Audit of On-Street Parking Meters

Report #2018/19-07|February 2019

Finding 1: Improving Vehicle-Detection Sensor Accuracy Rates and Meter Battery Life Could Reduce the Potential for Erroneous Citations and Slow the Rate of Incoming Citation Disputes

Finding 2: Mobile Payments Made in Event Zone B are Not Reflected on Parking Meters

Finding 3: Some Meter Configurations in the Data Management System User Interface Are Not Reliable

Finding 4: Usefulness of Contested Citation Data Has Improved

Finding 5: The Prevalence of Disabled Parking Placards May Have an Adverse Effect on the Availability of Disabled Parking Spaces and the City's Ability to Effectively Regulate Parking Through Demand-Based Pricing

City of
SACRAMENTO
Office of the City Auditor

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Table of Contents

Audit Fact Sheet **4**

Introduction **5**

Background **5**

The City's Parking Modernization Program 5

On-Street Parking Meter Revenue 6

On-Street Parking Meter Transactions 7

Contested Citation and Adjudication Process 8

Objective, Scope, and Methodology **8**

Finding 1: Improving Vehicle-Detection Sensor Accuracy Rates and Meter Battery Life Could Reduce the Potential for Erroneous Citations and Slow the Rate of Incoming Citation Disputes **10**

Vehicle-Detection Sensors Fell Short of Contracted Accuracy Rates 10

Low Batteries May Be Negatively Impacting Meter Revenue and the Customer Service Experience 16

The Number of Incoming Disputed Citations Could Be Reduced by Improving the Reliability of Meter Technology 20

Finding 2: Mobile Payments Made in Event Zone B are not Reflected on Parking Meters **24**

Nearly 20 Percent of Mobile Payments Failed to Reach the Meters 25

Failed Payments were Primarily Related to Meters Located in Event Zone B 26

Just Over 70 Percent of Mobile Payments that Reached the Meter Did So Within One Minute 29

Finding 3: Some Meter Configurations in the Data Management System User Interface Are Not Reliable **32**

Configurations for Meters on Virtual Machines are Not Accurately Reflected in the Data Management System User Interface 32

An Incorrect Meter Configuration Allowed for Payments to be Accepted During Restricted Hours and May Have Led to a Parking Citation 33

Finding 4: Usefulness of Contested Citation Data Has Improved **36**

The Quality of Citation Adjudication Data Has Improved 36

More Consistent Citation Data Could Be Leveraged to Identify Problem Meters 37

Finding 5: The Prevalence of Disabled Parking Placards May Have an Adverse Effect on the Availability of Disabled Parking Spaces and the City's Ability to Effectively Regulate Parking Through Demand-Based Pricing **40**

The Prevalence of Disabled Placards Constrains the City's Ability to Regulate Parking Availability and Turnover 40

California State Law May Incentivize the Abuse of Disabled Placards 43

Department Response 45

City of SACRAMENTO
Office of the City Auditor

AUDIT FACT SHEET

Audit of On-Street Parking Meters

February 2019 Report #2019-07

RECOMMENDATIONS

We made recommendations to work with the meter vendor to improve meter performance and ensure a consistent customer experience, with the goal of reducing the number of disputed citations. We also recommended optimizing how data is gathered and stored in the City's internal systems and pursuing updates to parking legislation at the State level. Our recommendations include:

Vendor Management

Work with the meter vendor to:

- Achieve contracted vehicle-detection sensor accuracy rates,
- Improve meter battery life,
- Reduce incoming citation disputes,
- Ensure a consistent customer service experience for mobile payments, and
- Require that the information in the data management system user interface be the most accurate and up-to-date information.

Data Optimization

- Require enforcement officers enter citation data in a consistent format, to aid in data aggregation and analysis.
- Continue to optimize data fields to ensure the department is receiving the most useful data.
- Conduct regular reviews of citation data to identify trends and correct anomalies.

Parking Regulation

- Continue to lobby for changes to the California State Vehicle Code that improve the City's ability to effectively manage parking services and reduces incentives for placard abuse.

BACKGROUND

The City of Sacramento's parking modernization efforts began in mid-2012 and included plans to upgrade approximately 4,500 of the City's single-space parking meters to new "smart" meters that accept credit card payments, are solar-powered, have pay-by-phone capabilities, and can be equipped with vehicle-detecting sensors. The objective of the *Audit of On-Street Parking Meters* was to independently evaluate the performance of the new on-street smart meters and to identify areas for improvement.

FINDINGS

Finding 1: Improving Vehicle-Detection Sensor Accuracy Rates and Meter Battery Life Could Reduce the Potential for Erroneous Citations and Slow the Rate of Incoming Citation Disputes

- Vehicle-detection sensors fell short of contracted accuracy rates;
- Low batteries may be negatively impacting meter revenue and the customer service experience; and
- The number of incoming disputed citations could be slowed by improving the reliability of meter technology.

Finding 2: Mobile Payments Made in Event Zone B are Not Reflected on Parking Meters

- Nearly 20 percent of mobile payments failed to reach the meters;
- Failed payments were primarily related to meters located in Event Zone B; and
- Just over 70 percent of mobile payments that reached the meter did so within one minute.

Finding 3: Some Meter Configurations in the Data Management System User Interface Are Not Reliable

- Configurations for meters on virtual machines are not accurately reflected in the data management system user interface; and
- An incorrect meter configuration allowed for payments to be accepted during restricted hours and may have led to a parking citation.

Finding 4: Usefulness of Contested Citation Data Has Improved

- The quality of citation adjudication data has improved; and
- More consistent citation data could be leveraged to identify problem meters.

Finding 5: The Prevalence of Disabled Parking Placards May Have an Adverse Effect on the Availability of Disabled Parking Spaces and the City's Ability to Effectively Regulate Parking Through Demand-Based Pricing

Introduction

In accordance with the City Auditor's 2018/19 Audit Plan, we have completed an *Audit of On-Street Parking Meters*. 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. In April 2018, the Office of the City Auditor released a *Preliminary Assessment of the City's On-Street Parking Meters*; this report provides a conclusion to the preliminary results from that effort.

The City Auditor's Office would like to thank the Parking Services Division for its cooperation during the audit process.

Background

The City's Parking Modernization Program

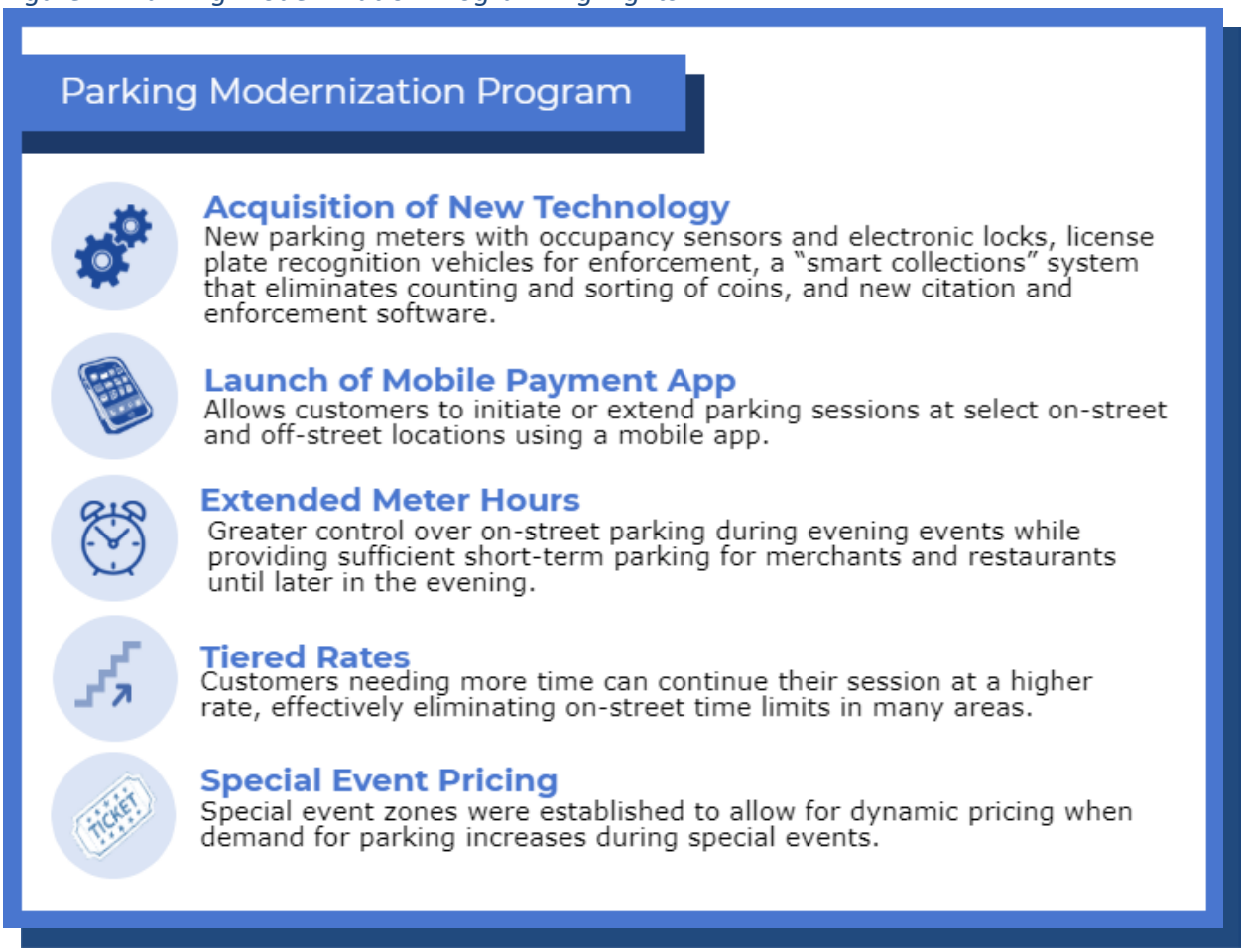
The City of Sacramento's parking modernization efforts began in mid-2012 and included plans to upgrade approximately 4,500 of the City's single-space parking meters to new "smart" meters that accept credit card payments, are solar-powered, have pay-by-phone capabilities, and can be equipped with vehicle-detection sensors. In October 2013, the City's Parking Services Division entered into an agreement with IPS Group, Inc. (IPS) to install the new smart meters and to supply a data management system (DMS) to assist with monitoring the new meters. The contract also included an option for IPS to obtain a mobile payment solution (mobile app) that would integrate with the new smart meters. IPS began installing the single-space smart meters in 2014.

ParkMobile is a mobile phone app operated by third-party vendor ParkMobile, LLC. Consumers can use the mobile phone app to pay for parking sessions at select parking meters and lots within the City of Sacramento. ParkMobile generally charges a $0.35 per use transaction fee for meter payments initiated through the app. The ParkMobile app was rolled out in phases; trials started in late 2014. Parking meters that accept payments via the ParkMobile app have a green decal, with a ParkMobile zone number, affixed to their fronts.

In September 2016, the City extended meter hours from 6:00 p.m. to 10:00 p.m. in the Downtown area and from 6:00 p.m. to 8:00 p.m. in parts of the Midtown area. Informational notices and warnings, as opposed to citations, were issued for the first 60 days in an effort to inform motorists of the later hours. The change in meter hours coincided with the opening of the Golden1 Center, which was also expected to influence parking patterns in the downtown area during evening events. In 2016, the City also installed sensors on some of the meters that detect when a vehicle has left a parking space and, to support tier-based pricing, resets the paid time to zero.

While not all of the objectives of the City's parking modernization program have yet been fully realized, some of the goals specifically related to on-street parking that have been implemented are shown in figure 1.

Figure 1: Parking Modernization Program Highlights

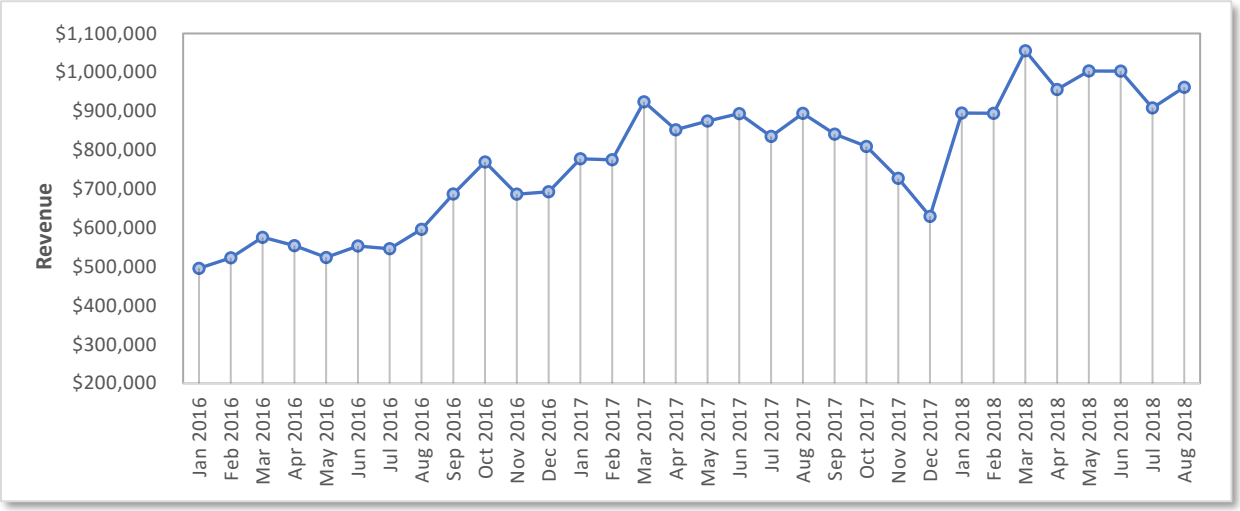


Source: Auditor generated.

On-Street Parking Meter Revenue

According to the parking meter DMS, single-space meter revenue has been steadily increasing over the last few years. This is likely partly due to the phase-in of single-space smart meters throughout the downtown area and the extension of metered parking during evening hours. As of September 2018, nearly 80 percent of the transactions were made with a credit card and the average credit card transaction was approximately $3.40. Figure 2 shows the total amount of revenue (coin, credit, and mobile payments) collected per month by on-street parking meters from January 2016 through August 2018.

Figure 2: Monthly Single-Space Smart Meter Revenue



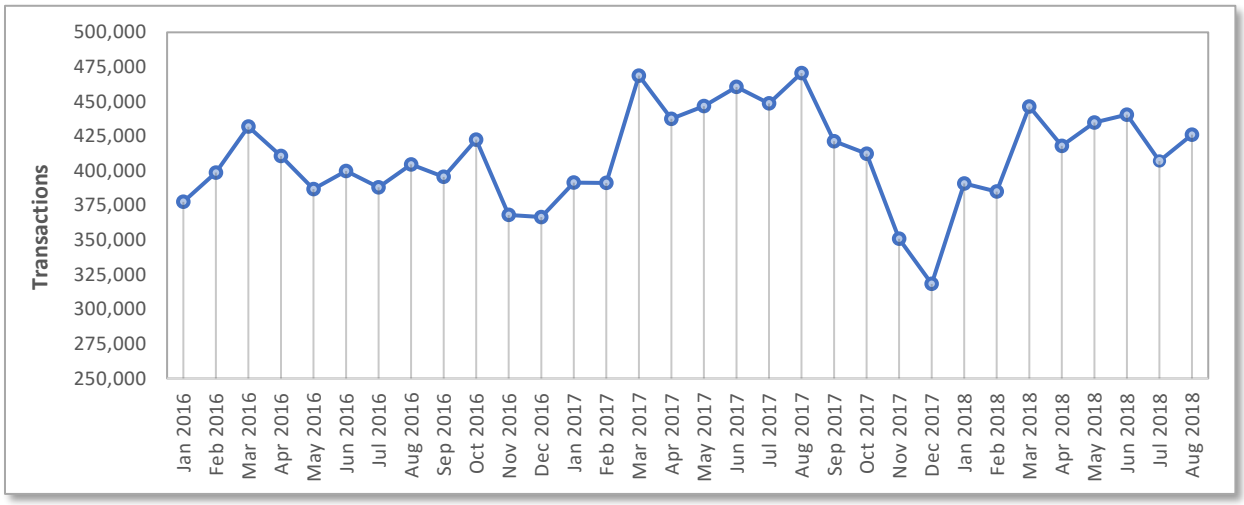
Source: Auditor generated based on IPS Data Management System (DMS) records.

