

**AGREEMENT FOR
TRAFFIC OPERATIONS EQUIPMENT
City of Glendale Solicitation No. IFB 24-54**

This Agreement for Traffic Operations Equipment ("Agreement") is effective and entered into between CITY OF GLENDALE, an Arizona municipal corporation ("City"), and Traffic Signal Controls, Inc., a Colorado corporation, authorized to do business in the State of Arizona, ("Contractor"), as of the ____ day of _____, 2024.

RECITALS

- A. City intends to undertake a project for the benefit of the public and with public funds that is more fully set forth in **Exhibit A**, pursuant to Solicitation No. IFB 24-54 (the "Project");
- B. City desires to retain the services of Contractor to perform those specific duties and produce the specific work as set forth in the Project attached hereto; and
- C. City and Contractor desire to memorialize their agreement with this document.

AGREEMENT

In consideration of the Recitals, which are confirmed as true and correct and incorporated by this reference, the mutual promises and covenants contained in this Agreement, and other good and valuable consideration, City and Contractor agree as follows:

1. Key Personnel; Sub-contractors.

- 1.1 Services. Contractor will provide all services necessary to assure the Project is completed timely and efficiently consistent with Project requirements, including, but not limited to, working in close interaction and interfacing with City and its designated employees, and working closely with others, including other contractors or consultants, retained by City.
- 1.2 Project Team.
 - a. Project Manager.
 - (1) Contractor will designate an employee as Project Manager with sufficient training, knowledge, and experience to complete the Project and handle all aspects of the Project (as determined by the City in its sole discretion); such that the work produced by Contractor is consistent with applicable standards as detailed in this Agreement;
 - (2) The City must approve the designated Project Manager; and
 - (3) To assure the Project schedule is met, Project Manager may be required to devote no less than a specific amount of time as set out in Exhibit A.
 - b. Project Team.
 - (1) The Project Manager and all other employees assigned to the project by Contractor will comprise the "Project Team."
 - (2) Project Manager will have responsibility for and will supervise all other employees assigned to the Project by Contractor.
 - c. Discharge, Reassign, Replacement.
 - (1) Contractor acknowledges the Project Team is comprised of the same persons and roles for each as may have been identified in the response to the Project's solicitation.

- (2) Contractor will not discharge, reassign or replace or diminish the responsibilities of any of the employees assigned to the Project who have been approved by City without City's prior written consent unless that person leaves the employment of Contractor, in which event the substitute must first be approved in writing by City.
- (3) Contractor will change any of the members of the Project Team at the City's request if an employee's performance does not equal or exceed the level of competence that the City may reasonably expect of a person performing those duties or if the acts or omissions of that person are detrimental to the development of the Project.

d. Sub-contractors.

- (1) Contractor may engage specific technical contractor (each a "Sub-contractor") to furnish certain service functions.
- (2) Contractor will remain fully responsible for Sub-contractor's services.
- (3) Sub-contractors must be approved by the City, unless the Sub-contractor was previously mentioned in the response to the solicitation.
- (4) Contractor shall certify by letter that contracts with Sub-contractors have been executed incorporating requirements and standards as set forth in this Agreement.

2. **Schedule.** The services will be undertaken in a manner that ensures the Project is completed timely and efficiently in accordance with the Project.

3. **Contractor's Work.**

3.1 Standard. Contractor must perform services in accordance with the standards of due diligence, care, and quality prevailing among contractors having substantial experience with the successful furnishing of services for projects that are equivalent in size, scope, quality, and other criteria under the Project and identified in this Agreement.

3.2 Licensing. Contractor warrants that:

- a. Contractor and Sub-contractors will hold all appropriate and required licenses, registrations and other approvals necessary for the lawful furnishing of services ("Approvals"); and
- b. Neither Contractor nor any Sub-contractor has been debarred or otherwise legally excluded from contracting with any federal, state, or local governmental entity ("Debarment").
 - (1) City is under no obligation to ascertain or confirm the existence or issuance of any Approvals or Debarments or to examine Contractor's contracting ability.
 - (2) Contractor must notify City immediately if any Approvals or Debarment changes during the Agreement's duration and the failure of the Contractor to notify City as required will constitute a material default under the Agreement.

3.3 Compliance. Services will be furnished in compliance with applicable federal, state, county and local statutes, rules, regulations, ordinances, building codes, life safety codes, and other standards and criteria designated by City.

Contractor must not discriminate against any employee or applicant for employment on the basis of race, color, religion, sex, national origin, age, marital status, sexual orientation, gender identity or expression, genetic characteristics, familial status, U.S. military veteran status or any disability. Contractor will require any Sub-contractor to be bound to the same requirements as stated within this section. Contractor, and on behalf of any subcontractors, warrants compliance with this section.

3.4 Coordination; Interaction.

- a. For projects that the City believes requires the coordination of various professional services, Contractor will work in close consultation with City to proactively interact with any other professionals retained by City on the Project ("Coordinating Project Professionals").
- b. Subject to any limitations expressly stated in the Project Budget, Contractor will meet to review the Project, Schedule, Project Budget, and in-progress work with Coordinating Project Professionals and City as often and for durations as City reasonably considers necessary in order to ensure the timely work delivery and Project completion.
- c. For projects not involving Coordinating Project Professionals, Contractor will proactively interact with any other contractors when directed by City to obtain or disseminate timely information for the proper execution of the Project.

3.5 Work Product.

- a. Ownership. Upon receipt of payment for services furnished, Contractor grants to City, and will cause its Sub-contractors to grant to the City, the exclusive ownership of and all copyrights, if any, to evaluations, reports, drawings, specifications, project manuals, surveys, estimates, reviews, minutes, all "architectural work" as defined in the United States Copyright Act, 17 U.S.C § 101, *et seq.*, and other intellectual work product as may be applicable ("Work Product").
 - (1) This grant is effective whether the Work Product is on paper (e.g., a "hard copy"), in electronic format, or in some other form.
 - (2) Contractor warrants, and agrees to indemnify, hold harmless and defend City for, from and against any claim that any Work Product infringes on third-party proprietary interests.
- b. Delivery. Contractor will deliver to City copies of the preliminary and completed Work Product promptly as they are prepared.
- c. City Use.
 - (1) City may reuse the Work Product at its sole discretion.
 - (2) In the event the Work Product is used for another project without further consultations with Contractor, the City agrees to indemnify and hold Contractor harmless from any claim arising out of the Work Product.
 - (3) In such case, City shall also remove any seal and title block from the Work Product.

4. **Compensation for the Project.**

4.1 Compensation. Contractor's compensation for the Project, including those furnished by its Sub-contractors will not exceed \$1,000,000, as specifically detailed in **Exhibit B** (the "Compensation").

4.2 Change in Scope of Project. The Compensation may be equitably adjusted if the originally contemplated scope of services as outlined in the Project is significantly modified.

- a. Adjustments to the Compensation require a written amendment to this Agreement and may require City Council approval.
- b. Additional services which are outside the scope of the Project contained in this Agreement may not be performed by the Contractor without prior written authorization from the City.
- c. Notwithstanding the incorporation of the Exhibits to this Agreement by reference, should any conflict arise between the provisions of this Agreement and the provisions found in the Exhibits and accompanying attachments, the provisions of this Agreement shall take priority and govern the conduct of the parties.

5. **Billings and Payment.**

5.1 Applications.

- a. Contractor will submit monthly invoices (each, a "Payment Application") to City's Project Manager and City will remit payments based upon the Payment Application as stated below.
- b. The period covered by each Payment Application will be one calendar month ending on the last day of the month or as specified in the solicitation.

5.2 Payment.

- a. After a full and complete Payment Application is received, City will process and remit payment within 30 days.
- b. Payment may be subject to or conditioned upon City's receipt of:
 - (1) Completed work generated by Contractor and its Sub-contractors; and
 - (2) Unconditional waivers and releases on final payment from Sub-contractors as City may reasonably request to assure the Project will be free of claims arising from required performances under this Agreement.

5.3 Review and Withholding. City's Project Manager will timely review and certify Payment Applications.

- a. If the Payment Application is rejected, the Project Manager will issue a written listing of the items not approved for payment.
- b. City may withhold an amount sufficient to pay expenses that City reasonably expects to incur in correcting the deficiency or deficiencies rejected for payment.

6. **Termination.**

6.1 For Convenience. City may terminate this Agreement for convenience, without cause, by delivering a written termination notice stating the Effective Termination date, which may not be less than 30 days following the date of delivery.

- a. Contractor will be equitably compensated for Goods or Services furnished prior to receipt of the termination notice and for reasonable costs incurred.
- b. Contractor will also be similarly compensated for any approved effort expended and approved costs incurred that are directly associated with project closeout and delivery of the required items to the City.

6.2 For Cause. City may terminate this Agreement for cause if Contractor fails to cure any breach of this Agreement within seven days after receipt of written notice specifying the breach.

- a. Contractor will not be entitled to further payment until after City has determined its damages. If City's damages resulting from the breach, as determined by City, are less than the equitable amount due but not paid Contractor for Service and Repair furnished, City will pay the amount due to Contractor, less City's damages, in accordance with the provision of § 5.
- b. If City's direct damages exceed amounts otherwise due to Contractor, Contractor must pay the difference to City immediately upon demand; however, Contractor will not be subject to consequential damages of more than \$1,000,000 or the amount of this Agreement, whichever is greater.

7. **Conflict.** Contractor acknowledges this Agreement is subject to A.R.S. § 38-511, which allows for cancellation of this Agreement in the event any person who is significantly involved in initiating, negotiating, securing, drafting, or creating the Agreement on City's behalf is also an employee, agent, or consultant of any other party to this Agreement.

