



A Citizen's Guide to **ShotSpotter Connect™**

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Introduction

Police departments are adopting new technologies that increase their efficiency and effectiveness. ShotSpotter Inc. is known for its gunshot detection solution (called ShotSpotter Respond™) that generates a rapid and precise police response to gunfire incidents. The company also provides a solution called ShotSpotter Connect™ that uses local data and artificial intelligence to provide risk assessments for where and when a number of different crimes are more likely to occur on a given day and time. The system directs police to these areas and suggests non-enforcement activities to prevent those crimes from happening.

Many citizens are taking an increased interest in how policing technology and practices impact our communities. Questions arise about how a system like Connect works, what types of data are used to create these risk assessments and what may be the positive and negative consequences of adopting such a system. We believe that transparency is critical in the application of technology within civic processes. Our hope is that this document helps you to understand more about Connect and its potential for making a positive impact in your community.

Why Crime Happens and How to Prevent it

Connect's purpose is to help police prevent crime so to understand its role, we must first look at what causes crime. According to the widely cited "Routine Activity Theory" there are three general conditions that must come together in time and space for most crimes to occur: 1) a motivated or likely offender, 2) a suitable victim or target, and 3) the absence of a capable guardian. When these three elements converge, a crime is likely to happen.



The key to crime prevention is minimizing the likelihood of any of the three elements. As discussed in more detail later, Connect strives to have a capable guardian (i.e., police) at the right place at the right time, along with some non-enforcement tactics designed to reduce the

likelihood of a suitable victim or target (i.e., reminding people to lock cars and remove valuables) to prevent crime.

How Police Determine Where to Patrol

A significant amount of patrol time is dominated by responding to “calls for service” which are calls initiated by the community for help related to violent crime (e.g., shooting, aggravated assault, car theft) or non-violent crime (e.g., noise disturbance, drug crimes, gambling). Patrol time is also occupied through department assigned activities such as regulating traffic, testifying in court, or training. When not engaged in one of these activities, police have “uncommitted” time, which is when they have some degree of discretion on where they go and what they do. The intent is to use this time proactively, be on the lookout for crime or suspicious activity, and gather input from the community.

There are several formal methods by which police have traditionally directed their resources during this uncommitted time and they fall into three main buckets:

Predictive Policing	A police strategy that uses historical data of crime events and/or offenders to predict where future crimes may occur.
Hot Spot Analysis	Using clusters of past crimes to determine what areas police should patrol.
“Gut-Based” Patrols	A scenario where officers rely on personal intuition and prior experience to decide which areas to patrol to reduce crime occurrence.

While well intended, these options have flaws that do not take into account the potential harm to the community. This may leave citizens feeling over-policed and discriminated against, and not actually maximize the crime deterrent effect.

PROBLEMS WITH TRADITIONAL PATROL METHODS

Predictive Policing	Hot Spot Analysis	“Gut-Based” Patrols
<ul style="list-style-type: none"> Relies solely on historical crime and sometimes offender data that includes low level crimes subject to enforcement bias such as drug arrests and disorderly conduct No protections to limit police oversaturation 	<ul style="list-style-type: none"> All of the issues of predictive policing Less accurate risk assessments Patrol plans updated every few weeks or months rather than on a daily basis 	<ul style="list-style-type: none"> Subjective human decisions can lead to unintentional biases No transparency into what choices were made by officers and why No protections to limit police oversaturation of areas

- No transparency nor reporting for accountability
- Provides no guidance on tactics used/interventions when police arrive

- No transparency or tools for accountability or auditing

Traditional predictive policing methods are often cited as being inherently biased and discriminatory against certain populations that are already disadvantaged and overpoliced. In response, ShotSpotter has created a tool that helps deter crime through precise data-driven patrol plans along with a more community friendly approach.

ShotSpotter Connect: A Community First Approach

ShotSpotter Connect is an entirely new approach to patrol strategy. It is a Community First Patrol Management solution and is the first to be built with civil liberty protections in mind. It uses data that is less susceptible to enforcement bias and gives police a new, lower-touch approach to patrolling. The goal of Connect is to allocate patrol resources in a more efficient manner to prevent crime while using a unique approach that minimizes bias, reduces over-policing, focuses on identifying and addressing community issues, and promotes community engagement.

