



PROJECT GREENLIGHT DETROIT: EVALUATION REPORT

**MICHIGAN STATE UNIVERSITY
SCHOOL OF CRIMINAL JUSTICE
MICHIGAN JUSTICE STATISTICS CENTER**

DECEMBER 2020

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This project was supported by Grant No. 2016-WY-BX-0005 awarded by the Bureau of Justice Assistance. The Bureau of Justice Assistance is a component of the U.S. Department of Justice's Office of Justice Programs, which also includes the Bureau of Justice Statistics, the National Institute of Justice, the Office of Juvenile Justice and Delinquency Prevention, the Office for Victims of Crime, and the Office of Sex Offender Sentencing, Monitoring, Apprehending, Registering, and Tracking. Points of view or opinions in this document are those of the authors and do not necessarily represent the official position or policies of the U.S. Department of Justice.

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Executive Summary

Project Greenlight Detroit (PGLD) represents an innovative approach to public safety. PGLD involves a partnership between the Detroit Police Department (DPD), the city of Detroit, and business owners. PGLD is a multiple component strategy that involves the installation of high-quality video systems in and around retail, service, and multi-unit residential locations; monitoring of the cameras in a Real-Time Crime Center; priority call response; and supportive collaboration between DPD and PGLD participants. PGLD is best viewed as part of a comprehensive set of crime and violence reduction strategies developed by DPD and its local, state, and federal partners over recent years. These comprehensive strategies include interventions aimed at high rate, repeat offenders, gangs and groups involved in violent crimes and shootings, and outreach, prevention, and community development strategies. PGLD represents a place-based intervention that builds upon crime analysis that indicates a small number of geographic locations account for a disproportionate amount of the crime and violence that occurs in the city. Additionally, these crime analysis patterns have revealed that violent crime is concentrated among a small proportion of street segments, particularly those where gas stations, bars and taverns, and small commercial entities such as convenience stores are located. Particularly, when combined with indicators of illicit drug sales, these types of locations demonstrate high risk for fatal and nonfatal shootings and other types of violent crime. PGLD represents a strategic response to these crime patterns based upon the partnership of the City, DPD, and PGLD business and property owners.

This report presents the results of a multi-year evaluation of PGLD. The report provides background on the development and key components of PGLD, provides insight into the implementation and key program outputs, and then examines the potential impact of PGLD on crime. The evaluation is complicated because of the nature of the PGLD program itself. In effect, the program has been in a continual “roll-out” since its launch in 2016. Thus, the program began with 77 PGLD locations in 2016 and has added 138, 235, 204 new locations from 2017-2019, respectively. Even in 2020, during the COVID-19 pandemic, an additional 62 PGLD locations were enrolled through the end of November. Indeed, the expansion of PGLD, requiring initial and ongoing investment by the business owner, represents an indicator of the success of PGLD. Yet, from an evaluation perspective, this is more complicated than studying the impact of a program initiated at one point in time. Second, we have reason to believe that PGLD results in increases in reporting of crime, particularly property and disorder offenses, to the police. This makes it difficult to assess trends in crime – is an observed increase in incidents indicative of more crime or a greater willingness to report the incident? Third, PGLD was implemented during a period of multiple crime and violence reduction strategies. Overall crime trends indicate that these strategies have improved public safety in Detroit (see Table 1). Indeed, fatal and nonfatal shootings were 38 percent lower in 2018-19 compared to 2011-12 and since 2016 fatal and nonfatal shootings have declined 27 percent compared to the prior five years.

Similar to the trends in fatal and nonfatal shootings, there has been a very encouraging decline in carjacking since the implementation of PGLD. As Figure 1 displays, carjackings have declined 38 percent from 2016 when PGLD was first implemented to 2019. We cannot directly attribute the citywide decline to PGLD, but carjacking is the type of public incident, with people in vulnerable contexts (a vehicle either on or with keys in proximity), for which you would expect

PGLD to have a deterrent effect. This is reinforced with an absolute decline in carjacking at PGLD locations, despite the significant increase in the number of PGLD participating locations.

Having noted these positive trends, it becomes very difficult in distinguishing the impact of any one of these strategies relative to the other strategies. In other words, DPD and its partners have developed comprehensive public safety strategies as recommended by prior research that suggests focusing on high-risk people, groups, and places. Having done so, the situation for the evaluation team is complex. Readers are cautioned to keep these nuances in mind.

Key Findings:

- PGLD is a multiple component strategy. At first glance, it appears to be a Closed-Circuit Television camera (CCTV) crime prevention strategy. Camera technology is a key component, but the program goes beyond typical CCTV approaches by including a formal partnership, clear standards and compliance enforcement, monitoring through a RTCC, priority call response, and follow-up by precinct officers and command staff.
- PGLD is popular as evidenced by the significant growth in the program (from 8 to 700+ PGLD participants since early 2016). This is more striking when considering that the business or property owner must make an initial financial investment as well as ongoing maintenance costs. This point is reinforced by the small number of program drop-outs over the 4+ years of PGLD as well as in interviews conducted with a small number of PGLD business owners.
- Incidents that were cleared by arrest increased at PGLD locations compared to non-PGLD locations. The largest increase was for carjacking. Indeed, clearances for PGLD-related carjackings were 38 percent compared to 19 percent at non-PGLD locations. Clearance by arrest for robberies increased from 11 percent to 15 percent. Clearances also increased for nonfatal shootings (from 24% to 30%) and for homicides (from 42.4% to 45.4%), although we were unable to rule out that this increase may have been due to random error. The total category (carjacking, robbery, nonfatal shootings, homicides) reflected a statistically significant increase in clearance by arrests at PGLD locations.
- The analysis of impact at the adjudication stage was limited due to a relatively small number of PGLD-related cases reaching the final disposition stage. Given this qualification, there was some indication that PGLD-related incidents were more likely to result in guilty pleas, guilty dispositions, prison/jail sentences, and maximum sentence length. This may reflect the greater availability of video evidence in PGLD cases.
- Overall, we found limited impact of PGLD participation on trends in crime. PGLD locations tended to have higher rates of crime, both before and after implementation of PGLD, than a similar sample of parcels that did not participate in PGLD. These higher rates of crime likely motivated participation in PGLD. There were increases in property and disorder crimes at PGLD locations with no measurable change in violent crime. We believe this likely reflects increased reporting of crime incidents, particularly less serious offenses, at PGLD locations. This interpretation gained support through a limited number of interviews with business owners along with media and public testimony, where PGLD participants reported they were much more likely to report a crime because they believed it would receive attention by DPD.

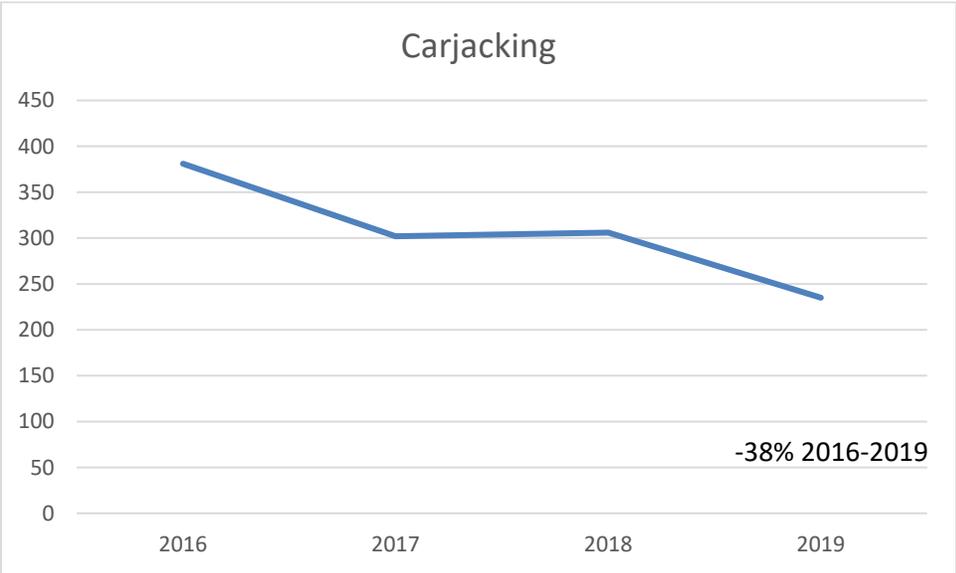
- One offense, carjacking, did decline substantially since the introduction of PGLD. Despite the significant growth in the enrollment of PGLD premises, the absolute number of carjacking incidents at PGLD locations declined by 46 percent from 2017 to 2019. Although there was also a decline in carjacking at non-PGLD locations, the decline at PGLD locations was about twice as large, thus suggesting the impact of PGLD. There was also a citywide decrease in carjacking during the period that PGLD was implemented. The findings suggest that PGLD contributed to the decline citywide as well as at specific PGLD locations.
- Finally, as noted above, although we cannot directly attribute the cause of the decline in shootings to PGLD, the trends in fatal and nonfatal shootings as well as carjacking, are welcome indicators of increased public safety during the period that PGLD has been operational.

Context of Increased Public Safety

Table 1: Fatal and Non-Fatal Shooting Trends, Detroit 2011-2019

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fatal	299	333	282	232	241	249	220	222	228
Non-Fatal	1273	1266	1192	1054	1039	957	841	753	767
Total	1572	1599	1474	1286	1280	1206	1061	975	995
Per month	131	133.3	122.8	107.2	106.7	100.5	88.4	81.25	82.92
						Percent change 2018-19 to 2011- 12		-37.9	
						Percent change 2016-19 to 2011- 15		-26.6	

Figure 1: Carjacking, 2016-19



Introduction

Project Green Light Detroit (PGLD) was designed to prevent, detect, and solve crime. The crime control strategy employed by the Detroit Police Department (DPD) builds upon closed-circuit television (CCTV) camera monitoring but adds to the technology through establishing active partnerships with the business community. While the concept of using video cameras to deter crime and video footage to detect or solve crimes is not new, the proactive integrated partnership between police and business is unique. As will be discussed in greater detail, the partnership involves an agreement by the business or property owner to install and monitor high quality camera technology along with a visible green light and signage; development and implementation of quality standards; monitoring of the cameras in a Real Time Crime Center (RTCC); support from a specially trained audio visual evidence response team; prioritization of police calls for service to PGLD locations; and collaboration between precinct leadership and the PGLD participants.

PGLD represents a place-based crime prevention and control strategy that complements people-, and group-based prevention strategies developed by DPD to reduce violent crime and enhance public safety.

Prior Research and Implications for PGLD

Most of the prior research with relevance to PGLD comes from studies of CCTV. As noted above, CCTV is a component of PGLD but PGLD goes well beyond CCTV. Indeed, the limitations of CCTV for crime prevention suggested in prior research are addressed in the program components of PGLD. (See Appendix for a more thorough review of prior research.)

Prior research on CCTV as a crime prevention strategy generally indicates that CCTV has a moderate crime prevention effect. The impact is more significant for certain types of crime (e.g., more visible crime occurring outside within camera range; McClean, 2013). As predicted, CCTV technology appears to enhance evidence availability (Ashby, 2017; Yung-Lien, 2018). Interviews with known offenders revealed that for CCTV to have a deterrent effect, the cameras needed to be visible (Willis et al., 2017). Several studies found that CCTV crime prevention efficacy was enhanced when the camera coverage (“watershed”) was increased and when camera placement considered potential crime attractors and generators (Piza et al., 2014; Welsh & Farrington, 2007; LaVigne et al., 2011). There was also some evidence that active monitoring of cameras was more effective (LaVigne et al., 2011) but other studies note that active monitoring is not a simple panacea (see discussion in Appendix).

The implications of this research are evident in PGLD program components:

- High quality camera technology
- Visibility through signage and flashing green light
- Active monitoring
- High standards and consultation with DPD on camera locations and coverage

Evaluation Methods

This study utilizes multiple methods to better understand the development, implementation, evolution, and impact of PGLD. One component of the evaluation involved a detailed process assessment. The process assessment involved qualitative research methods including review of documents, key participant interviews with PGLD personnel, ride-alongs, and interviews with a small group of PGLD business owners. This resulted in a comprehensive case study that we believe will be of value to DPD as well as to other jurisdictions interested in developing a Greenlight-type program. The case study is summarized in the following sections and the full case study is included as Appendix.

The research team worked with PGLD and DPD Analytics Specialists to study the impact of PGLD on crime incidents resulting in clearance by arrest. This involved identifying crime incidents at PGLD locations as well as incidents where evidence was captured by PGLD cameras. It also involved developing a comparison group of incidents occurring at non-PGLD locations. Details are provided in the subsequent section on arrests.

Having identified arrests occurring at PGLD locations or involving potential video evidence, as well as comparable incidents at non-PGLD locations, the next step in the analysis was to examine whether cases that did result in an arrest were more likely to result in a conviction. Here the focus was on violent crime incidents with the prediction that PGLD-related incidents would be more likely to result in conviction due to the presence of video evidence in certain cases.

The final step in the evaluation was to examine the impact of PGLD on crime. Here the research team worked with DPD to identify incidents occurring at PGLD locations as well as to identify incidents occurring at similar types of commercial parcels throughout the city. The commercial parcels not participating in PGLD served as a “counterfactual” to address the question of what would the crime trends at PGLD locations likely have been absent PGLD?

Process Assessment

Section 1: Background and Development of PGLD

As noted in the Executive Summary, DPD has developed a comprehensive set of violence reduction and public safety strategies. These strategies include the evidence-based Ceasefire and Project Safe Neighborhoods initiatives that focus on group and gang violence as well as repeat offending among a small group of chronic offenders. These strategies are complemented by enforcement strategies (e.g., Crime Gun Intelligence Center; GUNSTAT), intervention strategies (e.g., Ceasefire outreach), and prevention strategies (community engagement; youth mentoring and leadership). These strategies are supported by crime analysis, street level intelligence, multi-agency partnerships, and community engagement.

As these strategies developed, both law enforcement experience and advanced crime analysis techniques revealed that crime, and particularly violent crime, displayed clear geographic patterns. Specifically, violent crime was largely concentrated in geographic hotspots and specific street segments. Using a technique known as Risk Terrain Modeling, it was clear that street

segments characterized by gas stations, bars and liquor stores, and convenience stores, particularly in areas with illicit drug selling, were at disproportionate risk for violent crime, particularly shootings and robberies. These patterns provided a foundation for PGLD. Specifically, PGLD provided a concrete crime prevention strategy for physical locations at higher risk for violent crime.

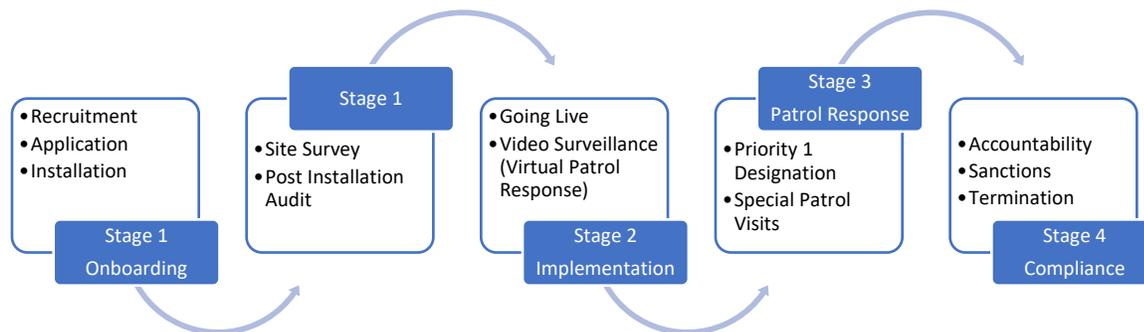
Given this assessment, and an initial focus on gas stations as hotspots for violent crime, DPD piloted PGLD at eight such establishments in January 2016. The program was immediately expanded and DPD set about involving business owners and communities in PGLD. While both groups were provided with information about the expected benefits of crime reduction, given the commitment and financial investment required on the part of the owners, the business groups were also offered incentives. Specifically, with the goal of creating safe havens throughout the city, participants in PGLD learned they would receive priority one designation on 911 calls for service as well as regular patrol drive throughs and visits.

As will be described subsequently, PGLD has grown significantly since January 2016. This has reflected active recruitment by DPD as well as apparent word of mouth. Key elements of PGLD’s program design can be understood through the processes involved in enrolling in PGLD.

PGLD Participation – From Onboarding to Compliance

One of the unique features of PGLD is that program participation involves a series of stages. These include onboarding, implementation, patrol response, and compliance (See Figure 2).

Figure 2: PGLD Program Participation Process



Stage 1: Onboarding

Recruitment

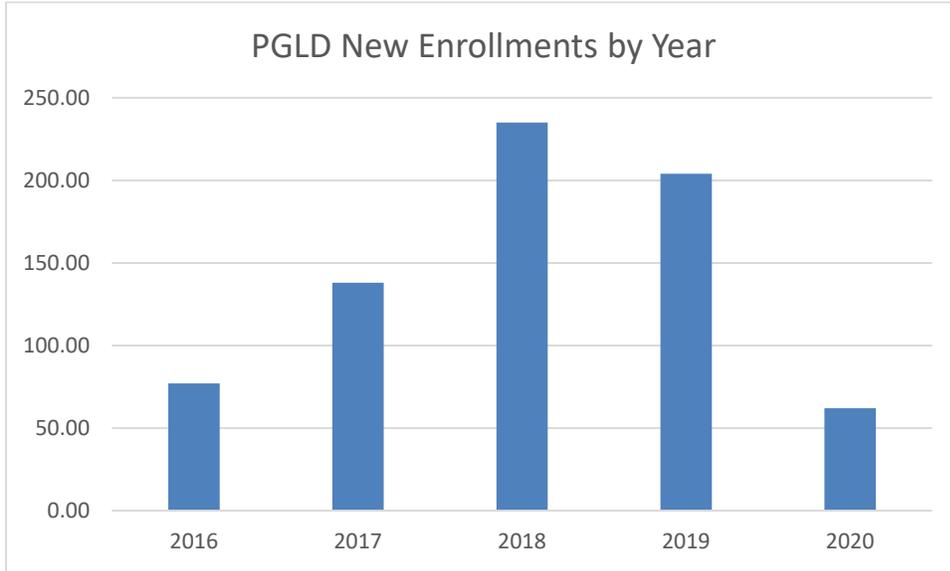
The onboarding process involves recruitment, installation, a site survey, and post installation audit.

Initially, much of the PGLD recruitment was done by DPD. With their own experience of responding to crime incidents at local businesses, as well as the crime analysis identifying place-based violent crime risk factors, DPD leadership through the precincts reached out to potential program participants to explain PGLD and encourage participation. The formal recruitment plan involved precinct commanders and Neighborhood Police Officer (NPOs) visiting targeted businesses to gauge and generate interest. To ensure that the program progressed, precincts were held accountable to document recruitment efforts. These efforts were reinforced by the Mayor and Chief who helped publicize PGLD and encourage participation.

DPD provided training and developed resource materials to assist personnel in the PGLD recruitment. This included some of the benefits of participation that included monitoring the cameras in the RTCC, priority one police response to calls for service occurring at PGLD locations, “special patrol visits” whereby routine patrol cars make a point to pass by PGLD locations, and the advice provided by DPD for camera installation and related crime prevention tips. These formal benefits were complemented by business owner’s desire to enhance public safety for customers and employees (see Appendix).

The benefits are important given the costs associated with PGLD participation. Business and other parcel owners participating in PGLD are responsible for purchasing and installing the high-quality cameras (estimated at \$4,000 - \$6,000) as well as for monthly service fees. To address these potential cost disincentives, the City and DPD worked with some local businesses and associations to develop grants to offset some of the costs for eligible businesses. These recruitment efforts have been very successful as displayed in Figure 3.

Figure 3: Enrollments in PGLD by Year



Note – 2020 data is current as of 11/30/2020. Provided by PGLD staff.

One of the key indicators of the success of PGLD is this increased enrollment. As Detroit Mayor Michael Duggan pointed out in 2019 “the city hasn't had to sell the program to businesses. They're selling it to each other through word of mouth” (Donnelly, 2019).ⁱ As displayed in Figure 3, the initial 8 gas station participants in 2016 has increased to over 700 in 2020.

The additional pattern observed since its launch in 2016 is the growth in other types of parcels participating in PGLD. These include service organizations such as churches and non-profits as well as multi-unit residential parcels such as apartment complexes. As of 2020, 62 percent of PGLD participants were retail businesses, 25 percent service organizations, and 13 percent multi-unit residential. Additionally, some of the PGLD participants involve a “corridor” where a group of owners cooperate in a multi-unit Greenlight location.

Application

The application process to enroll in PGLD has evolved over time. The process is now automated with an online application on the City of Detroit website. The application includes details about the business type and location as well as information about camera and lighting requirements and vendor options. The application includes a Memorandum of Understanding (MOU) that establishes the terms of agreement of the PGLD participant, the City, and DPD. Of note in the application and the MOU are the clear standards for compliance (see Appendices A and B) as well as the commitment of the City and DPD. These standards and agreements are considered essential elements of PGLD that support quality control and include dimensions such as:

- Quality standards for cameras and lighting
- Placement of cameras
- Signage and fixtures
- Remote access to video, video storage
- High speed internet connections

Similarly, the MOU addresses DPD commitments for video monitoring, surveillance, patrols, and meetings.

The formalization of the application and the development of the online application system has seemingly improved efficiency. Specifically, the onboarding time from application to start-up has declined from an average of 55 days to 21 days (see Appendix).

Installation

Upon receipt of the application, the next step involves a site survey. The site survey involves a planned meeting with a specialist from DPD’s Audio Video Evidence Response Team (AVERT), the parcel owner, and the camera installer (from one of the approved vendors). Led by the AVERT specialist, the survey involves determining how many cameras are needed, where they need to be placed, and appropriate angling. This includes design considerations to prohibit video capture that could violate the 4th Amendment of the Constitution (e.g., a camera with views into a residential door or window).

The site survey results in a quote by the vendor to the parcel owner of installation of cameras compliant with PGLD standards and the plan outlined in the site survey. This information is also recorded by DPD to support future audits for compliance with PGLD standards.

Post-Installation Audit

With the installation of cameras, the AVERT specialist returns to the location, meets with the vendor, and ensures that the cameras are appropriately installed. With a successful audit, the AVERT officer works with DPD technology specialists to connect the new PGLD participant with the RTCC. Once the connection with the RTCC is “live,” the parcel owner can then order and install signs, decals, and the flashing green light. This leads to another DPD visit to ensure that the signage and lighting is installed properly. This leads to a “compliance book” for the business indicative of the successful audit and providing a foundation for future compliance monitoring.

Stage 2: Implementation

Real Time Crime Center (RTCC)

The network of PGLD cameras is monitored by the DPD RTCC. Located at the Detroit Public Safety Building, the RTCC is a 24-hour, 7-day per week operation. The RTCC includes officers and analysts that monitor approximately 3,000 PGLD cameras from over 700 locations. The RTCC interfaces with the 911 call center. The analysts monitor cameras and engage in virtual

patrol. Calls for service involving PGLD locations and cameras generate an alert that can trigger the virtual support. RTCC analysts also support DPD officers, investigators, and special units by conducting tactical and strategic intelligence.

When a 911 call indicates a PGLD location, the analyst will view footage and can communicate with responding patrols. This serves investigatory, public safety, and officer safety goals. The analyst can also communicate with the PGLD site representative.

The RTCC serves as a critical resource utilizing the camera technology but also supporting the PGLD business, responding officers, and follow-up investigation. More detail is provided in Appendix.

Stage 3: Police Patrol Response to PGLD Locations

Two types of patrol are relevant for PGLD participants. The first is priority one patrol response. The second involves more proactive special patrol visits.

The priority one patrol response reflects a prioritization of 911 calls for service to PGLD locations. Essentially, this involves priority for an immediate response unless all available patrol cars are currently responding to a higher priority call.

The special patrol visits refer to patrol calls giving special attention to driving by or stopping in to PGLD locations when they are on patrol and have discretionary time available. This is like special patrols routinely used whereby DPD supervisors, typically during roll-call, will ask patrols to drive by and pay attention to certain locations while on patrol. These can include known hotspots, areas that may have received a complaint about illicit activity (e.g., suspected drug dealing), or similar locations where the patrols are intended to provide a crime prevention effect. PGLD locations represent specific areas to be included in discretionary patrols.

Related to the special patrols, DPD precinct commanders will have officers conduct patrols in and around PGLD locations. An example would be assigning a patrol car to drive through the PGLD parking lot. Similarly, the Neighborhood Police Officers (NPO) will periodically visit the PGLD premises. DPD tracks patrols at PGLD locations and estimated over 40,000 special patrol visits annually (see Appendix).

DPD also conducts PGLD site visits. These are described as wellness checks where a DPD officer will enter the PGLD location, conduct a scan of the premises, and check in with the business owner or employees. The officer will log the visit in a PGLD book that is maintained by the PGLD participant. The precinct NPO will periodically retrieve the logbook entries with the records becoming a key element of the PGLD tracking system to support program accountability.

Stage 4: Compliance

A notable component of PGLD is that it follows clear standards as well as a compliance system to ensure the standards are followed. As described above, the standards are built into the application, the site survey, and the installation and maintenance of the video cameras as well as

lighting and signage. It also includes factors such as the location and angles of the cameras and the internet connectivity with the RTCC. The above-described visits to PGLD locations provide an opportunity to review that the PGLD is adhering to the standards. Another example would be when the RTCC identifies a problem in terms of the live feed of camera video to the RTCC. When concerns arise, these are flagged in the PGLD tracking system for follow-up by a PGLD compliance officer. The compliance officer can correct the issue during a visit (e.g., changing the angle of a camera) or work with the parcel owner to rectify the issue. During ride-alongs and interviews, it became apparent that DPD PGLD staff work diligently to assist the parcel owner come into compliance. As described in Appendix, there is a formal process for removal of a PGLD participant that follows a graduated process of education and assistance, verbal and then written warnings, and a hearing. The finding that only a small number of PGLD's have been removed from the program (estimated at 41 in November 2020) reflects this commitment to support continued PGLD participation.

