

**PURCHASING DIVISION
CITY OF WORCESTER
MASSACHUSETTS 01608-1895
ROOM 201 - CITY HALL, 455 MAIN ST.
PHONE (508) 799-1220**

**SEALED BID INVITATION
(Supplies, Material, Equipment, Services)**

AN EQUAL OPPORTUNITY AFFIRMATIVE ACTION EMPLOYER

SEALED BID NO. CR-8619-W6

DATE: January 5, 2026

**CITY OF WORCESTER
Christopher J. Gagliastro, MCPPO
Purchasing Agent**

BUYER: Christopher J. Gagliastro

All bids are subject to the terms and conditions and specificity herein set forth except where specifically deleted by the City of Worcester in Section No. 6 below.

COMPLETE ORIGINAL COPY (including ALL pages) OF THIS BID MUST BE SUBMITTED IN A SEALED ENVELOPE:

DATE: FEBRUARY 11, 2026

TIME: 10:00 A.M. LOCAL TIME

PLACE: Purchasing Division, Room 201, City Hall, Worcester, Massachusetts

MARK SEALED ENVELOPE "Sealed Bid No. CR-8619-W6, Gunfire Abatement, Location, Alert Services & Patrol Management / WPD"

The name and address of the bidder must appear in the upper left hand corner of the envelope. The City of Worcester is not responsible for bids not properly marked.

GENERAL

1. This Bid Invitation covers: Provide gunfire abatement, location and alert services & patrol management as per the requirements and specifications of the City of Worcester Police Department for a period of three (3) years from April 6, 2026 through April 5, 2029.
2. A certified check or bid bond made payable to the "City Treasurer, City of Worcester" in the Amount of \$ N/A must accompany this bid.
3. All bids received will be publicly opened and read in the Bid Room at City Hall at date and time shown above.
NO BID WILL BE ACCEPTED AFTER TIME AND DATE SPECIFIED
4. A performance bond in the amount of \$ N/A of the total dollar award is required.
5. A payment bond in the amount of \$ N/A of the total dollar award is required.
6. All terms and conditions are applicable to this proposal except the following section numbers which are hereby deleted from this invitation: 39 - 43
7. **Questions pertaining to this bid must be directed to Christopher J. Gagliastro via e-mail at gagliastroc@worcesterma.gov**

8. The following meanings are attached to the defined words when used in this bid form.
 - (a) The word "City" means The City of Worcester, Massachusetts.
 - (b) The word "Bidder" means the person, firm or corporation submitting a bid on these specifications or any part thereof.
 - (c) The word "Contractor" means the person, firm or corporation with whom the contract is made by carrying out the provisions of these specifications and the contract.
 - (d) The words "Firm Price" shall mean a guarantee against price increases during the life of the contract.
9. Any prospective bidder requesting a change in or interpretation of existing specifications of terms and conditions must do so within five (5) days (Saturdays, Sundays and Holidays excluded) BEFORE scheduled bid opening date. All requests are to be in writing to the Purchasing Division (or e-mailed at: gagliastroc@worcesterma.gov). *No changes will be considered or any interpretation issued unless the request is in our hands within five (5) days (Saturdays, Sundays and Holidays excluded) BEFORE scheduled bid opening date.*
10. The contractor will be required to indemnify and save harmless the City of Worcester, for all damages to life and property that may occur due to his negligence or that of his employees, subcontractors, etc., during this contract.
11. The Contract Agreement will be in the form customarily employed by the City of Worcester and is on file in the Purchasing Division at City Hall.
12. Bids which are incomplete, not properly endorsed, or signed, or otherwise contrary to these instructions will be rejected as informal by the Purchasing Agent. **Conditional bids will not be accepted.**
13. The Bidder must certify that no official or employee of the City of Worcester, Massachusetts is pecuniarily interested in this proposal or in the contract which the bidder offers to execute or in expected profits to arise therefrom, unless there has been compliance with provisions of G.L. C. 43 Sec. 27, and that this bid is made in good faith without fraud or collusion or connection with any other person submitting a proposal.
14. As the City of Worcester is exempt from the payment of Federal Excise Taxes and Massachusetts Sales Tax, prices quoted herein are not to include these taxes.
15. All prices are to be firm F.O.B. Destination, City of Worcester, Massachusetts, unless otherwise indicated by the City. **Time reserved for award is ninety days.**
16. In case of error in the extension prices quoted herein, the unit price will govern.
17. It is understood and agreed that should any price reductions occur between the opening of this bid and delivery of any order, the benefit of all such reductions will be extended to the City.
18. The City of Worcester reserves the right to reject any and all bids, wholly or in part, and to make awards in a manner deemed in the best interest of the City.
19. Awards will be made to the bidder quoting the lowest net price in accordance with the specifications.
20. The supplier will be bound by all applicable statutory provisions of law of the Federal Government, the Commonwealth of Massachusetts, the City of Worcester, and the Department of Public Safety of the Commonwealth of Massachusetts.
21. Any bid withdrawn after time and date specified, the bidder shall forfeit deposit on bid as liquidated damages.
22. The contractor will not be permitted to either assign or underlet the contract, not assign either legally or equitably any monies hereunder, or its claim thereto without the previous written consent of the City Treasurer and of the Purchasing Agent of the City of Worcester.
23. If this bid shall be accepted by the City, and the bidder shall fail to contract as aforesaid and to give a bond in the amount as specified in Section 4, within ten (10) days, (not including Sunday or a legal Holiday) from the date of the mailing of a notice from the City to him/her, according to the address given herewith, that the contract is ready for signature, the City may by option determine that the bidder has abandoned the contract and thereupon the proposal and

acceptance shall be null and void and the bid security accompanying this proposal shall become the property of the City as liquidated damages.

24. When quoting, the bidder shall submit a signed copy of this bid form, and if bid accepted by the City shall constitute part of the contract of purchase. Do not detach any part of this form 30B (Sealed Bid Goods & Services) when submitting a bid. Bidder must sign and return complete form 30B (Sealed Bid Goods & Services).
25. If in the judgment of the Purchasing Agent any property is needlessly damaged by an act or omission of the contractor or his/her employees, servants or agent, the amount of such damages shall be determined by the Purchasing Agent of the City of Worcester and such amount shall be deducted from any money due the contractor or may be recovered from said contractor in actions at law.
26. It is agreed that deliveries and/or completion are subject to strikes, lockouts, accidents and/or Acts of God.

INSURANCE AND WORKER'S COMPENSATION

27. **COMMERCIAL GENERAL LIABILITY INSURANCE:** Contractor to supply the City of Worcester with certificates of insurance evidencing general liability coverage of not less than \$ 1,000,000.00 per occurrence / \$ 2,000,000.00 aggregate.
28. **AUTOMOBILE LIABILITY INSURANCE:** Contractor to supply the City of Worcester with certificates of insurance evidencing automobile liability coverage, bodily injury and property damage combined single limit, of \$ 1,000,000.00 (all owned, hired, and non-owned autos).
29. **COMPENSATION INSURANCE:** The contractor shall furnish the City of Worcester with certificates showing that all of his/her employees who shall be connected with this work are protected under Massachusetts' statutory worker's compensation insurance policies.
30. The Contractor shall carry public liability insurance with an insurance company satisfactory to the City so as to save the City harmless from any and all claims for damages arising out of bodily injury to or death of any person or persons, and for all claims for damages arising out of injury to or destruction of property caused by accident resulting from the use of implements, equipment or labor used in the performance of the contractor or from any neglect, default or omission, or want of proper care, or misconduct on the part of the Contractor or for anyone of his employ during the execution of the contract.
31. Prior to starting on this contract, the Contractor shall deposit with the Contracting Officer certificates from the insurer to the effect that the insurance policies required in the above paragraphs have been issued to the Contractor. The certificates must be on a form satisfactory to the Purchasing Agent.
32. Except as may otherwise be stated herein, the Contractor shall also carry bodily injury and property damage insurance in an amount not less than those set forth above covering the operation of all motor powered vehicles owned or operated by the Contractor and engaged in this contract.

