Montgomery County 9-1-1 Consolidation Report

Strengthening Montgomery County's 9-1-1 Systems - Together

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Glossary of commonly used acronyms

CAD	Computer Aided Dispatch - A computer based system, which aids PSAP Telecommunicators by automating selected dispatching and record keeping activities.
CPE	Customer Premise Equipment - Communications or terminal equipment located in the customer's facilities – Terminal equipment at a PSAP.
EMS	Emergency Medical Services - Rapid, field-delivered medical services via ambulance. Paramedics, EMTs, etc.
PEMA	Pennsylvania Emergency Management Agency
PSAP	Public Safety Answering Point - A set of call takers authorized by a governing body and operating under common management which receives 9-1-1 calls and asynchronous event
RDP	Remote Dispatch Point - An agency that does not receive 9-1-1 calls directly, but dispatches a local resource, such as a police department.
VoIP	Voice Over Internet Protocol - Provides distinct packetized voice information in digital format using the Internet Protocol. The IP address assigned to the user's telephone number may be static or dynamic. Examples: Comcast Digital Voice, FIOS, Vonage

BACKGROUND

As the Commonwealth of Pennsylvania faces a $3 billion shortfall in revenues for the year, so too does the Department of Public Safety confront a similar predicament in the balance of its 9-1-1 funding. As Act 78 – the legislation that provides funding from wireless phones – is due to expire June 30th, 2009, the Department of Public Safety finds itself facing the potential loss of more than $5 million annually from its operating budget. Regardless of the outcome of Act 78, wireless funding is not guaranteed year after year, and is based on an application process. As all but two counties in the Commonwealth deploy wireless 9-1-1 technology, wireless carriers may begin to seek reimbursement for their costs as well, draining funds from counties.

This comes at a time when the Department of Public Safety is yet again challenged with a deficit budget, estimated to be at least $1.1 million for the 2010 budget year due to declines in revenue from traditional "wired" telephones, as well as dramatic increases in technology costs.

As each of these issues converges at a time of global economic strain, the Department is compelled to review all areas of its largest budget line item – the provision of 9-1-1 services in Montgomery County. Through only a cursory inspection, one can quickly conclude that a great degree of duplication exists within and across geo-political boundaries in the county. The fundamentals are clear – increased consolidation of services will not only mean a positive fiscal outlook, but will result in improved inter-agency coordination, improved officer/citizen safety, faster delivery of public safety services, and the ability to offer enhanced technology and services to all first responders throughout Montgomery County.

The impetus to reduce remote dispatch points and public safety answering points is well-rooted in legislation, as well. Pennsylvania Act 17 states, with regard to county 9-1-1 plans, "PSAPs and dispatch centers shall be limited to one per county plan, unless geographical and technological considerations require otherwise." In the following pages it will be shown that neither geographical nor technological considerations exist in the 9-1-1 landscape throughout Montgomery County, and that a path forward to consolidation has benefits throughout the first responder community.

Overview

Currently, throughout Montgomery County, a citizen that dials 9-1-1 may speak to two or more telecommunicators before reaching someone that can provide life-saving instructions and dispatch needed help. Residents are served by no less than fourteen different dispatch centers, each with varying degrees of staffing, training, and technology.

The Department of Public Safety believes that a consolidation of services will bring a number of positive benefits not only to the users of 9-1-1 services, but also to the first responders. The potential benefits of consolidation include:

- **Improved officer/citizen safety** by eliminating life-threatening delays caused by transferred calls, and enabling better inter-agency coordination.
- **Dramatic cost savings** for individual municipalities in salaries, benefits, and the cost of operations.
- **More swift adoption and implementation** of new technologies enabled by economies of scale.
- **Improved performance** from a much larger, well-trained staff of telecommunicators.
- **The ability to offer new technology to all** first responders, countywide, due to considerable fiscal savings.

It is well recognized, that the term "consolidation" brings with it concerns such as loss of autonomy, lack of geographic familiarization, loss of quality control, personnel layoffs, and the inability of the consolidated operation to adapt to unique operating procedures and methods. Each of these concerns, and others, are addressed later in the report, with recommendations and potential solutions. The Department of Public Safety acknowledges that these are real and valid concerns, and believes that an open, cooperative, and collaborative approach throughout the process will result in a substantial benefit to all of the parties involved.

The suggested steps toward consolidation in this report are not typical, however. In a typical consolidation scenario, municipalities that are entirely autonomous – that is, they process their own 9-1-1 calls, and dispatch their own police, fire, and EMS resources – are considered for consolidation into a larger city or county operation. The oft-cited concerns previously suggested – loss of quality control, lack of geographic familiarization, etc. – should not be as prevalent in Montgomery County.

At present, the Department of Public Safety dispatches all EMS and fire units on a daily basis, and provides a computer aided dispatch system which interconnects all of the Public Safety Answering Points (PSAPs) and Remote Dispatch Points (RDPs) throughout the county. Furthermore, nearly every police vehicle in the county is equipped with an interconnection to the countywide CAD system, with fire and EMS units joining the system at a rapid pace.

Montgomery County is *essentially* consolidated, with less than 8% of calltaking de-centralized, and a small minority of individual police agencies self-dispatching. Of the 169 police, fire, and EMS agencies throughout the county, the Department of Public Safety is entirely responsible for 156 of them – more than 92%. This minority de-centralization, however, results in an extraordinary fiscal impact to both the Department of Public Safety, and ultimately to each and every first responder throughout the county.

So, too, does a typical consolidation often point to concerns of inadequate staffing levels of the primary agency, though staffing levels at the Department of Public Safety are at their highest levels in its history. The Department of Public Safety's Communications Division is well-equipped to comfortably assume both the calltaking and dispatch operations of all thirteen PSAPs and RDPs in the county.

Department telecommunicators are highly trained, undergoing at least ten weeks of initial classroom training, followed by up to four months of on-the-job mentoring and coaching with a highly-skilled veteran. Throughout their careers, department telecommunicators attend quarterly training seminars in which they are introduced to new policies, procedures, and technologies. In addition, the operating budget for telecommunicator training in 2009 was $128,100, which was invested in numerous professional development programs.

Recommendations

The Department of Public Safety believes that the following recommendations, once fully implemented, will result in clear and overwhelming benefits to the residents of Montgomery County and the public safety community as a whole:

1. **The three remote PSAPs in the county should be consolidated into a single, unified calltaking operation at the Department of Public Safety.**

   The following items are stark justification of this recommendation as an immediate, priority goal:

   - **Minimized life-threatening 9-1-1 call transfers.**

     Centralizing calltaking operations to the Department of Public Safety would require no financial investment from the Department nor the municipality, and could be accomplished with minimal effort.

- **Drastic Fiscal Savings.**

  Once fully consolidated, the Department and first responder community would realize an annual savings of at least $600,000.

- **Reduced technical and procedural complexities.**

  A complex system of determining the proper routing of an emergency call based on the delivery method – wireline, wireless, voice-over-internet, etc. – on the incident type, and on the location of the incident would be eliminated.

- **Re-investment of financial savings for countywide responder benefit**

  Tremendous financial savings realized by consolidation could be re-invested in improvements and upgrades to existing countywide systems for the benefit of all first responders – police, fire, and emergency medical.

  Countywide police, fire, and EMS responders would benefit from:

  - Enhanced 800 MHz Public Safety Radio Network
  - Widely deployed Mobile Data Computers
  - Full-featured police records management system with pre-populated CAD data
  - Advanced Digital portable radios and accessories
  - Tone/voice pagers

  These improvements could be funded in large part by the savings achieved from the consolidation of services described in this study.

2. **Dispatch operations for all Montgomery County police agencies should be consolidated into a single, unified operation at the Department of Public Safety.**

   In much the same manner as the three remote PSAPs, the costs related to the on-going, financial support of individual dispatch operations throughout the county weaken reserves which could be used for improvements and upgrades to countywide systems for the benefit of all first responders.

   The services that the thirteen Remote Dispatch Points provide to residents are currently available – without cost – from the Department of Public Safety.

   A complete consolidation of these agencies would result in an annualized savings of at least $515,000.

3. **Until fully implemented, institute a cost-recovery mechanism for any and all costs related to duplicative services.**

   In coming years, all countywide responders will benefit from several large-scale projects currently in planning. These projects bear a significant financial cost. The costs to subsidize individual Remote Dispatch Points solely benefit the agency served, and are entirely duplicative of services already provided without cost from the Department of Public Safety. As such, agencies that wish to continue this practice should assume the entire financial burden at the start of the 2010 calendar year.

9-1-1 IN MONTGOMERY COUNTY

The current configuration of 9-1-1 calltaking and dispatch operations in Montgomery County can best be described as complex and disparate. A network of different agencies provide some or a part of the calltaking and dispatch processes, depending on the location of the incident, the delivery method of the call (wireless, wireline, Voice-over-IP), and the type of incident that the caller is reporting. An emergency call may be initially received by one agency, but after a short period of interrogation may be transferred to another agency to complete the calltaking and to dispatch appropriate first responders.

Demographics and Geo-political boundaries

Montgomery County is comprised of 62 separate municipalities – 38 townships and 24 boroughs. These political regions are served by 94 fire companies (112 stations), 24 primary ambulance squads (43 stations), and 51 police departments. The 483 square miles of the county are home to more than 785,000 full-time residents.

9-1-1 Call Delivery

In order to better understand the complexities of the current 9-1-1 call delivery configuration in Montgomery County, it is instructive to understand some basic definitions. In the county, agencies may be separated into two categories: Primary Public Safety Answering Points (PSAPs) or Remote Dispatch Points (RDPs).

The Federal Communications Commission defines a primary PSAP is as an agency to which 9-1-1 calls are routed directly from the 9-1-1 Control Office, without any other intervention or transferring. The first agency that a caller is connected to after dialing 9-1-1 is the primary PSAP.

A Remote Dispatch Point, on the other hand, is any agency that either receives transferred calls from a primary PSAP, and/or provides radio dispatching of police, fire, or emergency medical units for a particular municipality.
Montgomery County is comprised of four primary PSAPs:

- Department of Public Safety
- Abington Township
- Cheltenham Township
- Lower Merion Township

There are additionally eleven Remote Dispatch Points:

- Horsham Township
- Lower Providence Township
- Montgomery Township
- Plymouth Township
- Pottstown Borough
- Pennsylvania State Police
- Springfield Township
- Upper Dublin Township
- Upper Merion Township
- Upper Moreland Township
- Whitemarsh Township

9-1-1 calls may be segregated in to one of four types:

- **Wireline 9-1-1 calls** – These calls originate from traditional "wired" telephones, and formed the basis for 9-1-1 service in the United States before wireless (cellular) phones.

- **Wireless 9-1-1 calls** – The calls originate from wireless phones/devices, such as cellular/mobile phones, Blackberry® devices, iPhones®, and other mobile-cellular equipment.

- **Voice-Over-Internet-Protocol (VoIP) 9-1-1 calls** – These calls originate from Internet-connected devices and services, such as Comcast Digital Voice®, Vonage, Skype, MagicJack, and others.

- **Telematics 9-1-1 calls** – These calls originate from vehicles equipped with emergency notification equipment, such as OnStar, ATX, and Hughes. While these calls originate from the vehicle as a cellular/mobile phone call, and are delivered to the PSAP by VoIP, they are frequent enough to warrant a unique category among 9-1-1 call types.

Of these types of 9-1-1 calls, only one PSAP or RDP – The Department of Public Safety – receives and processes all four. None of the Remote Dispatch Points process nor directly receive any of these calls, and of the three remaining PSAPs (Abington, Cheltenham, Lower Merion) each processes only one of the four types – wireline 9-1-1 calls.

Absent the ability of a PSAP or RDP to processes – from initial call to dispatch – all four types of emergency calls, a complex system of rules, policies, and technology is put in place to funnel calls to the appropriate agencies depending on the delivery method, the type of call, and the location of the incident.

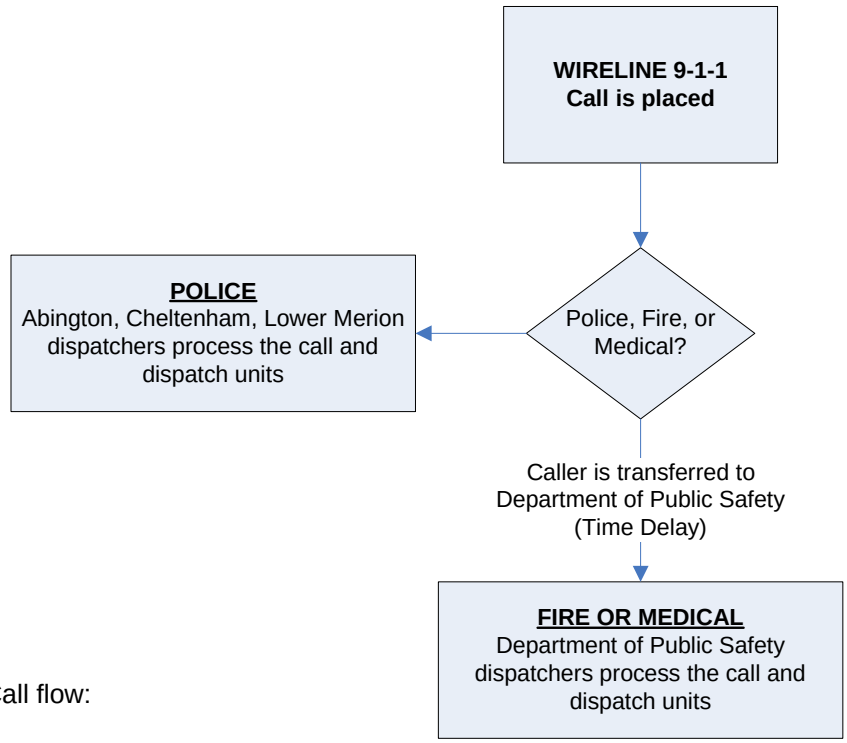
Table 1 shows the capabilities of each PSAP or RDP, as they relate to the different call delivery methods and types of incidents.