November and December months show a measurable decline in revenue, likely due in part to the free holiday parking offered during this time of the year.

On-Street Parking Meter Transactions

The number of on-street single-space smart meter transactions has increased from just over 4.7 million transactions in calendar year 2016 to over 5 million in calendar year 2017. Similar to the revenue data in the figure above, the months of November and December in the figure below show a measurable decline in the number of transactions, likely due in part to the free holiday parking offered during this time of the year.

Figure 3: Number of Single-Space Smart Meter Transactions per Month

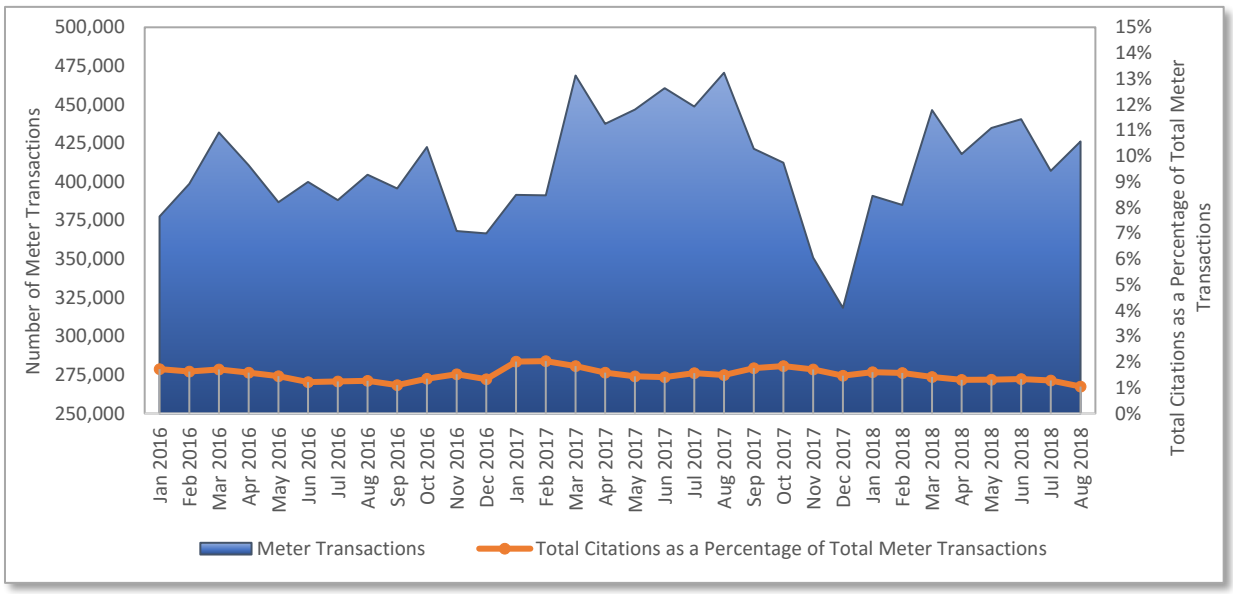


Source: Auditor generated based on IPS Data Management System (DMS) records.

Contested Citation and Adjudication Process

Parking citations are issued by enforcement officers when they encounter a vehicle that does not appear to be in compliance with City Code, such as a vehicle parked at an expired parking meter. However, City Code also allows for citations to be disputed (contested) when a driver believes they have been issued a citation in error. The process for contesting a citation is either completed online, by mail, or in-person, and provides drivers an opportunity to explain why they believe the citation should be dismissed. A hearing officer then weighs the evidence available and makes a determination on whether to uphold or dismiss the citation. To provide some context, figure 4 shows the percentage of meter citations issued compared to the total number of single-space meter transactions.

Figure 4: Percentage of Expired Meter Citations Issued Compared to the Number of Single-Space Smart Meter Transactions



Source: IPS Data Management System and AutoProcess citation records.

As shown in figure 4, the number of citations issued has not exceeded three percent of total smart meter transactions over the last three calendar years. For the first half of 2018, the number of citations issued has not exceeded two percent of total smart meter transactions.

Objective, Scope, and Methodology

The objective of the *Audit of On-Street Parking Meters* was to independently evaluate the performance of the new on-street smart meters and to identify areas for improvement. As there are significantly more single-space meters than multi-space kiosks in the City, this report primarily focuses on the City's single-space meters and generally excludes data related to the multi-space kiosks, which serve multiple spaces with one machine. The scope of our review included on-street parking meter and citation data between January 2015 and September 2018. In conducting our independent assessment we performed

testing, reviewed policies, interviewed staff, researched industry best practices, contacted third-party vendors, and analyzed meter transactions and citation data.

Finding 1: Improving Vehicle-Detection Sensor Accuracy Rates and Meter Battery Life Could Reduce the Potential for Erroneous Citations and Slow the Rate of Incoming Citation Disputes

A significant part of the City's parking modernization efforts included upgrades to the on-street parking meter technology. On-street parking meters equipped with vehicle-detection sensors, solar rechargeable batteries, and wireless capabilities were deployed with the goal of enhancing the customer experience by making it easier to pay for parking services, and for the City to monitor parking trends. However, with those changes in technology comes a learning curve and the potential for errors. Imprecise vehicle-detection sensor readings could cause meters to incorrectly reset to zero, resulting in erroneous citations. In addition, inaccurate occupancy status readings could reduce the usefulness of applications that provide customers with real-time information about parking space availability. We set out to independently evaluate how this new technology has impacted parking operations. Based on our analysis, we found that:

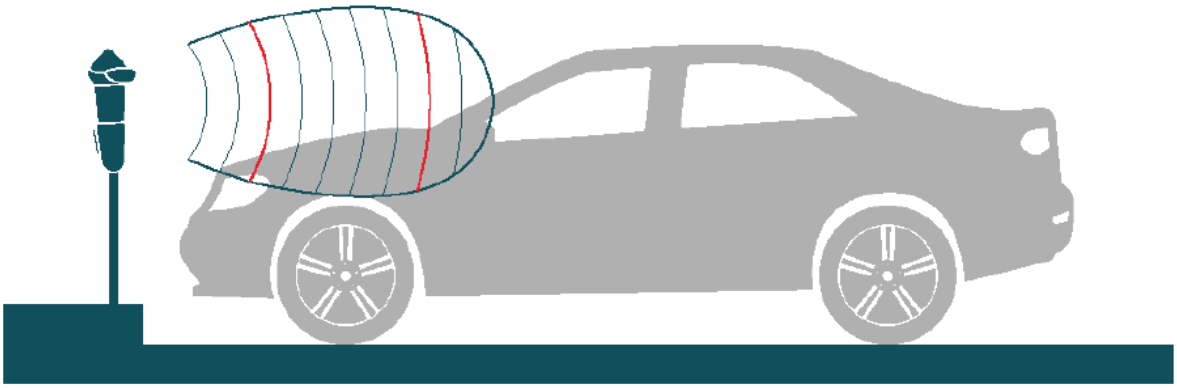
- Vehicle-detection sensors fell short of contracted accuracy rates;
- Low batteries may be negatively impacting meter revenue and the customer service experience; and
- The number of incoming disputed citations could be slowed by improving the reliability of meter technology.

We recommend the Parking Services Division continue to work with IPS to improve sensor accuracy rates, battery life, and communication issues, with the goal of improving the customer service experience and reducing the number of incoming disputed citations.

Vehicle-Detection Sensors Fell Short of Contracted Accuracy Rates

IPS single-space parking meter dome sensors use radar to detect the arrival or departure of vehicles to or from parking spaces. Figure 5 provides a basic illustration of how the vehicle-detection sensors operate.

Figure 5: Vehicle-Detection Sensor Radar Dispersion Scenario



Source: IPS Group Single-Space Parking Meter Dome Sensor - Installation Guide 101-033 Rev A.

Vehicle-detection technology facilitates tiered-based pricing, vehicle turnover calculations, and the use of mobile apps that let drivers know where available spaces are located thereby reducing the time it takes to locate an available space.

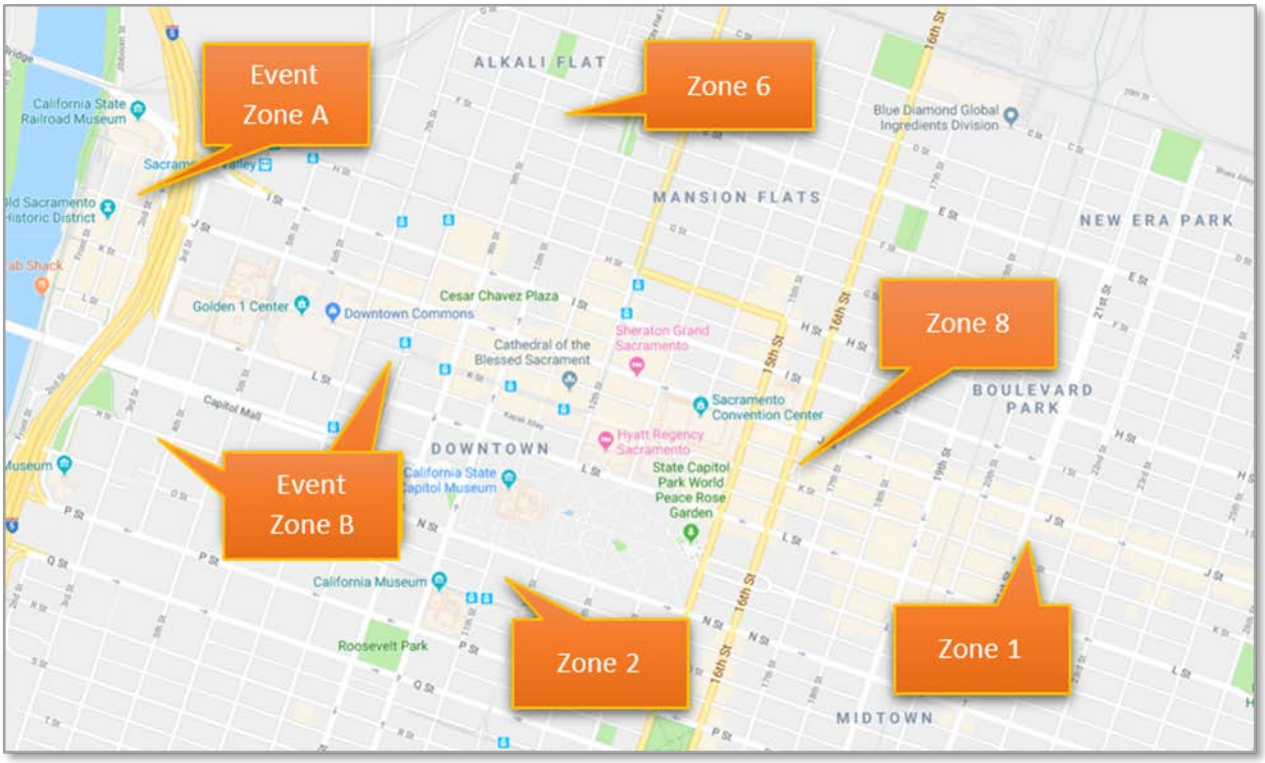
In 2016, the City amended its contract with IPS Group, Inc. to acquire and install approximately 4,500 of these vehicle-detection sensors, at no additional cost to the City, as part of the already agreed-upon $4.1 million parking meter procurement contract from 2013. The sensors were retrofit into the existing smart meters beginning in May 2016, with the majority installed by the end of October 2016. The terms of the amended contract with IPS Group, Inc. state that the sensors shall "provide greater than 95% average accuracy in detecting when the occupancy status of a parking space has changed due to the presence or absence of a motor vehicle that is parked within the delineated boundaries of the parking space."

We set out to test the accuracy and reliability of these vehicle-detection sensors to determine if they were reasonably in compliance with the terms of the contract. In July 2018, we observed a total of 410 parking meters. The sample areas included the following:

- Event Zone A (Old Sacramento)
- Event Zone B (Up to four-block radius around the Golden1 Center)
- Zone 1
- Zone 2
- Zone 6
- Zone 8

Figure 6 shows the approximate location of the testing areas.

Figure 6: Vehicle-Detection Sensor Testing Zones

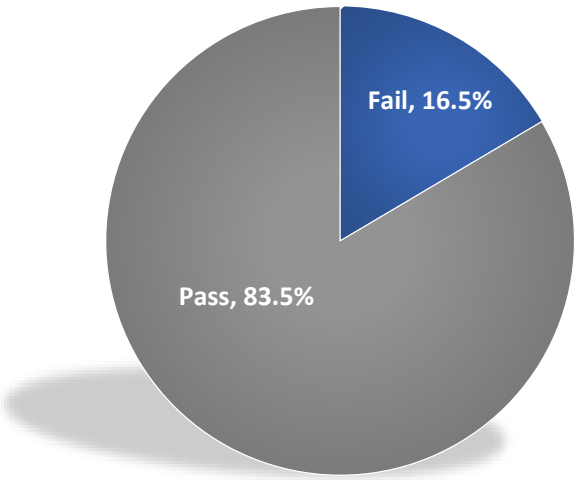


Source: Auditor generated using Google Maps.

Our sampling methodology did not consist of a random selection, as this would have taken significantly longer to achieve; however, we believe our sample size is sufficient to provide a sense of the overall sensor reporting accuracy. It is important to note that a limitation of the occupancy test is that the sensors always have a 50 percent chance of being correct at any point in time. As there are only two status options, either "occupied" or "vacant", a sensor could potentially be malfunctioning or the DMS could fail to record the correct status during the time we evaluated it. In addition, the time of year when the testing was completed—July—may have played a role in the overall results. Meter battery life appears to follow a seasonal trend with more critical batteries reported during winter months and fewer reported during summer months. This is discussed in more detail later in the report.

We compared the sensor activity recorded in the DMS to our observations to determine whether the sensors were accurately recording and reporting what we had observed. As shown in figure 7, 83.5 percent of the meters passed and 16.5 percent failed the occupancy test.