8. **Insurance.**

8.1 Requirements. Contractor must obtain and maintain the following insurance ("Required Insurance"):

- a. Contractor and Sub-contractors. Contractor, and each Sub-contractor performing work or providing materials related to this Agreement must procure and maintain the insurance coverages described below (collectively referred to herein as the "Contractor's Policies"), until each Party's obligations under this Agreement are completed.
- b. General Liability.
 - (1) Contractor must at all times relevant hereto carry a commercial general liability policy with a combined single limit of at least \$1,000,000 per occurrence and \$2,000,000 annual aggregate for each property damage and contractual property damage.
 - (2) Sub-contractors must at all times relevant hereto carry a general commercial liability policy with a combined single limit of at least \$1,000,000 per occurrence.
 - (3) This commercial general liability insurance must include independent contractors' liability, contractual liability, broad form property coverage, XCU hazards if requested by the City, and a separation of insurance provision.
 - (4) These limits may be met through a combination of primary and excess liability coverage.
- c. Auto. A business auto policy providing a liability limit of at least \$1,000,000 per accident for Contractor and \$1,000,000 per accident for Sub-contractors and covering owned, non-owned and hired automobiles.
- d. Workers' Compensation and Employer's Liability. A workers' compensation and employer's liability policy providing at least the minimum benefits required by Arizona law.
- e. Notice of Changes. Contractor's Policies must provide for not less than 30 days' advance written notice to City Representative of:
 - (1) Cancellation or termination of Contractor or Sub-contractor's Policies;
 - (2) Reduction of the coverage limits of any of Contractor or and Sub-contractor's Policies; and
 - (3) Any other material modification of Contractor or Sub-contractor's Policies related to this Agreement.
- f. Certificates of Insurance.
 - (1) Within 10 business days after the execution of the Agreement, Contractor must deliver to City Representative certificates of insurance for each of Contractor and Sub-contractor's Policies, which will confirm the existence or issuance of Contractor and Sub-contractor's Policies in accordance with the provisions of this section, and copies of the endorsements of Contractor and Sub-contractor's Policies in accordance with the provisions of this section.
 - (2) City is and will be under no obligation either to ascertain or confirm the existence or issuance of Contractor and Sub-contractor's Policies, or to examine Contractor and Sub-contractor's Policies, or to inform Contractor or Sub-contractor in the event that any coverage does not comply with the requirements of this section.
 - (3) Contractor's failure to secure and maintain Contractor Policies and to assure Sub-contractor policies as required will constitute a material default under the Agreement.
- g. Other Contractors or Vendors.
 - (1) Other contractors or vendors that may be contracted with in connection with the Project must procure and maintain insurance coverage as is appropriate to their particular contract.

- (2) This insurance coverage must comply with the requirements set forth above for Contractor's Policies (e.g., the requirements pertaining to endorsements to name the parties as additional insured parties and certificates of insurance).
- h. Policies. Except with respect to workers' compensation and employer's liability coverages, City must be named and properly endorsed as additional insureds on all liability policies required by this section.
 - (1) The coverage extended to additional insureds must be primary and must not contribute with any insurance or self insurance policies or programs maintained by the additional insureds.
 - (2) All insurance policies obtained pursuant to this section must be with companies legally authorized to do business in the State of Arizona and reasonably acceptable to all parties.

8.2 Sub-contractors.

- a. Contractor must also cause its Sub-contractors to obtain and maintain the Required Insurance.
- b. City may consider waiving these insurance requirements for a specific Sub-contractor if City is satisfied the amounts required are not commercially available to the Sub-contractor and the insurance the Sub-contractor does have is appropriate for the Sub-contractor's work under this Agreement.
- c. Contractor and Sub-contractors must provide to the City proof of the Required Insurance whenever requested.

8.3 Indemnification.

- a. To the fullest extent permitted by law, Contractor must defend, indemnify, and hold harmless City and its elected officials, officers, employees and agents (each, an "Indemnified Party," collectively, the "Indemnified Parties"), for, from, and against any and all claims, demands, actions, damages, judgments, settlements, personal injury (including sickness, disease, death, and bodily harm), property damage (including loss of use), infringement, governmental action and all other losses and expenses, including attorneys' fees and litigation expenses (each, a "Demand or Expense"; collectively, "Demands or Expenses") asserted by a third-party (i.e. a person or entity other than City or Contractor) and that arises out of or results from the breach of this Agreement by the Contractor or the Contractor's negligent actions, errors or omissions (including any Sub-contractor or other person or firm employed by Contractor), whether sustained before or after completion of the Project.
- b. This indemnity and hold harmless provision applies even if a Demand or Expense is in part due to the Indemnified Party's negligence or breach of a responsibility under this Agreement, but in that event, Contractor shall be liable only to the extent the Demand or Expense results from the negligence or breach of a responsibility of Contractor or of any person or entity for whom Contractor is responsible.
- c. Contractor is not required to indemnify any Indemnified Parties for, from, or against any Demand or Expense resulting from the Indemnified Party's sole negligence or other fault solely attributable to the Indemnified Party.

- 9. **E-verify, Records and Audits.** To the extent applicable under A.R.S. § 41-4401, the Contractor warrants their compliance and that of its subcontractors with all federal immigration laws and regulations that relate to their employees and compliance with the E-verify requirements under A.R.S. § 23-214(A). The Contractor or subcontractor's breach of this warranty shall be deemed a material breach of the Agreement and may result in the termination of the Agreement by the City under the terms of this Agreement. The City retains the legal right to randomly inspect the papers and records of the other party to ensure that the other party is complying with the above-mentioned warranty. The Contractor and subcontractor warrant to keep their respective

papers and records open for random inspection during normal business hours by the other party. The parties shall cooperate with the City's random inspections, including granting the inspecting party entry rights onto their respective properties to perform the random inspections and waiving their respective rights to keep such papers and records confidential.

10. **No Boycott of Israel.** To the extent A.R.S § 35-393 through § 35-393.03 are applicable, the parties hereby certify that they are not currently engaged in, and agree for the duration of the Agreement to not engage in, a boycott of goods or services from Israel, as that term is defined in A.R.S § 35-393.
11. **Uyghur Forced Labor Prevention Act (UFLPA).** Contractor certifies that it does not currently, and during the term of this Agreement, will not use:
 - a. the forced labor of ethnic Uyghurs in the People's Republic of China;
 - b. any goods or services produced by the forced labor of ethnic Uyghurs in the People's Republic of China; and
 - c. any contractors, subcontractors or suppliers that use the forced labor or any goods or services produced by the forced labor of ethnic Uyghurs in the People's Republic of China.
12. **Attestation of PCI Compliance.** When applicable, the Contractor will provide the City annually with a Payment Card Industry Data Security Standard (PCI DSS) attestation of compliance certificate signed by an officer of Contractor with oversight responsibility.
13. **Notices.**
 - 13.1 A notice, request or other communication that is required or permitted under this Agreement (each a "Notice") will be effective only if:
 - a. The Notice is in writing; and
 - b. Delivered in person or by overnight courier service (delivery charges prepaid), certified or registered mail (return receipt requested); and
 - c. Notice will be deemed to have been delivered to the person to whom it is addressed as of the date of receipt, if:
 - (1) Received on a business day, or before 5:00 p.m., at the address for Notices identified for the Party in this Agreement by U.S. Mail, hand delivery, or overnight courier service on or before 5:00 p.m.; or
 - (2) As of the next business day after receipt, if received after 5:00 p.m.
 - d. The burden of proof of the place and time of delivery is upon the Party giving the Notice; and
 - e. Digitalized signatures and copies of signatures will have the same effect as original signatures.
 - 13.2 Representatives.
 - a. Contractor. Contractor's representative (the "Contractor's Representative") authorized to act on Contractor's behalf with respect to the Project, and his or her address for Notice delivery is:

Traffic Signal Controls, Inc.
c/o Walter C Towle
255 Weaver Park Road #100
Longmont, CO 80501
tscsupport@trafsig.com
 - b. City. City's representative ("City's Representative") authorized to act on City's behalf, and his or her address for Notice delivery is:

City of Glendale
c/o Reuben Lopez
6210 W Myrtle
Glendale, Arizona 85301
(623) 930-2735

With required copy to:

City Manager
City of Glendale
5850 West Glendale Avenue
Glendale, Arizona 85301

City Attorney
City of Glendale
5850 West Glendale Avenue
Glendale, Arizona 85301

c. Concurrent Notices.

- (1) All notices to City's representative must be given concurrently to City Manager and City Attorney.
- (2) A notice will not be deemed to have been received by City's representative until the time that it has also been received by City Manager and City Attorney.
- (3) City may appoint one or more designees for the purpose of receiving notice by delivery of a written notice to Contractor identifying the designee(s) and their respective addresses for notices.

d. Changes. Contractor or City may change its representative or information on Notice, by giving Notice of the change in accordance with this section at least ten days prior to the change.

14. **Financing Assignment.** City may assign this Agreement to any City-affiliated entity, including a non-profit corporation or other entity whose primary purpose is to own or manage the Project.

15. **Entire Agreement; Survival; Counterparts; Signatures.**

15.1 Integration. This Agreement contains, except as stated below, the entire agreement between City and Contractor and supersedes all prior conversations and negotiations between the parties regarding the Project or this Agreement.

- a. Neither Party has made any representations, warranties or agreements as to any matters concerning the Agreement's subject matter.
- b. Representations, statements, conditions, or warranties not contained in this Agreement will not be binding on the parties.
- c. The solicitation, any addendums and the response submitted by the Contractor are incorporated into this Agreement as if attached hereto. Any Contractor response modifies the original solicitation as stated. Inconsistencies between the solicitation, any addendums and the response or any excerpts attached as Exhibit A and this Agreement will be resolved by the terms and conditions stated in this Agreement.

15.2 Interpretation.

- a. The parties fairly negotiated the Agreement's provisions to the extent they believed necessary and with the legal representation they deemed appropriate.
- b. The parties are of equal bargaining position and this Agreement must be construed equally between the parties without consideration of which of the parties may have drafted this Agreement.
- c. The Agreement will be interpreted in accordance with the laws of the State of Arizona.

- 15.3 Survival. Except as specifically provided otherwise in this Agreement, each warranty, representation, indemnification and hold harmless provision, insurance requirement, and every other right, remedy and responsibility of a Party, will survive completion of the Project, or the earlier termination of this Agreement.
- 15.4 Amendment. No amendment to this Agreement will be binding unless in writing and executed by the parties. Any amendment may be subject to City Council approval. Electronic signature blocks do not constitute execution.
- 15.5 Remedies. All rights and remedies provided in this Agreement are cumulative and the exercise of any one or more right or remedy will not affect any other rights or remedies under this Agreement or applicable law.
- 15.6 Severability. If any provision of this Agreement is voided or found unenforceable, that determination will not affect the validity of the other provisions, and the voided or unenforceable provision will be deemed reformed to conform to applicable law.
- 15.7 Counterparts. This Agreement may be executed in counterparts, and all counterparts will together comprise one instrument.