Table 1. PSAP and RDP Capabilities

	Answers Wireless 9-1-1 Calls?	Answers Wireline 9-1-1 Calls?	Dispatches Police?	Dispatches Fire?	Dispatches EMS?	Answers Telematics or VoIP Calls?
DEPARTMENT OF PUBLIC SAFETY	YES	YES	YES	YES	YES	YES
ABINGTON TWP POLICE DEPT	NO	YES	YES	NO	NO	NO
CHELTENHAM TWP POLICE DEPT	NO	YES	YES	NO	NO	NO
HORSHAM TWP POLICE DEPT	NO	NO	YES	NO	NO	NO
LOWER MERION TWP POLICE DEPT	NO	YES	YES	NO	NO	NO
LOWER PROVIDENCE TWP POLICE DEPT	NO	NO	YES	NO	NO	NO
MONTGOMERY TWP POLICE DEPT	NO	NO	YES	NO	NO	NO
PLYMOUTH TWP POLICE DEPT	NO	NO	YES	NO	NO	NO
POTTSTOWN BORO POLICE DEPT	NO	NO	YES	NO	NO	NO
SPRINGFIELD TWP POLICE DEPT	NO	NO	YES	NO	NO	NO
UPPER DUBLIN TWP POLICE DEPT	NO	NO	YES	NO	NO	NO
UPPER MERION TWP POLICE DEPT	NO	NO	YES	NO	NO	NO
UPPER MORELAND TWP POLICE DEPT	NO	NO	YES	NO	NO	NO
WHITEMARSH TWP POLICE DEPT	NO	NO	YES	NO	NO	NO

Given the complicated nature of call processing in Montgomery County, and the varying capabilities of PSAPs and RDPs alike, the following flow charts show graphically how a caller to 9-1-1 could expect to have an emergency call processed.

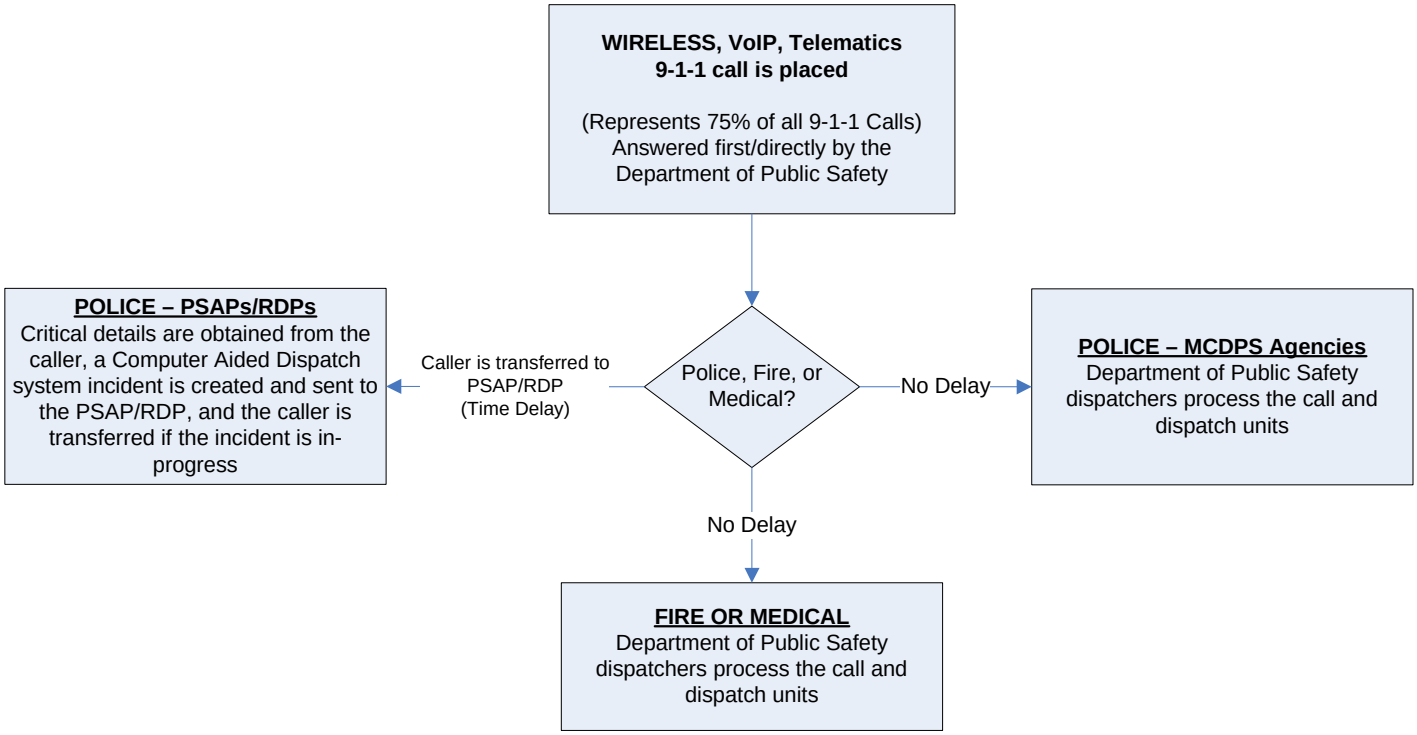
Figure 1. Call Flow - Wireline 9-1-1 from Abington, Cheltenham, Lower Merion Townships



Call flow:

1. A citizen places a 9-1-1 call from a traditional, wired telephone.
2. If the call originates from the boundaries of Abington, Cheltenham, or Lower Merion Townships, it is routed to one of these three respective PSAPs.
3. The nature of the call must first be determined.
    a. If the call is of a *police* nature, the PSAP will process the call, and dispatch the appropriate police units – **No Delay.**
    b. If the call is of a *fire or emergency medical nature*, the telecommunicator must verify the caller's information, obtain the nature of the incident, and then transfer the caller to the Department of Public Safety – **This results in an unnecessary delay.**
4. At the Department of Public Safety, telecommunicators again verify the caller's information (name, location, cross streets) and again obtain the nature of the incident. These steps are necessary to ensure that the call has been correctly transferred, and that units are dispatched to the correct location.
5. Department of Public Safety telecommunicators then dispatch the appropriate fire or EMS units to the caller's location.

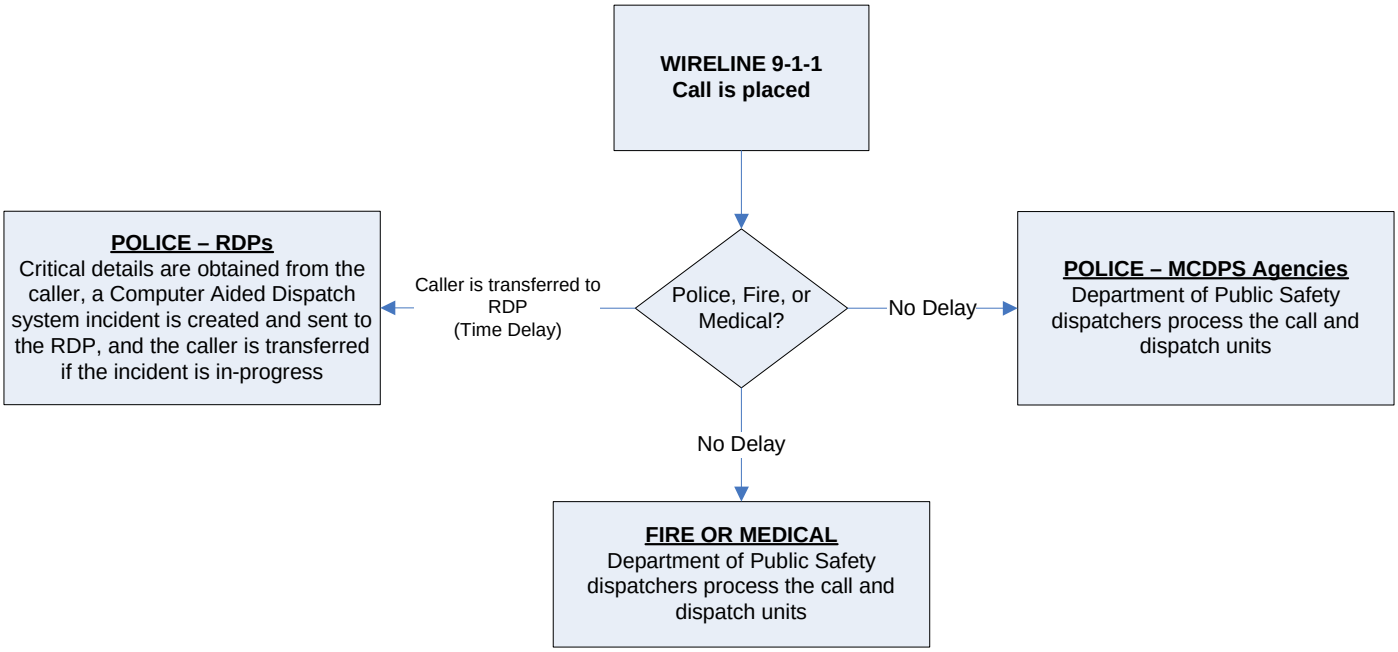
Figure 2. Call Flow - Wireless, VoIP, or Telematics 9-1-1 Call Placed from any location within Montgomery County



Call flow:

1. A citizen places a 9-1-1 call from a wireless telephone, a Voice-over-IP telephone (Comcast, Vonage, etc.) or a Telematics device (OnStar, ATX, Hughes).
2. Regardless of the originating location of the call, these three types are routed directly and first to the Department of Public Safety, and *represent more than 75% of all 9-1-1 calls placed in Montgomery County.*
3. The nature of the call must first be determined.
    a. If the call is of a *police* nature, and for a municipality that the Department of Public Safety provides service, the call is processed and a DPS telecommunicator dispatches the appropriate police units – **No Delay.**
    b. If the call is of a *police* nature, and for a municipality that the Department of Public Safety *does not* provides service, the telecommunicator must verify the caller's information, obtain the nature of the incident, create a Computer Aided Dispatch system entry, and then transfer the caller to the PSAP/RDP if the incident is deemed "in-progress" - **This results in an unnecessary delay.**
    c. If the call is of a *fire or emergency medical nature*, the call is processed and a DPS telecommunicator dispatches the appropriate fire or emergency medical units – **No Delay.**

Figure 3. Call Flow - Wireline (Traditional) 9-1-1 Call Placed from 59 of 62 Municipalities – excluding Abington, Cheltenham, or Lower Merion Townships



Call flow:

1. A citizen places a 9-1-1 call from a traditional, wired telephone in 59 of the 62 municipalities – excluding Abington, Cheltenham, and Lower Merion Townships.
2. The nature of the call must first be determined.
3. If the call is of a *police* nature, and for a municipality that the Department of Public Safety provides service, the call is processed and a DPS telecommunicator dispatches the appropriate police units – **No Delay.**
4. If the call is of a *police* nature, and for a municipality that the Department of Public Safety *does not* provides service, the telecommunicator must verify the caller's information, obtain the nature of the incident, create a Computer Aided Dispatch system entry, and then transfer the caller to the RDP if the incident is deemed "in-progress" - **This results in an unnecessary delay.**
5. If the call is of a *fire or emergency medical nature*, the call is processed and a DPS telecommunicator dispatches the appropriate fire or emergency medical units – **No Delay.**

AUTHORITY AND BACKGROUND

In 1990, the Pennsylvania General Assembly declared it in the public interest to provide the toll free number 9-1-1 for an individual within the Commonwealth to gain rapid, direct access to emergency aid.

The Public Safety Emergency Telephone Act, 35 P.S. §§ 7011-7021, as amended, ("the Act") became effective September 7, 1990, and provided for a statewide 9-1-1 emergency communication system whereby a person dialing "9-1-1" by telephone can be connected to a public safety answering point for the reporting of police, fire, medical or other emergency situations. Under the original Act, the Department of Community Affairs administered the program while the Pennsylvania Emergency Management Agency (PEMA) provided technical oversight.

The Act's preamble, which provides the legislative intent of the General Assembly, states the following:

> The General Assembly declares it to be in the public interest to provide a toll free number 911 for any individual within this Commonwealth to gain rapid, direct access to emergency aid. The number shall be provided with the objective of reducing response time to situations requiring law enforcement, fire, medical, rescue or other emergency service. It is the further intent of the General Assembly that authority and responsibility for the creation and implementation of a plan establishing, operating and maintaining adequate facilities for answering emergency calls and dispatching a proper response to the callers' needs shall be vested in the county government. Each county is encouraged to implement a 911 emergency communication system and to consider maximum integration of telecommunications facilities and capabilities within their planning, in order to economize the costs, as well as to effect a more rapid response capability.

The Act allows counties to recover the nonrecurring and the recurring costs of a 9-1-1 system by means of a fee assessed against a telephone subscriber. This fee is known as the contribution rate and is collected by the Local Exchange Carriers ("LEC"). The Act specifically states that "[t]he money collected from the contribution rate is a county fee collected by the telephone company." [Emphasis added].

Act 17 of 1998 amended Act 78 of 1990 by providing definitions for the powers and duties of PEMA and the Pennsylvania Public Utility Commission (PUC). In addition, this amendment provided definition for County Plans, training, and telephone records.

On August 11, 2000, regulations defined under Act 17 were implemented. 4 Pa. Code §120 b, c, and d established technical standards, personnel certification and training standards and quality assurance standards for all 9-1-1 systems and employees that operate and work respectively in jurisdictions under Act 78 as amended.

4 PA. Code Chapter 120b., *Public Safety Emergency Telephone Program*, specifically §120b.104. Technical standards for plans, section (b)(1), states,

> "To maximize efficiencies of communications and minimize operations/capital expenditures, PSAPs and dispatch centers shall be limited to one per county plan, unless geographical and technological considerations require otherwise.

> Counties shall provide supporting justification for additional PSAPs and dispatch centers included in the county plan. PSAPs and dispatch centers may be reduced over a multi-year period to minimize disruptions of existing communications systems."

4 PA. Code Chapter 120b., *Public Safety Emergency Telephone Program*, specifically §120b.104. Technical standards for plans, section (b)(2), states,

> "At a minimum, a 911 PSAP established within this Commonwealth shall possess the following capabilities: (i) The law enforcement, fire protection, emergency medical services, rescue services and advanced life support services within the boundaries of the political subdivision shall be included."

In December 2003, Governor Edward G. Rendell signed into law Act 56, which further amended Act 78 to allow for the collection of $1/per device, per month from all residents who own cellular devices capable of placing a 9-1-1 call. This surcharge is collected by the wireless service providers and remitted to the State Treasury for administration by PEMA. Counties/Cities operating a recognized 9-1-1 system must apply for those funds to develop and maintain an integrated wireless E-911 system. PEMA serves as the oversight for technical, planning, financial and training services and provides support in those areas for Counties/Cities to improve this service to residents and visitors.