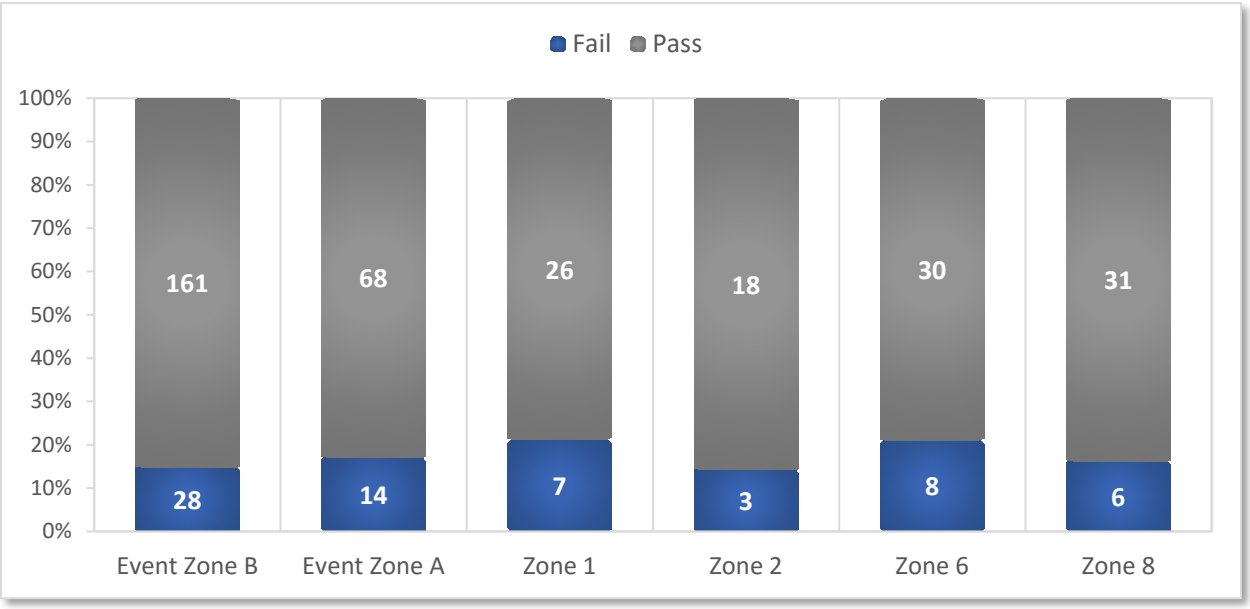
Figure 7: Occupancy Accuracy Testing Pass/Fail Percentage



Source: Auditor generated based on sample testing.

We also developed a chart of the results of the occupancy accuracy test by zone. Figure 8 provides an overview of the number of transactions that failed or passed, as a percentage of the total number of sensors tested within each zone.

Figure 8: Occupancy Accuracy Testing Pass/Fail Percentage by Location

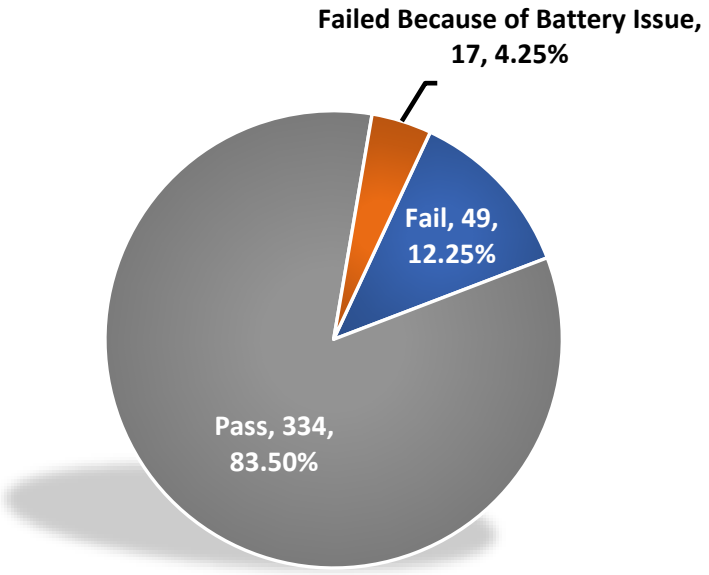


Source: Auditor generated based on sample testing.

Event Zone B had the highest number of sensors that failed the test (28); however, Zones 1 and 6 had the highest rate of failure at 21 percent of meters tested.

We noted that some of the sensors appeared to fail the occupancy test because the batteries had low or no power, or the meter had put itself in "sleep mode" because of a low battery and was therefore not reporting updates. In order to demonstrate the effect that these battery issues had on our testing results, figure 9 shows the overall count and percentage of sensors that failed to report due to what appeared to be a battery issue.

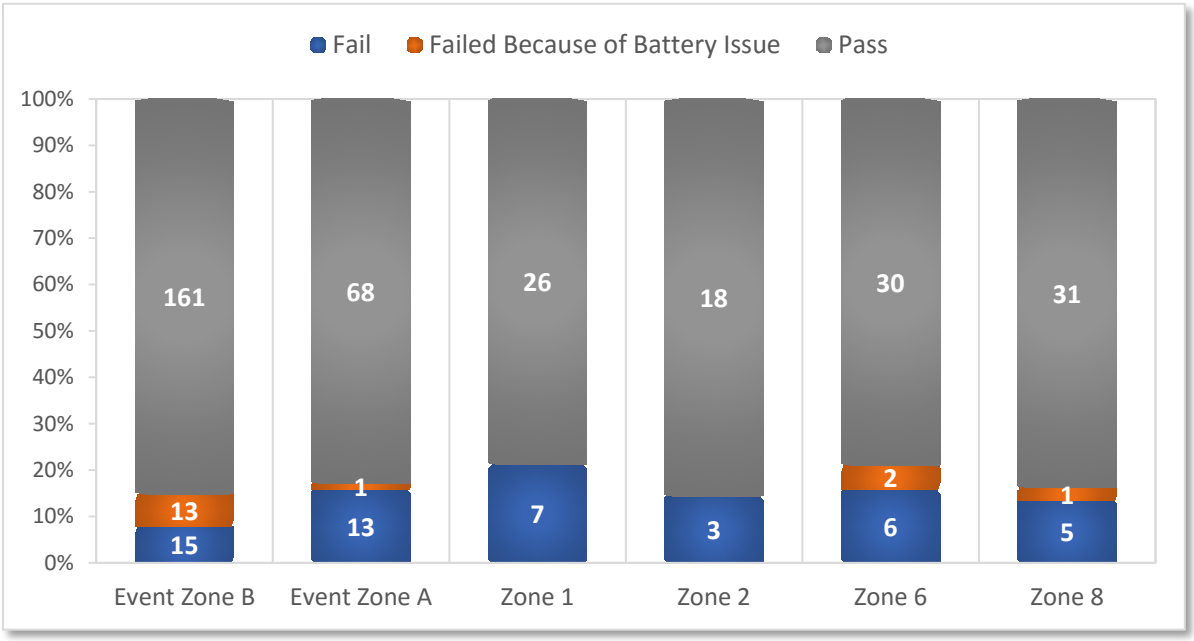
Figure 9: Results of Occupancy Accuracy Testing



Source: Auditor generated based on sample testing.

It appeared that just over four percent of the meters we tested had a battery that was too low to continue reporting occupancy updates to the DMS. We further analyzed the data by including a chart that highlights where battery issues appeared to be present.

Figure 10: Occupancy Accuracy Testing Pass/Fail Percentage by Location



Source: Auditor generated based on sample testing.

Figure 10 shows that Event Zone B had the highest number of meters that appeared to have a dead or severely low voltage battery during our testing period, with nearly seven percent of meters tested in that zone failing the occupancy test because of a battery issue.

The meter sensors we tested had an overall reporting accuracy rate of approximately 85 percent, which may be partially impacted by battery-related issues. This falls short of the contracted accuracy rate of 95 percent. Imprecise vehicle-detection sensor readings could cause meters to incorrectly reset to zero, resulting in an erroneous citation. It is important to note that in 2017, IPS updated the firmware on the parking meters to perform a "double-blink" when a meter resets, so that enforcement officers have additional information about the status of the meter before determining whether to issue a citation. The contract between IPS, Inc. and the City does not appear to impose a monetary penalty if the sensors do not meet the agreed-upon standards. However, the contract does require the vendor to work with the City to address any potential issues with the sensors. We recommend the Parking Services Division continue working with the vendor to achieve the desired standard, or if this is not feasible, to consider alternative products that have been proven to meet the standard.

RECOMMENDATION

We Recommend the Parking Services Division:

1. Continue to work with the vendor to achieve contracted vehicle-detection sensor accuracy rates or consider switching to a vendor that will meet the desired standard.

Low Batteries May Be Negatively Impacting Meter Revenue and the Customer Service Experience

IPS single-space smart meters contain a rechargeable main battery and a non-rechargeable backup battery. The manufacturer recommends recharging the main battery if it falls below 3,100 mV (millivolts). If the backup battery falls below 3,100 mV, the manufacturer recommends replacing it with a new battery. The figure below is a screenshot from the "Battery Voltage" report in the DMS showing when the battery voltage levels are considered "Bad", "Sufficient", or "Excellent" for three different meter types. The City of Sacramento uses the MK5 meter type.

Figure 11: Battery Voltage Key

Key :

Meter Type	MK 3	MK 5	MS
Bad	v <= 4500 mV	V <= 3100 mv	V <= 3100 mv
Sufficient	4500 mV < V <= 5800 mV	3100 mV < V <= 3400 mV	3100 mV < V <= 3400 mV
Excellent	v > 5800 mV	V > 3400 mV	V > 3400 mV
	No Data Available	No Data Available	No Data Available

Source: IPS Data Management System (DMS) records.

According to the DMS User Manual, the "Faulty Meters" report in the DMS "displays current fault alerts for card and coin jams, meters with low battery, and pole locations with coin boxes approaching 100% capacity…Once the fault is corrected, the entry will be removed from the list after the meter establishes communication with the DMS." We ran the Faulty Meters report on August 24, 2018, and again on September 19, 2018, to gain an overall understanding of the types of faults that were being reported and to get a sense of how many of those were battery-related. As we were focusing on battery faults, we excluded "cash box full" and non-reporting meter faults from our query. It is important to note that this report is a snapshot in time and only reflects the conditions present when the report was generated.

Figure 12 shows the number of single-space meters that reported errors as of the date of the reports. Some meters reported multiple types of errors. According to the DMS, 600 meters were reporting an error on August 24, 2018. A total of 31 of these errors were due to either "Coin blockage" or "Card Stuck." The remaining 569 meters were reporting some type of battery-related error. The Faulty

Meters report from September 19, 2018, indicated there were 790 meters reporting some type of error, with 760 of those errors being battery-related.

Figure 12: Count of Meters by Error Type

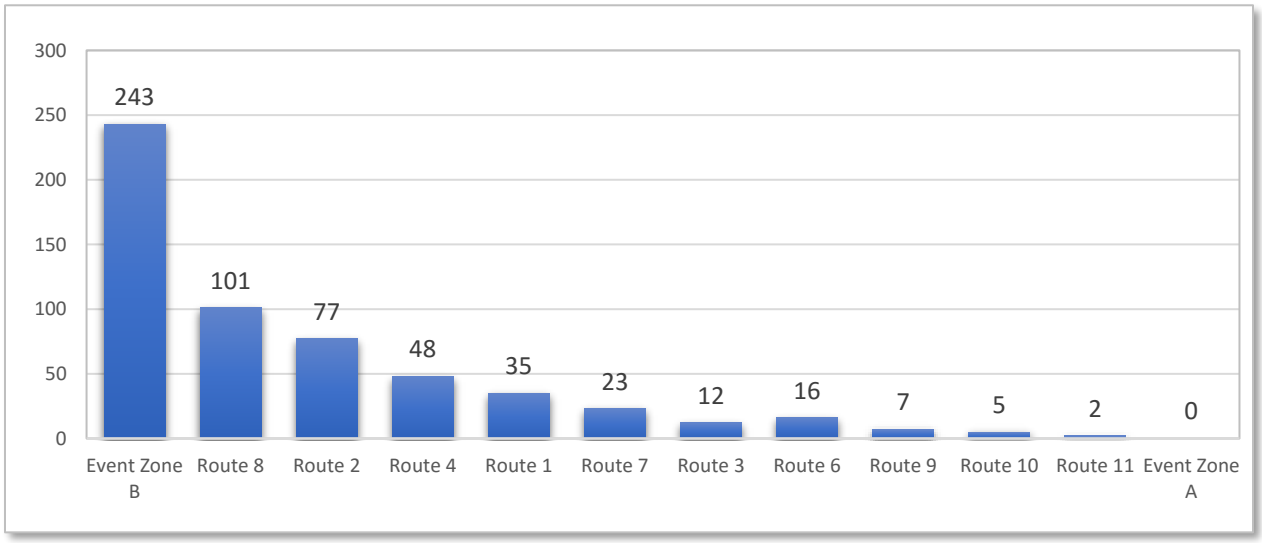
Description	Count as of August 24, 2018	Count as of September 19, 2018
Total Meters Reporting an Error	600	790
Meters Reporting a Battery-Related Error	569	760
Number of Single-Space Meters	4,399	4,399
Percentage of Meters Reporting a Battery-Related Error	13%	17%

Source: Auditor generated based on IPS Data Management System (DMS) records.

Based on the data from the two sample dates in the figure above, an average of 695 meters reported battery-related issues per day, which equates to just over 15 percent of total single-space smart meters.

To gain an understanding of where the "faulty" meters were located, we also developed a figure that shows the number of battery-related errors by location or "zone." The figure below shows a count of the battery-related errors reported on August 24, 2018 by location.

Figure 13: Number of Battery-Related Errors by Zone as of August 24, 2018



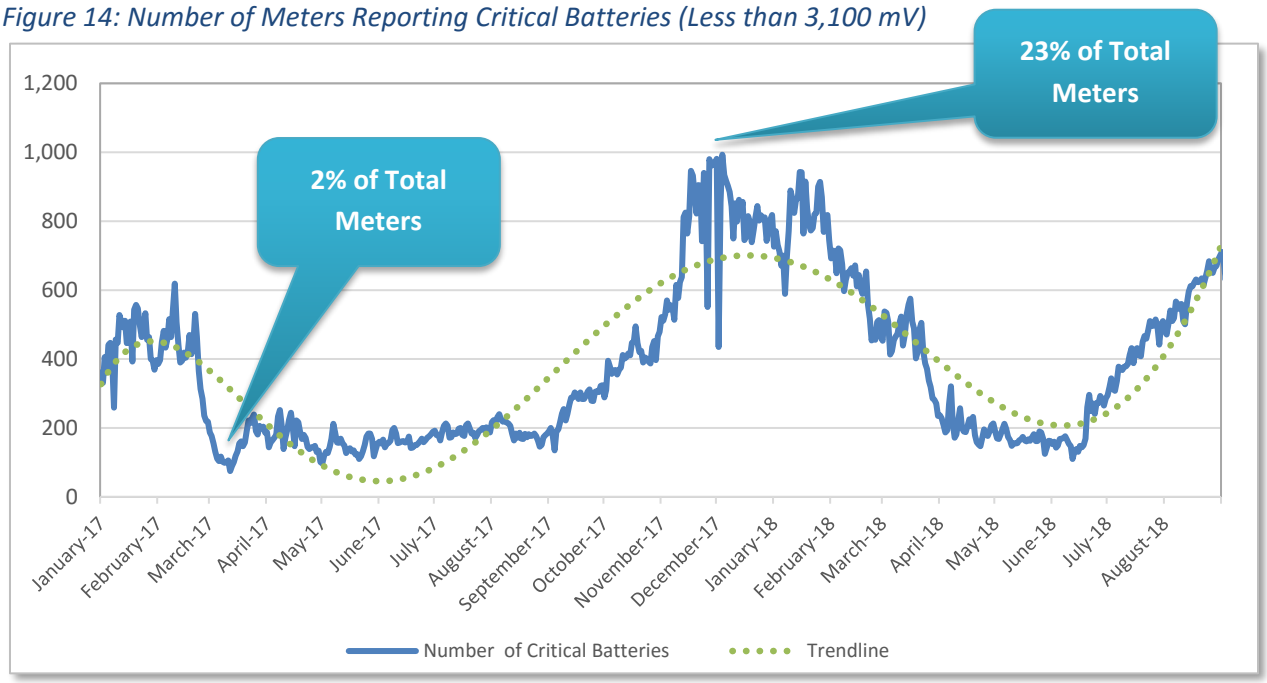
Source: Auditor generated based on IPS Data Management System (DMS) records.

