

# CITY OF PHILADELPHIA PENNSYLVANIA

OFFICE OF THE CONTROLLER

*Promoting honest, efficient, and fully accountable government*

**VIDEO SURVEILLANCE SERVICE PROJECT**

**2013 FOLLOW-UP**

**MAY 2013**



City Controller  
**ALAN BUTKOVITZ**



# CITY OF PHILADELPHIA

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The Office of the Controller commissioned and oversaw an independent review and evaluation, conducted by the accounting firm of EisnerAmper LLP, to follow-up on conditions noted in the May 2012 report on the City's Video Surveillance Service Project. This review was conducted pursuant to Section 6-400 (d) of the Home Rule Charter, and the results of the independent accountant's review are summarized in the executive summary attached to this report.

We believe that the recommendations in this report, as well as the May 2012 report, if implemented, will improve the effectiveness of the city's video surveillance assets.

We would like to express our thanks to the staffs of the Office of Innovation and Technology and the Philadelphia Police Department for the courtesy and cooperation displayed during the conduct of our work.

Very truly yours,

A handwritten signature in black ink, appearing to read "Alan Butkovitz".

ALAN BUTKOVITZ  
City Controller

cc: Honorable Michael A. Nutter, Mayor  
Honorable Darrell L. Clarke, President  
and Honorable Members of City Council  
Members of the Mayor's Cabinet



# Video Surveillance Service Project 2013 Follow-up

## Executive Summary

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### Why The Controller's Office Conducted The Examination

Pursuant to Section 6-400 (d) of the Philadelphia Home Rule Charter, the Office of the City Controller commissioned and oversaw an independent review, conducted by EisnerAmper LLP (EA), to follow-up on conditions noted in the May 2012 report on the City's Video Surveillance Service Project. That report indicated that 45 percent of surveillance cameras randomly selected from City inventory records were working. After we issued our report, the administration stated that it would have 90 percent of the cameras working by September, 2012.

### What The Controller's Office Found

Some of the more significant observations of this follow-up report are listed below. We believe management should immediately address these and other conditions described in the report.

- Despite a commitment from the administration to have 90 percent of the city's video surveillance cameras working by September 2012, as of February 2013 EA observed that only 32 percent of 31 randomly sampled cameras throughout the city were working properly. EA found the remaining cameras either not working at all (52 percent) or functioning with problems that diminished the quality of the image or field of vision (48 percent). Examples of problems observed included condensation or water spots inside the camera dome, film and dirt on the dome's exterior, and the inability to reliably depict the color of items such as vehicles and clothing. Other operational issues noted included difficulty in controlling the camera's movements and the inability to scan the full field of vision or zoom in on a subject.
- Some cameras which the City's Office of Innovation and Technology (OIT) considered to be functioning without problems exhibited images with jagged edges and a loss/lack of detail. These conditions could indicate that the bit rate was not high enough to pick up the data; possibly due to either low bandwidth or the cameras' compression setting. The most significant shortcoming noted when viewing historical video was the unreadable or pixelated images that resulted when the camera was zoomed onto a license plate.
- The OIT's inventory records listed 216 cameras in May 2012, while in February 2013 it showed 203 cameras. While no information was available to definitively explain the decrease, having fewer cameras in inventory has the effect of skewing the percentage to make it appear that a greater percentage of cameras are working properly. In addition, OIT has not specifically dedicated any one employee to work on the Video Surveillance Service Project in a full-time capacity.
- The Video Surveillance Service Project is not being used as a tool for crime prevention, but rather as a means for solving crimes after they are reported. The PPD's Real Time Crime Center (RTCC) does not operate in a watch center or virtual patrol capacity in which events are monitored as they occur. Instead, it is a 9-1-1 event-driven unit that works to identify suspects or develop leads and disseminates the information to police personnel in the field to improve the chances of criminal apprehension or safe resolution. The PPD reviews tapes of activity not actively monitored to determine if anything relevant to the crime has been captured on video.

### What The Controller's Office Recommends

In addition to revisiting and implementing the recommendations in our May 2012 report, management should: (1) implement a preventative maintenance program to ensure that video surveillance cameras receive regularly scheduled cleaning and upkeep; (2) deploy maintenance personnel to quickly respond to malfunctioning cameras identified by the RTCC; (3) allow RTCC personnel the capability to determine and change automatic tour and other camera settings as needed; and, (4) dedicate at least one individual in the OIT to manage the City's video surveillance program on a full-time basis.

**City of Philadelphia**  
**Office of the Controller**  
**Video Surveillance Service Project**  
**2013 Follow-up**

May 2013

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## INTRODUCTION AND UPDATE

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In May 2012, EisnerAmper LLP (“EisnerAmper” or “EA”) issued a report titled, “Video Surveillance Service Project,” as the result of a study requested by the City of Philadelphia Controller’s Office (“Controller’s Office”). In the 2012 study, EA selected a random sample of 20 cameras and found 9, or 45% of the sampled cameras, to be fully functioning at that time. This percentage was in line with the City’s records which, at that time, had indicated that 102 of its 216 existing video surveillance cameras (47%) were properly functioning. The report recommended that: (1) management evaluate whether the added benefits, if any, expected to be derived from additional project expenditures, justify the costs; (2) records for all video equipment be reconciled, and recordkeeping duplication eliminated where possible; (3) warranty and maintenance records be updated and kept current to mitigate the possibility of incurring unnecessary repair costs; and, (4) all warehoused video equipment be evaluated to determine its utility, and any obsolete equipment be sold or scrapped. In response to the study, the Mayor’s Office indicated that a contractor had been hired in March 2012 to increase the number of working cameras and that, as of June 2012, almost 70% of the cameras were working. The Mayor’s Office further projected that by September 1, 2012, up to 90% of the cameras would be working.

In January 2013, the Controller’s Office requested EA to conduct a follow-up study to determine whether the current operational status of the City of Philadelphia’s video surveillance cameras had reached the projected 90%. Accordingly, EA interviewed members of the Philadelphia Police Department (“PPD”) involved in the command and operation of the PPD’s video surveillance unit and determined that the Video Monitoring Unit (“VMU”) previously in place at the PPD when EA conducted the field work for our initial study has since been replaced by what is now known as the Real Time Crime Center (“RTCC”). Whereas the VMU had been staffed primarily with officers who rotated in and out of the unit, many of whom had either been placed on desk duty due to injury or were under investigation, the RTCC is considered a fully operational unit within the Philadelphia Police Department and is staffed with 3 shifts (24x7) of police officers, civilian criminal analysts and service representatives who are dedicated to the unit full-time. All members

of the RTCC are required to possess specific skill sets and undergo an extensive background check and test of computer knowledge. One of the detectives working in the unit took a three week video surveillance training course on video interpretation and the science behind it, and is scheduled to attend a more advanced seminar in the use and interpretation of video in law enforcement. Each shift is staffed with a minimum of one police officer at a supervisory level, one police detective, and one criminal analyst.