The compliance system extends beyond the PGLD owner to include the vendors serving PGLD. DPD provides training to the vendors and enters into MOU's with the vendors. One of the key items of the MOU is setting expectations about timeframes for responding to requests from PGLD owners. The MOU provides a mechanism for standards and accountability.

An additional component of the compliance system relates to AVERT. The team consists of DPD officers with special training in technology as well as in legal standards governing electronic evidence review, retrieval, and storage.

PGLD Participation – Summary of PGLD Owners Perceptions

As described above, the PGLD system is a highly structured system based on clear standards, a formal application, MOU's, response commitments, a RTCC, a specialized response team (AVERT), and compliance processes. A summary of the interviews of PGLD owners indicated support for PGLD with several common observations:

1. Most were motivated to participate in PGLD because they were convinced involvement would deter crime from occurring in or around their businesses.
2. Most applied a cost-benefit analysis upon considering entry into PGLD and concluded that involvement was a sound investment.
3. Most believe that participation in PGLD has in fact resulted in deterring crime on the property, especially exterior parking lots.
4. Specific types of offenses were perceived as deterred based on the PGLD treatment. Property offenses (e.g., theft or vandalism) and public order offenses (e.g., loitering or vagrancy) were most described as being prevented. One owner reported a reduction in crimes against persons.
5. Most customers and/or employees hold perceptions of being safer with the businesses' PGLD involvement as reported to the owners.
6. Most observed an improvement in police response time in 911 calls for service since entry into PGLD.
7. Many were not familiar with the accurate DPD process of how DPD handles 911 calls originating from PGLD sites.

8. Most were aware of the special patrol commitment by DPD and believe that DPD is fulfilling the commitment.

More detailed feedback provided by PGLD owners through interviews is presented in Appendix.

Section 2: Impact on Arrests

One of the presumed effects of PGLD is that the high-quality camera system would yield evidence when crime incidents occur that would result in arrest and prosecution. Indeed, a number of high-profile incidents have occurred at PGLD locations where very high-quality images were produced by the cameras. To test this assumed effect, we examined whether PGLD increased the proportion of incidents cleared by an arrest. We examined the violent crimes of homicide, nonfatal shootings, and robbery.

To conduct these analyses, MSU and DPD crime analysts identified incidents occurring at PGLD locations and nearby PGLD locations where PGLD cameras generated some video evidence related to the incident. These incidents are referred to as PGLD-related incidents. The comparison group of incidents were identified using a technique known as “furthest distance filtering.” Robberies, nonfatal shootings and homicides were selected based on their distance from a PGLD location as well as from incidents that included PGLD video evidence.

Having developed the sample of PGLD-related and non-PGLD related incidents, the key outcome was whether the incident was closed through an arrest or an “exceptional clearance.” Exceptional clearances are instances where the police believe they have the evidence to make an arrest, but some exceptional situation precludes an arrest, such as death of the suspect. We compare the percentage of the incidents cleared by arrest and conduct a statistical significance test (z-test) that estimates whether the observed differences are likely or unlikely to be the product of chance.

As displayed in Table 2, the difference in clearance rates were most pronounced for carjacking. For these offenses, incidents occurring at PGLD-related locations were cleared at nearly twice the rate as incidents at non-PGLD locations (38.2% vs. 18.7%). Robbery clearance rates were also higher for Greenlight-related incidents (14.6% compared to 11.3%) and this change was statistically significant. There was also an increase in clearances for nonfatal shootings from 24.2 percent to 30.3 percent. As of early December 2020, five of the 11 PGLD-related homicides (45%) had been cleared compared to just over 42 percent of the non-PGLD homicides.¹ For both the nonfatal shootings and homicides, the differences between PGLD-related and non-PGLD related clearances did not attain statistical significance. This means that the observed differences could be due to random error. The total category based on carjacking, robbery, nonfatal, and homicides also suggested that PGLD resulted in increased clearances for these violent offenses.

¹ The homicide clearance data were updated in December 2020 based on the likelihood that homicides will continue to be cleared due to ongoing investigations. For the other offense categories, the data were collected in summer 2020.

Table 2: Clearance by Arrest, Incidents Occurring at Greenlight-Related vs. Non-Greenlight Premises, 2017-19		
Offense	Greenlight-Related	Non-Greenlight Related
Carjacking		
Cleared by arrest*	26	135
Total	68	722
%	38.2%	18.7%
Significance Test	Significant <.05	
Robbery		
Cleared by arrest*	59	735
Total	404	6487
%	14.6%	11.3%
Significance Test	Significant <.05	
Nonfatal Shooting		
Cleared by arrest*	20	412
Total	66	1700
%	30.3%	24.2%
Significance Test	NS	
Homicide		
Cleared by arrest*	5	299
Total	11	706
%	45.4%	42.4%
Significance Test	NS	
Total (CJ,R,NFS,H)		
Cleared by arrest*	110	1581
Total	549	9615
%	20.0%	16.4%
Significance Test	Significant <.05	

*Includes clearance by an actual arrest or cleared by exceptional circumstances.

The DPD and MSU analysts also conducted a supplemental analysis to determine whether an AVERT response to the PGLD incident had an impact on clearance rates. As described above, AVERT is the legal entity within DPD that can retrieve camera evidence for use in court. They respond to incidents where the preliminary investigation suggests there may be video camera evidence of relevance to arrest and prosecution. AVERT, with specialized training in video evidence retrieval, chain of custody, and storage requirements, will then retrieve and process video evidence. This supplemental analysis was conducted for what the FBI's Uniform Crime Reports lists as Part I incidents occurring in 2017-18.

The results of this analysis are included in Table 3. These results indicate that when AVERT is asked to retrieve video evidence, there is an increase in arrest clearances for property and violent

crime incidents and the total Part I offenses.² These results suggest the potential for PGLD camera video to increase arrests and prosecutions, though it is worth noting that the majority of incidents did not result in AVERT responding likely due to a lack of video evidence.

Table 3 Clearance rates of incidents at PGLD locations by whether AVERT responded to the incident, 2017-18

Type of Crime	Total Part I		Violent Crimes		Property Crimes	
	AVERT - Yes	AVERT - No	AVERT - Yes	AVERT - No	AVERT - Yes	AVERT - No
# Cleared by arrest	45	103	25	58	20	45
Total incidents	353	2020	136	505	217	1415
Clearance rate	12.7%	5.1%	18.4%	11.5%	9.2%	3.0%
Statistically significant	*		*		*	

Impact on Adjudication

This section focuses on the impact of Greenlight footage on adjudication for serious, violent crimes. Crime incidents were narrowed down to incidents that occurred between 2017-2018 to allow for an adequate follow-up period for legal processing and adjudication. Data were obtained from the Detroit RMS, Project Greenlight Master list, Wayne County Prosecutor’s Office, 36th District Court online database, and a subset of bond data provided by the DPD. This resulted in a total of 1,004 cases, which was reduced to 710 cases due to missing data.

The conclusions from this analysis are limited to the relatively small number of PGLD-related incidents that had reached the prosecution and adjudication stage (N=40). Of these, only 23 had reached the final adjudication stage. There were no apparent demographic differences in terms of defendants in PGLD and non-PGLD incidents (see Table 4). There are some indications that PGLD-related cases may have resulted in somewhat stronger prosecution cases. This is reflected in the slightly higher proportion of guilty pleas, guilty dispositions, prison/jail sentences, and maximum sentence length. This may reflect the greater availability of video evidence in PGLD cases. Again, we urge caution in interpretation due to the small number of PGLD-related cases at final disposition.

² Part I crimes include the property crimes of larceny, motor vehicle theft, retail fraud, and burglary; and the violent crimes are murder, arson, robbery, and criminal sexual conduct of the 1st and 3rd degrees.

Table 4. Descriptive Information on All Cases that went to Prosecution (n = 710)

	Greenlight (n = 23-40)	Non-Greenlight (n = 448-670)
Variable	N (%)	N (%)
<i>Sociodemographic information</i>		
Age		
Mean (SD)	30.17 (10.62)	31.98 (11.16)
Range	20-62	18-81
Race		
Black	21 (91.30%)	622 (92.84%)
White	2 (8.70%)	48 (7.16%)
Sex		
Male	21 (91.30%)	607 (90.60%)
Female	2 (8.70%)	63 (9.40%)
<i>Case information data</i>		
Charge		
NFS	16 (40.00%)	201 (39.80%)
Robbery	24 (60.00%)	304 (60.20%)
Judicial status		
Final	19 (82.61%)	446 (66.57%)
Prosecutor	1 (4.35%)	98 (14.63%)
Closed	2 (8.70%)	72 (10.75%)
Warrant	1 (4.35%)	22 (3.28%)
District Court	--	1 (0.15%)
Open inactive	--	18 (2.69%)
Open active	--	13 (1.94%)
<i>Pre-trial information</i>		
Pre-trial status		
Bond	7 (31.81%)	240 (41.45%)
10% Bond	9 (40.91%)	139 (24.00%)
Remand	4 (18.18%)	130 (22.45%)
10% Bond with Tether	2 (9.10%)	40 (6.91%)
Bond (ROR)	--	18 (3.10%)
Bond with Tether	--	9 (1.55%)
Bond with Tether (ROR)	--	2 (0.34%)
10% Bond (ROR)	--	1 (0.17%)
Bond amount		
<\$25,000	3 (16.67%)	137 (30.58%)
\$25,000 - \$60,000	2 (11.11%)	76 (16.96%)
\$60,001 - \$175,000	9 (50.00%)	119 (26.56%)
\$175,001 - \$2,000,000	4 (22.22%)	116 (25.89%)

Table 4 - continued		
<i>Trial information</i>		
Disposition		
Plead guilty	12 (52.17%)	306 (48.49%)
Plead not guilty	9 (39.13%)	291 (46.12%)
No contest	2 (8.70%)	34 (5.39%)
Case outcome		
Guilty	19 (82.61%)	447 (72.68%)
Not guilty	4 (17.39%)	168 (27.32%)
Sentence		
Prison/jail	16 (69.57%)	322 (48.20%)
Probation/diversion	2 (8.70%)	116 (17.37%)
Not Available*	5 (21.74%)	230 (34.43%)
Sentence length		
Mean (SD)- Minimum sentence	13.31 (25.20)	10.87 (27.98)
Mean (SD)- Maximum sentence	27.77 (42.78)	21.19 (49.01)
Range	0-Life	0-Life

*"NA" should be interpreted with caution as it represents cases where the defendant was not guilty and received no sentence outcome, as well as cases that are still active and the outcome has yet to be reached.

Outcome Assessment - Impact on Crime

There are several theoretical foundations for predicting that PGLD would have an impact on crime. First, deterrence theory is based on the premise that potential offenders are rational actors who weigh the potential benefits of a criminal act against the potential costs of being arrested and punished (Nagin, 2013). Critical to deterrence is the extent to which PGLD alters the perceptions of potential offenders about this calculus of benefits versus costs, particularly whether PGLD increases the perception of the likelihood of arrest and prosecution.

A second theoretical foundation predicting crime prevention benefits through PGLD is situational crime prevention (Clarke, 1995). Situational crime prevention seeks to reduce opportunities for specific types of crime by strategies that make the crime more difficult to complete, increasing the risks, reducing the vulnerability of potential victims, and reducing the rewards. PGLD seeks to increase the risks, reduce the vulnerability of potential victims, and communicate a message of these increased risks. Situational crime prevention also suggests focusing on vulnerable locations where motivated offenders may encounter potential victims. The previously described crime analysis assessment of risks associated with gas stations, convenience stores, bars and liquor stores, and areas where illicit drug sales occur, reflects a situational crime prevention approach whereby high-risk locations implement place-based crime prevention strategies such as the PGLD model (Weisburd, 2018).

Thus, based on both deterrence and situational crime prevention theory, we predict that PGLD should have a crime prevention effect. A potential complication, however, is that prior research has indicated that police-community collaborative crime prevention strategies sometimes encourages increased reporting of crime incidents to the police (Weisburd & Gill, 2018). This can confound analysis of crime trends as increased reporting may offset actual declines in incidents. We approach the evaluation with this caution in mind.

The evaluation of the impact of PGLD on crime also presents several complex methodological issues due to the way in which it was implemented. In contrast to interventions which have a sharp “start” and “end” date, PGLD was implemented incrementally from 2016 through 2020. As the program progressed, the variety of business types changed as well. For example, the initial set of PGLD businesses were primarily retail establishments such as gas stations, liquor stores, and convenience stores. Through 2018 and 2019 a wider variety of business types were enrolled in PGLD, including a mix of service-oriented businesses, office parks, churches, and residential complexes. Because the composition of PGLD businesses changed over time, we must consider the likelihood that businesses enrolled at the beginning of the program are materially different than those enrolled near the end of the program. We also must consider that the effect of PGLD might change over time. That is, there may be an initial effect when a business is first enrolled, which might decay or increase over time. Indeed, in an earlier analysis of businesses enrolled in 2016, MSU researchers found many businesses experienced an initial spike in property crime and disorder crime reports which slowly decreased to pre-PGLD levels over time (Circo & McGarrell, 2020). Most likely this initial spike reflected an increase in reporting of property and disorder offenses to the police following implementation of PGLD.

The evaluation of crime trends was also affected by the COVID-19 pandemic that significantly affected Detroit beginning in March 2020 and continuing through the completion of this report at the end of 2020. Like many cities across the U.S., crime trends in Detroit have been significantly affected by the pandemic. This has included reductions in some offenses (e.g., residential burglary) and increases in others (e.g., fatal and nonfatal shootings). This external “shock” makes it impossible to disentangle the impact of PGLD from the impact of COVID-19. We do not have detailed data on how participating PGLD businesses were affected (e.g., dates of closures) nor how comparison non-PGLD businesses were affected. The pandemic also resulted in temporary shutdowns of the courts, limited operations of the courts, impact on the jail, and temporary influences on police human resources. Given all these factors and their unknown influence on crime at PGLD locations, non-PGLD locations, and across the city, we limit the crime trend analysis to the end of 2019.

Finally, we must also consider the most common concern in evaluation studies which is the estimation of a counterfactual trend. In short, this means we must provide some estimate of what would have happened in absence of PGLD. Without a randomized experiment (where businesses might have been randomly assigned to PGLD) we must employ one or more quasi-experimental designs to approximate a randomized control group. A variety of methods exist, including matching designs, propensity score weighting, and other time-series designs. With this in mind, we first lay out the data used in the analysis and provide a description of observed crime trends among PGLD businesses in the section “Descriptive Analysis”. We then move into our quasi-

experimental design, where we calculate estimates of the effect of Green Light on a variety of crime outcomes relative to a sample of comparison addresses in the section “Outcome Analysis”.

Data

For analysis, we consider all 700 locations that were enrolled in PGLD between January 2016 through September 2020. These locations were largely divided among three different types: retail, services, and residential. As shown in Table 5 below, the program expanded largely between 2018 and 2019 during which about 63 percent of locations were enrolled. Due to the 2020 Coronavirus pandemic the expansion of PGLD slowed dramatically with only 37 businesses enrolled at the time of the crime trends evaluation (9/25/2020). From this table it is also evident that the composition of businesses changed significantly from the inception of the program. In 2016 nearly 93 percent of PGLD businesses were retail establishments. In 2017 retail establishments comprised 75 percent of businesses. By 2018 and 2019 this had dropped to 56 and 48 percent, respectively. Overall, 62 percent of PGLD enrollments have involved retail establishments, one-quarter have involved service establishments, and 13 percent have involved multi-unit residential areas.

Table 5. PGLD Premises, by Live Year

	PGLD Live Year					Total	
	2016	2017	2018	2019	2020*	#	%
Retail	72	105	135	101	21	434	62%
Services	6	29	77	58	3	173	25%
Residential	0	6	26	48	13	93	13%
Total	78	140	238	207	37	700	100%

*As reported elsewhere in this report, there were 62 PGLD enrollments as of 11/31/20. The 37 reported in Table 5 reflect the count at the time the crime trend analysis was conducted.

In general, these premises were evenly distributed across the city. Below, Figure 4 shows the location of all PGLD locations by their parcel footprint. The majority of premises were small-scale retail and service businesses with a relatively small geographic footprint. Several PGLD premises included addresses that were geographically larger – including large businesses, shopping centers, and public parks. Figure 5 shows an example of the geographic parcel footprint of an individual business. For the purposes of this study, our unit of analysis focuses solely on crimes occurring on, or directly adjacent to, the geographic boundaries of each business’s parcel footprint.

Figure 4. Location of PGLD Premises, by Parcel Footprint

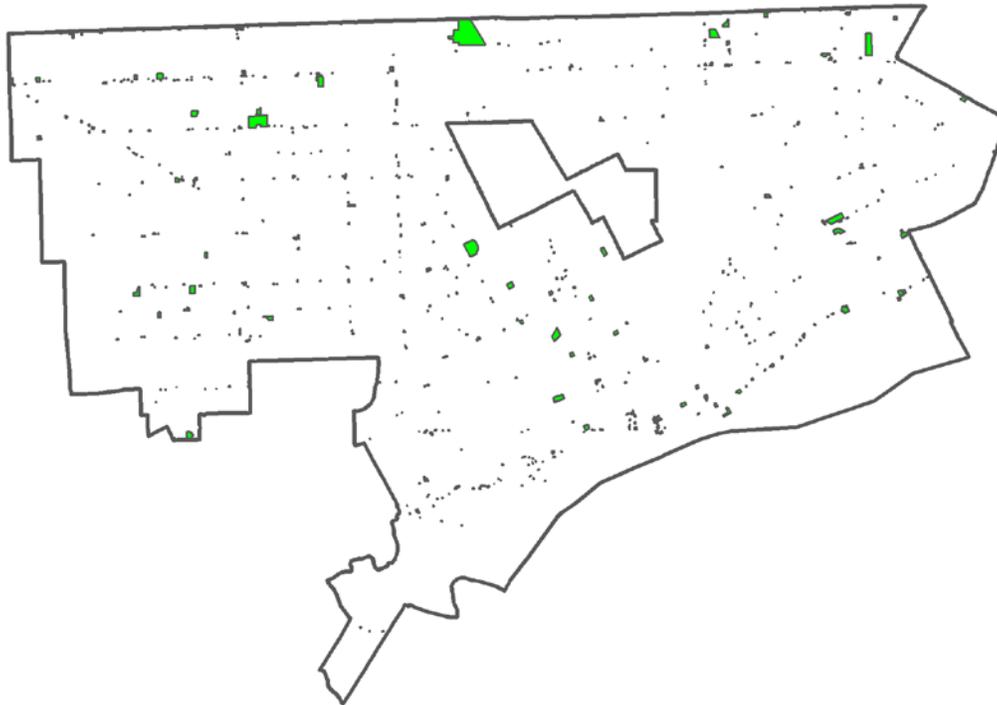


Figure 4: PGLD parcel addresses are highlighted in Green. Note the majority of addresses are small, while some premises are geographically quite larger. Dark lines reflect the city boundaries of Detroit.

Using these parcels as our unit of analysis, we constructed a set of data wherein we merged all crimes that occurred on or adjacent (within 10 feet) to the parcel. Using data obtained from DPD, only crimes that were recorded as having occurred at PGLD premises were used in the treatment group.³ This has the advantage of focusing attention to on-premises crimes only, while disregarding crimes farther away. While there may be some effect of PGLD cameras on crimes within the larger vicinity of the location (so-called “spillover effects”), we are more narrowly concerned with crimes directly on the premises. For analysis we utilized data from DPD’s record’s management system (RMS) which contains data on crime incident types, addresses, dates, and geographic coordinates. DPD switched RMS providers in mid-2016, and due to this historical data was only available on crimes from December 2016 onward. In addition, because of the innate complexities introduced by the 2020 Coronavirus pandemic, we restrict our analysis of crime data from 2017 through 2019. To model these trends over time we consider the year-quarter as our time dimension. Below, in our descriptive analysis we lay out general observed trends in crime at PGLD premises between 2017 and 2019.

³ This ensures that counts of crime at PGLD addresses are consistent with numbers reported by DPD. The specific crimes were provided to MSU researchers by DPD analysts via an SQL query.

Figure 5. PGLD Parcel Footprint Example, 18300 Morang Ave

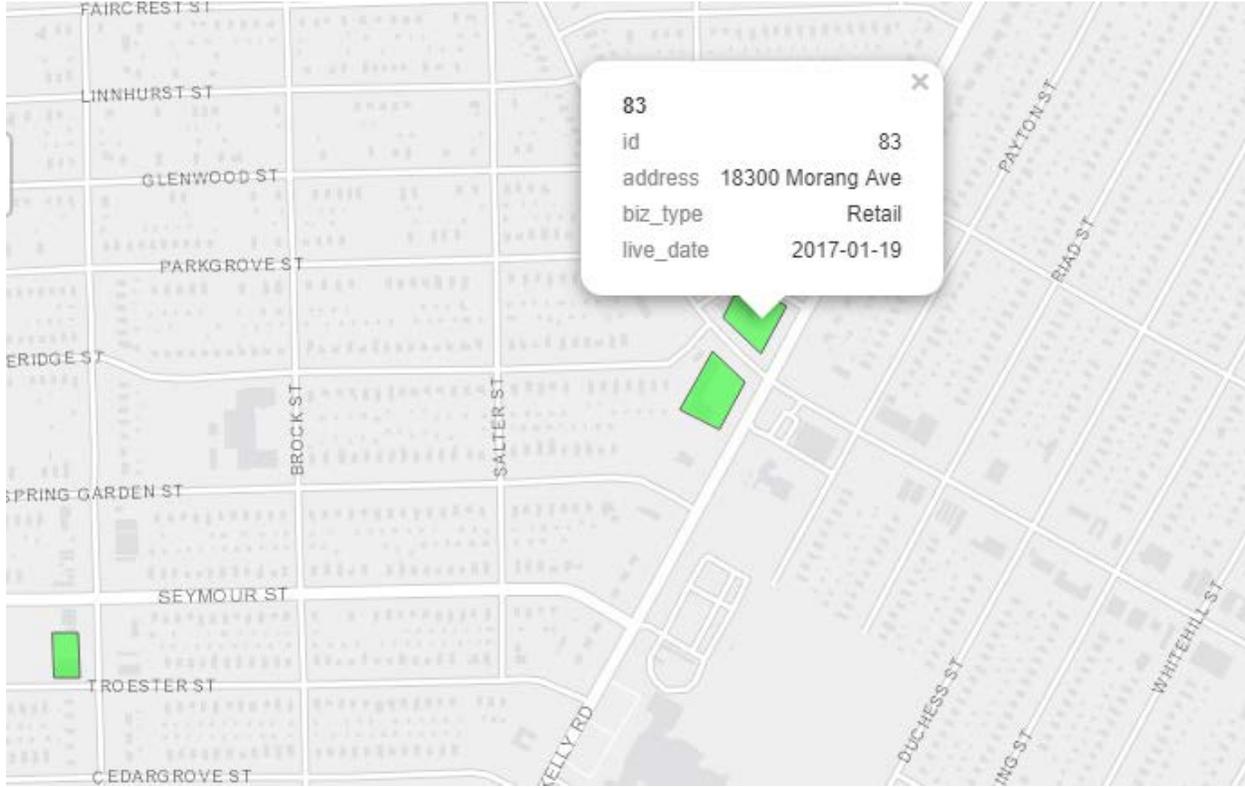


Figure 5: Example street-level plot of PGLD parcel addresses. The units of analysis in this study focus solely on crimes occurring directly within or adjacent to the parcel.

Descriptive Analysis

We begin by describing the raw change in incident counts at all locations that were enrolled or eventually enrolled in PGLD. For this analysis we consider crime at PGLD premises *only after* they were enrolled in PGLD. Below, Figure 6 shows the number of reported PGLD crime incidents, per-year-quarter⁴. Generally speaking, the raw number of incidents, as well as the average number of incidents increased year-over-year at PGLD locations. Table 6 shows the average and total number of reported PGLD incidents by year. Here, it is evident that PGLD businesses experienced an increase in reports in 2018 relative to 2017, and a smaller increase in 2019 relative to 2018. For example, at the end of 2017 there were 216 PGLD premises enrolled, comprising an average of 3.55 incidents per-premise, per-year. One year later, in 2018, the 456 PGLD comprised an average of 3.58 incidents per-premise, per-year.

⁴ Crime incident data reflects all unique crime incidents that were tagged at occurring at a PGLD premise from 2017 through 2019. The crimes reported do not include offense categories labeled as “OTHER”, “NULL” or “OUIL”. Crime categories include the following incidents: Violent Crimes = (HOMICIDE, AGGRAVATED ASSAULT, ROBBERY, SEXUAL ASSAULT), Property Crimes = (LARCENY, FRAUD, BURGLARY, DAMAGE TO PROPERTY, STOLEN VEHICLE, STOLEN PROPERTY), Disorder Crimes = (ASSAULT, DANGEROUS DRUGS, LIQUOR, DISORDERLY CONDUCT, OBSTRUCTING JUDICIARY, OBSTRUCTING THE POLICE).

