling legislation should continue to require that the Wireless E-911 Fund be audited annually. Like the proposed statewide wireline E-911 tax, more so than any other funding method, the action discussed here would ensure a stable and reliable funding source for the statewide deployment of emergency telecommunications services, thereby ensuring the effective and efficient delivery of this most important of public safety services to Virginia's citizenry.

Note also that in its current form, the Wireless E-911 Service Board has found it difficult to get and evaluate wireless carrier cost recovery information. Assuming that having wireless carriers recover wireless E-911 related costs through a state oversight Board is preferable to allowing these vendors to pass their costs along to that Board through Virginia's PSAPs, the Virginia Emergency Telecommunications Board needs to be able to verify wireless carrier costs before it can authorize reimbursement. Virginia will need, then, to provide confidentiality protection for the wireless carrier proprietary data, though this protection needs to be balanced with the Board's duty to determine whether wireless service provider requests for cost recovery are reasonable and direct. Further, Virginia would be well-served to apply the "reasonable" and "direct" standard both to wireline telephone companies and those third-party vendors of Phase I and Phase II location technology.

Finally, for the purpose of compensating a wireless carrier for accounting for and remitting the current wireless E-911 tax, *Code of Virginia*, §§ 56-484.8 to 56-484.11 allows each telephone utility to reduce the collected amounts by three percent and retain such amounts to defray costs incurred in complying with *Code of Virginia*, §§ 56-484.8 to 56-484.11. Looking at those states that do authorize payment of an administrative fee to the wireless carriers for administrative costs, the rate ranges from a low of one percent to a high of three percent of the gross tax collected. Recognizing that the administrative burdens of local exchange carriers and wireless carriers will be roughly equal, the administrative fee to the wireless carriers for the cost of collecting and remitting the tax should be reduced.

Recommendation (15): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to require that the statewide wireless E-911 surcharge be forwarded to the Virginia Emergency Telecommunications Board. As determined by the Virginia Emergency Telecommunications Board, those monies generated from the wireless E-911 surcharge will be utilized solely for all reasonable direct recurring and nonrecurring capital costs and operating expenses incurred by a public safety answering point and wireless service provider in designing, upgrading, leasing, purchasing, programming, installing, testing, administering, delivering, or maintaining all necessary data, hardware, and software required to provide wireless E-911 service. Public safety answering points may further recover direct personnel costs incurred in receiving and dispatching wireless E-911 calls only.

Recommendation (16): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider requiring that all local public safety answering points work with the Emergency Telecommunications Division to develop a standard system for identifying and reporting wireless E-911 costs.

Recommendation (17): The Virginia General Assembly may wish to consider amending Virginia's Freedom of Information Act (FOIA) (Code of Virginia, § 2.1-340 et seq.) to provide meeting and document FOIA exemption for the Wireless Carrier Cost Recovery Subcommittee of the Virginia Emergency Telecommunications Board, and staff of the Emergency Telecommunications Division designated by that subcommittee.

Recommendation (18): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider extending the "reasonable" and "direct" cost recovery standard currently applied to public safety answering points and wireless service providers to wireline telephone companies and third-party vendors of wireless E-911 location technologies and/or solutions.

Recommendation (19): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider reducing the administrative fee due wireless carriers for the cost of collecting and remitting the wireless E-911 tax to one percent of the total amount collected.

Wireline and Wireless E-911 Tax Rates. Many parties will disagree on how to determine the state wireline and wireless E-911 tax rate. Some will say that these tax rates should be comparable to those rates levied nationally. Others will propose that these rates be based on an estimate of the total costs associated with actually implementing and operating wireline and wireless E-911 in the Commonwealth of Virginia. With both methods, the actual cost to implement and operate wireline and wireless E-911 services will not be known until the service is implemented and operating. The key difference is that if the tax rates are based on an estimate of actual costs, fiscal accountability and planning processes are greatly enhanced. Further, with the estimated costs to implement in full and operate wireline and wireless E-911 emergency telecommunications services in hand, it would be possible to promulgate a statewide emergency telecommunications systems development and deployment plan and correlate service delivery and PSAP and wireless carrier cost recovery with the revenue collections. By successfully relating costs to revenues, the Commonwealth of Virginia would take the lead nationwide, ***effectively*** and ***efficiently*** delivering this important public safety service to its citizens.

Acknowledging that adequate funding is a critical element in ensuring timely wireline and wireless E-911 implementation, but that cost estimates associated with actually implementing and operating wireline and wireless E-911 that are specific to the Commonwealth of Virginia are not currently available, the following discussion outlines a plan of action that the Virginia General Assembly could adopt to obtain the necessary cost information while guaranteeing in the interim that a cost recovery mechanism is in place for Virginia's PSAPs (wireline and wireless E-911) and wireless carriers (wireless E-911).

Unfortunately, current local government wireline E-911 accounting methods do not lend themselves to a strict breakdown of those costs directly associated with the delivery of wireline E-911 services per *Code of Virginia*, § 58.1-3813. Similarly, the actual cost to implement and operate wireless E-911 services will not be known until those services are operational.

Acknowledging that adequate funding is a critical element in ensuring timely wireline and wireless E-911 implementation, but that cost estimates associated with actually implementing and operating wireline and wireless E-911 that are specific to the Commonwealth of Virginia are not currently available, the following discussion outlines a plan of action that the Virginia General Assembly could adopt to obtain the necessary cost information while guaranteeing in the interim that a cost recovery mechanism is in place for Virginia's PSAPs (wireline and wireless E-911) and wireless carriers (wireless E-911).

Wireline. Working from national tax rate data, the Virginia General Assembly should impose a wireline E-911 tax in the 2000 session of the Virginia General Assembly at a rate of .75-cents per hard-wire access line per month. Data collected for this report indicates that if levied at this rate for a period of one year (FY 2000), the proposed wireline E-911 tax would generate roughly $45 million, only a ***.13% drop*** in total local government revenue ($14.9 billion), and almost one-half of the total amount of PSAP operating budgets (FY 1999) as reported to Virginia's APA. Note that national figures indicate that 20 to 30% of those calls received by a PSAP are 911 emergency calls. Relying on those cost recovery standards developed by Virginia's Wireless E-911 Service Board, the wireline E-911 tax rate proposed here should cover those Virginia PSAP costs associated with the processing of wireline E-911 emergency telephone calls placed by dialing the digits 911 (an estimated 20 to 30% of $102 million). **Figure 6.1 below** illustrates the revenue impact of statewide tax rates ranging from .60-cents to .85-cents. Additionally, note that recent industry standards suggest that the number of hard-wire access lines – the unit on which it will be assessed – will continue to grow an estimated 5% annually. Also, implementing this proposed funding structure would result in an average tax reduction of .79-cents per month in 94 of Virginia's 135 local jurisdictions (cities and counties). In those 20 local jurisdictions currently levying the existing local option tax at a rate lower than the proposed .75-cents, the average monthly increase would be .23-cents. Finally, 16 localities levy no E-911 tax – 14 of which do not provide wireline E-911 services to

Implementing the proposed .75-cent statewide wireline E-911 tax would result in an average tax reduction of .79-cents per month in 94 of Virginia's 135 local jurisdictions (cities and counties). In those 20 local jurisdictions currently levying the existing local option tax at a rate lower than the proposed .75-cents, the average monthly increase would be .23-cents. Finally, 16 localities levy no E-911 tax - 14 of which do not provide wireline E-911 services to their citizens. The funding mechanism proposed here would result in an additional .75-cent/per month levy, though it would also promote the provision of wireline E-911 services in these jurisdictions. The remaining two jurisdictions either levy a percentage-based tax (Danville City), or no information concerning the existing tax rate was available (Middlesex County).

Figure 6.1: 3-Year Revenue Impact of Tax Rates for a Statewide Wireline E-911 Tax in the Commonwealth of Virginia

	FY 2000	FY 2001	FY 2002
Tax Rate			
.60-cents	$36,000,000	$37,800,000	$39,744,000
.61-cents	$36,600,000	$38,430,000	$40,406,400
.62-cents	$37,200,000	$39,060,000	$41,068,800
.63-cents	$37,800,000	$39,690,000	$41,731,200
.64-cents	$38,400,000	$40,320,000	$42,383,600
.65-cents	$39,000,000	$40,950,000	$43,056,000
.66-cents	$39,600,000	$41,580,000	$43,718,400
.67-cents	$40,200,000	$42,210,000	$44,380,800
.68-cents	$40,800,000	$42,840,000	$45,043,200
.69-cents	$41,400,000	$43,470,000	$45,705,600
.70-cents	$42,000,000	$44,100,000	$46,368,000
.71-cents	$42,600,000	$44,730,000	$47,030,400
.72-cents	$43,200,000	$45,360,000	$47,692,800
.73-cents	$43,800,000	$45,990,000	$48,355,200
.74-cents	$44,400,000	$46,620,000	$49,017,600
.75-cents	*$45,000,000*	*$47,250,000*	*$49,680,000*
.76-cents	$45,600,000	$47,880,000	$50,342,400
.77-cents	$46,200,000	$48,510,000	$51,004,800
.78-cents	$46,800,000	$49,140,000	$51,667,200
.79-cents	$47,400,000	$49,770,000	$52,329,600
.80-cents	$48,000,000	$50,400,000	$52,992,000
.81-cents	$48,600,000	$51,030,000	$53,654,400
.82-cents	$49,200,000	$51,660,000	$54,316,800
.83-cents	$49,800,000	$52,290,000	$54,979,200
.84-cents	$50,400,000	$52,920,000	$55,641,600
.85-cents	$51,000,000	$53,550,000	$56,304,000
ACCESS LINES	5,000,000	5,250,000	5,520,000

their citizens. The funding mechanism proposed here would result in an additional .75-cent/per month levy, though it would also promote the provision of wireline E-911 services in these jurisdictions. The remaining two jurisdictions either levy a percentage-based tax (Danville City), or no information concerning the existing tax rate was available (Middlesex County).

Simultaneously, the Virginia General Assembly should require the Virginia Emergency Telecommunications Board and Emergency Telecommunications Division to work with Virginia's PSAPs to determine estimated costs to fully implement and operate wireline E-911 in the Commonwealth. In developing this estimate, the Board and Division should work from the guidelines for reimbursable wireline E-911 costs adopted during the 2000 session of the Virginia General Assembly. The Board and Division should then determine an appropriate wireline E-911 tax rate based on the aggregated cost estimate and present this information to the Virginia

Figure 6.2: 3-Year Revenue Impact of Tax Rates for a Statewide Wireless E-911 Tax in the Commonwealth of Virginia

	FY 2000	FY 2001	FY 2002
Tax Rate			
.60-cents	$12,240,000	$14,400,000	$16,560,000
.61-cents	$12,444,000	$14,640,000	$16,836,000
.62-cents	$12,648,000	$14,880,000	$17,112,000
.63-cents	$12,852,000	$15,210,000	$17,388,000
.64-cents	$13,056,000	$15,360,000	$17,664,000
.65-cents	$13,260,000	$15,600,000	$17,940,000
.66-cents	$13,464,000	$15,840,000	$18,216,000
.67-cents	$13,668,000	$16,080,000	$18,492,000
.68-cents	$13,872,000	$16,320,000	$18,768,000
.69-cents	$14,076,000	$16,560,000	$19,044,000
.70-cents	$14,280,000	$16,800,000	$19,320,000
.71-cents	$14,484,000	$17,040,000	$19,596,000
.72-cents	$14,688,000	$17,280,000	$19,872,000
.73-cents	$14,892,000	$17,520,000	$20,148,000
.74-cents	$15,096,000	$17,760,000	$20,424,000
.75-cents	*$15,300,000*	*$18,000,000*	*$20,700,000*
.76-cents	$15,504,000	$18,240,000	$20,976,000
.77-cents	$15,708,000	$18,480,000	$21,252,000
.78-cents	$15,912,000	$18,720,000	$21,528,000
.79-cents	$16,116,000	$18,960,000	$21,804,000
.80-cents	$16,320,000	$19,200,000	$22,080,000
.81-cents	$16,524,000	$19,440,000	$22,356,000
.82-cents	$16,728,000	$19,680,000	$22,632,000
.83-cents	$16,932,000	$19,920,000	$22,908,000
.84-cents	$17,136,000	$20,160,000	$23,184,000
.85-cents	$17,340,000	$20,400,000	$23,460,000
WIRELESS SUBSCRIBERS	1,700,000	2,000,000	2,300,000

General Assembly no later than December 1, 2001. The Virginia General Assembly should then set the tax rate during the 2002 session of the Virginia General Assembly based on the aggregated wireline E-911 cost estimate. The effective date of the new tax rate would be July 1, 2002. If the cost data is not forthcoming, then the .75-cent wireline E-911 tax adopted during the 2000 session of the Virginia General Assembly will remain in effect.

Wireless. Working from national tax rate data, the Virginia General Assembly should continue the wireless E-911 tax at the already established rate of .75-cents per wireless customer, whose billing address is within the Commonwealth, per month. Working from industry standards suggesting an annual 15% growth rate in the number of wireless subscribers, levied at this rate the proposed wireless E-911 tax would generate roughly $15.3 million in fiscal year 2000, $18.0 million in fiscal year 2001, and $20.7 million in fiscal year 2002. **Figure 6.2 above** illustrates the revenue impact of statewide wireless E-911 tax rates ranging from .60-cents to .85-cents.

Simultaneously, the Virginia General Assembly should require the Virginia Emergency Telecommunications Board and Emergency Telecommunications Division to work with Virginia's PSAPs and those wireless service providers doing business in the Commonwealth to determine estimated costs to fully implement and operate wireless E-911 in Virginia. In developing this estimate, the Board and Division should work from the guidelines for reimbursable wireless E-911 costs adopted during the 2000 session of the Virginia General Assembly, and the wireless service provider plans for implementing wireless E-911 Phase II that must be submitted to the FCC by October 1, 2000. The Board and Division should then determine an appropriate wireless E-911 tax rate based on the aggregated cost estimate and present this information to the Virginia General Assembly no later than December 1, 2001. The Virginia General Assembly should then set the tax rate during the 2002 session of the Virginia General Assembly based on the aggregated wireless E-911 cost estimate. The effective date of the new tax rate would be July 1, 2002. If the cost data is not forthcoming, then the .75-cent wireless E-911 tax will remain in effect.

