
SmartBlockPHL

A SmartCityPHL project

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Frequently asked questions

Learn more about the objective of SmartBlockPHL, the technology that is being used, and how the data will be managed.

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About the project

What is the goal of the SmartBlockPHL pilot project?

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Several organizations already count people, vehicles, bicycles, and other uses of public space in Philadelphia. The Department of Health also runs ten air quality monitoring stations citywide.

However, the current methods of collecting this data aren't very efficient.

The City will use technology to collect that same data in real-time for six months through this project. The goal of SmartBlockPHL is to test ways to collect data accurately and efficiently while prioritizing the highest standards of civil liberties and data privacy.

In practice, this may help the City use smart technologies to create data-driven policies and improve operational management.

For example, by gathering data about how and when people use public space, the City can make better decisions about managing streets and sidewalks. This project will help the City improve safety for vulnerable users and ensure that public spaces accommodate many needs.

How will the pilot be conducted?

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The City will install 14 smart streetlights to collect information about pedestrian traffic, street activity, and the environment.

Each smart streetlight will have multiple sensors. The optical sensors will count pedestrians, vehicles, and bicyclists. The environmental sensors will measure temperature, relative humidity, and carbon monoxide.

Where and when will the pilot be conducted?

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The pilot will be conducted in Midtown Village at the 100th block of South 13th Street, between Chestnut Street and Walnut Street. This corridor was selected for the pilot due to its mix of dining

and retail uses, increased foot traffic, and existing public infrastructure.

The smart streetlights will be installed in July 2021. Starting in December 2021, the sensors will collect real-time information. The pilot will end in late 2022.

How will stakeholders be engaged through the SmartBlockPHL pilot?

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The City will share general information with community groups through presentations and the project website.

The City is also working with trusted partners like **US Ignite** and the SmartCityPHL Project Task Force to develop data management policies. These policies will establish sound and ethical privacy practices, reasonable security measures, and clear data sharing guidelines.

The task force will review and advise on any changes to the privacy or data management guidelines for the duration of the project. These meetings will be open to the public with meeting dates and times posted. The changes will also be shared with the public through the project website.

Data collection and privacy

What data will be collected?

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Data will only be collected for specific use cases. For SmartBlockPHL, these use cases are:

- Object counting.
- People counting.
- Bicyclists and vehicles.
- Crowd detection.
- Environmental shifts, including temperature, relative humidity, air quality.

No personally identifiable information will be collected or stored through this pilot. Only the metadata will be collected.

What is metadata in the context of this pilot?

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Simply put, metadata is data about data. It's information drawn from the analysis of the physical world, which is then reduced to a form that can't be connected back to the identity of people or objects.

For example, an optical sensor may detect four people walking down the street from this pilot. The metadata it reports might be:

- Mode: Walking
- Count of people: 4
- Date: August 15, 2021
- Time: 2:26 p.m.

Who will have access to the collected data, and how will they use it? **Less -**

At the beginning of the project, the technology provider (Juganu) will have access to calibrate the technical systems. The duration of the “training” period will be no longer than one week.

This training will improve the effectiveness of the systems’ algorithms. For example, the system will better distinguish between people and bicyclists based on their shape, size, and movement.

After this training is complete, no one will have access to the raw data from the sensors. The raw data is immediately anonymized on the edge (within the sensor itself). Only the anonymized metadata will be accessible to the City.

What are the privacy parameters for this pilot?

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The SmartBlockPHL project prioritizes data privacy and respect for civil liberties. That means:

- No personally identifiable information will be collected or stored through this pilot.
- The City and its partners will not have access to any real-time imagery or audio.
- The City will not use this data to enforce laws or issue tickets.
- Only aggregated and anonymized metadata will be used for internal studies and released through **Open Data Philly** .

A group of independent subject matter experts will review the City’s data management practices and advise the project team throughout the project. SmartCityPHL Project Task Force meetings will be open to the public.

The metadata will be reviewed and released to the public through **Open Data Philly** after the project ends. It will be available for everyone to download in standard formats or RESTFUL APIs.

About the technology

What are optical sensors?

