

Mobile Device  
Management and Accountability

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November 2012



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# Office of Multnomah County Auditor

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Date: November 7, 2012

To: Jeff Cogen, Multnomah County Chair  
Commissioners Kafoury, Smith, Shiprack, and McKeel  
Michael D. Schrunk, District Attorney; Daniel Staton, Sheriff

From: Steve March, Multnomah County Auditor

Re: Mobile Device Management and Accountability

Mobile devices can be an important tool for some Multnomah County employees and both their number and frequency of use have grown significantly in recent years. The County, as many other large public and private organizations, has been challenged to keep up with managing multiple devices and plans.

We recommend that the County provide stronger central management, create stronger controls and security, better document and evaluate need, monitor usage with regular reassessment of need, and contract for specialized services to assist in the management of these devices and their complex plans. We estimate the County could have saved over \$300,000 in the last fiscal year by following some of these basic recommendations.

During the course of this audit we did encounter what appeared to be improper personal use of some of these devices and we immediately notified management. We appreciate the swift action by the Chair to notify device users of rules and regulations regarding using mobile devices. Management also followed up with our audit team to identify potential misuse and conducted investigations under personnel rules and union contracts; as a result a number of individuals received some sort of reprimand while in other cases the use was confirmed as appropriate.

This audit was conducted by Judith DeVilliers and Nicole Dewees. We appreciate the assistance we received from the Department of County Assets, other departmental staff, as well as device users, liaisons, and supervisors, as well as management

CC: Joanne Fuller



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## Executive Summary

Mobile devices are an important tool for some Multnomah County employees. Changing technology transformed mobile devices from telephones into small computers. The added functionality of mobile devices led to a sudden growth in their popularity. Many large organizations, including the County, are facing significant challenges in managing a complex array of devices and plans.

The County does not have adequate processes to determine business need, monitor usage and cost, account for mobile devices, or provide adequate security. We estimate the County could have saved over \$300,000 in fiscal year (FY) 2012 with improved processes and controls. This number only includes the cost of unused devices and incorrect voice plans. Due to the lack of data, it does not include potential cost savings from incorrect data and texting plans or reductions in personal use. We estimate that employees potentially used over 20% of their cell phone minutes for personal use, so there may be significant savings from a reduction in personal calls.

We recommend the County (1) provide stronger central management of costs and choices for mobile devices; (2) create stronger controls for losses and security of devices; (3) evaluate and document employee needs for mobile devices; (4) monitor usage and reassess ongoing business needs and (5) contract for outside services to assist in the management of mobile devices and plans. In response to our audit, management has begun to take action. For example, the Chair sent an email to mobile device users outlining the personal use guidelines, HR has revised its mobile device policies and is in the process of getting final approval and management told us that they completed a project to have department directors review the business need of mobile devices.

## **Background**

Mobile communications include a large array of electronic devices that utilize cellular airwaves, such as cell phones, air cards and tablet computers. Mobile communications made up about 30% of the County's operating costs for communications. In FY2012, the County spent \$1.2 million on mobile device plans. This amount is only direct carrier charges and does not include the cost of Telecom, IT security and Helpdesk staff, or the 186 telecom liaisons.

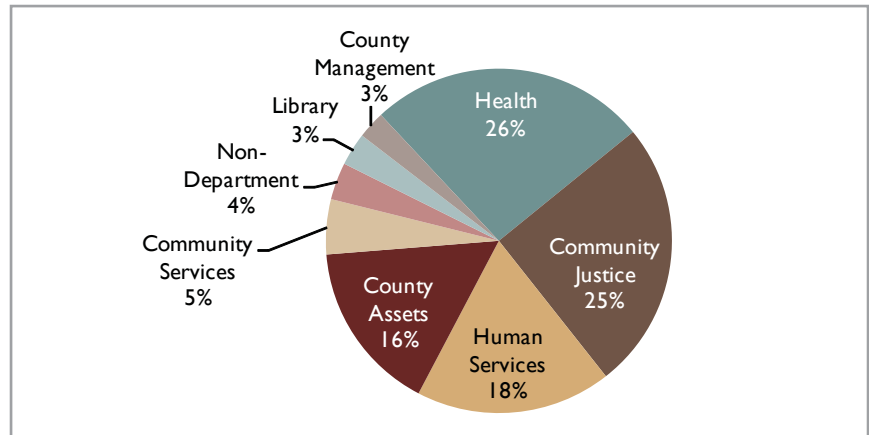
Management of mobile devices is mostly decentralized and departments have the authority to order devices and monitor usage. Within departments there are many people involved in managing mobile devices, including upper management, supervisors and telecom liaisons. Telecom liaisons support their work unit's telecommunication needs and most, but not all, of them assist with mobile devices. The telecom liaison role is tacked onto an existing job description (typically an office assistant) and takes up a small percent of the employee's job.

IT Security and Help Desk provide security support to departments. In addition, two non-management employees in the Department of County Assets Administrative Services Hub provide mobile device support to departments. These positions work with the department liaisons and carriers to manage and adjust plans. Although part of the Administrative Services Hub, we will refer to mobile device support as Telecom, as that is the name most commonly used to describe it.

Every department utilized mobile devices. Some departments, such as the Health Department and the Department of Community Justice, have a large number of employees that work away from their desks and therefore had the highest mobile device costs. The chart below shows the percent of the total mobile expenses that each department incurred during FY2012.



Exhibit 1

**FY2012 Mobile Device Costs**

Source: SAP Fund Center Report

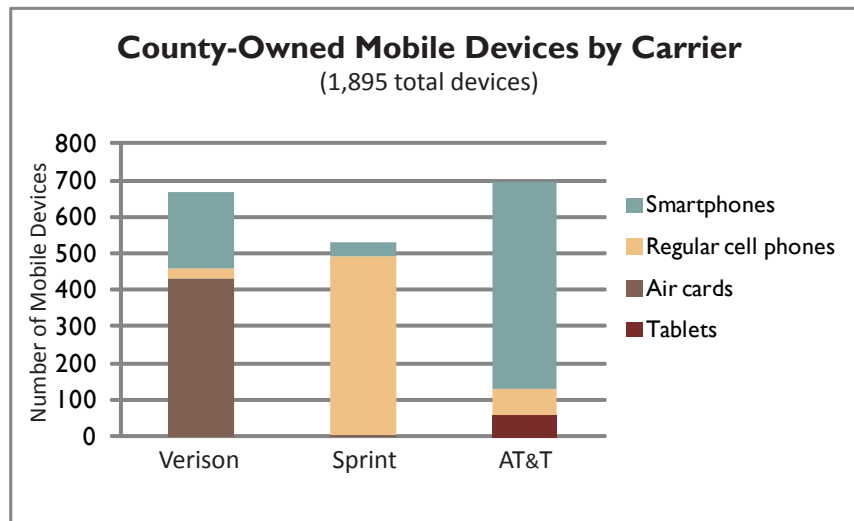
**Scope** The scope of our audit included all County departments except the Sheriff and District Attorney's Offices since Telecom does not manage their mobile devices. Our scope included fiscal year 2012. However, due to the complexity of the data, our detailed analysis of the wireless carrier's reports focused on just the January through March, 2012 billing periods. Our audit included the following mobile devices:

Exhibit 2

Device Type	Description	Total Monthly Cost	Average Monthly Cost Per Device	Number of Devices
Smartphones	Mobile phones with voice and text messaging, plus data plans that allow internet access.	\$67,104.03	\$82.64	812
Regular Cell Phones	Mobile phones that include voice (phone calls) and text messaging.	\$14,608.94	\$24.76	590
Air Cards	Broadband modems that allow laptops to connect to the internet using a cellular connection.	\$18,129.45	\$41.77	434
Tablets	Tablet computers, such as an iPad, with data plans that allow internet access.	\$2,082.06	\$35.29	59
Reimbursed Devices	The County provided a stipend to employees for the use of their personal cellular phones.	\$2,654.34	\$56.48	47
<b>Source:</b> County-owned device information from AT&T, Verizon and Sprint websites. Reimbursement information from Payroll. All data from March 2012. Costs only include the cellular plan and not the cost of purchasing devices. The County has more tablets, but we only included those with a cellular plan.				

Three different cellular carriers (AT&T, Sprint and Verizon) provided service for the County-owned devices. The chart below shows the mobile device types for each cellular carrier.

Exhibit 3



Source: Carrier website reports as of March 2012

**Methodology** Our audit findings are based on our analysis of usage and costs of all County-owned mobile devices, analysis of financial data from SAP (the County's enterprise system), interviews with each of the employees receiving a stipend, a survey of all telecom liaisons and cell phone users, interviews with Telecom staff and County management, and thirty in-depth case studies, which included extensive interviews and data analysis. We also reviewed best practices for managing mobile devices and security. Please see Appendix 1 for more information about our case studies. We obtained usage and cost data from AT&T, Verizon and Sprint websites and documents posted to Google Docs by Telecom staff.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

**Audit Findings** The County does not have adequate systems and processes in place to manage mobile devices. We believe the processes used in the past are not adequate to manage the complexity of mobile devices. We found that County employees are struggling with a broken and decentralized system and lack technical expertise and tools needed to manage \$1.2 million of annual mobile device expenses. Roles and responsibilities need to be redefined with significantly stronger central authority from Telecom and IT. Our findings include:

1. The County does not have an adequate process to match the business need with the appropriate mobile device and plan.
2. The County has incurred additional costs due to inadequate monitoring of mobile device usage.
3. Personal use of mobile devices has cost the County money.
4. The County does not have an adequate process to keep track of mobile devices.
5. Mobile device security needs improvement.

***1. The County does not have an adequate process to match the business need with the appropriate mobile device and plan.***

**What happened?**     **Unnecessary mobile devices-** Some employees had mobile devices without having a business need for one. We found 374 unused mobile devices. These had no voice, text or data usage for three consecutive months. Unused devices may indicate that departments did not fully evaluate the business need. In one of our case studies, a supervisor stated that his/her employee had a business need for a cell phone. However, the employee reported that they were able to perform all job duties without a cell phone and rarely used it. This potentially unnecessary mobile device cost the County about \$500 per year.

**Multiple mobile devices-** At least 291 employees had multiple devices. For example, many employees had two devices with data plans, such as an air card and a smartphone. There were even some employees with three different mobile devices. In some cases, the business need to access the internet could have been satisfied with just one of these devices. Duplicate mobile devices such as a smart phone and air card cost approximately \$171,000 per year; reducing this by 25% would result in an annual savings of approximately \$42,000 per year.

**Cost effective solutions not always selected-** Departments did not always evaluate costs when determining which device best met the business need. For example:

- **Costly smartphones-** Smartphones are an important tool for many employees. However, not all employees had a business need for one. In some instances, an employee requested a smartphone and a supervisor approved it without comparing the cost to other devices. This may have been done, in part, because one of the carriers only charged the County 99 cents per iPhone. However, the carriers required that the County pay for data plan for each smartphone, costing the County an average of \$32 per month or a total of \$311,808 each year. Essentially, this “free” phone actually cost at

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least \$384 more than a regular phone each year. This, in addition to other costs such as texting plans, resulted in smartphone plans costing an average of \$58 more per month than regular cell phones. The evidence suggests that some departments did not evaluate the ongoing costs when selecting devices.

- **Reimbursed phones can be more expensive-** The County paid some employees a stipend for the use of their personal cell phone (up to \$40 for voice and \$65 for voice and data). Most employees said they requested a stipend because they did not want to carry both a personal and a work cell phone. We looked at the usage history for 30 employees who had recently converted from County-owned plans to a reimbursed personal phone. For twenty of the thirty employees, a County-owned phone would have been the least costly option based on their actual phone use for the last six months. For those twenty, we estimated cost savings would have been \$614 per month or \$7,368 annually with a County-owned plan instead of an employee reimbursement. This does not take into account the difference in administrative costs for managing County mobile devices versus processing the stipends

**Some cost effective solutions used-** In some instances, the County found cost effective ways to meet the business needs of staff. In March 2012, 358 employees had pay-as-you-go plans at a low cost of \$15 per month. Some divisions such as, Developmental Disabilities had several cell phones and air cards that staff could check out as needed. This allowed many people to have access to important technology, without the expense of giving each person their own mobile device. Also, the Elections division put its cell phones into suspended status between elections. This allowed continuity by having the same phone number and avoided wasting money when staff did not need cell phones.

### **Why did it happen?**

**Unclear process-** There was not a clear County-wide decision making tool to determine who needed a mobile device or what level of service might be appropriate. The authorization form that the County created did not include any details about the business

need for a mobile device. In addition, some departments created their own processes, but few supervisors were aware of them. Several of the supervisors we interviewed were concerned that the County had not provided them with criteria to help them decide which mobile device and/or plan were most appropriate for their staff.

**Lack of expertise and time-** During the decentralization of mobile device management, the County gave departments more authority to order mobile devices and select plans. In many work units, telecom liaisons assumed this responsibility. However, some telecom liaisons ordered mobile devices so infrequently that it was difficult for some of them to stay up-to-date on all of the options. For example, there were dozens of different cellular plans and options and a consistently changing selection of mobile devices.