Conclusion. If set at the .75-cent rates discussed herein, the wireline E-911 tax and the wireless E-911 tax would generate together $60.3 million, $65.3 million, and $70.4 million during fiscal years 2000, 2001, and 2002, respectively. Accepting that roughly one-half of the wireless E-911 monies will go to wireless service providers, these totals represent only a .08%, .07%, and .04% drop, respectively, in Fiscal Year 1999 ***total*** local government revenue ($14.9 billion). At the same time, by implementing E-911 statewide, discriminating between 911 and #77 calls, and encouraging "economies of scale," call processing times – and with them PSAP personnel expenses – as well as PSAP equipment and systems costs, will drop. Concurrently, budget documents prepared by Virginia's Department of Planning and Budget suggest that total local government revenues will continue their steady increase (***66% over the last ten years***).

Recommendation (20): As part of the restructuring of Code of Virginia, § 58.1-3813, the Virginia General Assembly may wish to consider imposing a wireline E-911 tax at a rate of .75-cents per hard-wire access line per month; and to authorize the flexibility to change the rate once the estimated costs to fully implement and operate wireline E-911 in the Commonwealth become known.

Recommendation (21): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to continue imposing a wireless E-911 tax at a rate of .75-cents per wireless customer whose billing address is within the Commonwealth; and to authorize the flexibility to change the rate once the estimated costs to fully implement and operate wireless E-911 in the Commonwealth become known.

Recommendation (22): As part of the restructuring of Code of Virginia, § 58.1-3813, the Virginia General Assembly may wish to consider requiring the Emergency Telecommunications Division to re-evaluate the wireline E-911 funding mechanism annually, and include in its annual report to the Virginia State Crime Commission and the Public Safety Subcommittees of the House Appropriations and Senate Finance Committees of the Virginia General Assembly a recommendation to either reaffirm the funding mechanism or amend it as appropriate.

Recommendation (23): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider requiring the Emergency Telecommunications Division to re-evaluate the wireless E-911 funding mechanism annually, and include in its annual report to the Virginia State Crime Commission and the Public Safety Subcommittees of the House Appropriations and Senate Finance Committees of the Virginia General Assembly a recommendation to either reaffirm the funding mechanism or amend it as appropriate.

NON-EMERGENCY #77, AND THE STATE POLICE & WIRELESS 911

Non-emergency #77. The following passage, drawn from the Report of the U.S. Senate Committee on Commerce, Science, and Transportation concerning the Wireless Communications and Public Safety Act of 1999, describes in detail the problems posed by having more than one emergency number serve the nation's citizenry:

> In many areas contacting safety services using a wireless telephone is not simply a matter of dialing 911, as it is using a wireline phone. In fact, there are more than 20 different emergency wireless numbers across the United States. For example, a motorist traveling from Kansas City to Washington [D.C.] on Interstate 70 would need to know to dial "Star" 55 in Missouri, "Star" 999 in Illinois, 911 in Indiana, "Star" DUI in Ohio, 911 in Pennsylvania, and "Star" 77 in Maryland. Moreover, there may even be different emergency numbers at different points along the interstate highways within one state. This lack of consistency hampers the usefulness of wireless telephones in sudden emergencies, and fosters confusion and uncertainty for those who need assistance.

Looking to combat this identified "lack of consistency," the Wireless Communications and Public Safety Act of 1999 promotes public safety by designating 911 the universal emergency assistance number within the United States.

Introduced by the Virginia Department of State Police in 1996, #77 was implemented to create a standard State Police highway-related emergency number for the motoring public. Since that time, the Department has worked with wireless service providers, coordinated with localities, and installed signs along major thoroughfares to make the public aware that #77 is the number to call for the State Police.

Similar to other states the Commonwealth of Virginia has invested in the development and deployment of two highway-related wireless emergency numbers intended to put the motoring public in contact with the State Police. In keeping with the thrust of the Wireless Communications and Public Safety Act of 1999, and recognizing that certain non-emergency situations will arise in which the State Police should serve as the first point of contact for the motoring public, #77 should be maintained and designated as a non-emergency number. Further, the Commonwealth will need to undertake efforts to notify the public of the proper use of #77, and ensure that the wireless location technology advantages soon to be associated with wireless E-911 are available for #77. Accepting that an incident may occur during which a wireless

subscriber dials #77 during an emergency, and that wireless emergency location technology can dramatically reduce the associated emergency response time, public safety concerns require that Virginia take those steps necessary to ensure that any number a wireless caller might dial results in the same level of service delivery.

The State Police & Wireless 911. The Virginia Department of State Police continues to serve as the primary wireless 911 public safety answering point for those Virginia localities that currently do not take wireless E-911 calls directly. Item 461 2c (1999 Appropriations Act) reinforced this message, but also stated clearly that it is the intent of the Virginia General Assembly that wireless 911 calls be delivered directly by the wireless service provider to the appropriate local PSAP, thereby minimizing the need for call transfers whenever possible.

At this time, local PSAPs in Northern Virginia, and the Charlottesville/Albemarle and Lynchburg areas are primary PSAPs, meaning that wireless 911 calls are routed directly to them by the wireless service provider. In the remainder of the Commonwealth, wireless 911 calls are forwarded to one of the 7 Virginia State Police Regional Emergency Call Centers. If the wireless 911 emergency call requires the response of public safety personnel either in addition to or in lieu of the Virginia State Police, the Regional Emergency Call Center attempts to transfer the wireless 911 call to the local PSAP jurisdictionally responsible for answering the 911 calls from the location the call originated. Currently, the level of wireless 911 service provided both by the Virginia State Police and Virginia's local PSAPs is basic.

Though public safety concerns will be best served by a statewide enhanced emergency telecommunications system, as a precursor to establishing such a system, immediate public safety issues demand that those Virginia localities whose PSAPs are currently wireline E-911 compliant (108) be directed to begin taking wireless E-911 calls by a date certain. Data collected for this study strongly suggests that the transferring of emergency calls poses an unacceptable public safety risk. These emergency calls can be dropped, in which case the caller would need to place a second 911 call, and/or can be routed to the wrong local PSAP – in which case the call would need to be re-routed. Further, lacking Phase II location technology, call transferring places an unnecessary burden on the emergency caller, requiring them to explain their situation multiple times to receive emergency service.

In those areas of the Commonwealth where the wireless infrastructure is sufficiently built out to allow for the directing of wireless 911 calls to the appropriate local PSAP, those local PSAPs that are wireline E-911 compliant can begin taking wireless E-911 calls (Phase 0) immediately. FCC requirements provide wireless carriers with a six month window within which to implement Phase I or Phase II wireless E-911 service after receiving a valid request for such service from a local PSAP. Recognizing the important public safety interest served by having those local PSAPs serving Virginia's localities receive wireless 911 calls directly, and acknowledging the fact that those PSAPs serving 27 of Virginia's localities are not yet wireline E-911 compliant, the Virginia General Assembly should first require that all local PSAPs currently wireline E-911 compliant and capable of receiving wireless E-911 calls directly begin answering wireless 911 calls originating in their jurisdictions no later than January 1, 2001, and that all other local PSAPs capable of receiving wireless E-911 calls directly begin receiving these calls directly no later than January 1, 2002. Concurrently, the Virginia General Assembly should require that all of Virginia's local PSAPs are wireline E-911 capable by January 1, 2002. In

those areas of the Commonwealth where the wireless infrastructure is not sufficiently built out to allow for the directing of wireless 911 calls to the appropriate local PSAP, the Virginia Department of State Police should continue to serve as the primary PSAP, and have access to the Wireless E-911 Fund pursuant to the applicable PSAP cost recovery provisions, as determined by the Virginia Emergency Telecommunications Board.

Recommendation (24): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider designating 911 as the Virginia emergency telephone number, and to designate #77 as the Department of State Police wireless non-emergency number.

Recommendation (25): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider designating the Department of State Police Regional Emergency Call Centers as public safety answering points, and to authorize the Department of State Police to receive monies collected and deposited into the Wireless E-911 Fund pursuant to the applicable PSAP cost recovery provisions, as determined by the Virginia Emergency Telecommunications Board

Recommendation (26): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to authorize the Emergency Telecommunications Division to work with the Virginia Department of Transportation to coordinate the replacement of those road signs installed along Virginia's major thoroughfares that promote #77 as a wireless emergency number.

Recommendation (27): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to authorize the Emergency Telecommunications Division to develop a public education strategy to notify Virginia's citizenry of the proper use of #77, and to keep the citizenry abreast of future wireless 911 and #77 developments.

Recommendation (28): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to require that on or before January 1, 2001, all PSAPs serving Virginia's local jurisdictions that are currently wireline E-911 compliant and capable of receiving wireless E-911 calls directly begin answering wireless 911 calls originating in their jurisdictions; to require that all other local PSAPs capable of receiving wireless E-911 calls directly begin answering wireless 911 calls originating in their jurisdictions no later than January 1, 2002; and to authorize the Virginia Emergency Telecommunications Board to lead this effort and to make transitional or start-up payments to these PSAPs as determined by the Virginia Emergency Telecommunications Board.

Recommendation (29): As part of the restructuring of Code of Virginia § 58.1-3813, the Virginia General Assembly may wish to require that on or before January 1, 2002, that all PSAPs serving Virginia's local jurisdictions develop and deploy a wireline E-911 system; and to authorize the Virginia Emergency Telecommunications Board to lead this effort and to make transitional or start-up payments to these PSAPs as determined by the Virginia Emergency Telecommunications Board.

Recommendation (30): As part of the restructuring of Code of Virginia, §§ 56-484.8 to 56-484.11, the Virginia General Assembly may wish to consider designating the Department of State Police Regional Emergency Call Centers as public safety answering points, and to authorize the Department of State Police to receive monies collected and deposited into the Wireless E-911 Fund to offset dispatch center operating costs incurred for answering wireless 911 telephone calls originating in localities for which the Department of State Police continues to serve as the PSAP for wireless 911 telephone calls, as determined by the Virginia Emergency Telecommunications Board

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CONCLUSION

Since their inception, the management of Virginia's emergency telecommunications systems has been characterized by a lack of coordinated leadership and direction. Consequently, wireline and wireless 911 service delivery is not uniform across the state, answers to what constitutes an "allowable expense" are inconsistent, and those public safety interests that would be well-served by the development and deployment of a statewide, end-to-end enhanced emergency telecommunications system are all but ignored.

Working from the premise that improved public safety remains an important objective of Virginia State and local governments, by creating a permanent advisory body, the multiple 911 systems operating throughout the Commonwealth will be strengthened, and the communication, coordination, and cooperation required will be fostered. By introducing the ideals of equity, efficiency, economy, effectiveness, productivity, stability, and accountability to the cost recovery provisions of the enabling legislation, and thereafter directly relating wireline and wireless E-911 systems costs to revenues, Virginia will be able to more efficiently serve the citizenry's public safety interests, both now and in the future. Taken together, these moves will help to establish Virginia as ***the*** nationwide leader in the provision of enhanced emergency telecommunications services.

Appendix A

Virginia National Emergency Number Association Survey

1999 Virginia PSAP Survey

PSAP Name: _____ Date: _____

Jurisdiction(s) Served: _____

Point of Contact: _____

Address: _____

Telephone #: _____ Email Address: _____

Are you currently a member of? APCO _____ NENA _____

Population Served: _____ Area: _____ sq. miles

Type of Agencies Served by the PSAP: Police Fire EMS Sheriff

Type of Agency Managing the PSAP: Police Fire EMS Sheriff

Other (please specify): _____

Are the Telecommunicators? Sworn Civilian

Is the Center Manager? Sworn Civilian

Is the PSAP a primary PSAP or a secondary PSAP? Primary Secondary

Type of emergency telephone system? E-911 Basic 911 ANI Only 7-Digit #

Who is the primary answering point of wireless 9-1-1 calls: State PD Local PSAP

Number of personnel assigned to the PSAP: _____

Total PSAP budget: _____

Does the PSAP have separate call takers and dispatchers? Yes No

Does the PSAP utilize EMD: Yes No

Which EMD program? _____

Does the PSAP collect an E-911 Surcharge: Yes No

Appendix A, Continued

How much? _____

Does the PSAP utilize a CAD system: Yes No

Which CAD system? _____

Please provide the follow call data (if available):

Number of 911 calls: _____ Number of other phone calls: _____

Number of wireless 911 calls: _____

Number of incidents dispatched for: Law Enforcement: _____

Fire: _____ EMS: _____

Average call-processing time (from phone answer to dispatch): _____

Do you have future plans or are there other PSAPs in your jurisdiction we might have missed. Please let us know on another piece of paper. Please complete the above information and return it to: Steve Marzolf, 3 County Complex Court, Prince William, VA 22192-9201 or fax it to 703-792-7149.

Appendix B

Virginia Auditor's Public Accounts Survey

Please complete and return (mail or fax) this survey, by August 13, 1999, to:

Mail: Auditor of Public Accounts
Attn: Bill Cole, Deputy Auditor
P.O. Box 1295
Richmond, VA 23218

Fax: 804-225-3357

E-mail: whcole@apa.state.va.us

I. Please indicate your locality. Locality: _____

II. Please indicate the contact person & Phone number. Name: _____ Phone: _____

III. Does your locality receive E-911 service taxes?
Yes / No *(If no, you may stop and return the survey.)*

IV. What is the locality's monthly tax rate? Rate: _____

V. How are E-911 service taxes deposited and recorded? (Check appropriate box)
- ☐ General Fund
- ☐ Special Revenue Fund (Describe: _____)
- ☐ Other Fund (Describe: _____)

VI. How does the locality account for any balances (i.e. revenues greater than expenses) from year to year?
- ☐ No accounting – balances included in General Fund balance at end of year
- ☐ Maintained in separate department, function, or fund
- ☐ Balances are restricted, reserved, or designated
- ☐ Other explanation *(Describe in space below)*

VII. Does the locality use the local tax for purposes other than those delineated in the Code of Virginia (Section 58.1-3818)?
Yes / No *(If yes, please explain in the space below)*

Appendix B, Continued

VIII. Who maintains the *E-911* system? *(Check appropriate box)*

- ☐ Police Department
- ☐ Sheriff's Department
- ☐ Separate System
- ☐ Not Available

IX. Does the locality maintain, or does the PSAP (Public Safety Answering Point) provide, any records/information on call volume?
Yes / No *(If yes, please provide the call volume for the last three fiscal years)*

1999: _____
1998: _____
1997: _____

X. Please explain how personnel costs (if any) are charged for E-911 services.
(Describe in the space below)

XI. Please list the personnel (if any) funded by E-911 service taxes.
(List name, position, and percentage of time charged.)