Battery errors were most prevalent in Event Zone B; however, this is not necessarily surprising as Event Zone B contains more than 25 percent of the City's on-street smart meters. There are approximately 1,280 meters in Event Zone B, with a total of 243 (19 percent) reporting a battery-related issue on the date of our sample. While a battery-related issue may not necessarily mean the meter has fully shut

down, the meter could potentially go into "sleep-mode" intermittently until it receives enough solar energy to turn back on, or until the depleted battery is replaced with a fully-charged battery.

In order to perform a trend analysis of battery-related issues over a period of time, we also used the City's parking meter data from the DMS to generate information related to the number of parking meters reporting "bad" batteries per day. Figure 14 shows the number of individual meters that reported having a battery with less than 3,100 mV from January 2017 through August 2018.

Figure 14: Number of Meters Reporting Critical Batteries (Less than 3,100 mV)



Source: Auditor generated based on IPS Data Management System (DMS) records.

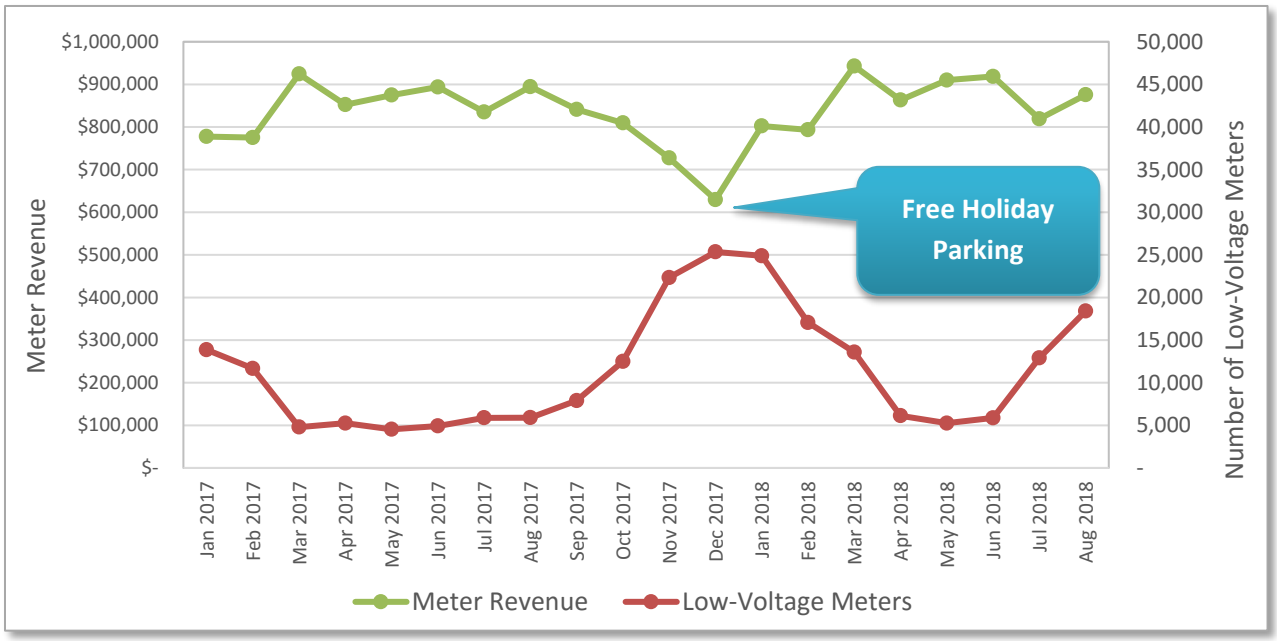
In figure 14, the solid line represents the number of individual meters that reported a "bad" battery and the dotted line represents an overall trendline. During our sample time period, it appears the critical batteries follow a cyclical pattern with more critical batteries during winter months and fewer critical batteries during summer months. This pattern is similar to the seasonal trend identified in the *Preliminary Assessment of the City's On-Street Parking Meters*[1], issued in April 2018, which used 311 call center data to conclude there was a high correlation between non-sunlight hours and the number of broken meters reported to the City's 311 call center.

In figure 15 we compare monthly meter revenue to the monthly total of low-voltage meters from January 2017 through August 2018. Correlation does not necessarily prove causation, and it is

[1] Sacramento Office of the City Auditor (2018). *Preliminary Assessment of the City's On-Street Parking Meters*. http://www.cityofsacramento.org/-/media/Corporate/Files/Auditor/Audit-Reports/Preliminary-Assessment-of-the-Citys-On-Street-Parking-Meters.pdf

important to note that free holiday parking is offered from Thanksgiving through Christmas, which will reduce parking meter revenue; however, there does appear to be somewhat of an inverse relationship between overall meter revenue and the number of meters reporting a low battery.

Figure 15: Comparison of Meter Revenue and the Number of Meters Reporting a Low-Voltage Battery



Source: Auditor generated based on IPS Data Management System (DMS) records.

The significant increase in the percentage of meters reporting critical batteries during winter months may indicate that the meters are not receiving a sufficient amount of sunlight exposure during these months to compensate for the amount of energy being expended. Of note is the increase in low-battery reports starting much earlier in 2018 than in 2017. The uptick in the number of low-voltage meters earlier in the year may indicate the presence of another problem, unrelated to sunlight exposure. Potential causes for the increase in low-voltage meter reports could include changes to meter software and battery degradation.

While the principal purposes of evaluating battery-related issues are to improve the customer service experience and to properly regulate parking turnover, working with the vendor to pinpoint battery-related issues could potentially result in the ancillary benefit of an annual increase in parking meter revenue. Based on the deviation from the average amount of parking meter revenue earned in 2017, excluding December because of the free holiday parking, we estimate revenue could be increased by approximately $250,000 per year.

Low-battery meters may not have enough power to accept payments or report occupancy status, which could lead to reduced meter revenue and inaccurate occupancy information. It could also contribute to

a poor customer experience as users may not be able to make a payment or may receive a citation when the meter turns back on. Based on the scope period, the percentage of parking meters reporting a "bad" or low battery ranges from 2 to 23 percent per day. During the winter months, this represents a significant number of meters. We recommend the Parking Services Division continue to work with the vendor to optimize battery life or consider alternative products that may meet the desired standard.

RECOMMENDATION

We Recommend the Parking Services Division:

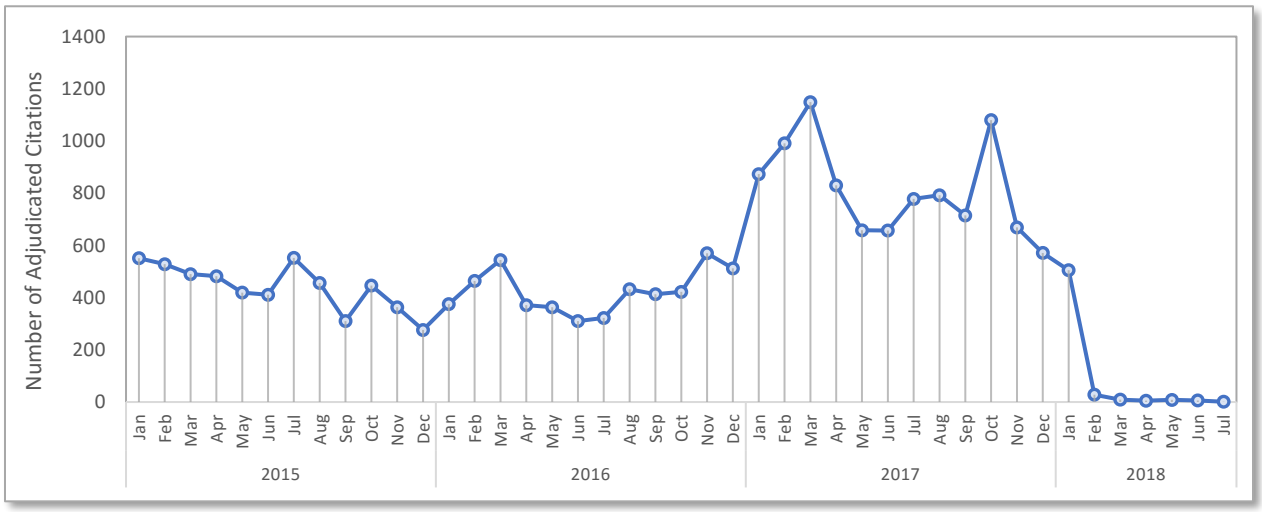
2. Work with the vendor to improve parking meter battery life or consider alternative products that will meet the desired standard.

The Number of Incoming Disputed Citations Could Be Reduced by Improving the Reliability of Meter Technology

When a parking citation is contested, it is reviewed by a hearing officer who weighs the evidence provided by the person who received the citation against the photo evidence that the parking enforcement officer recorded at the time the citation was issued, along with data from the meter, ParkMobile records, and other sources, to determine if the citation should be upheld or dismissed. Once a hearing officer makes a decision, they record their judgment in the citation system and issue a letter to the person who received the citation.

In order to evaluate the number of citations that are disputed each month, we ran a query in the citation management system to extract all adjudicated meter citations from January 1, 2015 through August 22, 2018. It is important to note that in our analysis we reference the date the citations were *issued* by enforcement officers, not the date the contested citations were processed (adjudicated) by hearing officers. The total number of adjudicated parking meter citations (by date of issuance) is displayed in figure 16.

Figure 16: Number of Adjudicated On-Street Meter Citations



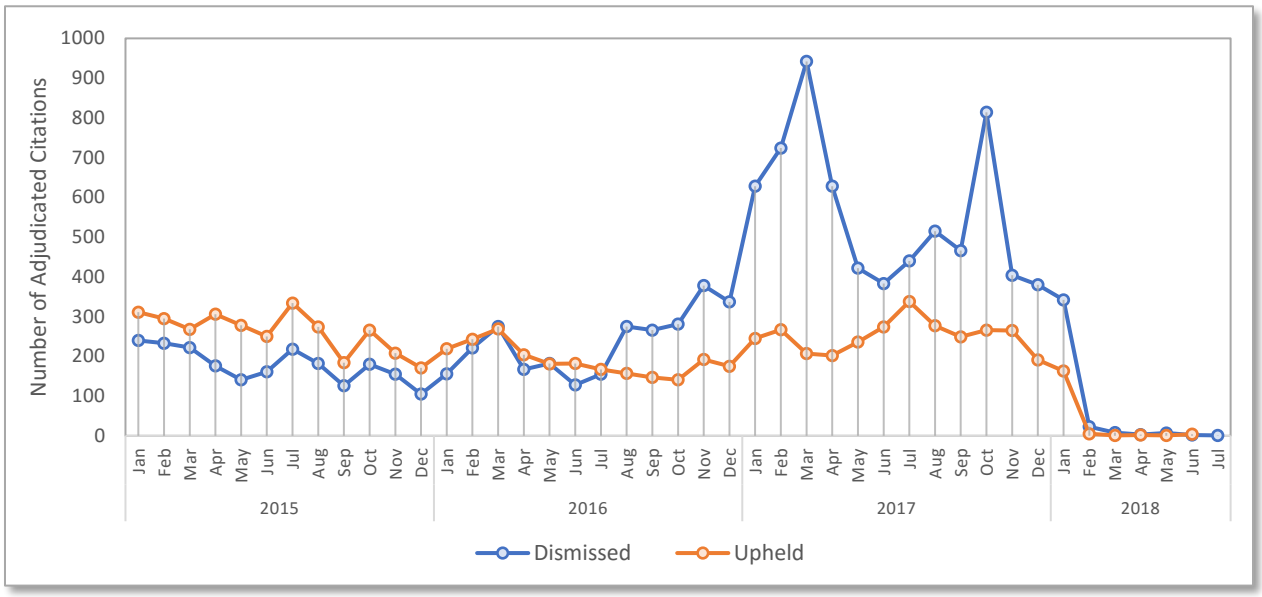
Source: Auditor generated based on Duncan citation system records. Based on date citation was issued.

A significant drop-off in the number of adjudicated citations can be seen in figure 16 because citations issued after January 2018 were still being processed when we extracted the data.

Contested citations may be dismissed for a variety of reasons. A dismissal does not necessarily mean that the enforcement officer made an error in issuing the citation. Some valid citations are dismissed as "warnings" and others may be dismissed when it is difficult for the hearing officer to make a conclusive determination based on the evidence they have available. In calendar year 2017, the City received over 23,000 parking-related citation disputes. During the same timeframe, approximately 15,000 citations were processed by hearing officers as either dismissed or upheld. This left a net backlog of more than 8,000 disputed citations. It takes approximately six months from the time a citation dispute is submitted to the time a hearing officer reviews the case. As the citation disputes are generally processed in the order they are received, the delay in citation processing is primarily due to the backlog. As there are more citation disputes coming in than are being processed, our goal was to identify potential ways to reduce the backlog.

We used citation data to develop figure 17, which displays the number of dismissed and upheld citations by month. From the beginning of calendar year 2015 through mid-2016, more citations were upheld than were dismissed. However, starting in August 2016, the Parking Services Division began dismissing more citations than they were upholding.

Figure 17: Adjudicated Citations by Outcome (Dismissed or Upheld)

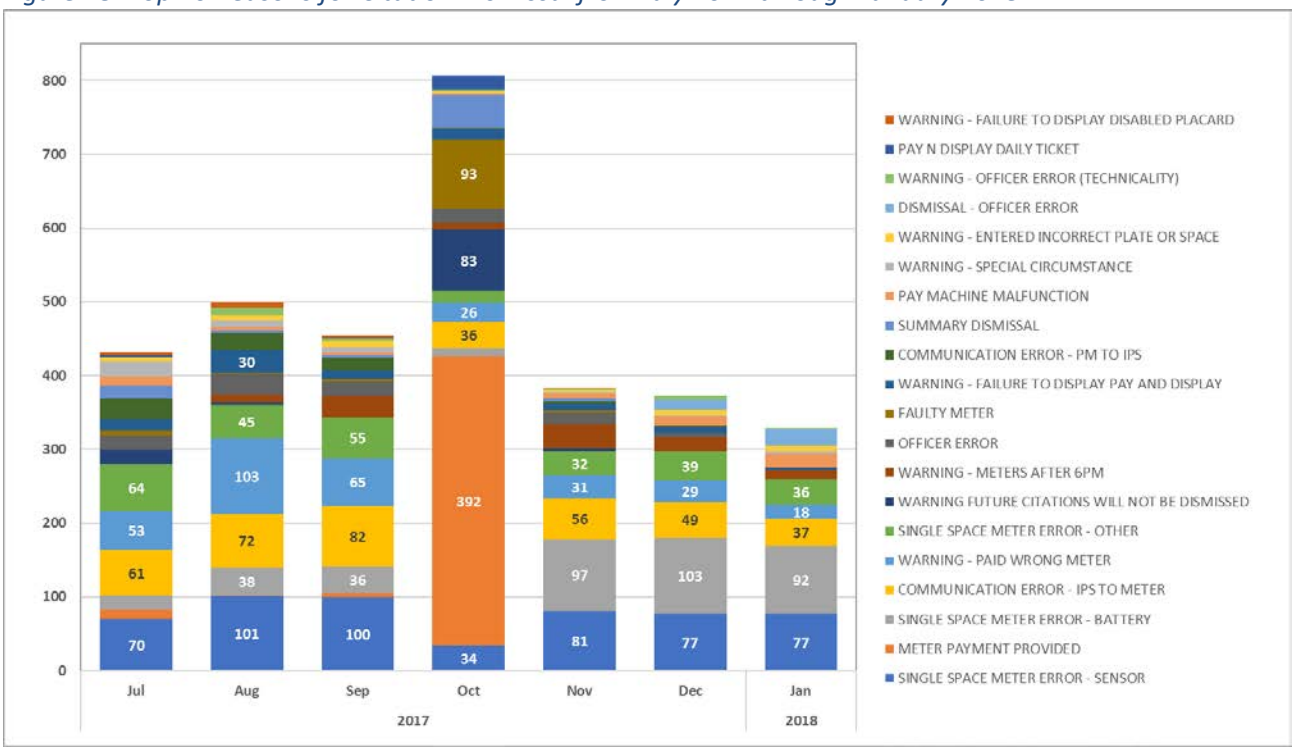


Source: Auditor generated based on Duncan citation system records. Based on date citation was issued.