One complexity of this analysis is the fact that PGLD’s implementation was staggered out over several years. In addition, even within years, PGLD premises were enrolled on an individual basis. Therefore, we additionally broke down crime trends separated by the PGLD live year. Here, we focus our attention on the four primary PGLD “cohorts” which reflect premises enrolled between 2016 through 2019. We combine analyses based on the “cohort” in which each location was enrolled into PGLD. This recognizes some of the differences in premise composition described above – for instance, the increased enrollment in service and residential properties relative to retail properties. Tables 7, 8, 9, and 10 show the mean number of all crimes, violent crimes, property, and disorder crimes reported by year-quarter from 2017 through 2019, respectively.

Figure 6. Crimes, Post-PGLD and PGLD Enrollments, by Quarter

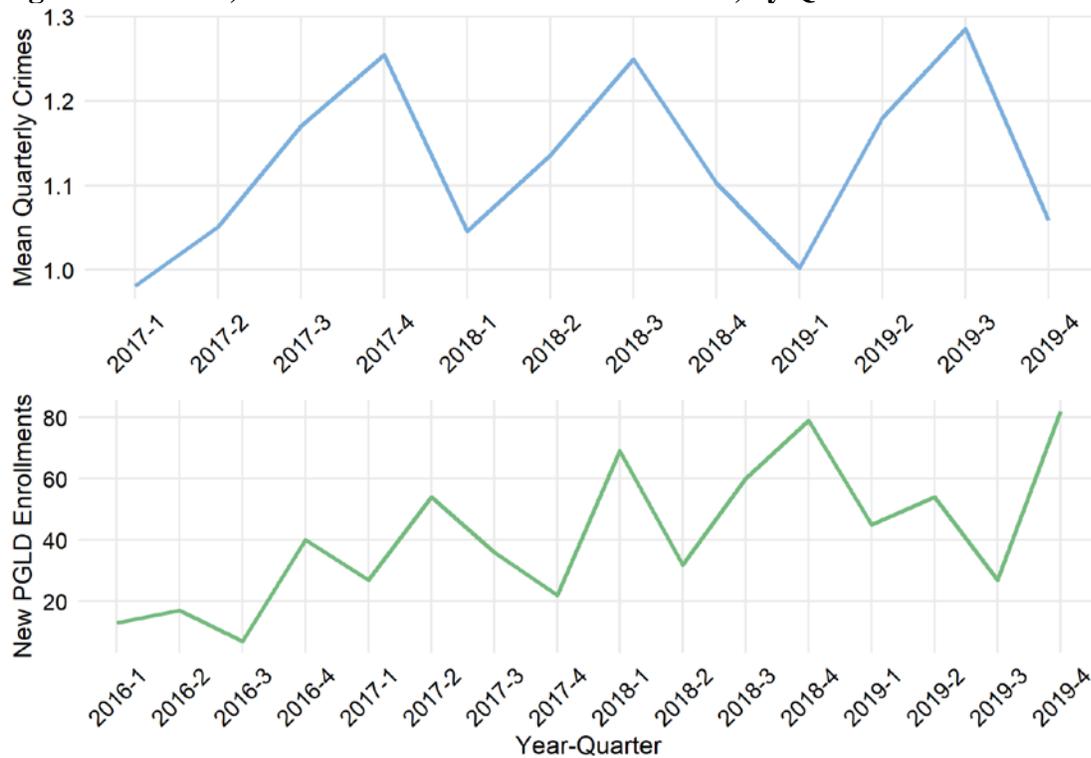


Figure 6: The top panel shows the average quarterly number of crime incidents, for businesses AFTER they enrolled in PGLD. The bottom panel shows the number of new PGLD enrollments by quarter.

Table 6. All Reported Incidents at PGLD Locations, by Year

	Average Incidents	Total Incidents	Year Ending, Total PGLD Business
2017	3.55	766	216
2018	3.58	1632	456
2019	3.93	2608	664

Review of the tables 7 through 10 does not reveal any clear patterns. The average number of total crime incidents at Greenlight locations ranges from .46 per quarter (meaning less than one-half an incident per business per quarter) to a high of 1.69. There are increases from quarter to quarter as well as decreases. The number of violent crimes at PGLD locations is fairly low ranging from .08 per quarter to .35 per quarter.

Table 7. All Crimes, by Green Light Live Year

All Crimes

Year/Qtr	Green Light Live Year							
	2016		2017		2018		2019	
	Incidents (mean)	% chg	Incidents (mean)	% chg	Incidents (mean)	% chg	Incidents (mean)	% chg
2017-1	1.09	-	0.46	-	0.66	-	0.77	-
2017-2	1.03	-6%	0.78	70%	0.72	9%	0.79	3%
2017-3	1.52	48%	0.92	18%	0.78	8%	0.98	24%
2017-4	1.52	0%	1.11	21%	0.66	-15%	1.02	4%
2018-1	1.23	-19%	0.88	-21%	0.85	29%	0.8	-22%
2018-2	1.23	0%	1.07	22%	0.96	13%	0.99	24%
2018-3	1.69	37%	1.12	5%	1.17	22%	1.2	21%
2018-4	1.34	-21%	1.09	-3%	1.04	-11%	1.03	-14%
2019-1	1.14	-15%	1.06	-3%	0.85	-18%	1.01	-2%
2019-2	1.29	13%	1.24	17%	1.06	25%	1.07	6%
2019-3	1.44	12%	1.28	3%	1.08	2%	1.35	26%
2019-4	1.08	-25%	0.99	-23%	0.92	-15%	1.26	-7%

Table 8. Violent Crimes, by Green Light Live Year
Violent Crimes

Year/Qtr	Green Light Live Year							
	2016		2017		2018		2019	
	Incidents (mean)	% chg	Incidents (mean)	% chg	Incidents (mean)	% chg	Incidents (mean)	% chg
2017-1	0.18	-	0.12	-	0.09	-	0.14	-
2017-2	0.12	-33%	0.11	-8%	0.08	11%	0.12	14%
2017-3	0.3	150%	0.14	27%	0.1	25%	0.22	83%
2017-4	0.25	-17%	0.23	64%	0.1	0%	0.2	-9%
2018-1	0.22	-12%	0.13	43%	0.12	20%	0.15	25%
2018-2	0.21	-5%	0.16	23%	0.1	17%	0.18	20%
2018-3	0.21	0%	0.19	19%	0.15	50%	0.22	22%
2018-4	0.23	10%	0.17	11%	0.14	-7%	0.18	18%
2019-1	0.26	13%	0.14	18%	0.12	14%	0.16	11%
2019-2	0.18	-31%	0.18	29%	0.13	8%	0.14	12%
2019-3	0.35	94%	0.16	11%	0.16	23%	0.21	50%
2019-4	0.16	-54%	0.19	19%	0.11	31%	0.22	5%

Table 9. Property Crimes, by Green Light Live Year

Property Crimes

Year/Qtr	Green Light Live Year							
	<u>2016</u>		<u>2017</u>		<u>2018</u>		<u>2019</u>	
	Incidents (mean)	% chg	Incidents (mean)	% chg	Incidents (mean)	% chg	Incidents (mean)	% chg
2017-1	0.7	-	0.27	-	0.44	-	0.45	-
2017-2	0.7	0%	0.53	96%	0.45	2%	0.49	9%
2017-3	0.87	24%	0.61	15%	0.55	22%	0.61	24%
2017-4	1	15%	0.63	3%	0.43	22%	0.52	15%
2018-1	0.73	-27%	0.55	13%	0.53	23%	0.46	12%
2018-2	0.7	-4%	0.67	22%	0.61	15%	0.6	30%
2018-3	1.03	47%	0.63	-6%	0.72	18%	0.71	18%
2018-4	0.81	-21%	0.65	3%	0.67	-7%	0.61	14%
2019-1	0.62	-23%	0.75	15%	0.49	27%	0.57	-7%
2019-2	0.77	24%	0.86	15%	0.66	35%	0.59	4%
2019-3	0.9	17%	0.9	5%	0.72	9%	0.83	41%
2019-4	0.69	-23%	0.55	39%	0.6	17%	0.75	10%

Table 10. Disorder Crimes, by Green Light Live Year
Disorder Crimes

Year/Qtr	Green Light Live Year							
	<u>2016</u>		<u>2017</u>		<u>2018</u>		<u>2019</u>	
	Incidents (mean)	% chg	Incidents (mean)	% chg	Incidents (mean)	% chg	Incidents (mean)	% chg
2017-1	0.21	-	0.08	-	0.13	-	0.18	-
2017-2	0.21	0%	0.14	75%	0.18	38%	0.18	0%
2017-3	0.35	67%	0.17	21%	0.14	22%	0.16	11%
2017-4	0.27	-23%	0.25	47%	0.13	-7%	0.29	81%
2018-1	0.29	7%	0.21	16%	0.2	54%	0.19	34%
2018-2	0.32	10%	0.24	14%	0.24	20%	0.21	11%
2018-3	0.45	41%	0.3	25%	0.3	25%	0.27	29%
2018-4	0.3	-33%	0.27	10%	0.22	27%	0.25	-7%
2019-1	0.26	-13%	0.17	37%	0.25	14%	0.28	12%
2019-2	0.34	31%	0.2	18%	0.27	8%	0.34	21%
2019-3	0.19	-44%	0.22	10%	0.2	26%	0.32	-6%
2019-4	0.23	21%	0.26	18%	0.21	5%	0.28	12%

The trend lines presented in Figures 7 to 10 show some of the fluctuation in crime trends. The most apparent pattern is a tendency to see an increase in incidents shortly after implementing PGLD. This likely reflects increased reporting of crime incidents due to DPD's commitment to respond to calls at PGLD locations. The pattern is less apparent for violent crimes that likely reflects that violent crimes are the most likely to be reported to the police, thus reporting levels for violent offenses may be least affected by PGLD.

Figure 7. All Crimes, by Green Light Live Year

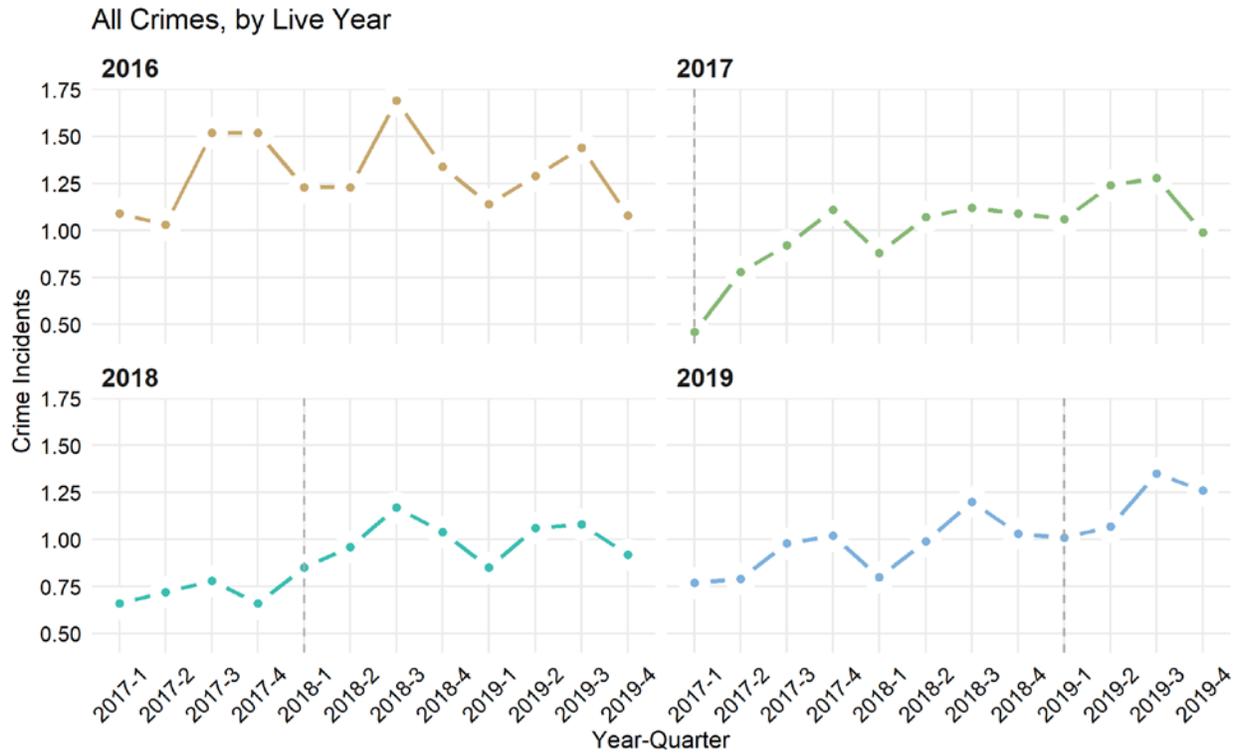


Figure 7: All crimes reported, by PGLD live year. The y-axis reflects the mean number of incidents reported by business in that cohort. The dashed lines indicate the start of enrollment for that cohort. Note that the 2016 cohort's enrollment occurred outside of the study period.

Figure 8. Violent Crimes, by Green Light Live Year

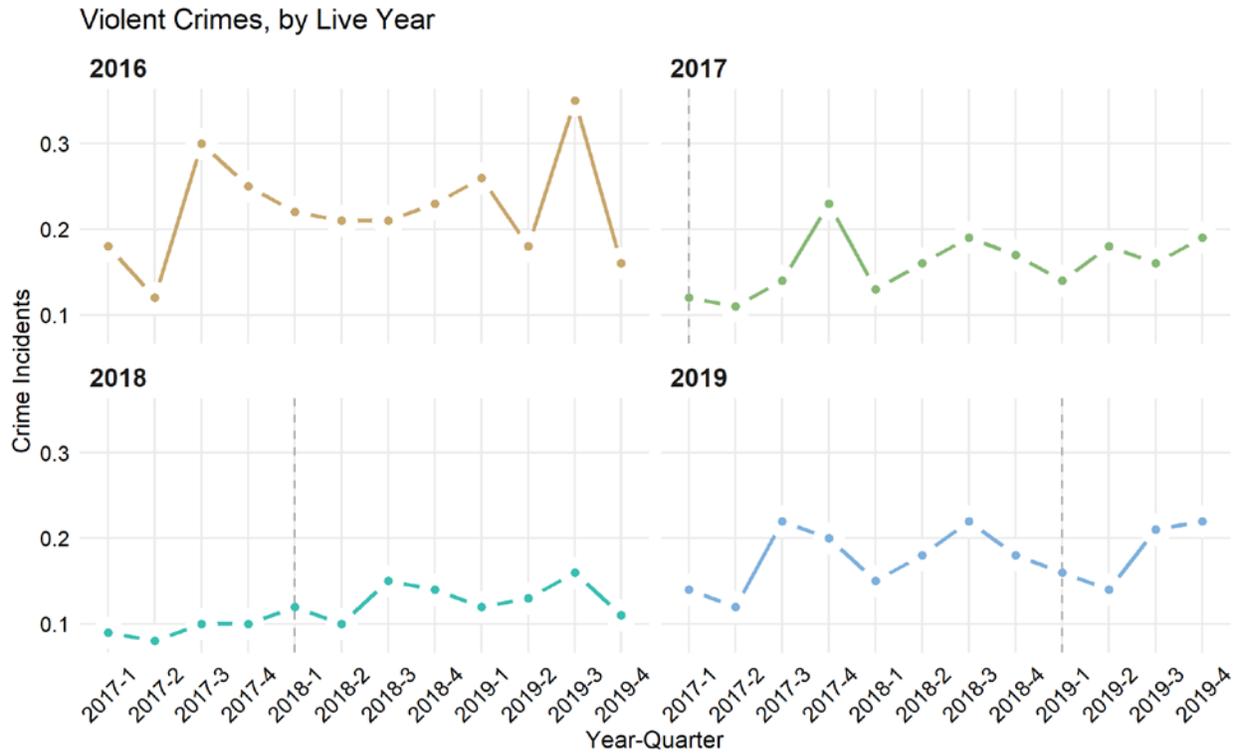


Figure 8. Violent crimes reported, by PGLD live year. The y-axis reflects the mean number of incidents reported by business. The dashed lines indicate the start of enrollment for that cohort. Note that the 2016 cohort's enrollment occurred outside of the study period.

Figure 9. Property Crimes, by Green Light Live Year

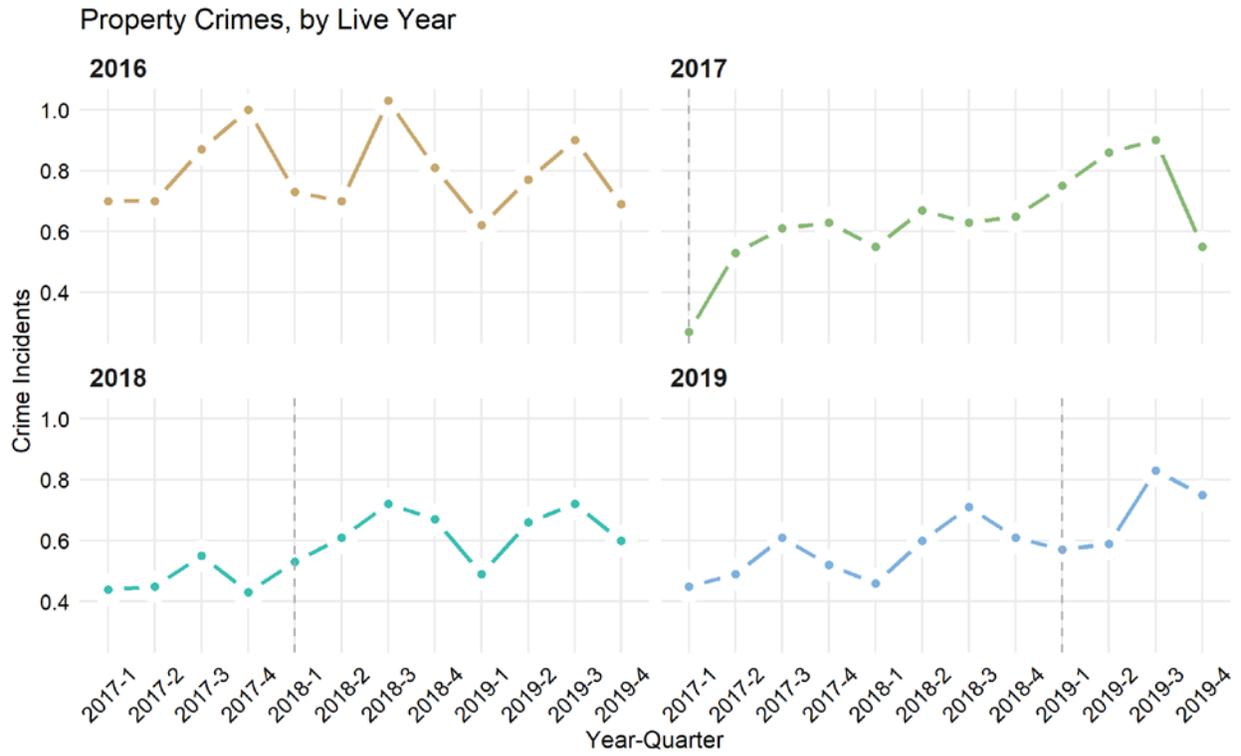


Figure 9. Property crimes reported, by PGLD live year. The y-axis reflects the mean number of incidents reported by business. The dashed lines indicate the start of enrollment for that cohort. Note that the 2016 cohort's enrollment occurred outside of the study period.

Figure 10. Disorder Crimes, by Green Light Live Year

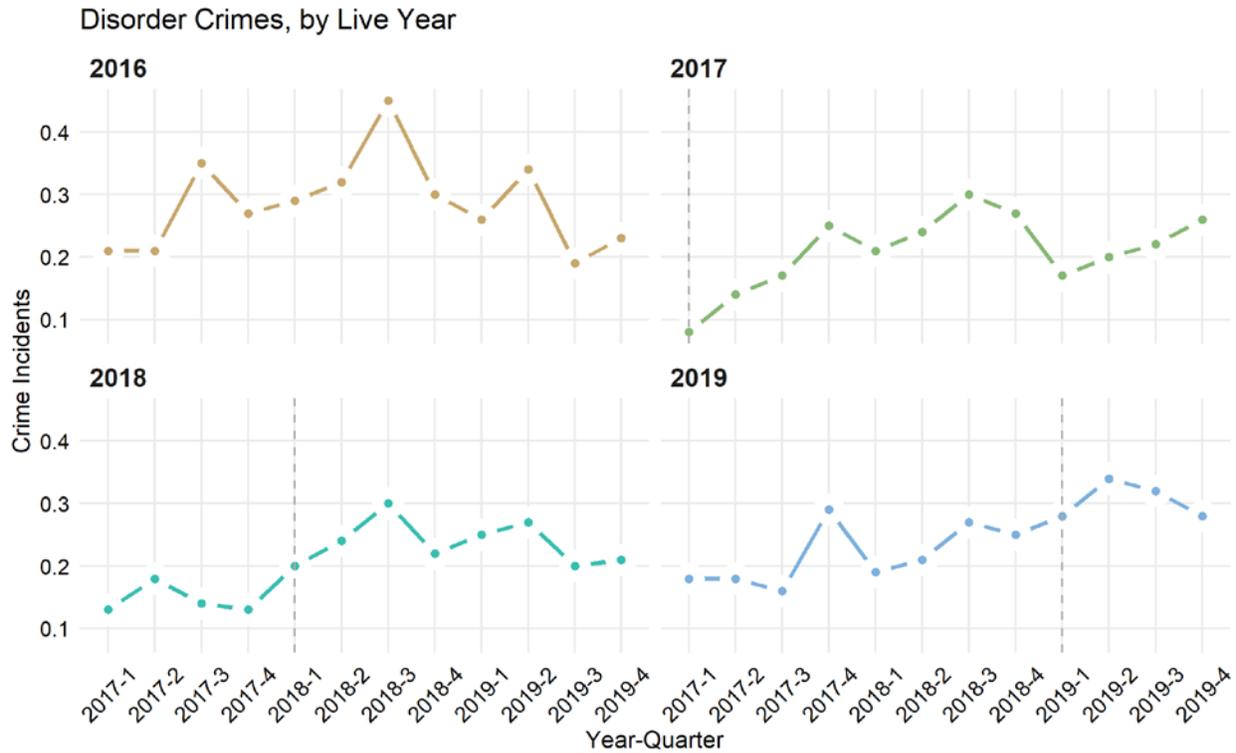


Figure 10. Disorder crimes reported, by PGLD live year. The y-axis reflects the mean number of incidents reported by business. The dashed lines indicate the start of enrollment for that cohort. Note that the 2016 cohort's enrollment occurred outside of the study period.

One complication of comparing raw crime trends year-over-year is that even within PGLD cohorts there is a staggered implementation of premises. As previous research found (Circo & McGarrell, 2020) many PGLD locations experienced at least a temporary increase in minor crime reports – primarily property and disorder crimes. Hence, changes over time might possibly be masked by the increase in initial reports followed by a small decrease later. In addition, it is likely that different premise types having different trends in crime reporting. For instance, retail businesses are fundamentally different than residential premises. Therefore, it is useful to distinguish trends between these two.

In order to address these two issues, we implement a descriptive “event-study” analysis where we index time relative to the year-quarter that each premise joined PGLD. Here, the year-quarter that a premise started is set to 0, while the year-quarter prior is -1 and the year-quarter following is 1. This provides a set of lags and leads while controlling for the differences in start time. We also divide the analysis by examining each of the three major premise types separately (Residential, retail, and service). Below, Figure 11 shows the results for the event-study divided by premise type for all crime types for one-year pre-PGLD and one-year post-PGLD. In general, Residential premises had the highest average number of crimes, followed by retail and service premises.

Several important patterns are evident from Figure 11. First, there tended to be an increase in crime incidents just prior to enrolling and starting PGLD. The increase just prior to enrollment may have been a motivation for participation. Second, the change from the year-quarter *prior* to PGLD (-1) to the year-quarter that the premises started PGLD (0) shows a uniform increase across all three premises types. These are especially evident among residential and retail premises, while service premises saw only a small increase. In the time post-PGLD implementation, residential premises show an initial slow decrease, which increases over time. Retail premises show a gradual increase but begin to decrease after about one-year post-implementation. Interestingly, service premises show a sharp decrease in the quarter following implementation, which tends to remain at levels similar or lower pre-PGLD.

