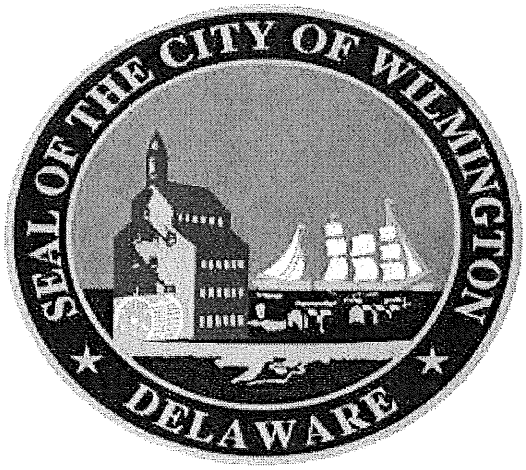

Internal Audit Department
Performance Audit Report
Of
15-10 Parking Meter

CONFIDENTIAL

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City Auditor's Office
Executive Summary

As part of our audit plan we conducted a performance audit[1] of 15-10 Parking Meter for the fiscal years ending June 30, 2013, June 30, 2014; and June 30, 2015. As stated on page 5 of this report, our objectives were to determine whether the City has adequate controls in place to ensure that all collections are properly recorded and accounted for, to identify the purpose of new meter technology, and to determine if new meter technology is performing according to established benchmarks.

The City of Wilmington has parking meters located throughout central downtown business district and various residential areas. As of the date of this report, there are three types of parking meter machines throughout the City that consist of Duncan and Duncan mechanized coin- only meters, Duncan (Smart Meters) and Kiosks. The Smart Meters and Kiosks offer payment options that include credit cards, debit cards, and cash (coins & dollar bills). Between 2010 and 2013 the City contracted with two parking meter vendors to install new parking meters. The first contract occurred in 2010 with Cale Parking Systems USA for purchase and installations of Kiosks "Pay and Display" parking meters. Sixteen (16) Kiosks were purchase and as of the date of this report, only 4 were installed at the Riverfront. The second contract occurred in 2013 with Duncan Solutions, Inc. for the purchase 200 smart meters with parking sensors. Approximately 170 smart meters were installed as a polite program. The internal audit department conducted an analysis of parking meter operations and found the following:

1. The average labor cost to repair a smart meter is $453.77 per month as compared to $1,466 per month to repair the old coin meters. The average labor cost of the Kiosks is $10.05 per month, the maintenance costs for the Kiosks is significantly less than the Smart meters and the old meters.

2. The average number of meter repairs per month is 41 repairs of the smart meters compared to 170 repairs of the old coin meters. The average number of repairs of the Kiosks is 1.

3. A broken machine means loss parking meter revenues for the City. Estimated loss of revenues per month due to repairs is $8,318.18 for the coin meters compared to $1,182.30 of the smart meters. The Kiosks machine does not sustain significant revenue loss because repairs of broken Kiosks are performed the same day of breakage.

See analysis on page 13 Exhibit 2

[1] A performance audit is a study of an organization's internal controls and the efficiency and effectiveness of its procedures and processes with due regard for economy and the express aim that it led to improvements.

Based on audit analysis, the Kiosks parking meters should provide more revenues with less maintenance costs as compared to the other meters. The audit identified other findings with parking meter operations:

1) No analysis on the purchase of new meter equipment.
    - No before or after analysis for the purchase of new meters.

2) Lack of contract performance.
    - Smart meters were not fully operational for 19 months after installation.

3) Incomplete Kiosks deployment.
    - 4 of 12 Kiosks installed.

4) Management forgoing less expensive meters.
    - Kiosks appear to be more economical than other meters.

5) New credit card technology increases risk to the City
    - EMV chip for credit card security – City could be liable for stolen credit card information.

6) City is behind in advances in parking meter technology.
    - Kiosks and cell phone app use increased but City is installing almost extinct single space meters.

Internal audit provided several recommendations in the report and recognize that the public works department was not a part of the process of the purchase of parking meters. We also recognize Public Works controls operations and maintenance of the parking meters and is able to lead in discussions and analysis in future parking meter operations for the City. The Department provided responses in the body of the report.