Analysis of Surrounding Counties

Of the counties that surround Montgomery County, none have a system of call delivery and dispatch as complex and duplicative. Table 2 shows the number of PSAPs and RDPs, per county. It should be clear from this chart that Montgomery County is in a unique position, and maintains a system that is unlike any other in the area.

In recent years, Delaware County, which was once de-centralized with numerous PSAPs and RDPs, is on the verge of being a single, unified operation in September when Media Borough transitions their services to the county.

Table 2. PSAPs and RDPs of Surrounding Counties

	Number of PSAPs	Number of Remote Dispatch Points*
Lehigh County	**2**	**2**
Bucks County		
Chester County	**1**	**1**
Delaware County	**1†**	**0**
Montgomery County	**4**	**13**

Notes:
* The Pennsylvania State Police are excluded.
†Media Borough to be consolidated 9/2009

{ Portions of this section courtesy the Pennsylvania Emergency Management Agency and the Pennsylvania Public Utility Commission }

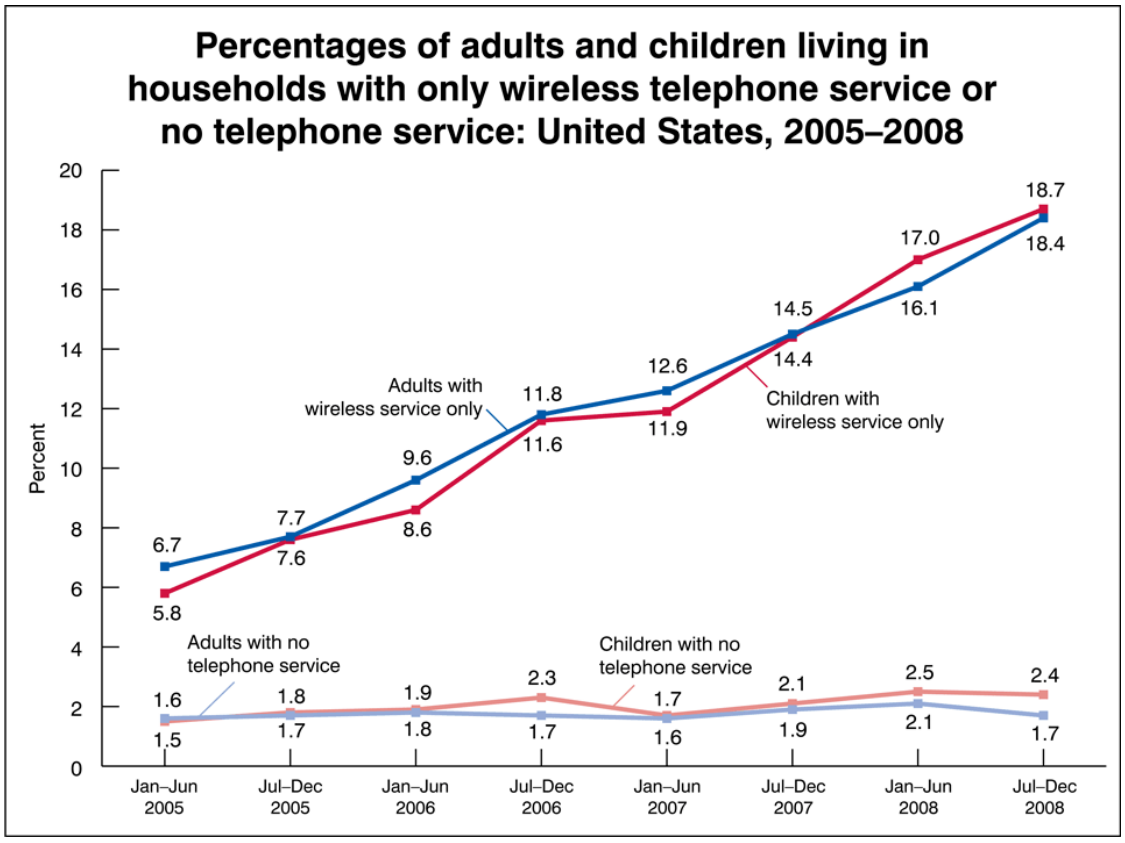
ANALYSIS

Background – Public Safety Answering Points

Before the analysis of call counts, utilization, and cost-per-call can be started, it is important to understand and acknowledge the changing landscape of phone usage not only in Montgomery County, but throughout the United States. In December, 2008, the Centers for Disease Control released a study entitled, "*Wireless Substitution: Early Release of Estimates From the National Health Interview Survey, January-June 2008.*" The preliminary results of this study indicate that during the three year study period, the number of adults that had wireless service only – no landline/wireline phone service – grew from 6.1 percent to 16.1 percent. In addition, 13.3 percent of all American homes reported that they received all or almost all of their calls on a wireless phone, despite having a wireline phone in the home.

These results are in-line with the trend that is taking place in Montgomery County, as well. On a month after month basis, the revenue received from wireline subscribers continues to drop at a steady pace, while at the same time the number of wireless calls received as a percentage of all 9-1-1 calls continues to rise. There is no question that at the inception of 9-1-1 service in Montgomery County – in 1993 – a large percentage of 9-1-1 calls were being processed by the three remote PSAPs. Although reliable Montgomery County call data is not available dating back to that time, it is safe to presume that wireless phone usage was not nearly as prevalent in 1993 and later years as it is today. As Figure 8 shows, the estimated number of wireless subscribers in December, 1993 was only 16 million, as compared to more than 270 million fifteen years later. Reliable data from just the past seventeen months – January, 2008 to May, 2009, shows a dramatic increase in the percentage of wireless 9-1-1 calls in Montgomery County, from 59% to 66%.

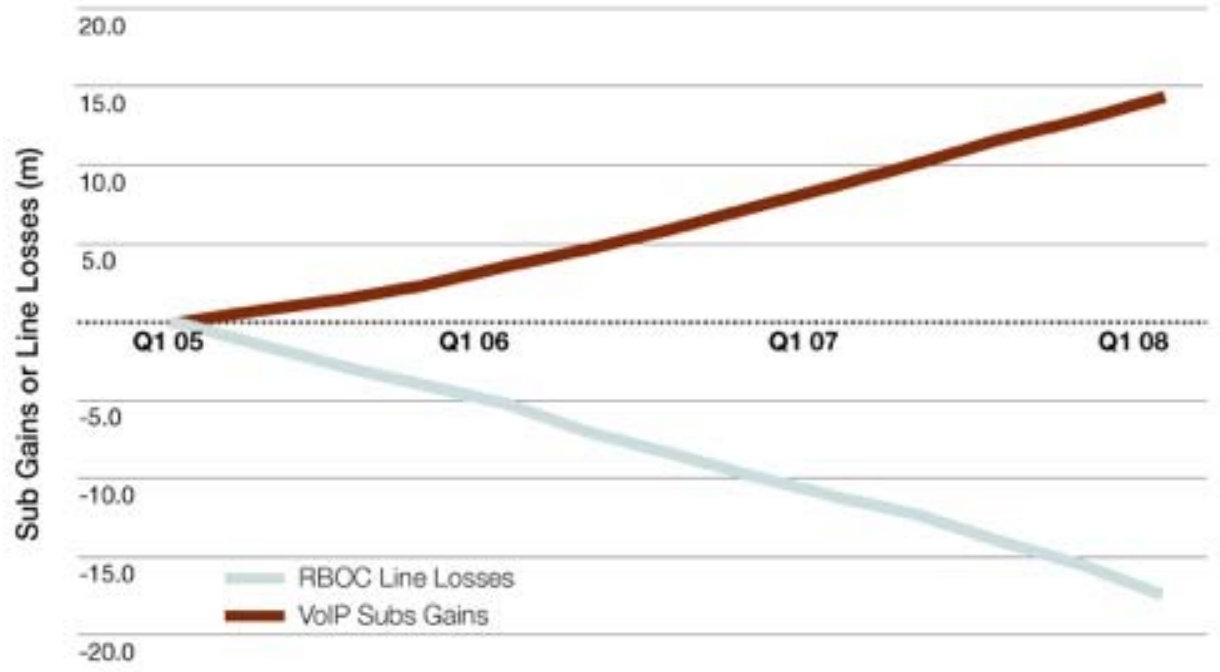
Figure 4. Percentage of adults and children with only wireless service



Similarly, users are transitioning not only from traditional wireline telephone service to wireless service, but also from traditional wireline telephone service to voice-over-IP (Internet) service. As Figure 5 shows, below, the number of subscribers dropping traditional wireline service in favor of VoIP service has grown by nearly 15 million in just three years since 2005. These losses, too, are impacting the utilization and cost effectiveness of the three remote PSAPs in Montgomery County. Again, there should be no question that VoIP service, let alone subscriber and revenue losses, were not an issue in 1993 at the inception of 9-1-1 service in Montgomery County.

The overall interpretation and conclusion that is drawn from these data should be clear: The utilization and workload of a PSAP that receives and processes only wireline 9-1-1 calls is rapidly diminishing – if it has not already arrived – at a point that is unsustainable. The increases in wireless and VoIP usage will only continue to grow, and the losses of traditional wireline subscribers will continue to diminish. As the fiscal analysis of this section will reveal, the cost-per-call associated with the three remote PSAPs in Montgomery County, on average, *is 13 times greater than that of the Department of Public Safety.*

Figure 5. Voice-over-Internet Subscriber Gains versus Traditional Wireline Telephone Subscriber Losses



Overview of Call Counts

As described earlier in this report, the call flow of a 9-1-1 call in Montgomery County is complex. Calls may arrive at one of four different PSAPs, they may be wireless or wireline, and they may be transferred either to or from the Department of Public Safety depending on the incident type. The interpretation and analysis of the associated call counts for 9-1-1 calls is no less complex.

Every effort has been made to fairly and accurately represent the true and correct call counts, giving credit to the PSAP that "processes" the call rather than simply stating a raw call count. For example, a wireless call that is received by the Department of Public Safety, but is transferred to one of the remote PSAPs for processing is considered *only* in the remote PSAP's call count. Since the majority of the workload would lie with the remote PSAP, that agency should receive credit for the associated call. In the same way, if a wireline call originates from one of the remote PSAPs for a medical emergency, and is transferred to DPS, credit for the call is given to DPS as the majority of the workload would lie with DPS.

The following pages contain several charts and explanations:

- **Comprehensive 9-1-1 Call Counts for All Montgomery PSAPs, DPS – Abington – Cheltenham – Lower Merion.** This chart is a complete representation of the raw and adjusted call counts for all phases of 9-1-1 calls in Montgomery County during the last seventeen months. It should be clearly noted that three columns, marked with *** ADJ** represent an interpolated, approximate value of the real call counts. A further call-by-call analysis is being performed to determine the exact percentage of transferred calls, by PSAP, though initial results show the margin of error to be less than ±6 percent.

- **Explanation of Call Count Fields**. A detailed description of each field is provided, as well as any assumptions or calculations that were made.

- **Example of Call Count Calculation – One Month.** Given the complex nature of 9-1-1 call flow, each of the steps in the calculations that were made are provided in order to fully disclose the true and accurate nature of the conclusions that are drawn.

- **Percentage of PSAP Utilization –** This chart and explanation show the total percentage of all 9-1-1 calls in the county, by remote PSAP, and how they individually contribute to the total 9-1-1 workload.

Comprehensive 9-1-1 Call Counts for All Montgomery PSAPs
DPS – Abington – Cheltenham – Lower Merion

		MC 911	MC 911 WRLS	ABGN CHEL LMER XFRS IN	MC TOTAL 911	XFRS TO ABGN	XFERS TO CHEL	XFRS TO LMER	ABGN 911	ABGN *ADJ	CHEL 911	CHEL 911 *ADJ	LMER 911	LMER 911 *ADJ
2008	Jan	9633	16219	618	25340	177	165	170	920	720	755	591	1168	914
	Feb	9106	16179	653	24820	145	168	152	891	685	769	591	1165	896
	Mar	9343	17724	616	26572	175	174	146	928	730	788	620	1175	925
	Apr	9118	17641	592	26203	186	197	173	928	739	748	596	1231	980
	May	9706	18948	642	28043	206	222	183	990	768	784	608	1093	848
	Jun	10047	19991	604	29422	214	222	180	1049	847	770	622	1318	1064
	Jul	9862	20917	601	30268	152	191	168	958	763	790	629	1206	961
	Aug	9206	19647	570	28244	207	230	172	897	716	785	627	1147	916
	Sep	9108	18365	541	26861	193	229	190	894	730	797	651	1253	1023
	Oct	9201	19792	572	28423	193	194	183	978	791	828	670	1185	958
	Nov	8426	18390	533	26258	210	180	168	910	741	795	647	1164	948
	Dec	9375	20163	779	29012	166	183	177	933	696	894	667	1237	923
2009	Jan	8746	17883	1171	26170	151	163	145	866	511	809	478	1184	699
	Feb	7703	15782	600	23091	135	163	96	956	773	781	631	1393	1126
	Mar	8543	17873	629	25932	167	164	153	910	700	750	577	1067	821
	Apr	8379	18697	619	26528	211	182	155	943	748	766	608	1286	1020
	May	8850	20234	618	28514	205	202	163	884	686	733	569	1148	891

Table 3. Comprehensive 9-1-1 Call Counts for All Montgomery PSAPs

Explanation of Call Count Fields

1. **MC 911** – This number represents the *raw* total number of **wireline** 9-1-1 calls received at DPS.
2. **MC 911 WRLS** – This number represents the *raw* total number of **wireless** 9-1-1 calls received at DPS.
3. **ABGN CHEL LMER XFRS IN** – This number represents the *raw* total number of 9-1-1 calls transferred to DPS via trunks solely for the use of those PSAPs. There is no method to differentiate the total number per PSAP that arrive on those trunks, so a simple total is shown.
4. **MC TOTAL 911** – This number represents the total number of **wireless and wireline** 9-1-1 calls received at DPS, minus the total number of calls transferred to Abington, Cheltenham, and Lower Merion. This is the *total* number of 9-1-1 calls that were handled by DPS.
5. **XFERS TO ABGN** – This number represents the total number of **wireless or wireline** 9-1-1 calls that were transferred to Abington Township. The assumption is made that the vast majority are wireless, as the number of wireline mis-routes is typically very small.
6. **XFERS TO CHEL** – This number represents the total number of **wireless or wireline** 9-1-1 calls that were transferred to Cheltenham Township. The assumption is made that the vast majority are wireless, as the number of wireline mis-routes is typically very small.
7. **XFERS TO LMER** – This number represents the total number of **wireless or wireline** 9-1-1 calls that were transferred to Lower Merion Township. The assumption is made that the vast majority are wireless, as the number of wireline mis-routes is typically very small.
8. **ABGN 911** – This number represents the *raw* total number of **wireless or wireline** 9-1-1 calls that were received by Abington Township. This number includes calls that were transferred FROM DPS, and TO DPS.
9. **ABGN *ADJ** – This number represents the *adjusted* total number of **wireless or wireline** 9-1-1 calls that were received by Abington Township. This number is adjusted for the portion of all calls transferred to DPS from Abington Township, on average.
10. **CHEL 911** – This number represents the *raw* total number of **wireless or wireline** 9-1-1 calls that were received by Cheltenham Township. This number includes calls that were transferred FROM DPS, and TO DPS.
11. **CHEL *ADJ** – This number represents the *adjusted* total number of **wireless or wireline** 9-1-1 calls that were received by Cheltenham Township. This number is adjusted for the portion of all calls transferred to DPS from Cheltenham Township, on average.
12. **LMER 911** – This number represents the *raw* total number of **wireless or wireline** 9-1-1 calls that were received by Lower Merion Township. This number includes calls that were transferred FROM DPS, and TO DPS.
13. **LMER *ADJ** – This number represents the *adjusted* total number of **wireless or wireline** 9-1-1 calls that were received by Lower Merion Township. This number is adjusted for the portion of all calls transferred to DPS from Lower Merion Township, on average.