ShotSpotter Connect is software that has three core elements of value:

ShotSpotter Connect		
Directs patrols to areas of highest risk of crime during each shift	Provides non-enforcement activities for officers when they arrive in the recommended area	Tracks officer activities to report on impact

How Connect benefits the community

ShotSpotter Connect helps:

- Proactively place officers at the right place, at the right time, to prevent crime
- Reduce bias related to where police resources are deployed
- Reduce over-policing and gaps in patrol plans
- Provide more valuable information to police on the effectiveness of their patrols
- Increase the use of non-enforcement activities that can reduce the likelihood of a suitable victim or target, and help create and facilitate trust within the community

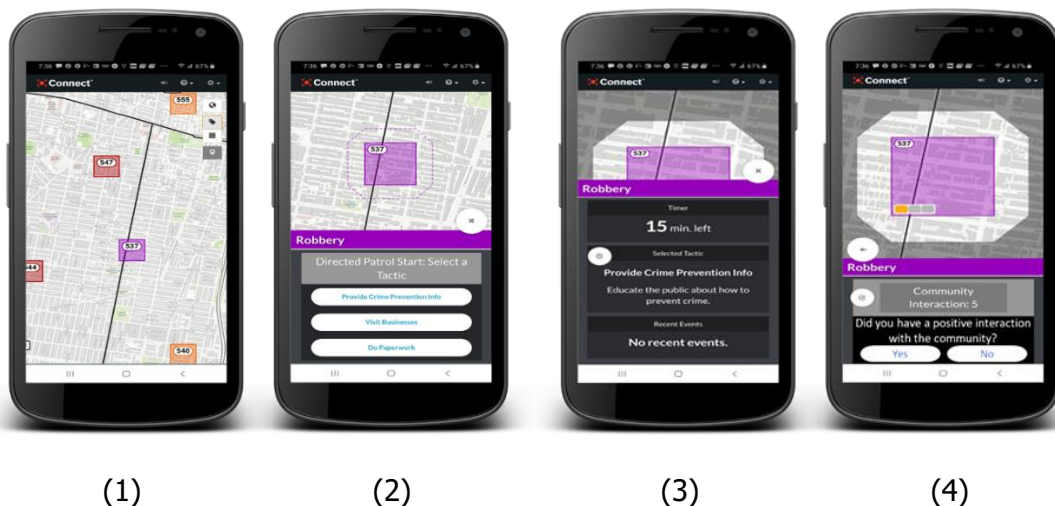
How Connect works

Connect uses local data and machine learning to assess the risk of crimes across the city that could happen during an officer's shift. These assessments are then turned into a patrol plan for each officer for their beat on a daily basis.

Officer Use of Connect

The goal of Connect is to direct officers to precise directed patrol areas within their normal area of assignment for short, focused periods of time. A well-known study called the Koper Curve Theory found that patrolling areas in 10-15 minute intervals creates a presence that results in the highest crime reduction benefit and can last for hours. This ties in directly to the Routine Activity Theory to increase the likelihood of a "capable guardian" being present. Connect provides officers with an interface that displays current directed patrols for their particular shift and jurisdiction. It also provides officers with a list of recent crime events in the patrol area being visited so that officers have awareness of recent activities and potential patterns or trends.

An officer progresses through four main Connect screens when visiting a directed patrol area, which are described below.