16. Term.

- 16.1 Extensions. The term of this Agreement commences upon the effective date and continues for a one (1)-year initial period. The City may, at its option and with the approval of the Contractor, extend the term of this Agreement an additional four (4) years, on an annual basis. Contractor will be notified in writing by the City of its intent to extend the Agreement period at least thirty (30) calendar days prior to the expiration of the original or any extension period. Price adjustments will only be reviewed prior to the extension period and any such price adjustment will be a determining factor for any renewal. There are no automatic extensions or renewals of this Agreement.
- 16.2 Extension for Procurement Process. Upon the expiration of the Term of this Agreement, including the initial term and any renewals, at the City's sole discretion, this Agreement may be extended on a month-to-month basis for a maximum of six (6) months to allow for the City to complete its procurement process to select a vendor to provide the services/materials similar to those provided under this Agreement. The City will notify the Contractor in writing of its intent to extend the Agreement at least thirty (30) calendar days prior to the expiration of the Term. Any extension provided under this subsection will continue under the same terms and conditions as in effect immediately prior to the expiration of the then-current term.

17. **Dispute Resolution.** Any controversy or claim arising out of or relating to this contract, or the breach thereof, shall be settled by arbitration administered according to the American Arbitration Association's Commercial Arbitration Rules, and judgment on the award rendered by the arbitrator may be entered in any court having jurisdiction thereof.
18. **Cooperative Use of Contract.** This agreement may be extended for use by other governmental agencies and political subdivisions of the State. Any such usage by other entities must be in accord with the ordinances, charter, rules and regulations of the respective entity and the approval of the Contractor and City. For a list of SAVE members, click on the following link: <http://www.mesaaz.gov/business/purchasing/save>
19. **Exhibits.** The following exhibits, with reference to the term in which they are first referenced, are incorporated by this reference.

Exhibit A	Project
Exhibit B	Compensation

(Signatures appear on the following page.)

The parties enter into this Agreement as of the Effective Date shown above.

City of Glendale,
an Arizona municipal corporation

By: Kevin Phelps
Its: City Manager

ATTEST:

Julie K. Bower
City Clerk (SEAL)

APPROVED AS TO FORM:

Michael D. Bailey
City Attorney

Traffic Signal Controls, Inc,
a Colorado corporation



By: Walter C Towle
Its: President

EXHIBIT A
TRAFFIC OPERATIONS EQUIPMENT
PROJECT

Contractor will provided traffic operations equipment on an as-needed basis.

	SOLICITATION NUMBER: IFB 24-54 / 42400072 TRAFFIC OPERATIONS EQUIPMENT	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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1. INTRODUCTION

The City of Glendale, Arizona (City), Transportation Department is soliciting an Invitation to Bid from qualified firms to provide Traffic Operations Equipment. Multiple City departments and divisions may also be using this contract, including but not limited to Field Operations, Police, Fire, Engineering, Parks & Recreation, Special Events, etc. The resultant contract WILL NOT include traffic equipment maintenance and services.

2. OBJECTIVES

The objective of the City is to award multiple contracts to multiple traffic equipment suppliers who are capable of providing a full range of traffic equipment, ancillary components and supplies. The City reserves the right to make multiple awards or to award by individual line items, by category or a group of line items, or to make an aggregate award, whichever is deemed most advantageous to the City.

3. REQUIRED SPECIFICATIONS

- **Products**: Contractors must be able to provide a full range of products, equipment, parts and materials to meet the needs of the City.
- **New Parts or Equipment**: All parts and equipment provided with this contract must be new, NOT refurbished or reconditioned, packed in the original packaging, delivered to the City free of rust, dents, corrosion or any other defects.
- **Inventory Stock**: Contractors must maintain sufficient inventory levels as to provide adequate support for the City's requirements. Failure to supply support may result in cancellation of the contract.
- **Current Products**: All products offered by the Contractor must be in current and ongoing production and capable of meeting or exceeding the specifications and requirements set for in this solicitation.
- **Changes to Products or Services**: Throughout the term of this contract, the City reserves the right to add, revise or make changes to products and services within the scope of the specifications as may be deemed necessary to best serve the needs of the City.
- **Safety Standards**: Equipment and supplies supplied by the Contractor under this contract shall comply with the current applicable Occupational Safety and Health Standards of the State of Arizona (OHSHA), the National Electric Code (NEC) and the National Fire Protection Association Standards (NFPA).
- **Defective Products**: All defective products delivered to the City must be replaced. The cost of transportation, unpacking, inspection, repacking, reshipping or other similar expenses must be paid by the Contractor. All replacement products must be received by the City within ten (10) calendar days of initial notification.
- **Subcontractors**: When subcontractors are used in the performance of certain functions under the contract, subcontractors will be subject to the same terms and conditions as the Contractor.

	SOLICITATION NUMBER: IFB 24-54 / 42400072 TRAFFIC OPERATIONS EQUIPMENT	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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4. QUANTITIES

The quantities referenced in this solicitation are estimates ONLY and are to be used for information purposes only. No commitment of any quantity is made during this contract. The quantities will be purchased on an as-needed basis and any quantities listed in this solicitation are the City's best estimate only. The actual requirements during the period of the resulting agreement will be determined by the actual needs and availability of appropriated funds.

5. BRAND NAME OR EQUIVALENT

There are a number of products that have been determined, through evaluation or testing, to be equivalent to the requirements of the specifications. The list of these brands is not intended to limit or restrict competition. Rather, it is to set the standard of quality, design, performance and characteristics of the products specified herein. Any bid which proposes products that are of equivalent quality, type of material, design and performance will be considered if sufficient evidence and information is given to establish it as equivalent and the City determines the product to be equivalent to the brand name and specifications

6. DELIVERY

All deliveries must be FOB Destination to Glendale Field Operations campus at: 6210 Myrtle Ave, Glendale AZ 88301

7. OTHER REQUIREMENTS

- a. Term. The term of the resultant contract shall be for a one (1) year initial term.
- b. Option to Extend. Based on satisfactory Bidder performance, the City, may at its option and upon mutual agreement with the Bidder, extend the term of this agreement for an additional four (4) years renewable on an annual basis. Bidder shall be notified in writing by the City Materials Manager of the City's intention to extend the contract period at least ninety (90) calendar days prior to the expiration of the original contract period.

8. SUSPENSION AND DEBARMENT. (APPLIES TO ALL PURCHASES.)

- a. This contract is a covered transaction for purposes of 2 CFR pt. 180 and 2 CFR pt. 3000. As such, the Contractor is required to verify that none of the Contractor's principals (defined at 2 CFR § 180.995) or its affiliates (defined at 2 CFR § 180.905) are excluded (defined at 2 CFR § 180.940) or disqualified (defined at 2 CFR § 180.935).
- b. The Contractor must comply with 2 CFR pt. 180, subpart C and 2 CFR pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.
- c. This certification is a material representation of fact relied upon by the City of Glendale. If it is later determined that the contractor did not comply with 2 CFR pt. 180, subpart C and 2 CFR pt. 3000, subpart C, in addition to remedies

	SOLICITATION NUMBER: IFB 24-54 / 42400072 TRAFFIC OPERATIONS EQUIPMENT	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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available to the City, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

- d. The Contractor agrees to comply with the requirements of 2 CFR pt. 180, subpart C and 2 CFR pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The Contractor further agrees to include a provision requiring such compliance in its lower tier covered transactions.

9. **PRICING REQUIREMENTS**

a. **Pricing**

Contractors must provide pricing for the following:

- i. **City's Core Products List:** The Core Products List provides for the deepest discounts on a variety of products frequently ordered by the City. Prices in the Core Products List must remain firm and include all charges that may be incurred by the Contractor in fulfilling the requirements of this contract. The Core Products List may change during the term of the contract depending on the needs of City.
- ii. **Discount Off of Catalog Products List:** Contractor must provide Discounts off of their Catalog Products List. The Catalog Products List must include the contractor's available products which are not included in the City's Core Products List. Catalog Products List pricing must be determined by applying the discounts to the prices listed on the Contractor's manufacturer's suggested retail price (MSRP) or catalog prices. Prices in the Catalog Products List must remain firm and include all charges that may be incurred by the Contractor in fulfilling the requirements of this contract. Catalog Products List is defined as one that is regularly maintained by a manufacturer, distributor or Contractor; is either published or available for inspection by customers; and which shows prices at which sales are currently or were last made to the general buying public.

b. **Price Changes**

Contractors may submit a request for price adjustments on the City's Core Products List 90 days prior to the contract renewal date. The request must be in writing and include supportive justification for the proposed price changes. Contractors may submit changes to the manufacturer's suggested retail price (MSRP) or catalog prices 90 days prior to the contract renewal date. The price adjustments and changes in manufacturer's price lists or catalogs will only be considered at the time of contract extension. The City will review the request and will determine if the price adjustments will be granted or if an alternate option is in the best interest of the City. The price adjustment or change in manufacturer's suggested retail price or catalog pricing, if approved, will be effective and executed via a contract amendment or contract extension letter. Any changes in prices will not become effective until the contract renewal date. Other than contract pricing, no additional cost, fees or surcharges must be allowed by the City.

	SOLICITATION NUMBER: IFB 24-54 / 42400072 TRAFFIC OPERATIONS EQUIPMENT	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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c. **Ordering**

Equipment or supplies must be purchased in accordance with this contract by the issuance of a purchase order and/or P-card.

d. **Order Acceptance**

Equipment delivered to the City will be subject to a complete inspection by the City Transportation Department. Inspection criteria includes conformity to the specifications, quality and performance standards. If the equipment delivered is returned to the Contractor for corrective action prior to acceptance for any reason, an additional period of 10 calendar days will be allowed for inspection when subsequent deliveries occur. The Contractor will be fully responsible for shipping charges for replacement equipment to correct items not in compliance with specifications.

e. **Contractor Performance or Product Deficiency**

When Contractor is notified of a performance or product quality deficiency, the Contractor will have 24 hours from the time of notification to initiate corrective action in any specific instances of unsatisfactory performance or quality. Failure to correct unacceptable product or to provide suitable material within the specified time frame may result in reduction of payment or non- payment for service. If the Contractor fails to correct the problem, the City reserves the right to correct the situation by whatever is deemed in the best interest of the City (e.g. with City personnel or by separate contract, and the cost of such actions deducted from the Contractor's monthly invoice).

f. **Billing or Invoicing**

Contractors must provide a detailed monthly invoice which includes the following:

- City Purchase Order reference number
- Itemized products purchased
- Separate line item for any product discount (if applicable)
- Separate line item for sales tax
- City of Glendale employee's name and department

Other City departments may also place orders. Invoices must be submitted to the billing address of the ordering Department. Payments may be delayed for invoices that do not provide the details listed above.

10. EMERGENCY BUSINESS SERVICES

During an emergency, natural disaster or homeland security event, there may be a need for the City to access the Contractor's business for products or services when needed. All products or services provided to meet an emergency request must be supplied as per the contract prices, terms and conditions. In general, emergency orders may be placed using a City Procurement Card.