Our examination revealed several significant internal control problems or weaknesses that could be considered pervasive in their effects on meter coin activities. We also identified other reportable weaknesses that are listed in the executive summary and described in the body of this report. In our opinion, the operational and administrative controls for meter coin activities in effect as of September 25, 2015, taken as a whole, were sufficient to meet the objectives stated in this report. Specific limitations that may hinder the effectiveness of an otherwise adequate system of controls include, but are not limited to, resource constraints, faulty judgments, unintentional errors, circumvention by collusion, and management overrides. Establishing controls that would prevent all these limitations would not be cost-effective; moreover, an audit may not always detect these limitations.

Earl T. Jeter, CPA
City Auditor
October 29, 2015

Statement of Auditing Standards

The Internal Audit Department (occasionally, "IAD") conducted an audit of Parking Meters for the fiscal years ending June 30, 2013; June 30, 2014; and June 30, 2015. The objectives of the audit was to determine whether the City has adequate controls in place to ensure that all collections are properly recorded and accounted for, to identify the purpose of new meter technology, and to determine if new meter technology is performing according to established benchmarks. Except as discussed in the following paragraph, we conducted our 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.

An internal control system consists of many policies and procedures designed to provide management with reasonable assurance that organizational goals and objectives will be achieved. Management is responsible for establishing and maintaining an effective system of internal control.

City Auditor's Office
Wilmington, Delaware
September 25, 2015

Statement of Objectives

The audit objectives were to determine whether the City has adequate controls in place to ensure that all collections are properly recorded and accounted for, to identify the purpose of new meter technology, and to determine if new meter technology is performing according to established benchmarks.

The Internal Audit Department documented areas where inefficiencies exist and where internal controls may be strengthened or improved.

Statement of Scope

The IAD performed a limited scope performance audit of all parking meters. The audit period covered fiscal years ending June 30, 2013; June 30, 2014; and June 30, 2015.

Statement of Methodology

The information used to perform this audit was obtained through:

- Discussion and interviews with Department of Public Works and Department of Finance staff,
- Observation and walk-thru of meter coin operations,
- Review of Requests for Proposals, vendor contracts, and meter repair logs on file,
- Analysis of accounting records and documents pertaining to meter purchases and repairs,
- Review of meter coin reports and PEMS application,
- Review of meter collection routes and schedules,
- Review of hourly pay rates of Department of Public Works meter technicians.

DISCUSSION AND BACKGROUND:

The City of Wilmington has parking meters located throughout central downtown business district and various residential areas. As of the date of this report, there are three types of parking meter machines throughout the City that consist of Duncan and Duncan mechanized coin- only meters, Duncan (Smart Meters) and Kiosks. The Smart Meters and Kiosks offer payment options that include credit cards, debit cards, and cash (coins & dollar bills).

Until 2010, the City's on-street parking system consisted of approximately 1,000 coin-only meters[2]. During the redevelopment of the Riverfront district, the City has temporarily removed coin-only meters in construction areas and eventually replaced the coin-only meter with kiosks.

Management goals for new meters were 1) flexible payment options and added convenience for users, 2) real-time monitoring, 3) additional controls for operation and maintenance (O&M) costs, 4) enhanced user compliance, and 5) increased flexibility for changing hourly-rates.

Kiosks "Pay and Display" Acquisition

In November 2010, the City awarded a $122,634.67 contract to Cale Parking Systems USA, Inc. The contract consisted of the purchase of ten (10) kiosk "Pay and Display" parking meters and related supplies. "Pay and Display" meters allow customers to pay for parking time with coin, dollar bills, and credit/debit cards. When parking time is purchased, the Kiosk machine prints a stamped date and parking time receipt to be placed inside the vehicle on the dashboard in plain view (Display) for parking enforcement officers. An additional six (6) kiosks were purchased in 2012 totaling $63,924. There are four (4) kiosks installed on Justison Street at the Riverfront.

Smart Meter Acquisition

In August 2013, the City awarded a $179,340 contract to Duncan Solutions for intelligent single-space parking meter technology. The contract included the procurement of 200 smart meters with sensor functionality and a 5-year fixed purchase price on additional meters. The initial installation of the smart meters was considered by management to be a pilot program to last for 12 months (June 2015 to June 2016). Approximately 170 smart meters were installed on North Market Street, 800 block, and 900 blocks of North French Street as a pilot program.