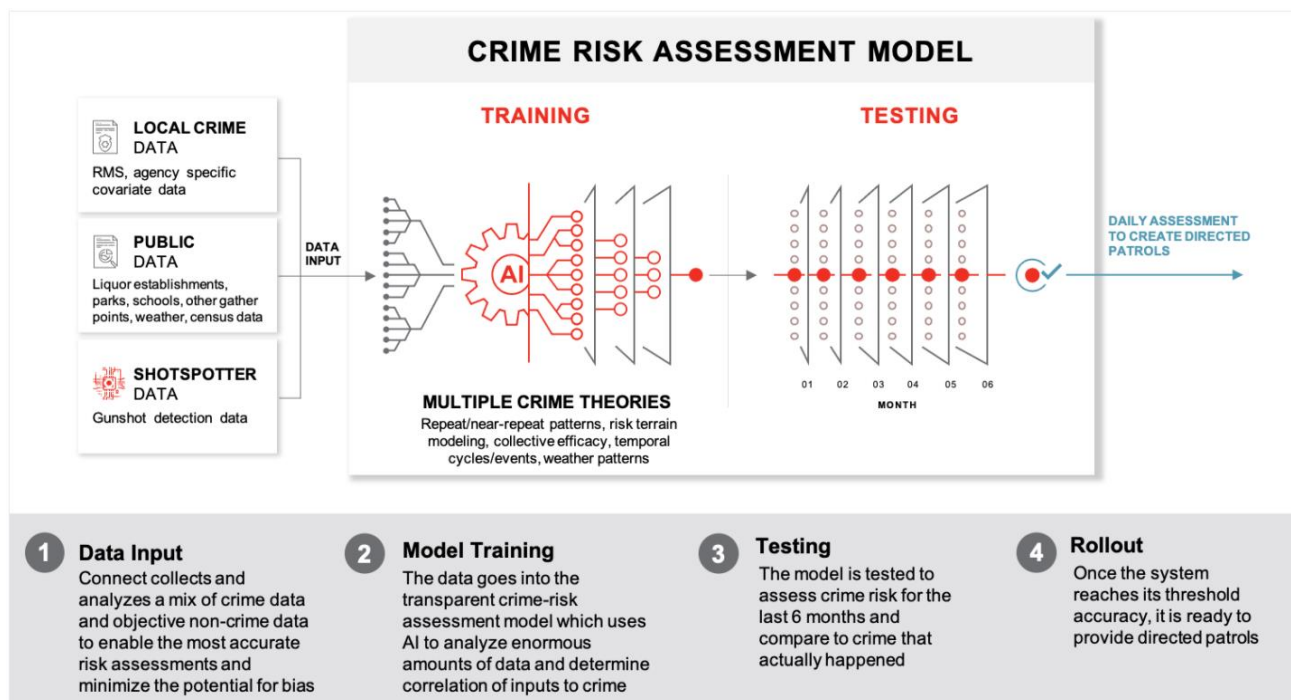


1. The initial Connect screen displays color-coded directed patrol areas for officers to visit. These patrol areas are presented for their entire beat/jurisdiction and change with every shift.
2. Once an officer enters or selects a directed patrol area, the officer is presented with the highest probability crime risk(s) for that area and a list of tactics that he or she can choose from. The tactics are non-enforcement activities focused on reducing the likelihood of suitable targets or victims and fostering positive community engagement.

3. Once a tactic is selected, the officer will see the selected tactic and recent crime events in that area. No offender or suspect information is presented. A 15-minute timer begins, which is the recommended amount of time an officer should spend in that area for the directed patrol based on research to deter crime with the least amount of time spent.
4. Upon exiting the directed patrol, the officer is prompted to enter actions taken, such as community interactions, or observations made during their patrol, and also asked a survey question that reinforces community engagement.

One of the main goals of Connect is to assist in increasing positive engagement between police and the community they serve. By providing officers with a framework of suggested light-touch, non-enforcement tactics and limiting the amount of time an officer should spend in an area, it helps them interact with the community in a more positive and respectful manner. We are aware that trust is earned over time and through actions. We believe that Connect can help foster a more trusting relationship between police and communities.

DETAILS OF THE CONNECT MACHINE LEARNING MODEL



Connect minimizes over-policing and biased patrols relative to traditional methods

To avoid the problems of traditional patrolling methods, ShotSpotter Connect has innovated in five major areas with: better data, better datasets, better controls, better reporting, and better transparency.

1. Better Data: Use Crime Data that is Least Susceptible to Bias

The team behind Connect has carefully thought about the data used by the model to reduce potential harm to community. As part of this approach, we do not make predictions about the actions of people - that means no arrest data, social media, or personal data is used.

Our models only ingest data for crime types that are typically called in from the community and not driven by police presence. This includes crimes like gunfire, homicide, aggravated assault/battery, robbery, burglary, motor vehicle theft, and general theft. We exclude misdemeanor and nuisance crimes like vandalism, drug use, and traffic stops that can create negative feedback loops with enforcement bias. Connect does not use arrest, demographic, or personally identifiable data.

Crime Data Source

Local Crime Data (agency data)	Records Management System (RMS) and/or Computer Aided Dispatch (CAD) data. No personally identifiable information, misdemeanor, or nuisance crime information used.
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2. Better Datasets: Use other Sources of Data excluding People Data

We are aware that there may be a level of inherent bias in crime data alone, therefore we supplement local crime data with multiple sources of relevant data from independent, open sources to further reduce bias. By incorporating data from non-biased, non-crime data sources into the model, new correlations may arise in the forecasts to make modeling more objective. Typical examples include seasonality, time of month, day of week, time of day, holidays, upcoming events, weather, and locations of liquor establishments. Factors such as these may also have an impact on crime risks.