**SOLICITATION NUMBER:
IFB 24-54 / 42400072**

**TRAFFIC OPERATIONS EQUIPMENT
EQUIPMENT LIST**

**CITY OF GLENDALE
Procurement Division
5970 West Brown Street,
Suite 210
Glendale, Arizona 85302**

<u>Item Number</u>	<u>Description</u>
1	CCTV Camera
2	Field Switch
3	Distribution Switch
4	Hub Cisco Router
5	12 Strand Single Mode Fiber Optic
6	24 Strand Single Mode Fiber Optic
7	72 Strand Single Mode Fiber Optic
8	96 Strand Single Mode Fiber Optic
9	144 Strand Single Mode Fiber Optic
10	Dynamic Message Sign (DMS) Amber
11	Dynamic Message Sign (DMS) Full color
12	Lane Control Sign (LCS)
13	Radar Detection - Stop Bar
14	Radar Detection - Advanced
15	Radar Detection - Midblock
16a	Travel-Time Reader
16b	Travel-Time Reader
17a	TS2 Type 1 cabinet, M60
17b	TS2 Type 1 cabinet, P44
17c	TS2 Type 1 cabinet, R77
18	TS2 Cabinet Power Supply
19a	TS2 Type 1 Controller
19b	TS2 Type 2 Controller
20	Malfunction Monitor Unit (MMU)
21	TS2 Bus Interface Unit (BIU)
22	TS2 Load Switch
23	TS2 Flasher Unit
24	Flash Transfer Relay - 120 VAC
25	Electrical Meter Pedestal
26	12" Red Circular LED Indication
27	12" Yellow Circular LED Indication
28	12" Green Circular LED Indication
29	12" Red Arrow LED Indication
30	12" Yellow Arrow LED Indication
31	12" Green Arrow LED Indication
32	16 x 18 Pedestrian Countdown LED Indication Module
33	2" ADA Compliant Pedestrian Push Button with 9"x15" Sign & Mounting Hardware
34	4 Wire Accessible Pedestrian Push Button with 9" x 15" Sign
35	No. 14 19-1 IMSA Signal Conductor Cable (21 conductor) Stranded
36	No. 14 19-1 IMSA Signal Conductor Cable (12 conductor) Stranded
37	No. 14 19-1 IMSA Signal Conductor Cable (7 conductor) Stranded
38	No. 14 19-1 IMSA Signal Conductor Cable (4 conductor) Stranded
39	No. 14 50-2 IMSA Loop Lead-In Cable Stranded
40	No. 12 Lighting Conductor Cable Tray Cable (4 conductor: Black Red White Green) Solid
41	No. 8 Conductor, Bare Copper, Solid
42	No. 6 Conductor, Bare Copper, Solid
43	No. 1 Pull Box
44	No. 1.5 Pull Box



**SOLICITATION NUMBER:
IFB 24-54 / 42400072**

**TRAFFIC OPERATIONS EQUIPMENT
EQUIPMENT LIST**

CITY OF GLENDALE
Procurement Division
5970 West Brown Street,
Suite 210
Glendale, Arizona 85302

45	No. 3.5 Pull Box
46	No. 5 Pull Box
47	No. 7 Pull Box
48	No. 7 Pull Box Extension
49	No. 1 Pull Box Lid
50	No. 1.5 Pull Box Lid
51	No. 3.5 Pull Box Lid
52	No. 5 Pull Box Lid
53	No. 7 Pull Box Lid
54	Type F Signal Head with 12" Visor and 5" Non-Louvered Backplate
55	Type R Signal Head with 12" Visor and 5" Non-Louvered Backplate
56	Type Q Signal Head with 12" Visor and 5" Non-Louvered Backplate
57	Type G Signal Head with 12" Visor and 5" Non-Louvered Backplate
58	Type T Signal Head w/ 12" Visor and Full Non-Louvered Backplate
59	Traffic Signal Head Backplate Retroreflective, Yellow Tape, Type XI, 3"
60	Pedestrian Signal Head Housing
61	Type II Signal Mount
62	Type V Signal Mount
63	Type VII Signal Mount
64	Vertical Hanger Signal Mount
65	Type A Signal Structure - 10'
66	Type A Signal Structure - 12'
67	Type A Signal Structure - 15'
68	Type G Signal Structure - 25'
69	Signal Pole, Type Q104
70	Signal Pole, Type Q106
71	Signal Pole, Type Q108
72	Signal Pole, Type Q114
73	Signal Pole, Type Mod. Q114 - 30'
74	Signal Pole, Type Q116
75	Signal Pole, Type Mod. Q116 - 30'
76	Not Used
77	Not Used
78	Signal Pole, Type W
79	Luminaire Mast Arm, Type Q104
80	Luminaire Mast Arm, Type Q106/Q108
81	Luminaire Mast Arm, Type Q114/Q116/V/Mod. R/W (8x12)
82	Signal Mast Arm, Type Q104 25 Foot
83	Signal Mast Arm, Type Q106 30 Foot
84	Signal Mast Arm, Type Q106 35 Foot
85	Signal Mast Arm, Type Q106 40 Foot
86	Signal Mast Arm, Type Q108 40 Foot
87	Signal Mast Arm, Type Q108 45 Foot
88	Signal Mast Arm, Type Q108 50 Foot
89	Signal Mast Arm, Type Q108 55 Foot
90	Signal Mast Arm, Type Q114 30 Foot
91	Signal Mast Arm, Type Q114 35 Foot
92	Signal Mast Arm, Type Q114 40 Foot
93	Signal Mast Arm, Type Q114 45 Foot
94	Signal Mast Arm, Type Q116 50 Foot
95	Signal Mast Arm, Type Q116 55 Foot
96	Not Used



**SOLICITATION NUMBER:
IFB 24-54 / 42400072**

**CITY OF GLENDALE
Procurement Division
5970 West Brown Street,
Suite 210
Glendale, Arizona 85302**

**TRAFFIC OPERATIONS EQUIPMENT
EQUIPMENT LIST**

- | | |
|-----|---|
| 97 | Not Used |
| 98 | Signal Mast Arm, Type W 70 Foot |
| 99 | Signal Mast Arm, Type W 75 Foot |
| 100 | Pedestrian Push Button Pole, 5'-6" |
| 101 | 1-Camera Video Detection System |
| 102 | 2-Camera Video Detection System |
| 103 | 3-Camera Video Detection System |
| 104 | 4-Camera Video Detection System |
| 105 | Time Activated School Zone Flasher |
| 106 | 15" Solar Power Radar Speed Feedback Sign with Fluorescent
White & Black 30"x42" Your Speed Sign |
| 107 | 15" Solar Power Radar Speed Feedback Sign with Fluorescent
Green & Black 30"x42" Your Speed Sign |

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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1. **CCTV Camera**

Equipment must consist of the following brands or approved equal:
Axis Communications Models Q6075-E

2. **Field Switch**

Equipment must consist of the following brands or approved equal:

Manufacturer	Model
EDS MOXA	EDS-516E-4GTXSFP-T

3. **Distribution Switch**

Equipment must consist of the following brands or approved equal:

Manufacturer	Model
SIEMENS - RUGGEDCOM EDS	RSG2200-F-RM-H2- XX-FG02 EDS-528E-4GTXSFP-LV

4. **Hub Cisco Router**

Equipment must consist of the following brands or approved equal:

- a. Cisco 3580

5 through 9

Equipment must conform to the following material requirements:

- a. All fiber optic cable must be single mode fiber optic cable that is of loose tube construction, filled with a water-blocking material, and constructed by a certified ISO 9001 or 9002 manufacturer.

Number of fibers	12, 24, 72, 96 or 144 as required
Cladding diameter	125 $\pm$ 1.0 μ m
Core -to -cladding offset	$\leq$ 0.8 μ m
Cladding non-circularity	$\leq$ 1.0%
Maximum attenuation	$\leq$ 0.35 dB/km at 1310 nm; $\leq$ 0.25 dB/km at 1550 nm
Microbend attenuation (1 turn, 1.25" diameter)	$\leq$ 0.5 dB at 1550 nm

- b. Fiber optic cable must be dielectric and comply with the requirements of REA PE-90 except where modified by these specifications. The fiber optic cable must comply with the following requirements:

Microbend attenuation (100 turns, 3' diameter):	$\leq$ 0.05 dB at 1310 nm
Mode-field diameter (matched cladding):	9.3 $\pm$ 0.5 μ m at 1310 nm; 10.5 $\pm$ 1.0 μ m at 1550 nm

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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Maximum chromatic dispersion:	≤ 3.2 ps/(nm x km) from 1285 nm to 1330 nm and < 18 ps/(nm x km) at 1550 nm
Fiber polarization mode dispersion:	≤ 0.5 ps/(km) ^{1/2}
Fiber coating:	Dual layered, UV cured acrylate
Coating diameter:	245 μ m 10 μ m
Minimum storage temperature range:	-40F to 158F
Minimum operating temperature range:	-4F to 158F
Rated life:	Certify a 20-year life expectancy when installed to manufacturer's specifications

- c. **Buffer Tubes:** Each buffer tube must be filled with a non-hygroscopic, non-nutritive to fungus, electrically non-conductive, homogenous gel that is free from dirt and foreign matter. The gel must allow free movement of the fibers, without loss of performance, during installation and normal operation including expansion and contraction of the buffer tubes. The gel must be readily removable with conventional nontoxic solvents.

Buffer tubes must be stranded around a central member using the reverse oscillation or “S-Z”, stranding process. Filler rods must be used in the fiber optic cable to lend symmetry to the cable section.

- d. **Central Strength Member:** The fiber optic cable must have a central strength member designed to prevent buckling of the cable.
- e. **Cable Core:** The fiber optic cable must utilize a dry water-blocking material to block the migration of moisture in the cable interstices.
- f. **Tensile Strength Members:** The fiber optic cable must have tensile strength members designed to minimize cable elongation due to installation forces and temperature variation. Underground fiber optic cable must withstand a 600 lbf (pound-force) tensile load where the change in attenuation does not exceed 0.2 dB during loading and 0.1 dB after loading. The cable must be rated for an installed tensile service load of 200 lbf (pound-force) or more.
- g. **Buffer Tubes:** Each buffer tube must be filled with a non-hygroscopic, non-nutritive to fungus, electrically non-conductive, homogenous gel that is free from dirt and foreign matter. The gel must allow free movement of the fibers, without loss of performance, during installation and normal operation including expansion and contraction of the buffer tubes. The gel must be readily removable with conventional nontoxic solvents.

