Benefits and Risks of Municipal Parking Services (MPS) Parking System in Hamtramck

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Executive Summary

This report finds that Municipal Parking Services' (MPS') Sentry System – a "smart" parking system – provides a blend of benefits and risks to the City of Hamtramck (CoH), MPS, Hamtramck residents, and the general public. To mitigate risks, this report presents concrete proposals for how the CoH can proceed in its relationship with MPS in ways that honor and address residents' needs, while still meeting the CoH's budgetary needs. These proposals include:

- CoH **declining renewal** of its contract with MPS and pursuing alternative parking enforcement provision options that can maximize benefits of increased revenue to CoH, while mitigating identified risks associated with the system's data collection, processing, and storage,
- CoH **creating a local ordinance** regarding data retention and use that protects Hamtramck residents' data privacy,
- MPS **removing or covering eye-level cameras** in Sentry Meters, and
- MPS **integrating face blurring technology** into its data processing pipeline, including deleting originals where faces are recognizable and identifiable.

When the CoH entered into a contract with MPS in July 2020 for the provision of parking services via MPS' "smart" Sentry System, this system was intended to generate revenue for CoH and MPS (Angerer, 2019), increase traffic to local businesses (Angerer, 2019), reduce illegal and dangerous parking behavior (Municipal Parking Services, 2023c), increase parking compliance (Municipal Parking Services, 2023b), and provide access to paying for parking via multiple modalities (Municipal Parking Services, 2023b). However, the Sentry System's implementation led to numerous public complaints about people not understanding why they were receiving parking tickets, reduced traffic to businesses (Sercombe, 2022), and concerns about MPS' data sharing practices with law enforcement (Perkins, 2022). While the CoH has made efforts to address some of these concerns with increased grace periods on some metered spots in parking lots (The Hamtramck Review, 2022), the CoH continues to receive complaints, and residents' concerns about data sharing practices with law enforcement remain unaddressed.

The last of these concerns is rooted in the risk of family separation and deportation by immigration enforcement agencies based on license plate data (Harwell & Romm, 2019; Talla, 2019), and the risk of Michigan State Police facial recognition technology's application to video data – like that collected by MPS – leading to wrongful arrests of people with darker skin tones (Democracy Now!, 2023; Hill, 2020). In a city where the US Census Bureau reports that 41.9% of the CoH's population was born outside of the US from 2017-2021 and approximately 45% of its residents report being non-White as defined by the US Census Bureau (United States Census Bureau Center for New Media, 2022b), the risks of family separation and wrongful arrest are especially heightened.

When the CoH reaches the end of its contract with MPS in early 2025, the CoH will have the opportunity to decline contract renewal, negotiate terms of a new contract, or renew its existing contract. To support the CoH in making an informed decision at this juncture, and given Hamtramck residents' concerns about the high-stakes risks of MPS' Sentry System in the CoH, I – a Hamtramck resident and PhD Candidate in Information at the University of Michigan School of Information – conducted a study to understand the balance of benefits and risks of using MPS' Sentry System in the CoH. This report presents recommendations to the CoH based on findings from this study.

Key Acronyms

ANPR – Automatic number plate recognition
CCTV – Closed-circuit television
COPPA – Children's Online Privacy Protection Rule
CoH – City of Hamtramck
DDA – Downtown Development Authority
DHS – US Department of Homeland Security
HIPAA – Health Insurance Portability and Accountability Act
ICE – US Immigration and Customs Enforcement
LPR – License plate recognition
MPS – Municipal Parking Services
PTO – US Patent and Trademark Office

1. Introduction

The City of Hamtramck (CoH), a 2.1 square mile city largely surrounded by Detroit, is the most densely populated and internationally diverse city in the state of Michigan with a population of 28,433 (US Census, 2020) and 41.1% born outside of the US (American Community Survey 2010). Incorporated as a city in 1922, in part as a tax haven for car company Dodge – formerly Dodge Brothers (Galster, 2012, p. 53), the CoH has seen several economic ups and downs through automotive industry booms and busts. Having experienced two periods of financial emergency and emergency management since 2000 (Abdel-Razzaq, 2014; Contract for Emergency Management Services, 2013), the CoH is currently experiencing a period of relative economic prosperity with a marginal surplus in revenue (City of Hamtramck, 2023). This surplus comes after several years of efforts to acquire one-time grants (Scorsone, 2023), collect city income tax, and collect fines and fees from city code enforcement (Sercombe, 2023).

Among the CoH's efforts to boost its revenue, has been the establishment of a new paid parking meter system. While the CoH already had a parking meter system in place, city officials cited concerns about receiving little revenue from the then-current parking meter system (Sercombe, 2020b), in part due to failing and under-repaired infrastructure (Angerer, 2019; Sercombe, 2020a). To augment this revenue and address these concerns, the CoH entered into a contract with Municipal Parking Services (MPS) in July 2020 for MPS to provide new parking enforcement infrastructure and services to the City of Hamtramck (CoH) until 2025. This system was intended to generate revenue for CoH and MPS (Angerer, 2019), increase traffic to local businesses (Angerer, 2019), reduce illegal and dangerous parking behavior (Municipal Parking Services, 2023c), increase parking compliance (Municipal Parking Services, 2023b), and provide access to paying for parking via multiple modalities (Municipal Parking Services, 2023b). However, the implementation of the Sentry System led to numerous public complaints about people not understanding why they were receiving parking tickets, reduced traffic to businesses (Sercombe, 2022), and concerns about MPS' data sharing practices with law enforcement (Perkins, 2022). While increased revenue for the CoH and MPS present identifiable benefits of the Sentry System, public reports indicate notable risks in tension with these benefits.

To understand tensions between benefits and risks of the Sentry System, I evaluated CoH documents, MPS documents, and news local news reports for whether MPS Sentry System in the CoH achieves or violates reasonable expectations of anticipated benefits and risks. I find that beyond the benefit of revenue to CoH and MPS, Sentry System poses civil and human rights risks to the general public associated with potential data sharing and secondary use by law enforcement and immigration agencies, and potentially health data and data about children with unspecified third parties. Public reports additionally document an unintended decrease in traffic to local businesses.

2. Context of Surveillance in Hamtramck

When the CoH reaches the end of its contract with MPS in early 2025, the CoH will have the opportunity to decline contract renewal, negotiate terms of a new contract, or renew its existing contract. As of yet, Hamtramck residents' unique concerns about the high-stakes risks of MPS' Sentry System in the CoH

remain unaddressed. In light of this context, this study aims to understand the balance of benefits and risks of using MPS' Sentry System in the CoH. The results of this study can support the CoH in making an informed decision about how to proceed with its contract in ways that honor and address residents' needs, while still meeting the CoH's budgetary needs. As context for this study, this section describes the history of MPS' "smart" parking technologies' use in Michigan and unique concerns held by Hamtramck residents about the technology's use.

