

WIRELESS ENHANCED 911

The State Has Successfully Begun Implementation, but Better Monitoring of Expenditures and Wireless 911 Wait Times Is Needed

Audit Highlights . . .

Our review of the State's wireless enhanced 911 (wireless E911) program revealed that:

- Under the leadership of the Department of General Services' 911 Office (General Services), California has addressed many of the concerns raised by two federal reports on nationwide implementation of wireless E911.*
- Although much work remains to be done, General Services plans to have wireless E911 implemented throughout most of the State by December 2005.*
- Most California Highway Patrol (CHP) centers do not have systems to monitor how long they take to answer 911 calls, and more than half the centers that tracked wait times did not meet the State's goal to answer 911 calls within 10 seconds.*
- Wait times were high, in part, because dispatchers at CHP centers handled significantly more 911 calls per dispatcher than did local answering points we contacted.*

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Department of General Services' and California Highway Patrol's responses as of August 2005

Since 1993, Californians have relied on a landline enhanced 911 (landline E911) system for fast, lifesaving responses from police, fire, and emergency medical services. The landline E911 system improved on the original "basic" 911 system by routing calls to dispatchers at the appropriate public safety answering points (answering points) and providing the callers' locations and telephone numbers on dispatchers' computer screens. However, the increasing use of mobile phones for 911 calls has created the need for a similar wireless emergency call system (wireless E911).

According to a 2002 report from the Federal Communications Commission (Hatfield report), national progress toward a fully functioning wireless enhanced 911 system has been delayed, with many states lacking the central coordination and dedicated funding source to implement such a system. Thus, 911 callers using mobile phones may have trouble connecting to appropriate answering points, and may not have their locations or mobile-phone numbers transmitted to dispatchers. Such problems with wireless emergency calls can compromise the success of emergency response teams in protecting life and property.

The Joint Legislative Audit Committee (audit committee) requested that the Bureau of State Audits review the State's emergency 911 response program to explore efficiency improvements and identify the cause of answering delays. We were also asked to determine the status of the State's implementation of the wireless E911 project and to identify obstacles that are contributing to any delays. Further, the audit committee asked us to identify the locations in the State where wireless 911 call wait times are longest and to determine the factors that contribute to the delays.

- ☑ *Unfilled dispatcher positions at CHP centers contributed not only to longer wait times but also to significant overtime costs for the CHP.*
 - ☑ *The CHP does not expect the number of wireless 911 calls diverted to local answering points to exceed 20 percent statewide.*
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The Department of General Services' 911 Office (General Services), which is responsible for coordinating the State's implementation of wireless E911, has helped the State avoid problems other states face during implementation. We are concerned, however, that the California Highway Patrol (CHP), which responds to the great majority of wireless 911 calls, has inadequately monitored the calls and has had difficulty hiring dispatchers.

Finding #1: General Services cannot readily differentiate expenditures for the wireless E911 project from those for the landline 911 program.

General Services enters expenditures from the 911 program into an expenditure database it maintains, enabling it to track its costs and manage the 911 program as a whole. However, General Services does not include elements in its database that would enable it to readily differentiate expenditures for the wireless E911 project from those for the landline 911 program. Rather, General Services can easily determine only its expenditures for the entire 911 program. As a result, when we asked General Services how much it had spent to date on the wireless E911 project, it could not provide us with that information. However, we analyzed data from General Services' database and determined it had spent at least \$4.7 million on wireless E911 as of June 2004. We were not able to obtain all of the wireless costs because some are not distinguished from landline 911 costs. Although the chief of General Services' 911 Office told us that a report that captures monthly costs for wireless E911 costs is under way, the report may not completely capture all wireless E911 costs because of the missing data elements in the database. Adding data elements to uniquely identify costs as wireless or landline would enable General Services to produce accurate expenditure information for both the landline and wireless E911 systems, use the information to make ongoing comparisons of actual expenditures and planned spending, and monitor the wireless E911 project to determine if its cost estimates are reasonable.

To adequately monitor the funding and progress of the implementation of wireless E911, General Services should separately track expenditures related to the wireless E911 project, comparing actual to anticipated expenditures.

General Services' Action: Corrective action taken.

General Services states that it has revised its existing project database to allow wireless E911 costs to be more easily identified and developed a reporting system to assist management in monitoring these costs.