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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Buffer tubes must be stranded around a central member using the reverse oscillation or “S-Z”, stranding process. Filler rods must be used in the fiber optic cable to lend symmetry to the cable section.

- h. **Central Strength Member:** The fiber optic cable must have a central strength member designed to prevent buckling of the cable.
- i. **Cable Core:** The fiber optic cable must utilize a dry water-blocking material to block the migration of moisture in the cable interstices.
- j. **Tensile Strength Members:** The fiber optic cable must have tensile strength members designed to minimize cable elongation due to installation forces and temperature variation. Underground fiber optic cable must withstand a 600 lbf (pound-force) tensile load where the change in attenuation does not exceed 0.2 dB during loading and 0.1 dB after loading. The cable must be rated for an installed tensile service load of 200 lbf (pound-force) or more.
- k. **Cable Jacket:** The fiber optic cable jacket must be constructed of a high or medium density polyethylene (HDPE/MDPE) jacket that has been applied directly over the tensile strength members and water-blocking material. The jacket must have at least one ripcord designed for easy sheath removal.

The cable must be wound on the reel in such a manner as to provide access to both ends of the cable to enable testing to be performed while the cable is on the reel.

- l. **Environmental:** The cable must be capable of withstanding the following conditions without damage or decrease in function:
 - i. Total immersion in water with natural mineral and salt contents;
 - ii. Salt spray or saltwater immersion for extended periods;
 - iii. Wasp and hornet spray

10. **Dynamic Message Sign (DMS) Amber**

Equipment must consist of the following brands or approved equal:

- a. Daktronics VF-2420-27X90-66-A

11. **Dynamic Message Sign (DMS) Full color**

Equipment must consist of the following brands or approved equal:

- a. Daktronics VF-2420-64X192-20-RGB

12. **Lane Control Sign (LCS)**

Equipment must consist of the following brands or approved equal:

- a. Daktronics VX-2428-48x48-20-RGB



City of Glendale
Solicitation Number: IFB 24-54 /42400072
TRAFFIC OPERATIONS EQUIPMENT
EXHIBITS PACKAGE

CITY OF GLENDALE
Procurement Division
5970 West Brown Street,
Suite 210
Glendale, Arizona 85302

13. Radar Presence Detection - Stop Bar

Equipment must conform to the following Wavetronix material requirements or approved equal:

- a. Reports real-time presence of both moving and stopped vehicles
- b. Patented Auto-Configuration Process
- c. Patented Digital Wave Radar II™ Technology
- d. Radar Vision™ Technology tracks vehicles in two dimensions
- e. Operating Frequency of 24.0 – 24.25 GHz (K-Band). K-Band provides the widest allowable bandwidth. This larger bandwidth provides a higher resolution signature with greater accuracy.
- f. Transmit bandwidth: 245 MHz
- g. Detection area of a 90-degree corner radar with a 140 ft. radius.
- h. Real Time Presence Data in 10 Lanes
- i. The Availability of 16 zones and 16 channels with user selectable zone to channel mapping
- j. Zones can be linked together using OR and AND logic.
- k. Fail-Safe Mode to put the intersection into recall in communication to the RPD is lost.
- l. No Cleaning or Adjustment necessary to maintain performance
- m. **Traffic Cabinet Components**
 - i. Each RPD system will have a pre-assembled backplate installed into the traffic cabinet, which will include: AC/DC power conversion, Surge Protection, Terminal Blocks for cable landing, and Communication Connection points.
 - ii. The RPD must use contact closure input file cards with 2 or 4 channel capabilities. The contact closure input file cards for the RPD must be compatible with industry standard detector racks.
- n. **Electrical**
 - i. The RPD must consume less than 10W.
 - ii. The RPD must operate with a DC input between 9 VDC and 28 VDC.
 - iii. The RPD must have onboard surge protection.
- o. **Communication Ports**
 - i. The RPD must have two communication ports, and both ports must communicate independently and simultaneously.
 - ii. The two communication ports will allow remote communications without interrupting the operation of the RPD and its interface to the contact closure cards and traffic signal controller.
- p. **Configuration**
 - i. The RPD must have a method for automatically defining traffic lanes, stop bars and zones without requiring user intervention. This auto-configuration process must execute on a processor internal to the RPD and must not require an external PC or other processor.
 - ii. The auto-configuration method must not prohibit the ability of the user to manually adjust the RPD configuration.
 - iii. The RPD must support the configuring of lanes, stop bars and detection zones in 1-ft. (0.3-m) increments.

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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- iv. The RPD must include graphical user interface software that displays all configured lanes and the current traffic pattern using a graphical traffic representation.

q. **Physical Properties**

- i. The RPD unit must consist of an enclosure of that conforms to the NEMA 250 standard for type 4X enclosures.
- ii. The RPD must obtain the operating voltage (115 V AC) for the pre-assembled backplate directly from the Traffic Signal Cabinet.
- iii. All external components of the RPD must be ultraviolet-resistant, corrosion-resistant, and protected from fungus growth and moisture deterioration.
- iv. The RPD must be able to withstand a fall of 5 ft. without compromising its functional and structural integrity.
- v. The RPD must include a connector that meets the MIL-C-26482 specification. The Mil- C-26482 connector must provide contacts for all data and power connections.

r. **Radar Design**

- i. The RPD must be designed with a matrix of radars. RPD must have at least 16 separate discrete antennas.
- ii. The circuitry must be void of any manual tuning elements that could lead to human error and degraded performance over time.
- iii. The RPD antennas must be designed on printed circuit boards.
- iv. The RPD must transmit a signal with a bandwidth of at least 245 MHz. This bandwidth provides the greatest accuracy for distinguishing closely spaced vehicles and gives the highest possible resolution.
- v. The RPD must provide at least 8 RF channels so that multiple units can be mounted in the same vicinity without causing interference between them.
- vi. The RPD must have a self-test that is used to verify correct hardware functionality.

s. **Operating Conditions**

- i. The RPD must maintain accurate performance in all weather conditions, including rain, freezing rain, snow, wind, dust, fog and changes in temperature and light, including direct light on sensor at dawn and dusk.
- ii. The RPD must be capable of continuous operation over an ambient temperature range of - 40°F to 165.2°F (-40°C to 74°C).
- iii. The RPD must be capable of continuous operation over a relative humidity range of 5% to 95% (non-condensing).

14. **Radar Detection – Advanced**

Equipment must conform to the following Wavetronix material requirements or approved equal:

- a. **Reports** per vehicle range, speed, Stop bar ETA (estimated time of arrival)



City of Glendale
Solicitation Number: IFB 24-54 /42400072
TRAFFIC OPERATIONS EQUIPMENT
EXHIBITS PACKAGE

CITY OF GLENDALE
Procurement Division
5970 West Brown Street,
Suite 210
Glendale, Arizona 85302

- i. Patented Dynamic Continuous ETA to the Stop bar
- ii. Patented Safe Arrival Technology provides protection for individual vehicles
- iii. Dynamic ETA tracking over the entire detection area
- iv. Operating Frequency of 10.5 – 10.55 GHz (X-Band).
- v. Number of channels: 8
- vi. Detection area 50 to 900ft.
- vii. Up to 25 simultaneous vehicle detections
- viii. Priority level (based upon discovery range)
- ix. Channel output from multiple alerts
- x. Logic filters for zone output
- xi. No Cleaning or Adjustment necessary to maintain performance
- b. **Traffic Cabinet Components:**
 - i. Each RAD system will have a pre-assembled backplate installed into the traffic cabinet, which will include: AC/DC power conversion, Surge Protection, Terminal Blocks for cable landing, and Communication Connection points.
 - ii. The RAD must use 4 Channel TS1 or 4 Channel TS2/ SDLC communication device or contact closure input file cards with 2 or 4 channel capabilities. The contact closure input file cards for the RAD must be compatible with industry standard detector racks.
- c. **Electrical:**
 - i. The RAD must consume 3.2 W @ 12 VDC.
 - ii. The RAD must operate with a DC input between 10 VDC and 28 VDC. The RAD must have onboard surge protection.
- d. **Communication Ports:**
 - i. The RAD must have two communication ports, and both ports must communicate independently and simultaneously.
 - ii. The two communication ports will allow remote communications without interrupting the operation of the RAD and its interface to the contact closure cards and traffic signal controller.
- e. **Configuration:**
 - i. The RAD must have a method for automatic and manual configuration of detection sensitivity in 7.5-ft (2.29-m) increments
 - ii. The RAD must support the configuring of detection zones in 5-ft (1.5M) increments.
 - iii. The RAD must support the display of configured alerts and their actuation.
 - iv. The RAD must include graphical user interface software with traffic representation.
 - v. The RAD must support Priority level (based upon discovery range for high-profile vehicles)
- f. **Physical Properties:**
 - i. The RAD unit must consist of an enclosure of that conforms to the NEMA 250 standard for type 4X enclosures.
 - ii. The RAD must obtain the operating voltage (115 V AC) for the pre-

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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assembled backplate directly from the Traffic Signal Cabinet.

- iii. All external components of the RAD must be ultraviolet-resistant, corrosion-resistant, and protected from fungus growth and moisture deterioration.
- iv. The RAD must be able to withstand a fall of 5 ft. without compromising its functional and structural integrity.
- v. The RAD must include a connector that meets the MIL-C-26482 specification. The Mil- C-26482 connector must provide contacts for all data and power connections.

g. **Radar Design:**

- i. The RAD must be designed with printed circuit board antennas. RAD must operate at frequency of 10.5-1055 GHz (X-band).
- ii. The circuitry must be void of any manual tuning elements that could lead to human error and degraded performance over time.
- iii. The RAD antennas must be designed on printed circuit boards.
- iv. The RAD must transmit a signal with a bandwidth of at least 45 MHz. This bandwidth provides the greatest accuracy for distinguishing closely spaced vehicles and gives the highest possible resolution.
- v. The RAD must provide at least 8 RF channels so that multiple units can be mounted in the same vicinity without causing interference between them.
- vi. The RAD must have a self-test that is used to verify correct hardware functionality.

h. **Operating Conditions:**

- i. The RAD must maintain accurate performance in all weather conditions, including rain, freezing rain, snow, wind, dust, fog and changes in temperature and light, including direct light on sensor at dawn and dusk.
- ii. The RAD must be capable of continuous operation over an ambient temperature range of -40°F to 165.2°F (-40°C to 74°C).
- iii. The RAD must be capable of continuous operation over a relative humidity range of 5% to 95% (non-condensing).