2.1 History of MPS' "Smart" Parking Technologies in Michigan

MPS, a technology company founded in 2013 and based in Austin, Texas and Minnetonka, Minnesota, specializes in the development and provision of parking infrastructure and services relying on automated vehicle detection (i.e., "smart"). MPS is one of many smart parking companies in the United States and around the world that have emerged over the last decades. Other smart parking companies include but are not limited to, Californian IPS Group (IPS Group, 2021), Swiss IEM Group (IEM Group, 2016), British Smart Parking (Parking, 2023), Italian Smart Parking System (Smart Parking Systems, 2017), and German Cleverciti (Cleverciti, 2024). Each of these companies relies on some combination of vehicle sensors – magnetic or radar – and cameras to identify vehicles, and some also rely on automatic number plate recognition (ANPR) or license plate recognition (LPR) technologies to identify vehicles.

In 2019, MPS launched its presence in Michigan through its five-year contract with the City of Flint to provide parking services (Ahmad, 2019)[1], and soon after similar five-year contracts with the CoH in 2020 (City of Hamtramck-Municipal Parking Services, 2020) and the City of Royal Oak in 2021 (O'Donohue, 2021). In each of these contracts, MPS is responsible for the costs of installing and maintaining parking infrastructure. In exchange, each city shares its parking revenues with MPS. In the CoH's case, MPS receives half of parking revenues. This contractual structure makes MPS an attractive partner for cities struggling to afford up-front costs of parking infrastructures. In Flint, for example, with an old parking kiosk system due for an expensive repair, this contractual structure was more cost effective in the short term (Raymer, 2019). The CoH with its aforementioned longstanding budget challenges, also benefited from the MPS contract approach. Finally, for Royal Oak, with its parking fund deficit incurred by the COVID-19 pandemic (Christensen, 2024) and an alternative option of an expensive parking system update (O'Donohue, 2021), the MPS' style of service provision was also attractive. While initially promising to be a boon for these Michigan cities that had been struggling with various parking-related issues, in all three cases, MPS' Sentry System has been met with dissatisfaction by municipal residents.

The bulk of dissatisfaction about MPS' Sentry System has concerned the system being confusing, experiencing technical malfunction, or reduced traffic to businesses. For example, after MPS' implementation of the parking system in the City of Flint, local complaints emerged about confusing payment systems and dysfunctional meters (Travis, 2020). In the City of Hamtramck, people issued complaints about not understanding why they were receiving parking tickets and reduced traffic to businesses (Sercombe, 2022). Similarly, MPS' implementation in the City of Royal Oak led to a barrage of complaints about decreased traffic and revenue to businesses downtown, and increased rate of parking

[1] The original contract between the City of Flint and MPS is not publicly available at this time, but a press release from the Flint Downtown Development Authority confirms the contract's existence and implementation on September 24, 2019 (Flint Downtown Development Authority, 2019).

violations that were dismissed in court (i.e., invalid or inappropriately issued parking tickets) (Craig, 2024; Llamas-Fossen, 2023). In addition to these common experiences across all three municipalities, Hamtramck residents expressed a unique concern about MPS' data sharing practices with law enforcement (Perkins, 2022). All three cities have since undertaken efforts to address complaints.

Responses to complaints across all three cities involved increasing the amount of time people could park in monitored spots. For example, the City of Flint lengthened the amount of time that people could park in metered spots (Ahmad, 2020), hoping to reduce the people's hesitance to park in front of businesses and risk receiving a parking ticket. CoH extended grace periods for some lots, but not for street parking (The Hamtramck Review, 2022). The City of Royal Oak began by commissioning a study (Rich & Associates, Inc., 2023) to assess how it could address residents' complaints. Based on the study's findings, the city increased the grace period for metered spaces from 5 to 15 minutes to reduce the risk of residents receiving a ticket while trying to pay for parking, increased maximum parking time limits from 2 to 3 hours at metered spaces, and added Juneteenth to the list of holidays for which parking at metered spaces is free (Johncox, 2023). Despite these efforts to address residents' challenges with parking systems, however, all three cities continued to receive complaints about technical issues and reduced traffic to businesses. Furthermore, CoH residents' unique concerns about data sharing practices with law enforcement remained unaddressed.

2.2 Understanding Hamtramck Residents' Unique Concerns about Data Sharing

The general public in Hamtramck and neighboring Detroit have expressed concerns about video and license plate data sharing with law enforcement and immigration enforcement agencies, both of which MPS indicates they can share data with (Municipal Parking Services, 2023b). The general public's concerns stem in part from concerns about family separation by immigration enforcement agencies. Regarding family separation, Hamtramck residents have specifically expressed concern about sharing license plate data with immigration enforcement agencies. In a recent City Council meeting, a contract for the provision of LPR technology by Flock Safety for law enforcement came up for discussion (Moise, 2023). Public comment expressed concerns about the development of a license plate database of people driving in Hamtramck, since government agencies US Department of Homeland Security (DHS) and US Immigration and Customs Enforcement (ICE) can and do often purchase access to license plate databases, which can introduce dangers of potential deportation and family separation (Municipal Parking Services, 2023a). This risk is especially high for Hamtramck, a city where the US Census Bureau reports that 41.9% of the CoH's population was born outside of the US from 2017-2021 (United States Census Bureau Center for New Media, 2022b). Potential sharing of MPS' license plate data with DHS and ICE thus presents urgent civil and human rights risks for Hamtramck residents.

In addition to family separation, Hamtramck residents' concerns with data sharing also stem from known risks to civil rights when the Michigan State Police's facial recognition technology is applied to video footage like that collected by MPS. In neighboring Detroit, Michigan State Police used its facial recognition technology (Biometrics and Identification Division, 2022) to identify a person in closed-circuit television (CCTV) footage. Based on one of the potential matches the technology returned, the Detroit Police Department wrongfully detained Robert Julian-Borchak Williams for a crime he did not

commit (Hill, 2020). In 2023, the same facial recognition technology led to the wrongful arrest of Porcha Woodruff for a crime that she did not commit (Democracy Now!, 2023). Despite federal and academic reports showing that facial recognition algorithms return a much higher rate of incorrect matches when images feature faces with darker skin tones (Boutin, 2019; Buolamwini & Gebru, 2018) – both Williams and Woodruff have darker skin tones – Michigan State Police continues to use this technology. Hamtramck is a city where approximately 45% of its residents report being non-White according to the US Census Bureau's definition (United States Census Bureau Center for New Media, 2022b). Neighboring Detroit has a more than 85% non-White population (United States Census Bureau Center for New Media, 2022a). Given these demographic make-ups and the documented civil rights violations associated with sharing video data in combination with facial recognition technology use, the possibility of MPS sharing video data featuring people's faces – especially Sentry Meter footage – with law enforcement is especially concerning for Hamtramck residents.