Example of Call Count Calculation – May, 2009

1. **MC 911** – 8,850 total 9-1-1 calls were received on the wireline 9-1-1 trunks at the Department of Public Safety.
2. **MC 911 WRLS** – 20,234 total 9-1-1 calls were received on the wireless 9-1-1 trunks at the Department of Public Safety.
3. **ABGN CHEL LMER XFRS IN** – 618 total 9-1-1 calls were received from Abington, Cheltenham, and Lower Merion PSAPs on trunks specifically reserved for these three PSAPs. Since these calls were transferred from the remote PSAPs, they are assumed to have originated from wireline subscribers, and to be of a medical or fire nature.
4. **MC TOTAL 911** – 28,514 total 9-1-1 calls were processed by the Department of Public Safety. This total is derived by:

	8,850	total wireline 9-1-1 calls received at DPS
+	20,234	total wireless 9-1-1 calls received at DPS
-	205	total 9-1-1 calls transferred to Abington Twp.
-	202	total 9-1-1 calls transferred to Cheltenham Twp.
-	163	total 9-1-1 calls transferred to Lower Merion Twp.
	28,514	total 9-1-1 calls processed by DPS

Equation 1. Call Counts - MC Total 911

5. **XFERS TO ABGN** – 205 total calls, either wireline, wireless, or VoIP were transferred to Abington Township. Since these calls were processed by Abington Township, they are removed from the total count of 9-1-1 calls processed by DPS.
6. **XFERS TO CHEL** – 202 total calls, either wireline, wireless, or VoIP were transferred to Cheltenham Township. Since these calls were processed by Cheltenham Township, they are removed from the total count of 9-1-1 calls processed by DPS.
7. **XFERS TO LMER** – 163 total calls, either wireline, wireless, or VoIP were transferred to Lower Merion Township. Since these calls were processed by Lower Merion Township, they are removed from the total count of 9-1-1 calls processed by DPS.
8. **ABGN 911** – 884 total 9-1-1 calls were received on the wireline trunks at Abington Township from any source – either an initial call by a resident, or by a transfer from DPS.
9. **ABGN *ADJ** – 692 total **adjusted** 9-1-1 calls were processed by Abington Township. This figure is derived by:

	884	total 9-1-1 calls received by Abington Twp.
+	733	total 9-1-1 calls received by Cheltenham Twp.
+	1,148	total 9-1-1 calls received by Lower Merion Twp.
	2,765	total 9-1-1 calls received by all remote PSAPs

Equation 2. Call Counts - ABGN *ADJ

Of which, 884 is 32% of 2,765. It is reasonable to assume that the total percentage of calls transferred to DPS for medical or fire emergencies is essentially uniform between PSAPs. More specifically, there is no evidence to suggest that any one of the PSAPs has a much higher percentage of fires or medical emergencies among its residents. Thus, it can be interpolated that of the 618 total calls transferred in to DPS from the remote PSAPs, Abington Township

accounted for 32% of them, or 198 calls. As a result, these 198 calls were processed by DPS, and are then subtracted from the total number of 9-1-1 calls processed by Abington Township, or 884 minus 198 = 686 total 9-1-1 calls.

10. **CHEL 911** – 733 total 9-1-1 calls were received on the wireline trunks at Cheltenham Township from any source – either an initial call by a resident, or by a transfer from DPS.
11. **CHEL *ADJ** – 569 total **adjusted** 9-1-1 calls were processed by Cheltenham Township. This figure is derived by:

	884	total 9-1-1 calls received by Abington Twp.
+	733	total 9-1-1 calls received by Cheltenham Twp.
+	1,148	total 9-1-1 calls received by Lower Merion Twp.
	2,765	total 9-1-1 calls received by all remote PSAPs

Equation 3. Call Counts - CHEL *ADJ

Of which, 733 is 26.50% of 2,765. It is reasonable to assume that the total percentage of calls transferred to DPS for medical or fire emergencies is essentially uniform between PSAPs. More specifically, there is no evidence to suggest that any one of the PSAPs has a much higher percentage of fires or medical emergencies among its residents. Thus, it can be interpolated that of the 618 total calls transferred in to DPS from the remote PSAPs, Cheltenham Township accounted for 26.50% of them, or 164 calls. As a result, these 164 calls were processed by DPS, and are then subtracted from the total number of 9-1-1 calls processed by Cheltenham Township, or 733 minus 164 = 569 total 9-1-1 calls.

12. **LMER 911** – 1,148 total 9-1-1 calls were received on the wireline trunks at Lower Merion Township from any source – either an initial call by a resident, or by a transfer from DPS.
13. **LMER *ADJ** – 891 total **adjusted** 9-1-1 calls were processed by Lower Merion Township. This figure is derived by:

	884	total 9-1-1 calls received by Abington Twp.
+	733	total 9-1-1 calls received by Cheltenham Twp.
+	1,148	total 9-1-1 calls received by Lower Merion Twp.
	2,765	total 9-1-1 calls received by all remote PSAPs

Equation 4. Call Counts - LMER *ADJ

Of which, 1,148 is 41.50% of 2,765. It is reasonable to assume that the total percentage of calls transferred to DPS for medical or fire emergencies is essentially uniform between PSAPs. More specifically, there is no evidence to suggest that any one of the PSAPs has a much higher percentage of fires or medical emergencies among its residents. Thus, it can be interpolated that of the 618 total calls transferred in to DPS from the remote PSAPs, Lower Merion Township accounted for 41.50% of them, or 257 calls. As a result, these 257 calls were processed by DPS, and are then subtracted from the total number of 9-1-1 calls processed by Lower Merion Township, or 1,148 minus 257 = 891 total 9-1-1 calls.

Utilization Summary

The following chart shows the total percentage of all 9-1-1 calls being processed in Montgomery County, by remote PSAP, and how they individually contribute to the total 9-1-1 workload. The counts are derived from Table 3, with some fields being calculated from simple arithmetic.

The total percentage of all 9-1-1 calls handled in the county is shown by PSAP, with the sum in the rightmost column representing the total percentage of all 9-1-1 calls – wireless, wireline, VoIP, or telematics – processed by the remote PSAPs. In January, 2008 this represented 8.1% of all 9-1-1, and has decreased to 7.0% just seventeen months later in May, 2009.

It should be clear by inspection that the workload of each remote PSAP has declined during the period represented: 2.6% to 2.2% for Abington Township, 2.1% to 1.9% for Cheltenham Township, and 3.3% to 2.9% for Lower Merion Township. These declines are again in-line with previous documentation and assertions that more citizens are transitioning from traditional wireline telephone service to other alternatives. This transition, in turn, is causing a rapid decline in the utilization and ultimately the fiscal sustainability of the remote PSAPs.

Percentage of PSAP Utilization

	ALL PSAPS WIRELESS	ALL PSAPS WIRELINE	WIRELESS PERCENTAGE OF ALL CALLS	ABGN % OF ALL 911	CHEL % OF ALL 911	LMER % OF ALL 911	REMOTE % OF ALL 911
Jan, 08	16219	11346	58.84%	2.6%	2.1%	3.3%	8.1%
Feb	16179	10813	59.94%	2.5%	2.2%	3.3%	8.0%
Mar	17724	11123	61.44%	2.5%	2.1%	3.2%	7.9%
Apr	17641	10877	61.86%	2.6%	2.1%	3.4%	8.1%
May	18948	11320	62.60%	2.5%	2.0%	2.8%	7.4%
Jun	19991	11964	62.56%	2.7%	1.9%	3.3%	7.9%
Jul	20917	11704	64.12%	2.3%	1.9%	2.9%	7.2%
Aug	19647	10856	64.41%	2.3%	2.1%	3.0%	7.4%
Sep	18365	10899	62.76%	2.5%	2.2%	3.5%	8.2%
Oct	19792	11050	64.17%	2.6%	2.2%	3.1%	7.8%
Nov	18390	10204	64.31%	2.6%	2.3%	3.3%	8.2%
Dec	20163	11134	64.42%	2.2%	2.1%	2.9%	7.3%
Jan, 09	17883	9975	64.19%	1.8%	1.7%	2.5%	6.1%
Feb	15782	9839	61.60%	3.0%	2.5%	4.4%	9.9%
Mar	17873	10157	63.76%	2.5%	2.1%	2.9%	7.5%
Apr	18697	10207	64.69%	2.6%	2.1%	3.5%	8.2%
May	20234	10427	65.99%	2.2%	1.9%	2.9%	7.0%

Table 4. Percentage of PSAP Utilization

PSAP Fiscal Analysis Overview

The following financial analysis is not meant to be a strictly detailed, comprehensive accounting of all costs related to the provision of 9-1-1 services. This analysis will focus primarily on the cost of the Customer Premise Equipment (CPE) – the equipment which is responsible for the answering and routing of 9-1-1 calls. CPE consists of the main telephone switch which connects the 9-1-1 circuits, as well as the equipment at the telecommunicator's consoles which allows the display of a caller's name and address, provides some recording capabilities, and enables other phone-related functions. With the exception of salaries and benefits for personnel, CPE represents the second largest expenditure to support a remote PSAP, and as a result will be the primary focus of this analysis.

It is acknowledged that there are many other costs related to the provision of 9-1-1 services: training, recruitment, physical plant, equipment maintenance, call recorders, and furniture to name just a few. For the purposes of this analysis, it is stipulated that these costs would generally scale according to the size of the operation.

That is, a 9-1-1 operation of 100 telecommunicators would pay a proportionate amount in furniture as an operation of 5 telecommunicators – the size of the expenditure would scale, in general, a proportionate amount. There are certainly many exceptions to this presumption, though in most cases the error would favor the larger operation due to economies of scale.

This analysis is also intended to focus on expenditures that would otherwise be unnecessary in a consolidated operation. The vast majority of these expenditures will be directly related to the CPE. It will be shown that the monthly recurring costs to support the three remote PSAPs are significant. The operations of these PSAPs now exceed that of the Department of Public Safety's operation, and are due to increase by an estimated 20% in 2010.

As the workload and utilization of the remote PSAPs diminishes at a rapid pace due to residents migrating to wireless and VoIP, while at the same time costs related to the provision of 9-1-1 service stand to increase at a similarly alarming rate, the time to consolidate is overdue.

Table 5. Remote PSAP Monthly Recurring Costs

	Abington Township	Cheltenham Township	Lower Merion Township	Dept. of Public Safety
ALI Database Links	$ 277.00	$ 277.00	$ 277.00	$ 277.00
Customer Premise Equipment	$ 8,442.00	$ 8,442.00	$ 13,296.00	$ 19,174.28
CPE - Support/Maintenance	$ 1,075.00	$ 1,075.00	$ 1,075.00	$ 10,079.36
Training	$ 72.00	$ 72.00	$ 72.00	$ -
Trunk Cost	$ 252.00	$ 252.00	$ 567.00	$ 2,394.00
Total Monthly 9-1-1 Cost	$ 10,118.00	$ 10,118.00	$ 15,287.00	$ 31,924.64
Average Monthly 9-1-1 Call Volume	726	611	936	27,576
Average Monthly Cost-per-Call	$ 13.94	$ 16.56	$ 16.33	$ 1.16

Line Item Explanation

As Table 5 shows, this analysis concentrates on several specific line items:

- **ALI Database Links** – When a caller dials 9-1-1, a request is made to a database to request the caller's name and physical address. This information is called Automatic Location Information, or ALI. Given the critical nature of this information, each PSAP maintains two separate and diverse links to the ALI databases – one in New Jersey, and the other in Maryland.

- **Customer Premise Equipment** – This single line item encompasses many items related to 9-1-1 service at the PSAP. CPE includes computer workstations, servers, phone switches, monitors, and software among other items. These items are all directly responsible for the processing of the telephone portion of a 9-1-1 call.

- **CPE – Support/Maintenance** – Most sophisticated computer and electronic equipment requires on-going software and hardware maintenance. These costs entitle the customer to rapid response support – typically that a technician will be on-site in less than 4 hours – as well as regular, routine software upgrades.

- **Training** – For the purposes of reconciliation and reimbursement, the initial cost of training was amortized over the five year lifetime of the remote PSAPs CPE costs.