15. **Radar Detection – Midblock**

Equipment must conform to the following Wavetronix material requirements or approved equal:

- a. The sensing devices must automatically configure the maximum number of lanes in the field by determining lane boundaries, concrete or metal barriers and detection thresholds. The non- intrusive detectors must automatically configure the number of lanes in the presence of barriers, medians and work zones, and must automatically calibrate vehicle speed, detection levels, sensitivity, and vehicle direction.
- b. The sensing devices must detect vehicle volume, speed, occupancy, and direction, in all weather conditions without performance degradation, and must be remotely accessible, and support the communications protocols specified herein.

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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- c. The sensing devices must automatically tune out stationary objects, such as barriers and retaining walls, prior to completing configuration.

d. **Sensor Performance:**

The sensing devices must provide the following performance:

- i. Accurate, real-time volume, average speed, occupancy and vehicle direction data.
- ii. User configurable settings for a collection interval from 20 seconds, or less, to 15 minutes, or more.
- iii. User configurable polling intervals from 20 seconds, or less, to 60 minutes, or more.
- iv. Detections correctly categorized into a minimum of 8 user-definable length-based classifications.
- v. Detection must occur at a range of 9 feet, or less, to at least 250 feet, simultaneously.
- vi. Sensor or associated field equipment provides a minimum of 3 hours of local data storage for detection interval settings of 20 seconds to 15 minutes in local storage.
- vii. Operation in side-fire mode, simultaneously detecting traffic in up to 6, or more, lanes.
- viii. Accurate performance in all weather conditions, including rain, wind, dust, fog and the extreme temperature ranges of central Arizona.
- ix. Capable of continuous operation over a temperature range of -35° F to +165° F and a humidity range of 5% to 95% (non-condensing).
- x. Continuous operation in a rainfall intensity of up to 2 inches per hour.
- xi. Volume data that is accurate within 5% of actual for any direction of travel under normal field operating conditions.
- xii. Individual lane accuracy that is within 10% of actual under normal field operating conditions. ("Normal field operating conditions" must be defined as when traffic is flowing at speeds greater than 10 MPH, with less than 10% truck traffic per lane.)
- xiii. Per vehicle speed data that is accurate within 5 MPH, for 90% of the measurements.
- xiv. True speed detection via dual radar speed trap without the requirement to enter average vehicle lengths for the speed calculation.
- xv. Occupancy data that is accurate within 20% of the actual occupancy for any lane when occupancy is less than 30%.
- xvi. Classification data that is accurately determined for 90% of all detected vehicles.
- xvii. Automatic configuration of vehicle direction, and that vehicle direction is accurately determined for 90% of wrong-way vehicles.
- xviii. Must be powered from solar or existing AC sources.
- xix. The sensor must not require cleaning or adjustment to maintain performance and must not rely on battery backup to store configuration information. The sensor, once calibrated, must not need recalibration to maintain performance over the entire operational temperature range unless the roadway configuration changes. Sensors must allow remote



City of Glendale
Solicitation Number: IFB 24-54 /42400072
TRAFFIC OPERATIONS EQUIPMENT
EXHIBITS PACKAGE

CITY OF GLENDALE
Procurement Division
5970 West Brown Street,
Suite 210
Glendale, Arizona 85302

connectivity to allow operators to change the unit's configuration, update the unit's firmware programming and recalibrate the unit automatically from the City of Glendale's Traffic Management Center.

e. **Communication:**

The sensing devices must provide the following communications features:

- i. All of the following protocols: RS-232, RS-485, and TCP/IP.
- ii. Built-in RS-232, RS-485 and internal Serial communication port.
- iii. Each communication port must support all of the following baud rates: 9600, 19200, 38400, 57600 and 115200.
- iv. RS-232 port must be full-duplex and must support true RTS/CTS hardware handshaking.
 - A. Interval data packets containing, at a minimum:
 1. One or more detection zones
 2. Collection interval duration
 3. Sensor ID
 4. 32-bit time stamps indicating end of collection interval
 5. Total volume, by detection zone
 6. Average speed in each detection zone during the collection interval
 7. Occupancy in each detection zone during the collection interval
 8. A minimum of eight vehicle classifications reported as number of vehicles of each classification identified in each detection zone during the collection interval
 9. Volume in a minimum of 15 user-defined speed bins
 10. Volume for both directions of traffic
 11. Average headway, in seconds
 12. Average gap, in second
 13. 85th percentile speed in miles per hour
 14. Vehicle count for correct and wrong-way vehicles in separate correct and wrong-way bins
 - B. Event (per vehicle) data packets containing, at a minimum:
 1. Sensor ID
 2. Lane Assignment
 3. Per vehicle speed value - wrong-way vehicles must show a negative speed value
 4. Vehicle length
 5. Classification, using up to 8 user-defined classes
 6. 32-bit time stamps indicating end of collection interval
 7. Range

f. **Central Server:**

The count system must utilize a server, dedicated for this specific function, installed in the TMC and meeting the following requirements:

- i. 1u form factor
- ii. Chassis capable of 4 – 3.5" hot plug hard drives
- iii. Xeon E5-2430L v2 2.4GHz, 15M cache, 7.2GT/s QPI
- iv. 2 · 4GB of RDIMM 1600MT/s

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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- v. Internal RAID 1 with 2 – 1TB 7.2k rpm 3.5 hot swappable hard drives
- vi. Dual hot swappable 350W power supplies w/2 power cords
- vii. SATA DVD drive
- viii. Embedded LOM Dual 1 GBE ports
- ix. Windows server 2008 software
- x. 7x24 HW /SW tech support and assistance 3 year
- xi. Standard Manufacturers hardware warranty support on site first year
- xii. Next business day onsite service after problem diagnosis first year
- g. **Operating Software:**
 - i. Software must display all configured lanes and provides visual representation of all detected vehicles.
 - ii. The graphical interface must operate on current City of Glendale core operating system software.
 - iii. The software must operate over a TCP/IP connection.
 - iv. Software must interface with the City of Glendale TMC software.
 - v. The software must give the operator complete control over the configuration process.
 - vi. The operator must have the ability to save the configuration information to a file or reload the sensor configuration from a file using the graphical user interface software.
 - vii. Using the installation software, the operator must be able to:
 - i. Add response delays for the communication ports
 - ii. Switch between data pushing and data polling
 - iii. Change sensor settings for Flow Control from "none" to "RTS/CTS" and back
 - viii. The operator must be able to upload new firmware into non-volatile memory of the sensor over any supported communication channel on the TCP/IP network.
 - ix. The system must be able to output data to Maricopa County RADS in an .xml format. The system must be able to export count station identifier number/code, location, time/date, per lane volume, classification and speed data for a user defined time period.

16A & 16B Travel Time Reader

Equipment must consist of the following brands or approved equal:

16A: Acyclica Roadtrend 3dbi 5 Band DSRC with antenna

16B: BlueToad CV DSRC/C-V2X

17A, B and C TS2 Type 1 Cabinet

Equipment must consist of the following brands or approved equal:

a. Econolite

18. TS2 Cabinet Power Supply

a. Equipment must conform to the following material requirements:

- i. The cabinet assembly must meet, as a minimum, all applicable sections of the NEMA Standard Publication No. TS2-1998 except where



City of Glendale
Solicitation Number: IFB 24-54 /42400072
TRAFFIC OPERATIONS EQUIPMENT
EXHIBITS PACKAGE

CITY OF GLENDALE
Procurement Division
5970 West Brown Street,
Suite 210
Glendale, Arizona 85302

- modified herein.
- ii. The cabinet must be constructed from type 5052-H32 aluminum with a minimum thickness of 0.125 inches.
 - iii. The cabinet must be designed and manufactured with materials that will allow rigid mounting, whether intended for pole, base or pedestal mounting. The cabinet must not flex on its mount.
 - iv. A rain channel must be incorporated into the design of the main door opening to prevent liquids from entering the enclosure. The cabinet door opening must be a minimum of 80 percent of the front surface of the cabinet. A stiffener plate must be welded across the inside of the main door to prevent flexing. The top of the cabinet must incorporate a 1- inch slope toward the rear to prevent rain accumulation.
 - v. The cabinet must be supplied with a natural aluminum finish. Sufficient care must be taken in handling to ensure that scratches are minimized. All surfaces must be free from weld flash. Welds must be smooth, neatly formed, free from cracks, blowholes, and other irregularities. All sharp edges must be ground smooth.
 - vi. All seams must be sealed with RTV sealant or equivalent material on the interior of the cabinet.
 - vii. The lower section of the cabinet must be equipped with a louvered air entrance. The air inlet must be large enough to allow sufficient air flow per the rated fan capacity. Louvers must satisfy the NEMA rod entry test for 3R ventilated enclosures. A non-corrosive, vermin- and insect-proof, removable air filter must be secured to the air entrance. The filter must fit snugly against the cabinet door wall.
 - viii. The roof of the cabinet must incorporate an exhaust plenum with a vent screen. Perforations in the vent screen must not exceed 0.125 inches in diameter.
 - ix. The sides of the cabinet near the top must be drilled and tapped to be capable of receiving a standard hanger during the installation of the cabinet. The hanger must be capable of being removed once the cabinet is installed.
- b. **Shelves:**
- i. All cabinets must be supplied with a minimum of one removable shelf manufactured from 5052- H32 aluminum. Shelf must be a minimum of 10 inches deep.
 - ii. The shelf must have horizontal slots at the rear and vertical slots at the front of the turned downside flange.
 - iii. The shelf must be installed by first inserting the rear edge of the shelf on the cabinet rear sidewall mounting studs, then lowering the shelf on the front sidewall mounting studs.
 - iv. The shelf must be held in place by a nylon tie-wrap inserted through holes on the front edge of the shelf and around the front sidewall mounting studs.
 - v. The front edge of the shelf must have holes punched every 6 inches

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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to accommodate tie- wrapping of cables/harnesses.