3. Data Collection and Analysis

This study used archival methods (L'Eplattenier, 2009; Ventresca & Mohr, 2017) to identify data for benefit and risk analysis. I began by identifying documents published by the two principal actors in the Sentry System's operation in Hamtramck – MPS and CoH. When reviewing these documents, I identified gaps in information about MPS' technology design and services. To clarify gaps in technology design and functionality, I searched the US Patent and Trademark Office's (PTO) patent and trademark database (United States Patent and Trademark Office, 2018) for any MPS technology applications that overlapped with those technologies they provide to the CoH according to the MPS-CoH contract, and reviewed these documents. To clarify gaps regarding service provision, I reviewed archival news coverage about the Sentry System's use and functionality in the CoH.

Using these techniques, I ultimately collected two datasets: original documents describing Sentry System technologies used by MPS in the CoH (e.g., contracts, trademark applications, terms of service agreements, privacy policies, CoH public meeting agendas, etc.), and six images produced by Sentry System technologies. All original documents are cited in the references section of this report. I have collated the image dataset in the Appendix of this report by making screenshots of the original public documents in which they were included (i.e., MPS trademark applications and presentations to various municipalities).

In order to understand benefits and risks of MPS' Sentry System in the CoH, I used historiographic techniques (Goodman & Kruger, 1988) and two structured reflexive techniques: the Open Data Institute's Data Ethics Canvas (Open Data Institute, 2021), and doteveryone's Consequence Scanning Toolkit (Brown, 2019). Historiographic techniques allowed me to understand and articulate how the Sentry System operated in the CoH, how services have been provided, and how services have been perceived by the general public in Hamtramck. Combining this historiographic analysis with reflexive analysis allowed me to identify when the Sentry System's service provision violated reasonable expectations of data collection, use, and storage by the general public.

4. How the Sentry System Works

In 2019, CoH agreed to a trial of MPS' Sentry System from July to August of 2019 on a stretch of Joseph Campau Avenue featuring much of Hamtramck's business district (Angerer, 2019). In December 2019, MPS presented a report with findings from the trial of their Sentry System to the CoH (Cassady & Collier, 2019, p. 12). Based on these findings, CoH voted on whether or not to enter into a contract with MPS for the use of their Sentry System (Angerer, 2019). The CoH voted in favor of approving a contract with MPS (Gitschlag, 2019). On July 1, 2020, MPS and CoH's contract for Sentry System use went into effect for five years, with a scheduled end-date in 2025. This contract explicitly outlines an opportunity for renewal in 2025 after the conclusion of MPS and CoH's current contract ends (City of Hamtramck-Municipal Parking Services, 2020). Figure 1 offers a visual representation of this timeline of events.

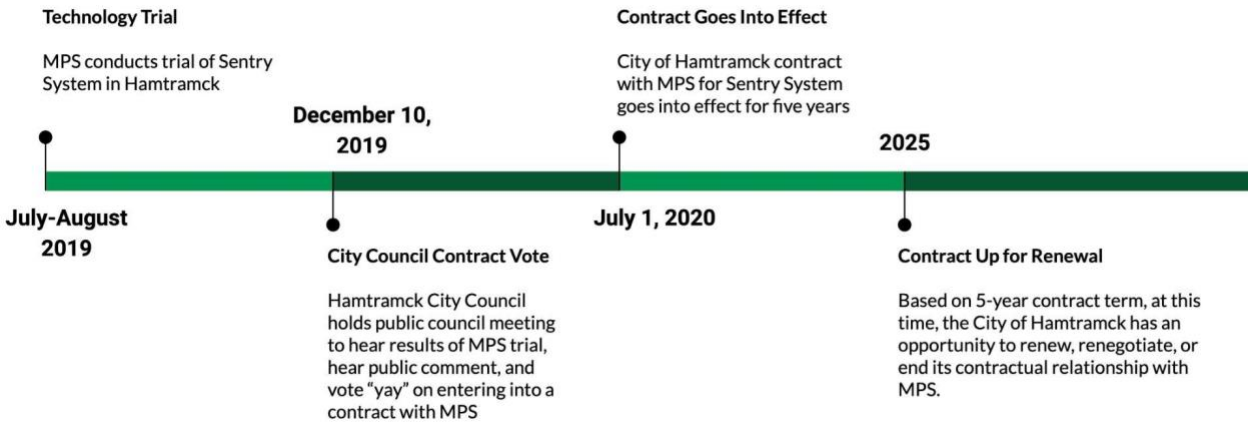


Figure 1. Timeline of MPS' relationship with CoH.

4.1 How the Sentry System Collects Residents' Data

The Sentry System is the name for a parking management system, which is itself made up of eight technological systems: ParkingSticks, SafetySticks, Magnetometers, Open Lot Technology, Sentry Meter, Sentry Mobile App, Sentry View, and Sentry Link. The first six of these systems support data collection and are detailed in this section (see Figure 2 for summaries of these six technological systems' functionalities and data they collect). The final two of these systems support data processing, detailed in the section called "Data Processing".