DISCOUNT

33. Prompt pay discounts will be considered when determining the low bid except when discounts are for a period of less than 30 days. In this event discounts will not be taken into consideration when determining low bid.
34. Time, in connection with discount offered, will be computed from date of completion and/or delivery and acceptance at destination, or from date correct bill or voucher properly certified by the contract is received if the latter date is later than the date of completion and acceptance and/or delivery and acceptance.

GUARANTEE

35. The bidder to who a contract is awarded guarantees to the City of Worcester all equipment, materials and or workmanship for a period of one (1) year after final inspection and acceptance and shall replace promptly any defective equipment, materials and/or workmanship required without additional cost to the City.

DELIVERIES AND COMPLETION

36. It is understood and agreed that in the event of failure on the part of the bidder to indicate date of delivery and/or completion, delivery and/or completion will be made within twelve (12) days from date of notification. Should the successful bidder fail to make delivery or complete contract within time specified, the City reserves the right to make the purchase on such orders at the open market and charge any excess over contract price to the account of the successful bidder, who shall pay the same.
37. The contractor shall familiarize himself with the location and facilities for storage.
38. The City through its Purchasing Division reserves the right to divert delivery from one location to another, and to allow for any change in operating conditions or for any other cause not now foreseen and to proportion deliveries according to available storage facilities.

SAMPLING AND ANALYSIS

39. Each bidder must state the commercial name of the product quoted, name, and address of operator or agent from whom the product will be purchased and in addition shall furnish an analysis of the product, date of analysis, by whom made and their address.
40. Samples of the product to be delivered may be taken by a representative of the City, either prior to delivery or while it is being delivered in the storage facilities at destination, or will be taken from the storage facilities to which the product has been delivered as determined from time to time by the Purchasing Agent. Bidder agrees to furnish the necessary manual labor, without additional cost required to assemble the physical samples, which is to be performed under the direction of the City representative.
41. The representative of the City taking the samples shall be given the opportunity, while sampling, to affix his or her signature to the delivery slip each item represented in his/her sample.
42. Any product after the sampling and analysis, not found meeting the requirements of the contract shall be sufficient cause for the cancellation of the contract at the option of the Purchasing Agent.
43. If any product is found that does not meet the analysis submitted by the bidder in his/her proposal, the Purchasing Agent may, at his or her option, exercise his/her right to reject the product and require that all or any part thereof shall be removed promptly by and at the expense of the contractor and replace it forthwith with a product satisfactory to the Purchasing Agent, or to retain the product and compensate the contractor in an amount as determined by the Purchasing Agent and the City Manager.
44. It is understood and agreed that it shall be a material breach of any contract resulting from this bid for the Contractor to engage in any practice which shall violate any provisions of Massachusetts General Laws, Chapter 151B, relative to discrimination in hiring, discharge, compensation, or terms, conditions or privileges of employment because of race, color, religious creed, national origin, sex, age or ancestry.
45. The undersigned as bidder, declares that the only parties interested in this proposal as principals are named herein; that this proposal is made without collusion with any other person, firm or corporation, that no officer or agent of the City is directly or indirectly interested in this bid; and he/she proposes and agrees that if this proposal is accepted he/she will contract with the City in accordance with the specifications, also the terms and conditions as spelled out in this bid form.
46. No Person, including but not limited to corporations, partnerships, limited partnerships or limited liability corporations, shall be eligible to receive a contract under this invitation to bid and/or requires for proposal if that person has been convicted of any felony offense involving the distribution of controlled substances as that term is defined under Chapter 94C of the General Laws and, for contracts to be performed for on-site services to the Worcester Public Schools, if that person or any person to be employed by that person in the performance of such on-site services has been convicted of a "sex offense" or a "sex offense involving a child" or a "sexually violent offense" or would meet the definition of "sexually violent predator" as those terms are defined in Section 178C of the General Laws and who must register with the sex offender registry board.

47. The Contractor shall at all times enforce strict discipline and good order among his employees and shall not employ for work or services relating to this contract any unfit person or anyone not skilled in the task assigned to him. In light of the fact that the performance of this contract requires the Contractor and its employees to have significant interaction with the public, the Contractor shall require all employees who may perform services under this contract to conduct themselves in a courteous, professional manner. If the Contractor is notified by the Contract Officer that any person engaged upon the work is incompetent, unfaithful, disorderly, discourteous, or otherwise unsatisfactory, then such person shall be discharged from providing services or work pursuant to this contract. Without limiting the generality of the foregoing, intimidation, threats and/or violent conduct of any kind or nature directed to members of the public are absolutely prohibited. Failure to comply with this requirement shall be grounds for termination of the contract.
48. The Contractor's performance may be evaluated on an ongoing basis including but not limited to consideration of complaints received from members of the public. In order to facilitate this evaluation, the Contractor shall provide the City with documents and records upon request. The Contractor shall further obtain from its employees authorization that appropriate City personnel may obtain all available criminal offender information ("CORI") from the Criminal History Systems Board. A high number of unresolved complaints, any number of complaints that are particularly severe, or employment of individuals who have been convicted or assault or other violent crimes shall be grounds for the early termination or non-renewal of the contract by the City.
49. The procurement officer shall award the contract to the lowest responsible and responsive bidder. The term "responsible bidder" means "a person who has the capability to perform fully the contract requirements, and the integrity and reliability which assures good faith performance." Consistent with its duty to maintain public order and promote public safety, the City has determined that this contract is of a type and nature so as to be particularly sensitive due, at least in part, to the contractor's inherent access and dealings with the members of the general public. Therefore, the City has concluded that additional scrutiny is justified as it determines whether a particular bidder is responsible, having the integrity and reliability to properly perform the requested services. This may entail consideration of the contractor's system of oversight, training and supervision of its employees, including but not limited to its requirement of a high standard of customer service and courtesy in its dealings with the public. The bidder's care and diligence in hiring and assigning its employees will also be considered. In making its determination, the City reserves the right to examine any and all information at its disposal, including but not limited to prior City contracts, the experiences and information obtained from current and former customers (whether identified by the bidder as references or not), as well as other sources available to the City, including but not limited to court documents, newspapers, financial reports (such as DUNS), and certain police data and reports.
50. The Contractor, acting through its owner(s) or any of its employees, or its agents or sub-contractors and any of their employees, shall not engage in any behavior, whether during the course of its duties under this contract or at any other time, that is illegal, criminal or otherwise shocking or offensive to the general public. The determination whether any particular behavior is illegal, criminal or shocking to the general public shall rest in the sound judgment of the Contracting Officer or the City Manager. In making such determination, the Contracting Officer or the City Manager shall apply the general standards of the community. No criminal conviction or formal charges shall be required to make such determination. Such behavior need be something more than trivial and something which would cause the general public to have concerns either about the safety of individuals coming in contact with the Contractor or about the character and integrity of the individuals with which the City does business. Violation of this provision shall be grounds for immediate and unilateral termination of this contract by the City upon five days' notice as otherwise provided herein

GIVE FULL NAMES AND RESIDENCES OF ALL PERSONS INTERESTED IN THE FOREGOING PROPOSAL.