- vi. The cabinet must have a minimum of one roll-out or otherwise concealable shelf that can be used as a shelf for a laptop computer or other tools when the cabinet door is opened.

c. **Component Mountings:**

- i. A minimum of one set of vertical “C” channels must be mounted on each interior wall of the cabinet for the purpose of mounting the cabinet components.
- ii. The channels must accommodate spring mounted nuts or studs.
- iii. All mounting rails must extend to within 7 inches of the top and bottom of the cabinet.
- iv. Sidewall rail spacing must be 7.88 inches center-to-center.
- v. Rear wall rail spacing must be 18.50 inches center-to-center.

d. **Doors:**

- i. The main door and police door-in-door must close against a weatherproof and dust-proof, closed-cell neoprene gasket seal.
- ii. The gasket material for the main door must be a minimum of 0.250 inches thick by 1.00 inch wide.
- iii. The gasket material for the police door must be a minimum of 0.250 inches thick by 0.500 inches wide.
- iv. The gaskets must be permanently bonded to the cabinet.
- v. The main door must be equipped with a three-point latching mechanism.
- vi. The handle on the main door must utilize a shank of 5/8 inches minimum diameter.
- vii. The handle must include a hasp for the attachment of an optional padlock.
- viii. The cabinet door handle must rotate counterclockwise to open.
- ix. The handle must not extend beyond the perimeter of the main door at any time.
- x. The lock assembly must be positioned so that the handle does not cause any interference with the key when opening the cabinet door.
- xi. The main door hinge must be a one-piece, continuous piano hinge with a stainless-steel pin running the entire length of the door.
- xii. The hinge must be attached in such a manner that no rivets or bolts are exposed.
- xiii. The main door must include a mechanism capable of holding the door open at approximately 90, 125, and 150 degrees under windy conditions.
- xiv. Manual placement of the mechanism must not be required by field personnel.
- xv. The main door must be equipped with a lock.
- xvi. Minimum of two keys must be supplied.
- xvii. The police door-in-door must be provided with a treasury type lock Corbin No. R357SGS or exact equivalent and a minimum of one key.
- xviii. The lock must be modified to work with a ‘Glendale’ No. 2 key.

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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- xix. Contact the COG traffic signal supervisor at (623) 930-2762 for more information.
- e. **Anchor Bolts:**
 - i. All base-mounted cabinets require anchor bolts to properly secure the cabinet to its base. The cabinet flange for securing the anchor bolts must not protrude outward from the bottom of the cabinet.
 - ii. Four anchor bolts must be required for proper installation.
- f. **Main Panel, Terminals, and Facilities:**
 - i. The main panel must be constructed from 5052-H32 brushed aluminum of 0.125 inches minimum thickness and installed so as to minimize flexing when plug-in components are installed.
 - ii. All main panels are provided with a mounting mechanism which allows easy access to all wiring on the rear of the panel without the removal of any cabinet shelves. Lowering of the main panel can be accomplished without the use of hand tools. Complete removal can be accomplished by the use of simple hand tools.
 - iii. The terminals and facilities must as a minimum be available in the following configuration:
 - A. Sixteen load switch sockets, six flash transfer relay sockets, one flasher socket, two (2) BIU sockets, two (2) 16-channel detector racks each with one BIU and one (1) spare SDLC cable.
 - B. All load switch and flash transfer relay socket reference designators must be silk-screen labeled on the front and rear of the main panel to match drawing designations. Socket pins must be marked for reference on the rear of the panel.
 - C. The main panels must have all field wires contained on two rows of horizontally mounted terminal blocks. One row must be wired for the pedestrian and overlap field terminations. The other row must be reserved for phase one through phase eight vehicle field terminations.
 - D. All field output circuits must be terminated on a non-fused barrier type terminal block with a minimum rating of 10 amps.
 - E. All field input/output (I/O) terminals must be identified by permanent alphanumeric labels. All labels must use standard nomenclature per the NEMA TS2 specification.
 - F. It must be possible to flash either the yellow or red indication on any vehicle movement and to change from one color indication to the other by use of a screwdriver.
 - G. Field terminal blocks must be wired to use four positions per vehicle or overlap phase (green, yellow, red, flash). It must not be necessary to de-buss field terminal blocks for flash programming.
 - H. The main panel must contain at least one flasher socket (silk screen labeled) capable of operating a 15-amp, 2-pole, NEMA solid-state flasher.
 - I. One RC network must be wired in parallel with each group of three flash-transfer relays and any other relay coils.
 - J. All logic-level, NEMA-controller and Malfunction Management Unit input



City of Glendale
Solicitation Number: IFB 24-54 /42400072
TRAFFIC OPERATIONS EQUIPMENT
EXHIBITS PACKAGE

CITY OF GLENDALE
Procurement Division
5970 West Brown Street,
Suite 210
Glendale, Arizona 85302

and output terminations on the main panel must be permanently labeled. Cabinet prints must identify the function of each terminal position.

- K. At a minimum, three 20-position terminal blocks must be provided at the top of the main panel to provide access to the controller unit's programmable and non- programmable I/O. Terminal blocks for DC signal interfacing must have a number 6- 32 x 7/32-inch screw as minimum.

All main panel wiring must conform to the following wire size and color:

Output	Wire Color	Wire Size (AWG)
Green/Walk	Brown	14
Yellow	Yellow	14
Red/Don't Walk	Red	14
MMU (other than AC power)	Violet	22
Controller I/O	Blue	22
AC Line (power panel to – black wire main panel)	Black	8/10
AC Line (main panel)	Black	10
AC Line (power panel to – black wire main panel)	Black	8/10
AC Line (main panel)	Black	10
AC Neutral (power panel to – white wire main panel)	White	8/10
AC Neutral (main panel)	White	10
Earth ground (power panel)	Green	8
Logic ground	Gray	22
Flash programming- orange wire flasher terminal	Black wire red or yellow field terminal	14

- L. All wiring, 14 AWG and smaller, must conform to MIL-W-16878/1, type B/N, 600V, 19-strand tinned copper.
- M. The wire must have a minimum of 0.010 inches thick PVC insulation with clear nylon jacket and rated to 105 degrees Celsius. All 12 AWG and larger wire must have UL listed THHN/THWN 90 degrees Celsius, 600V, 0.020 inches thick PVC insulation and clear nylon jacketed.
- N. Connecting cables must be sleeved in a braided nylon mesh or poly jacketed. The use of exposed tie wraps or interwoven cables is unacceptable.
- O. All Terminals and Facilities configurations must be provided with BIU wiring assignments consistent with NEMA TS2-1998 specifications.
- P. All Terminals and Facilities configurations must be provided with sufficient RS- 485 Port 1 communication cables to allow for the intended operation of that cabinet. Each communication cable connector must be a 15-pin metallized plastic shell D subminiature type. The cable must be



City of Glendale
Solicitation Number: IFB 24-54 /42400072
TRAFFIC OPERATIONS EQUIPMENT
EXHIBITS PACKAGE

CITY OF GLENDALE
Procurement Division
5970 West Brown Street,
Suite 210
Glendale, Arizona 85302

a shielded cable suitable for RS-485 communications.

- Q. All main panels must be pre-wired for a Type-16 Malfunction Management Unit (MMU).
- R. All wiring must be neat in appearance. All cabinet wiring must be continuous from its point of origin to its termination point. Butt type connections/splices are not acceptable.
- S. All connecting cables and wire runs must be secured by mechanical clamps. Stick-on type clamps are not acceptable.
- T. The grounding system in the cabinet must be divided into three separate circuits (AC Neutral, Earth Ground, and Logic Ground). These ground circuits must be connected together at a single point as outlined in the NEMA TS2 Standard.
- U. The main panel must incorporate a relay to remove +24 VDC from the common side of the load switches when the intersection is placed into mechanical flash. The relay must have a momentary pushbutton to apply power to the load switch inputs for ease of troubleshooting.
- V. All pedestrian push button inputs from the field to the controller must be opto-isolated through the BIU and operate at 12 VAC.
- W. All wire (16 AWG or smaller) at solder joints must be hooked or looped around the eyelet or terminal block post prior to soldering to ensure circuit integrity. Lap joint soldering is not acceptable.

g. Power Panel:

The power panel must consist of a separate module, securely fastened to the right-side wall of the cabinet. The power panel must be wired to provide the necessary filtered power to the load switches, flasher(s), and power bus assembly. It must be manufactured from 0.090-inch, 5052- H32 aluminum with a removable plastic front cover. The panel must be of such design to allow a technician to access the main and auxiliary breakers without removing the front cover. The power panel must house the following components:

- i. A minimum of a 30-amp main breaker. This breaker must supply power to the controller, MMU, signals, cabinet power supply and auxiliary panels. Breakers must be at minimum, a thermal magnetic type, U.L. listed for HACR service, with a minimum of 10,000 amp interrupting capacity.
- ii. A minimum of a 15-amp auxiliary breaker. This breaker must supply power to the fan, light and GFI utility outlet.
- iii. An EDCO model SHP-300-10 or approved equivalent surge arrester.
- iv. A 50-amp 125 VAC radio interference line filter.
- v. A 75-amp solid state relay.
- vi. A minimum of 8-position neutral bus bar capable of connecting three #12 wires per position.
- vii. A minimum of 6-position ground bus bar capable of connecting three #12 wires per position.

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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- viii. A NEMA type 5-15R GFI utility outlet.
- ix. A 4-position plug-in connector for wiring to the power bus assembly.
- h. **Power Bus Assembly:**
 - i. The power bus assembly must be manufactured from 0.090", 5052-H32 aluminum. It must provide filtered power for the controller, malfunction management unit, cabinet power supply, and all auxiliary equipment.
 - ii. Two spare filtered 110 V power outlets must be provided.
 - iii. It must include the SDLC Bus connecting cables wired into a surface mounted compression terminal block.
 - iv. The Power Bus Assembly must house the following components:
 - A. A minimum of three and a maximum of six power connectors.
 - B. Two terminal strips to hardwire the power connections.
 - C. SDLC terminal block with pre-wired cables.

All cabinet equipment requiring filtered power to operate, must be connected to the power bus assembly or hardwired directly to the supplied terminal blocks.

