



June 30, 2014

REPORT #: 2014-16

Brian Ganley, Chief Information Officer  
Information Services Department

Dear Brian,

Enclosed is the final audit report for the Mobile Device Operational Audit. Internal Audit would like to thank you and your staff for the support and assistance provided to us during the audit.

Should you have any questions, please feel free to contact Natalie Minami-Valdivia or myself.

Thank you,

A handwritten signature in black ink that reads "Michele Flynn" followed by a small "ED" monogram.

Michele Flynn,

City Auditor

Enclosure

cc: Yasmin Beers, Assistant City Manager  
Robert Elliot, Director of Finance  
Steve Hronek, Information Services Administrator  
Scott Ochoa, City Manager  
City Council  
Audit Committee

# **Mobile Device Operational Audit**

**June 30, 2014**

## Background

In accordance with Internal Audit's fiscal year 2013-14 audit plan and at the request of the Information Services Department (ISD), Internal Audit performed an operations audit of the City of Glendale's (City's) mobile devices.

The purpose of the audit was to perform the following:

- Obtain an understanding of the mobile devices and associated plan costs managed by the Wireless Communications Division (WCD).
- Determine if transitioning the mobile device plans from the shared minute plans to consumption plans could reduce the City's mobile device related expenses.
- Determine the accuracy and completeness of the mobile device inventory.
- Evaluate the positives and negatives of offering employees a stipend to utilize their personal mobile devices for City business.

All mobile devices are procured, inventoried, and maintained centrally by ISD. Mobile devices are maintained by the WCD. There are currently 0.3 full time equivalents (0.1 of the WCD Administrator's and 0.2 of the WCD Technical Staff Analyst's time) assigned to the Commercial Wireless. The Technical Staff Analyst spends approximately 20% of her time providing support to mobile device users, managing mobile device plans, managing mobile device inventory, and installing the appropriate mobile device management (MDM) software, reconciling and processing invoices, equipment recycling, employee training, and trouble-shooting.

The mobile device inventory includes cellular phones, smartphones, hot spots, iPads/tablets, and digital parking meters. WCD provides mobile devices and mobile plans based upon department management's request.

In November 2012, the City received and accepted an offer from Verizon to transition its mobile device plans from its primary carrier, T-Mobile, to Verizon. In order to receive the rebate, the City was required to maintain 400 minute pooled plans on all smartphones for a 90 day period and would then be eligible to transition its smartphones to any plan available to Verizon's Western States Contracting Alliance (WSCA) Master Service Contract. Subsequent to the 90 days, the Technical Staff Analyst received the \$65,125 rebate from Verizon and began switching ISD employees from the pooled plan to the consumption plan for a pilot program.

The ISD piloted the consumption plan for approximately one year from May 2013 to May 2014 and realized a cost savings. However, at the request of the ISD Chief Information Officer, the WCD delayed the conversion of the remaining plans pending the completion of this review by the Internal Audit Division. During the course of this audit, ISD transitioned its plans back from the consumption plans to the pooled minute plans due to consideration of policy revisions and evaluation of staff resources.

Currently, the mobile device related costs are allocated to the applicable departments through the cost allocation process. The WCD prepares a spreadsheet to allocate mobile device costs to the appropriate funds and organization. This spreadsheet is then provided to the cost allocation consultant to be included within the Citywide Cost Allocation Plan.

The City currently utilizes the following types of mobile plans:

- Consumption (Pay-as-you-go) Plan
  - Nationwide flat rate \$0.06/minute (incoming/outgoing)
  - Free nights & weekends
  - 100 free texts
  - Free Verizon to Verizon voice calls
- Pooled Minute Plan
  - 400 minute shared voice plan

- Free nights & weekends
- Free Verizon to Verizon phone calls
- Unlimited text/data (if blackberry or smart phone)

Currently, the City has approximately 132,000 pooled minutes per month.

- Tablet/iPads/Hotspots/USBs
  - \$37.99 mobile broadband plans with unlimited data usage.

Although the majority of the City's mobile device plans are on Verizon, due to operational and business needs (i.e. the inability to obtain reception within certain areas of the City), the City has a minor number of mobile devices with the following companies:

- T-Mobile
- Sprint
- AT&T
- USA Mobility (Pager)
- American Messaging (Pagers)GMPCS (Satellite Phones)

In addition to the City provided mobile devices, the City has allowed employees to utilize their personal devices to gain access to the City's server for email purposes. Although Bring Your Own Device (BYOD) has been allowed on a voluntary basis, the City does not currently have a documented BYOD policy or procedure for the business use of their personal devices. However, it has been the WCD's practice to install "Good Technology" MDM software on the employee's personal device prior to granting them access to the City's server for email purposes. The installation of the MDM software enables the City to partition the mobile device and remotely wipe data in the event that the mobile device is lost or stolen or the employee terminates employment.