The RTCC is an event- driven unit. The concept of “real-time” is to begin working on live events as they unfold and identify suspects or develop leads as quickly as possible and pass vital information to officers, supervisors or investigators in the field to improve chances of apprehension or safe resolution. With over 200 cameras and limited staffing per shift, the RTCC is not in a position to operate in a watch center, or virtual patrol, capacity, in which events are monitored and captured the moment they occur. The RTCC is notified of events primarily via the 911 dispatch system - with the most severe events assigned either priority 0, 1, or 2 being investigated – as well as from police radios, police units in the field and/or requests for information (“RFI”) from PPD detectives. Crimes that may not have been actively monitored during the day shifts are reviewed during the night tour to determine if anything relevant to the crime had been captured on video. The RTCC also has access to over a dozen databases (e.g. prior arrest records, current arrest warrants, license plates, firearms, etc.) to speed the process of identifying suspects or gathering information that may be critical to officers and investigators responding to an incident. The RTCC views their approach as “All Hazard”; they are not only fighting crime, but are mindful of Officer and Public Safety issues as well.

According to the PPD's inventory listing as of February 10, 2013, there were 202 PPD video surveillance cameras in place throughout the City's 21 police districts. Every Sunday morning, a member of the PPD's RTCC Operations staff updates the working status of each video camera on the PPD's inventory listing spreadsheet. This is accomplished by accessing each camera individually from the Command Center and noting the condition of the real time image as well as the PPD's ability to pan/tilt/zoom the camera. Problems with the camera are assigned a diagnostic code. The RTCC spreadsheet is sent to several members of the City of Philadelphia's Office of Innovation and Technology ("OIT") as well as various ranking officers of the PPD.

Although a camera may not be working at 100% capacity and/or the image may not be as high-quality as desired, RTCC attempts to actively use all cameras that are operational, regardless of the quality. While a camera may be up at the time the working status is recorded in the spreadsheet in the morning, it could be down in the afternoon, and vice versa. It is believed that this is most frequently due to weather conditions (e.g., wind, rain, etc.) or type of cabling (NOTE: there is an effort currently underway by OIT to convert all cameras to fiber optic cabling). Additionally, since 28 days of data from each camera is stored and available for review, while a camera may not be working today, there is a possibility that video images from that camera may be available from sometime during the previous 28 days.

A representative(s) from the RTCC attends weekly status meetings with members of OIT's Video Surveillance Service ("VSS") Project Team. It should be noted that not one individual from OIT is dedicated 100% to VSS; the individual who manages the City's IT Helpdesk continues to be the RTCC's primary contact at OIT. Cameras that have been identified by the PPD as in need of maintenance – including those with water in the lens as well as those unable to project an image –are evaluated by OIT according to where they fit into the Video Camera Priority List developed by the PPD in March of 2012. This list is used by OIT to determine the order in which the cameras reported as having problems should be addressed. OIT may go outside of this priority list due to equipment availability, proximity to other cameras in need of repair, or other relevant factors.

Approximately five years ago, a network design for the installation of 250 cameras was developed. Although some of the locations may have undergone significant change in regard to community profile, crime statistics, etc. since the development of that network design, the PPD is not aware of any changes to that network design and anticipates that new camera placements will continue to follow the same network design.

The current RTCC is located in PPD headquarters at 8<sup>th</sup> and Race Streets and is equipped with aging technology, particularly in regard to the overhead video monitors. Some of the monitors are in disrepair and were not functioning consistently at the time of our observations. We were informed that the RTCC was scheduled to move to the Delaware Valley Intelligence Center (“DVIC”) at 20th and Johnston Streets toward the end of March, 2013, however, this move has since been pushed back to an unspecified date.

Additionally, the RTCC is in the process of implementing “Wisdom Command and Control,” (“Wisdom”) which will integrate with the City’s 911 system and interface with the TimeSight software currently used to access and control the video cameras. Wisdom displays the video in native resolution (pixel for pixel view) which will allow for more enhanced images, as opposed to the TimeSight software which interpolates images automatically by either adding or subtracting pixels. As soon as an upgrade to the TimeSight software is made available, the RTCC will be able to control the cameras (i.e., pan/tilt/zoom) through Wisdom thus enabling the PPD to take advantage of the enhanced features and functions.

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## SCOPE AND APPROACH

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EA selected a random sample of 30 video surveillance cameras from the PPD camera inventory listing of 200 cameras dated January 27, 2013. PPD's February 3, 2013 inventory listing of 202 cameras resulted in the selection of one additional camera for testing, for a total of 31 cameras. See *Appendix A* for a list of the 31 camera locations selected in the sample.

On February 5, 2013, EA's Project Manager was stationed at the PPD's RTCC located at 8<sup>th</sup> & Race Streets, while at the same time, a team of EA staff members were deployed to travel to the 31 camera locations selected in the sample. Whenever a staff member arrived at a camera location, he would contact the Project Manager so that an observation of the staff member could be made from the RTCC. The purpose was to determine whether a video image from the camera at that location was visible. With the assistance of police officers assigned to the RTCC, the Project Manager tested each camera's field of vision, its ability to pan, tilt and zoom, and noted the quality of the image. Staff team members observed the state of the camera and took pictures of the camera at each designated location. See *Appendix B (first page)* for the form used by the Project Manager to record the results of testing cameras from the RTCC, and *Appendix C* for the form used by the staff team members to record their observations while on location.

EA compared the results for each of the locations selected in the sample to the recorded status of the cameras at those locations as tracked on the RTCC's inventory status spreadsheet as well as on the inventory status spreadsheet maintained by OIT's VSS Project Manager to determine whether the spreadsheets accurately reported the status of the sample of camera locations.

On February 13, 2013, eight days after the February 5th observations, the EA Project Manager returned to the PPD's RTCC to view the video for each location for the date and time of the original observation to determine if the videos were maintained, viewable, and if a requested date and time could be readily located. EA also viewed video images taken on

the night of February 5 for each of the 31 cameras in the sample to assess quality and usability of night video.

See *Appendix B (second page)* for the form used by the Project Manager to record the results of testing the accessibility and quality of the video taken at the time of the February 5<sup>th</sup> field observations as well as at night on the same date.

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## RESULTS

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### Initial Observation – February 5, 2013

*Table 1* on the following page presents a summary of the comparison of the cameras selected in the sample as reported in the RTCC inventory status listings as of January 27, 2013 and February 3, 2013, the status per EA's February 5, 2013 observation, and the status as reported on the OIT inventory listing dated February 12, 2013. *Appendix D* contains a detailed analysis comparing the status of the sampled cameras as observed by EA on February 5, 2013 and OIT's representation as of February 12, 2013.

The OIT categorizes the status of cameras as either "Working" or "Not Working," with free format text explanations inserted in the "History" or "Comments" columns maintained in the inventory spreadsheet. For comparison purposes, all cameras denoted by OIT with the status of "Working" are presented in the table on the next page with a Camera Status of "Y", and all cameras denoted by OIT as "Not Working" are presented with a Camera Status of "N."