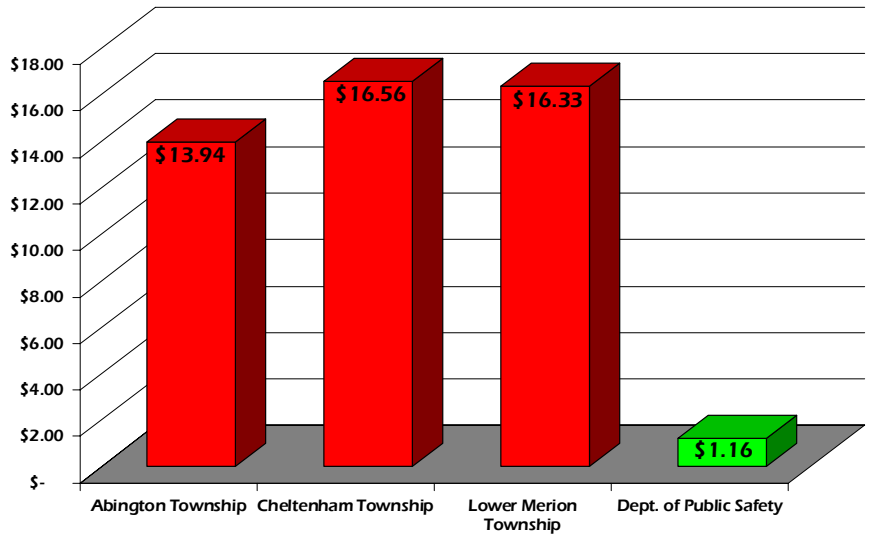
- **Trunk Cost** – Each 9-1-1 call that arrives at a PSAP requires a "trunk," which can be thought of as a single phone line. Calculations are made to determine the number of simultaneous calls a PSAP can expect to receive during its busiest period, and the number of trunks required to support that period are installed. Trunk capacity is proportionate to the size of the population served.

Summary

The cost viability of a PSAP, and a well-recognized metric throughout the industry, is the cost-per-call, or CPC. It should be noted that the CPC in a comprehensive fiscal analysis would encompass all costs directly related to the provision of 9-1-1 services, such as personnel, benefits, and other costs. For the purposes of this study, CPC is specifically related to the line items shown in Table 5.

It is clear from inspection that the cost-per-call for the three remote PSAPs is severely out-of-line with accepted limits. The total cost to operate the three remote PSAPs is $35,523.00 per month – **which exceeds the similar costs for the DPS operation by more than $3,000.** By similar inspection, the average cost-per-call is twelve to fourteen times that of DPS, yet combined the remote PSAPs account for only 7.0% of all 9-1-1 call processing in Montgomery County.

Figure 6. PSAP Cost per Call Comparison



An alternative method to compare the costs of the PSAPs would be to consider the total cost in comparison to the number of console positions each operates. As the end goal of providing 9-1-1 service is to ensure that the calls are answered and processed, the costs to support each console position should be considered. Again, however, this analysis shows an unsustainable cost structure of the remote PSAPs when compared to the Department of Public Safety. At best, the average cost of a console position is $3,200 at Lower Merion Township, as compared to only $1,000 for DPS.

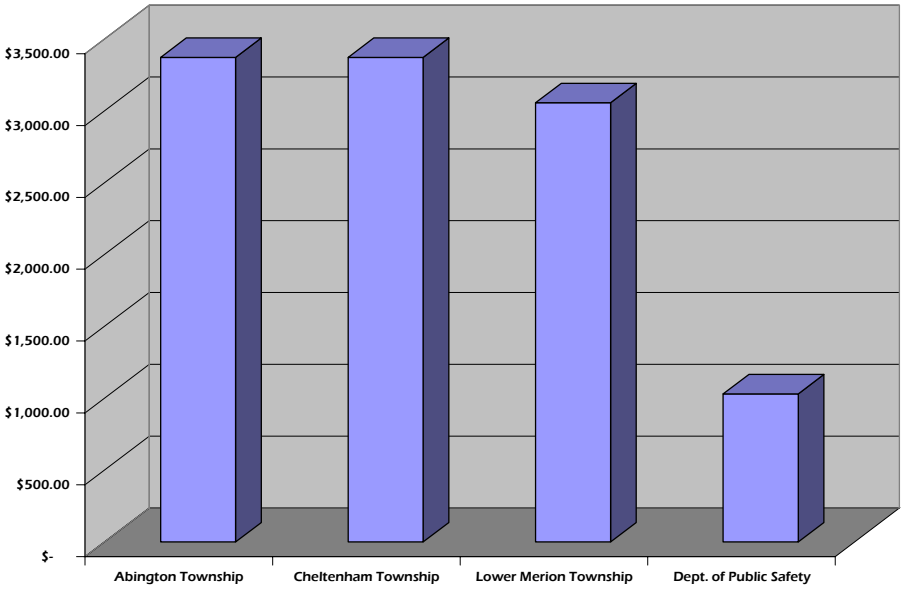
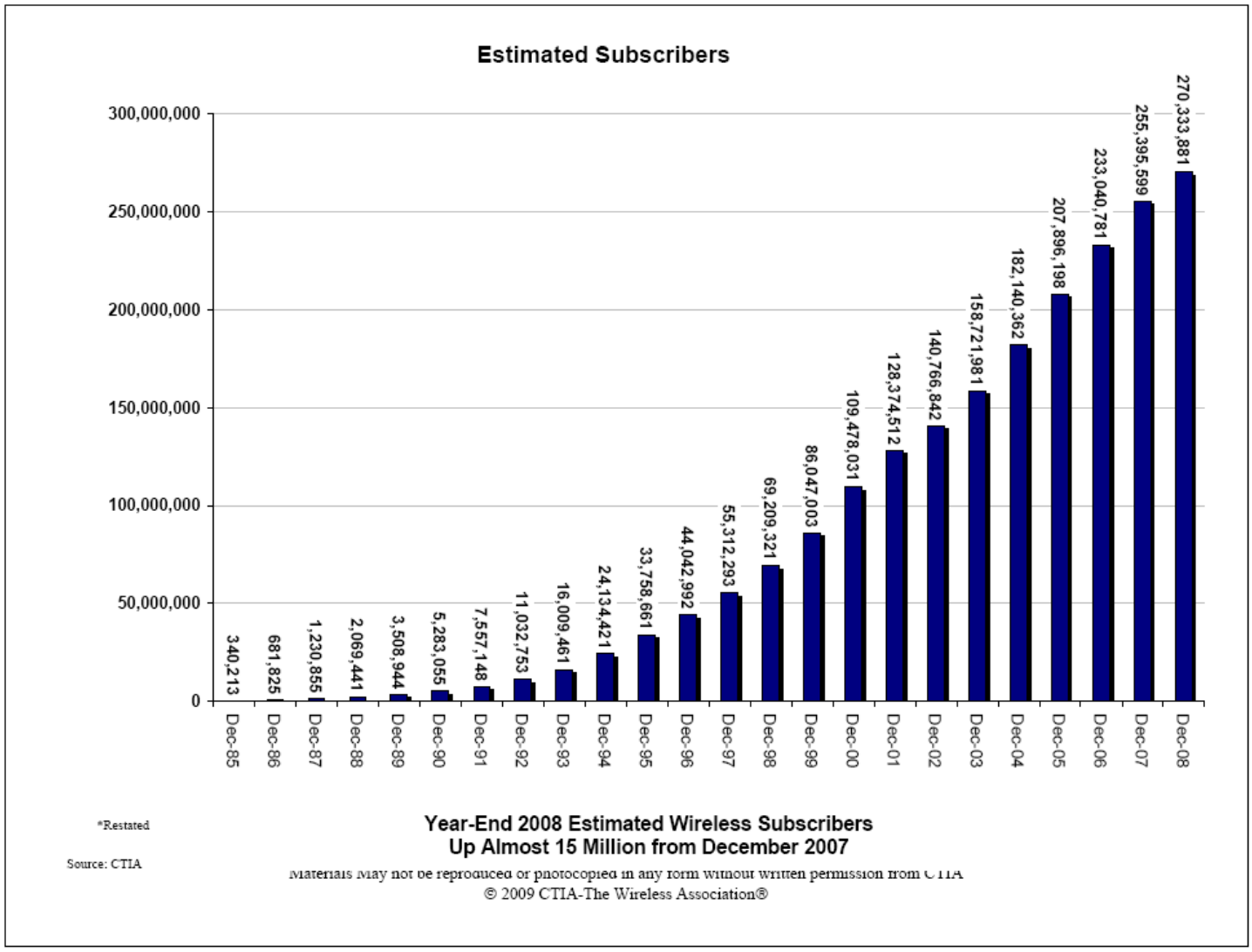


Figure 7. PSAP Cost per Console Position Comparison

The costs related to the CPE at the remote PSAPs are on the verge of growing even further out of proportion. The current contract with Verizon Business is due to expire in September, 2010 at the conclusion of a 5-year term. Having recently renewed a similar contract for the CPE at the Department of Public Safety, the cost of the expiring 5-year contract rose 21.8%, due in large part to advances in technology and the length of the original contract. It is reasonable to anticipate that the renewal for the remote PSAPs would be similar in size. If the renegotiated contract for the remote PSAPs increases by only 15%, the cost to support these facilities will increase to nearly $41,000 per month, while the cost for the DPS operation will remain at $32,000. By that point, too, it is reasonable to expect that the **total percentage of all 9-1-1 calls processed by the remote sites will be 6.5% or less.**

Figure 8. Number of Wireless Subscribers, by year



Background – Remote Dispatch Points

While the costs associated with supporting duplicative services at the Remote Dispatch Points are much less complex, they are just as substantial as the costs associated with the remote PSAPs.

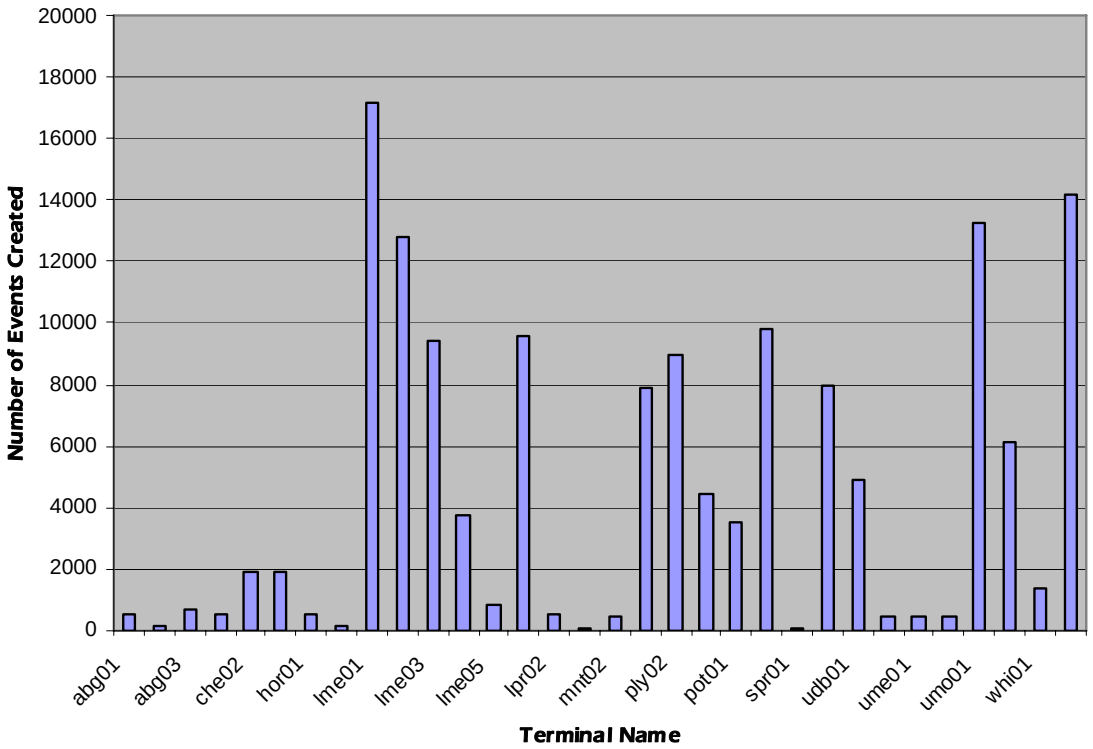
For the purposes of this analysis, the three remote PSAPs are considered to be Remote Dispatch Points, as well. In addition to answering and processing some 9-1-1 calls, the three remote PSAPs also provide radio dispatch services for their respective police departments, as do the other ten RDP agencies in the county:

- Horsham Township
- Lower Providence Township
- Montgomery Township
- Plymouth Township
- Pottstown Borough
- Springfield Township
- Upper Dublin Township
- Upper Merion Township
- Upper Moreland Township
- Whitemarsh Township

The cost savings achieved by consolidating Remote Dispatch Points stretches far beyond the direct cost savings to the Department of Public Safety. The level of duplication among these agencies, and the associated low utilization, allow for significant opportunities for savings to the individual municipalities. An independent study of an RDP was completed recently which suggested that the annual savings to the municipality from consolidation would be $339,000 per year.

The primary costs associated with supporting the RDPs are those related to the computer aided dispatch network and support. The Department of Public Safety provides – currently at no cost – the computer and network hardware, cabling, high speed data circuits, laser printers, and computer aided dispatch software to each of the thirteen RDPs. As Figure 9. Number of CAD Events Created, per terminal Figure 9 shows, more than half of the remote site terminals, however, are either rarely used, or used only to receive information from the Department of Public Safety.

Figure 9. Number of CAD Events Created, per terminal



Some agencies do not enter information into the CAD system, but rather utilize their own CAD systems. The process of entering information in a separate system prohibits other agencies and police officers throughout the county to share in the intelligence value of the data. *This has serious officer safety implications*, and creates islands of data throughout the county.

In addition, failing to utilize or failing to update the computer aided dispatch system degrades the quality of service that is provided to the municipality's residents. The CAD network provides the live location of police vehicles as they are enroute to an emergency event. 9-1-1 calltakers frequently update callers with the estimated time until they can expect help to arrive. Many remote sites do not update the CAD system to reflect that an officer has been sent to the emergency, and in turn calltakers cannot provide a status update to callers. This often leads to frustration and further concern of the resident.

Furthermore, Department of Public Safety technical services personnel and network administrators invest a considerable amount of time – during both regular business hours and overtime hours – to support this equipment and operations. In *every case these operations duplicate services that are already provided, or would be provided, without charge to the municipalities.* It is these costs that will be explored in the next section.

Costs to Support Operations

At the beginning of 2009, the Department of Public Safety began a project to replace the network and computer hardware that currently operates the countywide computer aided dispatch system. As this equipment reached five years in age, the proactive replacement plan was carried out to maintain the high availability of this critical equipment. At the conclusion of the project, it is projected that the total cost to replace the majority of the network and end-user hardware will be $480,000, of which the majority is related to the cost of the remote network at the RDP locations.

The Department of Public Safety's computer aided dispatch system is manufactured by the Intergraph Corporation of Huntsville, Alabama, and was placed into service June 6, 2006. At the time of this study, the network had an inventory of 110 total terminals, though only sixty-four of those are considered primary dispatch positions as Table 6 shows.