Name	Position	% Charged

Appendix B, Continued

XII. Are any of these positions funded by the Compensation Board?
Yes / No *(If yes, list name, position, and percentage of time charged.)*

Name	Position	% Charged

XIII. Please complete the financial information for revenues, expenses, and fund balances (if applicable) on the financial statement for the fiscal years ended June 30, 1999, 1998, and 1997?

Due Date: August 13, 1999

Appendix C

Virginia's Wireline E-911 Tax

§ 58.1-3813. Local tax for enhanced emergency telephone service.

A. Notwithstanding the rate limitations imposed under § 58.1-3812, any county, city or town which has, singly or by joint agreement, established or will establish an enhanced 911 emergency telephone system, hereinafter referred to as E-911, as defined herein, may impose a special tax on the consumers of the telephone service or services provided by any corporation coming within the provisions of Chapter 26 (§ 58.1-2600 et seq.); however, no such taxes shall be imposed on federal, state and local government agencies.

The governing body of any county, city or town may exempt from payment of the tax any subscriber to individual telephone service who resides in a nursing home or similar adult care facility.

Such tax shall be subject to the notification and jurisdictional provisions of § 58.1-3812.

B. The following phrases shall have the following meanings:

"E-911 system" means a telephone service which utilizes a computerized system to automatically route emergency telephone calls placed by dialing the digits "911" to the proper public safety answering point serving the jurisdiction from which the emergency telephone call was placed. An E-911 system includes selective routing of telephone calls, automatic telephone number identification, and automatic location identification performed by computers and other ancillary control center communications equipment.
"Public safety answering point" means a communications facility operated on a twenty-four-hour basis which first receives E-911 calls from persons in an E-911 service area and which may, as appropriate, directly dispatch public safety services or extend, transfer, or relay E-911 calls to appropriate public safety agencies.
"Public safety agency" means a functional division of a public agency which provides fire-fighting, police, medical, or other emergency services or a private entity which provides such services on a voluntary basis.

C. Prior to imposing such tax, the governing body of any city, town or county must find that an E-911 emergency telephone system as defined in subsection B of this section has been or will be installed in its respective locality and that the telephone company has central office equipment which will permit such system to be established.

D. Any such taxes imposed by this section shall be first utilized solely for the initial capital, installation and maintenance costs of the E-911 emergency telephone system. The jurisdiction shall reduce such tax when capital and installation costs have been fully recovered to the level necessary to offset recurring maintenance, repair, and system upgrade costs, and salaries or portion of salaries of dispatchers or call-takers, and, in counties with a

population of no less than 45,000 and no more than 47,000, of the director or coordinator of the E-911 program so long as such director or coordinator has no duties other than the responsibility for the E-911 program, paid by the locality which are directly attributable to the E-911 program only.

E. For the purpose of compensating a telephone utility for accounting for and remitting the tax levied by this section, such telephone utility shall be allowed three percent of the amount of tax due and accounted for in the form of a deduction in submitting the return and paying the amount due by it.

(Code 1950, § 58-587.2; 1982, c. 559; 1984, cc. 511, 675; 1993, cc. 25, 76; 1995, c. 45; 1997, c. 306.)

The 1997 amendment substituted "however" for "except that" preceding "no such taxes" in subsection A; in subsection B, deleted the subdivision designations and deleted "An" preceding the paragraph defining "E-911 system"; and inserted "and, in counties with a population of no less than 45,000 and no more than 47,000, of the director or coordinator of the E-911 program so long as such director or coordinator has no duties other than the responsibility for the E-911 program" preceding "paid by the locality" in the second sentence of subsection D.

Law review. - For comment, " '911' Emergency Assistance Call Systems: Should Local Governments Be Liable for Negligent Failure to Respond?", see 8 Geo. Mason L. Rev. 103 (1985).

Appendix D

Virginia's Wireless E-911 Tax

Article 6. Wireless Enhanced Public Safety Telephone Service Act. (This article is effective until July 1, 2002.)

§ 56-484.8. (Effective until July 1, 2002) Definitions.

"Board" means the Wireless E-911 Service Board created pursuant to this chapter.
"CMRS" means **"commercial mobile radio service"** as defined in Sections 3 (27) and 332 (d) of the Federal Telecommunications Act of 1996, 47 U.S.C. § 151 et seq., and the Omnibus Budget Reconciliation Act of 1993, Public Law 103-66, 107 U.S.C. § 312. It includes the term "wireless" and service provided by any wireless real time two-way voice communication device, including radio-telephone communications used in cellular telephone service or personal communications service.
"CMRS provider" means an entity authorized by the Federal Communications Commission to provide CMRS service within the Commonwealth of Virginia.
"FCC order" means Federal Communications Commission Order 94-102 (61 Federal Register 40348) and any other FCC order that affects the provision of E-911 service to CMRS customers.
"Public safety answering point" ("PSAP") means a county or municipality that operates a facility equipped and staffed on a twenty-four-hour basis to receive and process 911 service or has notified CMRS providers in its jurisdiction that it intends to operate such a facility.
"Wireless E-911 CMRS costs" means all reasonable direct recurring and nonrecurring capital costs and operating expenses incurred by CMRS providers in designing, upgrading, leasing, purchasing, programming, installing, testing, administering, delivering, or maintaining all necessary data, hardware, software and local exchange telephone service required to provide wireless E-911 service.
"Wireless E-911 fund" means a dedicated fund consisting of all moneys collected pursuant to the wireless E-911 surcharge, as well as any additional funds otherwise allocated or donated to the wireless E-911 fund.
"Wireless E-911 PSAP costs" means all reasonable direct recurring and nonrecurring capital costs and operating expenses incurred by a public service answering point in designing, upgrading, leasing, purchasing, programming, installing, testing, administering, delivering, or maintaining all necessary data, hardware, software and local exchange telephone service required to provide wireless E-911 service and direct personnel costs incurred in receiving and dispatching wireless E-911 calls.
"Wireless E-911 service" means the E-911 service required to be provided by CMRS providers pursuant to the FCC order.
"Wireless E-911 surcharge" means a monthly fee of seventy-five cents assessed upon each CMRS telephone number assigned by a CMRS provider.

§ 56-484.9. (Effective until July 1, 2002) Wireless E-911 Service Board.

A. The Wireless E-911 Service Board is hereby created as a body politic and corporate and a political subdivision. The Board shall consist of seven members. Six members shall be appointed by the Governor as follows: one representing the Virginia chapter of the Association of Public Safety Communications Officials, one representing the Virginia chapter of the National Emergency Number Association, one who is the finance officer of a county or municipality, one who is employed by a telephone company providing E-911 service as described in subsection B of § 58.1-3813, and two representing CMRS providers authorized to do business in Virginia. The Comptroller of the Commonwealth shall also be a member of the Board and shall serve as Chairman of the Board.

B. Two of the initial appointments by the Governor shall be for one year, two shall be for two years, and two shall be for three years. Thereafter, all appointments by the Governor shall be for three years except appointments by the Governor to fill vacancies, which shall be for the remainder of the unexpired term. Vacancies shall be filled in the same manner as the original appointment. Each member may be appointed to no more than two successive full terms.

C. Members of the Board shall serve without compensation; however, members of the Board shall be reimbursed for expenses as provided in Chapter 2.1 (§ 2.1-20.2 et seq.) of Title 2.1.

D. The Board may contract for such services as may be necessary to carry out its responsibilities under this chapter. Payment for such services shall be as approved by the Board from funds received from CMRS providers as provided in this chapter. Any information furnished to the Board and designated as confidential by a CMRS provider shall be disclosed only to the Chairman and staff designated by the Chairman to receive such information. Such information may be provided to the Board in combination with other information in such manner that the Board will receive all necessary information without disclosure of confidential information designated by a CMRS provider.

§ 56-484.10. (Effective until July 1, 2002) Funding.

A. A wireless E-911 surcharge shall be collected beginning July 1, 1998, by each CMRS provider from each of its customers whose billing address is within the Commonwealth and forwarded to the Board within thirty days.

B. Each CMRS provider shall reduce such collected amounts by three percent and retain such amounts to defray costs incurred in complying with this chapter. Each CMRS provider shall show the wireless E-911 surcharge as a separate item on bills to it customers. If a CMRS provider receives from a customer partial payment of a bill, the CMRS provider shall apply the payment against charges for wireless telephone service before applying any part of the payment to the wireless E-911 surcharge.

C. State and local taxes shall not apply to the wireless E-911 surcharge.

D. Not later than December 1, 2001, the Board shall advise the General Assembly (i) whether the wireless E-911 fund has been sufficient to make qualifying payments on a current basis and (ii) whether there is reason to reduce the amount of the wireless E-911 surcharge.

§ 56-484.11. (Effective until July 1, 2002) Uses of wireless E-911 fund.

A. The Board shall provide full payment to PSAP operators of all wireless E-911 PSAP costs and to CMRS providers of all wireless E-911 CMRS costs as defined in this chapter. For that purpose (i) each PSAP operator shall submit to the Board each year on or before October 1 its estimate of wireless E-911 PSAP costs it expects to incur during its next fiscal year and (ii) each CMRS provider shall submit to the Board on or before December 31 of each year its estimate of wireless E-911 CMRS costs it expects to incur during the next fiscal year of counties and municipalities in whose jurisdiction it operates. The Board shall review such estimates and advise each PSAP operator and CMRS provider on or before the following March 1 whether its estimate qualifies for payment hereunder and whether the wireless E-911 fund is expected to be sufficient for such payment during said fiscal year. Each PSAP operator and CMRS provider shall notify the Board promptly of any material change in its plans to provide wireless E-911 service.

B. The Board shall make such qualifying payments to each PSAP operator and CMRS provider in four equal payments at the beginning of each calendar quarter of such fiscal year. If the wireless E-911 fund is insufficient during any calendar quarter to make all such qualifying payments, the Board shall prorate payments equally among all PSAP operators and CMRS providers during such calendar quarter. Unpaid amounts shall be carried forward for payment during the next calendar quarter. Such carry-forward process shall continue until all qualifying payments have been made.

Appendix D, Continued

C. During the period July 1 through September 30 of each year the Board shall determine whether qualifying payments to PSAP operators and CMRS providers during the preceding fiscal year exceeded or were less than the actual wireless E-911 PSAP costs or wireless E-911 CMRS costs of any PSAP operator or CMRS provider. Each PSAP operator or CMRS provider shall provide such verification of such costs as may be requested by the Board. Any overpayment shall be refunded to the Board or credited to qualifying payments during the then current fiscal year, on such schedule as the Board shall determine.

D. Any estimate of wireless E-911 PSAP costs submitted to the Board after October 1 and any estimate of wireless E-911 CMRS costs submitted to the Board after December 31 of any year shall be reviewed by the Board as described in subsection A to the extent practicable as determined by the Board; however, qualifying payments based on estimates submitted in accordance with the schedule set forth in subsection A shall have priority for payment.

E. The Board shall review estimates of wireless E-911 PSAP costs or wireless E-911 CMRS costs to be incurred prior to July 1, 1999, and determine whether such costs qualify for payment hereunder. The Board may make such qualifying payments to the extent the wireless E-911 fund is sufficient for such payments.

F. The Auditor of Public Accounts, or his legally authorized representatives, shall annually audit the accounts of the Board in accordance with generally accepted auditing standards and the cost of such audit services shall be borne by the Board. The Board shall furnish copies of such audit to the Governor.

Appendix E

Item 461 2c (1999 Appropriations Act)

1999 Budget Amendment, Item 461 2c, Conference-Wireless-911 Language
Page 352, after line 5, insert:

"D.1. It is the intent of the General Assembly that wireless 911 calls be delivered directly by the Commercial Mobile Radio Service (CMRS) provider to the local Public Safety Answering Point (PSAP), in order that such calls be answered by the local jurisdiction within which the call originates, thereby minimizing the need for call transfers whenever possible.

a. On or before January 1, 2000, it is intended that the Cities of Chesapeake, Hampton, Newport News, Norfolk, Suffolk, and Virginia Beach shall begin answering wireless 911 calls originating in their jurisdictions.

b. On or before July 1, 2000, it is intended that Chesterfield and Henrico County and the City of Richmond shall begin answering wireless 911 calls originating in their jurisdictions.

2. Notwithstanding the provisions of Article 6 (§ 56-484.8 et seq.), Chapter 15, Title 56, Code of Virginia, the Wireless E-911 Service Board shall make transitional or start-up payments to the PSAPs serving the localities identified in paragraphs C.1.a. and C.1.b. above for costs associated with the assumption of wireless 911 telephone call answering responsibilities from the Department of State Police. In furtherance of this objective, the localities referenced in paragraphs C.1.a. and C.1.b. above shall submit by July 1, 1999, their estimates of the wireless 911 PSAP transitional or start-up costs they expect to incur during fiscal year 2000. These estimates shall include the initial capital, installation, and maintenance costs of the 911 wireless emergency telephone systems and recurring maintenance, repair, and system upgrade costs, and salaries or portion of salaries of dispatchers or call-takers, for the purpose of assisting localities in complying with the provisions of this paragraph.

3. Notwithstanding the provisions of Article 6 (§ 56-484.8 et seq.), Chapter 15, Title 56, Code of Virginia, the Department of State Police is authorized to receive monies collected in the Wireless E-911 Fund, not to exceed $750,000 in each fiscal year, to offset dispatch center operating costs incurred for answering wireless 911 telephone calls originating in localities for which the Department of State Police continues to serve as the PSAP for wireless 911 telephone calls. Such payments shall be made pursuant to procedures established by the Wireless E-911 Service Board.

4. The Wireless E-911 Service Board shall provide a progress report to the Governor and the Chairmen of the Senate Finance and House Appropriations Committees by October 1, 1999, on the progress in implementing the provisions of the Wireless Enhanced Public Safety Telephone Service Act of 1998. The Secretary of Technology and the Department of Information Technology shall provide such support as may be necessary to enable the Board to complete its report."