**Why is it important?**

**Cost-** The initial cost of a mobile device is only a small part of the total expense. Managers must consider the ongoing monthly charges before approving a mobile device. For example:

- **Unused devices-** There were 374 unused mobile devices, which cost the County \$42,955 during a three month period, or over \$170,000 in a year. We considered a device to be unused if there were no minutes, texts, or data used for three consecutive months.
- **Incorrect plans-** Of the mobile phones that were used, many of them were on plans that were much more expensive than needed. We estimate that 44% of mobile phones were on the wrong plan, which cost the County over \$135,000 annually. For example, one employee was on a 900 minute plan, but only used an average of 97 minutes. If the employee was moved to a more appropriate plan, it could have saved the County approximately \$988 annually. Due to a lack of information from the carriers, we were unable to calculate the expenses from data and texting plans. However, it is likely that the County has incurred additional costs due to staff being on incorrect data and texting plans.

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**How to fix it?**

- According to best practices, only someone in a position that is dedicated to understanding the ever-changing mobile market can effectively determine which devices and plans best meet the business needs of staff. Thus, Telecom, not departments, should have the responsibility for selecting the most cost effective plan and device based on the documented business needs of the employee.
- To help with better decision making and communication, the County should use a more detailed authorization form. (Please see Appendix 2 for an example.) The following parties should fill out the form:
  - o The employee's supervisor should document the business need based on criteria.
  - o The employee should sign that they understand policies.
  - o Telecom staff should use the information provided by the employee's supervisor to select the appropriate device and plan. Telecom staff should document the plan details and send the completed form to all parties.
- Departments should consider alternatives, when appropriate, such as shared mobile devices that can be checked out to staff as needed rather than assign individuals devices that are seldom used.
- International plans should require justification as to business need and department director approval.
- Departments should review the business needs for employees that have multiple devices, such as a smartphone, tablet and an air card. Potential options include tethering, which may reduce the cost for multiple devices.
- All departments should re-evaluate the business need, based on clearly defined criteria, of all current devices as soon as possible. In response to our audit, management told us that they recently completed a project that required the department directors to review the business need of all mobile devices.
- The employee's supervisor should re-evaluate the business need for the continued use of a mobile device on an annual basis.

- The County should re-evaluate the stipend value for the use of personal cell phones. Presently, there are individual plans on the market that provide unlimited minutes, text and data ranging from \$35 to \$50. The County should not pay more for reimbursements than the plans that are currently available for County-owned devices. Additionally, reimbursements should not exceed 60% of the cost of the employee's personal plan.



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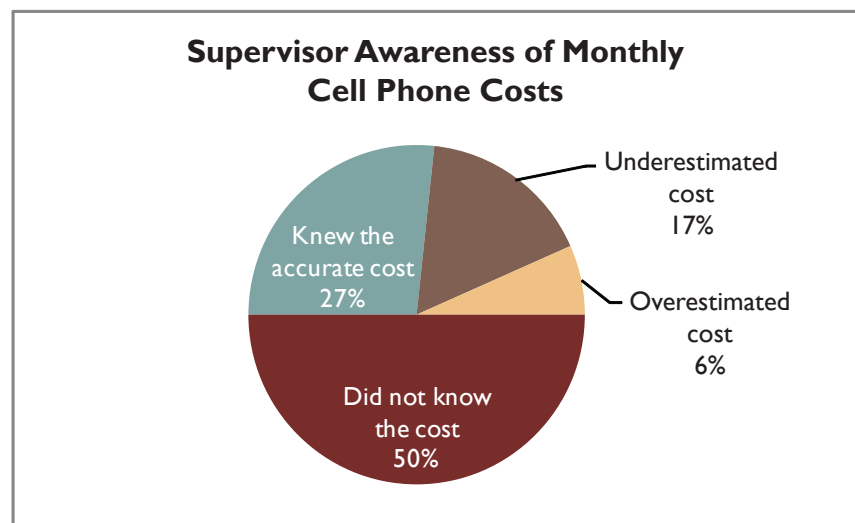
**2. The County has incurred additional costs due to inadequate monitoring of mobile device usage.**

**What happened?**

**Departments inadequately monitored usage and costs-**

Departments did not always monitor how employees used their mobile devices. Telecom liaisons often looked at the overall bill amount, but infrequently looked at reports about who employees called and texted and how much data they used. Additionally, only 27% of the supervisors we interviewed knew the accurate monthly cost of their employees' cell phone bills.

Exhibit 4



Source: Interviews with supervisors

**Centralized monitoring reduced some costs-** The County saved money due to the efforts of the Telecom staff. Telecom staff reviewed bills and looked for individuals that consistently used more minutes, data, or texts than their plan allowed. Telecom then moved these people to different, often more expensive, plans to help the County avoid future overage charges. Due to the large number of devices, Telecom staff did not have the capacity to monitor all of the mobile devices each month.

**Inappropriate usage cost money-** We found many instances of lengthy phone calls that incurred overage charges. For example, one employee placed a 178 minute call that resulted in \$80.10 of overage charges. This call was to a toll-free webinar, so if the employee had used a land-line, the call would have incurred no additional charges.

**County is not verifying accuracy of carrier bills-** The County received bills from the three vendors totaling over \$100,000 each month. The complexity of the plans made it nearly impossible to monitor billing statements.

**Why did it happen?** **Complex reports-** The billing, cost and usage reports on the mobile carrier websites were often time consuming to obtain and not easy to understand. For example, some of the problems with the carrier reports included:

- We had to download three different reports from one carrier just to find the usage details for an employee.
- The reports made it difficult to determine if calls and texts were sent outside of normal working hours.
- Some carriers did not provide sufficient information to monitor texting and data usage.
- Billing reports included all Multnomah County mobile devices, so if a telecom liaison wanted to monitor a few people, he or she had to dig through reports that included 1,900 different devices that were spread across three different carriers.
- Most significantly, it was not clear why there was an additional charge for some calls/texts/data, but not for others.

Due to this complexity, the County does not have a way to effectively monitor or verify the accuracy of billing statements. Large enterprises such as the County frequently require the services of a mobile device management company to monitor billing statements.

**Lack of process-** Management did not provide departments with a process of how to effectively monitor usage. When departments monitored usage, they typically checked the overall bill amount,

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but not the actual usage details. For example, in one of our case studies, a telecom liaison looked at the total mobile bill amount, but did not check the usage details. However, one of the employees in the work unit regularly used more minutes than the plan allowed, so there was an average of \$143 of overage charges each month, costing the County an estimated \$1,700 per year. In other instances, departments failed to notice unused and underused mobile devices because they only looked at the bill amount, rather than the usage details.