During our *Preliminary Assessment of the City's On-Street Parking Meters*, we noted that the increase in the number of dismissed citations beginning in mid-2016, as shown in figure 17, was attributed to citations that were dismissed for issues related to newly installed vehicle-detection sensors that needed to be calibrated. The spike in dismissed citations in October 2017 were attributed to a wireless signal carrier outage that occurred during that month. While there were some significant spikes in the number of citations dismissed during the period we evaluated, the number of upheld citations remained relatively steady.

Figure 18 shows the number of citations dismissed per month from July 2017 through January 2018. There were a total of 3,293 citations dismissed during this timeframe. With the exception of the 392 citations dismissed in October 2017, "single space meter error – sensor", "single space meter error – battery", and "communication error – IPS to meter" were the three highest technical reasons for dismissal from July 2017 through January 2018. During our sample period, there were 1,329 citations dismissed for one of these three reasons, representing 40 percent of dismissed citations during this timeframe, or an average of nearly 190 citations per month.

Figure 18: Top 20 Reasons for Citation Dismissal from July 2017 through January 2018



Source: Auditor generated based on Duncan citation system records.

While it may be difficult to prevent individuals from disputing citations when they were correctly issued, the City could leverage the dismissed citation data by using it to work with the meter vendor to reduce sensor, battery, and communication errors. Fewer errors could reduce the potential for erroneous citations, which are likely to result in a dispute. A reduction in the number of disputed citations by nearly 190 per month could help to improve citation dispute processing times.

As the City's Parking Modernization Program matures, the Parking Services Division can leverage the technology in which it has invested to continuously improve its operations, thereby reducing errors and optimizing the customer experience. Working with the vendor to improve sensor accuracy, communication issues, and battery reliability could reduce the number of contested citations. By addressing these issues, the total number of incoming disputes that were ultimately dismissed could be reduced by up to 40 percent. This would significantly improve the customer experience by reducing the potential for erroneous citations, while reducing the number of incoming citation disputes.

RECOMMENDATION

We Recommend the Parking Services Division:

3. Address deficiencies identified with parking meter sensor-accuracy and battery life to improve the customer experience and reduce the number of incoming citation disputes.

Finding 2: Mobile Payments Made in Event Zone B are not Reflected on Parking Meters

As part of the City's parking modernization efforts, IPS contracted with ParkMobile to provide the City's mobile payment solution for paying parking meters using a mobile app. The ParkMobile app offers the convenience of paying for a parking space using a mobile phone and allows the user to monitor remaining time and add time to a meter directly from their phone. The City's contract with IPS Group, Inc. includes language about the requirements for integrating with a mobile payment service provider. Under the Mobile Payment Integration section, the contract states that:

> "The Integrated solution shall include the ability to communicate mobile payments to the actual meter (*e.g.,* if a Customer purchased 30 minutes worth of time via Mobile Payment for a particular parking space, the proposed solution shall include a means to communicate the payment status so that meter display indicates 30 minutes worth of purchased parking), should Parking Services choose to use that feature."

We set out to evaluate if the mobile payments were successfully reaching the parking meters and to estimate the average time delay between when a mobile payment was made and when the signal reached the meter. Based on our testing, we found that:

- Nearly 20 percent of mobile payments failed to reach the meters;
- Failed payments were primarily related to meters located in Event Zone B; and
- Just over 70 percent of mobile payments that reached the meter did so within one minute.

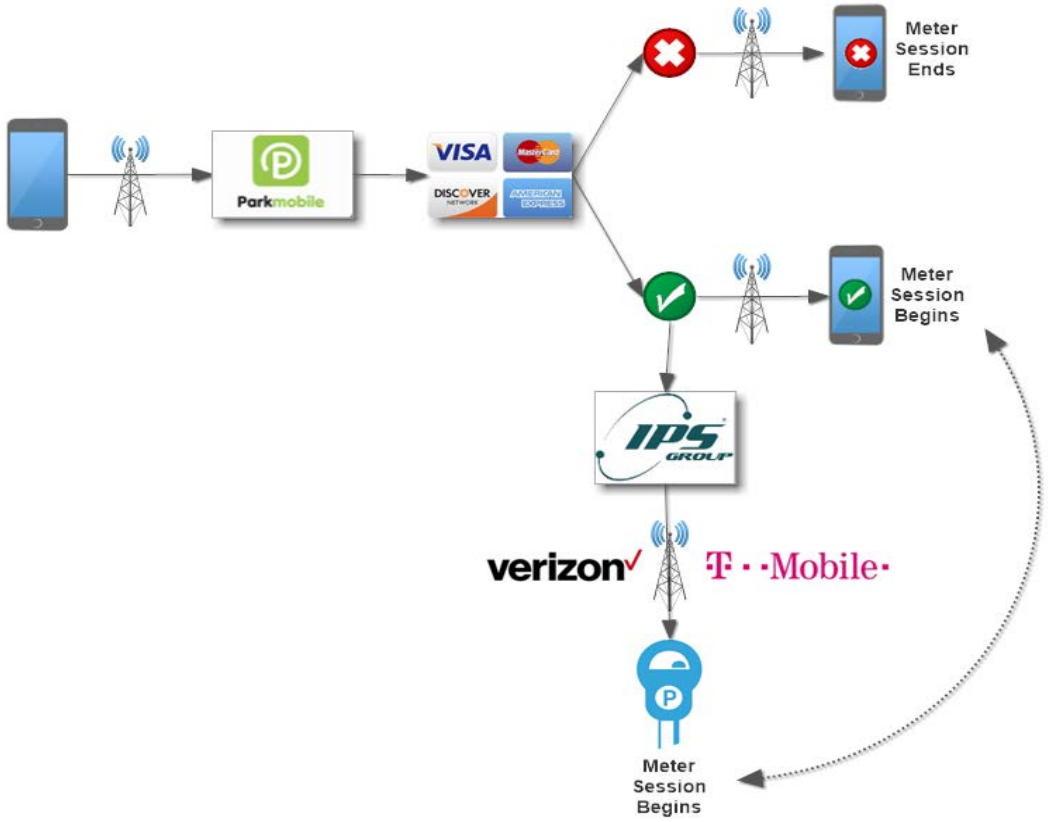
The Parking Services Division determined in October 2017 that a change to some of the meters' configurations, to allow for event pricing in Event Zone B, prevented those meters from receiving mobile payment signals and turning green when a mobile payment was made. Our independent evaluation of the meter data confirmed that this was the case. When the Parking Services Division became aware of this issue, they implemented a requirement that enforcement officers contact dispatch to verify if a mobile payment had been made prior to issuing a citation. However, this is a temporary solution and requires the City to take additional steps in order to mitigate the risk of potential erroneous citations. In our opinion, the current workaround does not provide an optimal customer service experience. There is potential for confusion when the meter light fails to turn green in Event Zone B, leaving customers unsure about whether they paid the correct meter or if the payment was successful. We recommend the Parking Services Division continue to work with the vendor to develop a long-term solution.

Nearly 20 Percent of Mobile Payments Failed to Reach the Meters

When a parking meter payment is made through the ParkMobile app, the information flows from ParkMobile to the credit card exchange for payment approval, then to the IPS software system for recording, and finally to the parking meter. ParkMobile controls the payment signal from the mobile app to the IPS software, where the payment is then recorded. IPS then forwards the signal to the meter and the meter displays the amount of paid time. The indicator light on the parking meter should then turn from red to green. The green light identifies to enforcement officers that the meter has been paid. Handheld units exist that allow enforcement officers to interface with payment systems to verify if a meter payment has been made; which the City has acquired and is currently in the process of testing. Currently, enforcement officers call in to their dispatch center when they encounter an expired meter, to confirm whether a mobile payment has been made. Due to known concerns that meter payments may not always be reflected on the meter, all expired meters must be verified prior to issuing a citation.

The figure below shows the general flow of information as a payment confirmation makes its way from a mobile phone to a parking meter. There are several steps along the way and a delay or error in any part of the process could adversely affect the transaction, resulting in the meter light not turning green.

Figure 19: Information Flow of a Mobile Payment to a Parking Meter



Source: Auditor generated.

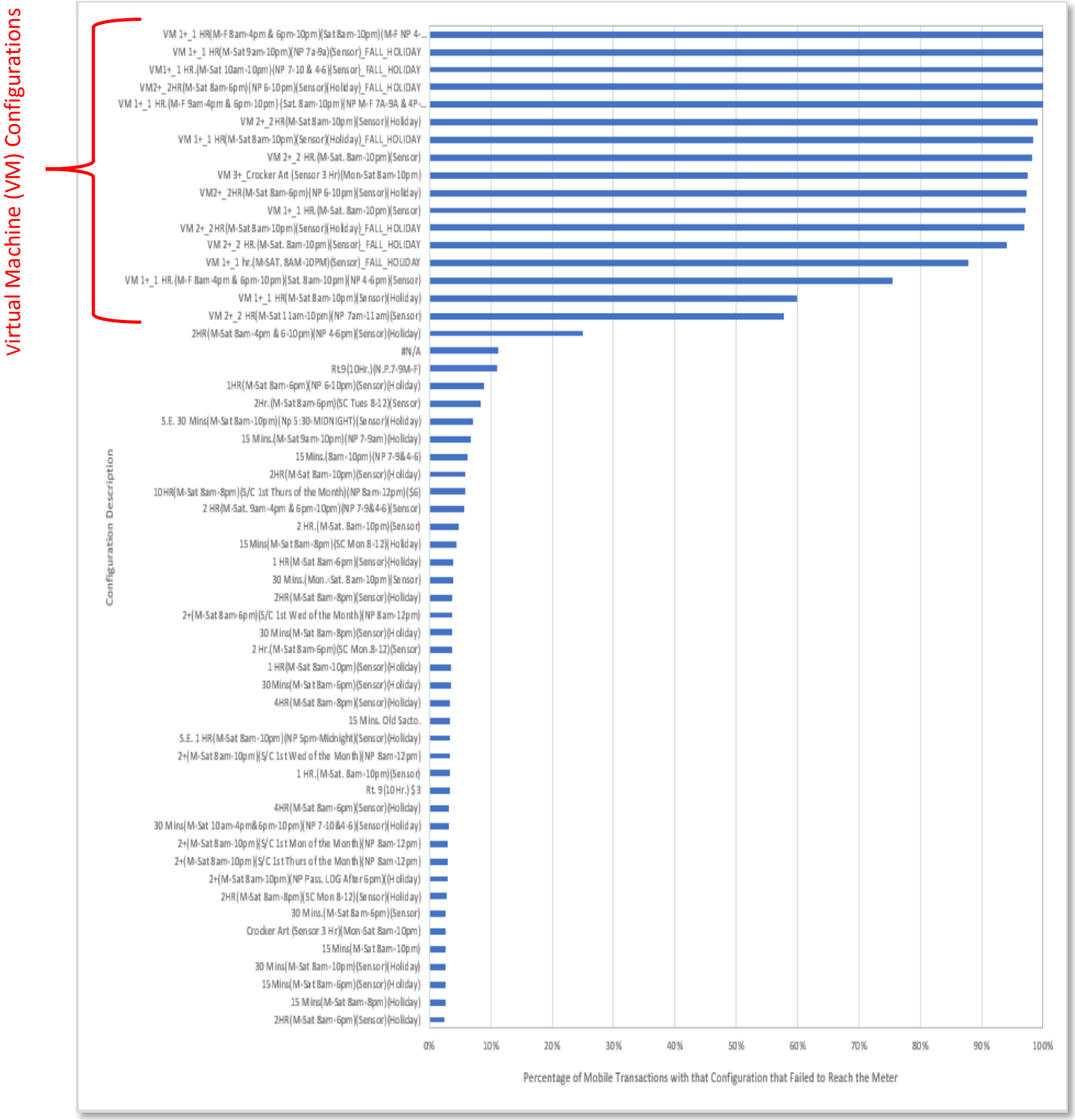
In order to determine if mobile payments are successfully communicating with the meters, we ran a report from the DMS for the period of June 1, 2018 through July 31, 2018, which shows the overall number of failed and successful payments. There were 48,371 transactions in our sample; of those, nearly 80 percent indicated they had successfully reached the meters. However, the remaining 20 percent failed to reach the meters.

Failed Payments were Primarily Related to Meters Located in Event Zone B

We then used the same data to evaluate whether the issue was widespread or was limited to specific meter configurations. Meter configurations are settings that dictate the meter's rates, hours of operation, display messages, LED behavior, and payment options. We grouped the failed transactions by their configuration description and noted that most of the mobile payment failures were associated with "virtual machine" (VM) configurations. These VM configurations[2] are software technology that were deployed as a workaround for limitations of the vendor's initial software. The initial software would not accept the special event pricing through the DMS and the VM configurations were used as a temporary way to support that pricing model. Figure 20 shows the percentage of mobile payment transactions that failed to reach the meter, grouped by configuration.

[2] A VM configuration is software technology that allows greater flexibility in programming the meters' behavior to account for functionality that had not been envisioned when the meters were initially purchased. The VM configuration software was needed to support the event pricing required for the meters in Event Zone B.

Figure 20: Percentage of Failed Mobile Payment Transactions by Configuration

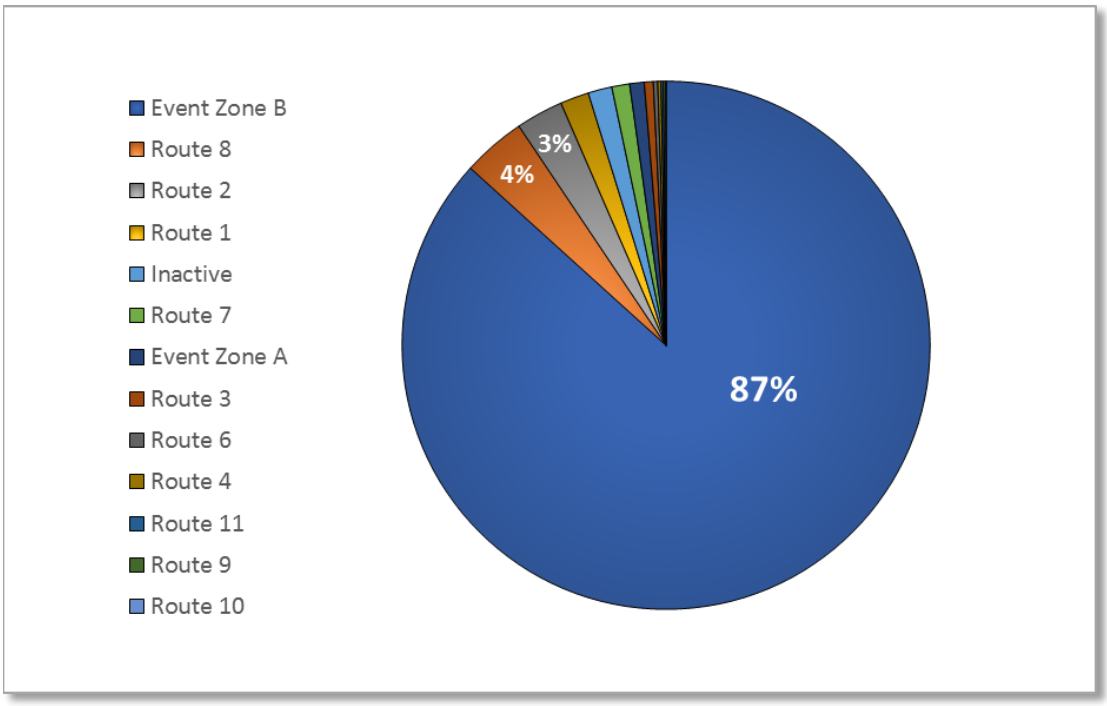


Source: Auditor generated based on IPS Data Management System (DMS) records.