Table 6. CAD Terminal Inventory, By Agency

Agency	# of Terminals	Agency	# of Terminals
Abington	3	Pottstown	2
Cheltenham	3	Springfield	2
Horsham	2	Upper Dublin	2
Lower Merion	5	Upper Merion	2
Lower Providence	2	Upper Moreland	2
Montgomery	2	Whitemarsh	2
Plymouth	3	DPS	32

The remaining forty-six terminals consist of:

(15) Administrative / maintenance functions
(18) Backup / disaster recovery
(13) Training

The on-going, annual cost to support the computer aided dispatch network consists of four primary line items:

- **Software license maintenance** – These costs are paid directly to Intergraph for continued technical support and software upgrades which enable new functions and features.

- **Data Circuit Costs** – These costs are related to the high-speed "T-1" data circuits that are required from the Department of Public Safety to each RDP in order to extend the computer network to their agencies.

- **Hardware Renewal** – These costs are for the five-year replacement/upgrade plan for both the computer aided dispatch system software, and related network/PC hardware. A three-year replacement plan would be more advantageous, though the cost would be prohibitive.

- **Technical Support** – These costs are for the business hours and after-hours support of the computer aided dispatch system network, software, and hardware.

RDP FISCAL ANALYSIS

Software License Maintenance

Software licensing of the computer aided dispatch software is segregated into the cost per individual product that Intergraph provides to the Department of Public Safety. The full suite of products are not used at the RDPs, however, so in order to provide the most realistic, balanced view of the financial impact, this analysis will concentrate strictly on the costs related to the products used – not the simple equal share of the maintenance contract.

The costs shown in Table 7 represent the **per terminal** costs, with both the monthly and yearly recurring costs detailed, as well as the individual products. These costs do not represent the total cost of purchase and implementation, which would be substantial.

This study seeks to show the achievable savings that would result from the elimination of on-going costs related to duplicative services in the county, but is not intended to be a cost-recovery mechanism, which would represent sums in the tens or hundreds of thousands of dollars. Furthermore, these costs do not consider the yearly or biennial upgrade of the computer aided dispatch software – those costs are omitted from this analysis as they are required despite the number of terminals included in the network. In addition, other costs **not** included in this analysis include:

- Oracle software licenses for the CAD databases
- Server maintenance and licensing
- Mobile data computer software
- Interfaces for paging, fire related products, or backup
- Any software related to the maintenance of the GIS map

Table 7. CAD Software Cost, per Terminal

Product	Monthly Cost
I/Executive	$ 47.75
I/Executive 2	$ 34.08
I/Dispatcher	$ 246.00
I/Informer	$ 27.25
I/Mobile Data	$ 54.50
I/Tracker	$ 31.00
Monthly Recurring Cost	$ 440.58
Yearly Recurring Cost	$ 5,287.00

Data Circuit Costs

The computer aided dispatch system network is extended out to each RDP through a high-speed data circuit (T-1) provided by Verizon Business. These data circuits are leased by the Department of Public Safety, and are maintained by Verizon when impaired. A single circuit is required to each site, and is billed at a monthly rate primarily determined by mileage to the location and engineering costs related to the interconnections between the two sites.

These circuits were purchased with a 5-year term, the maximum available at the time in order to keep the monthly recurring costs as low as possible. As Table 8 shows below, the total monthly cost for these circuits is nearly $10,000.

Table 8. Data Circuit Cost per month, by Agency

Agency	Monthly Recurring Cost	Agency	Monthly Recurring Cost
Abington	$ 901.87	Pottstown	$ 901.87
Cheltenham	$ 901.87	Springfield	$ 819.76
Horsham	$ 765.02	Upper Dublin	$ 765.02
Lower Merion	$ 805.72	Upper Merion	$ 552.27
Lower Providence	$ 436.32	Upper Moreland	$ 929.24
Montgomery	$ 778.35	Whitemarsh	$ 682.91
Plymouth	$ 600.80	DPS	$ -
Total Monthly Recurring Cost (All Sites):			$ 9,841.02

Hardware Renewal

As outlined in the overview of this section, the Department of Public Safety is in the final stages of a project to renew all computer and network hardware that encompasses the computer aided dispatch system network. The total cost of the project is $528,000, of which $366,000 – or $73,200 per year – is specifically attributable to RDPs. This does not include the annual licensing and maintenance costs for the hardware and software, which are included in the analysis below.

Given the critical nature of the computer aided dispatch system, and the levels of redundancy and high-availability that are required, a more aggressive replacement schedule of three years would be preferred for this hardware.

It is the general consensus of the network administrators, however, that a strict five-year replacement schedule is sufficient to balance both improvements in technology and the cost of maintenance. The benefit to the remote sites is that this spreads the cost of equipment renewal over a longer period, and is more favorable to the RDP for the purpose of this analysis.

The number of components in the project is extensive, and beyond the scope of this study to detail the individual cost of each. The costs related to computer hardware, network hardware, and installation are listed separately, with costs related to each terminal as well as costs related to each site – regardless of the number of terminals.

Table 9. Annual Hardware Renewal Cost, per Terminal

Per CAD Terminal	Yearly Recurring Cost
Hardware	$ 1,490.00
Software	$ 865.00
Installation (Amortized)	$ 150.00
Support	$ 478.00
Annual Cost Per Terminal	**$ 2,983.00**

Table 10. Annual Hardware Renewal Cost, Per Site

Per Site	Yearly Recurring Cost
Network Equipment	$ 2,135.00
Installation (Amortized)	$ 410.00
Support	$ 830.00
Annual Cost Per Site	**$ 3,375.00**

Technical Support

The costs involved in supporting the users and equipment at the Remote Dispatch Points is difficult to quantify, as it is not routinely tracked on a detailed accounting basis. For this reason, conservative estimates are made at these costs in the method most favorable to the RDPs. Generalized estimates of the time involved in tasks related to RDP equipment and users was gathered from numerous Department of Public Safety staff members, as well as detailed trouble-ticket reporting data drawn directly from calls for service at RDPs.

The cost estimates for support are shown in Table 11.

Table 11. Annual Cost of Technical Support, per Site

Task	FTE
Certification of dispatchers	0.25
Training (CAD)	0.10
Network Administration	0.60
Equipment Maintenance	0.40
Total	**1.35**

FTE Salary	$ 50,000.00
FTE Benefits	$ 16,000.00
Per site, annual cost of 1.35 FTEs	**$ 6,853.85**

Summary

Table 12, below, provides a detailed summary of the costs related to providing the computer aided dispatch system to each remote site on an annual basis. As described at the outset, the costs related to providing these duplicative services are equally as substantial as those of the 9-1-1 calltaking operations at the remote PSAPs.

One item which was entirely omitted from this analysis was the cost related to providing the countywide 800 MHz public safety radio system. All but two of the RDPs utilize the countywide radio network to support their operations. While there is certainly a significant cost related to providing that network, it is the opinion of the Department of Public Safety that the network benefits all first responders, and is in the interest of the public and field users to provide the network for use.

Nonetheless, it should not go unstated that there are cost multipliers involved in supporting the additional traffic, equipment, and operations that the RDPs impart on the network.

Their use of the network, however, is a benefit to consolidation. As many of the RDPs currently utilize the network for dispatch operations, and the Department of Public Safety maintains robust console equipment and network hardware, assuming dispatch responsibility would require – in most cases – no additional financial investments.

Table 12. Summary of Costs, All Remote Dispatch Points, by Site

	Per Site Costs			Per Terminal Costs			
	Hardware Renewal	Data Circuit Cost	Technical Support	Hardware Renewal	Software License Maintenance	No, of Terminals	Total Annual Cost, Per Site
Abington	$ 3,375.00	$ 10,822.44	$ 6,853.85	$ 2,983.00	$ 5,287.00	3	$ 45,861.29
Cheltenham	$ 3,375.00	$ 10,822.44	$ 6,853.85	$ 2,983.00	$ 5,287.00	3	$ 45,861.29
Horsham	$ 3,375.00	$ 9,180.24	$ 6,853.85	$ 2,983.00	$ 5,287.00	2	$ 35,949.09
Lower Merion	$ 3,375.00	$ 9,668.64	$ 6,853.85	$ 2,983.00	$ 5,287.00	5	$ 61,247.49
Lower Providence	$ 3,375.00	$ 5,235.84	$ 6,853.85	$ 2,983.00	$ 5,287.00	2	$ 32,004.69
Montgomery	$ 3,375.00	$ 9,340.20	$ 6,853.85	$ 2,983.00	$ 5,287.00	2	$ 36,109.05
Plymouth	$ 3,375.00	$ 7,209.60	$ 6,853.85	$ 2,983.00	$ 5,287.00	3	$ 42,248.45
Pottstown	$ 3,375.00	$ 10,822.44	$ 6,853.85	$ 2,983.00	$ 5,287.00	2	$ 37,591.29
Springfield	$ 3,375.00	$ 9,837.12	$ 6,853.85	$ 2,983.00	$ 5,287.00	2	$ 36,605.97
Upper Dublin	$ 3,375.00	$ 9,180.24	$ 6,853.85	$ 2,983.00	$ 5,287.00	2	$ 35,949.09
Upper Merion	$ 3,375.00	$ 6,627.24	$ 6,853.85	$ 2,983.00	$ 5,287.00	2	$ 33,396.09
Upper Moreland	$ 3,375.00	$ 11,150.88	$ 6,853.85	$ 2,983.00	$ 5,287.00	2	$ 37,919.73
Whitemarsh	$ 3,375.00	$ 8,194.92	$ 6,853.85	$ 2,983.00	$ 5,287.00	2	$ 34,963.77

RECOMMENDATIONS

The Department of Public Safety believes that the following recommendations, once fully implemented, will result in clear and overwhelming benefits to the residents of Montgomery County and the public safety community as a whole:

1. **The three remote PSAPs in the county should be consolidated into a single, unified calltaking operation at the Department of Public Safety.**

Consolidation of the three remote PSAPs – Abington, Cheltenham, and Lower Merion – could be accomplished rapidly, and without any additional cost to any agency. Only minor programming changes would be required to telephone company equipment in order to redirect calls to DPS.

There would be several significant benefits from this consolidation:

- Minimized life-threatening 9-1-1 call transfers.

  More than 20% of 9-1-1 calls that originate from Abington, Cheltenham, and Lower Merion Townships are transferred to DPS because they are for fire or EMS incidents. These transfers result in un-necessary duplication of questioning of callers, and introduce life-threatening delays when a caller requires vital emergency medical pre-arrival instructions, such as how to perform CPR or dislodge an object from a choking person.

  Citizens served by the remote PSAPs are actually receiving a *lesser degree* of service if they require emergency medical or fire resources, as it becomes necessary for the remote PSAP telecommunicator to transfer the call – which risks potentially losing the caller in the process. Delays in processing emergency calls that are transferred are often noted during quality assurance reviews, and have created citizen confusion which has negatively affected perceived quality.

- Drastic Fiscal Savings.

  Once fully consolidated, the Department and first responder community would realize an annual savings of at least $600,000. As this money is currently allocated from 9-1-1 funds, it is available for use for a wide variety of other eligible expenses which benefit the entire first responder community.

- Reduced technical and procedural complexities.

  The current configuration of PSAPs requires a DPS calltaker to determine the nature of an incident, the exact location at which it occurred, the delivery method of the call (wireless, wireline, voice-over-internet) and whether or not the emergency is of a police, fire, or emergency medical type. At this point, if the call is determined to be of a police nature, and in-progress, it must be transferred to a remote site. These steps reduce the effectiveness of the calltaking operation, and result in fewer details being entered into a computer aided dispatch system entry than would be if the calltaker processed the call from start to finish.

- Re-investment of financial savings for countywide responder benefit

  Tremendous financial savings realized by consolidation could be re-invested in improvements and upgrades to existing countywide systems for the benefit of all first responders – police, fire, and emergency medical.

  The annual savings from the complete consolidation of the remote PSAPs could be used for the payment of debt service on a much larger investment in technology which would benefit the entire first responder community.

2. **Dispatch operations for all Montgomery County police agencies should be consolidated into a single, unified operation at the Department of Public Safety.**

   In much the same manner as the three remote PSAPs, the costs related to the on-going, financial support of individual dispatch operations throughout the county weaken reserves which could be used for improvements and upgrades to countywide systems for the benefit of all first responders.

   The services that the thirteen Remote Dispatch Points provide to residents are currently available – without cost – from the Department of Public Safety. Substantial savings could be realized by each municipality.

By consolidating operations into a single, unified Communications Center, all information available about an emergency would be readily accessible by all responders and calltakers involved in the incident. This would dramatically increase operation intelligence throughout the county, and eliminate officer safety issues. These issues occur when remote dispatch points update their local computer systems, rather than updating the computer aided dispatch system which is used as a resource by most agencies.

3. **Until fully implemented, institute a cost-recovery mechanism for any and all costs related to duplicative services.**

   In coming years, all countywide responders will benefit from several large-scale projects currently in planning. These projects bear a significant financial cost. The costs to subsidize individual Remote Dispatch Points solely benefit the agency served, and are entirely duplicative of services already provided without cost from the Department of Public Safety. As such, agencies that wish to continue this practice should assume the entire financial burden at the start of the 2010 calendar year.

   More than half of the remote dispatch point CAD terminals are either unused, or dramatically under-utilized. Based on the costs associated with on-going technical support, data circuit costs, and hardware renewal, agencies which choose to continue to offer duplicative services should incur the costs associated with this option.

CONSIDERATIONS

When considering the option of consolidation, it is reasonable to question the technical, physical, and staffing configurations of the primary facility, in this case the Department of Public Safety. The Department's Operations Center, and associated 9-1-1 Communications Center, are more than adequately sized, staffed, and equipped to assume the full workload of not only the consolidated PSAPs, but also the Remote Dispatch Points. The following sections describe the various aspects of DPS, and their adequacy to lead a fully-consolidated operation.

PHYSICAL CONSIDERATIONS

The Montgomery County Operations Center is located in Eagleville, Pennsylvania, on a 9 ½ acre secured parcel. The facility itself is 18,100 square feet, of which 9,900 square feet is devoted entirely to 9-1-1 operations.

Fueled by 10,000 gallons of on-site storage, the Operations Center is powered by twin, redundant, 375-kilowatt diesel generators. Individually, these units are capable of handling the entire building electrical load for an un-refueled period of more than thirty (30) days. The Center's critical radio and IT equipment are cooled by three entirely independent, mission critical air conditioning units that are also separately powered by a 200-kilowatt diesel generator for maximum redundancy.