**Unclear roles and responsibilities-** County management did not clarify roles and responsibilities for monitoring. Many supervisors assumed that the telecom liaisons monitored usage. However, not all telecom liaisons believed that monitoring was their responsibility.

**Why is it important?**

The lack of monitoring resulted in:

- Additional charges- We found 23 employees who incurred monthly charges for dating, trivia and horoscope services that cost over \$400 during a three month time period. Some employees may have signed up for these services, but several of the businesses had a reputation for sending unsolicited text messages. These charges went unnoticed for several months before we brought it to management's attention.
- Lengthy calls- County policy states, "Employees will avoid lengthy conversations on county-owned cellular devices. If an employee anticipates that a call will last more than a few minutes, the employee will arrange to call the person back from a regular telephone, to the extent possible." We believe the policy assists in guiding the business need for a mobile device since employees who need to talk with clients or others at length may be better served with a land line. In addition to policy violations, many length calls resulted in overage charges.

- International plans- Several employees have international calling or text plans; some at the employee's request when they travel outside the United States. We question the County's need for this additional expense, except in rare instances.
- Unused mobile devices- As previously mentioned, 374 devices were not used during a three month period, costing nearly \$43,000, or over \$170,000 in a year.
- Underused mobile devices- As mentioned in the previous section, approximately 44% of mobile phones had more expensive plans than necessary, costing the County over \$135,000 annually.

**Inefficient use of time-** It is a poor use of time for each of the 186 telecom liaisons to monitor usage, as pulling reports requires significant time and expertise. Each of the telecom liaisons already has a full-time job and it is unrealistic for all of them to learn about the three carrier websites and download numerous reports each month just to monitor a few individuals.

#### **How to fix it?**

- The County should centralize the role of monitoring cellular device usage since departments lack the time and expertise to do this. Telecom should be given greater authority to monitor and manage cellular devices.
- However, due to the complexity of vendor reports, Telecom will need outside assistance. Telecom should contract with a mobile device management company. Many other enterprises have contracted with mobile device management companies. For example, Wireless Watchdogs is working with the State of Oregon to optimize their cellular plans and has produced cost savings for other local governments. The County should find a mobile device management company that can provide services such as rate plan optimization, cellular expense monitoring and inventory management. Many of these mobile device management companies will provide initial services at no charge as they recover overpayments to the carriers.

- The mobile device management company should also produce quarterly usage reports. Wireless numbers that have consistently gone below or above their plan limits would be included in an exception report to department management. Department managers should review the reports and re-evaluate employee business needs. Telecom can then make the appropriate plan changes.
- Our estimated savings of over \$300,000 per year can only be accomplished with increased management and monitoring that can be provided by centralizing this function and providing additional support such as a mobile device management company and perhaps additional staff.

### ***3. Personal use of mobile devices has cost the County money.***

**What happened?** **Potential abuse of mobile devices-** Our analysis of usage indicated that some employees may have used their mobile devices for personal use. We defined personal use as any phone call on nights and/or weekends to a non-County phone number (except for employees scheduled to work weekends) or when employees called the same non-County number more than 20 times in a month. A non-County number is any phone number that is not a desk phone, County-owned mobile device or mobile device reimbursed by the County. We recognize that this definition could potentially flag some business calls, but may be balanced out by missing some personal calls. In some instances the personal use may have been extensive enough to be considered abuse. Abuse is defined as “behavior that is deficient or improper when compared with behavior that a prudent person would consider reasonable and necessary business practice given the facts and circumstances.”<sup>1</sup>

Employees may have used an estimated 23% of their phone minutes to make personal phone calls on their County-owned cell phones.

During our analysis of a three month period, we found many examples of potential personal use, such as:

- One employee:
  - o Sent 392 text messages on nights and weekends to non-County numbers
  - o Used 2,081 minutes to call non-County numbers on nights and/or weekends
  - o Used 1,322 minutes and sent/received 151 text messages to an out-of-state weight-loss business
  - o Incurred \$1,437 in voice overage charges and \$23 in texting overage charges

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<sup>1</sup>United States. Government Accountability Office. Government Auditing Standards 2011 Internet Version, Washington, DC, 2011.

- An employee sent and received over 3,000 text messages and:
  - o Over 80% of the text messages occurred during nights and/or weekends
  - o Made calls to a foreign country
- Another employee incurred \$66 in roaming charges while traveling in the Caribbean.

**Management investigation-** Once we identified the problem, we alerted management to the potential personal use and possibilities of abuse. The County Chair sent an email to mobile device users clarifying that personal usage was not permitted, except in limited circumstances. In addition, Human Resources (HR) completed an independent investigation. HR requested the detailed phone call information for all employees that had more than 800 minutes of phone calls per month to non-County phone numbers. We provided HR with detailed phone usage for the 76 people who met these criteria. The following chart shows the results of HR's investigation.

Exhibit 5

<b>Human Resources' Investigation of Potential Personal Use of County Cell Phones</b>		
<b>Category</b>	<b>Actions Taken</b>	<b>Number</b>
Belonged to employees who had since left the County, had been assigned to contractors/volunteers, or simply could not be accounted for	Phone de-activated, no discipline issued	8
Determined to be used within policy	No discipline issued	29
Determined to be used moderately outside of policy	Oral reprimands	20
Determined to be used substantially outside of policy	Written reprimands	12
Determined to be used egregiously outside of policy	Written reprimands	7

Source: Human Resources

**Why did it happen?**     **Lack of monitoring-** Departments rarely monitored usage details of mobile devices. Please see previous section for more details.

**Policy not followed-** We believe that employees did not understand or did not follow County policy, or perhaps did not think there was an additional cost to the County.

**Why is it important?**     **Costs-**

- Personal use inflates to overall usage of phones, which causes people to be bumped up to more expensive plans and/or results in overage charges.
- For example, one individual was on an expensive 2,000 minute plan due to high usage levels. However, nearly half of the minutes used appear to be personal calls. This employee could have been on a 1,000 minute plan if personal use was eliminated, saving the County \$345 per year.
- By eliminating personal use, the County can better estimate its actual usage needs and select more appropriate plans.

**Ethical concerns-**

- County-owned mobile devices are public property and should be treated as such.