Finding #2: The State has diverted more than \$150 million of 911 program funds to the General Fund.

Although the Revenue and Taxation Code states that the money collected from the telephone surcharge must be used solely for the 911 program, the State Emergency Telephone Number Account (emergency account) has been tapped for other purposes. In six fiscal years since 1981–82, a total of almost \$177 million has been transferred from the emergency account to the State’s General Fund, and only \$24.6 million has been transferred back. The latest transfer was in fiscal year 2001–02 for more than \$63 million. It appears that the State does not intend to repay these transfers because it does not show any amounts receivable from the General Fund on its financial statements for the emergency account.

Although General Services believes these transfers will not adversely affect its ability to implement wireless E911, we believe the transfers could jeopardize future improvements to the 911 system. The Hatfield report raises serious questions about the nation’s 911 infrastructure. Specifically, the report states that the existing landline E911 infrastructure, although generally reliable, is seriously antiquated and built on outdated technology. To be effective in an overwhelmingly digital world, the analog infrastructure may need major upgrades to extend E911 access to a rapidly growing number of nontraditional devices. In response to these issues, General Services has indicated it is currently in the conceptual stages of a project to update the State’s landline E911 infrastructure, but it does not have a financial plan or cost estimate for such a project at this time. Should the State decide it is necessary to upgrade the infrastructure, the \$152 million in net transfers may hamper its efforts. Moreover, because the current surcharge is close to the legal maximum, if additional revenue is needed, legislation would be necessary to authorize that increase.

To ensure adequate funding is available for future upgrades of the 911 system infrastructure, General Services should complete its conceptual plan for the project and, if it determines significant upgrades are needed, complete a financial plan for the project.

The Legislature should consider the effects on future 911 projects when diverting funds from the 911 program.

General Services’ Action: Pending.

General Services reports that it is continuing work on its project, which it calls Next Generation E911 Network, in which General Services is evaluating ways to incorporate emerging technologies with a more flexible, sophisticated and cost-effective 911 system. General Services states that it has evaluated responses to a request for information that it sent out to obtain industry feedback on the 911 database requirements. General Services concluded that emerging industry standards must be finalized and technology trials completed prior to formulating a decision to

move ahead with a 911 database replacement, along with supporting network enhancements. General Services states that it is monitoring the industry's progress both in developing the necessary standards and, subsequently, obtaining the National Emergency Number Association standards organization's agreement to those standards. Additionally, General Services states it has continued to follow the progress of several technology trials that are being conducted in various locations in the nation; and that once the trials are conducted and their outcomes are reported, which in some cases may be by the end of 2005, it will be in a better position to make an informed decision regarding the future path for California. Subsequently, if it determines that significant upgrades are justified, General Services states that it will complete a financial plan for the database enhancement phase of the project.

Finding #3: Most CHP centers do not have systems to monitor how long they take to answer calls.

As required by state law, the CHP answers 911 emergency calls that originate from wireless phones and are not routed to local answering points, such as police, fire, or sheriff's departments. To respond to these calls, the CHP operates 24 centers that function as answering points for wireless 911 calls. Of the CHP's 24 centers, 15 lack systems to track either the amount of time a caller waits before a dispatcher answers a call or how many calls are unable to get through because all the center's lines are busy. Therefore, at these 15 centers, the CHP can neither determine how long a caller waits before reaching a dispatcher nor monitor its activities adequately to ensure that it answers 911 calls promptly. Thus, the CHP may be unaware that problems exist.

At nine of its 24 centers, the CHP has installed an automatic call distributor to improve its ability to answer calls. The call distributor routes incoming calls to available dispatchers and, when a dispatcher is not available, places the call in a queue until one becomes available. With these systems, the CHP is generally able to monitor how long callers must wait before being answered. However, according to its 911 coordinator, the CHP has not installed automatic call distributors in 15 of the 24 centers because it believes the volume of calls received by those centers does not merit the cost of installing and using the system. Rather, each of the 15 centers has a phone system with a certain number of phone lines. When a call comes into one of the centers, an available dispatcher answers the call. If no dispatcher is available, the call continues to ring until a dispatcher can pick up the line. Additionally, if the number of calls coming into the center exceeds its number of phone lines, the caller receives a busy signal. This type of system is likely to leave already-distressed callers even more upset by the lack of assurance that someone is responding to their emergencies. Further, the system lacks a mechanism to track how long callers wait for dispatchers to answer. Although the CHP does not have a good system to monitor wait times, the chief of the CHP's Information Management Division has indicated that the CHP closely tracks citizen's complaints about its handling of 911 calls.