(NOTICE: Give first and last name in full; in case of corporations, give corporate name and names of President, Treasurer, and Manager; and in case of firms give names of the individual members)

Name

Address

Zip Code

KINDLY FURNISH THE FOLLOWING INFORMATION REGARDING BIDDER:

(1) If a Proprietorship

Name of Owner _____

Business Address _____

Zip Code _____ Telephone No. _____

Home Address _____

Zip Code _____ Telephone No. _____

(2) If a Partnership

Full names and addresses of all partners

Name

Address

Zip Code

Business Address _____ Zip Code _____

Tel. No. _____

(3) If a Corporation

Full Legal Name _____

State of Incorporation _____ Qualified in Massachusetts ? Yes _____ No _____

Principal Place of Business _____
Street _____ P.O. Box _____

City/Town _____ State _____ Zip _____

Telephone No. _____

Place of Business in Massachusetts _____
Street _____ P.O. Box _____

City/Town _____ State _____ Zip _____

Telephone No. _____

GIVE THE FOLLOWING INFORMATION REGARDING SURETY COMPANY

Full Legal Name of Surety Company _____

State of Incorporation _____ Admitted in Massachusetts ? Yes _____ No _____

Principal Place of Business _____
Street _____ P.O. Box _____

City/Town _____ State _____ Zip _____

Place of Business in Massachusetts _____
Street _____ P.O. Box _____

City/Town _____ State _____ Zip _____

Telephone No. _____

NOTE

The Office of the Attorney General, Washington, D.C. requires the following information on all bid proposals amounting to \$1,000.00 or more.

F.I.D. Number of bidder _____

This number is regularly used by companies when filing their "EMPLOYER'S FEDERAL TAX RETURN, U.S." Treasury Department Form 941.

AUTHORIZED SIGNATURE OF BIDDER _____ TITLE _____
PLEASE SIGN

DATE _____ BID SECURITY \$ _____

The name of Customer Service Representative and the Contract Administrator responsible for servicing this account in the event of contract award are:

NAME (PLEASE PRINT) *Customer Service Rep.*

TEL. NO. _____

NAME (PLEASE PRINT) *Contract Administrator*

TEL. NO. _____

FAX NUMBER

FAX # _____

E-MAIL (Customer Service Rep.): _____

E-MAIL (Contract Administrator): _____

UNDER MASSACHUSETTS GENERAL LAWS, CHAPTER 30B: SECTION 10, THE FOLLOWING CERTIFICATION MUST BE PROVIDED:

Section 10. A person submitting a bid or a proposal for the procurement or disposal of supplies, or services to any governmental body shall certify in writing, on the bid or proposal, as follows:

" The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals."

(Please Print) _____ Name of Person Signing Bid

Signature of Person Signing Bid

Company

No award will be made without vendor certification of the above.

Bidders must state and identify the product offered, such as manufacturer's name, trade name, brand name and quality next to each item. WE MUST KNOW WHAT HAS BEEN OFFERED.

The quantities shown herein are estimated only and the Contractor will be required to furnish all quantities ordered by the City during the period of the contract.

YES NO

Delivery to be made to: City of Worcester locations as required, Worcester, MA

This Bid includes addenda numbered _____

NO PRICE ADJUSTMENTS ALLOWED. PRICES QUOTED ARE FINAL. CHECK BEFORE SIGNING!

BIDDER TO COMPLETE ITEMS BELOW

Item No.	Estimated Quantity	Description		Unit Price	Total Amount
		<p>Provide Gunfire Abatement, Location and Alert Services as per the attached requirements and specifications of the Worcester Police Department for a period of three years from April 6, 2026 – April 5, 2029.</p> <p>The City has implemented the ShotSpotter™ technology at various points throughout the City. Any new system being offered must meet the performance standard of ShotSpotter™ in order to be considered for award. The City shall make the sole determination as to a product/service meeting this performance standard.</p> <p>It is the bidder's responsibility to include any and all information about their service that demonstrates compliance with the City's performance standard.</p> <p>All questions pertaining to this bid must be sent via email to gagliastroc@worcesterma.gov</p>			See pricing page

TERMS, PROMPT PAY DISCOUNT _____ % 30 DAYS, NET 45 DAYS.

DELIVERY AND/OR COMPLETION TO BE MADE WITHIN as required by City DAYS FROM DATE OF NOTIFICATION BY THE CITY.

(PLEASE REFER TO SECTION NO. 36 RELATIVE TO DELIVERY).

NAME OF BIDDER _____

PRICING PAGE ~ GUNFIRE ABATEMENT, LOCATION, ALERT SERVICES & PATROL MANAGEMENT
BID #: CR-8619-W6

QTY	DESCRIPTION	UNIT PRICE	TOTAL
3 years	Subscription for 8.06 square miles of coverage service	\$ _____ Per Year	x 3 \$ _____ Total
1	Service initiation and start-up fees for the 8.06 square miles (if applicable)		\$ _____ Total One-Time Charge
1	Video surveillance and/or PSIM interface (if applicable)		\$ _____ Total One-Time Charge
1	Training-strategic program and tactical use		\$ _____ Total One-Time Charge
3 years	Subscription – Patrol Management Solution per attached specifications	\$ _____ Per Year	x 3 \$ _____ Total
			\$ _____ * TOTAL ALL ITEMS ABOVE

*Award to be based on this amount. Bidders must bid all items and/or include any and all fees required to complete the services.

Bidder Name:

Gunfire Abatement, Location and Alert Service - Specifications

1.0 REQUIREMENTS

Introduction

The City of Worcester is seeking proposals for a Gunfire Abatement, Location and Alert SERVICE, leveraging a Wide-Area Acoustic Surveillance System, (the "SERVICE") that detects gunfire and conveys incident alerts to our desired endpoints (e.g., PSAP, command staff desks, and field-based personnel (e.g., on an MDC in their vehicles). The City of Worcester anticipates initial and subsequent deployments to uniformly detect and alert for gunfire activity throughout one or more areas, where the total aggregate area covered (the sum of all areas) is 8.06 square miles. The service must be operational 24 hours per day, 7 days per week, 365 days per year, and must be supported round-the-clock by trained personnel. The service must provide coverage throughout the outdoor portions of the areas specified.

The City of Worcester desires a service that would deploy a wide-area acoustic surveillance system capable of detecting and locating gunfire and conveying actionable alerts and data. The City of Worcester prefers not to acquire the system and is seeking an ongoing (subscription-based) SERVICE. The equipment provided under this SERVICE must be installed, operated, managed and maintained by a qualified, capable, and reputable vendor. The SERVICE shall capture and convey gunfire activity intelligence in the form of both incident alerts and accumulated activity data. Alerts shall provide sufficient information for effective dispatch action, and accumulated activity data shall provide salient benefits to investigators, detectives, crime analysts and prosecutors.

The SERVICE must be a proven tool that aids law enforcement and first responders in its awareness of and response to incidents of gunfire and explosions enabling the suppression of gunfire-related violent crime, where such proof includes a proven history of:

1. Detecting and providing a geo-location of gunfire and explosive events
2. Operating in a complex and loud urban environment with dense buildings, foliage and topography obscures line-of-sight from a shooting location to acoustic sensors
3. Delivering a guaranteed detection and location performance in aggregate throughout an entire coverage area
4. History of contributing to reductions in gunfire-related violent crime and homicides
5. Successfully contributing to convictions (when incident alert data is used in trials and plea bargains as forensic evidence)
6. Enabling increased and safer responsiveness to incidents of gunfire

Responsiveness to the scene and to an exact location, a parcel/street address plus an exact location within a parcel enables faster identification and apprehension of perpetrators, identification of witnesses, confiscation of illegal firearms, and collection of physical evidence and clues. Evidence, including the particulars of each incident shall be captured and securely stored for use as probative forensic evidence. Combining police follow-through and community outreach enabled by and coupled with the capabilities of the SERVICE must contribute to criminals quickly learning that they cannot successfully discharge firearms for any reason as is often the case when reporting of gunfire incidents in urban high crime areas to 9-1-1 is extremely low (potentially as low as 20%). There are many reasons for the under-reporting of gunfire to 9-1-1 that includes: "numbness" to the regular occurrence of gunfire, fear of retaliation, and a visible lack of response (because of under-reporting). It is therefore expected that actionable alerts from the SERVICE will enable officers and investigators to respond to the incident, as well as conduct follow-up investigations that display a clear increase of presence and responsiveness that over time instills increased community confidence in the Worcester Police Department, as well as increased cooperation with investigations, all contributing to decreases in gunfire, homicides and related violent crime.