The coding scheme used by the RTCC and EA to categorize the status of cameras is as follows:

- Y = Yes; an image is displayed and the camera is functioning. For the purpose of this analysis, cameras denoted with a "Y" status are considered to be "Working".
- N = No image is displayed. NOTE: Problem is typically coded as "NID" = no image displayed. For the purpose of this analysis, cameras with no image displayed are considered to be "Not Working."

- P = Problem; an image is displayed, however, there is a problem that exists with the camera. NOTE: A series of diagnostic codes are used by the RTCC to describe the problem. The most common problems noted are: “PTZ” = Failure of Pan/Tilt/Zoom control; “CON” or “WAT” = Condensation or water in dome, may appear as fogginess or droplets on the dome or a pool or water at the bottom of the dome; “BNW” = Black and white picture, color absent from image even though the scene appears to be well lit; “BLR” = Blurry image, image appears fuzzy and out of focus; and “DRT” = Dirt, soil or other imperfection on the dome lens. For the purpose of this analysis, cameras with problems are considered to fall under the “Not Working” category, because these cameras are not functioning at a level that meets their intended purpose.

Table 1  
Camera Status Comparison

Camera Status	Sun 1/27/2013 (RTCC)		Sun 2/3/2013 (RTCC)		Tues 2/5/2013 (EA Observation)		Tues 2/12/2013 (OIT)	
Y	13	43 %	15	49 %	10	32 %	22	71%
N	17	57 %	16	51 %	21	68 %	9	29 %
<b>TOTAL</b>	<b>30</b>	<b>100 %</b>	<b>31</b>	<b>100 %</b>	<b>31</b>	<b>100 %</b>	<b>31</b>	<b>100 %</b>

Out of the total number of 31 cameras in the sample, EA observed there to be 10 (32%) in a “Working” status and 21 (68%) in a “Not Working” status. Of the 21 in a “Not Working” status, EA categorized 11 (52% of the “Not Working” cameras or 35% of cameras in the sample) as functioning with problems, i.e., at a reduced capacity. RTCC observed there to be 17 (57%) and 16 (51%) in the “Not Working” status on Sunday January 27 and Sunday February 3, respectively. Of the 17 on January 27 and the 16 on February 3, the RTCC categorized 6 (35% and 37.5%, respectively) as functioning with problems on each date. These percentages are quite different from OIT’s recorded status as of February 12, 2013, which categorized the cameras as 71% working and 29% not working. As a further comparison, the EA report issued in May 2012 indicated that 45% of the cameras were working and 55% of the cameras were not working.

It should be noted that the level of function of the cameras within the sample population varied based on who was evaluating the images. EA categorized more cameras with problems than the RTCC, therefore, EA has more cameras in the “Not Working” status than the RTCC. Specifically, there were six cameras that both RTCC and EA classified as “problem”. These six cameras were observed as having the problems listed in *Table 2a* below:

Table 2a

Problems noted by the RTCC and EA in Sampled Cameras

OIT Camera #	EA Observation
09-006	PTZ: EA’s 2/5/2013 observation noted a clear image but no pan/tilt/zoom (“PTZ”) capability from PPD, although the camera did have a functioning PTZ when on auto tour. EA’s 2/13/2013 follow-up noted that the zoom was very blurry, images were blocky, and that there was still no PTZ capability although the auto tour remained functional.
15-009	WAT: EA’s 2/5/2013 observation noted condensation on lens, blurry, bowl looks like it was filled with water, particularly for the NW and NE views. EA’s 2/13/2013 observation noted the same conditions.
14-015	WAT/PTZ: EA’s 2/5/2013 observation noted a big blob of brown debris on lens (possibly mold), loaded with water. Most views were affected by condensation. Also, PTZ was hard to control. EA’s 2/13/2013 observation noted that the condensation remained and the blob appeared larger/worse.
23-037	DRT/PTZ: During EA’s 2/5/2013 observation, it looked like there was a film over the images. No PTZ or movement capability from PPD, although the camera could still auto tour. EA’s 2/13/2013 observation noted the same conditions.
25-014	BLR/BNW: EA’s 2/5/2013 observation found very blurry images (all views); color was off, black & white with only red, no other colors. Condensation, fogginess or some other issue was noted. EA’s 2/13/2013 observation noted that the images were still blurry but marginally improved.
16-002	PTZ/BNW: EA’s 2/5/2013 observation found that the camera may have been tagged with the wrong street address; Intermittent panning with views at strange angles. Color appeared to be off, black & white with spotty reds, oranges. EA’s 2/13/2013 observation noted the same conditions.

Additionally, based on EA’s observation on February 5, 2013, five cameras categorized by the RTCC as “Y” (Working) were found to have problems substantial enough to warrant reporting by EA in the Problem category and therefore, as “Not Working.” The problems are described in *Table 2b* below:

**Table 2b**  
**Problems noted by EA in Sampled Cameras**

OIT Camera #	EA Observation
15-002	CON/BNW: During EA’s 2/5/2013 observation it was noted that there was condensation on the lens, most noticeable when the subject stood directly underneath the camera and when panning west. Color was found to be off, i.e., black & white with only select colors visible, specifically yellow, orange and red. (NOTE: OIT also noted condensation inside dome that needed to be wiped.) EA’s 2/13/2013 observation noted the same conditions.
19-025	PTZ: During EA’s 2/5/2013 observation it was noted that the camera did not auto tour, it falls and zooms to the pavement (NOTE: we observed that PPD did have the ability to control PTZ). EA’s 2/13/2013 follow-up noted that the zoom was very blurry and that the auto tour was still not functioning.
23-005	PTZ/BNW: During EA’s 2/5/2013 observation it was noted that it was difficult for the PPD to control the camera; there was a long delay between joy stick movement and camera reaction. During automatic camera tour, one view panned to a pink screen/no image. EA also observed the color to be off at every camera angle (black and white with very limited other colors, i.e., red and blue). We also found movements of pedestrians/cars to be jittery. EA’s follow-up on 2/13/2013 found that the camera was still panning to a pink screen for one view during the auto tour, color remained spotty and movement was still jittery.
23-011	DRT/BNW: During EA’s 2/5/2013 observation it was noted that the color was off for most views, i.e., mostly black and white with spotty color (yellows and oranges). Some views (especially noticeable during the auto tour) suggested possible film on the dome; North view in particular appeared filmy/dirty. EA’s follow-up on 2/13/2013 found all views to be filmy with faces distorted and no discernible facial features. PPD no longer had PTZ capability.
23-035	BNW: During EA’s 2/5/2013 observation it was noted that the color was off at every camera angle, i.e. black & white with spotty colors (red & blue). At 20-25’ without zoom the camera rendered a grainy image with only black, white and red. EA’s follow-up on 2/13/2013 noted that the color remained spotty.