Appendix F

Wireline E-911 Legislation

State	Wireline E-911 Tax Rate	Wireline Board, Department or Division?	Money to be used for PSAP salaries?	Does the legislation mandate oversight?
Alabama	$2.00 if population <25,000 not to exceed $2.00 local	Board of Commissioners	No	No
Alaska	$.50 if population > 100,000; $.75 if < 100,000; local	No	No	Yes
Arizona	not to exceed 1.5% of IPC's gross receipts; state	Department of Administration	No	No
Arkansas	NTE 5% or 12% if population < 15,000; local	No	Yes (capped)	Yes
California	$.50 (minimum) to $.75 (maximum); state	Department of General Services	No	Yes
Colorado	$.70 per service user; state	No	No	Yes
Connecticut	$.50 per line; state	Office of Statewide Emergency Telecommunications	No	Yes
Delaware	$.50 per line	No	Yes	Yes
Florida	$.50 per line; local	Division of Communications (in Dept. of Management Services)	Yes	Yes
Georgia	$1.50 per line; local	911 Advisory Committee (under Emergency Management Agency)	Yes	Yes (local expense)
Hawaii	local	Department of Health	No	Yes
Idaho	$1.00 per line; local	No	No	Yes
Illinois	$1.25 per line if population > 500,000 local	Emergency Telephone System Board (in each county) coordinated under State Commerce Commission		Yes

Appendix F, Continued

State	Wireline E-911 Tax Rate	Wireline Board, Department or Division?	Moneys to be used for PSAP salaries?	Does the legislation mandate oversight?
Indiana	3% of average monthly access line charge if county has consolidated or 2nd class city; 10% per line if county doesn't have consolidated or 2nd class city	No	Yes	Yes
Iowa	local surcharge NTE $1.00; local alternative: NTE $2.50 per line for 24 months	E-911 Joint Service Board (in each county)	No	Yes
Kansas	$.75 per line (maximum); local	No	No	Yes
Kentucky	$.70 per month; local	No	Not specified	No
Louisiana	$1.00 residential; $2.00 business (maximum); local	No		
Maine	$.20 per line; state	Emergency Services Communication Bureau (in Dept. of Public Safety)	Yes	Yes
Maryland	$.10 per line (state); $.50 per line maximum (local)	Emergency Number Systems Board (within Dept. of Public Safety and Correctional Services)	Yes (with restrictions)	Yes
Massachusetts	surcharge for directory assistance; state	Emergency Telecommunications Board (in office of Public Safety)	Unclear; caps expenditures for the Board at $500,00 per year	Yes
Michigan	4% is highest monthly rate for one party line; may raise cap to 16% if approved by voters; local	Emergency Telephone District Board (in county)	No	Yes
Minnesota	$.08 to $.30 per line for basic and E-911; state	No (Dept. of Administration coordinates implementation of 911 services)	No	Yes
Mississippi	$1.00 residential; $2.00 business; local	No	No	Yes

Appendix F, Continued

State	Wireline E-911 Tax Rate	Wireline Board, Department or Division?	Moneys to be used for PSAP salaries?	Does the legislation mandate oversight?
Missouri	NTE 15% of tariff or $.75 per line (whichever is greater) or voters may approve 1% sales tax; local	Emergency Telephone Board	Yes (local option)	Yes
Montana	$.25 per line; state	Department of Administration	No	Yes
Nebraska	NTE $.50 per line; smaller localities can pay up to $1.00; increase by $.50 per line if metropolitan city in county; local	No	No	Yes
Nevada	$.25 (county property tax); local	No	No	No
New Hampshire	no cap; state	Enhanced 911 Commission will establish as Bureau of Emergency Communications (to be attached to Office of the Commissioner of Administrative Services)	No	Yes
New Jersey	general fund; state	Office of Emergency Telecommunications Services and 911 Commission (in Dept. of Law and Public Safety)	No	Yes
New Mexico	$.51 per line; state (but additional local surcharge may be imposed)	No	No	Yes
New York	NTE $.35 per line; local	No	No	Yes

Appendix F, Continued

State	Wireline E-911 Tax Rate	Wireline Board, Department or Division?	Moneys to be used for PSAP salaries?	Does the legislation mandate oversight?
North Carolina	not specified; no cap; local	No	No	No
North Dakota	NTE $1.00 per line; E-911 databases charges fee but amount not specified; local	Emergency Services Communication System Advisory Committee	No	Yes
Ohio	NTE $.50 per line; local	No (local planning and advisory committees)	No	Yes
Oklahoma	NTE 15% of tariff rate per line; local	Coordinating agency in Dept. of Public Safety	No	Yes
Oregon	$.75 per line; state	Office of Emergency Management Duties and Powers	No	Yes
Pennsylvania	NTE $1.00, $1.25 or $1.50 per line, depending on county classification; local	Emergency Management Agency	No	Yes
Rhode Island	$.47 per exchange line; state	E-911 Uniform Emergency Telephone System Division within the Dept. of Administration's Advisory Committee	Yes	Yes
South Carolina	$.75 to $1.50 per subscriber for start-up costs; $.50 to $1.00 per subscriber for ongoing costs; local	Division of Information Resource Management	No	Yes
South Dakota	NTE $.75 per line (local) and $.01 per line for counties not collecting surcharge (state)	No	No	Yes
Tennessee	NTE $.65 residential or $2.00 business; local	Department of Commerce and Insurance	Unclear (most likely discretion of locality)	Yes
Texas	NTE $.50 per line for regional planning district and 0.013% equalization surcharge per intrastate long distance customer	Advisory Commission on State Emergency Communications	No	Yes

Appendix F, Continued

State	Wireline E-911 Tax Rate	Wireline Board, Department or Division?	Moneys to be used for PSAP salaries?	Does the legislation mandate oversight?
Utah	NTE $.50 per line; local	Public Service Commission	No	Yes
Vermont	no cap; general fund; state	Enhanced 911 Board	No	Yes
Virginia	local	No	Yes	No
Washington	NTE $.50 per line (local); $.20 per line (state)	Enhanced 911 Coordination Office	No	Yes
West Virginia	not specified; local	No (local advisory boards)	No	No
Wisconsin	$.25 - $1.00 (depending on size of population); local	No	No	Yes
Wyoming	NTE $.50 per line; local	No	No	Yes

Appendix G

Wireless E-911 Legislation

State	Wireless E-911 Tax Rate	Wireless Board, Department or Division?	Does the legislation mandate oversight?	Does the legislation provide for state-level 911 staff?	Does the governing body have both a fiduciary and a policy role?
Alabama	$.70 per month per connection; state	CMRS Emergency Telephone Services Board; extensive membership	Yes	No	Yes
Alaska	no applicable statute				
Arizona	$.20 per service; state	Department of Administration			
Arkansas	$.50 per subscriber; state	CMRS Emergency Telephone Services Board; extensive membership	Yes	No	Yes
California	50% (minimum) to 75% (maximum) per call; state	No (task force)	Yes	Yes	Yes
Colorado	$.70 per user; local	No			
Connecticut	NTE $.50 per line; state	E911 Commission; extensive membership	Yes	Yes	Yes
Delaware	no applicable statute				
Florida	$0.50 surcharge; 1% administrative fee	Wireless 911 Board			
Georgia	up to $1.00 (Phase I); additional surcharge equal to $1.50 (Phase II); state	911 Advisory Committee; extensive membership	Yes (local expense)	No	Yes
Hawaii	no applicable statute	No			
Idaho	no applicable statute				

Appendix G, Continued

State	Wireless E-911 Tax Rate	Wireless Board, Department or Division?	Does the legislation mandate oversight?	Does the legislation provide for state-level 911 Staff?	Does the governing body have both a fiduciary and a policy role?
Illinois	no applicable statute				
Indiana	NTE $1.00 with $.65 initial surcharge; state	Wireless Enhanced 911 Advisory Board; extensive membership	Yes	No	No
Iowa	$.30 maximum surcharge; state	Joint 911 Service Board; extensive membership	Yes	Yes (in Dept. of Public Safety)	Yes
Kansas	wireless users exempt from emergency telephone tax	No			
Kentucky	$.70 surcharge; state	CMRS Emergency Telecommunications Board; extensive membership	Yes	Yes	Yes
Louisiana	NTE $1.00 residential and $2.00 business per line (local); 5% per line if served by more than one supplier (local)	No		Yes	
Maine	$.52 per line; state	E-911 Council; extensive membership	Yes	Yes (via Emergency Services Communication Bureau in Dept. of Public Safety)	
Maryland	$.10 per line (state); $.50 per line (local)	Emergency Services Communications Bureau; extensive membership	Yes	Yes	Yes

Appendix G, Continued

State	Wireless E-911 Tax Rate	Wireless Board, Department or Division?	Does the legislation mandate oversight?	Does the legislation provide for state-level 911 staff?	Does the governing body have both a fiduciary and a policy role?
Massachusetts	no applicable statute				
Michigan	no wireless surcharge	Emergency Telephone Service Commission			
Minnesota	$.08 to $.30 surcharge per line for basic 911 funding; state	No (Dept. of Administration coordinates implementation of 911 services)	Yes	Yes	Yes
Mississippi	$1.00 residential, $2.00 business (local); $1.00 surcharge (state)	CMRS Board; limited membership	Yes	No	Yes
Missouri	$.50 surcharge; state	Wireless Service Provider Enhanced 911 Advisory Board; limited membership	Yes	No	No
Montana	$.25 per subscriber; state	Department of Administration	Yes	Yes	Yes
Nebraska	no applicable statute				
Nevada	no wireless surcharge				
New Hampshire	$.42; state	Enhanced 911 Commission (will establish a Bureau of Emergency Communications)	Yes	Yes	Yes
New Jersey	wireless funding through annual appropriations by legislature	Office of Emergency Telecommunications Services and 911 Commission (in Dept. of Law and Public Safety)			

Appendix G, Continued

State	Wireless E-911 Tax Rate	Wireless Board, Department or Division?	Does the legislation mandate oversight?	Does the legislation provide for state-level 911 staff?	Does the governing body have both a fiduciary and a policy role?
New Mexico	no applicable statute				
New York	$.70 per line; local	No	No	No	No
North Carolina	$.80 surcharge; state	Wireless 911 Board; extensive membership		No	No
North Dakota	no applicable statute				
Ohio	no applicable statute				
Oklahoma	no applicable statute				
Oregon	$.96 per line; state	Office of Emergency Management	Yes	Yes	Yes
Pennsylvania	no applicable statute				
Rhode Island	$.47 per device; state	E-911 Authority	Yes	Yes	Yes
South Carolina	$.58 per line; state	CMRS Emergency Telephone Services Board; limited membership	Yes	No	Yes
South Dakota	Cellular tax contained in definition of Exchange Access; state	Yes (task force); type of membership unknown			Yes
Tennessee	wireless surcharge not to exceed business rate ($2.00); surcharge of $0.85 to implement Phase I and $1.00 to implement Phase II	Yes (in Dept. of Commerce and Insurance)	Yes	Yes (from Dept.)	Yes

Appendix G, Continued

State	Wireless E-911 Tax Rate	Wireless Board, Department or Division?	Does the legislation mandate oversight?	Does the legislation provide for state-level 911 staff?	Does the governing body have both a fiduciary and a policy role?
Texas	$0.50 per subscriber; state	Advisory Commission on State Emergency Communications; extensive membership	Yes	Yes	Yes
Utah	$.53 per line; local	Public Service Commission; limited membership	Yes	No	No
Vermont	Enhanced 911 fund from legislative appropriations; state	Enhanced 911 Board; extensive membership	Yes	No	Yes
Virginia	$0.75	Wireless E-911 Service Board; limited membership	Yes	No	No
Washington	NTE $.25 per line; local (county)	Enhanced 911 Coordination Office and Enhanced 911 Advisory Committee; extensive membership	Yes	No	Yes
West Virginia	$.75 per subscriber; state; limited membership	Public Service Commission	Yes	Yes	Yes
Wisconsin	no applicable statute				
Wyoming	no applicable statute				

Appendix H

1999 E-911 Legislative Activity

State	Legislation	Subject Matter	Last Action	
Alabama	Not applicable			
Alaska	Not applicable			
Arizona	Not applicable			
Arkansas	House Bill 1258 (Amends § 12-10-318(b)(2))	Reduced allocation of local funding by 2%; local distribution based on a population basis; carrier cost recover unchanged	Introduced Enacted	1/21/99 2/11/99
California	Assembly Bill 1263 (Adds § 2892 to the PUC)	Intent to create a California wireless 911 taskforce; no substantive changes in amended version	Introduced Amended Referred to committee Enacted	2/26/99 4/7/99 5/26/99 7/11/99
Colorado	Not applicable			
Connecticut	House Bill 5408 (Amends § 28-29a)	Adds 2 CMRS provider representatives to the state E911 commission 5/14/99 reissued version adds only 1 CMRS provider representative to the commission; no substantive changes in enrolled version; no substantive changes in enacted version	Drafted by committee Reissued Reissued Enrolled Enacted	3/16/99 4/7/99 5/14/99 5/27/99 6/8/99
Delaware	Senate Bill 233 (Amends § 10005)	Adds wireless immunity	Introduced Session End	6/30/99
Florida	Senate Bill 178 (Creates § 365.172)	Creates Wireless 911 Board; adds $0.50 wireless surcharge; 1% administrative fee; express cost recovery; competitively and technically neutral; no substantive changes in engrossed version	Prefiled Introduced Engrossed Substituted on Senate floor by H.B. 621 Tabled Session End	12/2/98 3/2/99 4/22/99 4/23/99 4/23/99
	Senate Bill 180 (Creates § 365.174)	Adds protection of wireless proprietary information; no substantive changes in engrossed version; no substantive changes in enrolled version; no substantive changes in enacted version	Prefiled Introduced Engrossed Enrolled Enacted	2/2/98 3/2/99 4/22/99 4/26/99 5/26/99