Figure 11. Event-Study Plot: All Crimes by Premise Type

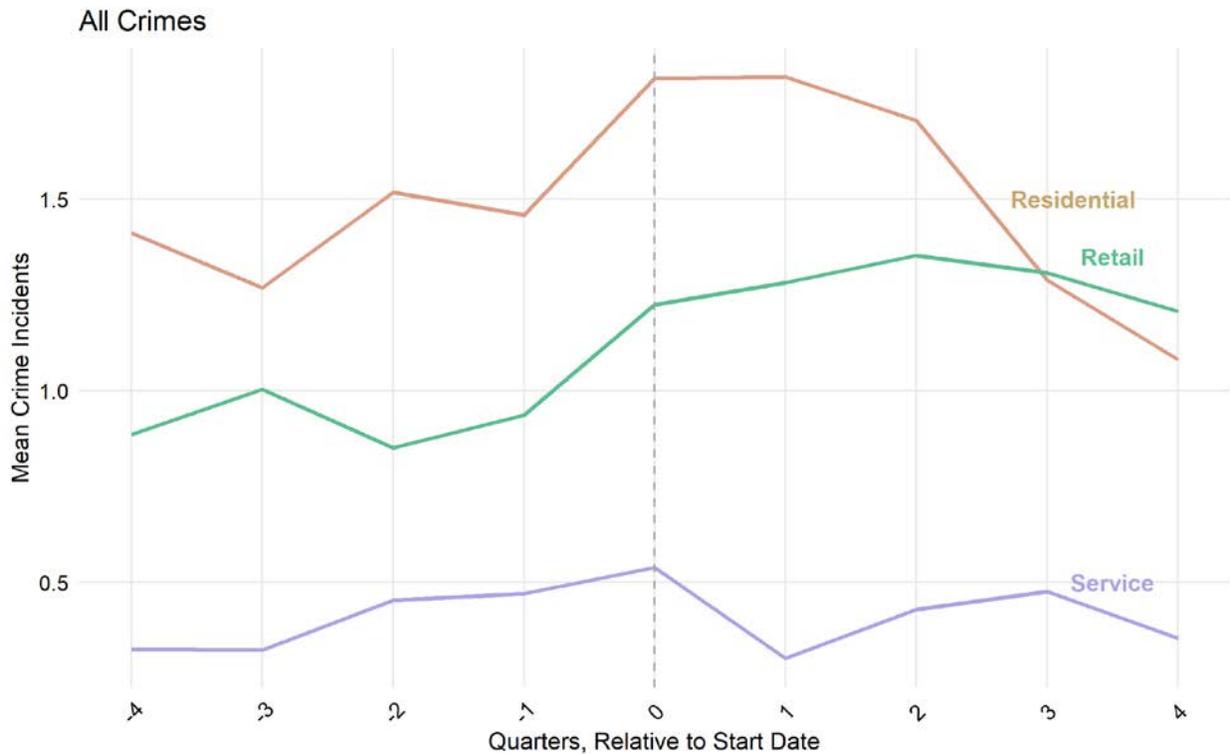


Figure 11. Event-study plot. Time is indexed relative to each individual business's start date (year-quarter). Note the differences in trends, post-start date by premise type.

Outcome Analysis

For our outcome analysis we consider a quasi-experimental design to determine a plausible effect of PGLD on crime net of other city-wide changes. Indeed, one of the challenges of crime outcome evaluations is parsing out the effect of the intervention from larger, structural changes in crime. For instance, there are likely city-wide trends in crime that are constant across businesses. These “fixed” effects reflect the changes in crime we wish to eliminate from our analysis. Removing these trends then allows us to determine the unique changes in crime due to the implementation of PGLD. To accomplish this, we employ a tool from economics known as a Difference-in-differences (DiD) fixed effects regression. A DiD regression is particularly appropriate here for a number of reasons. First, this design allows us to parse out pre-treatment differences in crime between PGLD businesses and non-PGLD businesses. It also allows us to use premises *not yet treated* as comparison units in our model. Second, the DiD model is remarkably simple in its design while also providing flexibility in estimation. In this case we are able to accommodate the staggered implementation of PGLD by comparing treated premises to non-PGLD premises and those not yet enrolled. In this way we can estimate the effect of PGLD over the course of time.

In our design we compare all businesses that were enrolled in PGLD between 1/1/2017 through 12/31/2019⁵. In total, this reflects 623 PGLD businesses. For comparison we utilize parcels that were not enrolled in PGLD. This data comes from the city of Detroit’s parcel database on Detroit Open Data (CITE)⁶. The units of analysis were constructed in the same way as the PGLD parcels. For analysis we restrict our attention to comparison parcels that experienced *at least* 1 crime between 2017 and 2019. This total equaled 1,136 distinct premises. Below, Figure 12 shows the raw comparison between the 623 PGLD parcels and the 1,136 comparison parcels. While the mean number of incidents among comparison parcels were significantly lower, they appeared to have similar trends prior to the end of 2018. By 2019 reported crimes at PGLD parcels appeared substantially higher than the comparison group which appeared largely driven by changes in property crimes.

⁵ For this analysis we omit the 77 PGLD premises that were initially enrolled as part of Phase I in 2016. Because we did not have access to crime data pre-2017 we are unable to estimate an appropriate pre-period which is necessary in our model design. However, results from this cohort of businesses can be found in Circo & McGarrell, 2016.

⁶ These were drawn from a list of roughly 25,000 parcels zoned as “B1: Restricted Business”, “B2: Local Businesses and Residential”, “B3: Shopping”, “B4: General Business”, “B5: Major Business” and “B6: General Services”. We omitted addresses that were listed as being vacant.

Figure 12. PGLD Parcels vs. Comparison Parcels, by Crime Type

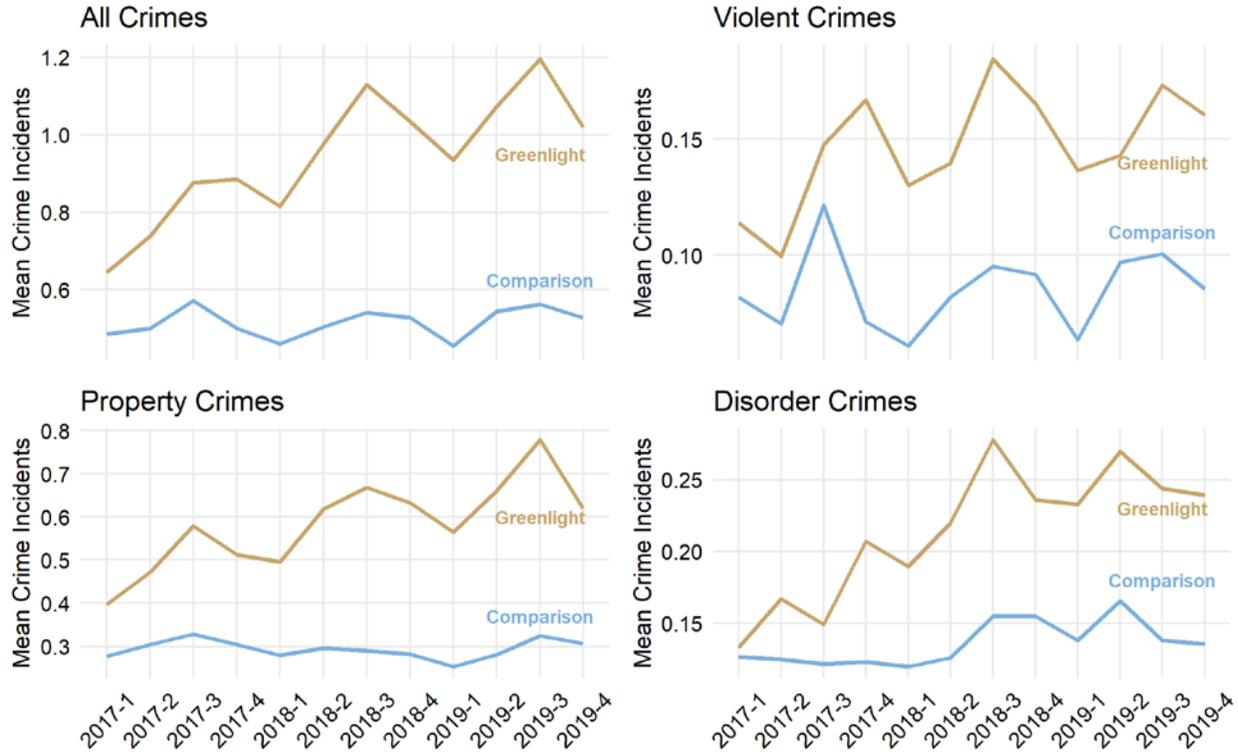


Figure 12. Each panel shows the total number of reported crimes at PGLD and Comparison parcels, including pre- and post-enrollment time. Note, while 'all crimes' shows a substantial increase, a large proportion of these are attributable to property-related crimes.

Given the mean number of incidents was lower among the comparison group, we chose a design method to account for this discrepancy. To adjust for these differences, we use a DiD design with a linear probability model. As stated above, the advantages of the DiD model is that it allows us to “subtract out” observed differences between PGLD parcels and comparison parcels – in particular, the mean difference in crime counts. In addition, we can separately control for idiosyncratic city-wide differences in crime over time - for instance, year-over-year trends and specific year-quarter effects. Thus, estimates from the DiD model provide us with an estimate of the causal effect of PGLD on crime. The assumption underlying this method is that absent treatment the trends in crime at PGLD and control premises would continue “in parallel” (the parallel trends assumption). Next, we also adjust our estimates for the design structure of the data. Because observations are clustered within businesses (year-quarter crime counts at each parcel address), we estimate cluster-robust wild-bootstrap standard errors (see Cameron, Gelbach, & Miller, 2008 for a discussion). This adjusts our standard errors to account for the nesting of data and the serial correlation of data observations – giving us more robust estimates of the uncertainty in the data. Our model, therefore, is as follows:

$$y_{it} = \alpha_i + \alpha_t + \beta^{DD}D_{it} + X_i + e_{it}$$

Where y_{it} is the estimated number of crimes at premises i at time t , unobserved unit indicators α_i , time period indicators α_t , and a treatment indicator for PGLD premises D_{it} . The coefficient of interest is the difference-in-differences estimate β^{DD} which is estimated with the interaction with the treatment indicator. The estimates, therefore, reflect a weighted average of all timing

group comparisons (Goodman-Bacon, 2018). In addition, we include a matrix of non-time varying covariates in X_i which allow us to statistically adjust our estimates for extraneous variables correlated with the outcome. Here, we include controls for the premise type (Residential, Retail, Services) where the reference category is residential. We also adjust for the premises' parcel size by including a variable for the natural log of the area of the parcel footprint. This provides a more precise estimate of the causal estimand.

Below, Table 11 shows the DiD regression results for each of the four outcomes (all crimes, violent crimes, property crimes, disorder crimes). Each model adjusts for time-period specific changes (the year-quarter dummies) as well as observed differences in reported crimes by premise type relative to residential premises. The coefficient of interest – the causal effect of PGLD on crime – is 'Green Light'. This is the variable that takes on the value 1 if and only if a business is both in the post-treatment period and is part of the treatment group. Because the model is a linear probability model, the coefficients are the estimated mean differences in crime between PGLD and comparison premises.

Table 11. Estimated Effect of Green Light, 2-Way DiD Estimates

	All Crimes			Violent Crimes			Property Crimes			Disorder Crimes		
	Coef.		S.E	Coef.		S.E	Coef.		S.E	Coef.		S.E
Green Light	0.26	***	0.08	0.01		0.01	0.18	***	0.05	0.07	**	0.02
Business Type												
Retail	-0.19		0.11	-0.02		0.02	-0.07		0.07	-0.09		0.04
Services	-0.51	***	0.10	-0.07	**	0.02	-0.27	***	0.06	-0.17	***	0.04
log(Parcel Area)	0.19	***	0.05	0.02	**	0.01	0.13	***	0.03	0.05	***	0.01
Year-Qtr Dummies	Yes			Yes			Yes			Yes		
Cluster ID	Yes			Yes			Yes			Yes		
N Observations	21,108			21,108			21,108			21,108		

***p < .001, **p < .01, *p <

.05

In general, the results indicate that PGLD premises experienced an *increase* in all reported crimes post-implementation (b = 0.26, p < .001). Averaging this estimate over all Green Light businesses in the sample (n = 623), this equates to roughly an increase of about 162 additional reported crime incidents between 2017 and 2019. Breaking this down by crime category, some differences are evident. The effect on violent crimes was negligible and not significant (b = 0.01, p = .53). Most of the increase in reported crimes were among property offenses (b = .18, p < .001), where the estimated increase was about 112 incidents. There was also a slight increase among disorder crimes (b = 0.07, b > .01), where the estimated increase was about 44 incidents.

These estimates are largely similar to a previous evaluation of the first cohort of businesses enrolled in 2016 (Circo & McGarrell 2020). These businesses experienced an increase in property and disorder crimes, while there was no effect on violent crimes. This increase in crimes was co-incident with a significant increase in proactive police patrols (so-called “special

patrol visits” runs) relative to other locations in the city. While seemingly counterintuitive, it is quite plausible that many of these minor crimes would simply have not been reported to police absent PGLD. Hence, the observed increase in ‘all crimes’ is largely driven by property crime reports at PGLD businesses. Finally, while service-based premises may have experienced more of a decrease in crime incidents post-PGLD, the raw number of incidents attributable to these locations weights them less in the final estimate. Indeed, both residential and retail premises comprise the bulk of reported incidents and so the results are largely dependent on crimes at these locations. It is worthwhile, however, to note that PGLD might have a more deterrent effect on these low-rate service premises compared to residential or retail establishments.

PGLD and Carjacking

In addition to general crime problems, one specific concern in Detroit has been the number of carjacking incidents. Often, these have been reported at locations such as gas stations or other retail establishments. Hence, one specific goal of PGLD would be to reduce these incidents at their businesses. Carjackings are also an interesting metric to track because they are incidents that are likely to be reported to the police. Like motor vehicle thefts generally, car owners have the financial incentive to report a stolen vehicle. Further, the personally threatening nature of carjacking also creates an incentive to report the incident. Additionally, carjackings are the type of publicly visible incidents that a video camera technology is most likely to have a deterrent effect upon.

Here, we begin with a basic analysis of the trend in carjacking during the period PGLD has been operational. In general, carjacking incidents decreased from 2016 through 2019 with the exception of a slight increase between 2017 and 2018. Between 2017 and 2019 carjackings decreased by about 22 percent overall, with a substantial 38 percent decline since PGLD launched in 2016 (see Table12).

Table 12. Citywide Carjacking Incidents (2016 – 2019)

Year	Carjackings	Change	% chg from previous year	% chg from 2016
2016	379			
2017	301	-78	-0.21	-0.21
2018	306	5	0.02	-0.19
2019	235	-71	-0.23	-0.38

Between 2017 through 2019 there were 69 reported carjacking incidents at businesses that were enrolled, or would eventually be enrolled, in PGLD (n = 700). During the same time there were 40 reported carjacking incidents at similar comparison businesses (see Outcome Analysis for detail on this group). As stated above, the general trend in carjackings throughout the city was decreasing from 2016 onward. Examining the data at both PGLD and non-PGLD locations, there is a general decreasing pattern from 2017 through 2019. From 2017 to 2019 carjackings decreased from 28 in 2017 to 15 in 2019 – reflecting a roughly 46 percent decrease. At the same

time, among the sample of comparison premises, carjackings decreased from 14 in 2017 to 11 in 2019 – a 21 percent decrease. As shown in Table 13 below, the decrease among PGLD premises increased as more businesses were enrolled in the program – especially between 2018 and 2019. While the sample size here is relatively low (thankfully, carjacking incidents remain rare relative to other crimes in the city) these analyses provide some evidence that PGLD premises experienced a decline in carjackings attributable to the program. Indeed, while the comparison premises largely decreased at rates like the overall city, PGLD premises decreased at a more rapid pace – 46 percent compared to -21 percent (2017 compared to 2019). Given the traumatic nature of this offense, with the potential for violence, this is welcomed news for Detroit.

Table 13. Carjackings at PGLD and Comparison Premises (2017 -2019)

Year	<u>PGLD Premises</u>			<u>Comparison Premises</u>			
	Carjackings	Change	% chg from prior year	Carjackings	Change	% chg from prior year	% chg from 2017
2017	28			14	-		
2018	26	-2	-0.07	15	1	0.07	0.07
2019	15	-11	-0.42	11	-4	-0.27	-0.21

Conclusion

The strongest indicators of the success of PGLD are the continued enrollments, and the sustained participation of Detroit business owners and other parcel owners. This is a program where at least 700 parcel owners have “voted” with their financial resources to enroll and continue to participate in PGLD. As described throughout, this program does not simply involve the installation of cameras but an ongoing engagement between these businesses, service agencies, and multi-unit residential complexes and the police department.

The process evaluation indicates that PGLD has been implemented in a very thoughtful manner with significant attention to quality standards and compliance.

PGLD has also witnessed the development of a Real Time Crime Center (RTCC). The RTCC not only supports PGLD but also supports DPD and public safety generally through both proactive crime analysis products and the support for investigations.

In terms of the various outcome measures associated with PGLD, the data suggest modest effects but in a positive direction. PGLD participation was associated with increased clearance by arrest for carjacking and robbery. These are typically public and visible offenses that are more likely to be susceptible to the PGLD crime prevention strategy. There were also increases in clearances for fatal and nonfatal shootings, though the differences were not outside the possibility of chance. When combining carjacking, robbery, nonfatal shootings, and homicide into an overall violent crime category, there was a statistically significant increase in clearances by arrest.

Given the relatively small number of arrests at PGLD locations that had reached final adjudication stage, it is difficult to assess the impact of PGLD on convictions and sentencing. There were modest increases in guilty pleas, guilty outcomes, prison/jail sentences, and maximum sentences for arrests at PGLD locations consistent with the availability of video evidence that may come from PGLD participation.

The findings on the impact on crime trends are difficult to interpret. We did not find clear and consistent indications of crime declines associated with PGLD participation. However, this was difficult to interpret because the increase in property and disorder offenses may reflect increased reporting of these incidents. This gained some additional credence from interviews with PGLD participants as well as seeing calls for service that seemed to reflect DPD responses to PGLD locations (through both DPD contact with PGLD business owners and special patrol visits at PGLD locations). In contrast to the ambiguity surrounding property and disorder offenses, the decline in carjacking, citywide and at PGLD locations specifically, is supportive of a conclusion that PGLD had a crime prevention impact on carjacking. Given the traumatic nature of carjacking, and the high potential for violence, this is an important outcome.⁷

⁷ Recommendations for future study and training are presented in the concluding sections of the Appendix.



Introduction

Has the motor city manufactured a vehicle capable of driving down the crime rate?

Project Green Light Detroit (PGLD) was designed to prevent, detect, and solve crime. The crime control strategy employed by the Detroit Police Department (DPD) builds upon closed-circuit television (CCTV) camera monitoring but adds to the technology through establishing active partnerships with the business community. While the concept of using video cameras to deter crime and video footage to detect or solve crimes is not new, the proactive integrated partnership between police and business is unique. Identifying these novel components and operation of PGLD provides a means for evaluation and replication.

This qualitative study describes the developmental process of PGLD. From garnering public support and a private multi-million-dollar investment, to sustaining the program, each stage is described. Some parts of PGLD are more conducive to the program's objectives than others. An analysis is offered of how the PGLD design and operation contributes to preventing, detecting, and solving crime.

Two extraordinary situations impacted PGLD operations in 2020. The anti-police brutality protests of 2020 and the COVID-19 outbreak are discussed in the context of the program.

Literature Review

Although PGLD goes beyond prior crime prevention CCTV strategies, the CCTV research provides some context for assessing the impact of CCTV. Broad summaries of this research are

problematic because of differences in the CCTV programs themselves as well as differences in the types of crimes studied in different research.

Several studies examined the presence of CCTV cameras as a stand-alone prevention strategy. For example, Piza, et al. (2018) studied the effect of CCTV on three offense types (auto theft, theft from auto, and violent crime). For the offenses studied, researchers found only slight crime prevention support against auto theft.ⁱⁱ While Spanish participants in Cerezo's (2013) quasi-experiment perceived that CCTV would prevent crime, official data did not support this contention. Instead, the study found evidence of crime displacement whereby crime appeared to move beyond the coverage of the cameras. This was especially the case for property crime. Radcliff, et al. (2009) found different outcomes, depending on CCTV site. Results indicated displacement, some reduction in serious and disorder offenses, with half of the sites showing no crime reduction.ⁱⁱⁱ

Fewer studies have focused on CCTV detection by police, though these studies also emphasize the type of offense that may be influenced by CCTV cameras monitored by the police. An Australian study (Wells, et al., 2006) found that the manner of offending makes certain types of crimes more visible than others. Behavioral incidents such as assaults were better captured on CCTV than less visible incidents like drug deals^{iv}. Similarly, McLean (2013) speculated that nature of offense may influence prevention and detection based on a study of pole and building level cameras placed in Schenectady, NY. The researchers' hypothesis that there would be a reduction of visible offenses (occurring outdoors in camera range) was supported. It was postulated that with such visible offenses, potential offenders perceive a higher risk of detection. While results varied across cameras, declines were most notable in disorder versus property offenses.^v

Surveilling CCTV for offense details includes identifying and tracking suspects which arguably straddles the line between detecting and solving. While the results of CCTV police surveillance studies tend to suggest a negligible effect on crime prevention or reduction due to detection, research suggests the greatest value rests in enhancing investigative capacity. Ashby (2017) sought to determine the extent to which CCTV provides "useful evidence" finding that "CCTV was associated with significantly increased chances of crimes being solved." Researchers analyzed over 250,000 crimes recorded by the British Transport Police during a four-year period, concluding that CCTV was available for 45% of cases and judged useful by investigators in 29% of cases. More serious crimes where precise location and time of offense were known resulted in more utility.^{vi} Enhancing investigations was also noted in the Taipei City, Taiwan study conducted by Yung-Lien (2018). While finding little effect of CCTV surveillance on lowering crime, researchers observed increases in clearance rates for robbery and burglary leading them to conclude the goal of every CCTV system must be to improve criminal investigation and prosecutions beyond seeking crime deterrence.^{vii}

Two local studies are relevant for this study of PGLD. The Detroit Police Department's (DPD) Technology for Improvements in Public Safety (TIP) involved the linkage of private surveillance cameras to DPD's Real Time Crime Center. The focus was on utilizing existing private cameras in the downtown area to enhance investigations and ultimately crime prevention with a primary goal of reducing larceny from vehicles in downtown parking lots. Like several of the above

studies, the evaluation suggested a modest 13% decline in larceny from vehicles (Circo, Krupa, & McGarrell, 2018).^{viii} This study also suggested the potential utility of collaboration between DPD and private businesses.

The second study was a Phase One study that involved the evaluation of the initial implementation of PGLD. The study focused on the initial 87 businesses that became part of PGLD in 2016. Comparing violent, property and disorder crimes at PGLD businesses and a comparison group of businesses not participating in PGLD, reductions were observed across all three crime types from 2015 to 2017 at PGLD businesses. The early results were complicated, however, by several factors. First, there was a clear pattern whereby the initial implementation of PGLD resulted in increased calls for service from PGLD locations. This likely reflected increased reporting due to the commitment made by DPD to prioritize responses to calls from PGLD locations. Second, this was a period where DPD implemented several different and complementary crime prevention strategies and the city observed overall declines in crime. This made it difficult to disentangle an overall decline in crime from the declines observed at PGLD locations.^{ix} The results were, however, sufficiently positive to support the continued development of PGLD and to suggest the need for the current evaluation.

Whether a study attempts to assess impact, results often advance knowledge about how CCTV police programs may be strengthened to improve effectiveness. Since this study focuses on describing how the mechanisms of PGLD can prevent, detect, or solve crime, this review continues with reporting results and discussion in the workings of CCTV program philosophy; CCTV program structure; and the human dimension of CCTV technology.

Program Philosophy – The development of police crime reduction programs is not exclusively framed in expected outcomes, but also the philosophical underpinnings expected to bring concept to reality. Prior to CCTV surveillance program initiation, police must identify and address stakeholder issues. For CCTV surveillance programs to be supported in the long-run, after “buy-in” and program implementation, continuously addressing public and private sector considerations is essential.

The public-private relationships involved in PGLD resemble what Burnet and Chandler (2009) describe as “tactical and operational coordination of policing services” between the two entities involving a more permanent ongoing relationship.^x Consistent with this ongoing public-private collaboration, Sousa and Madensen (2016) described how the Las Vegas Metropolitan Police Department (LVMPD) was able to gain community support for its CCTV crime reduction program. The LVMPD overcame concerns expressed about personal privacy, law enforcement overreach and displacement. Involving citizens in decision-making and providing assurances about training personnel as well as broadening patrols beyond the affected area are viewed as responsive to public concerns. The study’s results suggest that public confidence continued after program implementation.

As will be discussed in subsequent sections, DPD has taken several steps to secure public support similar to the LVMPD approach.

Program Structure

A CCTV surveillance monitoring program requires cameras capable of capturing highly visible images streamed to at least one monitor. To prevent crime, cameras, and or other notices (i.e., signage, beacons) must be visible to potential offenders. To detect crime, video footage must be available for viewing live. Currently this is frequently accomplished in real-time crime centers where police have access to live feed to multiple desk monitors and on a large multiplex. To facilitate detecting or solving crime, the captured video footage must be clear enough to identify people and what they are doing. To assist investigations, the footage must have been recorded and available for a period of time beyond commission of the crime.

Though not specifically focused on requirements, studies about police CCTV initiatives typically address some of the needs for program start-up. Meeting technical requirements that affect camera visibility, surveillance range, image quality, and monitors is part of the implementation agenda. Less discussed is signage and other beacons (e.g., lights) drawing attention to the camera's presence, and video storage.

It is postulated that if CCTV cameras are to be preventive, they must be viewable by potential offenders. Willis, et al. (2017) interviews of 899 Australian offenders found that most (69%) viewed CCTV surveillance cameras as effective in preventing crimes generally. Though interviewees often reported they were not specifically deterred, the results suggested an active awareness of surveillance technologies.^{xi} While both types of cameras were overt and thus visible to potential offenders, McLean, et al (2013) noted that cameras mounted on poles appeared more successful in reducing crime or disorder than building-mount cameras.^{xii}

Improving the odds that potential offenders will notice cameras, police erect signs and other beacons announcing their presence. While arguing the legal rights of the surveilled, Lippert (2009) cast doubts that signage results in presumptions about being under surveillance. A sign may not be interpreted to mean one is under surveillance absent observing cameras and correctly estimating the surveillance zone.^{xiii} Willis, et al (2017) speculates that measures like signage are more effective deterrents in certain locations (car parks) and for certain offenses (auto theft).^{xiv} Given the difficulty of isolating the effects of this added deterrent, it is unsurprising that no study was uncovered exclusively devoted to signage. Easier to measure is the extent to which factors affect image quality and coverage.