It is important to consider that cameras with BNW issues (i.e., black and white picture with spotty or unnatural coloring) do not allow the PPD to reliably identify the color of vehicles, clothing and other objects which may be of great importance to an ongoing investigation.

Additionally, when members of the RTCC unit are actively investigating an event in real time, PTZ, or “Pan/Tilt/Zoom” controls are of critical importance, therefore, cameras with PTZ issues (i.e., the inability for the PPD to control movement of the camera or to zoom), restricts the PPD’s ability to follow a subject or move to a specific area within the camera’s 360 degree field of vision, again potentially impeding an investigation. Cameras with CON issues (i.e., condensation) often offer blurred or otherwise impeded images making it difficult to discern facial features, logos on clothing and vehicles, and other identifiable details. Accordingly, as indicated above, cameras with noted problems are categorized as “Not Working,” in that their value to an investigation is impeded and the video images produced are subject to future challenges.

EA further observed that, even with cameras found to be functioning without any problems noted (i.e., coded as “Y”), movement was generally aliased (i.e., jagged edges, loss/lack of detail) signifying that the bit rate was not high enough to pick up the data possibly due to either low bandwidth or the camera’s compression setting. Additionally, although there were certain issues associated with the quality of an image that could possibly be corrected through adjusting camera compression (and various other) settings, no members of the PPD have been granted the security access rights needed to perform those functions. Any changes that need to be made to the camera settings must be requested of and performed by OIT personnel.

We determined that we wanted to track the status of the 31 sample cameras over a period of time. We obtained the PPD weekly camera inventory listings from January 6, 2013 to February 10, 2013. A summary of the findings is as follows:

- Nine of the cameras have been designated by the PPD as “Working” (Y) during the entire 5 week period.
- Two cameras identified by the PPD as “No Image Displayed” (N-Not Working) at some point during the course of the 5 week period were noted as either “Working” (Y) (1 camera) or working with a “Problem” (P) (1 camera) as of February 10.
- Five of the cameras identified by the PPD with “Problems” (P) on February 10 have

had the same problem noted every week since January 6.

- Nine (9) of the cameras identified by the PPD as “No Image Displayed” (N-Not Working) on February 10, 2013 had not been categorized as working at any point during the 5 week period starting on January 6, 2013.

When performing the detailed analysis, EA noted that the number of cameras identified on the Office of Innovation and Technology’s inventory listing dated February 12, 2013 totaled 203, a difference of one from the PPD’s February 3, 2013 inventory listing. This one was attributed to a new camera being entered on the OIT listing of February 12 which had not yet been added to the PPD’s February 10 listing. However, it was further noted that the total number of cameras reported on OIT’s March 2012 inventory listing was 216, corresponding to a decrease of 13 cameras from March 2012 to February 2013. An analysis of the difference of 13 cameras found that:

- the 216 total from 2012 included all cameras that were (1) installed, placed in production and active; (2) bagged and awaiting activation; and (3) in need of repair.
- the 203 total from 2013 did not include 10 cameras that were listed on the 2012 inventory as bagged and awaiting activation (one-half of the cameras on the 2012 list that were reported to be in the bagged status), 2 cameras that were listed on the 2012 inventory as in need of repair, and 1 camera that was listed on the 2012 inventory as actively working.

#### Follow-Up Observation – February 13, 2013

EA’s follow-up visit to the RTCC on February 13, 2013 to search the February 5 video for images taken of the Field Team with different cameras at specific times found the search capabilities to be effective and easy to use. The quality of the video viewed 8 days after being taken was found to be the same as when the images were originally captured.

The most significant shortcoming with viewing historical video is that, should there be a need to zoom in on an image – such as a license plate - the zoomed image is heavily pixelated and unreadable. See *Illustrations 1* and *2* below for examples of the quality of a zoomed image taken from video.



*Illustration 1 – Post-incident*



*Illustration 2 – Post-incident*

Accordingly, once a camera view is recorded in real time, the PPD does not have the ability to view a different image or improve upon the recorded image. Although video can be sent out to third parties for post-processing so that attempts to enhance images that may be needed as evidence in the most critical cases can be made, doing so is atypical primarily due to the time and cost involved.

Because of these limitations, the automatic tour settings on each camera become a critical factor in establishing the usefulness of the video taken. For every minute of video taken by an RTCC camera operator, there are hundreds of minutes during which the camera is automatically taking video without an operator. The auto tour settings on each camera determine which views are being recorded, i.e., angle of shot, length of time per view, distance (zoom), and number of views per tour.

EA viewed each (functioning) camera selected in the sample in auto tour mode during our initial and follow-up visits to the RTCC. In doing so, it was noted that there were certain views that did not appear useful (i.e., views of poles, cables, rooftops, abandoned houses, pink screens) and, for several of the cameras, the auto tour feature was either functioning with problems or not functioning at all. In a number of cases, views with the potential to provide more valuable images to aid in police investigations were identified by members of the RTCC, who also indicated that the relevance of specific views for each camera location is constantly changing due to changes in demographics, crime rates, time of day, etc. It was reported that currently, no members of the PPD have the security access rights needed to change the auto tour settings on any of the cameras, and that any changes that need to be made must be requested of and performed by OIT personnel.

During EA's February 13, 2013 follow-up visit, our review of the images taken on the night of February 5, 2013 for each of the 31 cameras in the sample found that, regardless of the camera, most images did not provide enough detail to be usable in making a positive identification of persons or vehicles. Additionally, the coloring of the images for the majority of the cameras had a strong greenish yellow tint that is indicative of low lighting. Well lit views, such as in the case of a baseball field and a basketball court, were found to provide

better images. Movement was generally aliased (i.e., jagged edges, loss/lack of detail).

Although many of the cameras in the total camera population are thought to have a night mode option, it is believed that only one or two of those tested have the option enabled. While the night mode option reverts to a black & white image, the image is finer with detail more pronounced. It was reported that currently, no members of the PPD have the security access rights needed to activate camera night mode settings. While any changes in that regard must be requested of and performed by OIT personnel, OIT does not typically work a night shift thus making it difficult to properly adjust a camera's night mode setting.

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## CONCLUSION

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Our sample of 31 cameras observed on February 5, 2013 found 32% of the cameras to be working without problems. Of the remaining 68%, 36% were working with problems and 32% were not working at all. According to the RTCC's inventory spreadsheets for the weeks January 6, 2013 through February 10, 2013, the average percentage of all of the cameras that were working without problems was 61%. Of the remaining 39%, 14% were working with problems and 25% were reported as having no image displayed or not working at all. As previously described, the categorization of "working with problems" is subjective as to the person doing the evaluating. However, it was evident that certain problems which caused EA to categorize a camera as "working with problems" were considered by the RTCC as minor, thus the RTCC categorized the camera as "working".