The virtual machine (VM) configurations identified at the top of figure 20 accounted for just over 85 percent of the total failed mobile payment transactions.

We also examined the failed mobile payment transactions by their location (zone) to evaluate where the meters experiencing failed mobile payment transactions were located. Figure 21 shows the percentage of failed mobile payment transactions by zone.

Figure 21: Percentage of Failed Mobile Payment Transactions by Location



Source: Auditor generated based on IPS Data Management System (DMS) records.

Nearly 87 percent of the failed transactions from our sample period were from meters located in Event Zone B. This is consistent with the VM configuration data in figure 20; most of the meters located in Event Zone B use VM configurations to support special event pricing.

Based on this information, it appears that the VM configurations are having a significant impact on the ability of mobile payments to successfully reach the meters. While the number of mobile transactions is still relatively small compared to the total number of meter transactions (6 percent as of July 2018), and the number of failed transactions represents an even smaller fraction of total transactions (1.25 percent as of July 2018), we expect that the issue of failed mobile transactions will continue to grow as the use of the mobile payment app becomes more popular.

It is important to note that the Parking Services Division is aware of this communication issue with the VM configurations and is working with IPS to implement a solution. Our independent evaluation of the meter data concurs with the Parking Services Division's assessment of the signal transmission problem. Since October 2017, when this issue was identified, the City's Parking Services Division has been requiring enforcement officers to contact Dispatch at the City's 311 Call Center to verify if a meter had

been paid through the mobile app before issuing a citation. The 311 Call Center is equipped with internet access and can look up payments in real-time to see if a meter has been paid through the ParkMobile app. This additional step is designed to prevent enforcement officers from issuing citations in error. When we observed enforcement officers contacting the dispatch center to confirm whether a mobile payment had been made, it did not take a significant amount of time; however, it is an additional step and would not be necessary if the payment signals were being received quickly. The City's Parking Services Division has recently acquired, and is in the process of testing, new handheld citation units that provide real-time data directly to enforcement officers. These new handheld units are expected to eliminate the need to contact 311 in order to verify mobile payment information.

While the City has developed a workaround designed to prevent erroneous citations as a result of using the mobile payment app, the customer service experience is not consistent across all zones. Customers in Event Zone B may be confused about whether their payment was accepted when the meter does not turn green. In addition, enforcement officers must radio in when they encounter an expired meter to determine whether it has been paid through the mobile app and this is not an efficient process.

RECOMMENDATION

We Recommend the Parking Services Division:

4. Continue to work with the vendor to ensure a consistent customer experience across all meters that accept mobile app payments.

Just Over 70 Percent of Mobile Payments that Reached the Meter Did So Within One Minute

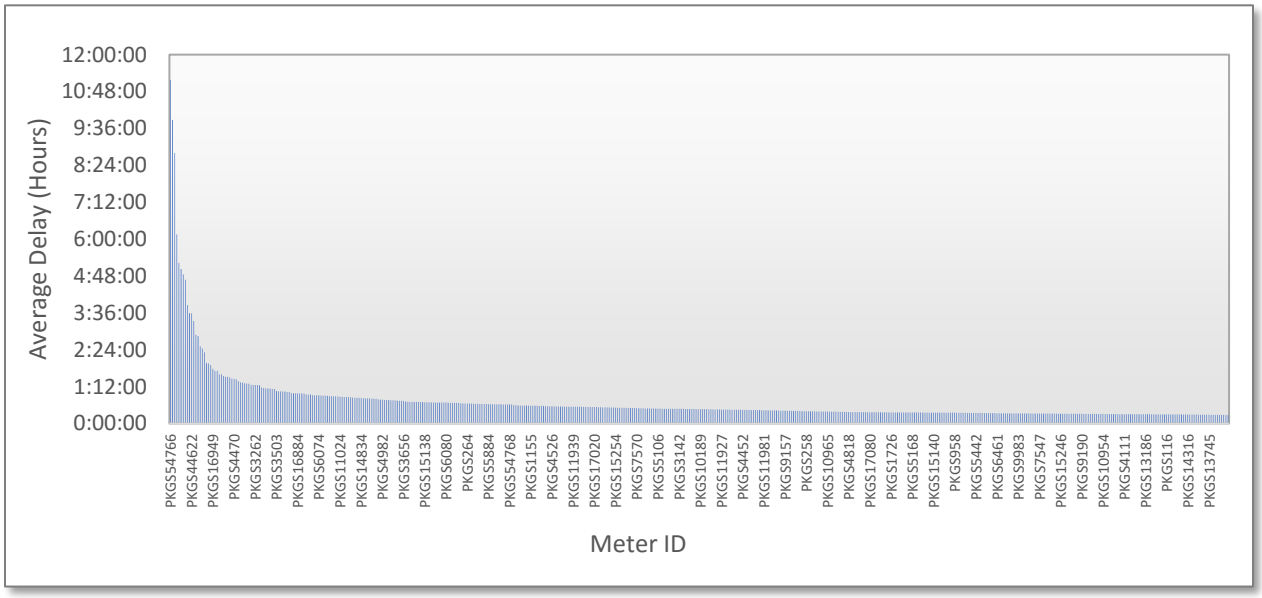
In addition to failed transactions, we also evaluated successful transactions to determine the average time to receive a signal from a transaction made through the mobile app. The meters rely on a wireless signal provided through either T-Mobile or Verizon to transmit and receive information. It appears that the delay in transmitting the signal to the meter is a known issue. ParkMobile's support website, under the section for Sacramento's on-street parking, states that:

> *"Parkmobile payments integrate with the meters for on-street parking in Sacramento, but there may be a delay. In other words, payments made through the Parkmobile service may not immediately reflect on the meter, but the City will have a record of your payment. However, Parking Enforcement Officers will be able to lookup the payment status of any parking space."*

This support note is dated May 3, 2017, which indicates that ParkMobile was aware that payments are not always immediately reflected at the meter.

Using transaction data from the IPS DMS, we evaluated how long, on average, it took mobile payments to reach the parking meters. Our sample period was from June 1, 2018 through July 31, 2018; our dataset included 26,474 transactions[3]. Based on our sample data, the average time it took a mobile payment signal to reach the parking meter was nine minutes. The figure below shows the average transaction delay, by individual meter, for the 500 highest meters.

Figure 22: Average Time Delay of Mobile Payments by Meter

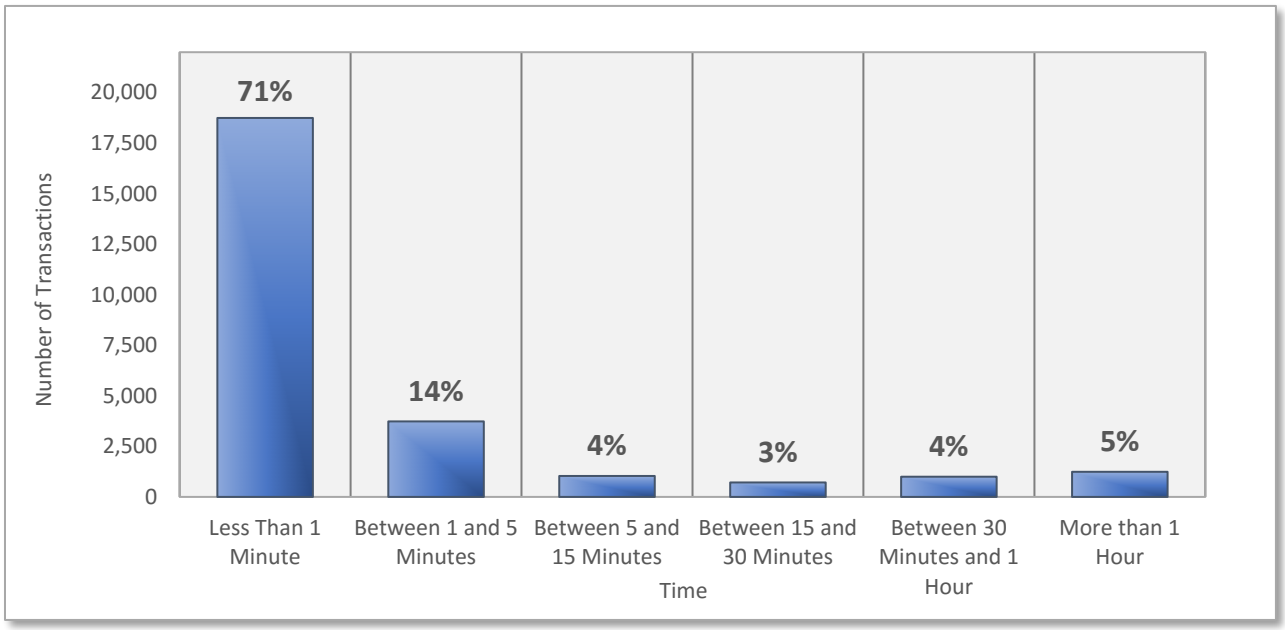


Source: Auditor generated based on IPS Data Management System (DMS) records.

It appears that while some meters experienced a significant delay, the majority of meters experienced a short delay. In order to gain a better understanding of the data, we also generated figure 23 which is a histogram that groups the mobile payment transactions by the amount of time it took to receive the signal.

[3] Due to data aggregation issues, we excluded transactions where a customer requested to extend their time using the mobile app.

Figure 23: Time Delay of Mobile Payments



Source: Auditor generated based on IPS Data Management System (DMS) records.

As shown in figure 23, 71 percent of the 26,474 transactions in our sample were received in less than one minute. An additional 14 percent were received between one and five minutes.

While 85 percent of mobile payment transactions that successfully reached the meter did so within five minutes, there is still room for improvement. Similar to the failed transactions mentioned above, customers may be confused about whether or not their payment was accepted when their meter does not immediately turn green, thereby reducing customer confidence in City operations. In addition, enforcement officers cannot rely on the meter display and have to verify whether or not a payment has been made through the mobile app, which is an inefficient process. To improve the customer experience and parking enforcement efforts, the Parking Services Division should further evaluate the meters with significant average delays to determine why payment signals are not always transmitted in a timely manner.

RECOMMENDATION

We Recommend the Parking Services Division:

5. Evaluate parking meters that experience a significant delay in receiving mobile payments to see if the delay can be reduced.

Finding 3: Some Meter Configurations in the Data Management System User Interface Are Not Reliable

The Government Accountability Office's (GAO) *Standards for Internal Control in the Federal Government*[4] state that "Management should design the entity's information system and related control activities to achieve objectives and respond to risk." While this guidance is directed towards Federal agencies, its internal control standards serve as a model for other agencies. During our review of on-street parking meters we noticed that there were some inconsistencies between the data management system (DMS) and the meters themselves, which could lead to confusion and contribute to poor third-party management. Specifically, we noted that:

- Configurations for meters on virtual machines are not accurately reflected in the data management system user interface; and
- An incorrect meter configuration allowed for payments to be accepted during restricted hours and may have led to a parking citation.

The Parking Services Division relies on the information in the DMS for various monitoring and reporting processes, including researching the validity of disputed citations. If data in the DMS is not dependable, enforcement officers may not have reliable information with which to judge a citation's legitimacy. We recommend the vendor improve access to real-time meter configuration information in the DMS user interface.

Configurations for Meters on Virtual Machines are Not Accurately Reflected in the Data Management System User Interface

Smart parking meters are assigned to a "configuration" in the data management system (DMS) that tells the meter how to behave. The configuration settings include a set of instructions that dictate the meter's rates, hours of operation, display messages, LED behavior, and payment options. A configuration could apply to a single meter or to hundreds of meters. Meters with the same hours of operation and rates could generally be served by the same configuration. However, parking restrictions vary throughout the City and, as of August 2018, the Parking Services Division had created approximately 100 active configurations to suit the City's various parking needs.

As there were many configurations to evaluate, we used the City's Open Data Portal to extract the parking restrictions associated with each meter and looked for differences between the two data sets to determine if there were inconsistencies that may help to narrow the scope of our review. Some meters

[4] United States Government Accountability Office. *Standards for Internal Control in the Federal Government*. (2014) Chapter 11. http://www.gao.gov/assets/670/665712.pdf.

appeared to contain more complex configurations, including no parking during certain hours of the day, and we selected these for sample testing.

We performed our testing by searching for Google Earth[5] images of parking hours and rates signage near the locations of the meters in our sample. When Google Earth images were inconclusive, we physically visited the meters to observe the street signage. We identified 106 meters that appeared to be inconclusive or inconsistent and required further testing to evaluate meter settings in comparison to street signage.

However, when we inquired with the Meter Shop about these inconsistencies, they informed us that some parking meter configurations were setup on "virtual machines" (VM) that did not always correctly display the meter's actual configuration in the DMS to the user. As mentioned previously, the meter vendor (IPS) could not meet all of the City's requirements for event parking hours and rates near the Golden1 Center, and VM configurations were created as a workaround. VM configurations are not visible to users in the DMS and the configurations that were displayed in the system were outdated. This presented a challenge when we attempted to use the data from the DMS to match the meter configurations to the street signage. The Meter Shop stated that because these VM configurations were not visible in the DMS, they also could not see the configuration settings and could not confirm through the DMS whether or not the meters were configured correctly to match the street signage.

We requested a report of all VM configurations from IPS and they provided us a listing of 26 VM configurations that were operating 839 meters. This equates to approximately 19 percent of the City's single-space meters. While the Meter Shop does have the ability to contact IPS to update and validate the meter configurations, it is concerning that such a large percentage of the meter configurations may not be accurately reflected in the user interface to the DMS.

An Incorrect Meter Configuration Allowed for Payments to be Accepted During Restricted Hours and May Have Led to a Parking Citation

Configuration 16156 was listed among the virtual machine (VM) configurations provided by IPS and was also the subject of a complaint received by the Auditor's Office. The complainant reported they paid the meter, but still received a citation for parking between the hours of 4:00 p.m. and 6:00 p.m. The complainant noted that the meter accepted the payment and added time to the display, even though the street signage said that there was no parking during this time. The complainant argued that if no parking was allowed during that time, the smart meters should not accept payment.

[5] Google Earth images are delayed images and may not always be reflective of current parking signage. However, we accepted this limitation as this method was significantly faster than physically going out to manually observe the street signage.

In order to test the configuration in question, we requested a copy of the VM script from IPS to review the instructions under which the meter is actually operating. IPS sent back a configuration description that indicated the meter is active from 8:00 a.m. to 10:00 p.m., but displays "No Parking" between 4:00 p.m. and 6:00 p.m. This configuration is consistent with the street signage we observed which also indicated "No Parking" between 4:00 p.m. and 6:00 p.m. In order to physically confirm the meter display, we also visited a meter using this configuration between 4:00 p.m. and 6:00 p.m. on August 8, 2018 and confirmed the meter correctly read "No Parking". Based on our testing and observation, it appears that configuration 16156 is now correct. However, the complainant received the citation back in November 2017, so we needed to go back further to evaluate the legitimacy of this complaint.