The smart meters are similar to old coin meters except the smart meters accept credit cards and debit cards. Also, the smart meters include parking sensors that will reset the meters to zero when a vehicle leaves the parking space. The smart meters has online real-time data reporting called Parking Enterprise Management Systems (PEMS). The PEMS system

[2] Information derived from request for proposals for meter services.

provides management information on parking occupancy, meter revenues, and meter maintenance alerts.

Although installation of the smart meters occurred November 2013, the meters did not become fully functional until June 2015. As of the date of this report, 170 of the smart meters are installed

Parking Meter Performance Analysis

IAD reviewed 1,480-meter repairs with the associated repair logs of all meter types within a seven (7) month test sample. The sample included repairs from fiscal years 2013, 2014, and 2015. The data retrieved from the logs was analyzed to identify trends in meter repairs and timing of repairs. The Munis software was used to retrieve meter revenues and maintenance labor records to determine labor costs related to meter maintenance, revenues earned, average time it takes to repair a meter and estimated losses from disable meters. We noted the following results for the testing periods **(See Exhibit 2) :**

- The average labor cost to repair a smart meter is $453.77 per month as compared to $1,466 per month to repair the old coin meters. The average labor cost of the Kiosks is $10.05 per month. The maintenance costs for the Kiosks is significantly less than the Smart meters and the old meters.

- The average number of meter repairs per month is 41 repairs of the smart meters compared to 170 repairs of the old coin meters. The average number of repairs of the Kiosks is 1.

- A broken machine means loss parking meter revenues for the City. Estimated loss of revenues per month due to repairs is $8,318.18 for the coin meters compared to $1,182.30 of the smart meters. The Kiosks machine does not sustain significant revenue loss because repairs of broken Kiosks are performed the same day of breakage.

Additional Analysis

4. Revenue from parking meters for fiscal year end 2013, 2104, & 2015 were $389,750.42, $349,026.94 & $416,794.24, respectively. IAD did not receive information from management to explain revenue changes among the years.

5. Monthly maintenance costs are approximately 25% of monthly meter revenue[3]

6. On average, 211 coin-only and smart Duncan meters are repaired by Public Works Traffic Maintenance Technicians each month.

7. 60.05% of meter repairs are due to coin jams.

8. 18.95% of meter repairs are battery replacements and 7.81% are "false alarms."

[3] Based on data from the City's financial system (Munis) on average, all meter types collect a net amount of $34, 049.16 per month.

9. The City has paid Duncan $94,300 for the smart meter equipment and wireless communication and $4,400 in monthly wireless meter management fees.

New Technology

Parking Meter Technology Add-ons: "Pay-by-Cell" and "License plate recognition"
Both kiosk and smart meter technology can integrate their current capabilities with a pay-by-cell option—a feature that allows for real-time addition to meter time based on zone, license plate, or parking space via a Smartphone application or a web-based overlay service. As a vehicle is enforced, the officer can check the parking meter, kiosk ticket slip, or a wireless handheld device with license plate recognition capability to confirm if a vehicle is non-compliant.

New Advances in Credit Card Technology
Banks and credit card companies have the option to issue their customers new payment cards that have a built in microchip called "Europay, MasterCard, and Visa," (EMV). EMV is a global industry standard used to govern card payment technology. EMV chip acceptance technology heightens security through the use of stronger authentication that reduces the value of stolen data. Businesses that accept credit cards as a form a payment need special processing devices to read the information in the chip cards.

FINDINGS

1. **No evidence of analysis on purchase of new meter equipment.**

   Department conducted a pilot program that lacks measurable outcomes. IAD did not find documentation that indicated before and after revenues or net receipts of the program. In addition, there is no indication of the duration of the pilot program.

2. **Lack of contract performance by vendor.**

   Smart meter vendor did not provide functioning sensor equipment and reporting systems for 19 months (November 2013 to June 2015).

3. **Incomplete Kiosks Deployment.**

   As of the date of this report four (4) of the twelve (12) kiosks are installed in the City.