The Mayor's office projected that 90% of the cameras would be "working" by September 1, 2012. Whether the evaluation is being done by the RTCC or EA, it does not appear that the Mayor's goal has been achieved.

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## RECOMMENDATIONS

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In addition to revisiting and implementing the recommendations contained in our May 2012 report, the following recommendations are offered for consideration to enhance the City of Philadelphia's video surveillance operations:

- Implement a preventative maintenance program to ensure that video surveillance cameras receive regularly scheduled cleaning and upkeep.
- Deploy maintenance personnel to respond quickly to the RTCC's identification of malfunctioning cameras.
- Allow PPD RTCC personnel the capability to determine and change camera automatic tour and other relevant settings, as needed.
- Dedicate at least one individual in the Office of Innovation and Technology (OIT) to manage the City's video surveillance program on a full-time basis.

**APPENDIX A:**  
**VIDEO SURVEILLANCE CAMERAS –**  
**LOCATIONS IN SAMPLE**

**Appendix A**  
**City of Philadelphia**  
**Video Surveillance Cameras**  
**31 Samples Selected - 2013**

<b>Smp. No.</b>	<b>Location</b>	<b>Div</b>	<b>District</b>	<b>OIT ID</b>
8	8th & Wallace Streets (S/W Corner)	C	6	06-006
15	1800 Wylie Street (N/E Corner)	C	9	09-006
27	842 Leland Street (Middle of the block)	C	9	09-009
3	15th & Thompson Streets (S/W Corner)	C	22	23-035
9	Broad & Jefferson Streets (N/E Corner)	C	22	23-009
10	15th & Jefferson Streets (S/W Corner)	C	22	23-005
11	18th Street and Master Street (S/E Corner)	C	22	23-003
14	Carlisle Street & Oxford Avenue (S/E Corner)	C	22	23-044
26	Carlisle & York Streets (S/E Corner)	C	22	22-024
28	12th Street & Girard Avenue (N/W Corner)	C	22	23-037
30	Broad Street & Montgomery Avenue (S/W Corner)	C	22	23-011
1	Broad Street & Erie Avenues (N/W Corner)	E	25	25-014
6	Lee & Ontario Streets (S/E Corner)	E	25	25-009
20	5th Street & Girard Avenue (S/E Corner)	E	26	26-008
23	7th Street & Girard Avenue (N/W Corner)	E	26	26-015
5	Frankford Avenue & Pratt Street (N/E Corner)	NE	15	15-002
12	Penn & Pratt Streets (S/E Corner)	NE	15	15-021
29	4900 Griscom Street (S/E Corner)	NE	15	15-009
7	Chew Avenue & Washington Lane (S/W Corner)	NW	14	14-008
16	Cheltenham Avenue & Knox Street (S/W Corner)	NW	14	14-015
24	Chew Avenue & Pleasant Street (S/W Corner)	NW	14	14-019
22	5th & Rockland Streets (N/W Corner)	NW	35	35-014
25	18th Street & Wingohocking Street (N/E Corner)	NW	35	35-004
18	200 W. Cheltenham Avenue (South of Wayne Avenue)	NW	39	39-023
19	Wayne Avenue & Seymour Street (N/E Corner)	NW	39	39-022
21	600 Tasker St.	S	3	04-010
4	Hicks & Wharton Streets (S/W Corner)	S	17	17-014
17	52nd & Chestnut Streets (S/W Corner)	SW	18	18-003
2	5238 Lansdowne Ave.	SW	19	19-025
13	Salford & Market Streets (N/W Corner)	SW	19	19-017
31*	36th & Filbert St.	SW	16	16-002

\* Sample selected due to 2 additional cameras on 2.3.2013 inventory listing

**APPENDIX B:**  
**RTCC OBSERVATION FORM**

**APPENDIX B**  
**CITY OF PHILADELPHIA VIDEO SURVEILLANCE PROJECT FOLLOW-UP 2013**  
**OBSERVATIONS AT RTCC – DAY 1**

LOCATION: \_\_\_\_\_ CAMERA # \_\_\_\_\_

SAMPLE NO. \_\_\_\_\_ DIV. \_\_\_\_\_ DISTRICT \_\_\_\_\_

DATE OF OBSERVATION: \_\_\_\_\_ TIME OF OBSERVATION: \_\_\_\_\_

STAFF OBSERVER: \_\_\_\_\_

**Field of Vision Testing and Image Quality:**

1. Can individual be seen standing in front of the camera?

\_\_\_\_\_

2. Quality of Image? (snowy, clear, obscured, obstructed) \_\_\_\_\_

\_\_\_\_\_

3. **Camera Attributes:** (note visibility of t-shirt lettering, etc.)

**Movable**

**Tilt**

**Zoom**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. List all of the locations in proximity to the camera staffperson was asked to stand and visibility of staffperson at each location:

Location

Visibility

(1) \_\_\_\_\_

\_\_\_\_\_

(2) \_\_\_\_\_

\_\_\_\_\_

(3) \_\_\_\_\_

\_\_\_\_\_

5. Other Observations/Comments:

\_\_\_\_\_

**APPENDIX B**  
**CITY OF PHILADELPHIA VIDEO SURVEILLANCE PROJECT FOLLOW-UP 2013**  
**OBSERVATIONS AT RTCC – DAY 2 (RETURN)**

**Field of Vision Testing and Image Quality of VIDEO tape:**

6. Ability to find day/time tested \_\_\_\_\_

7. Quality of DAY Video in general (i.e., snowy, clear, obscured, obstruction)  
\_\_\_\_\_

8. Quality of DAY Video for each attribute and location tested (i.e., ability to see lettering, etc.) :

Movable                      Tilt                                      Zoom  
\_\_\_\_\_

Location 1 \_\_\_\_\_

Location 2 \_\_\_\_\_

Location 3 \_\_\_\_\_

9. Quality of NIGHT Video in general (i.e., snowy, clear, obscured, obstruction, dark)  
\_\_\_\_\_

10. Quality of NIGHT Video for various locations:

Movable                      Tilt                                      Zoom  
\_\_\_\_\_

Location 1 \_\_\_\_\_

Location 2 \_\_\_\_\_

Location 3 \_\_\_\_\_

11. Other Observations/Comments:

\_\_\_\_\_

**APPENDIX C:**  
**OBSERVER SURVEY FORM**  
**(ON LOCATION)**

**APPENDIX C**

**CITY OF PHILADELPHIA VIDEO SURVEILLANCE PROJECT FOLLOW-UP 2013  
OBSERVER SURVEY FORM**

**LOCATION:** \_\_\_\_\_

**DATE OF OBSERVATION:** \_\_\_\_\_ **TIME OF OBSERVATION:** \_\_\_\_\_

**OBSERVER NAME:** \_\_\_\_\_

**Physical Appearance Testing:**

1. What is the physical appearance of the camera at this location? (Ex: intact, bagged, missing, other, etc.) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Take a picture of the camera at this location (with street signs, if possible)