We requested IPS provide us a date when configuration 16156 was last updated, and a copy of the prior configuration the meters were operating under, to find out if the meters had been incorrectly allowing for payments between 4:00 p.m. and 6:00 p.m. IPS responded that configuration 16156 was created prior to October 18, 2017 and that it did not include the "No Parking 4-6"' display during that time. The configuration was later updated on November 28, 2017 to include the "No Parking 4-6" enforcement hours. Based on the information provided by the vendor, it appears that meters under configuration ID 16156 were incorrectly configured to accept payment for parking between 4:00 p.m. and 6:00 p.m. from October 18, 2017 to November 28, 2017, even though the street signage indicated that parking was prohibited during those hours.

Based on IPS reports, there are a total of 39 meters under the 16156 configuration ID. Using the number of transactions from a sample of these meters, we estimate that just over 220 paid transactions occurred between 4:00 p.m. and 6:00 p.m., and that those transactions could potentially have resulted in a parking citation because even though the meters accepted the payments, the street signage did not allow for parking between 4:00 p.m. and 6:00 p.m. We attempted to locate any citations that may have been associated with these transactions, however citations for "NO PARKING CERTAIN HOURS" are not tied to specific parking meters, because the violation is not for an expired meter. Therefore, we were not able to determine if additional citations were issued in relation to this error.

Without direct access to the configurations of over 800 meters, the Parking Services Division is unable to verify if nearly 20 percent of the City's meters are configured correctly, without making a specific request from the vendor.

The key to managing a third-party relationship is to continuously monitor and assess the vendor's overall effectiveness. While the Parking Services Division can partner with third-party vendors to provide goods and services, it is still the responsibility of the Parking Services Division to monitor and assess the quality of the vendor's work. Without direct access to the configurations of over 800 meters, the Parking Services Division is unable to verify if nearly 20 percent of the City's meters are configured correctly, without making a specific request from the vendor. This workaround limits the effectiveness

of having a DMS that can be directly accessed by City staff. As evidenced by the meters that accepted payments during times when the street signs indicated no parking was allowed, incorrectly configured meters could lead to confusion and poor customer service when residents and visitors park at City parking meters.

RECOMMENDATION

We Recommend the Parking Services Division:

6. Require that the information in the data management system user interface be the most accurate and up-to-date information.

Finding 4: Usefulness of Contested Citation Data Has Improved

GAO *Standards for Internal Control in the Federal Government* state that "Management should use quality information to achieve the entity's objectives." The GAO considers information to be of "quality" if it is relevant, complete, accurate, accessible, and timely. Quality and timely data are important because they provide information that helps an entity achieve its objectives and may be relied upon for decision-making. During the *Preliminary Assessment of the City's On-Street Parking Meters* we noted there were deficiencies in the citation system's data quality that could be improved. For example, the reasons listed by hearing officers for upholding or dismissing a citation were not always clear or consistent. During this review we found that while some of the data fields have been enhanced since the prior report, opportunities for improvement still exist. Based on our analysis, we found that:

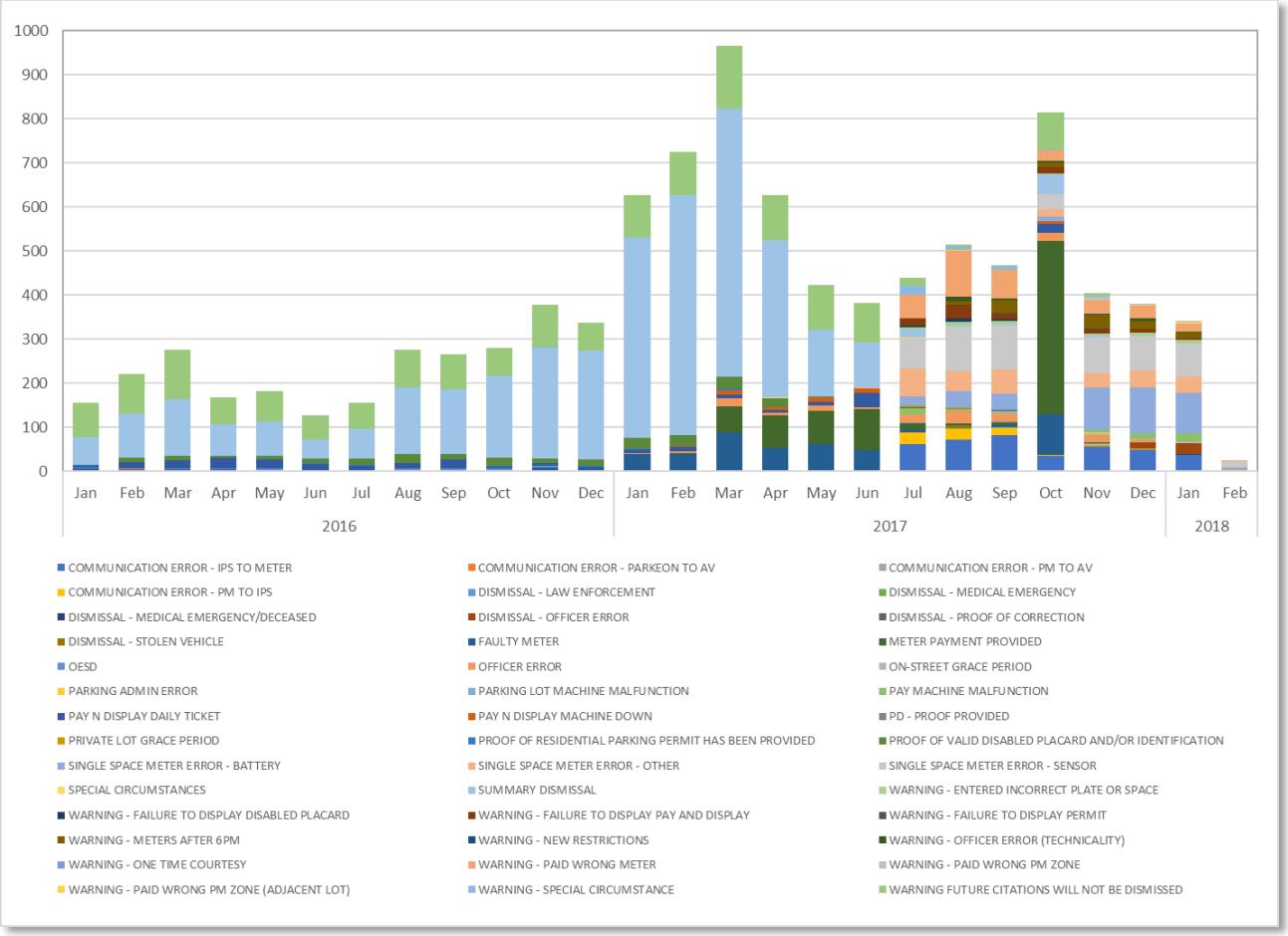
- The quality of citation adjudication data has improved; and
- More consistent citation data could be leveraged to identify problem meters.

Accurate and complete data can be a powerful tool to identify problems and aid in the decision-making process. In contrast, inaccurate or incomplete data can delay problem identification and lead to poor decision-making. By optimizing and leveraging the data captured in its information systems, the Parking Services Division could continuously improve the performance of the City's on-street parking meters and enhance the customer service experience.

The Quality of Citation Adjudication Data Has Improved

In order to evaluate changes made by the Parking Services Division to the citation adjudication fields, we obtained citation data for the period of January 2016 through January 2018. Figure 24 shows some of the most prevalent reasons for citation dismissal during our sample period. As mentioned previously, the Office of the City Auditor issued a *Preliminary Assessment of the City's On-Street Parking Meters* that identified data quality as a potential issue in evaluating parking meter dismissal reasons.

Figure 24: Reasons for Citation Dismissal



Source: Auditor generated based on Duncan citation system records.

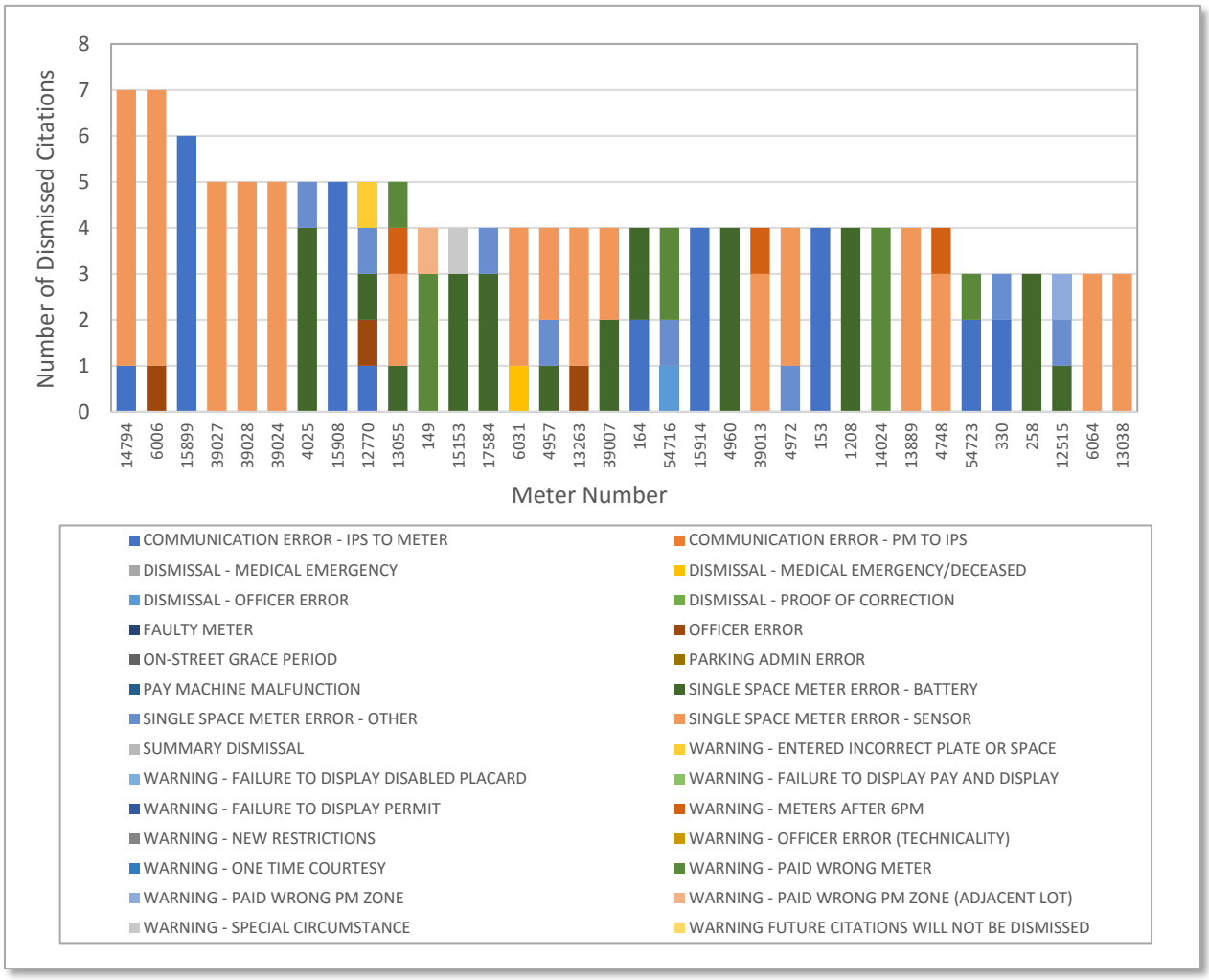
The "Summary Dismissal" field that had been frequently used in the past and lacked specific detail as to why the citation was dismissed, does not appear to still be in use. As shown in figure 24 the Parking Services Division has established additional tracking fields that are more descriptive than the prior fields, which can be seen starting in July 2017.

More Consistent Citation Data Could Be Leveraged to Identify Problem Meters

There are over 4,000 parking meters in the City and identifying which meters may have potential problems requires accurate, detailed, and up-to-date information. With improved data, the Parking Services Division can now pinpoint which meters may be unnecessarily causing erroneous citations and address those specific issues. Figure 25 shows the number of dismissed citations, by individual parking meter, for a sample of meters associated with the highest number of dismissed citations. It is important to note that the data set in figure 25 is not complete. The meter number is a field that is manually entered by enforcement officers and was not consistently applied. For example, some parking meters were entered as "PKGS12345" while others were entered as "12345" or "S12345." As this data was not

entered in a consistent format, it made aggregating the data more difficult. However, the examples below demonstrate how, when the data is optimized, it can begin to provide insight into potentially problematic meters.

Figure 25: Number of Dismissed Citations Associated with Specific Meters (November 2017-January 2018)



Source: Auditor generated based on Duncan citation system records.

As an example of how improved data can help to pinpoint issues related to specific meters, we noted that parking meter #14794 was associated with six citations that were dismissed for "SINGLE SPACE METER ERROR – SENSOR" during our sample period of November 1, 2017 through January 31, 2018. This many dismissed citations for the same parking meter for the same reason within a three-month window is likely an anomaly and indicates an issue that should be reviewed by the Parking Services Division.

Another example identified by this exercise is parking meter #14024; four citations associated with this meter were dismissed for "WARNING - PAID WRONG METER", indicating that it may not be clear to users which parking space is associated with this meter.

By optimizing and leveraging the data captured in its information systems, the Parking Services Division can continue to improve the performance of the City's on-street parking meters and enhance the customer service experience. We recommend the Parking Services Division enter citation data in a consistent format, continue to refine the data fields, and conduct regular reviews of citation data to identify trends and correct anomalies.

RECOMMENDATION

We Recommend the Parking Services Division:

7. Require enforcement officers enter citation data in a consistent format, to aid in data aggregation and analysis.
8. Continue to optimize data fields to ensure the department is receiving the most useful data.
9. Conduct regular reviews of citation data to identify trends and correct anomalies.

Finding 5: The Prevalence of Disabled Parking Placards May Have an Adverse Effect on the Availability of Disabled Parking Spaces and the City's Ability to Effectively Regulate Parking Through Demand-Based Pricing

Parking privileges for the disabled can be a sensitive issue and the State of California has long recognized the need to accommodate individuals with mobility problems. The laws regulating the issuance and use of disabled placards has evolved over time to become less restrictive and more accessible to a broader range of individuals, thereby allowing more individuals the opportunity to obtain a disabled placard. In addition, a recent California State Auditor's report found that the issuing body for disabled placards, the Department of Motor Vehicles (DMV), "does not sufficiently ensure that applications for placards are legitimate." As disabled placards allow for unlimited parking at metered spaces, the overall number of placards in use may have an adverse effect on the City's ability to provide accessible parking and regulate parking space turnover.

During our field research we noted a striking number of disabled placards and license plates in use in the downtown core, the use of which constrains the City's ability to effectively regulate turnover of parking spaces in these areas. Specifically, we noted:

- The prevalence of disabled placards circumvents the City's ability to regulate parking availability and turnover; and
- California State Law may incentivize abuse of disabled placards.