The SERVICE will help the Worcester District Attorney's Office prosecute a zero-tolerance program with the goal of deterring gunfire activity, including "celebratory" gunfire that has consequences of terrorizing

Gunfire Abatement, Location and Alert Service - Specifications

a community and ending in unintentional tragic death. While celebratory gunfire is less severe than gunfire intended to kill or intimidate, it is more than just a nuisance; it is an overt display of lawlessness often involving illegal weapons that ultimately can be used in the commission of homicides and crimes. In addition to locating and arresting perpetrators, illegal and dangerous gunfire can be deterred when monitoring is coupled with proactive awareness campaigns (prior to common times of celebratory gunfire such as July 4th and New Years Eve). In addition, the SERVICE shall provide enhanced situational awareness for officers, responders, and public safety.

Selection Criteria

The specifications set forth herein are a combination of Vendor selection criteria, technical requirements, and operational requirements for a Gunfire Abatement, Location and Alert SERVICE. The successful Vendor shall provide all elements necessary to implement the SERVICE.

Vendor must be capable of all aspects of installation and ongoing 24x365 system management and maintenance with minimal support from Worcester Police Department personnel, specifically with minimal to no support from the City of Worcester's IT department. The City of Worcester's IT department will not install or configure vendor-provided equipment.

The City of Worcester seeks a comprehensive SERVICE, not just individual "sensors" or equipment. The City of Worcester explicitly seeks a SERVICE so that we do not have to own or lease and maintain the necessary components to detect gunfire and receive alerts and have access to the accumulated activity data. Similarly, the City of Worcester does not wish to establish a data communications infrastructure or any field-deployed assets (e.g., acoustic sensors, cameras, networks, radio equipment, etc.), rather the City of Worcester seeks a comprehensive bundled offering with a single unified bill (can be annually recurring). The complete SERVICE must detect and geo-locate detectable gunfire anywhere within the defined coverage area, even in the circumstance of not having line-of-sight between the gunfire incident and the sensor network. Incident alerts that can be readily received and processed for dispatch are an essential requirement. The SERVICE must convey alerts to PSAP personnel (i.e., call-takers and dispatchers), command staff, and field-based personnel. The form and delivery of alerts must closely align with common and accepted PSAP procedures and practices. Alerts shall be exportable in real-time for use with complementary systems using a uniform API based on industry standard data communication methods and protocols.

Qualified vendors must specify overall performance of its SERVICE in terms of detection rate and location accuracy, and uptime. Detection and location accuracy must be specified and measured *throughout the entire outdoor coverage area*, not within the zone of coverage of a single sensor. This is particularly important because the City of Worcester seeks a resilient networked acoustic sensing capability such that line-of-sight from any given sensor is not required for successful detections, and where the SERVICE can continue to operate even under circumstances when individual acoustic sensors are offline.

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Gunfire Abatement, Location and Alert Service - Specifications

2.0 SPECIFICATIONS

The City of Worcester requires a SERVICE that detects gunfire, locates its origin, and conveys that information, in an actionable form, to multiple designated endpoints, especially PSAP and/or other command and control centers, as well as to personnel in the field. The City of Worcester does not wish to design or implement any aspect of the coverage provided, and explicitly does not wish to be responsible for recommending the placement or re-placement of, sensors or any other equipment.

The City of Worcester explicitly does not seek to purchase a PRODUCT or wish to procure capital equipment.

The City of Worcester serves a broad urban community that possesses both acoustic and RF propagation challenges. The SERVICE therefore must be capable of detecting the propagation of impulsive events via direct paths, but more importantly via non-direct or *non-line of sight* paths in environments that contain many common urban obstructions such as: tall buildings, topography, and foliage. More specifically, the SERVICE's acoustic sensors must be capable of accurately locating an incident even when large multi-story buildings are between the sensor and the incident, and in particular when the view from the sensor to the gunfire location is entirely obscured (blocked) by buildings, trees, topography, etc. It is a specific requirement that sensors be capable of detecting gunfire even if the direct path from the source is obscured and an echo path is the only path available to the nearest and/or other sensors.

The City of Worcester does not desire technology which relies on a single stand-alone acoustic sensor (or stand-alone unit with multiple microphone-sensors at a single location) nor a multiplicity of such units, regardless of whether such PRODUCTS report relative "direction/azimuth and elevation" (i.e. angles) or some other information. The City of Worcester believes that such units are solely for the purpose of monitoring a specific and small area and do not provide the full suite of benefits sought.

All field-deployed acoustic sensors should be inconspicuous to minimize vandalism and intentional damage. Also, the deployed apparatus (sensor plus mounting hardware) shall be small in size (sensor itself must be smaller than 1 cubic foot) and use non-penetrating mounting methods. All sensors shall be owned, installed and maintained by the Vendor providing the Service.

Acoustic Surveillance / Acoustic Sensing

2.1.1

2.1.2 ACOUSTIC RANGE; NON-LINE-OF-SIGHT OPERATION

The City of Worcester expects a form of (wide area) acoustic surveillance to meet the requirements set forth herein.

The City of Worcester expressly needs to detect incidents of gunfire that occur outdoors, often in inconspicuous locations. The technology underlying the SERVICE desired by the City of Worcester must be able to "hear" and hence detect and locate outdoor gunfire throughout entire areas up to multiple square miles. A requirement for proximity to a surveillance sensor (audio, video, or combined) is expressly not desired. Rather what is required is *omnipresent wide-area acoustic sensing* tuned to detect and locate gunfire, provided to the City of Worcester on an annual subscription basis, with no capital equipment to be purchased by the City of Worcester.

Each acoustic sensor must be capable of detecting gunfire at a *non-line-of-sight* straight line distance of at least 1 kilometer (3,300 feet, or 5/8 mile) from the origin of gunfire in, urban environments where intervening buildings, topography, and foliage are present. The system must operate 24x365, necessitating that it must detect during periods of typical urban ambient noise. Preference shall be given to acoustic sensors with proven histories of detections at ranges in excess of 1,600 meters (5,280 feet, or

Gunfire Abatement, Location and Alert Service - Specifications

1 mile) in, urban environments. The acoustic sensors must also be capable of conveying the actual audio received by the sensor causing it to trigger. All acoustic sensors must also have retrievable time-stamped audio, time-stamped with UTC time to be available for follow-up investigative and forensic analysis. All audio clips must also have a checksum, or similar mechanism, that validates the integrity of the audio clip for *chain of custody* matters (i.e., the audio is authentic and unaltered since it was originally stored by the SERVICE).

Please describe compliance with this requirement:

2.1.3 RESILIENT OVERLAPPING ACOUSTIC COVERAGE

The City of Worcester requires a SERVICE which can perform at the guaranteed detection rate throughout the coverage area. Because echoes and multipath can often cancel acoustic energy, Vendor's SERVICE shall be designed such that every outdoor location within the coverage area is covered by a plurality of acoustic sensors. Specifically, the SERVICE must be designed such that at every location within the specified coverage area, at least four (4) acoustic sensors are within the acoustic range of typical outdoor firearm discharges.