3. **CALL 215-XXX-XXXX**

**Field of Vision Testing:**

**List all of the locations in proximity to the camera you were asked to stand:**

- (1) \_\_\_\_\_
- (2) \_\_\_\_\_
- (3) \_\_\_\_\_
- (4) \_\_\_\_\_

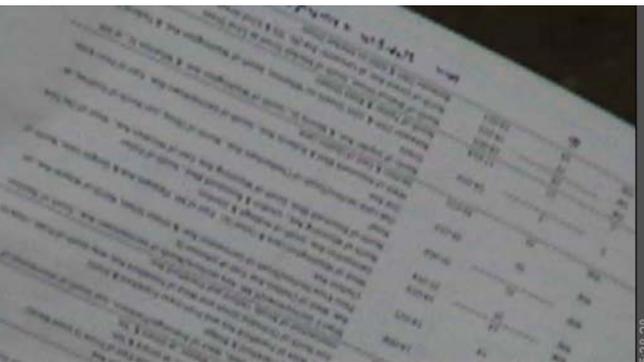
4. **Other Observations/Comments:**

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

**APPENDIX D:**  
**FEBRUARY 5, 2013**  
**OBSERVATIONS & COMPARISONS**

APPENDIX D

Video Surveillance Cameras – City of Philadelphia  
31 Sampled Cameras

Sample No.	Location/ (OIT ID)	EisnerAmper's Observation 2/5/2013	Conditions/Comments	OIT Status (2/12/2013)	Image
1	Broad & Erie (25-014)	Problems with Camera	<ul style="list-style-type: none"> <li>• very blurry images with zoom</li> <li>• could not see individual under camera with zoom</li> <li>• no identifiable features without zoom</li> <li>• black and white only, some red</li> <li>• condensation, fogginess</li> </ul>	Working/ Visual Inspection	
2	5238 Lansdowne Ave (19-025)	Problems with Camera	<ul style="list-style-type: none"> <li>• image of print at close zoom under camera is blurred</li> <li>• cannot read license plates or see facial features clearly without zoom</li> <li>• blurry at very close zoom in</li> <li>• auto-tour not functional</li> </ul>	Working/ Visual Inspection	

APPENDIX D

Sample No.	Location/ (OIT ID)	EisnerAmper's Observation 2/5/2013	Conditions/Comments	OIT Status (2/12/2013)	Image
3	15 <sup>th</sup> & Thompson St. (23-035)	Problems with Camera	<ul style="list-style-type: none"> <li>black and white picture with spotty colors (some red and blue)</li> <li>zoom at 20-25' renders grainy image with no identifiable features discernable</li> <li>close zoom blurry</li> <li>at 70' zoom, some images are clear, others are not</li> </ul>	Working/ Visual Inspection	
4	Hicks & Wharton St. (17-014)	Functioning Camera	<ul style="list-style-type: none"> <li>without zoom, do not know if subject is B/W, M/F</li> <li>zoom at 100' becomes clear, can see face</li> </ul>	Working/ Visual Inspection	

APPENDIX D

Sample No.	Location/ (OIT ID)	EisnerAmper's Observation 2/5/2013	Conditions/Comments	OIT Status (2/12/2013)	Image
5	Frankford Ave. & Pratt (15-002)	Problems with Camera	<ul style="list-style-type: none"> <li>condensation in dome, appears as fogginess or water droplets</li> <li>black and white with select colors, some colors absent</li> </ul>	Working/ Visual Inspection Condensation Inside Dome; needs to be wiped	
6	Lee & Ontario (25-009)	No Image Displayed	<ul style="list-style-type: none"> <li>no image, pink screen</li> </ul>	Not Working/Visual Inspection; Tech is scheduled to visit site location on 2/18/2013	

APPENDIX D

Sample No.	Location/ (OIT ID)	EisnerAmper's Observation 2/5/2013	Conditions/Comments	OIT Status (2/12/2013)	Image
7	Chew & Washington Lane (14-008)	Functioning Camera	<ul style="list-style-type: none"> <li>• very clear 360 degree views with no zoom</li> <li>• some dome issues, scratches</li> <li>• zoom after real-time is heavily pixilated and unreadable</li> </ul>	Working/ Visual Inspection	
8	8 <sup>th</sup> & Wallace St. (06-006)	No Image Displayed	<ul style="list-style-type: none"> <li>• no image, pink screen</li> </ul>	Working; technician reset camera, which resolved issue on 2/6/2013	

APPENDIX D

Sample No.	Location/ (OIT ID)	EisnerAmper's Observation 2/5/2013	Conditions/Comments	OIT Status (2/12/2013)	Image
9	Broad & Jefferson (23-009)	Functioning Camera	<ul style="list-style-type: none"> <li>• close zoom at ATM provides a very clear picture</li> <li>• across the street from the ATM, without zoom, cannot see lettering and face is blurry</li> <li>• zoom of one view partially obstructed by traffic light</li> </ul>	Working/ Visual Inspection	
10	15 <sup>th</sup> & Jefferson (23-005)	Problems with Camera	<ul style="list-style-type: none"> <li>• problems with pan, tilt and zoom control</li> <li>• at 22-25', decent image without zoom, face a little blurry and cannot read shirt lettering</li> <li>• one view of camera is obstructed by tree branches</li> <li>• one view of camera shows pink screen (no image)</li> </ul>	Working/ Visual Inspection	

APPENDIX D

Sample No.	Location/ (OIT ID)	EisnerAmper's Observation 2/5/2013	Conditions/Comments	OIT Status (2/12/2013)	Image
11	18 <sup>th</sup> & Master (23-003)	Functioning Camera	<ul style="list-style-type: none"> <li>• overall image without zoom is clear but some blurriness of facial features and shirt lettering</li> <li>• camera's zoom is very good, very clear</li> <li>• one view of camera is obstructed by telephone pole</li> </ul>	Working/ Visual Inspection	
12	Penn & Pratt St. (15-021)	No Image Displayed	<ul style="list-style-type: none"> <li>• no camera present at location, only mounting equipment</li> </ul>	Not Working/ Tech Suggest to Run Fiber to the Camera	

APPENDIX D

Sample No.	Location/ (OIT ID)	EisnerAmper's Observation 2/5/2013	Conditions/Comments	OIT Status (2/12/2013)	Image
13	Salford & Market (19-017)	No Image Displayed	<ul style="list-style-type: none"> <li>No image, pink screen</li> </ul>	Not Working/ Camera site not visited by technician for repair/ troubleshooting	
14	Carlisle & Oxford St. (23-044)	No Image Displayed	<ul style="list-style-type: none"> <li>No image, pink screen</li> </ul>	Not Working/ On 2-8 fiber was installed, on 2-14 techs scheduled to swap out Axis camera with Sony Camera	