**How to fix it?**

- Employees should sign a form indicating they understand what constitutes allowed personal use for their mobile device.
- Telecom should provide departments with detailed exception reports about voice, text and data usage. This information would be provided quarterly. The employee would sign that all usage was work related except calls or texts noted as personal. Supervisors would review and sign off.
- HR needs to clarify personal use in the County policy. In response to our audit, the County revised its policies and is in the process of getting final approval.
- Telecom or HR should provide employees with training about the appropriate use of mobile devices and what constitutes personal use.



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***4. The County does not have an adequate process to keep track of mobile devices.***

What happened? **The County cannot account for mobile devices** - The only inventories we could find were lists kept by some department liaisons and Telecom.

- These lists did not have all of the essential information, such as the personnel number of the employee, the location where the employee works, the status of the asset, and the serial number of the mobile device.
- Assets were not always assigned to employees. For example:
  - o 284 mobile devices were not assigned to a particular employee; rather they often were assigned to names such as “User 7,” and a program billing code, but no indication as to the name of the custodian or location of the devices. We believe some of these may be shared devices, but the County still needs to know who is accountable.
  - o We found 83 mobile devices assigned to names of individuals who no longer work for the County.
  - o We found 32 mobile devices assigned to people who do not appear to be County employees.
  - o We found 9 mobile devices assigned to a first name only; therefore the individual cannot be identified whether they are an employee or not.
- The County lacks accountability over assets, such as:
  - o Devices held by departments or Telecom for distribution
  - o Mobile devices transferred from one employee to another
  - o Unusable or outdated devices that have been destroyed
  - o Lost or stolen devices

**Why did it happen?**

**Lack of process-** County management did not create procedures to effectively keep track of purchases, transfers, and disposals of mobile devices. Several employees kept inventories, but management did not provide sufficient guidance about which elements to include in an inventory management system.

**Complexity of inventory management-** The County had 1,900 devices to track. During January through March 2012, 122 new mobile devices were ordered, 96 devices were disconnected, 67 employees changed carriers, and several hundred devices changed to a different plan. The County did not have software to help keep track of all of the changes. Many other enterprises have faced similar issues and have contracted with mobile device management companies.

**Unclear roles-** Management did not clarify who was responsible for inventory management and updating changes to user information.

**Why is it important?**

The County's mobile devices are valuable equipment. Each of the County's smartphones has a market value between \$375 and \$850, air cards have a retail value of \$46, and tablets cost an average of \$600. It is important that the County can account for these valuable devices, particularly when employees change jobs or end their employment with the County.

**Potential to incur significant charges-** In many ways mobile devices are like credit cards, in that they can incur significant costs without management approval. Examples include overage charges, international calling charges and third-party services, such as horoscope and dating services. The County must know who is accountable for each mobile device in order to assign responsibility for any charges.

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**Non-employees-** Because only County employees are subject to County policies, we questioned why the County issued mobile devices to non-employees. In one example, a person who was contracted by the County received a County-owned mobile device. In our analysis of three months of usage, this contractor used 9,885 minutes, 54% of which were flagged for potential personal use. Due to high usage levels, this contractor was on an expensive plan, but if personal use had been eliminated, the County could have saved over \$300 per year. This phone was recently taken out of service by County management.

**How to fix it?**

- The County's centralized inventory should include the detailed plan description, device serial number, phone number, employee name (or custodian if shared device), personnel number, employee work location and any changes such as transfers to a new employee, lost or stolen devices or if the device's SIM card was removed.
- The County should contract with a mobile device management company that provides inventory management services.
- The employee or custodian should sign a receipt upon receiving the mobile device.
- The County should account for all devices not assigned to an individual and all dispositions and losses of mobile devices.

## 5. Mobile device security needs improvement.

**What happened?** **Confusion about reporting lost devices-** One study found that 25% of Americans lose or damage their cell phone each year. Lost devices can potentially put sensitive information at risk and a quick response may help reduce this threat. In an email survey, we asked County-owned cell phone users, “If your phone was lost or stolen, who would you contact?” Cell phone users had a variety of answers, including telecom liaisons, supervisors, and Telecom. Only some of the County-owned cell phone users listed IT/Helpdesk. Many of the people mentioned may be able to assist an employee with their lost device, but only IT is able to remotely wipe sensitive data from a device and is also available 24 hours per day, 7 days a week.

Exhibit 5



Source: Survey of County-owned cellphone users

**Inability to monitor-** The County did not have software to monitor what employees downloaded onto their mobile devices. Employees could have potentially downloaded malicious apps or other harmful software onto their mobile devices without the County’s knowledge.

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**Passwords often used-** Telecom staff configure the settings of iPhones to turn on the password feature before giving the device to employees. Staff can turn off the password later, but ninety-two percent of County-owned smartphone users stated that they used passwords. We were unable to verify the accuracy of this claim. This is a high rate of reported password use, but there is always room for improvement.

**Security settings for accessing County email-** The County took steps to ensure that employees used passwords in some instances. When employees synced their mobile devices to their County email, security settings required employees to use a password and prevented them from accessing the County's Google Apps if the phone's password was turned off. However, an employee could still access County email through a smartphone's internet browser without having the phone's password turned on.

**Personal devices-** Many employees who did not receive reimbursements also used their personal mobile devices to access County systems. We did not survey this group, but it is likely that they had the same issues with inconsistent password use and inadequate knowledge of how to report lost or stolen devices that contain County information

**Why did it happen?**

**Lack of training-** The County did not provide training to employees about how to properly use mobile devices or who to contact in case of loss or theft.

**Lack of software-** The County did not have software to monitor downloads or ensure consistent password use.

**Why is it important?**

**Sensitive data at risk-** Many mobile devices contain sensitive information such as County emails, text messages, voicemails and client contact information. Lost or stolen mobile devices that do not have passwords pose a potential risk to this information. Staff must also know how to quickly report any lost or stolen devices. The IT Helpdesk is available 24 hours, seven days a week and has the capability to remotely wipe sensitive data from cell phones. County policy states that employees should contact the Helpdesk if devices are lost or stolen. However, relatively few County-owned

cell phone users listed the IT Helpdesk as the resource they would contact if their cell phone was lost or stolen. In addition, those who used their personal devices to connect to County systems may not have known to contact the IT Helpdesk if their devices were lost or stolen.

**Risk of malware-** Staff may have put sensitive information at risk if their mobile devices were infected with malware, such as viruses. Mobile device malware appears to be increasing. In fact, McAfee, a computer security company, recently found 3.5 times as many mobile malware samples in their database as they did in the previous year. Much of this malware came from third-party markets that sold apps. Even the official Google App store has had instances of app malware. Both County-owned and personal devices are at risk.