4. **Management forgoing less expensive option of meter installation.**

   See Exhibit 2

5. **New credit card technology increase risk to the City.**

   The Duncan smart meters and Cale kiosks are not equipped to process the EMV chip in credit cards. Effective October 1, 2015, the party that is the cause of a credit card chip transaction not occurring (i.e. the credit card processor does not have the equipment with the ability to read EMV data) will be held financially liable for any

resulting card-present counterfeit fraud losses. This may lead to increased costs to the City if credit card fraud originates from any meter transaction. Lack of preparation for the change in credit card security liability.

6. **City is behind advances in parking meter technology.**

   Kiosks and cell phone parking apps are on the rise, while the City continues to install single space meters.

CAUSE:
Ineffective strategic planning for the purchase of parking meters. When acquiring the kiosk and smart meter technology, management did not conduct a comprehensive cost study for meter deployment.

EFFECT:
City is not getting the "best bang for its buck" The lack of pertinent financial data from the parking meter increases the risk that management will not be able to pinpoint low performing meter, reduce maintenance costs, determine losses from disable meters, and strategically deploy additional meters.

RECOMMENDATIONS:
Management should reevaluate the future of its parking meeting deployment. New technologies are emerging that can greatly reduce maintenance costs and possibly increase revenues.

1) Perform an in-depth strategic analysis of meter placement that coincides with residential and economic growth in the downtown and central business district areas. Track key data using the back-office systems provided by each vendor. Analyze financial trends for each type of meter, including occupancy rates and maintenance costs. This will clearly identify the cost and benefit of the City's current meter types that may eventually lead to a uniform parking system throughout the City.

2) Determine annual meter performance goals, critical indicators, and revenue objectives. Correspond each with clearly defined benchmarks and measurable interim goals.

3) Create and implement an operational plan to meet target accomplishments.

4) For the coin-only meters, replace all meters with new more efficient meters.

5) Improve usage of the Meter repair log. Update the log to include all actions taken on a meter. Specify which meter is receiving maintenance. Management should use Microsoft Excel or similar software to track repairs.

6) Create a Service level agreement with fixed timeframes for maintenance and repairs with consideration of timeframe for meters returned to the vendor for advanced

repairs.

7) Work with finance department to receive monthly meter data for analysis. The data obtained from the Finance Department should capture data by meter type.

MANAGEMENT RESPONSE:

"Public Works comments on the Findings in the Internal Audit Department Report are provided, as follows (note: Findings in the Report are listed in **bold**, with addition of numbers for ease of future reference):

1. No evidence of analysis on purchase of new meter equipment.

Public Works did not set the size of the initial pilot-test area, which we used for testing and evaluation of smart-meter and sensor performance. For an undertaking such as this, the department would have recommended a pilot program that consisted of twenty to fifty units. The meter-procurement and pilot-study efforts were coordinated with an inter-departmental team, including the Finance Department, Department of Public Works (DPW), City Council, etc. At the time, DPW's primary function was with deployment and use of the Duncan Liberty smart-meters and separate occupancy sensors. We consider the pilot-test to have measurable outcomes. For instance, installation of new Liberty meters met one of our measurable outcomes/objectives, which was to establish accepting alternate forms of payment. Public Works does not have access to the revenue data to monitor before and after revenues for meters, although we consider revenue to be a primary and essential performance indicator. Currently the Public Works accounting staff is now assisting the transportation division with obtaining the critical revenue data from Finance (in MUNIS), so this key performance metric can be tracked and quantified.

2. Lack of contract performance by vendor.

We acknowledge that working sensors were not provided until mid-2015 and we are now in a one-year evaluation period of the fully-functional combined smart-meter/sensor equipment. It is important to note that the City did not pay the vendor for non-working sensors. In terms of the lack of stated performance measures in the original Request for Proposals (RFP) and for our open-ended pilot-test evaluation period, we mirrored our RFP after other cities and agencies. Unfortunately our original RFP did not include such measureable. In our efforts to continue with advance technology (in preparation of our mobile-payment RFP) our future RFP's will include performance measures outcomes.

In terms of revenues associated with the sensors, we replaced coin-only meters (which do not have sensors) with smart-meters, so there was not a loss of revenue in the transition. Now that we have functional sensors, we will be able to track the revenue impact from the newly installed functional sensors.