As Verizon charges the user in the event "Good Technology" is installed on their mobile device and the City currently does not provide reimbursement for any personal mobile device expenses, an exception to this rule has been made for employees that utilize Verizon as their mobile device carrier. Those employees with Verizon as their carrier were not required to install "Good Technology" on their mobile devices, but have been granted access through "Active Sync" mobile device management software. This software will enable employees to gain access to the City's server, does not add cost to the employee's monthly bill, but does not currently enable the City to remotely wipe their mobile device. Based upon discussions with the WCD Administrator, the City is currently researching the feasibility of switching all users to "Active Sync" once Microsoft Exchange 2013 has been implemented. With the implementation of Microsoft Exchange 2013, the WCD will gain the ability to remotely wipe mobile devices in the event

of employee separation or when a device is lost or stolen.

## Scope and Procedures

The scope of the audit included the processes to obtain a City owned mobile device, select the mobile plan, install a MDM software, review invoices, and allocate costs. Additionally, testwork was performed on the December 2013 and January 2014 mobile device plan invoices, detailed inventory listing, and to reconcile all of the mobile plans to the active inventory.

In order to accomplish the audit objectives, Internal Audit performed the following:

- Conducted interviews with key WCD personnel.
- Performed a walk-through of the mobile device lifecycle.
- Obtained and reviewed the Wireless Communication Administrative Policy and Procedure.
- Obtained and reviewed the WSCA Verizon plans.
- Obtained and reviewed the December 2013 and January 2014 Verizon plans.
- Performed a calculation of the potential savings available for transferring from the current pooled minute plans to the consumption plan.
- Conducted detailed testwork of invoices and inventory.
- Conducted online research of BYOD programs and other organizations stipend policies.

## Summary of Results

As a result of the audit procedures performed, seven improvement opportunities were identified related to policies and procedures, mobile device plans, cost allocation, invoice review and processing, and mobile device inventory. The recommendations included, but were not limited to, updating the wireless communications policy and procedure, reviewing the accuracy and cost effectiveness of mobile device plans invoiced, updating the cost allocation plan, department review of invoices, segregation of duties with regards to mobile device inventory, and sequential tagging of assets.

Additionally, in order to address the last audit objective related to the pros and cons of BYOD and the establishment of stipends for the business use of personal mobile devices, Internal Audit performed internet research of the pros and cons experienced by other organizations. Based upon the internet research performed, it appears that there are a number of pros and cons related to the BYOD and employer provided stipends. Although there are advantages related to establishing a policy for BYOD & stipend for business use of an employee’s personal mobile device, the key risks include the ability to properly secure the City’s sensitive data and potentially establishing a stipend that would exceed the costs that would be incurred by providing the employee with a City issued mobile device.

Based upon the analysis performed of pooled minute plans to consumption plans, Internal Audit has identified that a potential monthly plan usage savings of \$5,790 and \$6,040 for the months of December 2013 and January 2014

respectively. Internal Audit is recommending that the City consider transitioning from the pooled minute mobile device plans to consumption plans. Additionally, all BYOD devices should be required to have a MDM program installed and a cost analysis of the City provided mobile devices should be considered in the event that a stipend to compensate employees for the business use of their mobile devices is implemented.

The Observations, Risks, Recommendations, and Management Responses are detailed beginning on page 5 and the following supplemental information is provided as follows:

	Description	Page
Table 1	Total Quantity and Cost included within the two primary Verizon Plan invoices for January 2014	10
Table 2	Breakdown of Charge Types for the Nationwide Plans Included within the Cost Analysis	11
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Item	Observation/Risk	Recommendation	Management Response
<b>Policy and Procedure</b>			
1.	<p>Administrative policy regarding mobile devices has not been updated since October 1, 2007. As a result, the policies and procedures do not currently include BYOD policies and procedures. Additionally it was noted that the policies and procedures do not include the requirement that each mobile device be password protected.</p> <p style="text-align: center;">* * *</p> <p>Failure to periodically review and update policies and procedures increases the risk of outdated policies and procedures, lack of employee accountability, and inconsistent application of policies and procedures. Additionally, the lack of BYOD policies and procedures increases the risk of unauthorized usage and access to the City's sensitive data and/or City does not have adequate authorization to remotely wipe an employee's personal device.</p>	<p>It is recommended that the City review and update the WCD policy and procedure and incorporate BYOD. These policies and procedures should include, but not be limited to the following:</p> <ul style="list-style-type: none"> <li>-MDM software.</li> <li>-Require BYOD employee's to sign an electronic authorization consent form allowing the City to remotely wipe City sensitive data from personal device(s).</li> <li>-When practical, enable the MDM software security policies to require City owned and BYOD mobile devices to be password protected, auto-lock at a pre-determined time increment, and have the ability for the City to remotely wipe the mobile device of City email when deemed necessary.</li> <li>-Require the loss or theft of personal mobile device to be reported to the WCD.</li> </ul> <p>It is further recommended that the WCD enforce the new policy and procedures.</p>	<p>Management agrees with the recommendation and will update the Wireless Communications Policy and Procedure to include a password requirement, require the auto-lock feature to be set, and enable the feature to remotely wipe the mobile device's access to City email in the event of employee separation or the phone is lost or stolen when practical. Additionally, the mobile devices will be manually set with a default password and auto-lock feature, but will not be enforced through the MDM.</p> <p>The anticipated completion date is December 31, 2015.</p>

Item	Observation/Risk	Recommendation	Management Response
<b>Mobile Device Plans</b>			
2.	<p>Based upon an analysis of the City's voice, data, and messaging usage, it was calculated that the City could have potentially saved \$5,789 and \$6,040 for the months of December 2013 and January 2014 respectively by switching from the pooled minute plans to consumption plans.</p> <p style="text-align: center;">* * *</p> <p>Not transitioning the City's users from the pooled minute plans to the consumption plans increases the risk that the City is not taking advantage of the most economical plans which increases the City's mobile device plan related expenses.</p>	<p>It is recommended that the City consider the following:</p> <ul style="list-style-type: none"> <li>-Feasibility and potential cost savings of switching its users from the pooled minute plans to consumption plans.</li> <li>-Updating the policies to appropriately cover the implications related to transitioning to a consumption plan and personal use.</li> </ul>	<p>Management agrees with the recommendation and will poll other cities and consider the feasibility of switching its users where appropriate from the pooled minute plans to consumption plans. Necessary considerations will need to be taken into account related to defining whether or not the "occasional use for personal calls and messages" that is currently permitted will continue to be allowed and potentially establish a threshold for personal use reimbursement to minimize staff time related to invoice review and cost-recovery efforts. The anticipated completion date is December 31, 2015.</p>
3.	<p>City mobile devices are not consistently subscribed to the City designated plans.</p> <p style="text-align: center;">* * *</p> <p>Lack of a process to review the consistency of the mobile device plans increases the risk that users are put on the wrong mobile plan and incurring higher usage fees.</p>	<p>It is recommended that a review of the City's mobile device plans be included within the monthly invoice review.</p>	<p>Management agrees with the recommendation and has already begun reviewing the plans invoiced on a monthly basis.</p>



Item	Observation/Risk	Recommendation	Management Response
<b>Cost Allocation</b>			
4.	<p>Based upon discussions with the WCD Administrator and a review of the WCD Cost Study supporting documentation, we noted that the methodology was intended to allocate mobile device related actual costs based upon the mobile device type and quantity. However, based upon the final ISD Cost Study, it was noted that the Cost Study methodologies did not agree. Based upon the final ISD Cost Study, costs were allocated based upon the number of voice devices, excluding the number of mobile devices, and did not take into consideration the cost differences between the mobile devices.</p> <p style="text-align: center;">* * *</p> <p>Failure to properly allocate costs in accordance with the methodology provided to City departments and/or failure to properly reflect the total number of devices utilized by each department increases the risk that costs are not allocated in the manner communicated and/or in an equitable manner.</p>	<p>It is recommended that the ISD Cost Study methodology for mobile and data devices be reviewed and corrected where necessary. The methodology be documented and communicated to all departments.</p>	<p>Management agrees with the recommendation and will modify the cost allocation methodology and ensure that the allocation is properly calculated in the 2015-16 ISD Cost Study. The anticipated completion date is June 30, 2015.</p>

Item	Observation/Risk	Recommendation	Management Response
<b>Inventory</b>			
5.	<p>Two City mobile devices have been issued to a City contractor. * * *</p> <p>Issuing City mobile devices to contractors increases the risk that the contractor cannot be held accountable for usage, mobile device is not returned to the City upon termination of the contractual relationship, and employee-contractor relationship may be blurred.</p>	<p>It is recommended that the City issue mobile devices only to City employees.</p>	<p>Management agrees with the recommendation and will not issue any additional mobile devices to contractors effective immediately and will update the City's policy and procedure to prohibit the issuance of City owned mobile devices to City contractors with the next WCD policy and procedure update.</p>
6.	<p>Based upon a gap analysis performed of the asset tag numbers, it was noted that the asset tags were not properly accounted for and/or issued in numerical sequence. * * *</p> <p>Failure to properly account for each asset tag and issue them in sequential order increases the risk of an incomplete inventory.</p>	<p>It is recommended that all asset tags be issued in sequential order.</p>	<p>Management agrees with the recommendation and has implemented the recommendation and is issuing numerically sequenced asset tags for all mobile inventory.</p>