All critical operations of the 9-1-1 Center and radio system are powered by a recently-upgraded electrical system which consists of four separate uninterruptible power supplies totaling more than 275 kilovolt-amperes of backup capacity. Truly mission critical operations are protected by a recently-installed digital static transfer switch, which provides three unique levels of power redundancy for maximum protection from power loss.

Dual, redundant heating, ventilation, and air-conditioning units provide the environmental controls for the entire facility.

STAFFING

On August 10th, 2009, the Department of Public Safety will celebrate the conclusion of a highly successful two-year recruitment and hiring campaign as it welcomes nine additional telecommunicators. These new recruits will bring the division to a fully staffed level, with 130 total employees.

Communications Center staffing will be thirty telecommunicators per shift, on average, with increased staffing during normal busy periods and anticipated peaks in activity.

COMPUTER AIDED DISPATCH SYSTEM

The current computer aided dispatch system is designed by the Intergraph Corporation of Huntsville, Alabama. The system was made fully-operational June 6, 2006, and was recently upgraded to the most advanced version available in May, 2009. The design lifetime of the system is 7 – 10 years, so it remains well within the peak of its operational period.

PHONE INFRASTRUCTURE

The current phone system is leased, with service and support provided by Verizon Business. Both the console equipment and the central processing unit of the system were upgraded in 2007, at a total 3-year cost of $1.147 million. This upgrade resulted in the implementation of the latest versions of software and hardware available, as well as upgrades to monitoring, quality assurance, and redundancy components.

COMMUNICATIONS CENTER

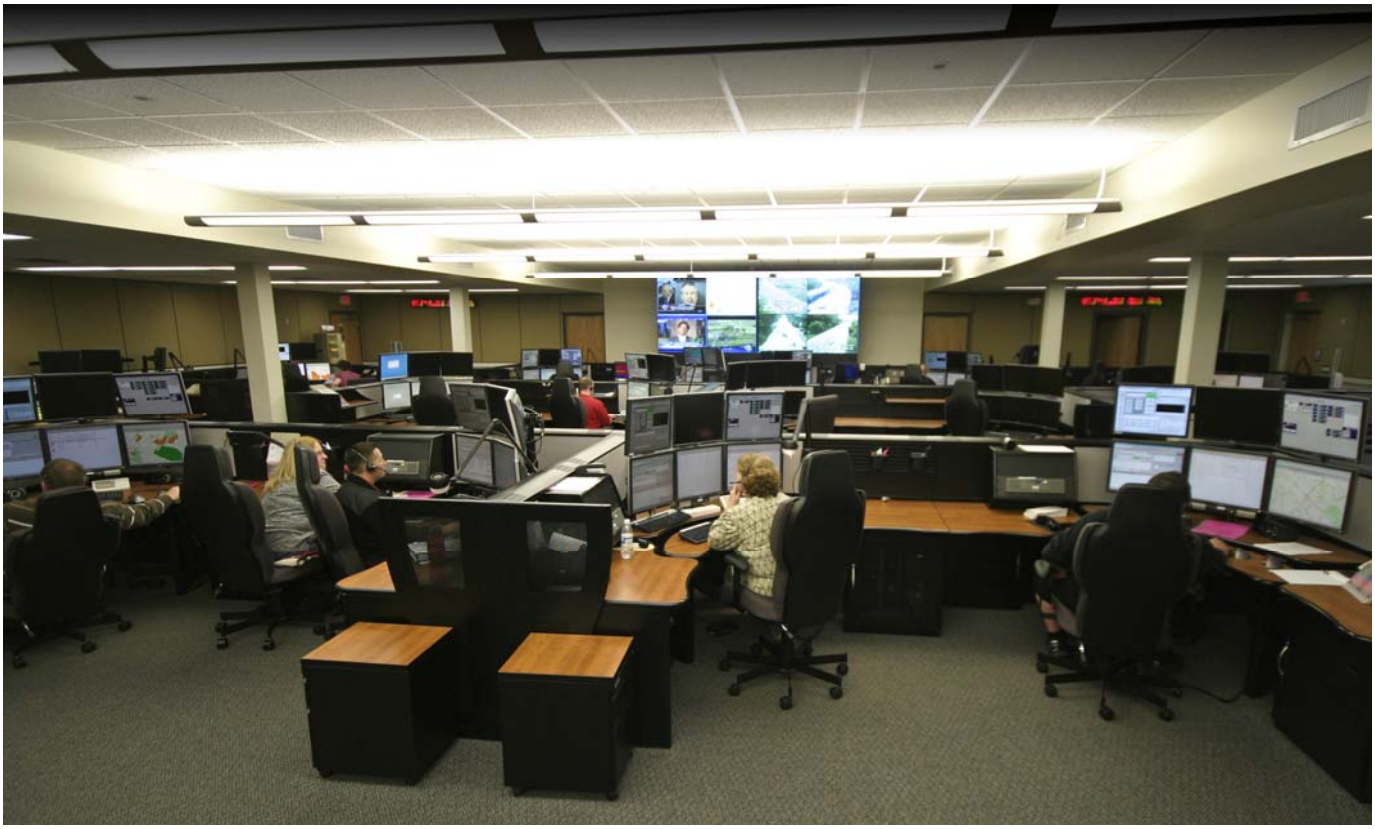
Completed in 2007, the Operations Center features a state-of-the-art 9-1-1 Center of more than 6,000 square feet. The Center boasts thirty-two total console positions, each with individual heating and air-conditioning units, ergonomic work surfaces, individual lighting controls, and 24-hour ergonomic seating. With thirty-two total console positions available, on average only twenty-two are fully utilized on a daily basis. The additional ten fully-equipped console positions allow for growth and expansion well into the future. Ultimately, the Center has a design lifetime of at least fifteen years.

The Backup 9-1-1 Center, located at the Department's Public Safety Training Campus in Conshohocken, is currently undergoing a nearly $150,000 transformation to both the facility and the supporting technology. Due to be completed by the end of 2009, the Backup Center will feature twenty total console positions, nearly identical furniture, dual, redundant air-conditioning units, ergonomic seating, and entirely redundant phone and IT systems. Furthermore, the facility itself is powered by a newly installed XXX-kilowatt diesel generator with an un-refueled runtime of more than XXX days.

IT INFRASTRUCTURE

By the end of 2009, a full-scale replacement and upgrade of all IT infrastructure related to the C.A.D. network is scheduled to be completed. This upgrade will result in triple-redundancy of all critical network IT components, and the expansion of the network to include neighboring counties, PennDOT, and the Pennsylvania State Police.

Furthermore, the project will "virtualize" much of the end-user IT hardware, centralizing it to highly-redundant and highly-available server equipment. This virtualization will allow the Department to essentially move the entire C.A.D. network to an alternate, backup location in seconds if needed. This level of disaster recovery and high-availability is nearly unheard of in the public safety IT community.



9-1-1 TRUNK CAPACITY

In April, 2009, Verizon conducted a busy study of all incoming 9-1-1 trunks to the Operations Center, accounting for both wireless and wireline traffic. It was subsequently determined that wireline trunk capacity was more than sufficient, and wireless trunk capacity was also within design limits.

PERSONNEL RETENTION

As of June, 2009 the turn-over rate for the Communications Division was less than 1.1 percent for 2009. The combination of dramatically increased training programs, enhanced personnel levels, and numerous opportunities for alternate assignments and advancement have contributed to this excellent metric. In February, the Association of Public Safety Communications Officials – the governing body for 9-1-1 Centers – announced that the turn-over rate nationwide for communications centers was 19 percent.

MANAGEMENT STRUCTURE

As Appendix A shows, the organizational structure of the Communications Division is more than adequately scaled to manage a consolidated operation. Each of several organizational units, or sections, are represented and are appropriately staffed.

POLICY FRAMEWORK

In the Fall of 2007, the Department of Public Safety entered into the self-assessment phase for Communications Center accreditation by the Commission for Accreditation of Law Enforcement Agencies (CALEA). A comprehensive policy framework is being developed to show compliance with XXX total standards. A state-of-the-art document management system is in place and utilized to track policy changes, new policies, and to verify receipt of policies by all employees. It is anticipated that the Communications Center will receive accreditation in the Summer of 2010.

GENERALIZED OBJECTIONS

In many cases the prospect of consolidation is often met with resistance due to perceived differences in quality of service, questions of adequate staffing, or geographic familiarity. These objections are often offered in an effort to forestall the implementation of a successful plan.

Many discussions have been held with police officers, citizens, and telecommunicators from the PSAPs and RDPs that are the focus of this study. The following pages contain a number of the most frequent generalized objections, as well as a clarifying response and steps that will be taken to minimize or eliminate the perceived risk.

1. "DPS telecommunicators do not maintain the high level of geographic expertise that remote PSAP telecommunicators do."

This is often the primary stated concern in a complete consolidation. A more typical consolidation is one in which the agency which is the subject of the consolidation receives and processes all 9-1-1 calls, as well as dispatches police, fire, and EMS resources. As detailed in earlier sections, this is not the case in Montgomery County, where the Department of Public Safety answers the majority of all 9-1-1 calls already, and dispatches more than 92 percent of all police, fire, and EMS agencies.

Given the advanced features of the computer aided dispatch system and its associated map, in conjunction with advanced location tools such as Wireless Phase II technology, DPS telecommunicators are able to locate a caller with as much accuracy – or more – than a remote PSAP telecommunicator. In 2008, as well as the first half of 2009, there has not been a single recorded complaint from a remote PSAP related to a location error. There is also evidence to suggest that location error rates of remote PSAPs are equivalent to, and in some cases greater, than that of DPS.

Mitigating steps:

- In June, 2009, steps were taken at DPS to expand the GIS function by adding additional staff. These additional staff members will focus primarily on improvements to the location-based systems used by telecommunicators.

- In addition, several temporary positions were created to facilitate the collection of data from municipalities which may not currently be provided, most importantly names of businesses and landmarks, referred to as "commonplaces." Commonplaces are the fundamental basis for the generalized objection that remote agency personnel know an area better than others. Most often, callers in an emergency situation refer to their location by referencing a nearby business or landmark, and having a vast database of these landmarks enables the DPS telecommunicator to rapidly verify a caller's location. In the past, DPS has relied on the municipality to submit changes to commonplaces and businesses, though submittals were not uniform in quantity across all municipalities. DPS recognized that this lack of submittal was ultimately detrimental to calltakers, and began a program to proactively collect and maintain commonplace locations in order to maintain the highest level of accuracy.

- Finally, a planned upgrade to the computer aided dispatch system in early 2010 will enable the use of high-resolution satellite imagery for calltakers, permitting multiple-angle views of a caller's location to aid in the location verification process.

2. **"The three remote PSAPs provide backup capability to the Department of Public Safety operation in the event of a 9-1-1 failure at the Operations Center."**

This understanding is incorrect. The Department of Public Safety maintains a Backup 9-1-1 Center at the Public Safety Training Campus in Conshohocken, which is the default backup location in the event of a 9-1-1 system failure. Daily operation of the primary 9-1-1 Center is maintained with thirty-eight 9-1-1 trunks, however the combined trunk capacity of the three remote PSAPs is only seventeen. Moreover, alternate routing schemes are not in place to re-direct wireless calls, nor the vast number of 10-digit circuits. Minimum calltaker staffing during the busy hour at the Department of Public Safety is seven telecommunicators – which is equivalent to the total number of personnel for *both* dispatch and calltaking at the remote PSAPs.

Mitigating steps:

- None.

3. **"The quality of DPS dispatch would be far less than our telecommunicators."**

There is no evidence to suggest that this would be the case. DPS telecommunicators receive as much, or more, training per year than those of the remote PSAPs and RDPs. In a collaborative consolidation, with regular and specific input on policies, procedures, and management of the operation, the quality expectations of the consolidated agency and its users can be easily met or exceeded.

DPS telecommunicators routinely provide directions to citizens and lost motorists, answer administrative questions related to parking tickets, parade and event times, and business issues of the police departments. After normal business hours, many police departments forward their administrative phone lines to DPS, which are answered promptly (typically in 3 seconds or less) and citizen questions are answered or referred to on-duty police officers. In fact, DPS telecommunicators answer and process more than 23,000 10-digit, administrative phone calls each month for various police departments throughout the county.

In addition, many telecommunicators are members of the communities that they serve, they maintain an expert knowledge of various geographies, and many participate in public education and outreach events.

The median salary of a DPS telecommunicator in 2009 was $49,151, and each enjoys a comprehensive medical and dental benefits package that is completely funded by the county. Rigorous pre-employment background and drug screening of applicants is conducted, as is on-going random drug screening and background monitoring.

Mitigating steps:

- DPS management would welcome specific examples of quality issues, and when substantiated, would take every step practical to ensure the expectations of quality were met or exceeded by the consolidated agency.

4. **"There would be no quality control of DPS calltaking."**

Currently there are four personnel devoted full-time to quality control and improvement at the Department of Public Safety: The Assistant Director for Professional Standards, two Quality Analysts, and a Quality Analyst Supervisor. This section within the Communications Division reviews not only emergency phone calls, but also radio transmissions to ensure compliance with policies and procedures. The quality assurance personnel utilize sophisticated software for grading, measuring, tracking and reporting reviews, and are deeply involved in the regular, day-to-day operations of the Communications Center. There is no evidence to suggest that any other PSAP or RDP in the county maintains a quality control and improvement program of more personnel, funding, or involvement in daily operations.

An investment of more than $500,000 was made in 2008 on advanced recording equipment and quality assurance software to ensure the highest possible degree of quality analysis, review, and reporting.

Mitigating steps:

- The governance structure for a consolidation transition team would include personnel to independently verify and participate in quality assurance reviews and reporting. All agencies involved would receive regular, written reports on quality assurance program outcomes, and a structure would be put in place to permit dynamic focus on topics or events that required specific attention.

5. "Remote PSAP telecommunicators interrogate callers in a manner that provides information critical for officer safety."