According to the CHP's 911 coordinator, as part of its implementation of wireless enhanced 911 (wireless E911), the CHP will be equipping each of these 15 centers with technology that will allow the CHP to monitor the amount of time callers wait before a dispatcher answers the call. The CHP expects to have the new systems in place by the end of 2005, consistent with the State's plan for implementation of wireless E911.

To assist it in answering 911 calls in a timely manner, as the CHP implements wireless E911, it should include a wait time monitoring system at the 15 centers that currently are without one.

CHP's Action: Corrective action taken.

The CHP states that it completed and submitted a purchase order for a management information system for all of its communications centers that will enable each center to monitor wait times. The CHP states that all but four of its centers have implemented the new system and the remaining four will be complete by December 31, 2005.

Finding #4: The CHP handles significantly more 911 calls per dispatcher than any of the four local answering points we reviewed.

For the nine centers that collected data, the CHP received between 598 and 1,733 calls per dispatcher each month from January through March 2004, whereas the local answering points we contacted received from 95 to 214 calls per dispatcher in the same period. The difference in the calls per dispatcher between the CHP and the local answering points is significant because even with the implementation of the wireless E911 project and its associated benefits, if the CHP does not have enough dispatchers to answer the wireless 911 calls it receives, it will likely continue to struggle to answer calls within the 10-second goal set by the State.

Disparities in staffing, however, do not fully explain the wide range in wait times at the nine CHP centers. For January through March 2004, the center with the highest average number of calls (1,733) per staff person, the Orange County Region, also had the shortest wait time, 4.7 seconds on average. On the other hand, the Los Angeles and San Francisco Bay Area regions had significantly fewer calls per staff and longer wait times—862 calls with a wait time of 49.2 seconds for Los Angeles and 598 calls with a wait time of 38 seconds for the San Francisco Bay Area Region. Dispatchers at CHP centers, as well as those at some local answering points, have duties other than answering emergency calls, such as answering nonemergency calls, but we do not know the relative impact on wait time of these additional duties at the various sites. The performances at the Los Angeles and San Francisco Bay Area CHP centers may also have been affected by their implementation of wireless E911. The 911 supervisor at the Los Angeles CHP center points out that implementation presented an additional challenge because the center's staff had to accustom themselves to the display

information from the wireless E911 calls they answered while continuing to work with the original system on other calls. Further, he indicated that test calls for wireless E911 implementation take up time, as the dispatcher has to confirm that various data are correctly transmitted.

To assist it in answering 911 calls in a timely manner, the CHP should identify additional practices that enable some centers, such as Orange County, to answer 911 calls in a timely manner despite high calls to staff ratios, and determine if the practices can be incorporated at other centers.

CHP's Action: Partial corrective action taken.

The CHP reports that it is addressing this recommendation through its Command Assessment Program, which requires biennial evaluation of the management practices and the essential functions of each CHP command. The CHP will incorporate innovations noted in these assessments into the training materials and curriculum at its statewide Dispatch Academy. The CHP also states that its Information Management Division, Office of Legal Affairs, and Department Training Division are presently developing the necessary policy and processes for implementation of the new strategy.

Finding #5: The CHP does not have a benchmark for the number of staff needed to answer calls.

According to the assistant commander of its Telecommunications Division, the CHP has not established a benchmark for the number of 911 calls per dispatcher that would allow the CHP to answer 911 calls promptly. If it had a benchmark, the CHP could compare its centers' current ratios of 911 calls per dispatcher against the benchmark to assess the need for additional dispatchers. To establish a reasonable benchmark, the CHP would need to develop a better system for tracking the total number of 911 calls received at each of its centers.