Please describe compliance with this requirement:

2.1.4 PLACEMENT OF SENSORS

Due to the complexity and ongoing reliability of dedicated RF data networks, The City of Worcester prefers a Vendor and SERVICE that uses wireless cellular networks for data communications from field-based assets (i.e., the acoustic sensors). The SERVICE's field-based assets (i.e., acoustic sensors) shall be capable of being placed for optimal acoustic detection and for optimal transmission of data via cellular networks. The City of Worcester prefers the placement of sensors above street-level (*i.e.* on rooftops and not on streetlamps or other "street poles if avoidable") because:

1. Elevating sensors to roof level will enable them to hear impulsive sounds from greater distances while also providing a natural reduction of street-level ambient noise.
2. Sensors deployed on rooftops, especially away from the edges, will be out of sight of public view prohibiting detection, resulting in minimal to no vandalism
3. Negotiating utility pole access agreements can delay deployment
4. Streetlamps or poles should be considered the placement of last resort.

Please describe compliance with this requirement:

2.1.5 ENVIRONMENTAL ENDURANCE

The components of Vendor's SERVICE deployed outdoors must operate 24x365 and therefore must withstand typical outdoor conditions that include: sunlight, rain, snow, hail, wind, and both daily and seasonal temperature extremes. Vendor must have components deployed outdoors and in austere conditions for at least 1 full year in each of the following: coastal areas subject to fog; areas where relative humidity exceeds 80%; where temperatures are between -10 degrees C and +50 degrees C.

To provide assurance that the SERVICE components intended for outdoor operation will reliably operate outdoors 24x365, under calm and austere environmental conditions, Vendor must prepare and submit a report of deployment sites that meet each of the criteria listed above indicating the length of time the equipment has been installed.

Component damage from direct lightning strikes and other force majeure events are understood to be outside the norm of acceptable endurance, and therefore component failures of this type are expressly excluded from the endurance criteria.

Please describe compliance with this requirement:

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Detection

2.1.6 DETECTION

Firearm discharges create a loud impulsive sound that is detectable above background noise up to two miles away from the origin of the discharge. In certain circumstances, such as gunfire originating indoors including from within a vehicle, the gunfire may not be detected. Detectable gunfire is defined as outdoor gunfire from unsuppressed weapons fired without obstruction of the muzzle. Examples of undetectable gunfire incidents include: use of a "silencer", extreme point-blank range, firing inside of a vehicle, firing from a partially enclosed and/or roofed area (e.g., a porch or patio).

The SERVICE shall detect loud impulsive incidents, classify them as gunfire, fireworks, or other, and send them to a VENDOR-staffed Incident Review Center. Within seconds of receiving the incident audio download, VENDOR's review personnel will begin analysis of the incident, which will include observing sensor audio wave files and listening to sensor audio. The outcome of this review is intended to confirm or change the classification of the incident type, and, depending on the reviewer's confidence level that the incident is or may be gunfire, will result in an alert ("Reviewed Alert") sent to the Worcester Police Department Alert Console. The incident review process shall be conducted expeditiously and then conveyed immediately to the Worcester Police Department in their standard process.

Please describe compliance with this requirement:

2.1.7 DETECTION VERSUS LOCATION (GEO-LOCATION)

The City of Worcester desires a SERVICE that distinguishes between detection and location (more properly, geo-location) of incidents. Products that provide only detection of an incident without providing a precise geographic location (i.e., a latitude and longitude coordinate) within a defined circular error of probability shall be deemed insufficient and will not be considered. Products that detect incidents via proximity or simply provide a range and bearing relative to the sensor, or that merely slew a video camera in the direction of the incident but that do not provide a precise geo-location shall be deemed insufficient and will not be considered.

The Vendor's SERVICE shall deploy a sensor network over the agreed upon coverage area with a design to detect at least 80% of the unsuppressed outdoor gunfire, with a location accuracy to the shooter's location within 25 meters in at least 80% of the incidents. The Vendor's SERVICE shall deploy no more than 25 sensors per square mile to meet this requirement.

Please describe compliance with this requirement:

2.1.8 GUNFIRE CLASSIFICATION ACCURACY

The Vendor's SERVICE shall employ technology that ensures that other sounds, especially those that are impulsive in nature (i.e. hammering, car backfires, etc.), are minimized to avoid spurious false triggering. The Vendor's SERVICE shall have the unique ability to detect gunfire that occurs within a distributed network of sensors.

The City of Worcester seeks to minimize the disruptions that result from other noises that may be considered false alerts and therefore shall give preference to a SERVICE that includes all the following:

- A VENDOR-hosted Reviewed Alert Service, providing immediate analysis of all incoming incidents and sending only confirmed gunfire incidents to the Worcester Police Department Alert Consoles.
- VENDOR-hosted Review Alert Service must be staffed 24/7/365.
- Reviewed Alerts shall place a "dot on the map" and closest parcel address denoting the location of the incident

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- Reviewed Alert will include Qualitative Severity information indicating: number of shots, drive-by shooting, full automatic and other informative comments as necessary.
- Reviewed Alert will also include the number of shooters, shooters in motion, and historical shooting incident location
- Reviewer personnel must be available 24x7x365 for discussion of incidents they have reviewed. It is preferable for such availability to be via software-based "chat" enabled within Vendor's software.
- Data shall be robust enough to support a forensic level post analysis to include (but not limited to): sequence of fire, location of each round of fire, and the exact time (in fractions of a second) of each round.
- A robust classification process that consistently traps and dismisses obvious false alerts.
- Classification and filtering algorithms adaptable to each unique deployment environment.
- Filtering alerts, temporarily or permanently within specific geographic areas to squelch temporary or ongoing impulsive noise problems (e.g., gun range, heavy construction activity, etc.).
- Filtering all alerts during periods of common and/or anticipated high activity, such as July 4th and New Years.

Please describe compliance with this requirement:

Location Determination

2.1.9 LOCATION ACCURACY

The City of Worcester anticipates that a network of acoustic sensors using physical properties of propagation will rely on time-difference-of-arrival (TDOA) to calculate the origin of gunfire. Doing so requires precise surveyed location of each sensor and precise timestamping of an impulse. Time stamps must be consistent across all sensors to within 1 millisecond (ms) accuracy to enable forensic analysis of incidents to help reveal a timeline of discharges that is known to be invaluable to corroborate or refute testimony of persons involved in shootings. This is particularly the case with gun battles involving two or more shooters.

Please describe compliance with this requirement:

The City of Worcester requires a SERVICE capable of calculating a precise geographic location of each detected incident using the standard latitude and longitude geographic coordinate system. Latitude and longitude reported must be accurate to within a circle radius of 25 meters, anywhere within the coverage area in 80% of detections. These locations must be presented to the Worcester Police Department's end-user(s) such that each incident is visibly plotted and displayed as a "bird's eye view" on Vendor-supplied visualization software. Multiple-round incidents must be distinguished from single-round incidents, and the SERVICE must be capable of "bundling" multiple-round shootings such that only a single alert is presented to users. This alert must specify and convey whether one or more rounds were fired.