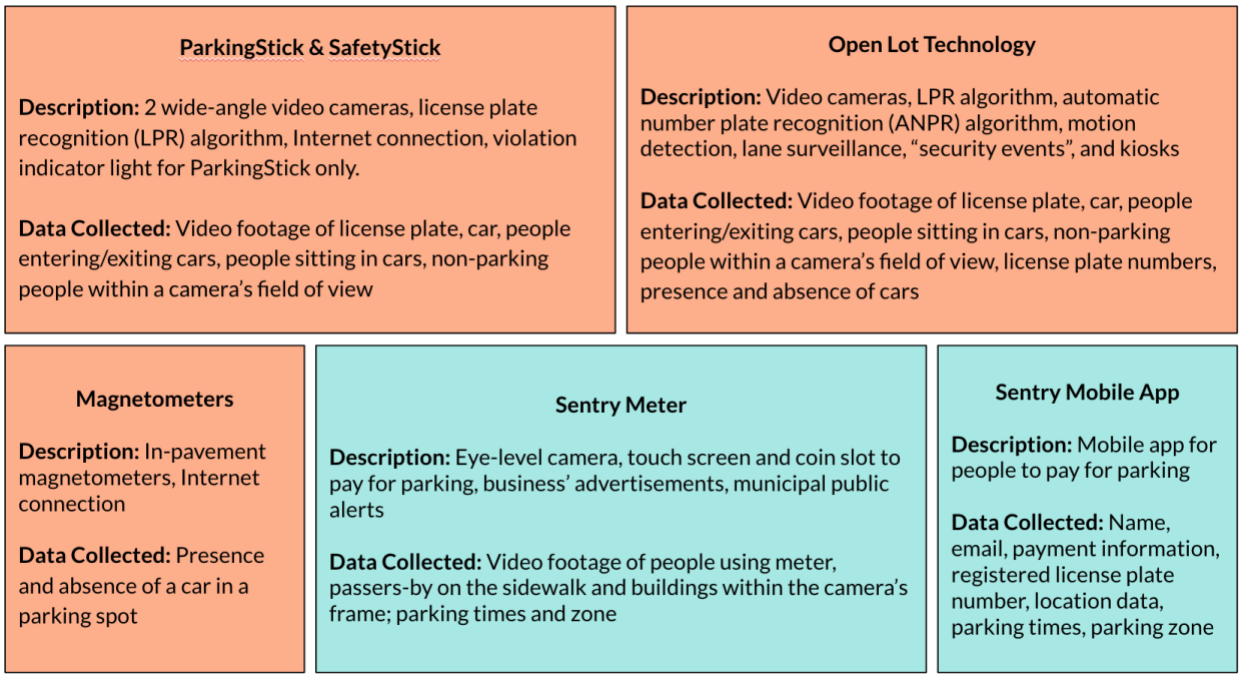


Figure 2. Overview of parking monitoring and payment technological systems involved in MPS' Sentry System and data collected by these systems. Pink-orange boxes represent parking monitoring systems and green boxes represent parking payment systems.

The first four of these systems – ParkingSticks, SafetySticks, Magnetometers, Open Lot Technology – support parking space monitoring. Their operation results in collecting a range of sensitive personal, personal, and non-personal data detailed in Figure 2. Magnetometers embedded in pavement under designated parking spaces detect the arrival and departure of vehicles, and send this information via Internet connection to ParkingSticks (Municipal Parking Services, 2023d). ParkingSticks monitor designated parking spaces using two wide-angle video cameras, LPR algorithms, Internet connection, and a parking violation indicator light to indicate when a parked car may be in violation of parking terms (Municipal Parking Services, 2023d). SafetySticks – made up of the same technological features as ParkingSticks *except* for the parking violation indicator light – are positioned to monitor spaces where it is illegal to park such as near fire hydrants, bus stops, driveways, cross walks, and other locations (Municipal Parking Services, 2023e). Open Lot Technology uses video cameras, an LPR algorithm, ANPR algorithm, motion detection, lane surveillance, "security events"[2], and kiosks to enforce metered parking spot violations in large lots (Municipal Parking Services, 2023c). It is unclear whether the LPR algorithm used to detect license plates by ParkingSticks, SafetySticks, and Open Lot Technology is built into video footage collection from the outset, or whether the LPR algorithm is used to process video data after the point of collection. The same is true for Open Lot Technology's ANPR algorithm. Figure 3 is an example of a still image taken from video footage collected by a SafetyStick.

[2] It is not clear from MPS documents what constitutes a "security event".

Figure 3. Still image taken from video footage of a SafetyStick (Municipal Parking Services, Inc., 2021, p. 19). Red rectangles highlight discrete data entities that may be used in the provision of parking services or by third parties for secondary uses.

The second two technological systems – Sentry Meter and Sentry Mobile App – support people in paying for parking. The Sentry Meter is an on-site parking payment system that allows parking people to pay by coin or credit card according to the zone they've parked in and their license plate number [CITATION]. An eye-level video camera that operates continuously records people as they use the Meter, in addition to collecting footage of passers-by on the sidewalk and buildings within the camera's frame when the Meter is not in use by a parking person. Figure 4 is an example of a still image from video footage taken from a Sentry Meter. Sentry Meters also provide advertising capabilities via audio/video touch screen to local businesses (e.g., business promotion) and the CoH (e.g., weather warnings, amber alerts, call/text/email emergency services, etc.) (Municipal Parking Services, 2023d).

Figure 4. Still image taken from video footage of a Sentry Meter (Cassady & Collier, 2019, p. 12). Red rectangles show discrete data entities that may be used to provide parking services or by third parties for secondary uses.

People can also pay for parking in a monitored spot via the Sentry Mobile App. Using the Sentry Mobile App requires the parking person to download the application onto a smartphone and accept the application's terms of service. Once a parking person has completed these steps, they provide their name, email address, payment information, their registered license plate number, the zone they are parking in, and the times at which they are parking. In addition, they can enable location tracking in the application to help them identify where there may be available parking, or to help them remember where they parked their car. Figure 5 provides screenshots of the Sentry Mobile App in-use.

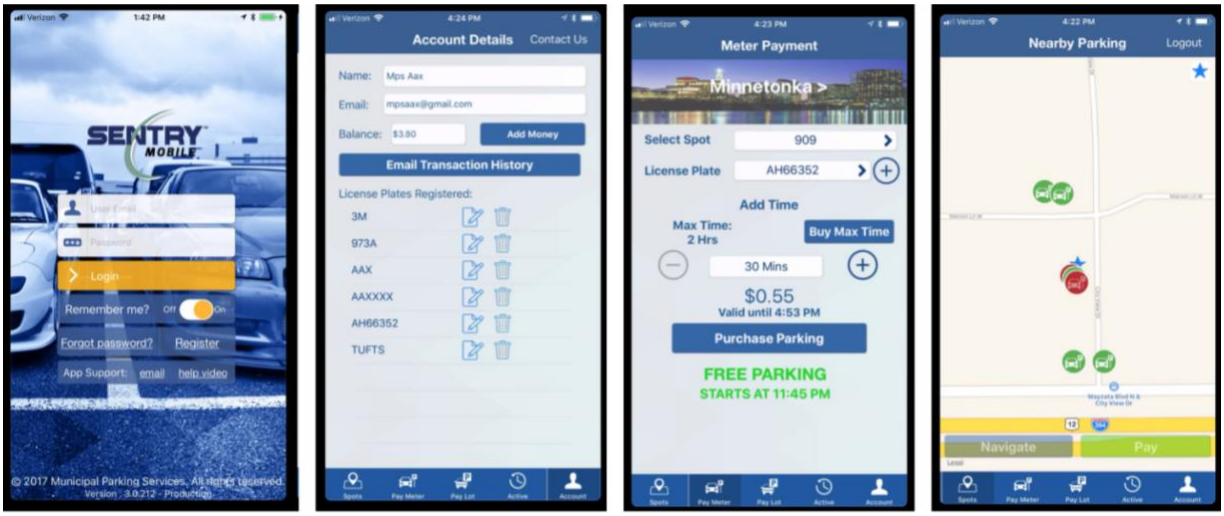


Figure 5. Screenshots of Sentry Mobile App in use.