Useful visible images can be produced through proper camera angling, employing multiple cameras, and quality equipment. Researchers have noted that camera angling can improve captured footage. Piza, et al. (2014) recommended that "police should account for the presence of crime generators/attractors and ground-level obstructions when selecting camera sites and design the operational strategy in a manner that generates maximum levels of enforcement."^{xv} A systematic review of 44 evaluations, involving multiple countries concluded that the ability for CCTV surveillance to reduce crime is improved with higher camera coverage (Welsh & Farrington, 2008).^{xvi} LaVigne, et al. (2011) noted that increasing the number of cameras with overlapping viewsheds can increase the ability for capturing crimes on surveillance.^{xvii}

Additionally, highly technical formulas may inform best practices for capturing surveillance footage. For example, Choi & Lee (2015) devised a surveillance resolution and coverage index to assess the effectiveness of a CCTV system monitoring a target area.

While camera quality can affect image quality, new technology continually results in producing sharper images. Similarly, internet services offered in “the cloud” are readily available from multiple providers which makes storing, sharing, and organizing digital files available with just a few keystrokes. Moreover, large video data can be maintained indefinitely. The culmination of these modern technological advancements affords police departments the ability to capture high quality images via digital broadcasting on desk monitors and large multiplex screens - frequently referred to as Real Time Crime Centers. The unlimited data available to police with dedicated control rooms begs the question of: how can police personnel best use the CCTV technology towards crime reduction?

As will be discussed subsequently, PGLD built upon these insights with program components emphasizing camera and video quality, video storage, active monitoring, signage, and police-business active collaboration.

The Human Dimension of CCTV Technology

Last, but by no means least, are the human resources necessary to run operations. CCTV police programs involve the work of many practitioners primarily concerned with surveillance, monitoring, and responding to reported or detected crime. Those typically performing these duties include (but are not limited to) surveillance operators, crime intelligence analysts, technical specialists, and police officers. How these CCTV personnel perform their “active” duties as in searching to detect crime or scanning real-time footage in response to calls for service can affect program impact.

To the extent that prior research has addressed CCTV surveillance, it has been determined that the degree of monitoring by CCTV operators can affect an ability to mostly detect and identify crime and some effect on the speed of solving crime. At least one study (LaVigne, et al. 2011) found a positive effect on crime detection with active/live monitoring of CCTV cameras.^{xviii} The results of the McLean, et al. (2013) study led researchers to consider whether cameras could be better exploited with active monitoring.^{xix}

Stainer, et al. (2013) observed CCTV operators in a United Kingdom control room to prefer (90% of the time) a crime searching strategy on single-scene spot-monitors versus the multiplexed wall of scenes.^{xx} Detecting crime can be hampered by an operator’s level of concentration. Näsholm, et al. (2014) found that CCTV operators monitoring just one high quality image screen often experience “inattentive blindness.” This deficiency was found to adversely affect the ability to “detect salient, ongoing stimuli appearing in the spatial field of their attentional focus.”^{xxi} More research is needed to inform the relationship between practitioner technique and work performance.

Donald (2019) reviewed 56 documents reporting mixed method research involving cognitive “processing challenges” in CCTV surveillance. The review suggests that study design, especially

those relying upon operator or researcher perceptions makes practical application of results difficult, and unreliable due to bias. To improve applicability of results, Donald recommends use of quantitative methods to “assess how much time operators actually spent actively monitoring cameras versus performing other duties and activities, and whether this is in line with the goals of surveillance.” Such research is expected to yield suggestions on intervention, selection, and training operators.^{xxii}

Some researchers question if humans are even able to see criminals on video, let alone accurately process the information. In addition to cognitive issues, psychological perceptual challenges may also limit an ability to detect crime by CCTV operators. Scott-Brown & Cronin (2007) described the failure to notice changes when blinking called “change blindness,” and a tendency to underestimate susceptibility to it referred to as change-change blindness” as compromising -- presenting situations where a suspect is not only incorrectly tracked, but potential inaccurate accounts being given.^{xxiii} To the extent that an operator is unwilling to face the truth about an error may be connected to stress, another psychological factor.

Since high stakes’ work such as emergency management may be stressful, research is sometimes designed to inform executives on hiring decisions, training, and interventions to mitigate adverse psychological effects on personnel. Such studies in law enforcement have focused on first responders including officers (Violanti, et al, 2017^{xxiv}; McCaslin, et al 2006^{xxv}; and Can and Hendy, 2014^{xxvi}) and to a lesser extent on 911 operators (Meischke, Hendrika, et al., 2018^{xxvii}; and Tracy and Tracy, 1998^{xxviii}). In the related field of security, Donald, and Donald (2015) observed operators performing surveillance for detecting theft in a simulated video to determine how operators’ cope and manage task overload. The results showed most study participants attempted to “manage attention resources and cope with vigilance demands” by alternating between task engagement and disengagement. The researchers found that task disengagement was associated with lower detection rates.^{xxix}

Although the results of most studies relative to CCTV operators suggest abilities and skill level may be improved, one study infers that “you either have it or you don’t.” Robertson (2016) compared the ability of an elite group from the New Scotland Yard Central Forensic Image Unit, London, known as “super-recognisers” to a control group on three tests of face recognition. The study found the super-recognizers outperforming on all tasks.^{xxx}

An additional factor in CCTV monitoring is management decisions about the integration of CCTV surveillance and patrol and how these configurations can affect crime reduction. Models can range from no integration to substantial interaction between the two sets of personnel. Observing a modest reduction in crime, researchers of the Chicago Police district level crime centers, found commanders could make faster data-driven decisions (Hollywood, et al., 2019). However, the decision-making was usually limited to increasing patrol and virtual surveillance on problem areas.^{xxxi}

To determine if CCTV enhanced police operations in Newark would affect crime levels, Piza et al. (2015) experimentally applied treatments by limiting CCTV operator surveillance; narrowing police patrol areas; and substituting traditional dispatching by improving direct communication between the two entities via two-way radio. The researchers concluded that this combined

approach provided a crime reduction benefit beyond a single strategy^{xxxii} Conversely, a Scandinavian study (Gerrell, 2016) about CCTV assist of police patrols in hot spots found no effect on violent crime prevention. While the study failed to observe an effect on assaults for CCTV monitoring linked to patrol, the researcher speculated results may have been influenced by less active patrols due to police officers serving as CCTV operators.^{xxxiii}

While results of the integration of CCTV surveillance and targeted patrol as a force-multiplier to impact crime control are mixed, research suggests that where there is impact, task structures including monitoring and patrol focus, workload and communication between CCTV operators and patrol units are factors.

Research Agenda & Methods

During the initial four years of Project Greenlight Detroit, the program has evolved considerably. Growing from just 8 participating businesses to now 700+, has resulted in some program components changing, while others have remained constant. This examination and description of the current mechanics of PGLD can inform future evaluations or replications of the program. To that end, this study will answer the following research questions.

- 1) How did the PGLD partnerships develop?
- 2) What are the workings of the PGLD apparatus?
- 3) Who are the principals (police department practitioners) involved in PGLD?
- 4) What are the activities of the DPD personnel working PGLD?
- 5) How do the DPD personnel perform their tasks?
- 6) How do the workings of PGLD prevent or deter crime?
- 7) How do the workings of PGLD detect crime?
- 8) How do the workings of PGLD solve crime?
- 9) How was PGLD affected by the anti-police brutality protests of 2020?
- 10) How was PGLD affected by the COVID19 National Emergency?

The current study employs the qualitative methods of observation and interview. PGLD owners were interviewed to obtain their perceptions about the program. CCTV operators/crime analysts were observed and interviewed intermittently to clarify their tasks. Program directors were interviewed to provide historical data and administrative functions of PGLD. The researcher accompanied police officers in the field to observe their work connected to PGLD while simultaneously interviewing them to gather information about the program.

The interview approach was utilized with the recognition of potential bias for workers to exaggerate performance. It is also acknowledged that researchers, particularly during participant observations, are subject to bias. Finally, as Adang (2018) points out, the proximity between researchers and study subjects made this form of research prone to “reactivity.”^{xxxiv} Notwithstanding the stated limitations, since this study aims to collect data for descriptive purposes, such biases are not likely to affect results. The practitioners describe the innerworkings of the program as the researcher observed how tasks are performed. (The need for this type of systematic study to identify the micro-level attributes that increase effective CCTV cameras

working was noted by Yung-Lien, 2019. The author argued that gathering such data could improve decisions on monitoring sites likely to be most productive.)^{xxxv}

One concern that the researcher expected to encounter is “reactivity.” Since research participants knew that they were being observed, it is possible that they were on their “best behavior.” Given that this study seeks to view the program in its entirety, such conduct could increase opportunities for observation. Consequently, optimal performance, though it may be atypical, improved the odds that some of the finer details of the program were observed and thus could be described.

To further describe and assess the program, a few interviews were conducted of business owners participating in PGLD. With a goal of interviewing approximately ten business owners, seven owners of traditional PGLD retail establishments such as gas stations, and party stores were sought. The aim was to interview three owners of less traditional businesses such as residential facilities. A random selection from each entry year was made from a list provided by DPD that considered type of business. Selections were made from establishments located on both the east and west sides of town.

The randomized list was presented to the DPD program manager who contacted owners to determine if they were willing to be interviewed. Subsequently, the program manager was able to refer seven of the twelve to the researcher for interview. Six of these persons, five of whom represented traditional PGLD businesses, were interviewed via telephone. To achieve the goal of a cross-sectional sample, a second list was provided to the program manager consisting of five less traditional PGLD businesses. Of these, the researcher received confirmation that four were willing to be interviewed. Subsequently, two of these business owners and one manager were also interviewed via telephone. The total sample of business owners/managers interviewed was nine; five from traditional PGLD businesses and four of less traditional PGLD businesses. In these exploratory interviews, the primary objective was to determine how business owners view the effectiveness of PGLD including crime deterrence and the special police services provided. A few open-ended questions were posed to gauge these perceptions. Interviews ranged in length from over three minutes to over seventeen minutes. To distinguish interviewees without revealing their identities, each was assigned a name consistent with the police phonetic alphabet code.

Where possible and appropriate, inclusion of documentation and illustrative case situations are two other methods expected to improve validity.

Background

The Detroit Police Department (DPD) initiated Project Greenlight with the primary goal to reduce crime through preventing, detecting, and solving crime. It was surmised that if businesses in high crime areas would live feed video to the DPD, such access would deter some crimes, swiftly permit personnel to detect offenses in progress, and or solve committed crimes.

Bringing an idea into reality that involved entities outside of the police department required forming partnerships, some formal and others less so. Given that the DPD planned to access and

use video footage owned by businesses, a formal arrangement was necessary with this group. To provide information about the program benefits and reduce suspicions about being spied upon, public support was also needed. Finally, since deterrence is dependent upon potential offenders' awareness about risk of detection, DPD required outlets to publicize the program.

After assessing that areas around gas stations were hotspots for violent crime, DPD piloted PGLD at eight such establishments in January 2016. The program was immediately expanded and DPD set about involving business owners and communities in Project Greenlight. While both groups were provided with information about the expected benefits of crime reduction, given the commitment and financial investment required on the part of the owners, the business groups were also offered incentives. Specifically, with the goal of creating safe havens throughout the city, participants in PGLD learned they would receive priority one designation on 911 calls for service as well as regular patrol drive throughs and visits.

Though not as tangible of an incentive, many Detroit communities and neighborhoods welcomed the promises of crime reduction through Project Greenlight. For example, hope for the program's success led the Detroit Association of Black Organizations to encourage participation and even sponsor half of the cost for a neighborhood gas station to participate in PGLD (Spencer, 2017).^{xxxvi}

The program's backing seemed to have continued for at least two years evidenced by representatives from three community groups organizing multiple protests demanding that businesses participate in Project Greenlight. Heralding PGLD as a way to make people safer at establishments, during one protest, the groups pressured non-participating businesses by displaying signs, marching, chanting, and attempting to deliver PGLD applications to owners (Mason and Herberg, 2017).

Perhaps the best gauge of community support in the City of Detroit originates from the Police Board of Commissioners (BOPC). This eleven-member civilian board consists of elected and appointed representatives from each of Detroit's seven districts. A review of the police board's minutes on December 10, 2015 and January 14, 2016 leading up to and at the launch of PGLD shows that the program was enthusiastically received (City of Detroit, 2015-2016).^{xxxvii}

Representation of community members at press events and an absence of opposition implied some community support when PGLD was launched in 2016. However, in mid-2019 DPD encountered substantial public resistance to PGLD when it became known that the agency was utilizing facial recognition technology. During the 2020 anti-police brutality protests, some groups called for the discontinuation of PGLD.

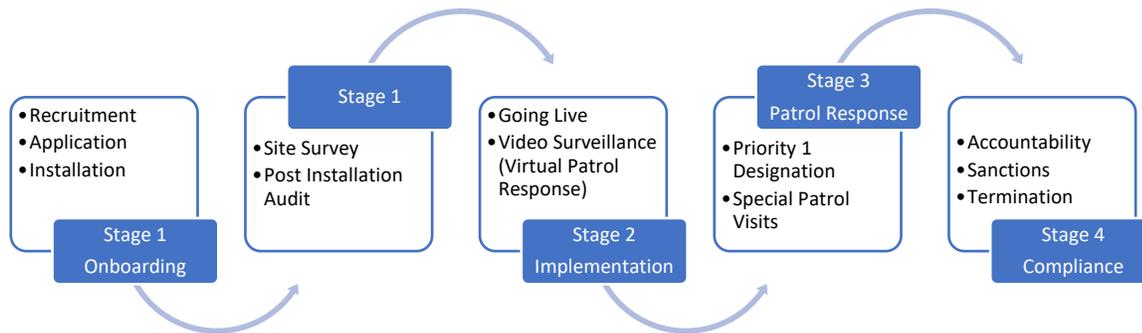
Publicity can be a double-edged sword. Much of the original publicity about the program was generated by City of Detroit press conferences as well as information placed on department and city websites describing PGLD goals and functions. Moreover, as the program started generating images of crime suspects and their subsequent capture, more news coverage ensued. However, recent publicity includes accounts over community ambivalence about the program primarily due to its perceived connection to facial recognition technology. (This topic will be discussed later in this report).

Articles and broadcasts in the media about PGLD often contain comments from owners, the public and DPD, some of which will be included in this report.

This descriptive study is arranged in sections and organized by program stages. Stage one is Onboarding and describes the recruitment, application, and installation process. Stage two is Implementation and involves Video Surveillance and Response. Stage three describes the Police Patrol Response to Project Greenlight Locations. Stage four describes Program Compliance.

Project Green Light Detroit Program Process by Stage

Figure A1. Stage One - Onboarding: Recruitment, Application & Installation



PGLD is a partnership between the City of Detroit, the DPD and hundreds of businesses and parcel owners located throughout the city. While intricate, the systematic process of onboarding has evolved practically.

Recruitment

Consistent with many program start-ups, early PGLD candidates were recruited directly by DPD. The only two factors necessary for PGLD eligibility are to be a business and located in the City of Detroit. To determine which candidates DPD should approach, the crime intelligence section developed a threat assessment on violent crime by location. Similarly, MSU researchers conducted Risk Terrain Modeling (RTM) analyses for DPD that indicated that gas stations, convenience stores, bars, and liquor stores, particularly in areas with indicators of illegal drug sales, were at high risk for shootings and robberies. Having pinpointed many high violent crime areas, DPD headquarters personnel met with appropriate precinct commanders to identify businesses that were good candidates for participating in PGLD.

It was reasoned that officers working directly in the community could exploit established relationships to encourage owner participation. The formal recruitment plan involved precinct commanders and Neighborhood Police Officer (NPOs) visiting targeted businesses to gauge and generate interest. To ensure that the program progressed, precincts were held accountable to document recruitment efforts. While officers working in precincts were familiar with the business owners, headquarters personnel remained involved due to their extensive knowledge about the mayor's and the police chief's vision for the program. Both Mayor Michael Duggan and Police Chief James E. Craig regularly publicized the program through media outlets.

Training and literature were developed for precinct personnel with tips on how to recruit successfully. Recruitment ideas included communicating the incentives for program participation such as priority one status during 911 calls for service, the ability of the police to monitor video feeds at any time, and regular patrols referred to as "special patrol visits." (See the Stage Four Section for more about special patrol visits). Additionally, the partnership agreement discussed below asserts that DPD, will attempt to monitor cameras "during emergencies and other exigent circumstances." In these types of situations, the DPD states it will make effort to continue monitoring until the agency determines the premise is secure. The agreement also avails police and city officials for meetings and explains enhanced patrols.

While DPD offers concrete incentives, other benefits may not be as apparent. An early participant's description of his decision to enroll highlights some of the *perceived* benefits of PGLD. The market owner cited ensuring the "safety of his customers," his increased "peace of mind," and his employees feeling safer as influencing his decision to participate (Lantigua-Williams, 2016). Other derivative benefits stated were the ability of capturing an offense on video (even when the business is closed), and the green light's signaling that his establishment is under police surveillance. This owner even speculated that participation in PGLD would attract more customers.^{xxxviii} To facilitate this, on its website the City of Detroit publishes an interactive map of businesses participating in PGLD. The continued opinion sharing on PGLD between officers and businesses has resulted in an array of possible advantages that may be touted during enlistment.

While many businesses recognize the advantages of participating in PGLD, one disadvantage cited is the cost. (If purchasing, PGLD participants spend approximately \$4,000 - \$6,000 on equipment and services). An owner of a party store said that "his resistance to signing up isn't that he's allowing crime to fester around his store — it's that the price tag is too high" (Hunter, 2018).^{xxxix}

Noting that participation growth had leveled off, DPD launched a marketing campaign and sought ways to make the program more affordable. In partnership with DPD, Invest Detroit and the Detroit Economic Growth Corporation (DEGC) temporarily offered "microdistrict" grants for small businesses in qualifying districts. DEGC and Invest Detroit (n.d.) asserted that the grants provided for up to \$1,500 reimbursement of installation costs, and half of monthly service

fees (up to \$125). While only a few PGLD candidates received the grants, DPD continues to pursue ways to reduce costs.^{xi}

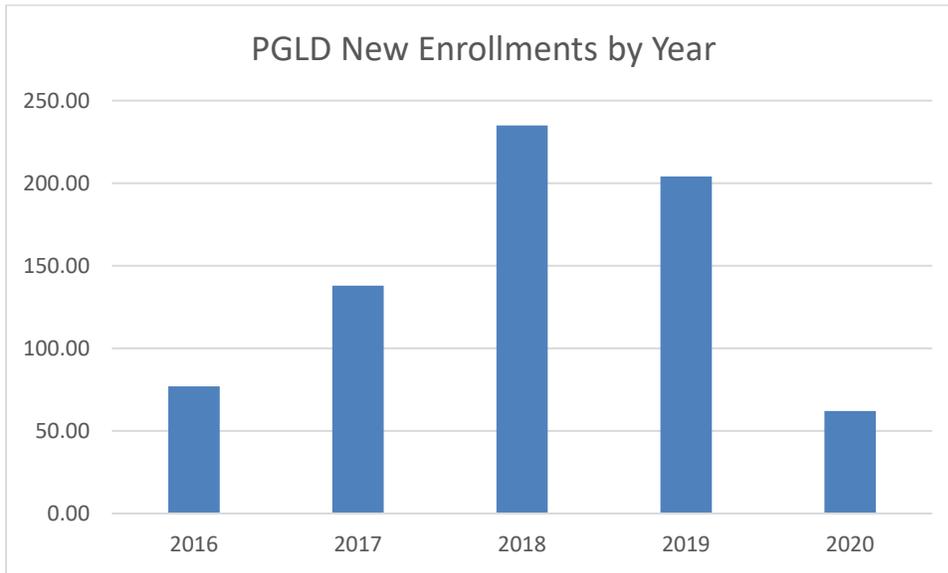
A partnership with the local energy company provided financial relief in the form of rebates. In a joint press conference with the City of Detroit, and the DPD, the Detroit Energy Company (DTE) announced that the upgraded lighting required by PGLD qualified for rebates.^{xii} Eligible businesses could receive up to \$7,000 reimbursement for installing the energy efficient lighting. Another financial incentive that DPD brokers are discounts. For example, camera vendors were requested to offer cost reductions to Project Greenlight participants. DPD announced that in response, one vendor (Comcast) reduced the installation cost and offered a multi-site installation discount (Helms, 2016).^{xiii} While DPD is not involved in PGLD procurement, to the extent that vendors respond with discounts, DPD provides that information to candidates during the onboarding process.

While alternatives have been facilitated by DPD, some businesses already have access to funding sources available to participate in PGLD. Public housing facilities receiving U.S. Housing and Urban Development (HUD) funds may tap into their capital funds account to enter Project Greenlight. Three multi-dwelling communities supported by HUD currently participate in PGLD. The Detroit Housing Commission's Interim Executive Director said the risk posed to residents and property influenced the decision to join the program – specifically concerns about unwanted street activities occurring in the neighborhood and unauthorized persons entering the premises (Gross, 2018).^{xiii}

Some businesses jointly agree to participate, making the program more financially accessible. Eligibility for Green Light Corridor designation is a minimum of five “closely-situated businesses,” signing on as partners. Such arrangements come with the financial incentive of extended camera coverage.^{xiv} Typically the businesses are within a two or three block radius. So far, five Detroit areas have been designated as PGLD Corridors.

The number of total businesses participating in PGLD has grown to over 700.

Figure 13: Enrollments in PGLD by Year



Note – 2020 data are current as of 11/30/2020. Provided by PGLD staff.

The program has become so prevalent that most participants contact DPD to sign-up without having been formally recruited. As Detroit Mayor Michael Duggan pointed out in 2019 “the city hasn’t had to sell the program to businesses. They’re selling it to each other through word of mouth” (Donnelly, 2019).^{xlv}

Survey results⁸ indicate for the past two years, the most common ways candidates learned about Project Greenlight include: Word of mouth (including friends, families, or neighbors); and media (television, radio, news, or internet). While the same survey cites City of Detroit or DPD personnel as referral sources, the recruitment model has evolved to becoming more situationally based. Officers seek participation when an offense takes place at a particular business or in an area of the city without CCTV camera coverage. For example, after thieves drove a truck through the store window on a busy downtown street, officers raised the issue of surveillance cameras with the owner. Hoping to avoid a repeat offense just before opening his second store, that business owner became the 500th participant in PGLD (Donnelly, 2019).^{xlvi}

Violence taking place in the Greektown area of Detroit was the catalyst for the first set of businesses to join PGLD as a consortium, becoming a Greenlight Corridor. Over a two-month span, this downtown area experienced aggravated assaults involving several people and a shooting of three persons. Because the incidents occurred outdoors, the business owners were

⁸ The researcher examined the raw data DPD obtained from the PGLD application which poses the question: “How did you hear about PGLD?”

persuaded that cameras could act as deterrents, and or to assist police in quickly identifying and arresting offenders (Rahal, 2018).^{xlvii}

Since summer of 2019, DPD electronically tracks recruitment efforts.

Application

At the program's onset in January 2016, entry was rather informal. DPD received and processed applications manually, frequently taken over the telephone. Several verbal and email exchanges occurred throughout the applicant process. Even with a small number of participants, this approach was not efficient often resulting in a long time-lag between application and installation. As the number of participants increased, the need for a more formal process became apparent.

The initial attempt to formalize the process was establishment of an online smart sheet (hereafter referred to as the PGLD tracking or online system) for internal use, but the application process remained unchanged. Dashboard automation did permit DPD to determine that the slowest part of the process was from signing of the Memorandum of Understanding to vendor selection. To speed up the process, DPD developed an automated system which improved tracking, communication, and processing from application to installation. Essentially, the automated system set a pace whereby everyone involved (DPD personnel, business participants, technology vendors) are compelled to remain on an established step by step timetable from application to implementation.

The most notable improvement was implementation of the online application in September 2018. Submissions in digitized form eliminated a processing backlog and reduced the application to onboarding time from approximately 55 days to about 21 days.

The Application

The current PGLD application is available online via the City of Detroit's website. Upon clicking the application link, candidates access a fillable Google Form which begins with a summary of camera and lighting requirements. Also, candidates are informed that while DPD does not charge a participation fee, owners are responsible to pay for installation and maintenance of PGLD cameras, cloud storage, green light, and signs. After this brief notice, applicants are invited to complete the online application (see https://docs.google.com/forms/d/e/1FAIpQLSd8RI2NBYwA1xwkuXp5B_HRli8opAl-DbsinCzzW0n61WpCeA/viewform; accessed 12/14/2020).

The first page of the PGLD application seeks details about the owner, the business and property. The second page addresses vendor options. Applicants are provided a list of several camera suppliers with different prices for purchasing or leasing. Page two also furnishes applicants with a couple of options to select signage and green light vendors. Applicants are informed that vendor selections can be changed before installation. On page three, applicants are required to agree to the terms and requirements contained in the Partnership Agreement Memorandum of

Understanding (MOU) for Project Greenlight Detroit (see below for a summary). The fourth and final page is a survey asking applicants about how they learned about the program and why they are interested. The last space above the submit button gives room for applicants to provide any additional information that DPD should know.

The Memorandum of Understanding

The PGLD MOU is a three-party agreement between the business applicant (company), the City of Detroit (Office of the Mayor) and the Detroit Police Department. While the PGLD MOU is not legally binding, there are sufficient clauses to compel compliance, or termination of the agreement. The current MOU consists of four articles and one appendix.