Appendix H, Continued

Senate Bill 182 (Creates §365.173)	Provides criteria for the wireless fund; no substantive changes in engrossed version; 54% of surcharge revenues reserved for cost recovery; no substantive changes in enrolled version; enrolled H.B. 17 and H.B. 591 change effective date to 7/1/99; no substantive changes in enacted version	Prefiled Introduced Engrossed Enrolled Enacted	12/2/98 3/2/99 4/23/99 4/26/99 5/26/99
House Bill 499 (Creates §365.172)	Same as S.B. 178	Prefiled Session End	1/29/99
House Bill 511 (Creates §365.174)	Same as S.B. 180; engrossed version elaborates on protecting trade secret information and proprietary confidential business information; 4/28/99 engrossed version of H.B. 513 changes the effective date of enrolled S.B. 182 to 7/1/99	Prefiled Introduced Engrossed Session End	1/29/99 3/2/99 4/23/99
House Bill 513 (Creates §365.173)	Same as S.B. 182; no substantive changes in engrossed version; 4/28/99 engrossed version changes the effective date of enrolled S.B. 182 to 7/1/99	Prefiled Introduced Engrossed Engrossed Session End	1/29/99 3/2/99 4/23/99 4/28/99
House Bill 621 (Creates §365.172)	Same as S.B. 178; no substantive changes in engrossed version; no substantive changes in enrolled or enacted versions	Prefiled Introduced Engrossed Enrolled To Governor Enacted	2/8/99 3/2/99 4/22/99 4/28/99 6/2/99 6/17/99
House Bill 17	Changes the effective date of enrolled S.B. 182 to 7/1/99; no substantive changes in enacted version	Enrolled Enacted	4/30/99 6/18/99
House Bill 591	Changes the effective date of enrolled S.B. 182 to 7/1/99; no substantive changes in amended version	Enrolled Enacted	4/30/99 6/18/99

Appendix H, Continued

Georgia	Senate Bill 170 (Amends § 46-5-122, et. seq.)	Requires wireless suppliers to provide certain information (corporate name, address, counties it serves, etc.) to the Emergency Management Agency; no substantive changes in substituted version; no substantive changes in enrolled or enacted versions	Introduced Substituted Enrolled Enacted	2/16/99 3/17/99 3/24/99 4/28/99
	Senate Bill 138 (Amends § 46-5-134)	Expands reimbursable expenses for PSAPs; no substantive changes in enacted version	Substituted Enrolled Enacted	3/17/99 3/24/99 4/27/99
Hawaii	House Bill 661 (Adds new chapter)	Defines CMRS; creates wireless E9-1-1 advisory board; creates wireless fund; adds initial surcharge of $0.30 and up to $0.50; CMRS provider may retain up to 84% of funds collected for full cost recovery and 2% for administrative expenses; adds confidentiality of provider proprietary information; House Draft 1 adds immunity for provider cost recovery from fund up to 125% of funds collected by provider; no substantive changes in House Draft 2; no substantive changes in House Draft 3; Senate Draft 1 allows providers to retain only the 2% of funds collected for administrative expenses with cost recovery provided through sworn invoices to the board; no substantive changes in Senate Draft 2	Introduced House Draft 1 House Draft 2 House Draft 3 Senate Draft 1 Senate Draft 2 Conference Draft 1 Vetoed	1/22/99 2/12/99 2/19/99 3/5/99 3/25/99 4/9/99 4/30/99 5/7/99
	Senate Bill 778 (Adds new chapter)	Same as H.B. 661 except adds wireless immunity; no substantive changes in Senate draft 1	Introduced Senate Draft 1 Committee Session End	1/22/99 2/19/99 2/24/99
	Senate Bill 102 (Adds new chapter to HRS)	Adds new E9-1-1 CMRS chapter; creates wireless board; substantially the same as Senate Draft 1 of H.B. 661; no substantive changes in House Draft 2	House Draft 1 House Draft 2 Vetoed	1/25/99 4/9/99 5/27/99

Appendix H, Continued

Idaho	House Bill 291 (Amends §§ 31-4802, et seq.)	Defines CMRS provider; applies the landline surcharge of $1.00 to wireless with 50% to be retained by the statewide 911 fund and 50% to be retained by the county treasurer's office; adds wireless immunity; includes technical neutrality; implicit cost recovery	Introduced Committee Session End	2/22/99 3/10/
Illinois	House Bill 1383 (Wireless Emergency Telephone Safety Act)	Adds statewide wireless surcharge of $.75 where there is no local surcharge currently in place; local surcharges currently in place shall not exceed $1.25 (ambiguous disbursements however); full wireless cost recovery; adds wireless immunity, protection of proprietary information; includes technical neutrality; House amended version preempts home rule and creates a wireless board to set the surcharge amount NTE $.75; no substantive changes in engrossed version; no substantive changes in enrolled version	Introduced Amended Engrossed Enrolled To Governor	2/17/99 3/5/99 5/4/99 5/20/99 6/8/99
	Senate Bill 1000	Same as HB 1383	Introduced Rules Committee Session End	2/25/99 5/20/99
	House Bill 2793	Amends H.B. 1383 upon its enactment to add reimbursement of administrative costs incurred by the Dept. of Central Mangement Services	**Enacted**	6/9/99
Indiana	House Bill 1428 (Amends § 36-8)	Requires service suppliers to provide 911 database information including phone number service address, class of service and designation of listed/unlisted to the county on a quarterly basis; no changes in enrolled version; no substantive changes in enacted version	Engrossed Enrolled Enacted	4/8/99 4/13/99 5/3/99
	Senate Bill 286 (Adds § 36/8/20)	Designates 911 and the universal emergency telephone number	**Enacted**	**5/3/99**
Iowa	Senate Bill 102 (Amends § 34A.2A and § 34A.7A)	Nonsubstantive Code corrections; no substantive changes in enacted version	Introduced Enacted	2/8/99 5/10/99
Kansas	Not applicable			
Kentucky	Not applicable			

Appendix H, Continued

Louisiana	House Bill 1129 (Adds § 33:9109)	Adds local wireless surcharge NTE $1.00; surcharge requires voter approval only in districts with no prior voter approval; adds wireless cost recovery; adds wireless immunity; recognizes FCC order requirements; requires agreements with carriers and sufficient collected funds prior to rollout of service and reimbursement	Introduced Committee **Session End**	3/29/99 3/29/99
	House Bill 1318	Adds DeSoto parish as communications district to authorize surcharge	Introduced **Session End**	3/29/99
	Senate Bill 939 (Amends § 33:9124, *et seq.*, Adds § 33:9111	Strikes wireless provisions from present code but adds a new section to provide for wireless funding and full provider cost recovery by district as mandated by the FCC Order; amount of surcharge not specified but may not exceed residential landline rate ($1.00); adds wireless immunity; prerequisite that LEC is capable handling call; no technical neutrality language	Introduced **Session End**	3/29/99
	House Bill 1947 (Amends §§ 33:9125, *et seq.*, adds § 9109	Substantially the same as S.B. 939	Introduced **Session End**	3/29/99
	House Bill 2102 (Amends §§ 33:9101, *et seq.* repeals §§ 33:9131, *et seq.)*	Allows for the creation of multi-parish communications districts; defines CMRS; communications districts may levy wireless surcharge NTE $0.85; providers may retain 1% as administrative fee; provider cost recovery; adds wireless immunity; no substantive changes in engrossed version; no substantive changes in reengrossed version; no substantive changes in enrolled version	Introduced Engrossed Reengrossed Reported with Amendments Enrolled **Session End**	4/26/99 5/10/99 5/24/99 6/3/99 6/20/99
	House Bill 1107 (Amends § 33:9124 and adds § 33:9128)	Pertains to Jefferson Parish only; allows district access to confidential customer data; no other state wireless law shall apply concerning Jefferson Parish	Enrolled	6/18/99
Maine	Not applicable			
Maryland	Not applicable			

Appendix H, Continued

Massachusetts	Senate Bill 410 (Amends ch. 6A §§ 18A, *et seq.*)	Adds wireless surcharge NTE $.75; adds wireless provider cost recovery; adds wireless immunity	Introduced Committee	1/6/99 2/1/99
	Senate Bill 1752 (Amends ch. 6A §§ 18A, *et seq.*)	Substantially the same as S.B. 410	Introduced	4/7/99
Michigan	Senate Bill 1010 (Amends §§ 484.1102, 1303, 1316, 1601, 1602, 1604)	Defines CMRS; adds CMRS to definition of service supplier; wireless immunity; substituted version revises wireless immunity	Introduced Recommended as substituted from committee Referred to Technology and Energy Committee Referred to Committee of the Whole Amended Passed Senate **Stalled in House**	3/11/98 4/22/98 4/23/98 5/26/98 6/11/98 6/11/98
	Senate Bill 492	Defines CMRS; defines wireless emergency service order as FCC Docket No. 94-102; adds wireless immunity, no wireless surcharge, or cost recovery; no substantive changes in reprinted or enrolled versions; no substantive changes in enacted version	Introduced Reprint Enrolled **Enacted**	4/13/99 5/20/99 6/10/99 **6/28/99**
	Senate Bill 492	Defines CMRS; defines wireless emergency service order as FCC Docket No. 94-102; adds wireless immunity, no wireless surcharge, or cost recovery; no substantive changes in reprinted or enrolled versions; no substantive changes in enacted version	Introduced Reprint Enrolled **Enacted**	4/13/99 5/20/99 6/10/99 **6/28/99**
	House Bill 4659 (Adds §§ 711, *et seq.*)	Creates Emergency Telephone Service Committee; CMRS represented; may recommend technical and operating standards; no substantive changes in enrolled version; no substantive changes in enacted version	Introduced Enrolled To Governor **Enacted**	5/11/99 6/16/99 6/16/99 **6/28/99**
Minnesota	House Bill 1971 (Amends §§ 403.02, *et seq.*, adds ch. 404)	Provider may recover all costs associated with compliance of the FCC Order; creates new wireless E9-1-1 chapter; adds wireless surcharge (amount not yet determined); defines wireless service; creates wireless advisory board; adds protection of proprietary information	Introduced Session End	3/15/99

Appendix H, Continued

Mississippi	Not applicable			
Missouri	Not applicable			
Montana	Not applicable			
Nebraska	Legislative Bill 570 (Amends § 86-1002, *et seq.*)	Adds $0.50 wireless surcharge	Introduced Session End	1/19/99
Nevada	Senate Bill 487 (Amends ch. 707)	Predominantly wireline bill; establishes a state fund for gov't expense; no express wireless cost recovery; adds wireless immunity; broad language permits technical standards to be set; no substantive changes in 1st reprint version; no substantive changes in enacted version	Introduced 1st Reprint **Enacted**	3/18/99 4/19/99 **5/13/99**
	Senate Bill 366 (Amends §§ 244A.7643, 7647)	Removes wireless surcharge; 2nd reprint version removes wireless surcharge after implementation of ANI and ALI systems is complete	1st Reprint 2nd Reprint **Enacted**	4/19/99 5/15/99 **5/29/99**
New Hampshire	Not applicable			
New Jersey	Senate Bill 1495 (Amends § 52:17C-1 *et seq.*)	Defines wireless enhanced 9-1-1 service; adds wireless immunity; amended version adds wireless funding through annual appropriations by the legislature; adds wireless provider cost recovery; no substantive changes in enacted version	Introduced Amended Passed Assembly **Enacted**	11/16/98 1/25/99 5/10/99 **6/24/99**
	Assembly Bill 2581 (Amends § 52:17C-1 *et seq.*)	Defines wireless telephone company; mandates wireless companies to provide service pursuant to FCC wireless E9-1-1 requirements; adds wireless immunity; no substantive changes in substituted version; retains technology and standard setting language of statute	Introduced Substituted	11/9/98 3/18/99
New Mexico	Senate Bill 86 (Amends § 63-9D-3, *et seq.*)	Adds wireless provider to definition of telecom company; adds aggregate $0.51 wireless surcharge; no direct cost recovery for carriers	Introduced House Committee Session End	1/20/99 2/4/99
	House Bill 456 (Amends § 63-9D-3, *et seq.*)	Not substantially different from S.B. 86	Introduced Died	2/4/99 3/4/99
New York	Senate Bill 967 (Amends § 309)	Creates state wireless emergency service account from wireless surcharge revenues which exceed $3,875,000 in any quarter in order to fund counties and cities	Introduced	1/13/99

Appendix H, Continued

New York	Assembly Bill 2246 (Amends § 309)	Creates state wireless emergency service account from wireless surcharge revenues which exceed $6,250,000 in any quarter in order to fund counties and cities	Introduced Senate Committee	1/21/99 5/26/9
	Assembly Bill 7550 (Amends § 309)	Defines CMRS; remits 50% of the funds collected from the $.70 wireless surcharge for wireless provider cost recovery; adds wireless immunity	Introduced	3/30/99
	Senate Bill 5207 (Adds § 310)	Defines wireless service; states requirements of wireless 911 routing	Introduced Assembly Committee	4/21/99 6/16/99
	Senate Bill 5357 (Amends § 309)	Same as A.B. 7550	Introduced	4/21/99
	Assembly Bill 8452 (Amends § 310)	Same as S.B. 5207 and S.B. 5357	Introduced	5/19/99
	Assembly Bill 8854	Mandates wireless ALI and the creation of a wireless cost recovery mechanism; implied wireless immunity	Introduced To Senate Rules	6/14/99 6/23/99
	Senate Bill 5810	Creates statewide wireless communications account; no express provider cost recovery	Introduced To Assembly Ways and Means	6/4/99 6/8/99
North Carolina	Not applicable			
North Dakota	Senate Bill 2307 (Amends 57-40.6, *et seq.*)	Defines CMRS provider; adds $1.00 wireless surcharge but no direct provider cost recovery; adds wireless immunity and confidentiality of proprietary information; no substantive changes in engrossed version; reengrossed version decreases surcharge to $0.25; specifies reimbursement of carriers by contract; conference committee version raises surcharge to $0.40 and establishes a wireless planning committee to develop legislation re wireless service, fees and allocation	Introduced Engrossed Reengrossed Conference Committee **Vetoed**	1/19/99 2/17/99 3/26/99 4/14/99 **4/20/99**
Ohio	House Bill 848 (Amends § 4931.40 *et seq.*)	Defines wireless service; creates wireless E9-1-1 service fund; adds $0.65 wireless surcharge; adds wireless service provider to definition of telephone company and therefore wireless immunity	Introduced	11/16/98