4.2 Who Processes Residents' Data?

The final two technological systems – Sentry View and Sentry Link – facilitate Sentry System's data processing. These systems triangulate data collected from the first six technological systems into user interfaces that MPS customer service representatives and CoH parking enforcement officers use to identify and enforce parking violations (see Figure 6 for visual representation of this process). Specifically, MPS' customer service representatives review video footage in combination with other data collected by the Sentry System for potential violation incidents (Municipal Parking Services, Inc., 2021, p. 14). If they identify a potential violation, the customer service representatives send evidence of the potential violation to CoH enforcement officers for approval. This evidence includes an MPS-selected still image taken from video footage of the potential violation, license plate number, parking zone, parking times, and name of the person associated with the violating license plate number if available. If the CoH enforcement officers confirm that they consider the potential violation an actual violation, MPS customer service representatives and third party Complus Data Innovations Inc. – now acquired by parent company, Passport (Passport News, 2019) – associate a license plate with an individual and residential address, and issue a ticket to the violating car owner's address (Municipal Parking Services, Inc., 2021, p. 15). A sample ticket is pictured in Figure 7. Beyond parking service provision, MPS can use de-identified data to generally improve services (Terms of Service, 2022). These steps facilitated by Sentry View and Sentry Link are how MPS and CoH process data collected by Sentry System.

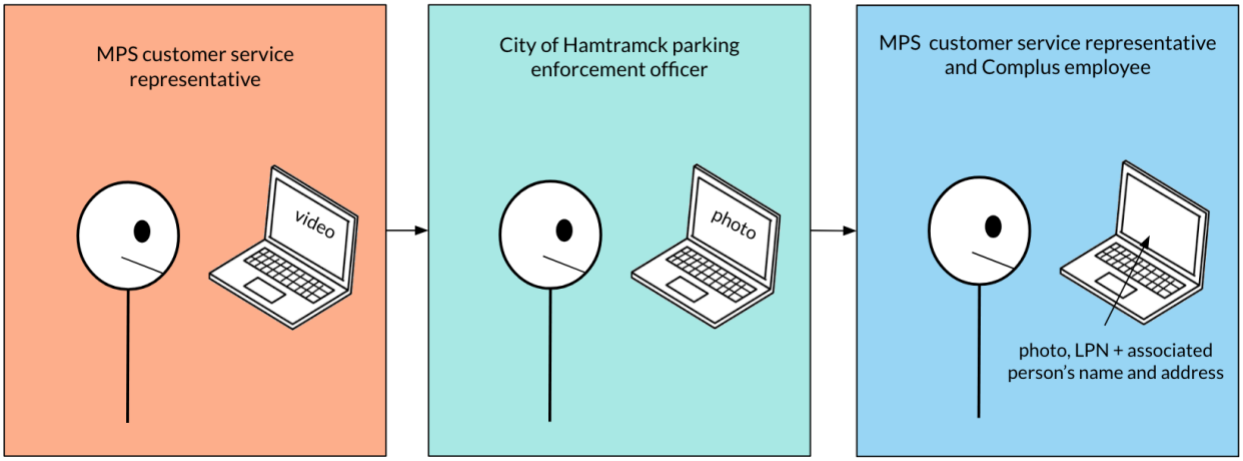
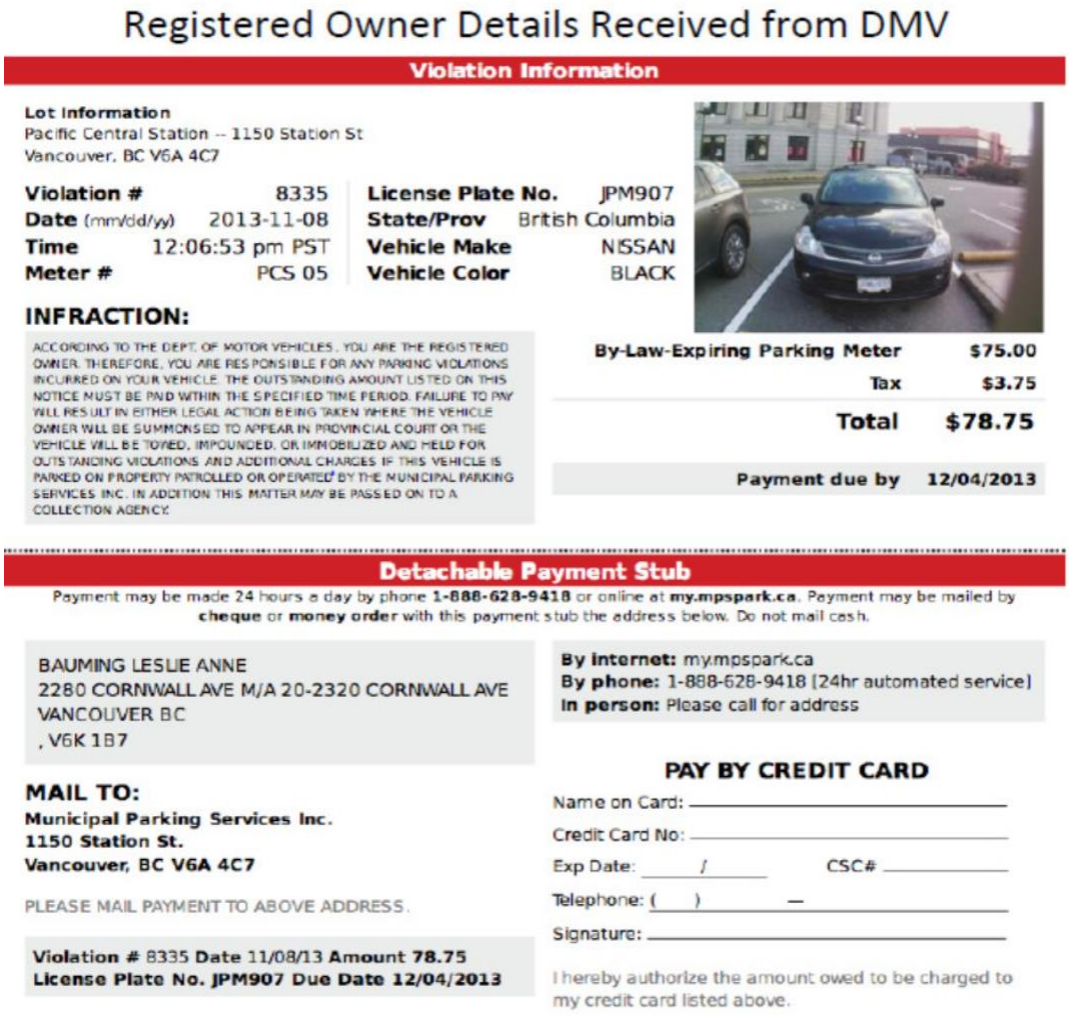


Figure 6. Visualization of how MPS and CoH process data from the Sentry System.