3. Incomplete kiosks deployment.

In terms of the current inventory of kiosks, there are various places where we've tried to deploy additional kiosks. For various intervening factors, such as parallel economic development initiatives, Office of Economic Development, the kiosks were not installed when we otherwise were ready to do so. Generally, not installing the added kiosks achieved a net overall economic benefit (outside of meter revenues) as these OED projects move forward. Examples of economic development projects which affected existing or planned kiosk/smart-meters include the construction related residential developments along various blocks on N. Market Street. A collective decision was made not to install kiosks next to the

Community Education Building at the time. Other potential location for kiosks was in the proximity of the new Harlan Flats development located on Justison Street. Due to the construction of that project it obviously was not feasible to use that location.

In addition, the need to control and manage costly kiosk upgrades such as ADA and EMV modifications contributed to the decision to delay future installations of kiosk. ADA and EMV modification were modifications that were totally out of our control. Based on discussions and a meeting with our kiosk vendor, we delayed further updates in mid-2014, taking into account the need to change the scope of the upgrades to include the following (at least in part, only after the updates become available from the vendor):

-Suitable alphanumeric keypad (such as for entry of license plate information, to accommodate EVM for chip-card credit card companies which elect to require entry of PIN numbers, etc)

-Suitable touch-pad (such as for chip-cards when the credit card company requires a live signature, etc.)

-Latest ADA updates (which evolve over time, and result in us incurring costs to remain up-to-date)

Based on a recent check of revenue information for the Cale kiosks, which we have not yet validated with Finance, it potentially could take a year or so before we even break even on recouping the costs of these kiosk upgrades to comply with ADA and EVM and provide an improved customer interaction, etc.

4. Management forgoing less expensive option for meter installation.
The kiosks are not an inherently less-costly option. They are actually very significant costs involved with owning, operating, and maintaining the kiosks. To be cost-effective, we only are installing single-space smart-meters where single-space meters previously had been installed. To convert blocks which currently have single-space meters to sole use of kiosks would be a significantly more costly venture (perhaps on the order of $1.5 million). Also, there are locations where kiosks would be relatively infeasible to install (such as in front of the City/County building). It is important to note that Public Works is working on implementing real-time use of Cityworks (our Computerized Maintenance Management System) so that accurate and reliable data which is necessary to track the time it takes to repair a meter will be available. We do not consider the current repair data to be suited for use beyond the parking citation appeals process.

In terms of the time-factor for meter repairs, per discussion with a foreman at the traffic shop (note: supervisor of meter crew), he indicated we handle the repairs "right away" (i.e., we typ. do not sit on repairs of the smart-meters for 3.92 days and we typ (typically). do not sit on repairing coin-only meters for 5.5 days)

5. New credit card technology increase risk to the City
There has been considerable discussion about EMV, however, the vendors do not yet have equipment to support that technology. To that end, we are seeking input from Finance/Law about whether or not to temporarily disable the credit-card feature on our meters. We also note that our transportation engineer participated in a national parking conference in October

of 2014 and he attended a session on EMV, where it was apparent that the parking kiosk/meter vendors were pressing the banking/credit-card panel, which unfortunately could not give the parking equipment vendors definitive answers on U.S. deployments.

6. City is behind advances in parking meter technology.
If we had remained exclusively in the coin-only world, the City would indeed be behind in parking technologies. Actually, our procurement and installation of kiosks and single-space smart-meters (esp. with sensors) are current technologies. We also are drafting an RFP for mobile-payment and meter-less parking technologies, which in concert with the Finance department's electronic permitting technology deployment. At the risk of being repetitive, this "Mobile Payment and Meterless Parking Meter Technologies" RFP (16059PWPS) will include a pilot-test period with stated metrics, as well as overall stated performance measures. We also have proposed an up-to-date parking study in coordination with the Wilmington Parking Authority (WPA) and other key stakeholders, particularly in our evolving downtown and riverfront areas.

Public Works sincerely appreciates the professionalism and overall efforts of our audit office staff with preparing this important Report. We understand it would have been easier and more efficient to compile this Report if real-time parking meter data had been collected the past few years. We've recognized the need for this time-stamped and "live" data for some time and are awaiting receipt of a portable tablet computer, so our meter crew can collect accurate data without the time-lag from when the work is performed and when it is entered into our CMMS (Cityworks)."