Item	Observation/Risk	Recommendation	Management Response
7.	<p>Based upon testwork performed, it was noted that 4 out of 5 (80%) stolen mobile equipment randomly selected for testwork did not have a police report on file as required by the City's Wireless Communication's Policy and Procedure.</p> <p style="text-align: center;">* * *</p> <p>Failure to enforce the City's Wireless Communication's policy and procedure decreases the City's ability to properly hold employees accountable for City property.</p>	<p>It is recommended that the WCD either enforce the policy or update the policy to make practice and policy consistent.</p>	<p>Management agrees with the recommendation and will enforce the current policy for radios only effective immediately. The policy and procedure will be updated to reflect this practice in the next policy update.</p>

**Supplemental Information**

**Table 1 – Total Quantity and Cost Included within the Two Primary Verizon Plan Invoices for January 2014**

As the City primarily procures mobile services through Verizon Wireless, Internal Audit performed its analysis on the two primary Verizon invoices for the December 2013 and January 2014. In January 2014, the City maintained the following 772 plans with Verizon Wireless at a cost of \$27,757:

Plan	Quantity	Cost
ENTERPRISE GATEWAY UNLIM	1	\$0
MOBILE BROADBAND \$37.99 monthly access charge \$.25 per minute after allowance	10	\$380
MOBILE BROADBAND UNLIMITED \$37.99 monthly access charge \$.25 per minute after allowance	204	\$7,812
MOBILE BROADBAND USA ONLY \$37.99 monthly access charge \$.25 per minute after allowance	33	\$1,255
NATIONWIDE EMAIL & DATA 400 \$64.09 monthly access charge 400 monthly general allowance minutes	309	\$16,471*
NATIONWIDE FLAT RATE ON-NET \$.06 per minute after allowance	210	\$1,707*
NATIONWIDE FOR BUSINESS BASIC \$30.75 monthly access charge 100 monthly general allowance minutes \$.25 per minute after allowance	5	\$132*
<b>Total</b>	<b>772</b>	<b>\$27,757</b>

Based upon a review of the invoices and discussion with the Technical Staff Analyst, the Enterprise Gateway Unlimited does not have a charge associated with it and the Mobile Broadband Plans are a flat rate and do not change, so only the Nationwide plans were reviewed. The Nationwide Plans, denoted within the cost column with an asterisk (\*) totaled \$18,310 for the two major Verizon mobile device plan invoices. Based upon a review of the invoice, \$17,251 of this \$18,310 was attributable to monthly voice, data, and text messaging usage. The remaining \$1,059 was attributable to pro-rated charges resulting from plans initiated/terminated during the month, equipment purchases such as mobile devices, and surcharges & other charges & credits, and taxes, governmental surcharges & fees. A detail of this breakdown is provided in Table 2 on the following page.

**Table 2 – Breakdown of Charge Types for the Nationwide Plans Included within the Cost Analysis**

Based upon the January 2014 Verizon invoice, the monthly cost was broken down into the following categories:

Description	Cost
Monthly Charges	\$17,251
Pro-rated Charges	\$13
Equipment Charges	\$398
Surcharges & Other Charges & Credits	\$472
Taxes, Governmental Surcharges & Fees	\$176
January 2014 Invoice Total	\$18,310

**Table 3 – Monthly Usage Cost Analysis for December 2013 and January 2014**

A review of the December 2013 and January 2014 invoices was performed. We compared the actual mobile device monthly costs with the estimated cost of transitioning to consumption (pay-as-you-go) plans. The results of our analysis are as follows:

	December 2013	January 2014
<b>Actual Cost</b>	\$17,063	\$17,251
<b>Proposed Consumption Cost - Voice, Data, &amp; Text (excludes Mobile Broadband Plans)</b>	\$11,273	\$11,211
<b>Potential Cost Savings</b>	\$5,790	\$6,040
<b># of Consumption Plans</b>	525	524
<b>Maximum Cost of Consumption Plans</b>	\$121	\$116
<b>Minimum Cost of Consumption Plans</b>	-	-
<b>Average Cost of Consumption Plans</b>	\$21	\$21