Please describe compliance with this requirement:

Detection rate shall be defined as the percentage of gunfire incidents occurring *anywhere within the defined coverage area* which are correctly detected and properly geo-located within the coverage area. The SERVICE must detect and properly geo-locate (provide latitude and longitude) for 80% of naturally occurring outdoor incidents within the coverage area. This requirement obviates systems and corresponding services that report only an angle (bearing) and/or elevation angle to an incident necessarily do so relative to the perspective of only one sensor because:

1. recipients of the alerts (i.e., PSAP and field-based personnel) prefer not to be forced to infer the true and actual location

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2. without a precise geo-location, slewing video surveillance assets (cameras) are less likely to capture activity, especially if they are not collocated with the detecting equipment
3. precise geo-locations provide definitive forensic location data for investigatory and court/prosecutorial purposes
4. a precise geo-location is required for accurate translation to a street address from GIS data using parcel and/or address point data provided by the City of Worcester

It is therefore an absolute firm requirement that incident locations be calculated, plotted, and visualized as geo-locations (latitude/longitude) and conveyed as such on Vendor's visualization software on a map providing an aerial "bird's eye" view location of the incident with an exact location within a parcel denoted.

Please describe compliance with this requirement:

Fully Managed Server Infrastructure

2.1.10 HOSTED SERVER/COMPUTING INFRASTRUCTURE

The Vendor's SERVICE including all servers and centrally located processing shall be in a reliable and secure ("cloud") hosting facility. Implicit in this requirement is all platform and application software, whether Vendors or from third parties, shall be installed and running within the hosted infrastructure.

Please describe compliance with this requirement:

2.1.11 SERVICE ACCESS VIA SECURE (HTTPS) DATA COMMUNICATIONS CONNECTIONS

The Worcester Police Department shall be able to access and use the SERVICE using standard Windows computers (Windows XP and Windows 7). Preference shall be for rich internet application (RIA) software (such as those based on Microsoft Silverlight) or entirely browser-based solutions. Usage shall consist of administrative access to set preferences, PSAP access to receive alerts for dispatch, command staff access for activity awareness, investigations access for investigative follow-up, crime analysis access for analysis and correlation with complementary data. Secure communications (HTTPS) are preferred to accommodate the above-mentioned end-users using and accessing the SERVICE from any location. The SERVICE must support role-based logins so that any authorized end-user accessing the system is presented with the views, tools, and data relevant to their job functions.

Please describe compliance with this requirement:

2.1.12 DATA STORAGE AND ACCESS

The City of Worcester requires that Vendor's SERVICE permanently archive all data and information pertaining to incidents, system operating settings, workstation interactions, end-user activity logs, etc. The Worcester Police Department shall have the ability to access incident data records singularly and in aggregate for a period of not less than two (2) full calendar years, plus a minimum of 5 years archived offline, for a total of 7 years of accessible activity data. In addition, archived Incident data must be retrievable upon notice for investigatory and prosecutor needs; Vendor shall respond to all requests and make available stored incident data, including subpoenas, within ten (10) days of the request.

Please describe compliance with this requirement:

Incident data including audio shall be secured in a tamper evident data format so that it provides a proven secure chain of custody and that there has been no subsequent modification. Event audio shall be introduced as evidence, provided to District Attorneys and played for jurors when permissible. For data security reasons, none of the permanent data above may be stored solely on the deployed sensors

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deployed in the field. This is a critical security requirement because breach, vandalism, and destruction of field-based assets are a concern.

Permanent Information shall minimally include:

- All incident information defined below under Alert Console Software (i.e., incident date/time, geo-location, street address, sensors participating, end-user notes, etc.)
- Audio recordings with GPS derived universal time code (UTC) timestamps from all sensors participating in a location, with anti-tamper awareness, such as an MD5 hash, attached to such recordings at the time of storage such that they can later be proven to be authentic and safeguarded from tampering
- All incident “metadata” (dispatcher/end-user actions, workflow steps, comments, tag numbers and/or keywords, etc.)
- Sensor telemetry and status data
- The number and type of client workstations accessing and the types of users authorized to use the SERVICE

Please describe compliance with this requirement:

Alerting, Reporting, and Forensics

2.1.13 ALERT CONSOLE SOFTWARE

Vendor must provide an Alert Console that minimally supports the functionality listed below. Preference shall be given to an Alert Console implemented as a Windows or Rich Internet software application. The Alert Console must explicitly support the following roles: call-taker, dispatcher, field-based personnel (via a notebook computer/MDC).

Exclusive of network propagation latency the Alert Console must cause an actual visual and audible alert within five (5) seconds of the SERVICE’s server creating and logging an Incident Alert.

- Visible and audible (annunciation) of the arrival of new Alerts
- Display a scalable aerial map image
- Overlay an incident geo-location marker (“dot”) at a specific lat-long coordinate
- Display the address of the parcel containing the lat-long coordinate, or otherwise and if available display a nearest address; the City of Worcester understands that some parcels, such as public parks and wooded areas may not have a nearest address; however, this highlights the need for the placement of a marker (dot) on an aerial map image
- Date and time of the incident
- Delineate between single-round “shots fired” incidents and multiple-round “shots fired” incidents
- Provide the direction and speed of travel of a shooter when multiple rounds are detected along a path indicating that it is possible that the shooter was moving (i.e., as could be the case in a drive-by shooting)
- Convey the possibility of multiple shooters involved when multiple-round “shots fired” incidents are detected (i.e., as could be the case in a “gun fight”)
- Automatic and manual zooming to view incident geo-location (latitude/longitude) relative to nearby landmarks (e.g. buildings, streets, etc.) to provide responding officers with situational awareness and improve approach and containment
- Behavior of the Alert Console software should support common and typical PSAP practices for call-taking and dispatching
- Display relevant “beat,” “region” or other geographic groupings, based on the City of Worcester’s existing geographic areas, with no limit to the number of areas, and a maximum of two (2) hierarchical levels of grouping (i.e., multiple “beats” in a region, or multiple “patrols” in an “area”)
- Record CAD ID or other incident-specific details while an alert is displayed
- The Alert Console software must synchronize with multiple call-takers using self-assignment

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- acknowledgment of an Alert
- Incident details should be able to be easily placed into a computer's clipboard for pasting into a CAD event record's description/synopsis field
- Field (mobile) alert consoles should be able to receive and play "trimmed" audio (i.e., only the gunfire sound duration, not a lengthy audio stream somewhere within which gunfire is found) from multiple sensors.

Please describe compliance with this requirement:

2.1.14 ADDITIONAL SOFTWARE FEATURES

Either as a part of the above Alert Console or as a separate application (delivered in the same form as the former), Vendor must provide the following additional features:

- Ability to search for and review any past incident by Incident number, CAD ID, incident type, or date before or after, comments, street address, or coverage area (in the case of multiple coverage areas).
- Ability to save a trimmed audio clip of any Incident from one or multiple sensor locations.
- Ability to display a list of incident(s) which meet one or more criteria chosen from: start date (of a date range), end date (of a date range), type of incident, content of comments, content of address, incident ID (range), content of CAD ID field, and/or coverage area (in the case of multiple coverage areas).
- Print an incident-specific report containing an aerial map and all incident specific details (including all criteria listed above).
- Print a report listing all incidents which match one or more criteria chosen from: start date (of a date range), end date (of a date range), type of incident, content of comments, content of address, incident ID (range), content of CAD ID field, and/or coverage area (in the case of multiple coverage areas).
- Export a file to the user's local computer in comma-separated values format (CSV) containing all incidents matching one or more criteria chosen from: start date (of a date range), end date (of a date range), type of incident, content of comments, content of address, incident ID (range), content of CAD ID field, and/or coverage area (in the case of multiple coverage areas).

2.1.15

2.1.16 INCIDENT ALERTING TO FIELD-BASED PERSONNEL

The Vendor's SERVICE shall support conveyance of alerts (in accordance with the immediately preceding criteria) to any compatible (Windows) computer anywhere so long as that computer can establish a secure IP data connection to the hosted service. Alerts to field-based personnel must operate seamlessly and cooperatively with Alerts to the PSAP. The Alert Console must be configurable for an MDC to be used with touch screen controls and require minimal user interaction.