In addition to primary data processing, MPS can share data with third parties (beyond Complus) for secondary processing. Specifically, MPS' privacy policy specifies that MPS can share any data with "other companies in the MPS world wide group" and governmental agencies (e.g., municipalities, law enforcement, and others) (Terms of Service, 2022). It is not immediately clear from MPS' documentation or searches using a wider general purpose search engine which companies fall into "the MPS world wide group". Since this secondary processing is done by third parties, MPS and CoH documents do not specify what secondary processing can look like.



Registered Owner Details Received from DMV

Violation Information

Lot Information
Pacific Central Station -- 1150 Station St
Vancouver, BC V6A 4C7

Violation #	8335	**License Plate No.**	JPM907
Date (mm/dd/yy)	2013-11-08	**State/Prov**	British Columbia
Time	12:06:53 pm PST	**Vehicle Make**	NISSAN
Meter #	PCS 05	**Vehicle Color**	BLACK

INFRACTION:

ACCORDING TO THE DEPT. OF MOTOR VEHICLES, YOU ARE THE REGISTERED OWNER. THEREFORE, YOU ARE RESPONSIBLE FOR ANY PARKING VIOLATIONS INCURRED ON YOUR VEHICLE. THE OUTSTANDING AMOUNT LISTED ON THIS NOTICE MUST BE PAID WITHIN THE SPECIFIED TIME PERIOD. FAILURE TO PAY WILL RESULT IN EITHER LEGAL ACTION BEING TAKEN WHERE THE VEHICLE OWNER WILL BE SUMMONSED TO APPEAR IN PROVINCIAL COURT OR THE VEHICLE WILL BE TOWED, IMPOUNDED, OR IMMOBILIZED AND HELD FOR OUTSTANDING VIOLATIONS AND ADDITIONAL CHARGES IF THIS VEHICLE IS PARKED ON PROPERTY PATROLLED OR OPERATED BY THE MUNICIPAL PARKING SERVICES INC. IN ADDITION THIS MATTER MAY BE PASSED ON TO A COLLECTION AGENCY.

By-Law-Expiring Parking Meter	**$75.00**
Tax	**$3.75**
Total	**$78.75**
Payment due by	**12/04/2013**

Detachable Payment Stub

Payment may be made 24 hours a day by phone **1-888-628-9418** or online at **my.mpspark.ca**. Payment may be mailed by **cheque** or **money order** with this payment stub the address below. Do not mail cash.

BAUMING LESLIE ANNE
2280 CORNWALL AVE M/A 20-2320 CORNWALL AVE
VANCOUVER BC
, V6K 1B7

By internet: my.mpspark.ca
By phone: 1-888-628-9418 (24hr automated service)
In person: Please call for address

MAIL TO:
Municipal Parking Services Inc.
1150 Station St.
Vancouver, BC V6A 4C7

PLEASE MAIL PAYMENT TO ABOVE ADDRESS.

Violation # 8335 **Date** 11/08/13 **Amount 78.75**
License Plate No. JPM907 Due Date 12/04/2013

PAY BY CREDIT CARD

Name on Card: _____
Credit Card No: _____
Exp Date: ____/____ CSC# _____
Telephone: ( ) _____ — _____
Signature: _____

I hereby authorize the amount owed to be charged to my credit card listed above.

Figure 7. Image of a sample parking ticket that a person could receive in the mail (Municipal Parking Services, Inc., 2021, p. 8).

4.3 How are Residents' Data Stored?

MPS stores data according to its data retention policy delineated in its contract with the CoH. This policy states that "City [CoH] shall disclose, and MPS shall comply with, any local or other ordinances regarding data retention and use" (MPS Contract with City of Hamtramck, 2020). Since the CoH does not have specific ordinances or regulations concerning data retention and use, MPS is at most required to comply with US federal data retention policies, though it is likely that no federal data retention policies apply either. Given a lack of regulations, it is possible that MPS can store Sentry System data from CoH indefinitely.

5. Achieving Reasonable Expectations for Data Collection, Processing and Storage

In this section, I present findings from analyses concerning whether MPS Sentry System's service provision to the CoH violates reasonable expectations of data collection, use, and storage by the parking people or the general public. Based on historiographic analyses of archival documents, I understand "reasonable expectation" as determined by explicitly stated intended consequences of the Sentry System (see Table 1), applicable legal frameworks, and local and national public opinion concerning the Sentry System or closely related technological systems. The remainder of this section presents findings from analyses that establish whether Sentry System service provision to the CoH violates these expectations of data collection, use, and storage by the parking people or the general public.

5.1 Explicitly-Stated Intended Consequences

No.	Intended Consequences of the Sentry System	Achieved (Y/N)
1	Generating revenue for CoH (Angerer, 2019)	Y
2	Generating revenue for MPS (Angerer, 2019)	Y
3	Increasing traffic to local businesses (Angerer, 2019)	N
4	Reduce illegal and dangerous parking behavior (Municipal Parking Services, 2023e)	Not enough data
5	Increase parking compliance (Municipal Parking Services, 2023d)	Not enough data
6	Providing access to paying for parking via multiple modalities (Municipal Parking Services, 2023d)	Y

Table 1. Intended consequences of the Sentry System identified by applying the consequence scanning reflexive method (Brown, 2019) to collected datasets.

Generating Revenue for the CoH and MPS

MPS' report on its Sentry System trial period between July 20, 2019 and August 31, 2019 indicates that the **Sentry System generated revenue for both CoH and MPS** – intended consequences one and two (see Table 1). MPS reported a revenue of $377 collected for 14 trial-metered spots during the 43-day trial through Sentry Meters and ParkingSticks (Cassady & Collier, 2019, p. 4), shared between CoH and MPS. In an update on revenues presented to the CoH on July 25, 2023, MPS indicated that between June 2022 and June 2023, the Sentry System collected approximately $32,000 per month in revenue (Municipal Parking Services, 2023a). The roughly $192,000 in revenue generated from June 2022 to June 2023 for the CoH – half of a total revenue of $384,000 generated since half went to MPS – exceeded City Manager Kathy Angerer's projection of a yearly $100,000 generated revenue for the CoH from the Sentry System (Sercombe, 2020b).