Based upon our review of the December 2013 and January 2014 invoices, we noted that the City could potentially reduce its mobile device plan base costs by \$5,790 and \$6,040 in the respective months. As it is recognized that by implementing a consumption (pay-as-you-go) plan will increase monthly expenses for specific high-end users, the maximum cost for the highest consumption usage was calculated for December 2013 and January 2014 as \$121 and \$116 respectively. As there will be some high-end users, there will also be those that do not have any usage in a given month. In the event that a mobile device does not have any usage in a particular month, the usage fees would be zero as was evidenced within the calculation of the minimum costs for December 2013 and January 2014. When taking into account all potential consumption plan usage costs and the number of potential nationwide plans based upon current usage, the average cost per consumption plan mobile device would be \$21 versus the current \$49.99 pooled minute plan primarily used for smartphone devices.

**Table 4 - Conversion to Consumption Only Plan**

Although it appears that the City has the potential to realize cost savings from the conversion of pooled minute mobile device plans to consumption plans, the following pros and cons were identified:

<b>Pros</b>	<b>Cons</b>
-Save money on mobile device plans.	- Wireless Communications Division will need to monitor plans and make adjustments as necessary. Increased management and staff time in all departments may be required to review bills, follow-up with staff, and process reimbursements.
-Only charged for actual usage.	- Lose ability to purchase promotional/discounted rates; however, upgrades are available on the 247 mobile broadband plans.

**Table 5 – BYOD Pros and Cons<sup>1</sup>**

Based upon staff discussions and online research, the following BYOD pros and cons were identified:

Pros	Cons
-Cost: Eliminate equipment, usage, and mobile device related accessory, and staff mobile device plan and invoicing management costs.	-Cost: Costs associated with BYOD (i.e. loading MDM software, user support, providing access to the network more frequently) cost more than issuing company devices.
-Privacy: Texts will not be subject to the California Public Records Act. The City only allows network access to the user's City email account. As the email account is on the server, there is no need to obtain the user's personal mobile device.	-Privacy: Business related communications are not subject to the California Public Records Act and may be construed as preventing government transparency.
-Work Satisfaction: Eliminate the need for employees to carry multiple mobile devices.	-Work Satisfaction: MDM software takes memory and potentially slows phone processing time.
-Technology: As people tend to upgrade their mobile devices more frequently, there is the potential for efficiencies to be realized through use of more frequently updated technology.	-Technology: Increased number of device types and platforms to support resulting in increased staff support time.
-Productivity: Employees are more likely to have their device(s) with them at all times responding to emails and phone calls more timely after hours.	-Productivity: Potential loss in productivity resulting from time required to replace a lost and/or stolen mobile device.
	-Information Security: Security issues related to safeguarding City confidential information, risk that personal devices have been 'jail broken' compromising the mobile device's security.

<sup>1</sup>**Information obtained from staff discussions and the following websites:**

[visagemobile.com/mobilityblog/2012/09/17/byod-the-pros-and-the-cons/](http://visagemobile.com/mobilityblog/2012/09/17/byod-the-pros-and-the-cons/); [whitehouse.gov/digitalgov/bring-your-own-device](http://whitehouse.gov/digitalgov/bring-your-own-device); [cio.com/article/696971/Pros and Cons of BYOD Bring Your Own Device](http://cio.com/article/696971/Pros-and-Cons-of-BYOD-Bring-Your-Own-Device); [emedialaw.com/files/2013/02/SAP-BYOD-Policy-Guidebook2.pdf](http://emedialaw.com/files/2013/02/SAP-BYOD-Policy-Guidebook2.pdf); [cio.com/article/print/703511](http://cio.com/article/print/703511)



**Table 6 – Stipend Pros and Cons**

In addition to the option to allow employees to participate in the BYOD program, management may consider providing employees with a stipend for the business use of their personal mobile devices. Based upon online research performed, the following pros and cons were identified:

Pros	Cons
-Compensate employees for business use of their personal mobile device for City business.	-Potential to increase expenses by setting stipend above the City available cost plans.
	-Mobile device plan prices fluctuate and it is difficult to take away and/or reduce a stipend once it has been established.

Based upon a review of the voice, data, and messaging usage costs calculated above for the December 2013 and January 2014 invoice, it was noted that the average cost of a user's mobile device voice, data, and messaging usage (excluding mobile broadband, hot spots, visual voicemail, and applicable taxes) was \$21 under a consumption plan. In the event that the City opts to provide a stipend for its BYOD users, it is recommended that at a minimum the determination of the stipend amount take into account the average calculated plan costs to the City.