Please describe compliance with this requirement:

2.1.17 INCIDENT AUDIO CLIPS

Audio captured and conveyed to Worcester Police field (mobile) alert consoles must be in the form of clips. Entire streams are not acceptable. Having specific clips enables field personnel to instantly play and audition the incident without having to seek or search. Clips from different acoustic sensors deployed at different locations provide different perspectives that can be invaluable for post-event forensic analysis, therefore the City of Worcester shall give preference to Vendor's whose SERVICE can offer multiple audio clips from different locations and perspectives.

Please describe compliance with this requirement:

2.1.18 SHOOTERS IN MOTION

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The Vendor's SERVICE shall individually compute the location of each round fired within a multiple-round shooting incident, to identify incidents where shots have been fired by a shooter in motion, such as is the case with a drive-by shooting from within a moving vehicle, and in those cases shall compute and display the direction and velocity of travel of the shooter and convey that information on the Alert Console. This will greatly aid the determination of egress from a crime scene and therefore help to establish a containment perimeter.

Please describe compliance with this requirement:

2.1.19 INCIDENT TYPE CLASSIFICATION

The Vendor's SERVICE must minimize occurrences of false alarms. Acceptable techniques include methods previously mentioned herein.

It is understood that certain heavy industrial equipment such as jack hammers and pylon drivers, as well as cherry bomb and M-80 type fireworks, may trigger the SERVICE and, at times, be falsely classified as gunfire. It is desired that firecrackers, bottle rockets, transformer explosions, sonic booms, thunder and other events shall generally not cause a problem and should be appropriately discriminated and filtered out. However, it is a requirement that a report can be generated on all other incidents such as fireworks to include time of activation, locations and the audio clip associated with the event(s).

Please describe compliance with this requirement:

2.1.20 DATA ACCESS & REPORTS

The City of Worcester requires that Vendor provide a data store to house all incident data information to facilitate the generation of (summary and detail) reports, activity reports, pattern and trend analytics, and correlation with complementary data (e.g., locations of known felons, parolees, etc.). The data store shall provide the ability to download data in CSV (comma separated value) via secure access (e.g., HTTPS) for use with reporting and analysis tools such as ArcGIS, CrimeView, Crystal Reports.

Please describe compliance with this requirement:

The SERVICE should minimally include reports for specific Incidents that include a map image denoting the exact parcel and lat-long coordinate, as well as activity summary reports suitable for CompStat and other intelligence-led policing needs. Reports must be visible on the computer screen and must also be able to be printed.

Please describe compliance with this requirement:

Cities and counties regularly use analytics and data to develop targeted strategies, operations, and programs for proactively combating crime. Analytical reports complement CompStat reviews by identifying hot spots, patterns, trends, and locations of interest, adding a more complete picture of an area's crime characteristics. Incident details provide crime analysts with a wealth of intelligence to aid in an agency's development of effective and proactive anti-crime strategies and tactical operations. The SERVICE shall be fully capable of providing detailed crime and intelligence analysis through a variety of on demand reports. SERVICE data and associated SERVICE reports shall be capable of showing incident activity by location and time. Specific to location, the reports should rely on GIS based area designations that align with the Worcester Police Department's patrol areas (e.g., districts, beats, etc.). The Vendor shall provide a list of and include examples of all crime analysis report data.

Please describe compliance with this requirement:

2.1.21 INTEROPERABILITY WITH COMPLEMENTARY SYSTEMS

The City of Worcester requires that the SERVICE be interoperable with complementary policing and

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surveillance technologies and systems, specifically: Video Surveillance and CAD systems.

Combining acoustic and video surveillance is a natural and powerful combination. Interfacing digital based acoustic and video surveillance systems increases the value and benefits of both systems. Using data communications to transmit incident locations information from an acoustic surveillance system to a video surveillance system enables a truly intelligent combined surveillance system. A video surveillance system receiving real-time gunfire or explosive incident location data can perform multiple interrelated functions, such as:

- Identify and slew cameras that could view the scene of the incident
- Identify cameras that could view egress routes from scene of the incident and slew them accordingly, including activate license plate recognition
- Automatically route the feeds of the cameras to one or more monitors
- Automatically route the feeds of the activated cameras to a recording device, and tag or bookmark the recordings for easy recall

All events must be logged in our CAD system. Preference shall be given to a Vendor whose SERVICE can interoperate with our CAD system streamlining the work activities of our PSAP personnel.

Please describe compliance with this requirement:

2.1.22 FORENSIC ANALYSIS & WITNESS TESTIMONY

The SERVICE's data must be admissible as trial evidence. Therefore, strong preference shall be given to Vendors providing examples of objective and accurate forensics data used in court cases. Specifically, the forensic data must provide details essential for assisting investigators to reconstruct an exact timeline of a shooting as well as enable them to corroborate or refute testimony from perpetrators, victims, and witnesses.

When a gunfire incident is detected and located, a variety of data relative to that incident shall be stored in a historical database that can be accessed and used during the course of an investigation. The SERVICE shall generate incident reports for inclusion in investigative reports to support on-going investigations and to support the prosecution of offenders. In addition, the SERVICE shall produce audio clips of incidents that reveal what actually occurred and can be used to corroborate and/or refute untruthful statements by victims, witnesses, and suspects.

Worcester Police Department Investigators must be able to access or otherwise create reports and audio clips from the SERVICE for inclusion in their investigative reports in support of court trials. Investigators shall be trained to access the SERVICE to perform the following functions:

- Generate single and aggregated Incident Reports (geo-location, street address, location on map)
- Review and playback audio clips
- Evaluate the sequence of each round discharged
- Recall and review Incidents
- Export Incident data to third party reporting and analytics application software

The Vendor shall have a minimum of 5 years of experience in providing detailed forensic reports following chain of custody rules and then providing expert witness testimony as required in support of prosecutions. The Vendor must provide expert witness testimony from industry specific experts having reviewed as many incidents and authored no fewer than 50 detailed forensic reports based on data from Vendor's SERVICE. The Vendor shall include at least one such example of a detailed forensic report having been used in a trial. The Vendor shall have a history of testimony in forensic documentation and expert witness inclusive of evidentiary forensic information having been accepted as scientific evidence and used in each of the following scenarios; pre-trial processes, trials and courtroom sessions. District

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attorneys as well as U.S. attorneys shall have the option of using this critical forensic data to elicit plea bargains saving taxpayers prosecution costs and jury risk.

In situations where physical evidence is insufficient to positively implicate more than one shooter, the SERVICE shall be capable of providing evidentiary information that may assist in the potential identification of the number of shooters along with the distance between the origins of shots (i.e., the location of each shooter), and a sequenced timeline of each shot from each specific shooting location. This information along with all captured incident details must be available to this agency via any combination of automated and manually generated reports that include critical detailed timelines and data that reveal the sequence of a shooting incident, identify individual shots fired by multiple shooters, and provide the precise location of involved persons during the incident. Supporting such detailed forensic incident sequences and timelines requires that precise timestamps on all incidents must be accurate to +/- 1 millisecond based on Universal Time.

Please describe compliance with this requirement:

Training and Customer Support

2.1.23 PROGRAM DEVELOPMENT, TRAINING & CUSTOMER SUPPORT

The Vendor shall provide consultation for the development of the Worcester Police Department's Strategic Program to Reduce Gunfire-related violent crime. The Vendor shall outline its Strategic Program addressing the following elements:

- Assessment of gunfire-related problems
- Application and enforcement of laws, and their respective consequences
- Organizational preparedness
- Program Management
- Development of policy and standard operating procedures
- Best practices developed from a broad range of customer experiences
- Comprehensive and practical development of gunfire reduction strategies and tactics
- Developing measurable results relative to reduction in illegal gunfire incidents and related violent crime

The City of Worcester knowingly is specifying a complex and multi-faceted system. Training and customer support is therefore anticipated and mandatory.