- How to fix it?**
- IT should contract with a mobile device management company that can prevent non-work related apps and lock users out of County systems if the device is lost or stolen or if no password is used. Some companies can provide both bill monitoring services (as mentioned above) and mobile security management, so IT may want to coordinate with Telecom when contracting these services.
  - Employees are the first line of defense and often the most effective tool for keeping systems secure. IT should provide employees (both County-owned and personal device users) with training about preventative security measures (passwords and downloads) and appropriate responses to situations (reporting lost, stolen or broken devices). In fact, a County workgroup authored a report to IT management in December 2011 that stated that the County should implement security training for mobile device users.

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## Recommendations

There are four distinct components of mobile device management: procurement, inventory management, cost and usage monitoring, and security. We believe that each of these functions should be performed by those with the most expertise. Currently the system is decentralized and there are not processes in place to support the large number of people involved in managing mobile devices. Mobile devices are complex and require dedicated staff, rather than those who can only set aside a small amount of time. In our opinion, the two Telecom employees have done an excellent job, but they lacked the software, authority and defined processes needed to manage mobile devices for a large organization. Thus, we recommend that the County centralize the procurement and inventory of mobile devices using current Telecom staff, hire an outside company to monitor mobile device billing statements, and ensure that IT is given greater authority and resources for managing mobile security issues.

We suggest that the County implement the following recommendations.

1. The County should ensure that business needs are matched with the most cost effective mobile device and plan.
  - According to best practices, only someone in a position that is dedicated to understanding the ever-changing mobile market can effectively determine which devices and plans best meet the business needs of staff. Thus, Telecom, not departments, should have the responsibility for selecting the most cost effective plan and device based on the documented business needs of the employee.
  - To help with better decision making and communication, the County should use a more detailed authorization form. (Please see Appendix 2 for an example.) The following parties should fill out the form:

- o The employee's supervisor should document the business need based on criteria.
  - o The employee should sign that they understand policies.
  - o Telecom staff should use the information provided by the employee's supervisor to select the appropriate device and plan. Telecom staff should document the plan details and send the completed form to all parties.
- Departments should consider alternatives, when appropriate, such as shared mobile devices that can be checked out to staff as needed rather than assign individuals devices that are seldom used.
- International plans should require justification as to business need and department director approval.
- Departments should review the business needs for employees that have multiple devices, such as a smartphone, tablet and an air card. Potential options include tethering, which may reduce the cost for multiple devices.
- All departments should re-evaluate the business need, based on clearly defined criteria, of all current devices as soon as possible. In response to our audit, management told us that they recently completed a project requiring all department directors to review the business need of all mobile devices.
- The employee's supervisor should re-evaluate the business need for the continued use of a mobile device on an annual basis.
- The County should re-evaluate the stipend value for the use of personal cell phones (it is currently \$65). Presently, there are individual plans on the market that provide unlimited minutes, text and data ranging from \$35 to \$50. The County should not pay more for reimbursements than the plans that are currently available for County-owned devices. Additionally, reimbursements should not exceed 60% of the cost of the employee's personal plan.



2. The County should monitor usage and costs of mobile devices.
  - The County should centralize the role of monitoring cellular device usage since departments lack the time and expertise to do this. Telecom should be given greater authority to monitor and manage cellular devices.
  - However, due to the complexity of vendor reports, Telecom will need outside assistance. Telecom should contract with a mobile device management company. Many other enterprises have contracted with mobile device management companies. For example, Wireless Watchdogs is working with the State of Oregon to optimize their cellular plans and has produced cost savings for other local governments. The County should find a mobile device management company that can provide services such as rate plan optimization, cellular expense monitoring and inventory management. Many of these mobile device management companies will provide initial services at no charge as they recover overpayments to the carriers.
  - The mobile device management company should also produce quarterly usage reports. Wireless numbers that have consistently gone below or above their plan limits would be included in an exception report to department management. Department managers should review the reports and re-evaluate employee business needs. Telecom can then make the appropriate plan changes.
  - Our estimated savings of over \$300,000 per year can only be accomplished with increased management and monitoring that can be provided by centralizing this function and providing additional support such as a mobile device management company and perhaps additional staff.

3. The County should prevent and monitor personal use of mobile devices.
  - Employees should sign a form indicating they understand what constitutes allowed personal use for their mobile device.
  - Telecom should provide departments with detailed exception reports about voice, text and data usage. This information would be provided quarterly. The employee would sign that all usage was work related except calls or texts noted as personal. Supervisors would review and sign off.
  - HR needs to clarify personal use in the County policy. In response to our audit, the County revised its policies and is in the process of getting final approval.
  - Telecom or HR should provide employees with training about the appropriate use of mobile devices and what constitutes personal use.
4. The County should create a process to keep track of mobile devices.
  - The County's centralized inventory should include the detailed plan description, device serial number, phone number, employee name (or custodian if shared device), personnel number, employee work location and any changes such as transfers to a new employee, lost or stolen devices or if the device's SIM card was removed.
  - The County should contract with a mobile device management company that provides inventory management services.
  - The employee or custodian should sign a receipt upon receiving the mobile device.
  - The County should account for all devices not assigned to an individual and all dispositions and losses of mobile devices.

5. The County should improve mobile device security.
  - IT should contract with a mobile device management company that can prevent non-work related apps and lock users out of County systems if the device is lost or stolen or if no password is used. Some companies can provide both bill monitoring services (as mentioned above) and mobile security management, so IT may want to coordinate with Telecom when contracting these services.
  - Employees are the first line of defense and often the most effective tool for keeping systems secure. IT should provide employees (both County-owned and personal device users) with training about preventative security measures (passwords and downloads) and appropriate responses to situations (reporting lost, stolen or broken devices). In fact, a County workgroup authored a report to IT management in December 2011 that stated that the County should implement security training for mobile device users.



## Appendix

























## Appendix 1

### Case Studies

We conducted studies of thirty County-owned cell phones based on a representative sample. The case studies included interviews and analysis of reports from the cell carriers. We contacted the following people who had ordered, used, or authorized the cell phone.

- **Supervisors-** We interviewed each of the supervisors who authorized the cell phones in our sample.
- **Telecom Liaisons-** We interviewed each of the telecom liaisons who were associated with the cell phones in our sample. In addition, we emailed a survey to all telecom liaisons.
- **Cell Phone Users-** We emailed a survey to all County-owned cell phone users.

We selected three of these case studies that reflected the most common types of responses that we received. The following exhibit illustrates the lack of processes for managing the County's 1,900 cellular devices.