Appendix H, Continued

	House Bill 310 (Amends § 4931.40 *et seq.*)	Same as H.B. 848	Introduced	4/27/99
Oklahoma	House Bill 1228 (Adds § 2843)	Wireless Emergency Number Act—adds $0.50 wireless surcharge; adds provider cost recovery, immunity and confidentiality of proprietary information	Prefiled Introduced Committee **Session End**	1/6/99 2/1/99 3/1/99
Oregon	Not applicable			
Pennsylvania	Not applicable			
Rhode Island	Not applicable			
South Carolina	Senate Bill 418 (Amends § 23-47-50(F))	Minor change in the wireless surcharge amount; no substantive changes in amended version	Introduced Amended To House **Session End**	1/28/99 4/8/99 4/14/99
	House Bill 3710	Joint resolution to approve regulations of the budget and control board regarding the CMRS surcharge and provider cost recovery	Introduced Passed Senate **Enacted**	3/10/99 6/1/99 **6/11/99**
South Dakota	House Bill 1292 (Adds new §§ 10-34-45)	Mandates statewide comprehensive E9-1-1 plan; no substantive changes in engrossed version; no substantive changes in engrossed version	Introduced Engrossed Engrossed **Signed by Governor**	2/1/99 2/17/99 3/8/99 3/8/99
Tennessee	Senate Joint Resolution 228	Ratifies the wireless surcharge established by the board of $0.85 to implement Phase I and then $1.00 to implement Phase II	Introduced To Governor **Enacted**	4/28/99 6/4/99 **6/15/99**
Texas	House Bill 1983 (Amends §§ 771.001, *et seq.*)	Continues and expands the functions of the commission on state wireless emergency communications; commission as statewide funding vehicle with mandatory contract terms for regional commissions; no substantive changes in substituted version; no substantive changes in engrossed version; no substantive changes in 5/14/99 substituted version; no substantive changes in enacted version	Introduced Recommend as substituted from Committee Engrossed Recommended as substituted from Committee To Governor **Enacted**	3/1/99 4/8/99 4/20/99 5/14/99 6/1/99 **6/20/99**
	House Bill 1984 (Amends §§ 771.001, *et seq.* and §§ 772.451, *et seq.*)	Allows for the consolidation of emergency communication districts; no substantive changes in engrossed or enacted versions	Introduced Engrossed **Enacted**	3/1/99 4/28/99 **6/20/99**

Appendix H, Continued

	Senate Bill 366	Same as H.B. 1983	Introduced Session End	2/1/99 3/
	Senate Bill 768	Same as H.B. 1984	Introduced Session End	3/ /99
Utah	Not applicable			
Vermont	Not applicable			
Virginia	House Bill 1880 (Amends § 56-484.11)	Mandates annual audit of the wireless E9-1-1 fund by the auditor of public accounts; no substantive changes in engrossed version	Introduced Engrossed Enrolled **Enacted**	1/15/99 1/25/99 2/17/99 **3/27/99**
	House Bill 1569 (Amends §§ 58.1-3812, *et seq.*)	Allows counties with smaller populations to pay the local director from proceeds from the E9-1-1 tax	Enrolled **Enacted**	2/16/99 **3/24/99**
Washington	Not applicable			
West Virginia	Senate Bill 180 (Amends § 24-6-6b)	Wireless fees from counties without relay towers utilized to fund the development of wireless E9-1-1 service	Introduced **Session End**	1/21/99
Wisconsin	Not applicable			
Wyoming	Not applicable			

Appendix I

E-911 Tax Rates						
Locality	**1999**	**1998**	**1997**	**1996**	**1995**	**1994**
City of:						
Alexandria	0.25	0.25	0.25	0.25	0.25	0.25
Bedford	2.00	2.00	2.00	2.00	2.00	2.00
Bristol	0.65	0.65	0.65	0.65	0.65	0.65
Buena Vista	1.77	1.77	1.77	1.77	1.77	1.77
Charlottesville	1.04	1.04	1.04	1.04	1.04	1.04
Chesapeake	1.95	1.95	1.95	0.50	0.50	0.50
Clifton Forge	No tax	No tax	No tax	Unavailable	Unavailable	0.76
Colonial Heights	0.38	1.00	0.38	0.38	0.38	0.38
Covington	0.76	0.76	0.76	0.76	0.76	0.76
Danville	Percentage	No tax	No tax	No tax	No tax	No tax
Emporia	1.00	1.00	1.00	1.00	1.00	0.40
Fairfax	0.88	0.88	0.88	0.44	0.45	Unavailable
Falls Church	1.00	1.00	1.00	1.00	0.18	0.18
Franklin	2.00	0.92	0.92	0.92	0.92	0.92
Fredericksburg	0.90	0.90	0.90	0.90	0.90	0.90
Galax	1.00	1.00	1.00	1.00	1.00	1.00
Hampton	2.50	2.50	2.50	1.44	1.44	Unavailable
Harrisonburg	0.60	0.60	0.60	0.60	0.60	0.60
Hopewell	2.00	2.00	2.00	Unavailable	Unavailable	0.88
Lexington	1.00	1.00	1.00	1.00	1.00	1.00
Lynchburg	2.00	1.44	1.44	1.44	Unavailable	Unavailable
Manassas	0.80	0.80	0.80	0.80	0.80	0.80
Manassas Park	1.25	1.25	1.25	1.25	1.25	1.25
Martinsville	1.67	1.67	1.67	0.72	0.72	0.72

Appendix I, Continued

E-911 Tax Rates

Locality	1999	1998	1997	1996	1995	1994
Newport News	2.85	2.85	2.10	1.66	0.89	0.89
Norfolk	2.20	2.20	2.20	1.66	1.66	1.66
Norfolk	0.26	0.26	0.26	0.26	0.26	0.26
Petersburg	1.18	1.18	1.18	0.35	0.35	0.35
Poquoson	2.50	2.50	2.50	2.50	2.50	2.50
Portsmouth	1.50	1.50	1.50	1.50	1.50	0.50
Radford	0.55	0.55	0.55	0.55	0.55	0.55
Richmond	2.00	2.00	2.00	2.00	2.00	1.50
Roanoke	1.45	1.45	1.45	0.99	0.99	0.46
Salem	0.90	0.90	0.90	0.90	0.90	0.40
Staunton	1.70	2.15	1.70	1.70	1.70	0.85
Suffolk	1.75	1.75	1.25	1.25	1.25	1.50
Virginia Beach	1.95	1.95	1.95	1.95	1.95	1.95
Waynesboro	0.70	0.70	0.70	0.70	0.70	0.70
Williamsburg	1.00	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
Winchester	0.95	0.95	0.95	0.95	0.95	0.95
County of:						
Accomack	1.00	1.00	1.00	1.00	1.00	0.75
Albemarle	1.39	1.39	1.39	1.39	1.39	1.39
Alleghany	0.30	0.30	0.30	0.76	0.76	0.30
Amelia	1.00	1.00	1.00	1.00	1.00	1.00
Amherst	1.00	1.00	1.00	1.00	1.00	1.00

Appendix I, Continued

E-911 Tax Rates

Locality	1999	1998	1997	1996	1995	1994
Appomattox	No tax	No tax	No tax	No tax	No tax	No tax
Arlington	1.60	1.60	1.60	0.95	0.25	0.25
Augusta	2.00	2.00	2.00	2.00	0.92	0.92
Bath	No tax	No tax	No tax	No tax	No tax	No tax
Bedford	2.00	2.00	2.00	2.00	2.00	2.00
Bland	No tax	No tax	No tax	No tax	No tax	No tax
Botetourt	1.75	1.75	1.75	1.75	No tax	No tax
Brunswick	2.00	2.00	2.00	2.00	2.00	2.00
Buchanan	No tax	No tax	No tax	No tax	No tax	No tax
Buckingham	0.55	0.55	0.55	0.55	0.55	0.55
Campbell	1.60	1.60	1.60	1.60	1.60	1.60
Caroline	1.00	1.25	1.00	1.00	1.00	1.00
Carroll	1.00	1.00	1.00	1.00	1.00	1.00
Charles City	2.00	2.00	2.00	2.00	2.00	2.00
Charlotte	2.00	2.00	2.00	2.00	2.00	2.00
Chesterfield	2.00	2.00	0.50	0.50	0.50	0.50
Clarke	2.00	2.00	2.00	1.00	1.00	0.50
Craig	No tax	No tax	No tax	No tax	No tax	No tax
Culpeper	1.50	1.50	1.50	1.50	1.50	1.50
Cumberland	3.00	3.00	3.00	3.00	3.00	3.00
Dickenson	No tax	No tax	No tax	No tax	No tax	No tax
Dinwiddie	0.55	0.55	0.55	0.55	0.55	0.55
Essex	1.50	1.50	3.00	3.00	Unavailable	No tax
Fairfax	1.75	1.75	1.69	1.69	1.30	1.30
Fauquier	2.00	2.00	2.00	2.00	3.60	0.30

Appendix I, Continued

E-911 Tax Rates

Locality	1999	1998	1997	1996	1995	1994
Floyd	0.80	0.80	0.80	0.80	0.80	0.80
Fluvanna	No tax	No tax	No tax	No tax	No tax	No tax
Franklin	0.80	0.80	1.00	1.00	1.00	1.00
Frederick	0.95	1.25	0.95	0.95	0.95	0.95
Giles	1.50	1.50	1.50	1.50	1.50	1.50
Gloucester	1.35	1.35	0.50	0.50	0.50	1.00
Goochland	1.00	1.00	1.00	1.00	1.00	1.00
Grayson	1.00	1.00	1.00	1.00	1.00	1.00
Greene	2.00	2.00	2.00	2.00	2.00	0.60
Greensville	1.10	1.10	1.10	1.10	1.10	1.10
Halifax	0.40	0.40	1.25	1.25	1.25	1.25
Hanover	1.00	1.00	1.00	1.00	1.00	1.00
Henrico	1.00	1.00	1.00	1.00	0.20	0.20
Henry	0.72	0.72	0.72	0.72	0.72	0.72
Highland	No tax	No tax	No tax	No tax	No tax	No tax
Isle of Wight	1.00	1.00	1.00	1.00	1.00	1.00
James City	1.20	1.20	0.20	0.20	0.50	0.30
King & Queen	No tax	No tax	No tax	No tax	No tax	No tax
King George	2.00	2.00	2.00	2.00	2.00	2.00
King William	3.00	3.00	3.00	3.00	3.00	No tax
Lancaster	1.25	1.25	1.25	1.25	1.25	1.25
Lee	No tax	No tax	No tax	No tax	No tax	No tax
Loudoun	2.00	2.00	2.00	0.71	0.71	1.00
Louisa	No tax	No tax	No tax	No tax	No tax	No tax
Lunenburg	1.50	1.50	1.50	0.50	0.50	0.50

Appendix I, Continued

E-911 Tax Rates						
Locality	**1999**	**1998**	**1997**	**1996**	**1995**	**1994**
Madison	No tax	No tax	No tax	No tax	No tax	No tax
Mathews	No tax	No tax	No tax	No tax	No tax	No tax
Mecklenburg	2.00	2.00	2.00	2.00	0.95	1.5
Middlesex	Unavailable	Unavailable	No tax	No tax	No tax	No tax
Montgomery	0.83	0.83	0.83	0.83	0.83	0.83
Nelson	2.00	2.00	2.00	2.00	2.00	Unavailable
New Kent	2.42	2.42	2.42	2.42	2.42	1.60
Northampton	1.00	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
Northumberland	1.80	1.80	1.80	Unavailable	Unavailable	Unavailable
Nottoway	1.12	1.12	1.12	1.12	1.12	1.12
Orange	1.25	1.25	1.25	1.00	1.00	0.75
Page	1.25	1.25	1.25	1.25	Unavailable	Unavailable
Patrick	1.96	1.96	1.96	1.26	1.26	1.26
Pittsylvania	1.50	1.50	1.50	1.50	1.50	1.50
Powhatan	1.25	1.25	1.25	0.67	0.67	Unavailable
Prince Edward	0.49	0.49	0.49	0.49	0.49	0.49
Prince George	0.64	0.64	0.64	0.64	0.64	0.64
Prince William	1.18	1.18	1.18	0.85	0.85	0.85
Pulaski	0.42	0.42	0.42	0.42	0.42	0.42
Rappahannock	1.50	1.50	1.50	2.00	2.00	2.00
Richmond	1.95	1.95	1.95	1.95	1.95	Unavailable
Roanoke	1.06	1.46	1.06	1.06	1.06	0.46
Rockbridge	1.25	1.25	1.25	1.25	1.25	Unavailable
Rockingham	0.60	0.70	0.70	0.60	0.60	0.60
Russell	No tax	No tax	No tax	No tax	No tax	No tax

Appendix I, Continued

E-911 Tax Rates						
Locality	**1999**	**1998**	**1997**	**1996**	**1995**	**1994**
Scott	No tax	No tax	No tax	No tax	No tax	No tax
Shenandoah	1.70	1.70	1.70	1.70	1.00	0.60
Smyth	1.50	1.50	1.50	1.50	Unavailable	Unavailable
Southampton	0.69	0.69	0.69	0.69	0.69	0.96
Spotsylvania	1.00	1.00	1.00	1.00	0.50	0.50
Stafford	1.25	1.25	0.85	0.85	0.85	0.85
Surry	2.00	2.00	2.00	2.00	2.00	2.00
Sussex	2.17	2.17	2.17	2.17	2.17	2.17
Tazewell	1.50	1.50	1.50	1.50	No tax	No tax
Warren	1.00	1.00	1.00	1.00	1.00	1.00
Washington	0.65	0.65	0.65	0.65	0.65	0.65
Westmoreland	2.00	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
Wise	0.36	0.31	0.26	0.26	0.26	0.26
Wythe	1.75	1.75	1.50	1.50	1.50	1.50
York	2.13	2.13	2.13	2.13	2.13	2.13
Town of:						
Altavista	1.60	1.60	1.60	1.60	1.60	1.60
Blacksburg	1.25	1.25	1.25	0.36	0.23	0.23
Chincoteague	1.00	1.00	1.00	0.30	0.30	Unavailable
Christiansburg	0.50	0.50	0.50	0.50	0.50	0.50
Colonial Beach	1.50	1.50	1.50	1.50	1.50	1.50
Farmville	0.49	0.49	0.49	0.49	0.49	0.39
Pulaski	0.42	0.42	0.42	0.42	0.42	0.42