Expectations that the Sentry System would generate revenue for the CoH and MPS were thus met, however it is **not clear exactly how much of an increase or decrease** from the CoH's previous parking system this 2022-2023 revenue is, given partial and potentially conflicting indications about prior revenue. While MPS reports that the CoH's prior parking system generated approximately $7,000 per month or $84,000 per year (Municipal Parking Services, 2023a), averaging revenues across monthly revenue and expenditure reports available through the CoH's City Council meeting agendas archives shows an approximate monthly revenue of $18,566.55 in 2018, or $129,965.85 for the entire year (see Table 2). It is thus possible that the CoH's parking revenue increased anywhere from $62,034.15 per year according to CoH reports, or $108,000 per year according to MPS reports.

Table 2. Revenues from parking meter collections *pre*-MPS

Month	**Revenue**
November, 2017 (Angerer, 2017)	$10,172.90*
December, 2017 (Angerer, 2018j)	$10,172.90*
January, 2018	NA**
February, 2018 (Angerer, 2018a)	$16,099.09
March, 2018 (Angerer, 2018b)	$19,314.99
April, 2018 (Angerer, 2018c)	$22,879.95
May, 2018 (Angerer, 2018d)	$26,400.37
June, 2018 (Angerer, 2018e)	$30,794.37
July, 2018 (Angerer, 2018f)	$650.50*
August, 2018 (Angerer, 2018g)	$650.50*
September, 2018 (Angerer, 2018h)	$5,481.39
October, 2018 (Angerer, 2018i)	$8,995.69
November, 2018	NA***
December, 2018	NA***
Total	**$129,965.85 ($18,566.55/mo)**

* It is unclear whether these values are accurate, since the revenue values are exactly the same for two months in a row. These values were thus omitted from calculations.

** Revenue and expenditure report attached to archived meeting agenda for January, 2018 refers to December, 2017.

*** Revenue and expenditure reports are not available through the CoH's City Council meeting agenda archive.

Reduce Illegal Parking and Increase Parking Compliance

MPS reports that SafetySticks detected at least 13 fire lane parking violations per day during this time period (Cassady & Collier, 2019, p. 6). However, it is **not clear whether detecting these violations led to a decrease** in cars parked in illegal parking zones or dangerous parking behavior to increase safety hazard prevention – intended consequence number four (see Table 1). Additional data describing whether the rate of illegally parked cars in SafetyStick monitored areas has decreased is necessary to establish whether the Sentry System is having this intended consequence. Similarly, it is **not clear whether the Sentry System has increased parking compliance**. Additional data describing parking compliance before and after the Sentry Sytem's installation is necessary to establish whether parking compliance has increased.

Increase Traffic to Local Businesses

According to local news reports, the Sentry System has led to ***decreased*** **traffic to local businesses** (intended consequence 3 in Table 1). Two years after the system's installation, local business owners reported losing business traffic because of the Sentry System (Sercombe, 2022). In addition to loss of traffic, a business owner reported additional loss of revenue from having to pay for customers' parking tickets when parking people receiving tickets without understanding why (Sercombe, 2022). These reports indicate that the Sentry System has *decreased* traffic to local businesses – the *opposite* of intended consequence three.

5.2 Applicable Legal Frameworks

Given insufficient information about with whom data are shared, there may be risks associated with collecting and sharing personal sensitive data that violate expectations based on existing regulatory frameworks. In particular, Sentry Meters, ParkingSticks, and SafetySticks may collect video footage of someone entering a medical facility or of children and share these data with third parties (see Figures 3 and 4). The US public has acknowledged potential risks with sharing these types of data by establishing regulations like the Health Insurance Portability and Accountability Act (HIPAA) (Office for Civil Rights, 2021) and the Children's Online Privacy Protection Rule (COPPA) (Federal Trade Commission, 2013). According to HIPAA's Privacy Rule, covered entities[3] and their business associates[4] are responsible for protecting "individually identifiable health information" – protected health information (PHI) – that they hold or transmit (Office for Civil Rights, 2012). PHI can include images or video footage of individuals when used, transmitted, or stored alongside data concerning the pictured individual's "past, present, or future physical or mental health or condition, the provision of health care to the individual, or the past, present, or future payment for the provision of health care to the individual, and that identifies the individual or for which there is a reasonable basis to believe can be used to identify

[3] Covered entities include "1) a health care provider that conducts certain standard administrative and financial transactions in electronic form; 2) a health care clearinghouse; or 3) a health plan" (Office for Civil Rights, 2012)
[4] A business associate is "a person or entity (other than a member of the covered entity's workforce) that performs certain functions or activities on behalf of, or provides certain services to, a covered entity that involve the use or disclosure of protected health information." (Office for Civil Rights, 2012)

the individual" (Office for Civil Rights, 2012). Video or photographic evidence of an identifiable individual entering or exiting a healthcare facility such as that collected by MPS technologies could thus potentially fall under PHI. Related, COPPA regulates website or online services' data collection, use, and storage about children under the age of 13.While neither of these regulations require legal compliance by MPS as an organization type – MPS is not a covered entity, business associate, website, or online service provider, these regulations represent the U.S. public's expressed values and interests about how health and children's data should be treated. In this sense, while MPS does not violate reasonable expectations regarding legal frameworks like HIPAA's Privacy Rule or COPPA, MPS does violate the public's trust premised on these legal frameworks.

5.3 Public Opinion about Similar Technologies

The general public in Hamtramck and neighboring Detroit have expressed concerns about video and license plate data sharing with law enforcement and immigration enforcement agencies, both of which MPS indicates they can share data with (Municipal Parking Services, 2023b). Following a journalist's investigation, CoH appears not to have paid for services that would enable continual data sharing with law enforcement (Perkins, 2022). However, during the same journalist's inquiry, a police officer also indicated over the phone that the police do review video footage from the MPS Sentry System to identify people perpetrating non-parking-related crimes. Regardless of whether CoH has paid for this continual service or not, law enforcement agencies are still able to obtain access to Sentry System data through search warrants (Michigan Legislature, 2014), geofence warrants (National Association of Criminal Defense Lawyers, 2022), or administrative subpoenas (Cornell Law School, 2013).

Recall that approximately 45% of CoH's residents report being non-White according to the US Census Bureau's definition, and that 41.9% of the CoH's population was born outside of the US from 2017-2021 (United States Census Bureau Center for New Media, 2022b). Recall also the documented civil rights violations associated with sharing video data in combination with Michigan State Police's facial recognition technology use (Democracy Now!, 2023; Hill, 2020) and the known uses of license plate data for immigration enforcement (Harwell & Romm, 2019; Talla, 2019). Given these facts, the possibility of MPS sharing video data featuring people's faces – especially Sentry Meter footage – with law enforcement or sharing license plate data with DHS and ICE present urgent civil and human rights risks for Hamtramck residents.