Currently, to monitor the number of 911 calls it receives, the CHP requires each center to track the number of 911 calls it handles during one day each month and report these counts to the CHP's Telecommunications Division. The CHP then multiplies the counts by the number of days in that month to arrive at an estimate of the total 911 calls the CHP answered for the month. However, this process has resulted in unreliable data. The CHP used a fully manual tally system to count 911 calls in 19 of the 24 centers. In these centers, the CHP relied on dispatchers to make tally marks on a sheet each time they completed a 911 call. However, administrators at several centers told us this process did not produce accurate results because it is difficult for dispatchers to remember to tally after each call. In fact, four of the 19 centers preparing manual counts had automatic call distributors, which enable the centers to produce automated reports detailing the number of 911 calls they receive each month.

Additionally, this process assumes that the activity level of one day will be representative of the entire month. However, the volume of 911 calls the CHP receives is affected by factors that are highly variable, such as weather and major incidents. Therefore, one day would not necessarily be representative of others. Because these centers report the number of 911 calls for only one day each month, the results are not necessarily reliable and may result in an overstatement or understatement of call activity. Only the San Diego center reported calls for each month based on its automated call distributor data. Additionally, another center with the automated call distributor, Stockton, had not submitted tally reports during 2003.

During 2003, the Los Angeles CHP center performed manual tallies of its 911 counts. However, these manual counts significantly understated its actual number of 911 calls—by almost 705,000, or 43 percent. On the other hand, the Fresno CHP center produced manual call tallies that significantly overstated its 911 calls—by almost 222,000, or 76 percent. Because the CHP does not track actual 911 calls at all its centers, we are unable to determine whether, in total, the CHP overstated or understated its 911 calls. Nonetheless, it is clear that the CHP's current process to develop an estimate of the number of 911 calls it receives produces unreliable results. Without reliable data relating to the number of 911 calls its centers answer, the CHP will have difficulty developing a benchmark for the number of 911 calls per dispatcher that would allow the CHP to answer 911 calls promptly.

To assist it in answering 911 calls in a timely manner, the CHP should implement a reliable system for monitoring the number of 911 calls its centers receive. Additionally, it should develop a benchmark reflecting the ratio of 911 calls per dispatcher that would allow the CHP to answer 911 calls within the state goal of 10 seconds.

CHP's Action: Partial corrective action taken.

The CHP states that the management information system it is implementing, as described in finding #3 above, will also enable it to monitor the call volume at each of its call centers. Additionally, the CHP states that it is developing a benchmark that will consider call volume data, communication center size, and incorporate shift parameters and the impact of seasonal and special events that affect high traffic volumes. The benchmarks will be utilized to evaluate and validate dispatch staffing levels. The CHP states that it intends to develop a benchmark using six months of call data collected after its new management information system is implemented. The CHP reports that a committee comprised of management and dispatch personnel has developed a staffing questionnaire and gathered statistical data from representative communication centers. The CHP will use this information to complete a budget change proposal for additional dispatchers for fiscal year 2006–07.

Finding #6: CHP dispatchers' salaries are generally lower than those of dispatchers at the local answering points.

We compared the dispatcher salaries paid by the CHP in its Los Angeles and Sacramento centers with those paid by selected local answering points in the same areas. The salaries of CHP dispatchers are generally lower than those of dispatchers at the local answering points we contacted. Although the starting pay for dispatchers at the Sacramento County Sheriff's Office is lower than the CHP's, all other local answering points we contacted paid starting salaries ranging from \$40 to \$842 per month more than the starting salaries for CHP dispatchers.

To help attract and retain dispatchers at its centers, the CHP should request that the Department of Personnel Administration perform a statewide salary survey to determine the adequacy of the current salaries for CHP dispatchers.

CHP's Action: Corrective action taken.

The CHP reports that using a salary comparison of 13 public agencies' (agencies) dispatcher salaries that CHP had prepared as a basis, the Department of Personnel Administration surveyed the agencies and confirmed that the CHP dispatcher salary scale is not in parity with that of the agencies surveyed. According to the CHP, based on the results of this survey, the Department of Personnel Administration negotiated a tentative agreement with the dispatchers' union that includes a 10 percent pay raise during the term of the two-year agreement. The contract is still pending ratification of the union membership, and approval by the Legislature and governor. The CHP states that although the dispatchers' salary is still below the average pay of the 13 public safety agencies surveyed, when combined with continued recruitment and retention efforts, it should allow the CHP to fill and retain more dispatcher positions.