Article I of the MOU outlines the responsibilities of the business entity. The first article details specification requirements for camera equipment including positioning, resolution, visibility, durability, and hardware. Matters relative to equipment operation on producing quality images for monitoring include usage of compatible brands and models; high speed internet connections; 30-day network storage; cloud subscription; sufficient external illumination (an exception is listed in Appendix of the MOU); and an ample supply of electricity. Article I also outlines the need for businesses to fund all requirements including the acquisition of PGLD branding items of signage and fixtures: one green light; one wall sign; flag signs; and door decals. Location of these fixtures are subject to approval by DPD and the City of Detroit. Article I concludes with describing the requirement for DPD to remotely access live and recorded video footage; provide an unobstructed view; recognize the need for periodic revisions to technical specifications; and acknowledge failure to comply may result in agreement termination.

Article II addresses DPD's commitments for surveillance, meetings, and patrols. While not obligating the agency, DPD states that it will monitor PGLD participating businesses during emergencies. At the agency's discretion, DPD and Detroit City personnel, and community members may meet to discuss public safety. Additionally, in Article II DPD asserts its intention to assign (and document on site) targeted patrols and work with employees of participating businesses to further law enforcement efforts.

Article III outlines that the term of agreement generally consists of one year and bases for termination. If either of the parties terminate the agreement, the business is expected to remove all items branded with "Project Green Light Detroit."

Article IV is a miscellaneous section disclaiming that the agreement is a binding contract. Also, in this article, it is stated that one party cannot subcontract its duties or obligations without written approval.

(See MOU PGLD Agreement at: <https://detroitmi.gov/departments/police-department/project-green-light-detroit/agreements>; accessed 12/14/2020.)

Installation

Upon receipt of the electronic application, DPD's automated system is activated. The PGLD manager is electronically notified and after reviewing the application, sends a confirmation email to the applicant. A PGLD tracking system is automatically populated affording the PGLD manager immediate access. A number of tasks are performed to connect the applicants with selected vendors and delegate installation meetings to DPD personnel.

The Site Survey

The actual installation process begins with a scheduled site survey between an expert from the DPD's Audio Video Evidence Response Team (AVERT), the business owner and the camera installer. During this initial meeting, an assessment is made about the number of cameras needed, where cameras should be installed, and how to angle cameras for maximum coverage.

The AVERT officer (typically a sergeant or detective) acts as the primary advisor to ensure that camera placement will result in capturing the best images for detecting and solving crime. The first matter to resolve during the site survey is determining the number of cameras necessary to cover a given business. Since all doors accessible to the public must be covered as well as the exterior of the property, a minimum of four cameras is necessary.⁹ Although not required, a business may elect to rent or purchase more than the minimum number of cameras required by DPD. (The optional extra cameras are also set up for live feed into DPD's Real Time Crime Center).

Upon determining the number of cameras to meet the requirements of PGLD, the officer assesses where to place each one. Drawing upon expertise and experience, the AVERT officer's primary objective is to ensure that cameras placed indoors and outdoors obtain a clear view of people. While outdoor placement is designed to capture views of both pedestrians and vehicles, people are the priority. Where cameras are affixed to monitor vehicles proceeding through the property, the intent is to legibly capture license plates. Having established placement, decision-making turns to angling.

Best practices are applied for angling cameras to capture clear views of people consistent with PGLD goals include maintaining cameras at an optimal height of 10 – 11 feet which produces a straighter frontal view; directly face cameras toward all regularly used entrances; and angling interior cameras to focus on doorframes which produce narrower views. An exception is that cameras are not positioned such that they may capture footage that violates the 4th Amendment of the U.S. Constitution which protects against unauthorized searches and seizures. DPD does not support angling cameras to focus on residential doors or windows. For example, for businesses managing multi-family units, cameras are placed and positioned in common areas such as property entrances, lobbies, and parking lots.

⁹ An exception is businesses along a Green Light Corridor – mostly bars and restaurants. Unlike individual Green Light locations, businesses along a Green Light Corridor are only required to have cameras on the outside (City of Detroit, 2018).

Based upon the aforementioned site survey, including selections, the owner is provided a quote by the camera vendor. The owner is not obliged to select a particular vendor before a contract is executed. Upon receiving the estimate, sometimes “sticker shock” sets in causing an owner to adjust by decreasing the number of cameras or changing vendors. However, the process does not proceed until after the owner has entered a contractual arrangement and the cameras have been installed.

All the information about the business and vendor representatives, camera placement and angling are entered into the PGLD tracking system by the AVERT officer for future reference and auditing purposes.

Post-Installation Audit

A business signals commitment to PGLD participation when a contract is executed with resultant install of cameras.

After installation, an AVERT expert returns to the PGLD site during a pre-arranged meeting with the vendor. An audit is performed to determine whether the cameras are placed and angled correctly. The AVERT expert verifies that the preferred views are captured and that the intended coverage range is realized. Using a mapping application, the officer catalogs and labels each camera’s location and directional angle. (The result is that monitors have ready access to street names and directions).

The post-installation audit also ensures that technical requirements are met according to industry standards. For this reason, the AVERT expert performing the audit must have received training and is certified by AXIS, the company that manufactures the cameras installed at PGLD locations.

Upon passing the installation audit, the AVERT officer coordinates with information technology specialists externally and internally. The department’s Information Technology Unit performs tasks to connect the site to the Real Time Crime Center so that video footage is viewable.

Project Greenlight Notices

After one week of going live with the Real Time Crime Center, the PGLD participant can order signs, decals, and a green light(s) for installation. In addition to these notices, Green Light Corridors also have illuminated signs attached to light poles along the corridor.

Within two weeks, a DPD officer ensures that the business is complying by verifying that all required signage and the green light has been installed. Soon after this, a “compliance book” is

delivered to the business. (For more on this topic, see special patrol visits and compliance sections).

The entire installation process typically is accomplished within about 21 days.

DPD reported that using data available from September 2019, on average 60 percent of businesses that apply go live.¹⁰

Stage Two – Implementation: Video Surveillance and Response

The actual work of monitoring of PGLD cameras takes place on the Detroit Police Department property conducted by personnel of the agency.

The Real Time Crime Center

Once cameras from participating businesses are connected to the Detroit Police Department, monitoring live or recorded video is made possible. From PGLD's inception until late 2017, the video feed was directed to a few monitoring workstations.

On November 17, 2017, a Real Time Crime Center (RTCC) became fully operational. Located at the Detroit Public Safety Headquarters, the center runs 24-hours per day and seven days per week. The three rotating shift times are: from 7am to 3pm (day shift), from 3 pm to 11 pm (afternoon shift), and from 11 pm- 7 am (midnight shift).

The center¹¹ is equipped with a state-of-the-art technological system consisting of a series of sizable flat screen monitors extending across the front of the workroom facing operators. Other monitors are elevated along the sides of the center and typically display television news. Most of the floor space consists of rows of workstations equipped with telephones and computers connected to multiple desk monitors. An elevated command station is situated in the back of the workstations with a panoramic view of the entire operation. Along the rear is an adjoining conference room with a glass wall which can serve as a command center during emergency operations. Connecting offices for command staff and cubicles for more operational personnel are situated on the side borders of the operation.

The RTCC is designed to provide personnel with maximum capability and flexibility in monitoring. DPD utilizes multiple service providers and systems for video management and interfacing with the 911 call center. The result is the ability to live stream the footage from PGLD sites to the RTCC and present staff with varied access for video viewing. Currently, approximately 3,000 PGLD cameras from 700 locations are connected to the RTCC. Some of the

¹⁰ Descriptions in this section are based on interviews of the Project Greenlight Program Manager, and with a detective (expert) assigned to the Audio Visual Evidence Response Team (AVERT). Also, information was obtained from content on the City of Detroit/Detroit Police Department website (detroitmi.gov), from the National Public Safety Partnership webinar where DPD officials discussed PGLD and news sources as referenced.

¹¹ This description was applicable until mid-March 2020 when the facility was temporarily relocated off-site pending construction of an expanded RTCC.

multiplex screens show rotating images from video feeds of Project Greenlight locations, of cameras placed to observe illegal dumping, traffic cameras and license plate readers. Other screens are fixed to monitor locations of concern such as threats based on intelligence assessments, enforcement operations, or major events. The sources of feed do not transmit audio.

In July 2020, two Precinct Intelligence Units (PIU) were launched in the 8th and 9th precincts. These units are each equipped with several monitoring workstations. Additionally, precincts are outfitted with one monitoring station typically located and operated by the front desk staff. Shortly after the COVID-19 outbreak was declared as a national emergency, CCTV operators monitored Green Light locations from home. Coincidentally, this occurred around the time of a planned expansion which would have necessitated temporary relocation. As of this writing, the RTCC is being operated from the two PIUs as construction is underway to expand the center. It is anticipated that the expansion which will accommodate more CCTV operators will be completed by the end of 2020.

Personnel working PGLD

At any given time, the RTCC is staffed with several crime analysts and police officers. Approximately two to four per shift are dedicated to monitor Project Greenlight connected cameras. While crime analysts may be assigned to PGLD, they are cross trained so that they can obtain varied experiences to assist where needed. Some of those duties include conducting general intelligence, reviewing “dumping camera footage,” monitoring license plate readers, and familiarization with facial recognition technology.

Much of the two-week instructional course for crime analysts occurs through on-the-job training. The first week typically acquaints analysts with the police culture as many newly hired lack experience working for a law enforcement agency. Trainees are familiarized with how to use systems and databases. They are also trained on how to conduct intelligence “work ups” (various checks performed to generate leads). During the second week of training, trainees primarily “shadow” senior personnel with the objective to put into practice what they learned. After this, the trainees start providing crime analyst services.

Each person working on PGLD is assigned multiple precincts to monitor and coordinate with patrol. The description of activities in this subsection is exclusive to those designated as Project Greenlight monitors.

Crime analysts and police officers performing the function of “virtual patrol” (see below for a description) are expected to complete several tasks. Described here is an excerpt of the duties relevant to PGLD monitoring, analysis and communication as listed in an internal document entitled “Job Specification Crime Analysts – Real Time Crime Center.”

For the purpose of preventing, suppressing, or detecting criminal activity PGLD assigned personnel work with “a variety of sources and transfers the information into a computerized form.” Personnel collect, analyze, and disseminate information to aid investigations, and increase apprehensions. Personnel are expected to interpret crime data and make timely notifications to

the appropriate persons (i.e., patrol and superiors). Additionally, crime analysts and police officers (hereafter referred to as CCTV operators) populate and maintain relevant databases.

Virtual Patrol

Each shift, CCTV operators in the RTCC review live streamed and recorded video referred to as “virtual patrol.” While the term “patrol” is suggestive of routine live monitoring, in most cases, CCTV operators’ virtual patrol is responsive and includes reviewing recorded footage. Active monitoring typically commences with a call for service through DPD’s 911 dispatching center. An integrated system automatically provides data to assist personnel. First, the system recognizes PGLD locations alerting the 911 center. Second, a broadcast in the RTCC announces “Green Light” which is a signal to CCTV operators that monitoring is needed. Third, video live feed from call origination is immediately displayed on the big screen and accessible on RTCC workstation monitors.

As CCTV operators hear the alert about a 911 call, based on their precinct assignments, they immediately and simultaneously: consult the PGLD tracking system which briefly describes the incident and start reviewing the corresponding video feed. Shortly thereafter, the assigned CCTV operator is often verbally conveyed additional information from the 911 call center.

Since it is rare that the offense is still in progress at the time active monitoring begins, CCTV operators often view footage depicting on site activity closer to when it was reported there was a problem (i.e., from the time the call was placed to 911 minus how long ago the incident was said to have occurred). CCTV operators also typically place a call directly to the telephone number where the 911 call originated. During this conversation, CCTV operators seek to obtain as much information as possible such as descriptions on suspects, involved vehicles, and routes of escape. To the extent that such information is obtained, it is conveyed by CCTV operators to patrol units responding to the PGLD location. (For communication purposes, CCTV operators have at the ready at least two portable radios tuned to the frequency of the precincts being monitored).

Frequently the conversation between the CCTV operator and the PGLD site representative pertains to the incident status. The CCTV operator’s attempt to obtain a more accurate description of what is occurring based on what they see, sometimes results in an admission of “up-calling”. (Where callers to 911 describe a situation as more serious than it is to solicit quicker police response). At other times, PGLD locations report that a low threat incident has been resolved (e.g., a loiterer has left the parking lot) in which case a patrol car is no longer requested. When this happens, the CCTV operator updates the patrol unit. Factors such as how close the patrol unit is to the location and other priorities, determines if officers still respond.

When a patrol unit is enroute to a PGLD, the CCTV operator is actively monitoring camera feeds from the scene for clues. CCTV operators scour available cameras and angles based upon information obtained about the location of the incident. Although a CCTV operator can bring up to 64 cameras at once, pictures are too small to observe detectable details. Consequently, as a practical matter, CCTV operators usually search only 4-12 cameras at a time.

Information sought is for enhancing officer safety and/or furthering an investigation. An example of the former as told to the researcher by a CCTV operator is being able to alert officers about a higher number of perpetrators on the scene than reported to 911. The CCTV operator related that they are also able to call for back-up assistance on behalf of officers they witness as being assaulted. Monitoring continues until the officers arrive on the scene. And while there is no requirement to continue monitoring, after police arrive, analysts typically do so until after officers have left the scene.

CCTV operators monitoring PGLD sites have also on occasion observed important details passed on to officers resulting in enforcement action taken. A violent situation occurring at a PGLD location monitored in the RTCC by a CCTV operator provides an illustration. During summer, 2020 a “911 call was received regarding a male pointing a gun at his girlfriend at a PGLD location. Analysts were able to watch the location and immediately notify officers to describe the male with the gun. The clerk allowed the girlfriend to go behind the counter for safety until police arrived. Upon arrival, police had a brief struggle with the suspect but were able to make an arrest. A warrant was sought.”¹²

In addition to the 911 calls, CCTV operators search for video footage on crimes suspected to have occurred in view of a PGLD camera. Sometimes this occurs when a request is made from the field, but since CCTV operators are monitoring radio transmissions, they often take the initiative to assist. The researcher observed several CCTV operators rewind camera PGLD footage to locate and track the movements of a vehicle suspected to be involved a shooting. At times, officers also request video footage checks when a suspect’s escape route is believed to in view of PGLD cameras.

DPD takes advantage of every intervention strategy to solve crimes. At times, PGLD footage is examined to make identifications and arrests in cases involving other initiatives such as Operation Ceasefire, and the National Integrated Ballistic Information Network (NIBIN). While DPD has access to facial recognition technology, it has not been utilized in real time. The agency recently adopted a policy which prohibits the use of this technology during any form of video live streaming.

When time permits outside of the 911 call response and assistance rendered at active PGLD linked crime scenes/escape routes, routine virtual patrol is possible. This type of passive monitoring can also produce useful results. A Project Manager related that in 2018 a crime analyst monitoring a live stream from a Green Light location observed a robbery and shooting. Observing the perpetrator with a rifle and the victim attempting to escape upon being shot, the CCTV operator radioed units. This immediate notification to patrol officers facilitated a quick response and arrest. Other duties performed during down-time may include searching footage for reported crime. For example, in another case, after reviewing footage from Project Greenlight cameras, personnel of the RTCC were able to corroborate that the offender had assaulted victims with a shotgun leading to formal charges (Dado, 2018).^{xlvi}

¹² This information was provided to the researcher by the Crime Analyst Supervisor.

Teamwork is on display at the RTCC. If an operator is already actively monitoring when a new call comes in, another CCTV operator is requested to assist. Recognizing this in advance, frequently, another CCTV operator will preemptory state that they will cover the new call. The lateral placement of all PGLD CCTV operators in a single row is conducive to communication flow. CCTV operators need only look left or right to find someone else working PGLD locations.

CCTV operators update action taken within the PGLD tracking system already populated with an event number which all involved parties have access to. Typical data entered are CCTV operator name, location, nature of incident, observations, and response. CCTV operators also make notations in the PGLD tracking system for the compliance team when it is discovered during active monitoring or routine checks that cameras are malfunctioning or not producing quality images. (For more, see the Stage Three and Stage Four sections).¹³

Stage Three – Police Patrol Response to Project Greenlight Locations

Two types of patrol are distinguished relative to Project Greenlight: priority one response to 911 calls for service and “special patrol visits.” The agency tracks both types of patrols.

Priority One Patrol Response

While the PGLD MOU does not expressly state that participants will receive a “priority one” patrol response, this commitment has publicly been asserted by DPD officials. Among them, Police Chief Craig stated that “priority 1 runs are given precedence over other emergency calls” (Hunter, 2018).^{xlix} Moreover, during interviews and participant observation, there was a consensus that PGLD business are indeed provided with a priority response. DPD could not point the researcher to a document which explains the preference, and it was confirmed that the assurance is verbal.

Considering the statements made publicly and to the researcher, DPD’s intent is to immediately respond to 911 calls for service from PGLD locations on the condition that officers are not working a situation with a higher priority at the time. For example, reports of crimes against persons at a non PGLD location would be responded to before reports of crimes against property at a PGLD site. Still, given the intricacies involved in receiving calls and dispatching officers; and that the call center was not a subject of study, evaluating the priority one practice was outside the scope of this assessment. However, several reactions about priority one status shed light on perceptions of this practice.

First, besides DPD personnel articulating an intent to bestow the priority one status on PGLD, business owners have interpreted that they enjoy this status. Boasting about priority one patrol status is viewed as a means for attracting customers. As the president of the Chaldean American Chamber of Commerce told the Detroit Journalism Cooperative (2018) store owners agree that

¹³ Descriptions in this section were obtained from interviews of the Crime Analyst Supervisor, and the Project Manager; researcher observations of crime analysts working in the Real Time Crime Center on 12/20/19 and 3/10/20 with interviews of those crime analysts; the job description of Crime Analysts working in the Real Time Crime Center obtained from DPD; and other sources as referenced.

“better police response time” will help their businesses.¹ But, when PGLD businesses do not perceive they are receiving priority patrol response they sometimes complain. After it took about 10 minutes for police to respond to a call about a participating business being trashed, the owner became upset. When officers arrived, the perpetrators were gone leaving the owner to ponder: "What is the reason for me putting a Green Light out, paying \$7,000, plus over \$700 a year fee - every year - if that green light is going to do me nothing" (Fox 2, 2020).^{li} While DPD does not receive compensation from PGLD owners, perceptions on the part of participants and non-participants of a reciprocal relationship permeate popular literature. The responses of business owners interviewed is consistent with the understanding that PGLD businesses expect to receive priority one police response. Two of these owners said that they have complained to DPD about response times to 911 calls for service to their PGLD businesses.

Second, businesses not participating in the program have criticized the priority status for PGLD businesses. Allegations of it being an unfair practice is a common criticism. Reporter Ross Jones (2018) posing a question about whether it makes sense that a Green Light business gets a quicker response time was met with a “no.” That replying party store owner of a non-participating business added “it’s almost like, you’re paying them to come to you first.”^{lii} A different business owner protested: “We should all be equal. I pay high taxes already. Now I have to pay extra to get the police to come?” Although the owner admitted that DPD responds quickly when a weapon is involved, in other situations “it takes a long time”(Hunter, 2018).^{liii}

Third, even residents perceive that a quicker police response takes place at Project Greenlight locations. Calling them “zones of safety,” Mayor Duggan reported that those feeling endangered or threatened have gone to Green Light locations to call 911 (City of Detroit, 2017).^{liv} A woman who had been shot elsewhere was reported to have driven to a gas station precisely because it was a PGLD location. The bleeding woman crawled into the store yelling for the police to be called. She said she stopped in the store because she saw the green light (Erickson, 2017).^{lv} A church pastor said that he hopes never to have to use the benefit that goes along with his church’s greenlight. But says “it also allows for those in our community who find themselves in an uncomfortable situation to find refuge.”^{lvi}

Fourth, DPD defends the priority one practice. Referencing paragraph one of this section, when Chief Craig acknowledged priority one designated calls given precedence, he explained that “Green Light runs don’t trump violent crimes” (Hunter, 2018).^{lvii} After police did not respond as quickly as an owner thought they should, he told reporters that DPD personnel (dispatcher and responding officers) said it was because the business was not in PGLD. Citing official records, the agency refuted the business owner’s claims while still guarding the practice. According to Hunter (2018), Assistant Chief James White said: “It’s fair to say if you’re a Green Light location, you’ll get measurable attention, but to say non-Green Light businesses don’t get attention is not a fair statement.”^{lviii}

PGLD Dedicated Patrols (Special Patrol Visits)

Participants of PGLD enjoy “special patrol visits” type patrol. For decades¹⁴, DPD utilized the phrase “special attention” to communicate to officers the need for patrolling a specific location. Typically, the call for special attention is announced during roll call along with the rationale for providing extra patrol to the target (e.g., there have been multiple burglaries, so be on the lookout for suspicious activity). The result is that although not specifically assigned, several units per shift check on the targets while conducting routine patrol. DPD has utilized the special attention concept through “special patrol visits” for PGLD participants.

During a podcast about PGLD, a question was posed about what constitutes the special patrol function. A high ranking DPD officer described it as extra patrols to a business, occurring when officers have “down-time,” and where they speak to the clerk as a security measure to ensure that everything is “okay.”^{lix}

Special patrol visits to the PGLD locations consist of regular passes around the property exterior, visits inside of the establishment, and reports of these rounds documented within DPD and at the PGLD site.

Exterior Patrol

Although not labelled as such, the DPD’s intent to provide PGLD locations with special patrols is included in the PGLD MOU. Relevant to this subsection is the DPD statement that parking lots will be patrolled and other parts of the property to include engaging loiterers. The MOU states that these patrols are at the DPD’s “discretion.”

Precinct commanders determine how PGLD locations will be patrolled within their respective precincts. One approach is to assign designated units per shift; another is general special patrol visits for PGLD locations. Some precincts have assigned Neighborhood Police Officers to patrol PGLD locations. Of course, commanders can combine different methods such as designating special patrols during high crime periods while more generally during other times (this is like the 4th Precinct approach).

The researcher observed an officer conduct several patrols of PGLD locations in the 4th Precinct. Based on these participant observations, the primary objective of this special patrol appeared to be a wellness check. The officer searches for actionable matters to engage or resolve immediately as well as reporting situations that require follow-up. Tapping into the strategic intelligence that identifies PGLD locations as high risk, officers proceed with vigilance. During patrols, officers actively search for crimes against persons or property with an intention to intervene. Officers seek to interrupt drug dealing, prostitution and other crimes that take place in the public realm. Much of the incidents encountered on special patrol visits are public order offenses such as loitering and vagrancy. Observations regarding the latter found such persons moved along upon the patrol car coming into view, or when the officer alerted them to her presence through the public address system.

¹⁴ The researcher recalls from her tenure as a DPD officer that as early as the mid-1970s, this phrase was in use.

In addition to applying traditional policing methods in patrolling the PGLD locations, officers also draw upon tactical intelligence. For example, during one pass the observed officer drove around the rear of an apartment building, exited the vehicle, and checked the door to ensure it was locked. It was explained complaints were received that people were placing pennies in the door jamb giving the false *appearance* that a door was locked. This ploy affords criminal access to the property.

Patrol officers can develop operational intelligence since they can access Project Greenlight cameras. Surveilling cameras can provide valuable information about where to patrol to thwart crimes in progress. Correspondingly, reviewing camera footage after a previous patrol can alert officers about the necessity to return to a PGLD location.

Upon arriving and departing a PGLD business, the patrol officer notifies the communications center. DPD maintains a record of these reports and periodically releases statistics to the public about the aggregate number of special patrol visits to PGLD sites. Hunter (2017) described DPD reporting 40,471 special patrol visits to PGLD businesses that year which was an average of 111 each day.^{lx}

On-Site Visits

The PGLD MOU asserts that the discretionary patrols are “based on the totality of circumstances” and may include “entering into the entity.” Customarily, exterior patrols are often followed by interior checks.

Consistent with the overall intent of patrols, officers enter PGLD locations to perform a wellness check. Based upon participant observation, officers first enter a site scanning the premises for signs of trouble, including anything that may be out of order. Next, the officer greets a business representative and engages in brief conversation to inquire whether there is a need for police assistance. The most common remark from the officer observed was “any issues” [to report]? The researcher listened to an exchange recorded by Graham (2017) between a PGLD business owner and an NPO conducting a special patrol visit check whose greeting was followed by “you alright?”^{lxii} In the case of the 4th Precinct observation, typically the worker who was usually busy with a customer, did not state a need for further police assistance.

The special patrol visits are also perceived as a benefit by PGLD owners. A liquor store owner told the Detroit Journalism Cooperative (2018) that having the police stop by every day is “like having a security guard monitoring my property, but it’s the police.” The owner expressed concern about whether the patrols would diminish if the program is expanded.^{lxiii} One of the interviewed owners asserting lack of patrols speculated if his party store was receiving less attention because there are “too many” green lights in the responding precinct.

It was noted that busier establishments with greater public access were more likely to receive the subsequent inside visit. For example, several gas station stores were entered, while grounds of an apartment building were patrolled without entry. Also, the one owner interviewee reporting that

complaints were made to DPD about a lack of internal wellness checks owns a residential facility (motel).

Prior to concluding a visit inside of a PGLD location, the officer is provided with access to a logbook maintained on the property. Since most of the sites visited were busy gas stations where workers were behind bullet proof glass, officers were granted access behind the counter to make their notations.