APPENDIX D

Sample No.	Location/ (OIT ID)	EisnerAmper's Observation 2/5/2013	Conditions/Comments	OIT Status (2/12/2013)	Image
15	1800 Wylie St. (09-006)	Problems with Camera	<ul style="list-style-type: none"> <li>• clear image, but no pan, tilt and zoom capability</li> <li>• cannot see individual's features standing under camera and cannot zoom for better visibility</li> </ul>	Working/ Visual Inspection	
16	Chelton & Knox (14-015)	Problems with Camera	<ul style="list-style-type: none"> <li>• water in the dome</li> <li>• big blob of brown debris on lens</li> <li>• cannot see image of individual across the street from camera without zoom</li> <li>• zoom was hard to control</li> </ul>	Working/ Visual Inspection; Dome needs to be cleaned	

APPENDIX D

Sample No.	Location/ (OIT ID)	EisnerAmper's Observation 2/5/2013	Conditions/Comments	OIT Status (2/12/2013)	Image
17	52 <sup>nd</sup> & Chestnut St. (18-003)	No Image Displayed	<ul style="list-style-type: none"> <li>no image, pink screen</li> </ul>	Not Working/ Visual Inspection	
18	200 W. Chelton Ave (39-023)	No Image Displayed	<ul style="list-style-type: none"> <li>no image, pink screen</li> </ul>	Not Working/ Visual Inspection; to resolve no image add wireless camera	

APPENDIX D

Sample No.	Location/ (OIT ID)	EisnerAmper's Observation 2/5/2013	Conditions/Comments	OIT Status (2/12/2013)	Image
19	Wayne & Seymour (39-022)	No Image Displayed	<ul style="list-style-type: none"> <li>no image, pink screen</li> </ul>	Not Working/ Visual Inspection; technician scheduled to visit site on 2/19/13	
20	5 <sup>th</sup> & Girard Ave (26-008)	No Image Displayed	<ul style="list-style-type: none"> <li>no image, pink screen</li> </ul>	Not Working / Visual Inspection; Camera was discussed on 2/6 and will be addressed at a later date	

APPENDIX D

Sample No.	Location/ (OIT ID)	EisnerAmper's Observation 2/5/2013	Conditions/Comments	OIT Status (2/12/2013)	Image
21	600 Tasker St. (04-010)	Functioning Camera	<ul style="list-style-type: none"> <li>• 20-25' with zoom lettering is visible and facial features are clearer</li> <li>• view across the street, face is grainy and details are not sharp</li> <li>• 60'-70' across street with zoom is blurry</li> </ul>	Working/ Visual Inspection	
22	5 <sup>th</sup> & Rockland (35-014)	Functioning Camera	<ul style="list-style-type: none"> <li>• image and shirt lettering clear with zoom</li> <li>• one view partially obstructed by pole;</li> <li>• moving vehicles and moving pedestrians display jagged edges</li> </ul>	Working/ Visual Inspection	

APPENDIX D

Sample No.	Location/ (OIT ID)	EisnerAmper's Observation 2/5/2013	Conditions/Comments	OIT Status (2/12/2013)	Image
23	7 <sup>th</sup> & Girard Ave. (26-015)	No Image Displayed	<ul style="list-style-type: none"> <li>no image, pink screen</li> </ul>	Not Working / Visual Inspection; Fiber box needs to be reconstructed or separate from traffic box	
24	Chew & Pleasant (14-019)	Functioning Camera	<ul style="list-style-type: none"> <li>clear image of individual across the street with zoom;</li> <li>without zoom, cannot tell if individual is M/F, B/W</li> </ul>	Working/ Visual Inspection	

APPENDIX D

Sample No.	Location/ (OIT ID)	EisnerAmper's Observation 2/5/2013	Conditions/Comments	OIT Status (2/12/2013)	Image
25	18 <sup>th</sup> & Wingohocking St. (35-004)	Functioning Camera	<ul style="list-style-type: none"> <li>• zoom shows clear image, shirt lettering slightly blurred but readable</li> <li>• soft focus on all images</li> <li>• blurred effect on image in motion</li> </ul>	Working/ Visual Inspection	
26	Carlisle & York St. (22-024)	Functioning Camera	<ul style="list-style-type: none"> <li>• looking across the street with zoom at 25', lettering on shirt and face very clear</li> <li>• without zoom, cannot tell if person across the street is B/W, M/F</li> <li>• at 100-110', with zoom image is blurry, cannot make out lettering or facial features</li> </ul>	Working/ Visual Inspection	

APPENDIX D

Sample No.	Location/ (OIT ID)	EisnerAmper's Observation 2/5/2013	Conditions/Comments	OIT Status (2/12/2013)	Image
27	900 Leland St. (09-009)	Functioning Camera	<ul style="list-style-type: none"> <li>blurred motion, no sharp images without zoom</li> <li>very clear facial features and t-shirt lettering with zoom at 35'</li> </ul>	Working/ Visual Inspection	
28	12 <sup>th</sup> & Girard Ave (23-037)	Problems with Camera	<ul style="list-style-type: none"> <li>looks like there is a film over images</li> <li>failure of pan, tilt and zoom control</li> <li>no zoom images of entrance to drug store are fairly clear</li> <li>cannot read one-way sign 20' away</li> <li>cannot read letters on sign directly under camera 12-15' away</li> </ul>	Working/ Visual Inspection	

APPENDIX D

Sample No.	Location/ (OIT ID)	EisnerAmper's Observation 2/5/2013	Conditions/Comments	OIT Status (2/12/2013)	Image
29	4900 Griscom St. (15-009)	Problems with Camera	<ul style="list-style-type: none"> <li>• water in camera dome</li> <li>• condensation on lens</li> <li>• at 60' can see lettering on shirt, but facial features not clear</li> <li>• 360 degree not helpful due to height of camera at cable level, captures poles and cables</li> <li>• blurred zoom at 100' by emergency room entrance but license plates are legible</li> </ul>	Working/ Visual Inspection	
30	Broad and Montgomery (23-011)	Problems with Camera	<ul style="list-style-type: none"> <li>• dirt, soil on dome</li> <li>• image across the street is blurred but useable without zoom</li> <li>• 75-80' people are blurred, hard to tell if M/F, B/W</li> <li>• color is off, mostly black and white with spotty color for most views</li> </ul>	Working/ Visual Inspection; camera reset on 1-8-13	

APPENDIX D

Sample No.	Location/ (OIT ID)	EisnerAmper's Observation 2/5/2013	Conditions/Comments	OIT Status (2/12/2013)	Image
31	36 <sup>th</sup> & Filbert (16-002)	Problems with Camera	<ul style="list-style-type: none"> <li>intermittent pan, tilt and zoom control and strange angles</li> <li>image is slightly blurred, unable to read license plates with no zoom</li> </ul>	Working/ Visual Inspection	

Totals		
Problems with Camera/ No Image Displayed	21	67.7% of total sample
Functioning Cameras	10	32.3% of total sample

**APPENDIX E:**  
**COMPARISON OF PHILADELPHIA'S**  
**AND BALTIMORE'S**  
**VIDEO SURVEILLANCE PROGRAMS**

## Appendix E

### Comparison of Philadelphia's and Baltimore's Video Surveillance Program

The following presents a comparison of Baltimore's CitiWatch program to the City of Philadelphia's video surveillance program and the PPD's Real Time Crime Center.