Appendix I, Continued

E-911 Tax Rates

Locality	1999	1998	1997	1996	1995	1994
South Boston	1.20	1.20	1.20	1.20	1.82	1.82
Vinton	1.00	1.00	1.00	1.00	0.26	0.46
West Point	1.55	1.55	1.55	1.55	1.55	1.55
Wise	0.26	0.26	0.26	0.26	0.26	0.26
Wytheville	1.00	1.00	1.00	1.00	1.00	1.00
Amherst	1.00	1.00	1.00	1.00	1.00	1.00
Chase City	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
Coeburn	0.26	0.26	0.26	0.26	0.26	0.26
Dublin	0.42	0.42	0.42	0.42	0.42	0.42
Fries	1.00	1.00	1.00	1.00	1.00	1.00
Glade Spring	0.89 (Imposed by Washington County)					
Goshen	1.25 (Imposed by Rockingham County)					
Kenbridge	0.50	0.50	0.50	0.50	0.50	0.50
Lawrenceville	2.00	2.00	2.00	2.00	2.00	2.00
New Market	1.70	1.70	1.70	1.70	1.70	0.80
Onancock	0.75	0.75	0.75	0.75	0.75	Unavailable
Orange	Imposed by Orange County					
Pearisburg	Imposed by Giles County					
Ridgeway	Imposed by Henry County					
Rural Retreat	1.50 (imposed by Wythe County)					
Saltville	1.50	1.50	1.50	1.50	Unavailable	Unavailable
Shenandoah	1.25	1.25	1.25	1.25	1.25	Unavailable
Windsor	Imposed by Isle of Wight County					
Average Tax Rate	$1.30	$1.30	$1.28	$1.30	$1.10	$0.99

Appendix J

E911 Tax Revenues Last Six Years						
Locality	**1999**	**1998**	**1997**	**1996**	**1995**	**1994**
Cities:						
Alexandria	$ 299,367	$ 310,560	$ 294,154	$ 285,886	$ 300,741	$ 269,473
Bedford	103,000	103,900	94,357	91,416	89,201	78,604
Bristol	86,046	63,416	56,616	79,992	66,435	[illegible]
Buena Vista	71,224	59,326	60,163	52,678	55,571	56,350
Charlottesville	346,847	337,045	371,349	282,985	294,078	300,640
Chesapeake	2,057,466	1,807,168	517,404	488,373	462,746	436,030
Clifton Forge	[illegible]	[illegible]	[illegible]	41,204	19,169	[illegible]
Colonial Heights	122,536	104,332	42,791	41,137	36,391	38,113
Covington	13,000	13,652	13,364	13,475	13,194	
Danville	184,540	-	-	-	-	-
Emporia	38,056	37,240	36,364	35,369	35,199	14,188
Fairfax	266,242	214,682	118,939	108,762	51,943	49,936
Falls Church	124,000	124,827	116,991	101,563	19,433	19,227
Franklin	98,987	103,828	86,781	44,056	41,402	41,333
Fredericksburg	150,000	150,045	139,245	132,308	126,170	121,901
Galax	39,658	51,787	31,659	24,092	22,877	21,906
Hampton	2,111,210	1,486,229	1,132,002	1,095,778	1,066,062	1,049,486
Harrisonburg	232,280	133,552	115,304	119,899	113,002	117,853
Hopewell	38,999	46,783	44,800	40,737	36,365	39,114
Lexington	44,012	42,794	46,390	37,116	37,421	39,290
Lynchburg	1,008,684	1,057,751	744,380	303,059	316,397	310,793
Manassas	173,849	167,106	163,706	156,270	139,006	132,942
Manassas Park	56,273	57,016	51,484	48,683	44,665	41,979
Martinsville	178,020	175,013	79,163	70,853	72,785	83,138
Newport News	2,404,268	2,053,326	1,577,780	335,134	707,646	680,749
Norfolk	3,369,220	3,227,375	2,192,402	2,324,784	2,271,702	2,121,389
Norton	16,312	20,298	17,455	11,330	10,723	
Petersburg	265,352	262,490	179,410	74,857	73,032	71,818

Appendix J, Continued

E911 Tax Revenues Last Six Years						
Locality	**1999**	**1998**	**1997**	**1996**	**1995**	**1994**
Cities:						
Poquoson	152,307	157,666	147,988	141,787	120,881	81,885
Portsmouth	1,087,620	978,931	810,677	858,813	714,380	244,756
Radford	63,507	55,900	50,427	49,312	49,071	42,307
Richmond	3,000,000	2,999,243	2,617,099	3,060,067	3,035,615	1,925,961
Roanoke	1,090,634	942,525	696,851	551,611	402,089	294,628
Salem	146,052	155,562	139,594	131,128	67,165	61,168
Staunton	242,581	265,178	269,021	269,317	240,049	122,622
Suffolk	476,520	524,854	456,602	397,981	349,180	306,386
Virginia Beach	5,294,561	5,941,556	5,409,685	4,978,002	4,448,067	3,667,311
Waynesboro	90,000	89,063	84,476	80,840	79,127	77,478
Williamsburg	80,000	76,270	69,860	46,877	41,687	31,176
Winchester	308,963	260,674	253,003	166,510	146,679	110,442
Totals	$26,012,648	$24,166,163	$18,963,725	$17,829,484	$16,003,466	$12,855,354
Counties:						
Accomack	248,678	211,974	206,846	197,819	191,782	154,516
Albemarle	767,358	713,508	670,511	660,772	815,861	705,935
Alleghany	20,000	19,446	20,017	50,822	49,662	48,857
Amelia	51,000	51,343	50,809	47,899	44,883	42,826
Amherst	191,598	157,511	149,886	146,972	118,388	174,285
Appomattox	-	-	-	-	-	-
Arlington	3,136,460	2,977,821	1,772,626	1,701,994	889,676	928,288
Augusta	664,071	635,397	601,808	290,799	254,246	270,910
Bath						
Bedford	330,785	719,138	619,909	582,626	558,530	530,511
Bland						

Appendix J, Continued

E911 Tax Revenues Last Six Years						
Locality	**1999**	**1998**	**1997**	**1996**	**1995**	**1994**
Counties:						
Botetourt	290,000	287,826	827,986	105,261		
Brunswick	172,949	165,145	160,079	160,624	151,392	147,429
Buchanan						
Buckingham	33,000	33,472	36,734	32,523	35,204	30,015
Campbell	469,786	459,461	442,297	422,036	412,218	407,267
Caroline	141,929	102,766	101,053	100,339	93,365	88,478
Carroll	188,500	162,918	162,849	108,497	158,348	153,050
Charles City	39,437	37,801	35,048	39,272	29,672	24,115
Charlotte	128,562	111,622	114,002	113,314	108,937	25,076
Chesterfield	2,837,666	1,762,952	1,401,151	658,465	685,757	658,285
Clarke	153,702	116,116	169,627	66,586	57,877	30,789
Craig	-	-	-	-	-	-
Culpeper	306,459	318,903	316,624	280,488	247,768	258,195
Cumberland	35,883	33,869	26,877	30,567	24,453	23,931
Dickenson						
Dinwiddie	65,000	65,858	62,773	60,617	58,071	55,201
Essex	78,488	70,095	179,847	186,926	28,056	
Fairfax	13,790,031	13,172,802	11,685,847	8,579,020	8,126,483	4,383,918
Fauquier	767,985	691,948	654,127	620,559	418,857	221,294
Floyd	160,348	159,963	137,843	3,085	8,533	2,602
Fluvanna						
Franklin	218,477	222,764	201,368	217,458	223,923	219,290
Frederick	399,062	363,252	285,873	310,304	305,735	294,150
Giles	130,000	128,643	131,928	128,407	136,280	134,141
Gloucester	215,188	218,587	287,322	229,579	217,691	208,795
Goochland	100,000	101,543	92,957	86,812	81,890	78,146
Grayson	107,187	87,587	85,447	84,955	79,679	77,649
Greene	140,000	141,793	134,670	120,393	29,275	-

Appendix J, Continued

E911 Tax Revenues Last Six Years						
Locality	**1999**	**1998**	**1997**	**1996**	**1995**	**1994**
Counties:						
Greensville	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Halifax	$63,000	$63,129	$193,770	$183,046	$176,695	$182,117
Hanover	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Henrico	2,066,678	1,995,191	1,863,301	1,177,661	340,333	323,370
Henry	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Highland	-	-	-	-	-	-
Isle of Wight	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
James City	402,632	381,099	230,321	139,985	72,652	62,601
King & Queen	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
King George	191,076	168,627	172,759	167,864	156,898	150,496
King William	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lancaster	100,000	$ 100,780	$ 98,958	$ 90,164	92,969	92,058
Lee	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Loudoun	1,323,252	1,811,559	908,108	809,988	701,153	646,335
Louisa	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lunenburg	84,876	91,317	90,778	67,658	28,017	27,480
Madison	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mathews	-	-	-	-	-	-
Mecklenburg	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Middlesex	25,000	25,631	-	-	-	-
Montgomery	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Nelson	209,755	215,493	186,434	180,983	173,725	168,409
New Kent	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Northampton	90,762	73,148	76,889	74,903	72,963	-
Northumberland	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Nottoway	89,000	88,354	90,206	81,294	80,201	78,497
Orange	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Page	164,199	157,220	160,186	-	-	27,258

Appendix J, Continued

E911 Tax Revenues Last Six Years						
Locality	**1999**	**1998**	**1997**	**1996**	**1995**	**1994**
Counties:						
Patrick	204,607	190,822	240,108	190,727	175,843	[illegible]
Pittsylvania	574,478	490,553	452,547	433,372	434,764	392,779
Powhatan	128,000	128,252	117,114	90,526	44,437	50,149
Prince Edward	Tax collected by the Town of Farmville					
Prince George	93,778	87,160	83,197	80,402	76,924	70,757
Prince William	1,745,798	1,605,000	1,252,000	1,011,000	856,094	596,950
Pulaski	63,526	65,798	58,468	61,868	64,998	66,687
Rappahannock	87,004	72,558	74,211	85,237	85,087	79,163
Richmond	76,674	88,040	85,964	76,136	78,281	88,051
Roanoke	923,815	617,813	540,525	523,329	442,654	212,864
Rockbridge	158,968	162,327	149,328	118,892	132,195	127,225
Rockingham	270,181	234,169	194,640	191,998	185,120	165,394
Russell	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Scott	-	-	-	-	-	-
Shenandoah	$ 413,009	$ 438,760	$ 414,907	$ 390,691	$ 206,931	$ 129,838
Smyth	284,559	268,648	262,060	259,897	105,584	-
Southampton	55,000	54,809	53,474	54,894	55,915	72,004
Spotsylvania	653,227	554,566	402,412	395,348	365,322	366,678
Stafford	592,368	568,009	501,671	451,208	287,225	251,332
Surry	55,000	54,689	52,291	54,405	67,435	67,378
Sussex	116,000	115,816	117,727	111,124	110,787	97,637
Tazewell	337,156	385,462	322,769	130,820	-	-
Warren	188,063	175,988	189,039	151,828	152,138	150,644
Washington	184,000	183,489	174,222	167,432	162,546	205,432
Westmoreland	98,113	80,157	77,150	84,408	75,438	69,235
Wise	100,000	99,423	89,568	54,378	53,135	47,598
Wythe	172,606	162,405	133,188	151,076	136,161	122,174
York	694,096	652,909	607,097	569,507	539,050	437,828

Appendix J, Continued

E911 Tax Revenues Last Six Years						
Locality	**1999**	**1998**	**1997**	**1996**	**1995**	**1994**
Total counties	**$ 41,367,142**	**$ 39,077,199**	**$ 33,596,098**	**$ 27,012,854**	**$ 22,889,030**	**$ 16,859,122**
Towns:						
Abingdon	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Altavista	-	-	-	-	-	-
Ashland	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Big Stone Gap	-	-	-	-	-	-
Blacksburg	260,000	259,097	160,648	150,617	153,263	[illegible]
Blackstone	-	-	-	-	-	-
Bluefield	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Bridgewater	-	-	-	-	-	-
Chincoteague	40,296	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Christiansburg	62,154	62,008	54,013	51,224	45,056	47,282
Colonial Beach	34,741	35,684	31,957	32,649	30,848	29,905
Culpeper	-	-	-	-	-	-
Dumfries	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Farmville	57,523	55,689	59,699	47,162	44,854	35,798
Front Royal	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Herndon	-	-	-	-	-	-
Leesburg	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Luray	-	-	-	-	-	-
Marion	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Pulaski	25,000	24,171	25,409	27,474	22,209	32,615
Richlands	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Rocky Mount	-	-	-	-	-	-
Smithfield	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
South Boston	56,771	58,734	59,961	57,234	-	-
South Hill	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Appendix J, Continued

E911 Tax Revenues Last Six Years

Locality	1999	1998	1997	1996	1995	1994
Towns:						
Strasburg						
Tazewell	-	-	-	-	-	-
Vienna						
Vinton	52,207	50,724	48,977	43,431	29,594	20,901
Warrenton						
West Point	29,840	30,306	28,617	28,921	27,990	27,287
Wise						
Wytheville	67,153	65,271	61,415	62,961	55,541	52,940
Total towns						
Grand Total						

Source: 1994 - 1998 are based on the Comparative Report of Local Government Revenues and Expenditures, as adjusted for information provided by the localities.

1999 amounts are based on surveys returned by the localities; for localities not returning a survey or not providing the taxes received, the 1999 amount is estimated based on prior years.

Localities in *italics* did not return the survey.

This schedule does not include towns collecting E911 Wireless taxes that are not in the Comparative Report of Local Government Revenues and Expenditures.