CONCLUSION:

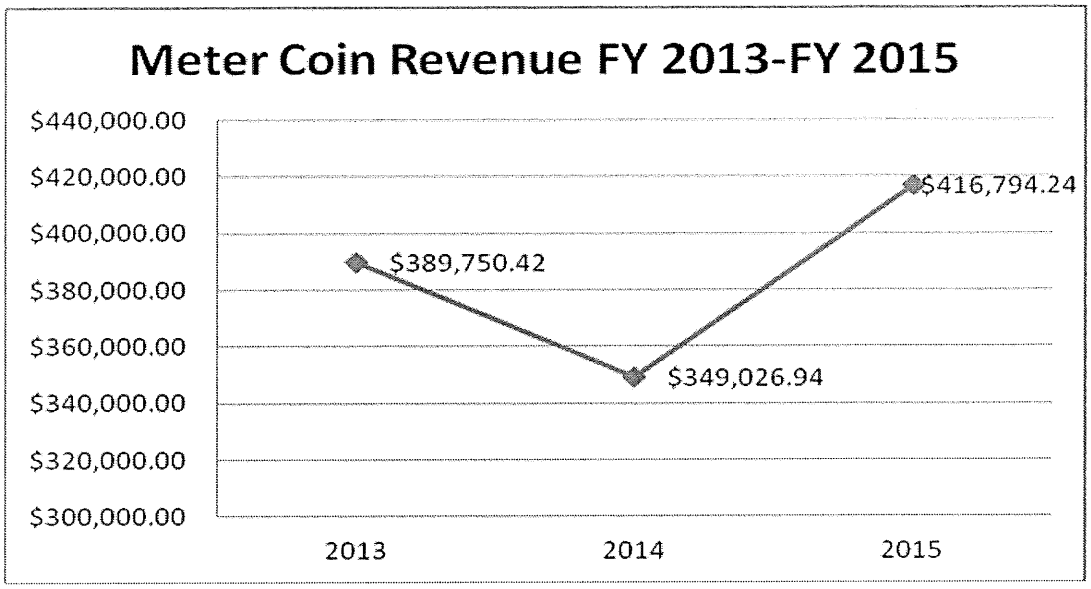
We would like to express our appreciation to the Department of Public Works and the Department of Finance for their assistance during this audit

AUDIT TEAM:

Tamara Thompson, CIA, CGAP
Audit Manager

Yvette Johnson, MBA, CGAP
Senior Auditor

Exhibit 1[4]:



[4] Annual revenue projection is $400,000.

Exhibit 2:

Analysis of Meter Performance FY 2013- FY 2015[5]

	Smart Meters	Kiosks	Coin-only meters
Percentage of Total Repairs tested (population:1,478)	**19.28%**	**0.41%**	**80.31%**
Average # of repairs per month	41	1	170
Timing of Repairs (Average days to repair)	3.92 days	Same day	5.55 days
Average monthly revenue collected[6]	Net $34,049.16 for all meter types		
Approximate cost of labor for 1 repair	$10.81	$3.22	$8.90
Approximate cost of labor for monthly repairs[7]	$453.77	$10.05	$1,466.03
Estimated loss per month in potential revenue due to inoperable meters[8]	$1, 182.30	$0	$8, 318.18
Citations dismissed per month due to broken meters[9]	Net $1,000 for all meter types		

[5] Based on monthly averages obtained from selected test periods.

6 Unable to calculate distinct meter type revenue due to 1) limited data being captured by back-office reports, 2) lack of report reconciliation with general ledger, and 3) co-mingling of meter coins during bank deposit.

[7] Technicians have additional duties (i.e. coin collection, sign installation, inventory preparation, etc) that are not consistently captured on the meter repair log; therefore, the "start" and "end" time recorded on the log may not accurately depict the actual time spent on meter repair, but instead reflect time spent in the field. **The time spent on meter repair calculation used in this analysis is based on the estimate derived from the professional judgment of the Transportation Administrative Supervisor and Transportation Engineer: Smart meter repair average a maximum of 20 minutes to repair 1 meter; coin-only meter repair average a maximum of 15 minutes of repair 1 meter; and Kiosk repairs average a maximum of 15 minutes of repair per Kiosk. Maximums were used in this analysis.**

[8] Revenue potential for each meter is $8 per day based on assumption of 100% utilization.

[9] Based on Xerox report. Total of $44,320 in citation dismissals from January 2012-June 30, 2015.