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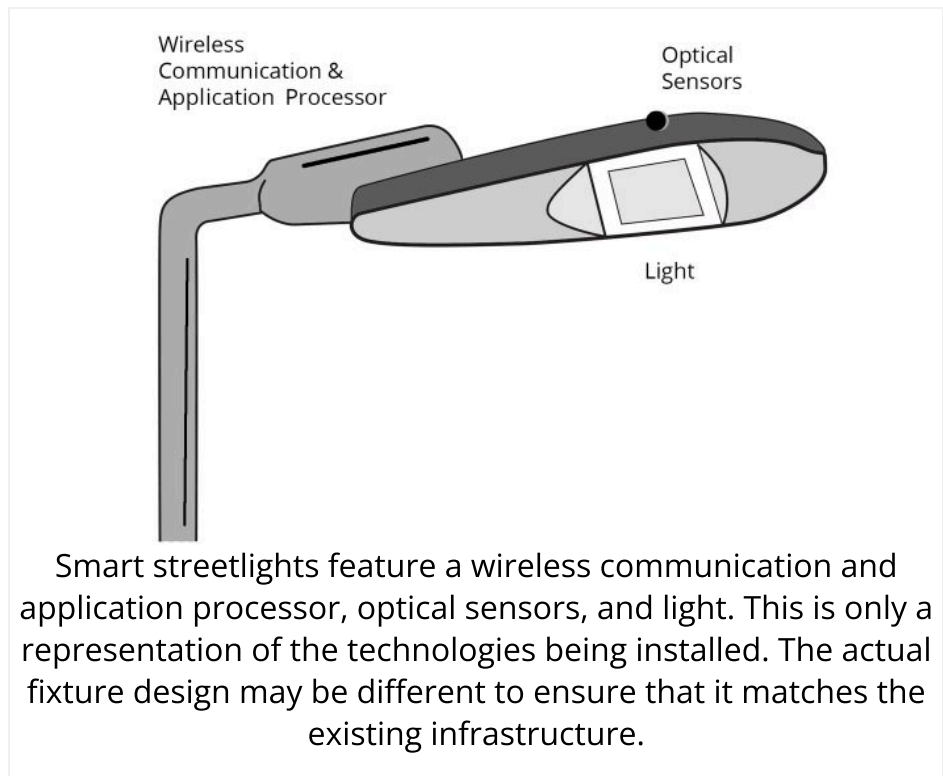
Optical sensors measure light and its characteristics and produce electronic signals. The smart streetlights used in SmartBlockPHL are able to analyze these signals and send text-based metadata to the City's Data Center.

Unlike cameras, the optical sensors do not transmit or store video, and they are not capable of facial recognition.

How does the technology work?

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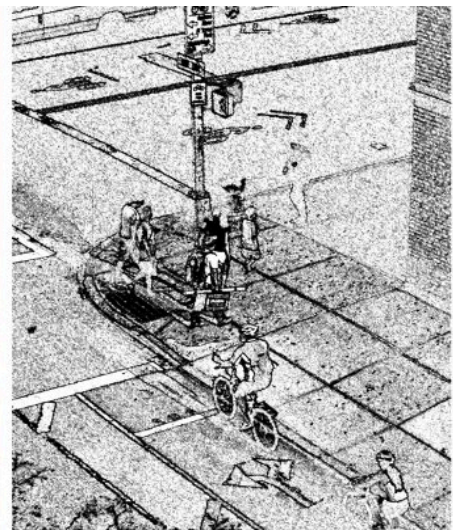
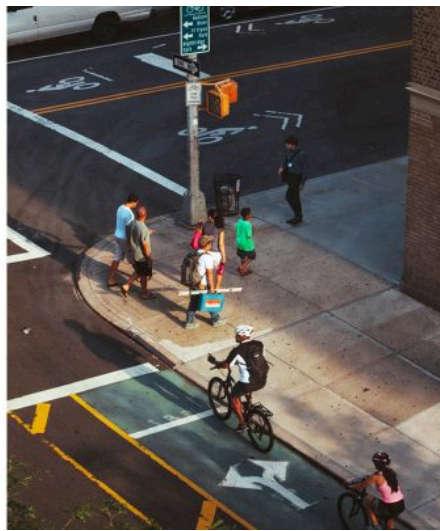
The sensors in the smart streetlights are programmed to detect specific events and collect data about them. The events and data are specific to pre-defined use cases (see "What data will be collected?"). The following image illustrates the parts of the smart streetlight.



The data is captured and processed in the following manner:

1. The sensors on the smart streetlight pick up information and capture the data needed to support a use case.
2. An onsite computer aggregates and analyzes the data within the streetlight. This process is often called edge computing. This technology ensures that the raw data—including any visual—is instantly deleted and never goes beyond the onsite device (or the streetlight, in this case).
3. The processed image is turned into metadata that is specific to the use case.
4. The smart streetlight sends metadata to the City's Data Center, where it is safely stored. A wireless mesh network connects each smart streetlight to the City's Data Center to ensure the safe transfer of data.

The following images show the difference between what a camera detects (original image) and what the sensor converts it to for analysis (edge image). This conversion takes a fraction of a second.



Original image (left) and edge image (right): These images illustrate the process taking place inside a smart streetlight to detect and count people and vehicles in the street. The original image is discarded after the sketch is created and counts are recorded.

Who owns and manages the equipment and the data?

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All equipment, including the lights, sensors, and servers, will be owned and managed by the City.

With the exception of the initial “training” period of one week as the fixtures are installed, no one has access to the raw data from the sensors. All data generated through this pilot will be owned and managed by the City.

The aggregated metadata from the pilot will be released through **Open Data Philly** . .

Questions?

Reach out to **SmartCityPHL@phila.gov** with any questions or concerns about this project.

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