Documenting Special Patrol Visits

The DPD holds its officers accountable for conducting special patrol visits to PGLD locations. As stated, the agency requires officers making such patrols to radio their presence. DPD keeps track of the information to among other things, assess the program's progress. Consistent with Article 2, subsection entitled patrols of the MOU reference "signing in at the Entity," officers visiting inside do make notations in what is referred to as "the book." After a participant has met all PGLD requirements, a book is delivered to the establishment.

Contained in the loose-leaf type special patrol visit book are green sheets with the following headers: Date, time, assignment, rank, badge#, name and signature. Each page has several blank lines. During the officer's visits, the researcher observed her fill out a line with the exception of one location. At that site, the worker did not seem to comprehend what was being requested relative to the book. While explaining that the employee may be new, the officer still reported to the precinct the need for a book to be delivered to the site.

There are conclusions that may be drawn about what is written in the special patrol visit book. For example, the researcher took notice of earlier entries. In some cases, a location had been visited already that day. (In one case, the observed officer was the third one checking in). While this activity would suggest a high level of patrols, DPD takes steps to avoid an opposite impression.

NPOs pick up the completed pages and replenish the book. Along the way, it was surmised that if all filled in pages are removed, it could give the false appearance that no one had been checking in recently. (It was stated that this assumption is more probable at sites where owners are usually not at the establishment during special patrol appearances). Consequently, the last page is left in place when new pages are substituted. The removed pages are stored in precincts and maintained by neighborhood policing teams.¹⁵

¹⁵ Information in this section is based upon the researcher's accompanying an officer on patrol in the 4th Precinct on 3/5/20; interviews of DPD personnel; interviews of PGLD business owners; the City of Detroit website; a podcast about PGLD as referenced; and media reports as referenced.

Interviews with PGLD Business Owners

As stated in the methods section, a few exploratory interviews were conducted of owners and/or managers of businesses participating in PGLD.

A summary of the interviews of PGLD owners indicate that:

1. Most were motivated to participate in PGLD because they were convinced involvement would deter crime from occurring in or around their businesses.
2. Most applied a cost-benefit analysis upon considering entry into PGLD and concluded that involvement was a sound investment.
3. Most believe that participation in PGLD has in fact resulted in deterring crime on the property, especially exterior parking lots.
4. Specific types of offenses were perceived as deterred based on the PGLD treatment. Property offenses (e.g., theft or vandalism) and public order offenses (e.g., loitering or vagrancy) were most described as being prevented. One owner reported a reduction in crimes against persons.
5. Most customers and/or employees hold perceptions of being safer with the businesses' PGLD involvement as reported to the owners.
6. Most observed an improvement in police response time in 911 calls for service since entry into PGLD.
7. Many were not familiar with the accurate DPD process of how DPD handles 911 calls originating from PGLD sites.
8. Most were aware of the special patrol commitment by DPD and believe that DPD is fulfilling the commitment.

Stage Four – Compliance of Project Green Light

To ensure that PGLD remains a viable program, every involved component must meet their respective responsibilities. This section identifies how DPD ensures that PGLD businesses, and vendors meet their obligations under the program. The agency has also developed policies, and procedures to ensure that DPD personnel perform their duties consistent with effective operations of PGLD. Many of the expectations for DPD personnel have been discussed elsewhere. However, to the extent that additional employee accountability and compliance was not introduced, it is included in this section.

DPD's Guiding Principle on Compliance

To understand DPD's level of commitment to effective and efficient operation of PGLD, a description of the agency's guiding principle on compliance is included. According to the Program Manager, the City of Detroit and DPD aims to enroll and activate as many businesses as possible in PGLD. Therefore, every effort is made towards retention. The agency has imparted to all personnel involved in the program to "go the extra mile" to maintain compliance as opposed to removing businesses from the program as a first resort.

Moreover, since PGLD is built on relationships, the agency avoids unnecessary adverse actions. Officers are encouraged to adopt a cooperative approach when interacting with business personnel. Rather than operating in a strict enforcement mode that can result in swift termination, it is stressed that the goal is to facilitate maintenance of equipment or removing the obstacles impeding compliance. When violations are encountered, as much support as possible is offered to avoid removal. For this reason, most businesses typically come into compliance during the accountability process.

Compliance – Project Green Light Businesses (Accountability, Sanctions & Termination)

DPD verifies that businesses are meeting their responsibilities as outlined in the Memorandum of Understanding. The responsibilities for business owners participating in PGLD can be categorized as: camera and lighting equipment; requisite services/subscriptions; signage and green light(s); and conduct.

For many of the items listed in the agreement, officers need only verify that a participating business is complying during the installation or audit phases. (See Stage #1 for more). However, DPD has built into the process several checks to alert personnel if a business is not operating in compliance with the program.

There are many ways that it comes to the attention of DPD that a business may not be complying including through virtual or physical patrols. CCTV operators discover malfunctioning, misaligned or out of focus cameras either operationally or through routine camera checks. When it is determined that cameras need to be checked, information is entered into the PGLD tracking database designed for this purpose.

Another means for recognizing that a business is not operating consistent with PGLD's rules and regulations, is the patrol officer. For example, when a camera's angle has been tampered with, it is obvious to the trained eye of an officer who will call it in. Any such information is also ultimately entered into the same PGLD tracking system accessible by the CCTV operators.

While patrol officers and CCTV operators typically identify deficiencies, it is the compliance officer that typically responds to those concerns. The researcher accompanied a compliance officer on his rounds. The compliance officer started his day by reviewing the PGLD tracking system that lists concerns provided by other personnel. Using the information as leads for site visits, the compliance officer sets a route based on the precincts assigned and the locations planned to be checked. The compliance officer proceeds to the PGLD locations without providing prior notice. DPD seeks to bring a site into compliance as soon as possible. The type of issue dictates the compliance officer's actions in the field. On the first stop, a misaligned camera was investigated. Just as the monitoring had revealed, the officer pointed out that the DPD approved camera angle had been altered – with the camera now facing in the wrong direction. It was explained that sometimes people intentionally move cameras. The officer speculated that culprits are those in the range of vision of DPD angled cameras who are attempting to conceal their activities. Similarly, he reported that coverings have been placed on camera lens to hamper police monitoring.

Problems encountered such as misaligned or covered cameras, can often be remedied on the spot by the compliance officer and without entering the business. While these types of situations are considered “non-compliance,” they are not attributable to inaction on the part of the PGLD business. Conversely, for situations that appear within control of the owner, entry into the establishment becomes necessary.

Often violations appear in the PGLD tracking system about failure to receive live feeds from particular PGLD cameras. To address this form of non-compliance, the officer must enter the site and troubleshoot. The nature of the problem determines whether the officer can apply a fix to bring the site into compliance. For example, minor technical glitches are often remedied by rebooting the system. Sometimes it requires multiple reengagements of a system to bring each connected camera back online. But if a certain type of service is not available to the site, no amount of rebooting will resolve the issue.

There are situations where the compliance officer determines that the violation requires action on the part of the business owner. As stated in the MOU, PGLD locations must “at all times” provide for a “high-speed internet connection.”¹⁶ Still, on a number of occasions the compliance officer finds that a lapse in service with the internet provider is the reason for non-connectivity with the RTCC. In such cases a message is directed to the owner – often through a worker that the matter needs to be resolved. A verbal warning that the PGLD location has 14 days to come into compliance is issued.

If it is the case that the problem cannot be identified or resolved by rebooting, or reconnecting service, the compliance officer suggests a service call to the camera installer. The researcher observed a follow-up visit to an auto parts business that required technical assistance as three quarters of its cameras were offline. By the end of the visit, both the compliance officer and the workers expressed relief as all the cameras were brought back online.

In general, the personnel working at PGLD businesses were welcoming and attentive towards the compliance officer who always displayed a professional demeanor. Even the workers not as cognizant of the PGLD program posed no resistance, providing immediate access to parts of the establishment that are normally off limits to patrons such as control rooms. Workers willingly facilitated messaging the owners including writing notes and attempting to reach them by telephone in the officer’s presence.

A few of the businesses checked by the compliance officer appeared to be permanently closed, so entry was not possible nor any longer warranted. Some of these businesses will be removed from the program, but if the business is in the process of transfer, DPD attempts to recruit the new owner as a PGLD partner.

The compliance officer’s rounds may consist of checking the exterior of new PGLD locations for signage and the greenlight. Arguably, erecting signage and the greenlight could be considered part of the on-boarding process, but it is not a requirement for these signals to be in place at the time of Stage Two (live streaming and monitoring) and Stage Three (patrols). In effect,

¹⁶ See the MOU, Section 1.2.

compliance officers are responsible for verifying the last phase of the on-boarding process. Like equipment-related violations, failures to erect signage and the greenlight outside of the established timeframe results in a verbal warning that compliance is required within 14 days. Precincts also hold the responsibility of once per month conducting a compliance check where they ensure that the flashing green light, signs, cameras, and logbook are being maintained properly. All personnel making compliance checks report their results which ultimately are recorded in the PGLD tracking system for appropriate follow-up.

Notwithstanding DPD's effort to assist owners in upholding their responsibilities to the Green Light program, the onus to comply rests with the businesses and they are held accountable. The next subsection describes the process of removal for non-compliance.

Removal for Non-Compliance (Businesses)

Given the lengths DPD undergoes to bring a business into compliance rather than expel, removal from PGLD is a rare occurrence. Over the course of this 4-year program, only 29 businesses¹⁷, or about 4 percent have been removed – and some of those businesses eventually became compliant, returning to the program. The process of removal is intentionally lengthy with flexibility built into the process. If an owner is attempting to achieve compliance, operating in “good faith” taking measured steps (not merely saying so), it is unlikely they will face removal.

Warnings to businesses are progressive in terms of formality. The steps to removal of a business from PGLD are as follows:

Step 1) A Verbal Warning Issued with the notice that Compliance Officer will return in two weeks to reinspect.

Step 2) A Written Warning is provided with notice that if the business is still not in compliance in two weeks' time, there will be a recommendation for removal from the program.

Step 3) Recommendation of Removal from PGLD to the Real-Time Strategy Board.

Step 4) Case heard before the Real-Time Strategy Board. The board which meets once per month embraces the guiding principle whereby adverse action is a last resort. Consequently, a recommendation of removal is only adopted when it has been established that a businesses' failure to act demonstrates intentional non-compliance. The board seeks to determine from officers if every effort has been exhausted to bring the business into compliance; and still may make attempts to facilitate resolving the matter. For example, the board may suggest as a last resort that precinct officers visit the business and offer advice on coming into compliance.

Step 5) Removal - If the Board decides that a business is to be removed from PGLD, the establishment's cameras are disconnected from the Real Time Crime Center.

¹⁷ This has been updated to 41 as of November 2020.

If a business is no longer participating in PGLD for whatever the reason, dismissal or business turn over, DPD communicates internally and externally. An interdepartmental template communicates to a precinct and compliance officer that there is no longer a need to monitor the establishment pursuant to PGLD requirements. Pursuant to the MOU, the business is also informed via a certified letter that it is to immediately remove all signage and greenlights affiliated with PGLD. In 2019, the City of Detroit sued a restaurant franchise owner for refusing to remove signage after dismissal from the program.

Compliance – Service Providers

As PGLD progressed, the need for a Vendor Accountability Process became apparent. Though unintentional, it was determined that the business on-boarding process could be delayed by camera vendors not installing in a timely fashion. DPD’s response was to provide training, create a formal onboard process for new vendors, and formalize an agreement as documented in a separate¹⁸ Memorandum of Understanding for Tier Two vendors (see, <https://detroitmi.gov/departments/police-department/project-green-light-detroit/agreements/tier-two-installer-agreement> (accessed 12/14/20)).

In addition to the requirements pertaining to experience, certifications, warranties, insurance, and audits, the MOU sets forth installation provisions and timelines. Relevant to timelines is providing the agency with a site map designating camera placements one business day after the site survey: and completing installation within five days of the site survey. Installers are expected to submit to post-installation audits and may not fail more than two.

If a vendor fails to abide by the terms of the MOU or act in “bad faith,” the agreement can be terminated – in effect removing the vendor from the installation approval list. While DPD expects vendors to meet standards, it is recognized that unforeseen problems may arise. Consistent with DPD’s approach to retain PGLD partnerships, the agency puts forth the effort to first communicate with vendors when timelines are not being met. The Program Director reported that typically after troubleshooting with a vendor representative, a quick resolution is reached.

Compliance – The Audio-Visual Evidence Response Team (AVERT)

As discussed throughout this descriptive study, DPD personnel working in various phases of PGLD hold substantial responsibilities. Adding to that list is the Audio-Visual Evidence Response Team’s duty to recover digital evidence. AVERT is DPD’s designated gatekeeper to recover video evidence.

Video footage streamed into DPD is owned by the entity possessing the cameras from which the image originated. Accordingly, should the need arise for DPD to preserve video footage as evidence, it must be legally seized. Complying with rules, regulations, and laws, requires they are recognized and understood.

¹⁸ On the City of Detroit’s PGLD website, there are two different vendor agreements: Tier Two for camera installers and Tier One for vendors that provide cloud storage and camera kits to Tier Two Installers.

Given the technical expertise necessary to acquire digital evidence while ensuring that all legal requirements are met, training is extensive. Officers seizing digital evidence must attend training courses - earn and maintain certifications in forensic video analysis and the law; digital multimedia evidence processing; and recovering evidence from CCTV video recordings.

To ensure compliance, DPD has enacted policies and procedures for acquisition of digital evidence that require all requests be submitted to AVERT. In turn, before seizing and providing evidence, the AVERT certified expert must ensure that the request is connected to a criminal investigation. (Officers may download and review video footage from Green Light sites searching for information connected to an offense. But when information is to be used as evidence for prosecution, a request is made to AVERT). If necessary, it is the AVERT expert seizing the digital evidence that provides court testimony about acquisition, chain of custody and storage.¹⁹

Analysis

As identified in research questions #1 to #5, this study sought to understand how PGLD can meet its objectives. To that end, this analysis discusses how the program can prevent, detect, and solve crime (research questions #6, #7 and #8). Information acquired about operation of the various stages of the process will be evaluated in the context of these three program objectives to include application of relevant theoretical frameworks. Updates on how PGLD operations have been impacted by the 2020 protests against police (research question #9) and by COVID-19 (research question #10) are also included in the discussion.

Prevention of Crime

The Detroit Police Department seeks to prevent crimes from occurring through the PGLD program. The main strategy for prevention is erecting and monitoring cameras in high-risk businesses. It is postulated that would-be offenders are dissuaded from offending if they know that their actions are being recorded and monitored by police. This crime prevention effect is based on several related theoretical perspectives: deterrence, rational choice, and situational crime prevention.

According to Deterrence Theory (Paternoster, 2010), individual deterrence is based on calculations about punishment – certainty, severity, and swiftness.^{lxiii} Applying deterrence theory to PGLD, if a prospective offender decides not to commit a crime because it is reasoned the cameras will result in certain punishment, then deterrence has occurred. Because deterrence is based on rational calculations, interventions must be credible enough for a would-be offender to think before engaging in crime.

Situational crime prevention is based on the simple calculation that for a crime to occur there must be a motivated offender, a vulnerable victim, that come together in time and space (Clarke,

¹⁹ Information described in Stage four derived from interviews with the Program Director, and an AVERT expert; observation and interview with a Compliance Officer on 12/23/20; and review of MOUs as referenced.

1980).^{lxiv} Crime can be prevented through actions that reduce the motivations of an offender, or that decrease the vulnerability of a potential victim, in particular places. The deterrent effect of a camera may reduce the motivation of an offender and may also decrease the vulnerability of a victim through the monitoring of the cameras. The placement of the PGLD cameras in businesses and other locations where people congregate, reflects the situational aspect of this crime prevention strategy.

There are several ways that PGLD conveys messages about the presence of the cameras at participating sites. First, the cameras are mounted at 10-11 feet, a height that places the camera in view. Second, signs are displayed labelling the business as a Green Light participant, depicting a CCTV camera and warning “monitored at police HQ.” Third there is a bright green piercing strobe light that can be seen a substantial distance away erected on or near the top of the business. While all these practices combine to brand a location as a Green Light participant, per comments in open-source literature, the visible green light seems to draw most attention. DPD also engages in a fourth practice that can achieve deterrence – publicity.

Deterrence theory also suggests that besides deterring one individual from offending based on a particular experience of punishment, others knowing about that punishment can be deterred too. To facilitate this form of general deterrence, punishments must reach the public. From the inception of PGLD, the Mayor of Detroit and the Police Chief have participated in numerous press events informing the public about the program. Typically, statements are made that reinforce the program’s purposes as well as identifying cases where offenders have been arrested based on video footage from PGLD locations. Despite publicity surrounding suspect identification and arrests, television coverage on convictions and sentencings tend to focus mostly on high-profile cases.

Preventing criminal behavior has also been discussed in the context of Rational Choice Theory. The crux of the theory according to Cornish & Clark (1987) is that criminals are rational, so they calculate the risk of detection in deciding whether to commit a crime.^{lxv} The implication is that for a crime reduction strategy to be effective, it must be conveyed that there is a higher chance of being caught and punished. Several questions about DPD’s operation of PGLD can assess this strategy: Are cameras working? Are cameras being monitored? Is the police response quicker at PGLD sites? Do police frequently patrol PGLD locations?

Are cameras working? DPD’s robust compliance program quickly identifies when a PGLD connected camera is malfunctioning or misaligned. The agency responds by sending a compliance officer to rectify the problem or arrange for a vendor to do so. Those who do tamper with cameras typically can discover within about 48 hours that the cameras have been repositioned properly. This action on the part of DPD not only signals that the cameras are working, but that the police are also in fact monitoring.

Are cameras being monitored? Photographs and videos released to the public from PGLD locations suggest that cameras are being monitored. It is beyond the scope of this

assessment to calculate the contribution such awareness affects deterrence, but a situation involving two wireless cellular businesses owned by AKA Delta²⁰ merits examination:

Delta said that he entered one of his sites into PGLD in 2016 because of several burglaries. When asked about incidents occurring after joining PGLD, he seemed to recall a possible break in. The researcher was able to locate an article (Terry, 2016) that described the burglary taking place two weeks after Delta entered the location into PGLD. Germane to this discussion is that the CCTV cameras captured the break-in, theft, and escape which was publicized on television in an attempt to apprehend the suspects. Delta was quoted as musing that the offenders may not have known it was a green light location.^{lxvi} Apparently the broadcast served to publicize that the store was a green light location, because based on Delta's reporting, it was after this he says everything came to "a halt – it just stopped." Delta said that he proved it to himself that the green light was preventing crime when he opened another cellphone store. After experiencing issues at the new store, he added the green light there and "everything stopped right then and there as well."

It is unknown the extent to which information about monitoring registers in the mind of potential offenders, but public statements indicate that usually active monitoring commences when DPD receives a 911 call. These practices may send competing messages to the criminal element.

Do police respond quicker to PGLD sites? While the Detroit Journalism Cooperative (2018) comparison of data provided by DPD suggests that the agency responds only about 30 seconds quicker to PGLD sites,^{lxvii} the priority one status extended to participating businesses has been widely publicized. Additionally, endangered persons' fleeing to PGLD locations for safe harbor indicates a perception that police response is quicker. As reported elsewhere, most of the business owners expressed belief that participation in PGLD prevented crime at their businesses.²¹ How this deterrence is achieved was mostly attributed to potential offender recognition of rapid police response to their PGLD businesses. Several owners said they were certain that potential offenders watch for police response times. They also described offenses occurring in and around their properties abruptly ending after becoming a PGLD location. One anecdotal account offered as proof was particularly compelling:

According to AKA Bravo a group of teenagers came in every night at about 2:00 am. One would hold the door while the others filled their backpacks and pillowcases with merchandise. He said they stole all of these items and escaped in less than five minutes. After one of the offenders tried to get into the cashier's area, the employee quit. Bravo said things just kept escalating to the point that he knew he had to do something; and everyone told him that green light was "good," so he signed up. After doing so, the very next time the teens showed up he was assured by the police seeing everything

²⁰ Recall that interviewees were assigned anonymous names consistent with the police phonetic alphabet code.

²¹ Even owners critical of the program believe that PGLD deters crime – the criticism was of the police response necessary to actually prevent crimes.

from the cameras and a quick response – so quick that “all of sudden these guys disappear.” Moreover, Bravo reports that he can deescalate angry reactions of breaking things (e.g., after refusing to sell cigarettes to teens) by pointing out that he has the “green light.” Similarly, the opportunistic thefts of electronic devices when offenders would break windows of customers’ cars on the parking lot ceased completely.

Do police frequently patrol PGLD locations? PGLD sites are the recipients of special patrol visits. Through its precincts, DPD endeavors to provide as much extra patrol to PGLD locations as possible. In addition to patrolling the premises, officers often enter the establishment to perform wellness checks which is also conducive to deterrence. Seeing an officer get out of the car, not just patrolling the exterior can plant the idea that one never knows when an officer will show up at PGLD locations. Some PGLD owners that were interviewed also suggested that the extra patrols help deter crime. Bravo pointed out when would-be offenders see police around, they conclude “it’s not too safe” for them. A nursing home manager said that the extra patrols seem to have eliminated the car thefts, and the stealing of catalytic converters from vehicles in and around the property – to the extent that exterior security guards are no longer necessary. AKA Charlie expressed disappointment in decreased patrols because he thinks the return of the criminal element is directly related to them watching: When “lots of cop cars coming all day long, the trouble people knew [we were] watched, [they] would not come.” Additionally, AKA Alpha said people now enter his business with “respect”- instead of loitering on the parking lot, they come inside, conduct business and then leave.

According to Routine Activities Theory (Cohen & Felson, 1979), crimes are more likely to occur during the convergence of three situations: where there are suitable targets (desirable victims), likely (motivated) offenders and an absence of guardians.^{lxviii} Situational crime prevention strategies informed by Routine Activity Theory (RAT) often seek to modify the most controllable variable of guardianship. DPD’s PGLD potentially can affect all three of the variables. The persistent work of checking up on PGLD locations can be considered “guardianship” as advanced in RAT. Consistent with RAT theory, such strong guardianship would make a PGLD target less desirable thereby dissuading a “motivated offender” from committing a crime there. However, as raised with other theories on deterrence, prevention is dependent on would-be offenders taking note of the officers and the cameras. Also, while deterrence may be realized at one location, offending may just be delayed with displacement being the result.

Examination of the PGLD site surveys conducted in the installation process indicate that DPD educates business owners with target hardening strategies. As the AVERT expert discusses justification for camera placement, owners are informed that every door accessible to the public must be monitored. In turn, some owners deduce a property presents too many access points that may be exploited by the criminal element – deciding to close off the unnecessary ones. Similarly, compliance officers constantly provide victimization avoidance tips. For example, after determining that a camera facing the restaurant’s parking lot was malfunctioning because of fire (too close to an outdoor pit), the compliance officer surveyed the area providing suggestions to remedy the situation.

DPD's special patrol practice of intervening in public order offenses can also impact deterrence. The results from observing special patrol visits and interviews indicate that officers often disrupt loitering and vagrancy. Social order theories suggest that disorder and criminality are correlated. For example, the Broken Windows theory suggests criminals interpret disorder as an invitation to engage in crime with impunity (Wilson & Kelling, 1982).^{lxi} While creating what Mayor Duggan has called a "zone of safety^{lxx}" at PGLD locations, without addressing the root causes for disorderly conduct behaviors like loitering and vagrancy, displacement is possible. The officer applying the special patrol visit did tell the researcher that DPD works with local community groups to address homelessness. Applying this type of Problem-Oriented Policing approach could also positively impact prevention efforts. Additionally, research suggests that crime prevention at micro-places can generate a diffusion of benefits to surrounding areas (Bowers et al., 2011).^{lxxi}

Detection

A discussion about detection needs to establish what is meant by the concept. A strict interpretation is that detection occurs when police unilaterally discover an offense. However, this definition fails to account for situations where police arrive when crimes are still in progress, though reported by another party; nor would it include immediate success in uncovering important elements of a crime such as locating weapons or identifying suspects, victims, and witnesses. This analysis utilizes the Wells, et al. (2006) broader definition of detection that includes identification and other taskings that advance capture.^{lxxii}

Improving crime detection is another way in which police agencies can facilitate prevention. As discussed in the previous section, if indeed criminals calculate risks, informing the offender pool about increased detection should reduce crime. Since DPD regularly reports (and shows) through news outlets how PGLD cameras capture images of people engaging in crime, the potential offender pool is in effect placed on notice. DPD's goal to detect crime via PGLD is realized in several other ways. First, the PGLD system speeds up the reporting time from when an offense occurs to when the police can respond. Second, video surveillance capabilities improve detection. And third, the combination of CCTV operators' virtual patrol and on-the-street police responses provide more resources towards detection.

While DPD's CCTV program is designed to improve crime detection, tasks performed by personnel becomes critical in realizing the agency's goal. DPD selects detectives possessing a combination of criminal investigation and technical skill for camera installation surveys. As such, cameras are placed with detecting crime and identifying suspects at the forefront. Consequently, images have been extracted from PGLD cameras that result in identifying people, vehicles and license plates associated with criminal offenses.

Earlier research suggests that "size matters" when it comes to the ability to effectively detect crime through CCTV. LaVigne (2011), noted that increasing the number of cameras with overlapping viewsheds can increase surveillance coverage. This approach has been adopted by DPD permitting site partnerships referred to as PGLD Corridors. Five such corridors in the City of Detroit are close enough to produce overlapping viewsheds. While individual PGLD locations can acquire several cameras to produce many overlapping views, DPD personnel adopt a neutral posture, requiring only the minimum number of cameras according to the program. However, if extra cameras are acquired, these too are connected to the police department for monitoring.