Other Data Sources

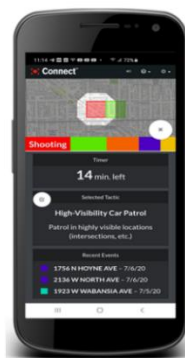
ShotSpotter Gunfire Data	For agencies that use the ShotSpotter gunshot detection solution, gunfire occurrence data is imported into Connect to create gun crime risk assessments
Geographic Data (public data)	Provides environmental context such as streets and buildings to the locations at which crimes occur.
Temporal Data (public data)	Provides information based on time such as sport event schedules, school schedules, and holidays.
Natural Terrain Data (public data)	Useful in identifying natural geographic structures such as hills, valleys, waterways, and other natural topographical areas.
US Census Data (public data)	Provides information from the American Community Survey (ACS) on social, economic, housing, and demographic characteristics such as population density and vehicle density.
Homeland Infrastructure	Provides detailed information about major points of interest such as schools, hospitals, banks, public transit points, and more.

Foundation-Level Data – HIFLD (public data)	
Open Street Maps (public data)	Detailed information about street networks and other major points of interests in a city such as parking spaces that are not available in the homeland security data repository.
Weather (public data)	Captures daily and seasonal weather patterns that may correlate with crime risks.

Connect also has a policy to not model crimes that are largely susceptible to enforcement bias. You can view the [ShotSpotter Crime Modeling Policy](#) on our website to get additional information on the data policies and strategy in place to continuously strive to minimize the effects of enforcement bias. on our website to get additional information on the data policies and strategy in place to continuously strive to minimize the effects of enforcement bias.

3. Better Controls: Maximize the Reduction of Harm

Connect utilizes intelligent patrol metering to measure the amount of time an officer spends in a directed patrol area and to minimize occurrences of over-policing. Each directed patrol area has a visible 15-minute timer and patrol meter to keep track of time and number of visits to an area. The timer is activated whenever an officer begins a visit in a directed patrol area and provides visual guidance on how much time should be spent in an area before moving to a new area. The patrol meter provides data on which directed patrol areas have already been visited and whether the area has received the prescribed amount of visits. These two features combined significantly reduce the occurrences of over-policing and potential harm to the community.



Timer



Patrol Meter

4. Better Reporting: Prioritize Oversight and Accountability

Connect logs patrol activities including time, place, and tactics used. Agencies can generate reports in Connect to show what areas officers visited during a shift, what tactics were employed, and how much time was spent in each area. These reports provide insights into

officer activities during their uncommitted time and provide a level of oversight to command staff that can be fed into future assignments and strategies.

5. Better Transparency: Be Proactively Transparent

We are committed to being transparent about how our system works and use third parties to provide objective assessments. The company proactively self-volunteered to an audit by New York University's Policing Project, which is in progress. We are adopting their recommendations to strengthen and enhance transparency and community protections.

The Onboarding Process for New Connect Agencies

Once an agency contracts with ShotSpotter we assign a Customer Success Director who leads an onboarding process that includes extensive training on the application and educates agencies on how to develop a usage policy and best practices learned from other agencies with a focus on positive community engagement.

Connect Impact on Crime

Greensboro PD in North Carolina performed a side-by-side study testing the effectiveness of an earlier version of Connect looking at its impact on crime trends, as well as seeing how it fits in with their department's current practices. They found that in the areas where officers used Connect, Part 1 crimes (major crimes) were reduced by 33% relative to groups not using Connect. ShotSpotter is working with customers to further evaluate efficacy and the results of those studies will be published when available.

About ShotSpotter

ShotSpotter is a leader in precision policing solutions that enable law enforcement officials to more effectively respond to, investigate, and deter crime. The company's products are trusted by more than 100 U.S. cities to help make their communities safer.

Our mission is: "To earn the trust of police departments in helping them provide equal protection for all, and strengthening the police community relationship, ultimately reducing crime." This statement guides and informs every decision we make. It's part of the fabric of culture and defines who we are.

For additional information, visit our [ShotSpotter Connect FAQs doc](#) and [Connect webpage](#).