All telecommunicators – RDP, PSAP, or DPS – are required to obtain and maintain APCO certification as a Public Safety Telecommunicator, which forms the basis for telecommunicator training within the public safety community. Most DPS calltakers receive and process more than 100 emergency calls per 12-hour shift, which exceeds the total call volume of any of the individual PSAPs or RDPs 24-hour volume. Before applying for final certification and testing as a calltaker, each employee is required to meet a rigorous list of pre-requisites, which include:

- Recommendation of a Communications Training Officer
- Recommendation of Supervisor
- Minimum (1000) 9-1-1 calls
- Minimum (500) 10-digit calls
- Minimum of (10) calls deemed "High Stress"
- Minimum of (10) calls of a Priority 1 or 2 nature
- Minimum of (100) Emergency Medical Dispatch calls

There is no evidence to suggest that a DPS telecommunicator is less trained, prepared, or experienced to interrogate a caller and obtain information that is vital to officer safety.

Mitigating steps:

- A function of the consolidation process would be to ensure that the training programs and topics offered to DPS telecommunicators met the needs of the agencies served, and focused on the suggested areas of improvement. Prospective agencies would be encouraged to review the telecommunicator curriculum, make suggestions, and observe a class in session.

6. "Remote PSAPs and RDPs can maintain direct contact with the caller, and simultaneously the responding officers, for maximum officer safety."

Given the advanced capabilities of the current phone and computer aided dispatch equipment at the Department of Public Safety, high-priority in-progress calls could be quickly conferenced with the DPS telecommunicator that was communicating with the agency's officers, thus achieving the same result. This method would allow the DPS telecommunicator to maintain direct contact with the caller, as well as radio contact with responding officers for maximum officer safety. Life-threatening delays caused by transferring callers to remote sites would be eliminated, and the service to the responding officers and citizens would be maintained or dramatically increased.

Mitigating steps:

- Phone system modifications could be implemented, without additional complexity, to allow a radio telecommunicator to participate in a high-priority, in-progress phone call while at the same time maintaining direct and immediate contact with officers.

7. "The policies and procedures of a remote PSAP are different from the method DPS uses to process and dispatch calls."

It is acknowledged that there exists a wide variety of polices, procedures, and methods related to both calltaking and dispatching of public safety personnel throughout the county. PSAPs and RDPs alike utilize varying methods and practices to conduct their daily operations. Any consolidation plan must include considerable involvement of the consolidating agency in the development of polices and procedures, as well as the governance of the consolidated entity during the transition period and beyond.

The plan proposed in this study is no different. It is not only expected – but required – that agencies involved in the consolidation become stakeholders in the Department of Public Safety operation, and provide unique guidance and policy direction throughout the process. A consolidation plan is only successful if the expectations of the agency are met, which is possible only if there is significant and lasting input from the agency.

Mitigating steps:

- The consolidation transition team would be charged with – as a primary responsibility – the development and documentation of specific, unique policies and procedures. Each of these would be evaluated in depth to determine applicability to all DPS customers.

8. "The remote PSAP agency would lose all control of the calltaking and dispatch process, risking citizen and officer safety, and diminishing quality beyond acceptable limits."

In most cases, based simply on the quantity of wireless calls that DPS receives, initial calltaking is considered "2-stage," in that a calltaker is processing the phone call and entering details in the computer aided dispatch system, and separate telecommunicator is receiving the details and providing them to officers via radio. At a point when the calltaker determines that critical details have been gathered, the call is transferred to the remote PSAP or RDP. It is this transfer that is the most life-threatening and offers the greatest risk to officer safety.

Each RDP maintains only a single incoming phone line for 9-1-1 transfers, and the probability that this line is in use during a high-priority incident is significant. During the process of transferring a call, no additional details can be gathered from a caller until contact is made with the remote site. Furthermore, with the prevalence of wireless phones, many high-priority incidents generate more than one initial phone call. RDPs and remote PSAPs do not maintain staffing levels to answer and process a large influx of calls. A recent bank robbery generated seven phone calls within twenty-seconds of the initial event – each with varying degrees of information on the perpetrators and get-away vehicle. It is very unlikely that any RDP would have the personnel to rapidly answer and process these calls simultaneously.

RDPs also lack the ability to receive automatic location information (ALI), and they are unable to query a wireless device for an updated location.

Finally, the Department of Public Safety currently provides both calltaking and dispatch for thirty-six primary police agencies throughout the county, and does so in a high-quality, professional manner on a daily basis with the **highest regard for both citizen and officer safety**.

Mitigating steps:

- See mitigating steps in #5.

9. "Who will monitor cameras and prisoners?"

The Department of Public Safety recognizes that this is a fundamental concern for many agencies. The potential solutions to this issue are outside the scope of this document, but can be overcome to the satisfaction of the agencies involved. Some possible solutions, offered without explanation, are: Central locations for booking and housing prisoners, maintaining a smaller staff for these and other administrative functions, or cooperative agreements with neighboring agencies. Many of the thirty-six agencies currently dispatched by DPS have overcome this issue, and a survey of these agencies for suggestions and best practices would likely bring even more suggestions.

With the advancement of IP-camera technology, it is also possible that inexpensive links to a select number of remote agencies could be established for the purpose of monitoring closed-circuit cameras from DPS. This option has several liability and staffing elements, which would have to be investigated in much greater detail to determine if it is a viable option.

Mitigating steps:

- DPS would survey current DPS-dispatched agencies to develop a comprehensive accounting of the steps these agencies utilize to overcome this issue. In combination with this analysis, possible technology alternatives and centralization options would be discussed with all agencies involved to determine the most effective and viable option.

10. "Would our telecommunicators lose their jobs?"

It should be recognized that remote site telecommunicators perform functions well beyond calltaking and dispatching on a daily basis.

Remote site personnel conduct many administrative tasks, greet and provide service to walk-in traffic, and process data in records management systems to name just a few. Every agency – either self-dispatched or dispatched by DPS – maintains some degree of administrative support personnel, which would continue in a consolidated landscape.

It is also recognized that remote site telecommunicators maintain a level of agency knowledge related to specific polices, procedures, and methods used. This knowledge would not only be vital during the consolidation process, but beyond to ensure that every stakeholder's expectations are met.

Mitigating steps:

- *The Department of Public Safety is committed to evaluating every agency's concerns related to personnel on a case-by-case basis, and integrating personnel laterally in the DPS community wherever possible.*

HYPOTHETICAL ALTERNATIVES

Several hypothetical alternative consolidation scenarios have been offered for consideration during initial discussions. These alternatives are described following, with consideration given to the viability of each as a realistic alternative.

1. **Combine the three remote PSAPs – Abington, Cheltenham, Lower Merion - into a single operation.**

The total adjusted call volume for the three remote PSAPs is 2,273 calls per month based on calculations explained in earlier sections. Utilizing Erlang-C calculations to determine the number of calltakers required for this volume, and assuming an 80-second average call length, one calltaker would be required 24 hours per day to meet the PEMA requirement that 90% of 9-1-1 calls are answered in ten seconds or less. The current DPS standard is that 98% or better are answered in three seconds or less, which would require two full-time calltakers.

The least expensive operation to support this alternative would be either Abington or Cheltenham Township. With a 2009 monthly recurring cost of $11,019.87 for the customer premise equipment at these locations, the Cost-per-Call in this scenario would be $4.45, which is still four times greater than that of DPS.

2. **Reconfigure the 9-1-1 system to allow remote PSAPs to receive wireless, VoIP, and telematics calls**

It has been made clear to the Department of Public Safety from the PEMA Bureau of 9-1-1 Programs, that there is no support for the delivery of wireless calls to remote PSAPs.

3. **Enable remote PSAPs to process EMS and fire calls, individually.**

Some remote PSAPs are already processing emergency medical and fire calls, despite personnel lacking specific training and certification to do so, and despite agreements that have been in place since the inception of 9-1-1 service in Montgomery County.

In even the most ideal circumstance, the processing of fire and EMS calls would add approximately 200 additional calls per day to a single, consolidated remote PSAP. Such a small addition would make little difference in the Cost-per-Call, and would not achieve gains significant enough to suggest financial viability of these operations. In order to meet the Cost-per-Call of the Department of Public Safety, Abington, Cheltenham, and Lower Merion would need to receive and process 8,722 – 8,722 - and 13,177 calls per month respectively.

4. **Combine the three remote PSAPs, and enable that operation to process EMS and fire calls.**

Under this scenario a single PSAP would be responsible for processing approximately 2,917 calls per month. One calltaker would be required 24 hours per day to meet the PEMA requirement that 90% of 9-1-1 calls are answered in ten seconds or less. The current DPS standard is that 98% or better are answered in three seconds or less, which would require two full-time calltakers.

Again, the least expensive operation to support this alternative would be either Abington or Cheltenham Township. With a 2009 monthly recurring cost of $11,019.87 for the customer premise equipment at these locations, the Cost-per-Call in this scenario would be $3.47, which is still three times greater than that of DPS.

SUMMARY

[CITATIONS]

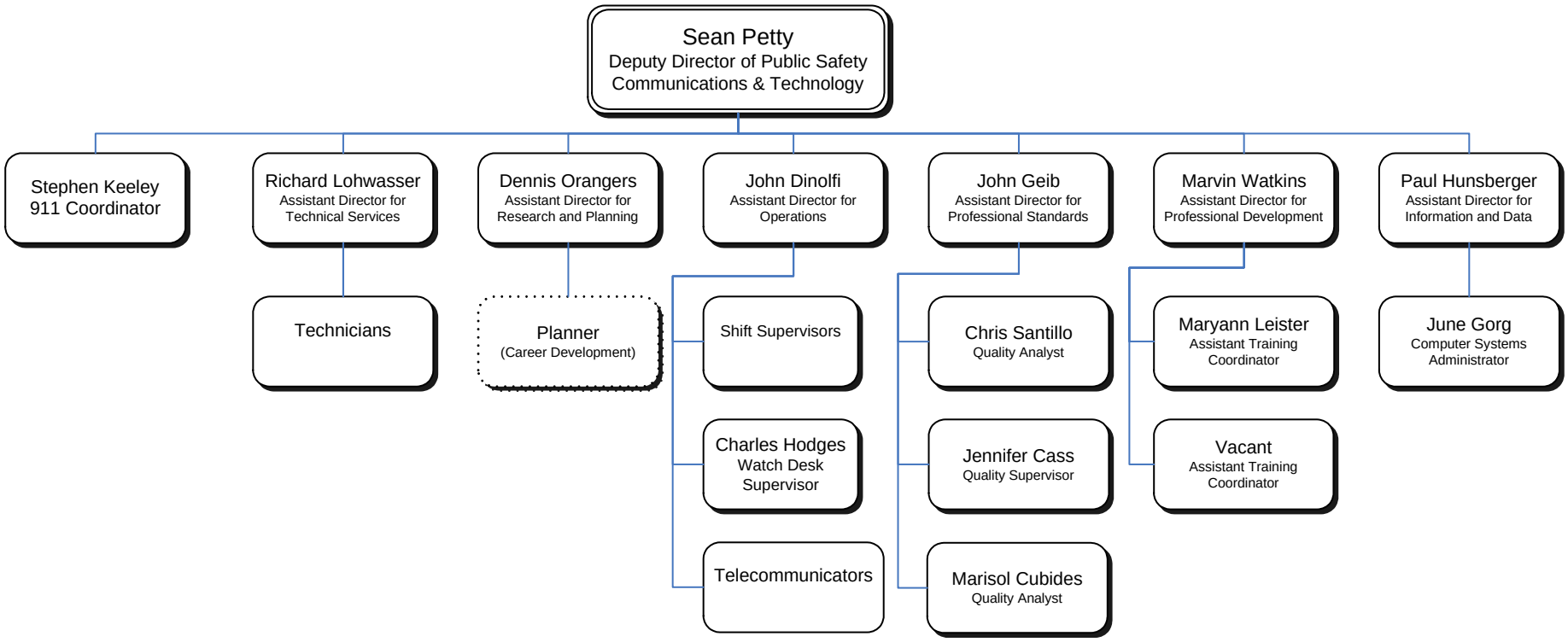
Blumberg SJ, Luke JV. Wireless substitution: Early release of estimates from the National Health Interview Survey, July-December 2008. National Center for Health Statistics. May 2009. Available from: http://www.cdc.gov/nchs/nhis.htm.

Weiser, Phil, Hatfield, Dale N. and Bernthal, Brad,The Future of 9-1-1: New Technologies and the Need for Reform. Journal of Telecommunications and High Technology Law, Vol. 6, No. 2, 2008. Available at SSRN: http://ssrn.com/abstract=1146803

Montgomery County Dept. of Public Safety

Communications & Technology Division Organizational Chart
June, 2009

Appendix A. Communications Division Organizational Chart



Montgomery County Department of Public Safety

Communications & Technology Division

Sean Petty – Deputy Director

"Who to Call"

Communications Center Supervisor – 24 Hours Per Day
610-631-6541
For: Immediate dispatch issues, complaints, tone/voice/alpha activation issues, equipment failures

John DiNolfi
Assistant Director
Operations
jdinolfi@montcopa.org
610-631-6516

- Procedure/SOP Updates
- Field User / Dispatch Issues
- Special dispatch requests/ procedures
- 9-1-1 Center Tours

John Geib
Assistant Director
Professional Standards
jgeib@montcopa.org
610-631-6538

- CALEA Accreditation
- All formal 9-1-1 / field complaints/investigations

CAD HELP LINE
610-631-3001

- MDC/CAD Software Questions
- Logon/Password Issues
- New Officer/Unit Logons

Paul Hunsberger
Assistant Director
Information Systems
phunsberg@montcopa.org
610-631-6548

- 9-1-1 Addressing Issues
- Mapping / GIS
- GPS Field Surveying
- Requests for maps

Steve Keeley
9-1-1 Coordinator
skeeley@montcopa.org
610-631-6509

- Subpoena/Tape/Radio/ MDC Record Requests
- 9-1-1 System outages/ Failures
- VoIP Issues

Richard Lohwasser
Assistant Director
Technical Services
rlohwass@montcopa.org
610-631-6542

- Field Radio Issues
- Tone/Voice Pager Issues
- Alpha Pager Issues
- 800 MHz System Issues

Dennis Orangers
Assistant Director
Research & Planning
doranger@montcopa.org
610-631-6545

- Response Plan Updates (Run Cards)
- Fire Service MDC Questions
- CAD Reports
- General Fire Service Questions/Issues

Marvin Watkins
Assistant Director
Professional Development
mwatkins@montcopa.org
610-631-6507

- MDC C.L.E.A.N. Testing
- NCIC Validations
- Police Dept Daily Bulletin
- Training Schedules
- Training Programs
- APCO Certifications


COUNTY OF MONTGOMERY, PA
DEPARTMENT OF PUBLIC SAFETY
MONTGOMERY COUNTY
1784