While the number of cameras may present more vantage points for detection, exploiting those opportunities rests with CCTV operators. DPD's preference of monitoring PGLD locations when 911 calls are placed from sites reduces the availability of CCTV operators for routine monitoring to detect crime. Arguably, the decrease in *quantity* of monitoring is over-ridden by the increase in the *quality* of monitoring of active crime scenes.

The nature of work DPD assigns PGLD CCTV operators may improve possibilities for detecting crime. The literature review revealed studies of CCTV operator performance being influenced by cognitive, and psychological factors, some of which could be overcome by work structure. Since most monitoring of PGLD sites involves searching for recent or ongoing offending, these CCTV

operators may be less prone to some of the cited shortcomings – particularly deficiencies associated with mundaneness. For example, the “inattentional blindness” described by (Näsholm, et al. 2014) is less likely for PGLD CCTV operators because they regularly view multiple screens of different scenes.

PGLD CCTV operators’ level of concentration is not likely to be adversely affected because work is “boring.” However, albeit “exciting,” the video images’ connected to emergency management can produce stress. Donald and Donald (2015) found a coping mechanism for CCTV operators was basically to “check out” periodically. Such task disengagement was associated with lower detection rates. Given that the research subjects were performing surveillance to detect theft, the work is different from that of PGLD CCTV operators. Although PGLD CCTV operators are not immune to stress, since they are searching for offenses that *probably* occurred as opposed to those which *might* occur, the vigilance demands are different as are likely the coping mechanisms. For example, a CCTV operator speaking about the images of violence that lingered from viewing a shooting captured at a PGLD site camera told Clark (n.d.): “After you see things over and over again, you kind a compartmentalize (what you’ve seen.)”^{lxxiii}

Generally, PGLD CCTV operators were observed engaging in the type of live monitoring that is positively related to crime detection consistent with (McLean, et al., 2013). Another point of analysis is: how does the combination of CCTV monitoring with patrols affect the ability to detect crime?

Since policing has frequently relied on increasing patrols to reduce crime, it is not surprising that a PGLD presentation drew inquiry if the program’s objectives could be solely met by the added patrols. Like the findings cited in Piza et al. (2015), DPD’s strategy of CCTV surveillance combined with targeted police patrol can result in crime control benefit beyond one single strategy.

Prior to CCTV monitoring, in cases where 911 dispatchers did not keep callers on the line, typically police were unable to take steps towards detection until arriving on the scene. The advantage to adding CCTV monitoring to patrol response of 911 calls is the effort that can be undertaken during the gap time. Sivarajasingam (2003) hypothesized CCTV monitoring might be useful to observe escalating situations (e.g., animated disputes) as precursors to violence finding its utility in harm reduction and quick police action.^{lxxiv} For DPD to realize this type of benefit through PGLD, the CCTV operators must obtain useful information and pass it to responding officers. CCTV operators working PGLD can obtain such information through calls to the site, and reviewing live and rewind footage, but the extent to which this is accomplished is an open question.

An interview with one of the PGLD owners (AKA Echo) illustrates the challenge CCTV operators encounter in gathering information that can improve detection. The gas station owner said that after calling 911 to report an armed person inside of the store, he received a call from a CCTV operator. Echo described the exchange as irritating with too many questions being asked. His interpretation is that instead of sending a patrol car right away, he was being asked to leave his position of safety to obtain more descriptive information. When it was suggested that he

conduct a search of the suspect, Echo said that he became so “mad” that he hung up the phone on the operator who called back. By the time the police arrived, the suspect had departed.

Research findings on studies of CCTV operators and patrol officers suggest that crime may be reduced where there is direct communication between the two practitioners (Piza et al., 2015). The results of this study demonstrate the method CCTV operators communicate their findings is via two-way radio, but little data (a few anecdotal cases) inform the value added to the patrol function in detecting crime. During the observation of CCTV operators, it was infrequent that responding officers were contacted. Granted, radio discipline is essential in police operations, but some reticence in speaking on the two-way radios was observed. When a civilian CCTV operator would convey information, sometimes the officer would ask questions – many of which could not be precisely answered before the officer arrived on scene.

The special patrol visits hold the potential to increase crime detection in at least two ways. More random visits to high-crime risk locations increase the chances that police will detect a crime in progress. Additionally, by patrol officers frequently entering businesses they can become more familiar with the property layout. This development of muscle memory can provide a tactical advantage when responding to crimes occurring at a PGLD site.

Solving Crime

Cameras provide a source of information to solve crimes occurring on the property of participating businesses and those occurring within view. CCTV operators initially gather intelligence through monitoring which is utilized to investigate crimes. Much of the active monitoring is initiated by 911 calls from PGLD sites. Though rare, routine monitoring by CCTV operators generates intelligence connected to criminal activity leading to investigations. At other times, CCTV operators take the initiative to monitor PGLD cameras based on patrol activity. Another mechanism that drives intelligence gathering from PGLD video footage originates from real-time officer requests, often to track suspect movement for identification and capturing purposes. Similarly, detectives investigating crimes that suspect a camera may have recorded images connected to an investigation request an intelligence workup. For example, DPD was able to solve a robbery taking place at a group home. When the perpetrators used a stolen bank card at an ATM at a PGLD location, released video footage resulted in their capture (City of Detroit, 2020).^{lxxv} Although the ability to effectively utilize intelligence to solve crime was not evaluated in this study, as described, DPD exploits the full range of possibilities that PGLD offers to develop intelligence to solve crime.

DPD operates PGLD in a manner that ensures optimum camera placement, positioning, and maintenance through compliance. These actions resolve some of the impediments to solving crime identified in prior research. Ashby (2017) concluded that while a good quality recording could provide significant detail at various points during an offense, if data is not in an easily retrievable format, it lessens the ability to assist in an investigation.^{lxxvi} The quality of PGLD cameras and other efforts mentioned ensures that high-definition images are readily available and accessible when the agency needs to tap into the video footage. However, as practitioner Klepczarek (2003) pointed out, the investigative solutions of CCTV reduce as time goes on.^{lxxvii} Investigators must take advantage of the window of opportunity to obtain video footage, but this

requires at minimum establishing the venue of the offense and or the escape route. The use of PGLD footage is limited by time given the restricted 30-day cloud video storage. While many violent crimes are detected shortly after the offense providing investigators with time to locate and assess PGLD footage, intelligence developed after the 30-day storage limit may preclude access to this resource.

Solving crime is not only an ability to identify and arrest subjects to bring forth charges; but it is also for the case to reach a successful prosecution resulting in conviction. Officers must take care when acquiring and handling evidence to meet the inevitable challenges often brought by the defense in court. DPD's assignment of AVERT, officers specially trained and certified in legal acquisition and storage of digital evidence is a measure in furtherance of solving crime. Also, some of the same processes employed to detect crime such as good camera placement and positioning will enhance investigations towards solving, and successful prosecuting toward conviction. (The researcher tracked a small sample of people identified through PGLD footage and noted some convictions).

Ultimately, DPD's ability to prevent, detect or solve crime through PGLD is dependent upon the partnership agreement that permits CCTV monitoring. In that regard, this analysis turns to the effort that facilitates and supports these types of alliances.

Project Green Light Partnerships²²

The City of Detroit/DPD has developed partnerships with the ambitious goal of bringing down the crime rate. And the city/department has forged these partnerships largely in view of a significant stakeholder – the public. While each of these three groups (police, businesses, and the community) share the common goal of crime reduction, developing these relationships posed challenges. Moreover, maintaining these relationships as competing interests emerge may be even harder. A brief analysis of how these partnerships were formed is examined in this subsection. Also discussed is how the unexpected “tests” in the form of the COVID-19 Pandemic National Emergency and the 2020 anti-police brutality protests have tested the strength of PGLD relationships.

The concept of Project Green Light was a collaboration of the Mayor of Detroit, the Police Chief, and a gas station owner. It is unlikely that it was hard to sell gas station owners on the threat assessment that gas stations were hot spots for violent crime. But having a businessman on the team probably sealed the deal. In short, DPD essentially told the owners if they would expose their business to police monitoring, the agency would respond to calls for assistance quicker and use images to further investigations. The accounts reviewed in this research suggest that at the time businesses sign up for PGLD they are persuaded their business will realize benefits.

The simplicity of the arrangement averted some of the typical hurdles that private-public partnerships encounter – the most significant of which can be cost. If the government were

²² As presented in the literature review, public-private partnerships can take adopt different forms. The relevant properties of the City of Detroit/DPD partnership with PGLD owners include its “tactical and operational coordination of policing services” and its permanent ongoing relationship (Burnet & Chandler, 2009).

burdened with funding, several fiscal requirements would have needed to be proposed and met even before partnerships could be established. If the private partners during the pilot phase had been bigger businesses, owners could have faced similar oversight impediments such as a board of directors' approval. As it was, getting business owners to accept a "business arrangement" worked out. However, the PGLD arrangement was not without criticism.

Providing priority one response, and extra patrols in exchange for monitoring PGLD locations was touted by some as a quid pro quo arrangement. But given that the businesses do not relinquish ownership of the video footage nor is the City of Detroit/DPD provided with anything of direct financial value, the opposition did not stop program launch. Moreover, DPD was able to convince the community that they would be the most significant beneficiaries of the PGLD partnership. (DPD had also appealed to owners that their customers' safety be considered. While employees are often protected behind bullet-proof glass, patrons are vulnerable to criminals).

A theoretical framework (Sousa & Madensen, 2016) on garnering public support for CCTV programs identifies five areas of concern: "slippery slope," "covert spying," technological boundaries," "net-widening," and "displacement."^{lxxviii} Data obtained through this research suggests that DPD encountered a few of these challenges, and upon doing so the agency was able to overcome them. For example, DPD's strict adherence to the practice of not placing cameras to view windows or doors of residences preempts concerns of covert spying, and net-widening. However, as discussed in the next section, it took longer for DPD to resolve the technological boundary challenge of applying Facial Recognition Technology to PGLD video footage.

As described in the background section, the roll out of PGLD basically was largely unchallenged by the community – including during Police Board of Commissioners' meetings. Besides occasional comments to reporters about an unease at being watched and recorded, many welcomed what they hoped would be a reduction in crime. Although it is outside the scope of this study to assert extent, the PGLD partnership has in fact delivered on detecting and solving some crimes.

PGLD is often highlighted in the local news. DPD releases images and video clips of suspects soliciting the public's help. The agency provides follow-up information when tips obtained from the public result in identifications and arrests. Also, when the program achieves a milestone, often a press conference is arranged. When the 100th and 500th businesses signed up for PGLD, a press conference attended by the mayor, police chief and others was held at those businesses. As reported, some of the PGLD press has been negative – of late it has surrounded the COVID-19 emergency and the 2020 protests against police brutality.

COVID -19 Outbreak National Emergency

As discussed in Stage Two, the outbreak of the coronavirus impacted PGLD operations – most notably monitoring from off-sites instead of the Real Time Crime Center. The interruption of installations and operational use of the program to identify violators of COVID-19 restrictions are two other aspects of the program worth mentioning.

Initially the DPD suspended the priority one designation and installations at PGLD sites for operational reasons. The agency had to prioritize operations due to increased public safety demands that came with the national emergency while also experiencing a staff reduction (DPD personnel needed to be quarantined if they contracted the virus or came in contact with someone who had). Sometime in June 2020, DPD was able to resume its work towards onboarding new PGLD businesses; however, vendors encountered work shortages of installers.

Consequently, installations were on temporary hold. At the time of this writing 65 applications to participate in PGLD are pending review. DPD has resumed the priority one status to PGLD sites. According to interviews of some business owners, PGLD special patrols were impacted by the COVID-19 outbreak. While most interviewed reported no change, a few owners noted a negligible effect in the form of less special patrols. One owner indicated that the interruption was temporary while another suggested that the COVID-19 emergency was the beginning of diminished patrols. A nursing home discontinued interior wellness checks due to state-imposed restrictions on visitors to the facility.

Shortly after Michigan enacted orders, it was announced by DPD that among the actions the agency would take to enforce social distancing is the use of video footage from PGLD locations (Fox News, 2020).^{lxxix} The extent to which DPD actually utilized PGLD cameras to monitor potential violators of social distancing or stay-at home orders was not detailed. Gross (2020) reported that the agency's decision to use cameras in this manner was said to have "received little push back" from the public, but the practice was challenged by civil liberty advocates.^{lxxx}

Anti-Police Brutality Protests

After the video of the horrific killing of George Floyd by Minneapolis police officers was broadcast, widespread protests against police brutality were initiated in many U.S. cities - including Detroit. Protests occurred in various parts of the city including outside of DPD Headquarters. During community-police discussions, a list of demands was issued with PGLD and facial recognition on the same line. While PGLD enjoyed a fairly positive reputation in Detroit, facial recognition technology was met with skepticism. Much attention was paid around the middle of 2019 when politicians, legal analysts and others publicly criticized that the technology was an overreach, impeding on civil liberties. Detroiters expressed particular concern to the assertion that facial recognition technology (FRT) was prone to false positives when applied to people of color.

Unlike the publicizing of PGLD, DPD press references about FRT when purchased in 2017 appeared to be in response to inquiry. Hunter (2017) reported that the DPD Assistant Chief, James White, defended the use of FRT:

"This isn't some super-secret piece of technology," White said. "This isn't Big Brother, and we're not covertly trying to monitor people. We're not going to use it to ID everyone who goes into our Green Light locations; it will be strictly confined to investigating violent crimes."^{lxxxi}

Although that press interview posed tough questions, it was not until almost two years later that DPD's use of FRT faced more stringent and extensive opposition. Moreover, the narrative

appeared to be controlled by those outside of DPD, placing the agency on defense. The City Council's vote to expand the Real Time Crime Center was even placed in jeopardy. Although approval came with a split vote, a statement made by a council member illustrates the misperceptions:

"I've been to over 10 community meeting in the last three weeks to ask them specifically what they feel about Real Time Crime Centers. Invariably the conversation conflates and they start talking about facial recognition technology. I'm going to make it very clear the contract that we've moved out of committee does not include software, nor does it include cameras" (Gross, 2019).^{lxxxii}

The muddling of surveillance programs contributed to at least one planned initiative; the Neighborhood Real-Time Intelligence Program being placed on hold. Moreover, public outrage rose to the point that the Board of Police Commissions engaged in several contentious meetings with DPD leadership. One police commissioner was even arrested for disorderly conduct during the July 11, 2019 meeting (Hunter, 2019).^{lxxxiii} The end result was development of a policy that restricts DPD's applying facial recognition to footage where a crime was committed. DPD is also periodically required to report when the software has been applied. Although the policy agreement was reached in July 2019, FRT was revisited again about one year later.

During summer 2020, Facial Recognition Technology was placed on a list of protest demands pulling PGLD along with it. To address the issues presented by protesters, DPD leadership adopted a cooperative and transparent approach. The mayor and police chief agreed to meet with protest leaders to discuss demands. Appearing as number two on the list was "End Project Greenlight and Facial Recognition" (Haddad and Colthorp, 2020).^{lxxxiv} Apparently a collaborative approach was taken during the closed-door meeting. Afterwards one of Detroit's deputy mayors was quoted as having said to the group "help us get the work accomplished" (Ley and Clark, 2020).^{lxxxv}

The relationship with PGLD owners did not appear to have been adversely affected by the protests as evidenced by at least one news interview. That owner, the first to join PGLD told reporters he did not agree with the discontinuation of the program (Ley and Hutchinson, 2020).^{lxxxvi} DPD's approach also served to insulate PGLD businesses from unwarranted protests. AKA Golf, a shopping center owner, said he considered turning off his green light over concerns of public backlash at misperceptions about facial recognition technology (FRT). Golf expressed concern about potential picketing around the property, a shopping center. However, Golf said public outrage subsided when the Police Chief effectively explained the difference between PGLD and FRT in a televised broadcast. As further evidence of DPD's continued relationship with the business community, several new applications to participate in PGLD were submitted during the summer of 2020.

While it does not appear that DPD anticipated some of the challenges to PGLD, the way the agency has engaged with the business partners and the community has seemingly positively affected perceptions of the program. Throughout this situation, DPD appeared to have been operating in good faith contrary to the list of "bad faith" behaviors outlined by Fuzzy (2007) in the literature review. Moreover, the agency's guiding principle to make every effort in preserving relationships appears to have been at work here as well.

Implications, Recommendations & Future Research

Several implications for policy, practice and future research may be derived from this study. Some components of PGLD are so unique that the results may not be generalized to other CCTV police programs. However, primary objectives of this study are program process assessment and replication. Thus, identifying areas for future study can further improvement in these types of crime reduction strategies.

Program Structure and Personnel

The results of this study imply that more benefits could be derived from the combined surveillance – patrol enhancement strategy. Although there are different models in CCTV monitoring and patrol programs, for PGLD, active monitoring of sites is usually connected to a 911 call. Ideally, CCTV monitors are expected to exploit the few moments between the call from a business to when a patrol officer responds to enhance operations (e.g., officer safety, capturing escaping suspects). Future probing is necessary to understand how often this happens and why this does not occur more often.

A significant impediment revealed in this study is the dynamic between CCTV monitors and callers to 911 from PGLD sites. The problem may be attributed to undefined expectations on the part of the businesses and unrealistic expectations on the part of DPD officials. Many of the business owners/managers interviewed were either unfamiliar or do not hold an accurate view of how DPD handles 911 calls originating from their sites. For example, as described in the Analysis Section/Detection Subsection, one owner was irritated by the questions posed by the CCTV operator to obtain descriptors on an armed suspect. Another owner who said that he trains personnel to alert 911 that they are calling from a green light location attributes faster response to the actual times when this identification is made. Even an owner having toured the RTCC was not well versed on what occurs after a call is placed from a PGLD site to 911.

Adding to the undefined expectations of some PGLD owners, DPD officials may be expecting more from the exchange between CCTV operators and 911 callers than can be delivered – at least as the program is currently structured. CCTV operators are trained in use of monitoring equipment and how to exploit video footage. However, is there also preparation on developing the type of verbal communication skill needed to manage emergencies? For example, are CCTV operators equipped to provide advice to a caller about their safety while awaiting police response? It is recommended that DPD officials reconsider if the envisioned manner of gathering information during the gap period between a 911 call and arrival of patrol is feasible.

Another personnel-related reason for not realizing more benefit from a surveillance-patrol strategy also involves preparation. Are patrol officers and CCTV operators fully prepared to collect and use intelligence that can be obtained from monitoring? Realistic expectations are formed when program capabilities are made clear. If there is indeed video footage available from PGLD sites that could assist responding officers, it may be possible that either CCTV operators are missing the information or observing but not passing it on.

Answering research questions about observation, communication, and interviewing²³ capabilities can inform training models. For example, cross training may be in order such as between 911 dispatchers and CCTV operators. Assigning officers to work a shift in the Real Time Crime Center could sensitize them to both limitations and the vast array of possibilities that comes from CCTV monitoring. Similarly, there may be a need to augment CCTV operator training on police culture with “ride-alongs” of officers on special patrol visits to PGLD businesses. Or perhaps it is discovered that practical exercises including simulations on all technical equipment including the two-way radios would be useful for civilian CCTV operators.

Another avenue for future research regarding enhancement of the surveillance-patrol strategy is the PGLD program structure. Based on current design, the nature of the calls originating from PGLD businesses should be explored. If most of the calls to 911 are regarding low priority, non-violent offenses it is not anticipated that CCTV operators would make observations contributing in a significant way to street patrol operations. In fact, the determination that some PGLD employees engage in “up calling,” which is discovered by CCTV operators could be a factor as well. This avenue of inquiry leads to implications relative to business owners.

Program Structure and Businesses

The motivations of some business owners for participating in PGLD can be inferred from data obtained in this study. Some owners presented altruistic motivations. Most seemed persuaded by program incentives such as the quicker and extra patrols. However, these two ideals are not mutually exclusive given that reducing crime can be the motivation while rapid response and extra patrols becomes the delivery mechanism.

While it could be argued that it is not as essential to understand *why* an owner decides to participate, as is actual participation, rationales for participation can affect program implementation. Speaking about offenders knocking items off shelves in his store, an owner told Fox 2 Detroit (2020) “those guys are the reason why I bought Green Light and Green Light didn't help.”^{lxxxvii} For not realizing a quick enough police response, he complained to the press. Also, during the incident he locked the vandalizers inside of the store (Lange, 2020).^{lxxxviii}

The significance owners place on what they expect from DPD in exchange for expending funds on PGLD was also expressed during the exploratory interviews. Two owners critical of 911 patrol response and lack of special patrols brought up the fact that they were “paying” for the services. Their discontent seemed to be exacerbated by extraordinary expectations which may have been conceived during recruitment into the program. For example, one dissatisfied owner said DPD should provide security by placing a stationary patrol on his parking lot each night when he closes at 1:00 am.

Future study of PGLD should explore motivations for program entry and examine those motivations in relationship to conduct, and compliance. Results of such research can inform police executives on the best ways to recruit businesses while balancing program goals and

²³ CCTV operators are in effect conducting interviews when calling PGLD sites. However, it is unknown if this group has received interview training.

maintaining agency autonomy. The good news from the exploratory interviews and statements made by owners to the press is that these relationships are not particularly fragile. Where criticism is made of police response, owners seek to remedy the situation so that PGLD is working to prevent, detect or solve crime – not planning to leave the program unless the police department does not deliver on the incentives. It is recommended that DPD periodically engage in post-incident meetings with owners after 911 calls for service, regardless of outcome, to obtain feedback.

While DPD seeks to be responsive and preserve relationships with businesses, placating can reach a point of counterproductivity. Interviews of owners suggests that a “hard sell” can backfire if it is interpreted that PGLD is strictly transactional. Given these concerns, police departments employing the PGLD model, will need to consider how they address the issue of priority 1 calls, special patrols, and facial recognition. Identifying ways to leverage business owner commitment to the program mission of preventing, detecting, and solving crime relates to the next implication.

The results of this study suggest that most of the universe of video footage generated by PGLD goes unmonitored. Yet, there exists the possibility that crimes are recorded by PGLD cameras. Although it would be labor intensive and require a significant staff increase to “routine patrol” the 700 PGLD locations, DPD could propose that businesses “police” their footage. Even with the limit of the 30-day cloud storage capacity, technology offers additional means for mining video footage for potential crimes.

Concerns about misidentification contributed to the restrictions imposed on applying Facial Recognition Technology to PGLD footage. Other than to solve crime, FRT is prohibited, but other technologies exist that can detect possible crime. Grega, et al. (2016) discussed the use of algorithms that alert when a firearm or knife is visible in an image.^{lxxxix} Also computer visual technologies (CVT) can be designed to detect behavior anomalies associated with crime such as offense patterns for robbery and assault (Idrees, 2018).^{xc} Exploring the use of behavior-based technologies is worthwhile. CVT can potentially increase the ability and speed to search footage for crime; and resolve concerns associated with racial profiling given a focus on what people are *doing* opposed to what they look like.

Developing policies and applying these types of sensor technologies could increase detection. Detecting crime is a precursor to solving crime. The more a strategy can solve crime and is publicized, the greater chances for deterrence and public safety perceptions.

Public Support

This review of PGLD showed that while the public may not be a formal partner in PGLD, community support is necessary to sustain the program. Moreover, perceptions of the program influence overall public trust in the police department to the extent that other initiatives may be impacted. When public support for FRT was withdrawn at least two other DPD/City of Detroit crime reduction efforts were placed on hold.²⁴ This reaction highlights the importance of garnering and retaining public support. Given the stakes, perhaps consideration should be given to appointing a czar to coordinate the various community outreach efforts.

Studying public perceptions about PGLD's ability to prevent, detect and solve crime, can gauge support of the program. While most of the interviewed PGLD owners said that customers/and or employees told them they feel safer with PGLD participation, this is secondary data. A random sampling of public perceptions can provide a more accurate picture of dominant views. On one end of the spectrum are protestors demanding the end of PGLD. Conversely, this study revealed protests demanding businesses join PGLD (with one community so supportive of PGLD as to raise funds to pressure a business to participate). Which is the prevailing viewpoint? Future research could identify how the program can be modified for improvement and reveal ways the public can be engaged to adopt a more active role in crime reduction. Summaries of previous research, such as Sousa and Madensen (2016) can provide a relative roadmap for how police can use CCTV programs to involve the public in crime prevention.^{xci} Encouraging increased use of an area to extend guardianship; encouraging more precaution; and encouraging people to intervene were among the perceived benefits.

One commonality of the studies on public support of policing programs outlined in the literature review was stressing a need to demonstrate public benefit. While many newspaper quotes suggested that patrons of PGLD locations "feel safe," conducting interviews to precisely identify the properties of PGLD associated with safety would be useful in multiple ways – including administration of DPD's guiding principle to preserve relationships.

Conclusion

This study found PGLD to be a vehicle capable of preventing, detecting, and solving crime. While some parts of PGLD are more conducive to program performance, the overall sum is not insignificant. More research is needed to identify the extent to which the program is meeting its objectives; determine which components need to be switched or tweaked; and identify ways to gear PGLD up to maximum performance.

Still, the program's reputation is reaching every facet of society that is affected by and has an effect on crime reduction – including the criminal element. This point is driven by Chief James Craig relaying an arrestee's comment on PGLD: "Where do we go? We can't go anywhere because we don't know whose watching."^{xcii}

²⁴ These are the Neighborhood Real-Time Intelligence Program and a proposed city mandate requiring retail businesses open after 10:00 pm to participate in PGLD.

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Notes (Appendix)

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