6. Recommendations

The Sentry System provides a blend of benefits and risks to CoH, MPS, parking people, and the general public. Benefits include revenue to CoH and MPS. It is not yet clear from public reports whether the Sentry System has decreased parking in illegal spots or provided a more convenient payment system for parking people. Beyond benefits, Sentry System poses civil and human risks to the general public associated with potential data sharing and secondary use by law enforcement and immigration agencies. The Sentry System also poses risks to the general public associated with potential sharing and secondary use of health data and data about children with unspecified third parties. Public reports additionally

document an unintended decrease in traffic to local businesses. The following paragraphs recommend steps to mitigate these risks and documented harms while maximizing benefits, specifically that:

- CoH **declines renewal** of its contract with MPS and pursues alternative parking enforcement provision options that can maximize benefits of increased revenue to CoH, while mitigating identified risks associated with the system's data collection, processing, and storage,
- CoH **creates a local ordinance** regarding data retention and use that protects Hamtramck residents' data privacy,
- MPS **removes or covers eye-level cameras** in Sentry Meters, and
- MPS **integrates face blurring technology** into its data processing pipeline, including deleting originals where faces are recognizable and identifiable.

6.1 CoH Decline Renewal of Contract with MPS

This document recommends declining renewal of its contract with MPS in 2025. The acquisition of a newly proposed LPR technology by Hamtramck law enforcement faced public concerns about civil and human rights risks of collecting license plate data given their potential acquisition and use by DHS and ICE (Municipal Parking Services, 2023a). Responding to these concerns, CoH City Council voted five to one not to acquire LPR technology from Flock Safety (Faraj, 2023). The Sentry System's LPR technology operates in very similar ways to that which the CoH voted against acquiring. Following this vote's precedent and CoH's demonstrated interest in mitigating civil and human rights risks to its community, this document recommends that CoH decline renewal of its contract with MPS.

To fill the gap in parking service needs if CoH declines renewal of its contract with MPS, this document suggests watching the City of Flint's approach to identifying new service providers closely after it declined its own contract renewal with MPS in 2024. To date, the City of Flint's Downtown Development Authority (DDA) – branch of the city's governance responsible for parking services – has explored at least three alternative parking service options (Ireland-Curtis, 2023). Each of these options responds to Flint residents' complaints about confusing usability by relying on slightly more analog systems that do not involve cameras or LPR technology, and instead involve live enforcement officers directly issuing tickets (Davis, 2024). While the DDA has not yet selected a service provider, they expect to do so by Fall 2024 (Fonger, 2024). Until then, parking remains free of charge downtown (Davis, 2024). Following a similar model, the CoH could solicit parking service proposals from multiple potential service providers that do not involve cameras or LPR technology, and that require live parking enforcement officers to directly issue tickets.

6.2 CoH Create Local Ordinance on Data Retention and Use

This document recommends that CoH creates a local ordinance (or ordinances) on data retention that prioritizes Hamtramck residents' privacy. In order to do so, the CoH can benefit from the State of Michigan's General Schedules on data retention and use for Local Government, specifically its 2022 approved General Schedule #11 for Law Enforcement (Department of Technology, Management & Budget, 2022). This General Schedule provides guidelines for law enforcement data retention and use, including parking ticket and citation data (Item Numbers 11.052-11.054), license plate reader data (Item

Number 11.061), and audio and video data (Item Number 11.057). Michigan municipalities can adopt this General Schedule as-is like the City of Detroit has (Detroit Police Department, 2019), or with modifications like the City of Norton Shores has (Gale, 2021). According to MPS' contract with the CoH, MPS would be required to comply with General Schedule #11 if the CoH were to adopt it as a local ordinance (MPS Contract with City of Hamtramck, 2020). While adopting General Schedule #11 only partially mitigates concerns about MPS secondary data uses for other law enforcement activities and immigration enforcement – law enforcement and immigration agencies could still use parking meter data within the data retention time frame –, it makes important steps to ensuring that MPS is unable to indefinitely retain Hamtramck residents' data.

6.3 MPS Remove Sentry Meter Eye-Level Cameras

This document recommends that MPS remove or cover eye-level cameras in Sentry Meters. The preceding analyses find that eye-level camera footage is not integral to MPS providing parking services to CoH. At the same time, these cameras collect video footage which may present a number of data sharing risks concerning health data, data about children, video and image data about people's faces more generally, and business addresses. Since these data do not affect MPS' ability to provide parking services to CoH, this document recommends removing or covering eye-level cameras in order to mitigate risks. It is possible that MPS may generate profit from selling data collected via eye-level cameras to third parties. While this may affect MPS' revenue streams in the short term, this document proposes that through building increased trust with the US public through actions described in the following recommendations, MPS can broaden its market in parking service provision.

6.4 MPS Blur Faces in SafetyStick and ParkingStick Video Footage

In addition to removing or covering eye-level cameras in Sentry Meters, this document recommends that MPS integrate face blurring technology into its data processing pipeline, including deleting originals where faces are recognizable and identifiable. The State of Michigan continues to use a facial recognition algorithm that returns higher false-positive matches for darker-skinned faces, and has accordingly led to the wrongful detention of two known persons in the last three years. Given Hamtramck and neighboring Detroit's demographic make-ups, in order to reduce the risk of wrongful detention motivated by this facial recognition technology's use, this document recommends that MPS integrates face blurring technology into its data processing pipeline. This technological change would also support MPS in building trust with the general public by voluntarily making efforts to protect potential health data in accordance with the public's expressed interest codified by HIPAA's Privacy Rule, and data about children according to the public's values expressed via COPPA.

Appendix

Dataset

Figure 8. Still image taken from video footage from a Sentry Meter camera (Cassady & Collier, 2019, p. 12)

Figure 9. Still image taken from video footage from a ParkingStick camera (Municipal Parking Services, Inc., 2021, p. 8)

Figure 10. Still image taken from video footage from a SafetyStick camera (Municipal Parking Services, Inc., 2021, p. 16)

Figure 11. Still image taken from video footage from a SafetyStick camera (Municipal Parking Services, Inc., 2021, p. 18)

Figure 12. Still image taken from video footage from a SafetyStick camera (Municipal Parking Services, Inc., 2021, p. 17)

Figure 13. Still image taken from video footage from a SafetyStick camera (Municipal Parking Services, Inc., 2021, p. 19)

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