Case Studies Based on Actual Interviews and Surveys								
Case Study A	Who authorized this phone and is there documentation?  I authorized this phone. I don't recall filling out any authorization forms.	Who authorizes the purchase of new cell phones?  The supervisor authorizes any new purchases.	Why does this employee need a cell phone?  This employee needs a phone because he/she is a manager and is out of the office about 30-40% of the time.	How often are you out of the office and how much do you use cell your phone?  I am out of the office 10-24% of the time. I rarely or never use my cell phone. I could perform my job duties without a cell phone.	How much is your employee's cell phone bill each month?  The monthly cell phone bill is about \$85 with taxes. [Actual cost is \$42]	Who is responsible for checking the phone bill?  I look at the bill summary. If it looks odd, I contact the purchasing staff and they can pull the detailed usage for me.	Do you review the cell phone bill each month?  The telecom liaison reviews the bills and shows me if there are any variances.	If your phone was lost or stolen, who would you contact?  The IT helpdesk.
	Supervisor A	Telecom Liaison A	Supervisor A	Cell Phone User A	Supervisor A	Telecom Liaison A	Supervisor A	Cell Phone User A
	What we found: This employee hasn't used this phone in many months, yet the County is being charged \$42 per month, which is about \$500 each year.							
	Who authorized this phone and is there documentation?  I authorized this phone and I filled out the authorization forms.	Who authorizes the purchase of new cell phones?  The supervisor authorizes any new phones. I'm not aware of any authorization forms.	Why does this employee need a cell phone?  This employee is out of the office about 85% of the time and needs to stay in touch with clients and coworkers.	How often are you out of the office and how much do you use your phone?  I am out of the office 50-74% of the time. I use my phone to stay in contact with clients and my supervisor.	How much is your employee's cell phone bill each month?  Not sure, maybe around \$60. [Actual cost is \$103]	Who is responsible for checking the phone bill?  I don't think that this is my job responsibility.	Do you review the cell phone bill each month?  I used to review the bills, but I stopped getting a copy of the bills several months ago.	If your phone was lost or stolen, who would you contact?  My immediate supervisor.
Supervisor B	Telecom Liaison B	Supervisor B	Cell Phone User B	Supervisor B	Telecom Liaison B	Supervisor B	Cell Phone User B	
What we found: Each month, this employee used an average of 450 minutes, 50 texts, and 450,000 KB of data. The monthly phone bill is \$103, which totals about \$1,200 per year. On average, there are 50 minutes each month that appear to be for personal use.								
Case Study B	Who authorized this phone and is there documentation?  I may have authorized it, but it may have been my boss. The telecom liaison might have the documentation.	Who authorizes the purchase of new cell phones?  The supervisor authorizes the phone. I have not seen any authorization forms.	Why does this employee need a cell phone?  Everyone in this program is issued a cell phone. This employee works outside of the office about 50% of the time and needs to be able to call in case of an emergency.	How often are you out of the office and how much do you use your phone?  I am out of the office 50-74% of the time. I use my phone to stay in contact with clients, my supervisor, and my coworkers.	How much is your employee's cell phone bill each month?  I don't know. I believe that the phones bills are bundled. [Actual cost is \$250]	Who is responsible for checking the phone bill?  I check the total amount and then if there is anything out of the ordinary, I check the details. If anything is alarming, I bring it to the supervisors.	Do you review the cell phone bill each month?  The office assistant reviews the bills and lets management know if there are long-distance calls or a shift in minutes.	If your phone was lost or stolen, who would you contact?  My supervisor.
	Supervisor C	Telecom Liaison C	Supervisor C	Cell Phone User C	Supervisor C	Telecom Liaison C	Supervisor C	Cell Phone User C
	What we found: Each month, this employee used an average of 1,425 minutes, 775 texts, and 665,000 KB of data. The average monthly phone bill is \$250 which totals about \$3,000 per year. This employee consistently went over the plan limits and incurred overage charges of \$143 per month or an estimated \$1,715 per year. On average, there are 775 minutes each month that appear to be for personal use. Reducing personal use may have eliminated overage charges.							
	Each case study is for one particular cell phone.							

## Appendix 2

Multnomah County  
Mobile Device Authorization Form

**Section 1 - To be filled out by supervisor**

Employee Name \_\_\_\_\_ Desired Start Date \_\_\_\_\_  
Employee Email \_\_\_\_\_ SAP Personnel # \_\_\_\_\_  
Employee Land Line Number \_\_\_\_\_

What percent of your employee's time is spent away from a desk or in the field?

\_\_\_ Less than 10%  
\_\_\_ 10% to 49%  
\_\_\_ 50% or more

Some work units have shared mobile devices to check out to employees as needed. Would this work for your employee?

\_\_\_ Yes  
\_\_\_ No

How long is this mobile device needed?

\_\_\_ Project, end date \_\_\_\_\_  
\_\_\_ Ongoing

Who will the employee share their cell number with and contact the most often?

\_\_\_ % of expected calls to/from supervisor  
\_\_\_ % of expected calls to/from co-workers  
\_\_\_ % of expected calls to/from employees  
\_\_\_ % of expected calls to/from clients/public

How often does this employee have a **business need** to use the following features on his/her mobile device?

Phone calls

\_\_\_ Rarely or never  
\_\_\_ 1 to 2 calls per day  
\_\_\_ 3 to 5 calls per day  
\_\_\_ More than 5 calls per day

Websites

\_\_\_ Rarely or never  
\_\_\_ 1 to 2 websites per day  
\_\_\_ 3 to 5 websites per day  
\_\_\_ More than 5 websites per day

Text messages

\_\_\_ Rarely or never  
\_\_\_ 1 to texts per day  
\_\_\_ 3 to 5 texts per day  
\_\_\_ More than 5 texts per day

Streaming music or video

\_\_\_ Rarely or never  
\_\_\_ A few minutes per day per day  
\_\_\_ More than 10 minutes each day  
If this feature is needed, please explain why \_\_\_\_\_  
\_\_\_\_\_

Emails

\_\_\_ Rarely or never  
\_\_\_ 1 to 19 emails per day  
\_\_\_ 20 to 39 emails per day  
\_\_\_ 40 or more emails per day

Other

\_\_\_\_\_  
\_\_\_\_\_

Supervisor's Signature \_\_\_\_\_ Date \_\_\_\_\_



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## Appendix 2

### Section 2- To be filled out by employee

Please read the following statements and initial to indicate that you understand them.

\_\_\_\_ Personal calls are not allowed on public agency cellular devices, regardless of length or frequency. Calls for emergencies or scheduling conflicts that directly relate to official duties are the only personal calls allowed. The County has no discretion on this rule, as it is based on Oregon ethics laws.