A proven customer support program (aka – "customer experience program") is expected to identify the challenges, successes and solutions of all customers in an effort to identify best practices that can be shared across all agencies. The Vendor must have developed a comprehensive list of "best practices" compiled from their installed base's experience with utilizing the system/SERVICE within a PSAP (dispatch center), by investigators, patrol and field-based personnel, prosecutors, and crime analysts.

The Vendor shall provide an outline or overview of their training program(s) and also identify the number of years their program has been in existence, the frequency and methods of training, and the credentials of the trainers.

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3.0 VENDOR QUALIFICATIONS

References

An important consideration of the City of Worcester will be the depth and breadth of customer references. Vendor will be required to provide references to prove any claims made in response to our request. References may be requested to substantiate any and all of the following aspects of the Vendor and its SERVICE: deployment, maintenance, forensic and court testimony, training, and crime reduction metrics.

Vendors are cautioned not to make claims or statements to which they are not prepared to contractually commit to.

The Vendor is expected to examine all documents, forms, specifications, standard provisions and all instructions. Failure to do so will be at Vendor's own risk.

Independent Validation

The Vendor shall identify if they have participated in DOJ-sanctioned testing to support this performance level guarantee. In addition, the Vendor shall provide an independent efficacy study and published findings.

Size of Existing Deployments

Vendor must provide references to at least ten (10) deployments, *each of which provides a performance guarantee level within a coverage area of at least three (3) square miles*. In order to prove the scalability of its SERVICE, at least two (2) of these references must be deployments consisting of at least fifty (50) sensors deployed in a single, collaborative network. All references must be of commercial sales at prices substantially consistent with the prices vendor is offering in this proposal.

3.1.1 ACTIVITY LEVELS WITHIN DEPLOYMENTS

At least two (2) of these existing SERVICE references must have documented average gunfire activity levels within the coverage area of at least five (5) gunfire incidents per day. Vendor must prove these activity rates by providing historical reports for SERVICES (which may be redacted for specific customer name and/or incident locations, if required for confidentiality reasons).

3.1.2 PEAK ACTIVITY LEVELS

Vendor must supply evidence of at least one (1) SERVICE with a real-world peak activity load of 500 incidents (of all types: gunfire, fireworks, etc.) within a 24-hour period. Such activity levels are typical around July 4th and New Year's Eve, and supporting these activity loads is critical to successful SERVICE deployment. Vendor must submit a report (which may be redacted for specific customer name and/or incident locations, if required for confidentiality reasons) detailing SERVICE performance of at least this level.

History of Deployments

Vendor must provide references to at least six (6) deployments which have been operating in continuous service for longer than three (3) years each.

Location of Deployments

Vendor must provide references to deployments in at least 10 (10) US states. Locations of deployments must include states in a range of temperature climates, specifically including cities with average daily

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temperature in the winter below freezing and in the summer in excess of 90 degrees Fahrenheit.

Monitoring and Maintenance

The vendor's ability to monitor and maintain this SERVICE is a critical component of our evaluation. All references provided by the Vendor must have a continuous or nearly continuous history of ongoing maintenance contracts with the Vendor subsequent to deployment.

Crime Reduction

The Vendor must provide customer references to both performance (see above) and a *proven history of reducing crime*. Vendor must provide customer-attributed crime reduction statistics (either homicide reduction, violent crime reduction or gunfire rate reduction) in at least five (5) separate cities.

Forensic and Court Testimony

Vendor must provide references to instances in which its data have been admitted as scientific evidence in a criminal court. Such evidence must include at least three (3) separate trials in at least three (3) different states. Vendor must also provide details of courtroom expert witness testimony by its full-time employees in at least three (3) separate cases. The names and contact information of prosecuting attorneys or district attorneys are required for each case.

Financial and Contract Performance

Vendor must submit evidence of at least five (5) successful commercial deployments and acceptance of the technology offered under this proposal on single contract values in excess of US \$1,000,000.00 (Research, test and/or development or other similar contracts are not acceptable.)

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PATROL MANAGEMENT SYSTEM SPECIFICATIONS

INTRODUCTION

Requirement:

City of Worcester seeks a crime forecasting and patrol/task force management system. Required features include the ability to:

- Use machine learning-driven analysis to help strategically plan directed patrols and tactics for maximum crime deterrence
- Incorporate data such as gunshot incidents, crime events, temporal cycles, and geographic variables to produce high probability crime forecasts that are turned into patrol plans (“directed patrols” or “patrols”) that are available to watch commanders, crime analysts, and officers in the field.

Requirement:

The solution must address the needs of patrol officers, task force officers, command staff, and crime analysts in the following ways:

- Patrol and Task Force Officers – Automate the process of creating crime risk forecasts and directed patrol plans, by beat and shift, along with recommended specific tactics.
- Command Staff – Track directed patrols completed, including tactics applied and activities logged by the officer during each patrol session.
- Crime Analysts – Automate labor-intensive aspects of crime analysis and employ multiple crime analysis theories into risk forecasts.

Requirement:

Additional features must include:

- Incorporation of objective, non-crime data
- Flexibility of system to be configured to meet the <Agency>’s needs, such as choosing which crime types to focus on, weighting those crime types relative to each other and determining tactics and activities logged.
- Ease of use of the system for patrol officers.
- Proactive suggestion of patrol tactics based on crime type and agency best practices.
- Integration with ShotSpotter gunshot detection, location, and forensic analysis service
- Transparency about how the solution works and what data is used to foster community trust.
- As a web-based application, the solution must be available through mainstream web browsers (Chrome, Firefox) on multiple devices such as desktop computers, laptops, tablets, MDTs, and smartphones.

Requirement:

The solution must provide forecasts of gun crime and other selected major crime types within and outside the City of Worcester’s current ShotSpotter coverage area(s) and include the following:

- Unlimited web-based access to the patrol management solution via mobile, MDT, and desktop devices
- Vendor must provide service to implement a data feed to provide the agency’s historical data to the patrol management solution
- Vendor must host, secure, monitor, and maintain the patrol management application software and data

Vendor must describe how the patrol management solution meets the following requirements:

Requirement:

CRIME FORECASTING AND DIRECTED PATROL PLANNING

Describe how the solution assesses multiple data sources to create crime risk forecasts and recommended directed patrols.

Crime Models

- Describe how the solution supports the ability to define crime models and generate crime forecasts.
 - Must include gunshot incident data (as applicable)

Patrol Dosage

- Describe how the solution supports the ability to generate directed patrol recommendations based upon available patrol resources.

Adaptive Tactics

- Describe how the solution supports the ability for agencies to create and assign tactics to specific crime types.

Requirement:

COMMAND STAFF/ANALYST USER EXPERIENCE

Describe how the solution supports command staff/analyst activities with respect to:

- Viewing directed patrols and visit activity on a map
- Creating custom directed patrols (as needed)
- Creating directed patrol reports
- Provide a detailed description of the directed patrol report

Requirement:

PATROL OFFICER USER EXPERIENCE

Describe how the solution supports patrol officer activities with respect to:

- Access to the patrol management solution on a mobile device or MDT
- Providing pertinent situational awareness to the officer concerning the directed patrol
- Capturing the amount of time an officer stays within a directed patrol
- Managing close adherence to the Koper curve theory with officer visits
- Allowing officers to provide feedback on observations

Requirement:

PATROL ACTIVITY INSIGHTS

The solution must provide the ability to analyze the results of directed patrols.

Reporting

- Describe the solution's reporting capabilities.