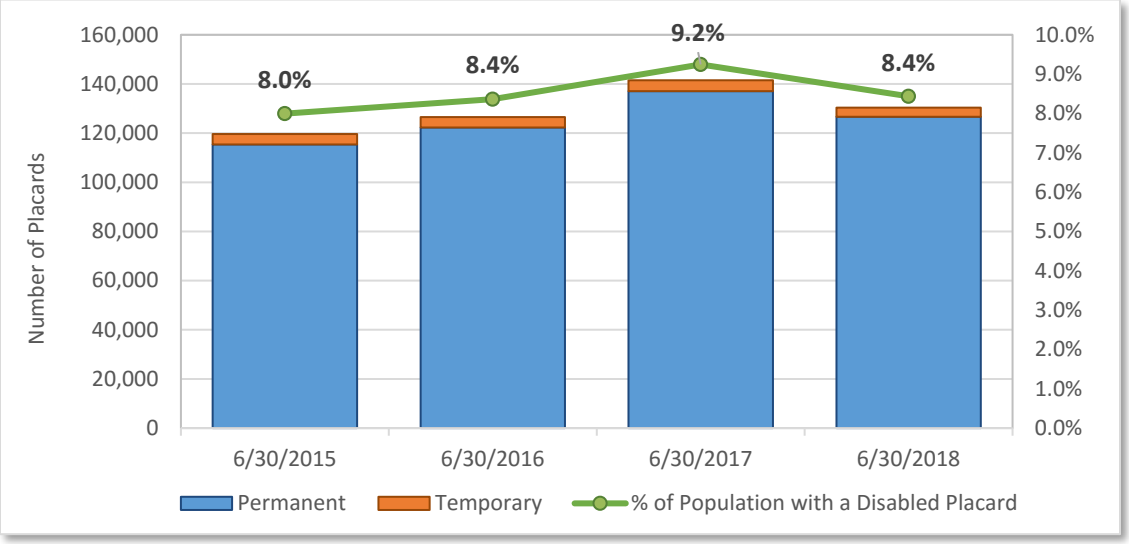
We recommend the City, in cooperation with the League of California Cities, parking associations, and disabled persons associations, continue to lobby for changes to the California State Vehicle Code that improve the City's ability to effectively manage parking services for the disabled.

The Prevalence of Disabled Placards Constrains the City's Ability to Regulate Parking Availability and Turnover

Generally, to qualify for a disabled parking placard an individual must have a qualifying medical condition, obtain approval from a certified medical professional, and submit an application to the Department of Motor Vehicles. Qualifying medical conditions can include impaired mobility, limited use of the lower extremities, and visual problems. The original text of this vehicle code section was introduced into law in 1959 and, at that time, contained a narrower definition of what constituted a qualifying medical condition. It stated that "Any person who has lost, or has lost the use of, both legs or is so severely disabled as to be unable to move without the aid of a wheelchair shall be allowed to park for unlimited period in parking zones restricted as to the length of time parking is permitted." The law was amended in 1972 to allow for those with placards to park at meters without making a payment.

We obtained data from the DMV in order to evaluate the number of placards in use each year. The figure below shows the number of permanent and temporary placards in use, along with the estimated percentage of the Sacramento County population[6] that has a disabled placard from 2015 through 2018.

Figure 26: Percentage of Sacramento County Population with a Disabled Placard



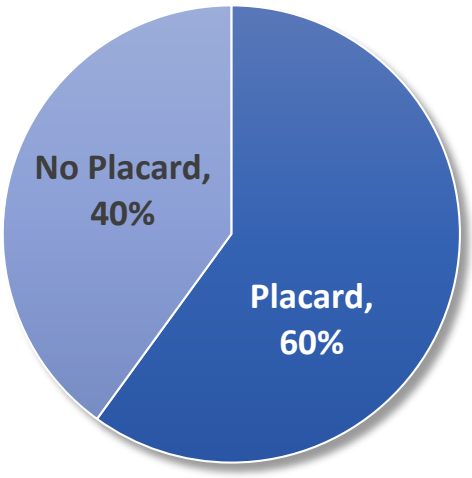
Source: Auditor generated based on DMV and Census Bureau data.

Based on the annual data from the DMV, over 100,000 people in Sacramento County have a disabled parking placard, which represents approximately 8.4 percent of the County's population. It is important to note that population estimates are based on the total number of residents, not just those over the legal driving age.

To assess the number of placards in use at metered spaces downtown, we performed limited testing of 58 metered spaces. We found that 60 percent of the metered spaces we tested near the Capitol and along I Street were being occupied by vehicles displaying disabled placards. While the frequency of disabled placard use may vary in different parts of the City, and this limited sample is not necessarily representative of the entire population of parking meters, there were a significant number of meters in the areas we tested that were being occupied by disabled placards that allow for unlimited parking.

[6] Population estimates are from the Census Bureau Fact Finder website https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=PEP_2017_PEPANNRES&prodType=table. We assumed a 1 percent population growth rate for 2018 as the data was not yet available.

Figure 27: Prevalence of Disabled Parking Placards in Areas Tested



Source: Auditor generated based on limited sample testing.

The California State Auditor's report on placard use noted that, of the approved applications they tested, most medical providers did not include enough information on applications when certifying disabilities. In addition, they found that nearly 18 percent of the applications did not match the signature on file with the appropriate licensing health board; persons that had been issued multiple replacement placards; and placards were registered to individuals that were likely deceased. Ultimately, the report concluded in its executive summary that the "DMV does not sufficiently ensure that applications for placards are legitimate." Failure to validate the legitimacy of applications could lead to placards being issued to individuals that do not qualify.

Efforts have been made in California to limit placard issuance. In 2016, legislation was introduced in the California State Assembly to only allow for those with severe mobility impairments to qualify for free parking. Assembly Bill 2602[7] aimed to establish a "a two-tiered disabled person parking system, whereby only those persons with disabilities that severely limit mobility and dexterity may qualify for free and unlimited parking at metered spaces and at parking payment centers or kiosks, and for unlimited parking in parking zones with time limits." However, the bill died when its sponsor left the Assembly before the bill was finalized.

Metered spaces are not the only parking spaces affected by the number of placards being issued. Disabled parking spaces close to shops and services outside the City's core may also be impacted by the overall number of placards in use. This could potentially leave disabled persons without the ability to park near services when they need them.

[7] California Legislative Information site. AB-2602 Disabled Parking Placards (2016). https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160AB2602.

California State Law May Incentivize the Abuse of Disabled Placards

Section 22511.5 of the California Vehicle Code[8] states that disabled persons displaying a special license or placard are "allowed to park in any metered parking space without being required to pay parking meter fees." This essentially means that disabled persons who display the appropriate placard or license plate can park for unlimited periods, for free, at on-street metered parking spaces in the City.

Placard abuse may be carried out in a variety of ways, including use by individuals that request a placard when they do not necessarily require it, use by someone other than the person the placard was issued to, use of a deceased person's placard, or use of a placard when the medical condition the placard was issued for no longer persists. According to the California State Auditor's report on disabled placard use, "The ability of placard users to park for free in metered parking spaces and for unlimited amounts of time in time-restricted parking zones creates a significant incentive for abuse." Those that abuse the system could potentially, for unlimited periods, occupy parking spaces meant for those who are disabled.

"The ability of placard users to park for free in metered parking spaces and for unlimited amounts of time in time-restricted parking zones creates a significant incentive for abuse"

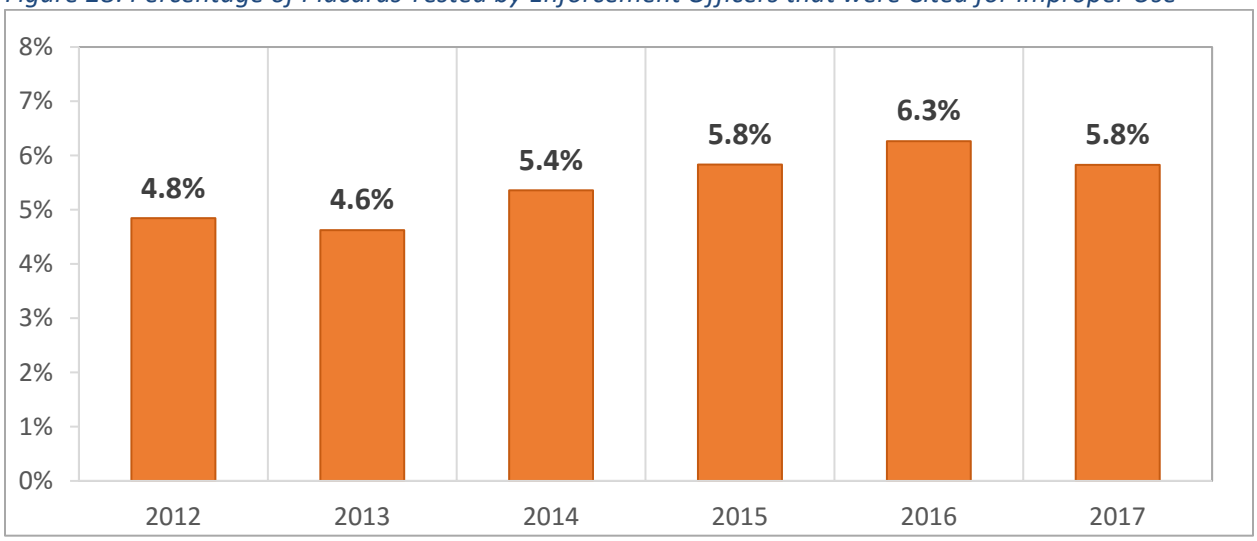
--California State Auditor's Office

It is important to note that the potential for placard abuse is not limited to Sacramento; urban areas all over the country are struggling with how to combat the issue of placard abuse. The cities of Baltimore, Maryland and Portland, Oregon have started requiring disabled persons to pay at parking meters, while the State of Michigan and State of Illinois have more "narrowly defined" the requirements to obtain free parking in an effort to reduce placard abuse.

While the level of disabled placard abuse is debatable and difficult to quantify because not all abusers are caught, the *potential* for abuse is evidenced by the number of persons who have actually been cited for placard abuse. In the City of Sacramento, 508 citations were issued by enforcement officers for placard abuse between 2012 and 2017. Parking enforcement officers evaluated over 9,000 placards and plates during this period. Figure 28 shows the percentage of total placards tested each year that were cited for improper use.

[8] California Legislative Information Website. Vehicle Code Division 11, Chapter 9. http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=VEH&sectionNum=22511.5.

Figure 28: Percentage of Placards Tested by Enforcement Officers that were Cited for Improper Use



Source: City of Sacramento parking enforcement records.

On average, about 5.4 percent of the placards tested annually were cited by enforcement officers for improper use. Those that improperly use disabled parking placards may be preventing disabled individuals from having access to parking when they need it.

While the purpose of regulating disabled spaces is to ensure that spaces are available for disabled persons when they need them, removing the financial incentive for individuals to obtain placards when they do not need them for mobility purposes could have the ancillary benefit of increasing on-street parking meter revenue. To provide some context on the cost of free parking to the City, the average annual revenue of a parking meter is approximately $2,100. If the free parking incentive was eliminated and meter usage was increased by just 15 percent at Event Zone B's 1,280 meters, this could increase parking revenue by over $400,000 annually.

Current California State law regarding disability placards and plates may have been drafted with good intentions; however, in our opinion, by providing a financial incentive the law may have also inadvertently made it more desirable to obtain a disabled parking placard. We recommend the City continue to lobby for changes to the California Vehicle Code that will improve the ability to regulate parking turnover and provide accessible parking for disabled persons.

RECOMMENDATION

We Recommend the City Manager's Office:

10. Continue to lobby for changes to the California State Vehicle Code that improve the City's ability to effectively manage parking services and reduces incentives for placard abuse.

City of
SACRAMENTO
Department of Public Works

MEMORANDUM

DATE: January 25, 2019

TO: Jorge Oseguera, City Auditor
Lynn Bashaw, Assistant City Auditor

FROM: Hector Barron, Director of Public Works HB

CC: Fran Lee Halbakken, Assistant City Manager
Matthew Eierman, Parking Services Manager

SUBJECT: Response to Audit of the City's On-Street Parking Meters (#2019-0X)

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1. The Department of Public Works acknowledges receipt and concurs with the findings in the City Auditor's *Audit of On-Street Parking Meters*.

2. The Department continues its efforts to modernize the parking system, including enhancing technologies, processes, gaining efficiencies, and increasing service levels. This is consistent with the Department's mission to provide innovative and sustainable public infrastructure and services for Sacramento.

3. The implementation of various new technologies results in a transitional period. We will continue to work with stakeholders and vendors to adapt technologies to the City's programs, policies, and specific environment.

4. The Department of Public Works would like to take this opportunity to thank the City Auditor and staff for their efforts in reviewing the data and the Division's operations. Please feel free to contact me directly should you have additional questions.

5. Below, please find the Department's response to the findings identified in the audit report.

Finding 1: Improving Vehicle-Detection Sensor Accuracy Rates and Meter Battery Life Could Reduce the Potential for Erroneous Citations and Slow the Rate of Incoming Citation Disputes

- We continue to work with the vendor to address the vehicle detection sensor accuracy in Sacramento's unique on-street environment. However, in order to improve the customer experience and reduce the potential of issuing a citation in error, the Division was proactive by requiring the vendor to develop and

deploy a "reset-to-zero enforcement mitigation" feature, where the red LEDS will "double-blink" when the meter has been reset by the sensor. Officers were directed not to issue a citation at a meter where the LEDs indicate a reset-to-zero occurred.

- Battery degradation is normal with any rechargeable electronic mechanism. We continue to work with the vendor to gauge battery performance in Sacramento's unique environment and determine where optimization can be done.
- We are actively evaluating other technologies that will allow the City to achieve its goals with tiered rates at an accuracy greater than the 95% rate required in the contract.

Finding 2: Mobile Payments Made in Event Area B are not Reflected on Parking Meters

- The Department continues to use a mobile payment verification process to eliminate issuing citations to vehicles that are paid through mobile payment when it is not reflected on the parking meter.
- The Department has already acquired the new handhelds for officers, as mentioned in the audit report, and currently is in the process of deploying them. The new handhelds are wirelessly connected to payment systems and will allow officers to see, in real time, whether a mobile payment has been applied to a meter, no longer requiring the officer to contact Dispatch to inquire whether a meter was paid through mobile payment.
- In the future, Enforcement Officers will not need the green lights on the meter to confirm mobile payment. Therefore, Parking Services will work with the vendors to remove that feature. Customers still will have their receipts from the mobile app as proof of payment. Parking Services will initiate a PR campaign to set customers' expectations that the lights will not turn green; therefore, providing a consistent customer experience.

Finding 3: Some Meter Configurations in the Data Management System Are Not Reliable

- We will continue to support the vendor to update the user interface of its Data Management System to allow City personnel to review and update the configurations for meters using a Virtual Machine. The vendor has indicated the software development is complete and is waiting for Quality Control to validate its performance.

Finding 4: Usefulness of Contested Citation Data Has Improved

- The Department also believes that accurate, complete, and timely data can help identify issues and trends, and can be used in the decision-making process.
- The new officer handhelds, which is a component of the new citation processing system, will compel consistency in data entry, leading to more efficient data aggregation and analysis. For example, parking

meter IDs must be entered with the full identifier that includes the letters, "PKGS", followed by a series of digits.

- The new citation processing system will allow us to generate more meaningful reports about citation activity in real time, allowing us to review data frequently to identify trends and correct anomalies.
- The new citation processing system includes a process that can proactively void citations that were issued due to mistyped license plate numbers by customers.

Finding 5: The Prevalence of Disabled Parking Placards and License Plates May Have an Adverse Effect on the Availability of Disabled Parking Spaces and The City's Ability to Regulate Parking Through Demand-Based Pricing

- The Department's Parking Services Division organized the Special Taskforce on Placard Abuse (S.T.O.P. Abuse) in 1992. It continues to investigate placard abuse and enforces to the extent that state law allows.
- The City is involved with stakeholders, other jurisdictions, the California League of Cities, parking professional organizations, and legislative consultants to endorse reform at the state level.