Appendix K

Summary of Revenues and Expenses by Locality
For Localities Responding to APA Survey For the
Fiscal Years 1997-1999

Locality	1999 E911 Taxes	1999 Total Revenues	1999 Total Expenses	1998 E911 Taxes	1998 Total Revenues	1998 Total Expenses	1997 E911 Taxes	1997 Total Revenues	1997 Total Expenses
Cities:									
Alexandria	$ 299,867	$ 299,867	$ 3,601,889	$ 310,561	$ 310,561	$ 2,818,871	$ 294,165	$ 294,165	$ 2,615,821
Bristol	86,046	87,282	120,619	92,172	93,158	111,710	35,778	36,452	22,510
Buena Vista	71,224	167,607	243,230	69,826	165,158	179,820	60,163	57,861	118,959
Charlottesville	346,847	355,285	809,685	337,045	373,307	890,637	371,349	431,127	778,529
Chesapeake	2,057,466	2,057,466	1,977,508	1,807,168	1,807,168	627,635	517,404	517,404	319,531
Colonial Heights	122,536	122,536	92,951	104,332	104,332	104,552	42,791	42,791	93,777
Danville	184,540	1,320,638	1,320,638	515,267	515,267	515,267	415,499	415,499	415,499
Emporia	38,056	38,056	169,141	37,240	37,240	173,445	36,354	36,354	154,277
Fairfax	266,242	266,242	502,588	256,488	256,488	441,886	118,939	118,939	151,587
Franklin	98,987	98,987	94,299	103,828	103,828	84,794	97,890	97,890	27,741
Hampton	2,111,210	2,111,210	1,797,943	1,486,229	1,486,229	1,614,614	1,182,002	1,182,002	1,038,149
Harrisonburg	232,280	250,476	235,372	132,886	132,886	113,064	114,780	114,780	105,751
Hopewell	68,999	68,999	220,482	46,783	46,783	214,521	11,999	11,999	170,724
Lexington	44,012	44,012	213,330	42,794	42,794	153,253	46,390	46,390	158,307
Lynchburg	1,005,684	1,165,918	3,051,690	1,066,527	1,172,401	1,799,112	647,459	1,052,603	1,629,264
Manassas	173,849	173,849	705,950	167,106	167,106	652,853	163,706	163,706	557,188
Manassas Park	56,278	56,278	50,057	57,014	57,014	50,057	61,444	61,444	50,057
Martinsville	178,020	178,020	200,822	175,013	175,013	188,223	79,163	79,163	169,805
Newport News	2,404,268	2,404,268	2,324,586	2,059,326	2,059,326	2,248,632	1,577,780	1,577,780	1,701,078
Norfolk	3,369,220	3,369,220	2,934,580	3,154,713	3,154,713	2,924,762	2,381,819	2,381,819	2,895,993
Norton	16,812	16,812	DNP	20,298	20,298	DNP	17,455	17,455	DNP
Petersburg	265,352	265,352	597,333	260,288	260,288	449,000	158,273	158,273	447,000
Poquoson	152,307	152,307	277,389	152,667	152,667	163,182	147,988	147,988	198,847
Portsmouth	1,087,620	1,215,109	1,215,109	978,931	1,314,992	1,314,992	810,677	1,317,289	1,317,289
Radford	53,507	53,507	20,963	55,900	55,900	43,997	50,427	50,427	24,962
Richmond	DNP	DNP	DNP	2,728,946	2,999,243	2,840,766	2,617,099	2,617,099	2,784,884
Roanoke	1,090,634	1,090,634	2,524,481	942,525	942,525	2,602,995	696,851	696,851	885,176

Appendix K, Continued

Summary of Revenues and Expenses by Locality For Localities Responding to APA Survey For the Fiscal Years 1997-1999

Locality	1999 E911 Taxes	1999 Total Revenues	1999 Total Expenses	1998 E911 Taxes	1998 Total Revenues	1998 Total Expenses	1997 E911 Taxes	1997 Total Revenues	1997 Total Expenses
Salem	146,052	146,052	551,285	153,724	153,724	548,798	139,594	139,594	444,300
Staunton	342,531	342,531	557,162	265,377	265,377	389,296	269,030	269,030	387,617
Suffolk	476,520	476,520	1,207,544	524,854	524,854	952,487	456,602	456,602	261,588
Virginia Beach	5,291,561	6,541,361	6,787,947	5,081,489	6,342,445	5,925,602	4,825,707	5,813,226	5,284,316
Williamsburg	80,000	80,000	380,771	76,273	76,273	312,398	39,860	39,860	[illegible]
Winchester	308,963	497,218	503,974	274,542	900,538	702,592	285,337	485,593	397,530
Counties:									
Albemarle	767,858	887,965	1,788,152	713,508	786,707	740,240	670,511	763,988	723,988
Alleghany	-	-	-	-	-	-	-	-	-
Amherst	191,698	191,698	178,274	156,962	166,962	100,013	149,886	149,886	37,409
Arlington	3,136,460	3,154,902	4,311,394	2,977,891	2,994,977	4,122,385	1,779,636	1,784,415	4,107,863
Augusta	664,071	664,071	822,796	633,104	633,104	2,157,079	576,788	573,788	1,087,489
Bedford	330,785	439,009	982,722	710,278	792,432	1,011,808	614,177	659,131	100,552
Botetourt	[illegible]	[illegible]	[illegible]	287,826	287,826	583,823	327,986	584,958	424,682
Brunswick	172,949	196,041	147,484	165,145	186,145	224,515	160,079	182,579	73,110
Buckingham	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Campbell	469,786	504,830	419,692	480,687	519,140	535,256	438,373	579,666	481,841
Caroline	141,929	275,984	279,815	103,073	103,073	115,562	100,711	100,711	94,132
Carroll	335,345	347,074	432,714	294,603	329,038	344,892	273,787	293,298	279,657
Charles City	39,437	40,570	26,952	37,253	38,182	26,920	35,048	35,654	26,395
Charlotte	128,562	135,886	359,024	115,362	129,393	151,107	113,018	124,345	10,741
Chesterfield	2,837,666	2,838,151	4,145,098	1,762,952	1,768,686	3,877,040	1,401,151	1,401,165	[illegible]
Clarke	153,702	153,702	307,677	116,118	116,118	160,913	69,628	69,628	80,621
Culpeper	306,459	578,990	512,774	318,908	318,903	759,518	316,624	316,624	[illegible]
Cumberland	35,883	35,883	114,222	33,869	33,869	15,377	29,267	29,267	21,018
Dinwiddie	[illegible]	[illegible]	[illegible]	65,858	65,858	10,289	62,778	62,778	[illegible]

Appendix K, Continued

Summary of Revenues and Expenses For Localities Responding to APA Survey For the Fiscal Years 1997-1999

Locality	1999 E911 Taxes	1999 Total Revenues	1999 Total Expenses	1998 E911 Taxes	1998 Total Revenues	1998 Total Expenses	1997 E911 Taxes	1997 Total Revenues	1997 Total Expenses
Essex	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Fairfax	13,790,031	13,790,031	17,053,541	13,172,802	13,172,802	17,397,731	11,685,847	11,685,847	13,588,136
Fauquier	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Floyd	160,348	196,554	197,000	N/A	N/A	N/A	N/A	N/A	N/A
Franklin	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Frederick	399,062	399,062	794,552	333,252	333,252	991,284	DNP	DNP	DNP
Gloucester	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Greensville	46,341	46,341	46,341	44,611	44,611	44,611	43,530	43,530	43,530
Henrico	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Henry	DNP	DNP	DNP	223,883	686,904	739,998	224,165	849,570	692,678
Isle of Wight	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
James City	402,632	402,632	648,677	381,099	381,099	612,185	230,321	230,321	596,494
King George	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
King William	141,669	141,669	17,675	137,229	137,229	36,185	131,279	131,279	193,216
Loudoun	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lunenburg	84,876	94,386	156,575	97,086	105,424	149,514	91,688	97,281	27,562
Mecklenburg	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Montgomery	45,201	165,858	224,463	55,784	147,630	195,215	48,347	133,408	179,869
Nelson	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
New Kent	184,026	184,026	173,452	170,706	170,706	135,415	157,696	157,696	112,988
Northampton	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Orange	201,318	201,318	419,787	175,260	175,260	245,520	151,873	151,873	241,038
Page	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Patrick	204,607	214,965	225,929	190,289	204,412	195,738	187,375	252,509	234,666
Pittsylvania	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Prince George	93,773	93,773	74,251	87,150	87,150	84,260	83,197	83,197	115,497
Prince William	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Pulaski	63,526	63,526	79,423	65,347	65,347	98,739	58,195	58,195	56,124

Appendix K, Continued

Summary of Revenues and Expenses For Localities Responding to APA Survey For the Fiscal Years 1997-1999

Locality	1999 E911 Taxes	1999 Total Revenues	1999 Total Expenses	1998 E911 Taxes	1998 Total Revenues	1998 Total Expenses	1997 E911 Taxes	1997 Total Revenues	1997 Total Expenses
Rappahannock	37,004	37,582	124,200	72,258	72,464	63,600	74,211	74,201	70,100
Richmond	76,674	76,674	144,606	88,040	88,040	42,796	85,964	85,964	9,050
Roanoke	923,815	923,815	594,936	617,818	617,818	507,942	540,525	540,525	315,004
Rockbridge	158,968	158,968	533,749	161,547	161,547	190,979	148,977	148,977	242,549
Rockingham	270,181	302,925	321,992	264,169	374,376	361,893	194,640	403,253	276,555
Shenandoah	413,009	413,009	.363,669	437,006	437,006	337,059	413,836	413,836	300,571
Smyth	284,559	289,849	205,666	278,627	284,456	365,948	350,232	350,232	388,299
Spotsylvania	653,227	653,227	281,619	554,566	554,566	283,326	402,412	402,412	666,340
Stafford	592,868	592,868	1,122,969	568,010	568,010	1,089,709	501,671	501,671	1,019,444
Tazewell	337,156	337,156	467,216	351,814	386,046	342,346	322,769	324,140	342,082
Warren	188,063	188,063	229,485	175,988	175,988	186,814	189,039	189,039	220,026
Westmoreland	98,113	334,389	220,916	80,157	80,157	59,794	77,150	77,150	73,607
Wythe	172,606	172,606	161,781	162,141	162,141	220,764	142,729	142,729	263,465
York	694,096	694,096	848,766	652,909	652,909	546,543	607,097	607,097	559,884
Towns:									
Chincoteague	40,296	52,646	151,229	N/A	N/A	11,067	N/A	N/A	N/A
Christiansburg	62,154	62,154	97,975	56,967	56,967	55,542	54,013	54,013	55,222
Colonial Beach	34,741	34,741	25,669	33,107	33,107	25,590	31,957	31,957	25,560
Farmville	57,523	60,327	46,385	55,689	57,729	43,889	59,699	60,894	43,336
South Boston	56,771	56,771	174,690	58,784	58,784	162,011	59,951	59,951	146,588
Vinton	52,207	52,207	DNP	50,724	50,724	DNP	48,977	48,977	DNP
West Point	39,340	39,340	116,591	30,176	30,176	112,458	29,204	29,204	110,015
Wise	Tax collections are remitted to the County of Wise for operation of the E911 system.								
Wytheville	67,153	67,153	163,042	64,932	64,932	139,383	61,148	61,148	137,926
TOTALS	$ 61,317,473	$ [illegible]	$ 94,108,564	$ 50,923,192	$ [illegible]	$ 35,629,094	$ 50,009,512	$ 56,904,[illegible]	$ 69,393,996

GENERAL ASSEMBLY OF VIRGINIA -- 1998 SESSION

HOUSE JOINT RESOLUTION NO. 215

Directing the Virginia State Crime Commission to study the wireline and wireless 911 and E-911 systems, the #77 service, and the effect of such calls on state and local public safety agencies.

Agreed to by the House of Delegates, March 12, 1998
Agreed to by the Senate, March 10, 1998

WHEREAS, the 911 and E-911 systems, and the #77 service play a significant role in the delivery of emergency and public safety services to the citizens of the Commonwealth; and

WHEREAS, dialing 911 can summons emergency help when a quick response is critical; and

WHEREAS, the E-911 system, an advanced telecommunications system designed to gather pertinent information about an emergency call, automatically displays the caller's telephone number and location, and a list of the police, fire, and medical agencies serving the geographical area of the call; and

WHEREAS, the list of such police, fire, and medical agencies facilitates the dispatch of emergency services even more quickly; and

WHEREAS, although the 911 and E-911 systems are intended to report emergencies, a growing number of persons use these systems to notify authorities or request help for nonemergency situations, which has contributed to congested 911 and E-911 telephone lines; and

WHEREAS, the implementation of #77 to enable citizens to report urgent, but nonemergency problems would alleviate the burden on the 911 and E-911 systems, and improve the response time, effectiveness, and efficiency of the systems; and

WHEREAS, the increased use of cellular phones and other technological changes affecting the use of the 911 and E-911 services by citizens of the Commonwealth may ultimately result in an increased economic impact on localities; and

WHEREAS, local governments do not have a dedicated revenue source to fund wireless (cellular) 911 calls and face critical financing issues as technology advances; and

WHEREAS, there is currently no uniform method of delivering wireless 911 calls to public safety agencies in the Commonwealth; and

WHEREAS, changing technology requires public safety agencies to re-evaluate the means of delivering the services that are requested of them by citizens who call 911, E-911, and #77; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the Virginia State Crime Commission be directed to study the wireline and wireless 911 and E-911 systems, the #77 service, and the effect of such calls on state and local public safety agencies. The Commission shall determine (i) which jurisdictions in the Commonwealth do not have wireline and wireless E-911 services and what actions are necessary to provide such service in those jurisdictions; (ii) the impact of federal regulations in the Federal Communications Commission docket order 94-102 on localities; (iii) the impact of wireless 911 services on the Department of State Police; (iv) the management of wireless 911 calls in other states; (v) the impact of the wireless 911 and E-911 systems on the wireline 911 and E-911 systems; (vi) the most efficient funding mechanisms for wireline and wireless 911 and E-911 systems; (vii) the extent to which common management of the wireline and wireless 911 and E-911 systems can maximize the economic and operational efficiencies of both systems; and (viii) the current volume of 911, E-911, #77, and wireless 911 calls in the Commonwealth and the projected volume through the year 2005.

The Commission shall recommend (i) how to improve the 911 and E-911 systems, and ways to promote the use of #77 among citizens for nonemergency services, (ii) how to provide wireline and wireless E-911 services in jurisdictions that do not have such service, (iii) ways to mitigate the economic impact on localities of complying with the Federal Communications Commission docket order 94-102, (iv) how to fund most efficiently the wireline and wireless 911 and E-911 systems, and (v) how to manage any increased responsibility that the Department of State Police may incur due to an increase in the volume of 911, E-911, and #77 calls.

The Commission shall consult with the Department of State Police, the State Corporation Commission, the Department of Emergency Services, and the Office of the Attorney General in

conducting this study.

The Commission shall complete its work in time to submit its findings and recommendations to the Governor and the 2000 Session of the General Assembly as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents.

VIRGINIA STATE CRIME COMMISSION
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