#### Differences

Category	City of Baltimore	City of Philadelphia
Number of cameras	622	202
City population (est.)	621,000	1,514,000
Citizens per camera	998	7,495
Brand of cameras	DVTEL  Tele-tector of Maryland, Inc. installs new cameras and provides maintenance on existing cameras	Sony & Axis  Carr & Duff: new equipment and equipment installation  Federal Signal: connection, repair and other maintenance services
Video surveillance software	DVTEL  By Tele-tector of Maryland, Inc.	TimeSight  By TimeSight Systems
Uptime (working without problems)	Reported to be 97%	Observed at 32%
Technology staffing	Two (2) members of the Technology Group (both engineers) are 100% (full time) dedicated to the video surveillance project. While they both work regular business hours (9-5), one engineer is always on call 24 x 7. The Director of the Technology Group until recently had been 100% dedicated to the project, as well. He is now the head of fiber optics for the City of Baltimore in addition to heading the technical portion of the video surveillance project.	No members of OIT are or have ever been 100% (full time) dedicated to the video surveillance project. OIT is not on call 24 x 7 to the video surveillance program. OIT supports the RTCC during regular weekday business hours.

Category	City of Baltimore	City of Philadelphia
Police Department staffing	<p>Uses BPD retired police officers (hired as consultants by a related company formed by the City of Baltimore).</p> <p>Minimum staffing for a given shift consists of 2 retired police officers. Staffing is at lowest levels in the morning with staff progressively added during the course of the day – commensurate with crime rates.</p>	<p>Uses PPD active police officers. For any given shift, the minimum staffing is comprised of 1 police supervisor, 1 police detective and 1 civilian criminal analyst.</p>
Vendor support	<p>Uses one outside vendor to handle the integration of all cameras (numerous brands of cameras obtained over the years from various vendors). The vendor also installs new cameras, performs maintenance on existing cameras and supports the video surveillance software.</p>	<p>Uses multiple vendors to handle various aspects of the camera program.</p>
Maintenance	<ul style="list-style-type: none"> <li>• Preventative/scheduled maintenance is performed on each of Baltimore’s 622 cameras by the outside vendor at least once/quarter. One service truck is stationed to perform daily cleanings of cameras/domes M-F.</li> <li>• Three trucks service cameras throughout the City M-F.</li> <li>• BPD reports of cameras in need of maintenance are typically responded to within a 24 hour time frame, unless parts are needed.</li> </ul>	<ul style="list-style-type: none"> <li>• There is no preventative maintenance program in place in Philadelphia at this time</li> <li>• PPD reports the status of cameras weekly to OIT. OIT evaluates where the camera fits into the Video Camera Priority List developed by the PPD in March of 2012. This list is used by OIT to determine the order in which the cameras reported as having problems should be addressed</li> <li>• Based on the sample of 31 cameras tested, the turnaround time for addressing cameras reported as not working (9 of 31) or having problems (5 of 31) was no less than 5 weeks.</li> </ul>

Category	City of Baltimore	City of Philadelphia
Police Operations	There are 17 video surveillance workstations located at the CitiWatch headquarters, plus all of Baltimore's 9 police districts are equipped with one workstation per district which have access to live and archived video.	All video surveillance workstations are centralized at the PPD RTCC. There are no workstations located in any of Philadelphia's 21 police districts.
Software capabilities	Can watch 24 tiles (camera locations) at one time. Dashboard is user-configurable.	In the current TimeSight system, the maximum number of cameras allowed per monitor is 36, however, the tiles are too small to effectively observe any activity. The RTCC believes a 3x3 tile view, or 9 cameras per monitor, is the smallest practical tile size for viewing video. The current workstation configuration is equipped with three monitors, thus 27 cameras can be monitored at one time. While the new Wisdom system can only be displayed on two monitors, it is configurable for the size and number of video windows; in Wisdom, the smallest practical viewing size is generally a 4x4 configuration displaying 16 camera feeds. If 2 monitors are placed in video mode, this would allow for 32 camera views at one time.
New camera locations	Police perform physical site surveys for potential camera locations. Every 7 days new camera locations are taken under consideration. Factors for placing new cameras include whether there is already another camera (i.e., traffic) at a location, the logistics of installing a camera at a location, and crime statistics over the past 2 years +.	Approximately five years ago, a network design for the installation of 250 cameras was developed. Thus far, new camera placements have continued to follow the same network design.

Category	City of Baltimore	City of Philadelphia
Camera positioning	Most cameras are mounted on (14') arms.	Most cameras are mounted on poles (no arms).
Signage	Location of every camera is public; signs are mounted on poles at each camera location.	Camera locations are confidential (i.e., locations are not purposefully made public).
Camera settings	<ul style="list-style-type: none"> <li>• Camera auto tours are set by police personnel and can be changed at any time. More than one tour is set per camera (depending on time of day). Up to 60 different tours can be set per camera.</li> <li>• All cameras are set to revert to night mode.</li> </ul>	<ul style="list-style-type: none"> <li>• Camera auto tours are set by OIT, not police personnel. Tour settings have not been changed on cameras for some time.</li> <li>• Most cameras are not set to revert to night mode.</li> </ul>
Image quality	<ul style="list-style-type: none"> <li>• No noticeable aliasing of movement (i.e., movement appears clear, no jagged edges).</li> <li>• Images were generally sharper and clearer than Philadelphia's cameras.</li> </ul>	<ul style="list-style-type: none"> <li>• Movement for cameras tested was generally aliased (i.e., jagged edges, loss of detail).</li> <li>• Sharpness of images depended on camera. Even the sharpest image however, did not appear as sharp as the Baltimore camera images.</li> </ul>

### Similarities

- A Technology Group coordinates support of the camera equipment, installation of new equipment and cabling.
- The video surveillance (real time) monitoring activity is performed by police personnel.
- Both cities retain 28 days' worth of video.
- Camera compression settings are changed by the Technology Group (not police personnel).
- Streets Departments assist with the running of cable, as needed.
- The majority of post processing work (i.e., enhancing images, etc.) is outsourced.

- Neither City's video surveillance unit functions as a true "watch center" or "virtual patrol" in which events are monitored and captured the moment they occur. Both respond to 911 calls, police radio calls and requests for information by police detectives investigating crimes that are in progress or have already occurred to aid in the apprehension of suspects. However, of the two, Baltimore's use of video surveillance tends to be more "crime driven," as the unit looks at current conditions and crime statistics to determine which locations to focus on in a given day. While the PPD RTCC considers itself to be more "event driven," they are cognizant of current crime conditions in the City and will survey locations with that in mind.