\_\_\_\_ Due to security concerns, only work-related cellular device “apps” (i.e. third-party application software) are allowed. Personal “apps” are prohibited on County-owned cellular devices.

\_\_\_\_ Streaming music or video for personal use is not allowed.

\_\_\_\_ Services that establish reoccurring charges to County-owned cellular devices are prohibited without authorization.

\_\_\_\_ A detailed report of my usage will be distributed to my supervisor for review.

Employee’s Signature \_\_\_\_\_ Date \_\_\_\_\_

## Appendix 2

### Section 3- To be filled out by telecom

Employee's mobile phone number \_\_\_\_\_ Mobile vendor name \_\_\_\_\_

Mobile device type \_\_\_\_\_ Device serial number \_\_\_\_\_

Plan allowances:

Minutes \_\_\_\_\_

Texts \_\_\_\_\_

Data KB \_\_\_\_\_

Other \_\_\_\_\_

List any accessories that came with the mobile \_\_\_\_\_

Annual review date (one year from today) \_\_\_\_\_

Telecom Staff Signature \_\_\_\_\_ Date \_\_\_\_\_

*Telecom should retain this form and email a copy to supervisor and employee.*

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**Response  
to Audit**





## Jeff Cogen, Multnomah County Chair

501 SE Hawthorne Blvd., Suite 600  
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Phone: (503) 988-3308  
Email: [mult.chair@co.multnomah.or.us](mailto:mult.chair@co.multnomah.or.us)

November 8, 2012

TO: Auditor Steve March

FROM: Chair Jeff Cogen

RE: Response to Cell Phone Audit

Dear Auditor March:

Thank you for your audit of departmental cell phone use. I always welcome opportunities to improve our services in Multnomah County.

As our budget has declined over the last decade, we have sought myriad ways to increase employee productivity and responsiveness. We've asked many of our employees to do more with less, and be available around the clock, whether that's on the weekends or their lunch break.

New mobile technology, with its seamless integration of email, calendar and other applications, provides us with the opportunity to have a nimble, mobile workforce that can meet the public's need anywhere, anytime. But as your report illustrates, as we capitalize on the opportunities of new technology, we must protect against potential downsides as well. Multnomah County is not alone in this challenge. With this rapidly evolving technology, many large organizations are working to balance the flexibility and responsiveness that mobile technology affords us with stewardship of our resources. We appreciate your assistance in shedding light on these issues and hope to work with you going forward to identify best practices.

First, in response to early data you collected indicating potentially widespread personal use of mobile devices, I immediately sent an email to all county employees using mobile devices directing them to familiarize themselves with our rules and to cease any and all use outside of those guidelines. In addition, the Chief Operating Officer conducted a swift countywide investigation (with the exception of Sheriff's Office or District Attorney's Office personnel). The results of that investigation confirmed that some (although far from all) employees with documented high mobile minutes usage

were using their county devices for personal calls outside the standards in our policy. Where appropriate, employees were issued either a verbal or written reprimand.

Secondly, all department directors were asked to reaffirm the business need for employees who have either a county mobile device or are receiving reimbursement for a personal mobile device that they use for county business. If an employee no longer required a mobile device for business purposes, departments turned in the unused devices.

#### What we learned:

- The methodology used in the audit to define “potential personal use” is only one way to look at “potential personal use” and may not accurately capture the type of calls made by employees on their county mobile phones.
  - The three departments with the largest mobile phone use were the Health Department, the Department of County Human Services, and the Department of Community Justice. All three interact with Multnomah County residents, contractors and local businesses every day. Defining as “potential personal use” any call on nights or weekends to a non-county number may not recognize the kind of work those departments do. Therefore, the 20% estimate in the audit may be overstated.
- Due to budget reductions under Chair Wheeler in FY 2008-2009, our central Information Technology (IT) group reduced staff by three employees in the IT/Telecom area and transferred responsibility for management of mobile devices and the budget for mobile device service to county departments. In the same time period, mobile devices transformed from flip phones to mini-computers, and the use of these mobile devices county-wide significantly increased.
- At the time of decentralization, processes and training were put in place. However, over time, organizations and personnel shifted and departments began using various ways of approving and tracking their employees’ use of mobile devices.

#### What we have done:

- Confirmed with all departments (excluding MCSO and MCDA) that the only employees issued mobile devices or reimbursement are those who require mobile devices based upon a business need.
- Confirmed that all employees using mobile devices are familiar with the current rules governing their use.
- Reviewed all mobile device minute, text and data use and investigated potential personal use.

- Confirmed the requirements of the Ethics Commission on the use of mobile technology and revised and clarified our rules accordingly. The updated rules are nearing adoption.
- Decreased the number of mobile device carriers and adjusted rate plans to decrease county costs ~\$11,000/month.
- Created a centralized inventory of mobile devices, implemented a formal request for issuance of new mobile devices and changes to mobile device data and service plans, clarified that mobile devices may not be issued to volunteers and contractors, and restricted the ordering/use of Android mobile devices for departments that must meet federal security requirements such as HIPAA and CJIS due to industry-wide concerns about security.
- Evaluated and selected a mobile device management (MDM) system to assist County IT/Telecom staff in monitoring and securing mobile devices. The first departmental priority for implementing the MDM system is the Department of Community Justice due to the nature of their work and the mobility of their workforce.
- Set up processes to suspend service when an employee with a county mobile device leaves county employment or when a mobile device is inactive for calls, texts, and data activity for more than three months.
- Provided periodic tips on cybersecurity and specifically mobile device security to all county employees via the Wednesday Wire including links to more detailed training and information.

What we are going to do:

- Utilize a revised version of the form that was included in the audit to request new mobile devices and to annually confirm with employees that they are using their mobile devices for county use, as well as to confirm that the employee requires the mobile devices to optimally do their job.
- Propose in the Fiscal Year 2013-4 budget additional staff to help departments monitor the use of mobile technology.
- Once the updated rules governing mobile device use are adopted, we will communicate those rules to employees.
- Evaluate and clarify the role of the departmental IT/Telecom liaisons and reduce the number of personnel involved in this activity, where appropriate.

- Explore and evaluate mobile device carriers, vendors and services that can provide best practices in a cost effective manner.
- Evaluate organizationally, the processes and responsibilities for mobile device asset management, while balancing the cost benefit.

I believe that with the changes we have already implemented and the ones I am committed to implementing in the near future, we have significantly improved Multnomah County's management of our mobile devices. I want to thank you and your staff for your work on this audit. Thanks to the leadership of my team particularly Travis Graves, Steve Herron and Sherry Swackhamer for their work addressing these issues.