- i. **Vehicle Detection Rack:**
 - A. A minimum of one vehicle detector amplifier rack must be provided in each cabinet in the following configuration:
 - 1. Supports up to 16 channels of loop detection (eight 2-channel detectors), two 2-channel preemption devices and one BIU.
 - 2. If design plans call for a second detector rack, then a second detector rack should be added. Detector rack BIU mounting must be an integral part of the detector rack.
 - 3. All BIU connectors must have jumper address pins corresponding to the requirements of the TS2 specification. The jumpers may be moved to change the address of any individual rack. The address pins must control the BIU mode of operation. BIUs must be capable of being interchanged with no additional programming.
 - 4. Each cabinet must contain detector interface panels for the purpose of connecting field loops and vehicle detector amplifiers. The panels must be manufactured from FR4 G10 fiberglass, 0.062 inches thick, with a minimum of 2 oz. of copper for all traces.
 - 5. One 8-position interface panel must be provided for an 8-channel rack cabinet and one 16-position interface panel must be provided for a 16-channel rack cabinet. The interface panel must be secured to a mounting plate and attached to the left sidewalk of the cabinet.
 - 6. Each interface panel must allow for the connection of eight or sixteen independent field loops. A ground bus terminal must be provided between each loop pair terminal to provide a

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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- termination for the loop leading cable ground wire.
 7. Each interface panel must provide a 10-position terminal block to terminate the field wires for up to two 2-channel preemption devices.
 8. A cable consisting of 20 AWG twisted pair wires must be provided to enable connection to and from the panel to a detector rack. The twisted pair wires must be color coded red and white wire.
 9. All termination points must be identified by a unique number and silk screened on the panel. Each detector rack must accommodate rack mountable preemption devices.
 10. Each detector rack must be powered by the cabinet power supply and be connected to the power bus assembly by means of Burndy connector # SMS12PDH1.
 11. Each detector rack must be supplied with a full array of two (2) channel detector cards unless otherwise specified. The detector cards must be EDI Oracle 2E, Reno C-1000 or Econolite LM 622.
 - j. **Cabinet Test Switch and Police Panel:**
 1. A test switch panel must be mounted on the inside of the main door. The test switch panel must provide as a minimum the following:
 - i. AUTO/FLASH SWITCH – When in the flash position, power must be maintained to the controller and the intersection must be placed in flash. The controller must not be stop timed when in flash. Wired according to NEMA-TS2-1998 the MMU forces the controller to initiate the start-up sequence when exiting flash.
 - ii. STOP TIME SWITCH – When applied, the controller must be stop timed in the current interval.
 - iii. CONTROL EQUIPMENT POWER ON/OFF – This switch must control the controller, MMU, and cabinet power supply AC power.
 2. Momentary test push buttons for vehicle and pedestrian inputs are not required. The police door switch panel must contain the following:
 - i. SIGNALS ON/OFF SWITCH – In the OFF position, power must be removed from signal heads in the intersection. The controller must continue to operate. When in the OFF position, the MMU must not conflict or require reset.
 - ii. AUTO/FLASH SWITCH – When in the flash position, power must be maintained to the controller and the intersection must be placed in flash. The controller must be stop timed when in flash. Wired according to NEMA-TS2-1998 the MMU forces the controller to initiate the start-up sequence when exiting flash.
 - iii. AUTO/MANUAL SWITCH – Cabinet wiring must include an AUTO/MANUAL switch and a hand cord with a police push button.
 3. All toggle type switches must be heavy duty and rated 15 amps minimum. Single- or double-pole switches may be provided, as required.

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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4. Any exposed terminals or switch solder points must be covered with a non-flexible shield to prevent accidental contact.
5. All switch functions must be permanently and clearly labeled.
6. All wire routed to the police door-in-door and test switch push button panel must be adequately protected against damage from repetitive opening and closing of the main door.
7. All test switch panel wiring must be connected to the main panel via a 36-pin Burndy connector #SMS36R1, or exact equivalent.
8. All wiring from the main panel to the test switch panel must be connected to the switch panel via a 24-pin Burndy connector #SMS24R1 or exact equivalent.

k. **Resistor Panel:**

An odd phase red resistor panel must be included in each cabinet.

l. **Auxiliary Devices:**

- i. **Load Switches:** Load switches must be solid state and must conform to the requirements of Section 6.2 of the NEMA TS2 Standard and the most recent City of Glendale specification.
- ii. **Flashers:** The flasher must be solid state and must conform to the requirements of section 6.3 of the NEMA TS2 Standard. Flashing of field circuits for the purpose of intersection flash must be accomplished by a separate flasher. The flasher must be rated at 15 amperes, double pole with a nominal flash rate of 60 FPM.
- iii. **Flash Transfer Relays:** All flash transfer relays must meet the requirements of Section 6.4 of the NEMA TS2 Standard. The coil of the flash transfer relay must be de-energized for flash operation. The full complement of relays must be supplied with each cabinet to allow for maximum phase utilization for which the cabinet is designed.
- iv. **Malfunction Management Units:** Each traffic signal cabinet assembly must be supplied with one Malfunction Management Unit as defined by the requirements of Section 4 of the NEMA TS2-2003 Standard and the most recent City of Glendale specification.
- v. **Bus Interface Units:** All Bus Interface Units (BIUs) must meet the requirements of Section 8 of the NEMA TS2 Standard. The full complement of Bus Interface Units must be supplied with each cabinet to allow for maximum phase and function utilization for which the cabinet is designed. Each Bus Interface Unit must include power on, transmit and valid data indicators. All indicators must be LEDs.
- vi. **Cabinet Power Supply:** The cabinet power supply must meet the requirements of Section 5.3.5 of the NEMA TS2 Standard. The cabinet power supply must provide LED indicators for the line frequency, 12 VDC, 12 VAC, and 24 VDC outputs. The cabinet power supply must provide (on the front panel) jack plugs for access to the +24 VDC for test purposes.
- vii. **Load Switch Jumpers:** 10 load switch jumpers must be provided with each cabinet.

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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m. **Auxiliary Cabinet Equipment:**

- i. The cabinet must be provided with two (2) thermostatically controlled (adjustable between 80-150 degrees Fahrenheit) ventilation fans in the top of the cabinet plenum. The fan plate must be removable with the use of simple hand tools for serviceability. A minimum of two exhaust fans must be provided. The fan must be a ball bearing type fan and must be capable of drawing a minimum of 100 cubic feet of air per minute. Each Fan/Thermostat assembly must be connected to the Power panel by means of a 4-position plug-in cable.
- ii. A 25-watt incandescent lamp mounted on a 14-inch flexible arm must be included. The flexible arm must be permanently mounted to the middle of the cabinet door. The lamp must be wired to either a 15-amp ON/OFF toggle switch mounted on the power panel or to a door activated switch mounted near the top of the door.
- iii. A fluorescent lighting fixture must be mounted on the inside top of the cabinet near the front edge. The fixture must be rated to accommodate at minimum a F15T8 lamp operated from a normal power factor UL or ETL listed ballast. The lamp must be wired to either a 15-amp ON/OFF toggle switch mounted on the power panel or to a door activated switch mounted near the top of the door.
- iv. A resealable print pouch must be mounted to the door of the cabinet. The pouch must be of sufficient size to accommodate one complete set of cabinet prints.
- v. A minimum of two sets of complete and accurate cabinet drawings must be supplied with each cabinet.
- vi. A minimum of one set of manuals for the controller, Malfunction Management Unit and vehicle detector amplifiers must be supplied with each cabinet.
- vii. At a minimum, an additional electrical outlet must be provided in the cabinet. The outlet must be wired through a fuse to protect equipment using the outlet from surges. The outlet must be placed in a manner such that devices can be plugged in while still allowing the cabinet door to close.

n. **Testing and Warranty:**

- i. Each cabinet assembly must be tested as a complete entity under signal load for a minimum of 48 hours.
- ii. Each assembly must be delivered with a signed document detailing the cabinet final tests performed.
- iii. The cabinet must be assembled and tested by the controller manufacturer or authorized local distributor to ensure proper component integration and operation.
- iv. The cabinet assembly and all other components must be warranted for a period of one year from date of shipment. The manufacturer's warranty must be supplied in writing with each component. Second

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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party extended warranties are not acceptable.

- v. Any defects must be corrected by the manufacturer or supplier at no cost to the owner.
- o. **Replacement Coverage:**
If a malfunction occurs during the warranty period, the supplier must, within two (2) weeks after notification, furnish a like unit, module, or auxiliary equipment, for use while the warranted unit is being repaired.
- p. **Reliability Clause:**
While under warranty, the isolation and repair of any unit malfunction must be the responsibility of the supplier. Any unit experiencing a total of three failures that has twice been returned to the supplier for repair must be replaced with a new unit of the same type at no charge to the City. The replacement unit's warranty must be that of a new unit.

NOTE: Malfunctions do not include damage caused by lightning, power surges, negligence, acts of God, or use of equipment in a manner not originally intended by its manufacturer.

19A and 19 B - **TS2 Type 1 & Type 2 Controller**

Equipment must conform to the following material requirements:

- a. The controller must be compact to fit in limited cabinet space.
- b. Hardware:
 - i. Electronics: A microprocessor must be used for all timing and control functions. Continuing operation of the microprocessor must be verified by an independent monitor circuit, which must set an output and indicate an error message if a pulse is not received from the microprocessor within a defined period.
 - ii. A built-in, high efficiency switching power supply must generate all required internal voltages as well as 24 VDC for external use. All voltages must be regulated and must be monitored with control signals. Fuses must be mounted on the front of the controller for 120 VAC input and 24 VDC output.
 - iii. Timing of the controller must be derived from the 120 VAC power line. User- programmed settings and intersection configuration data must be stored in Flash Memory. Memory requiring an energy storage device (battery or capacitor) to maintain user data must not be acceptable. To facilitate the transfer of user-programmed data from one controller to another, a data transfer module (data key) using a separate serial flash memory device must be included. This data transfer module must be easily removable and directly accessible from the front of the controller. The controller will not require this module to be present for proper operation.
 - iv. The timing parameters must be capable of being downloaded from a Windows based computer. The controller manufacturer must provide a software program which stores the timing database and allows them to



City of Glendale
Solicitation Number: IFB 24-54 /42400072
TRAFFIC OPERATIONS EQUIPMENT
EXHIBITS PACKAGE

CITY OF GLENDALE
Procurement Division
5970 West Brown Street,
Suite 210
Glendale, Arizona 85302

- be downloaded directly to the controller.
- v. All controller software must be stored in Flash Memory devices. The controller software must be easily updated without the removal of any memory device from the controller. The use of removable PROMS or EPROMS from the controller must not be acceptable. The controller must include an option that allows updating software using a Windows based computer. This option must allow updating the controller software via a serial or Ethernet port from the front of the controller. Updating the controller software must require the intersection to be in flash for no more than ten seconds using Ethernet file transfer.
 - vi. All printed circuit boards must meet the requirements of the NEMA Standard plus the following requirements to enhance reliability:
 - A. All plated-through holes and exposed circuit traces must be plated with solder.
 - B. Both sides of the printed circuit board must be covered with a solder mask material.
 - C. The circuit reference designation for all components and the polarity of all capacitors and diodes must be clearly marked adjacent to the component. Pin 1 for all integrated circuit packages must be designated on both sides of all printed circuit boards.
 - D. All printed circuit board assemblies, except power supplies, must be coated on both sides with a clear moisture-proof and fungus-proof sealant.
 - vii. Front Panel: The front of the controller must consist of a panel for the display, keyboard, and connectors for all necessary user connections. It must only be necessary to open the front panel during optional installation and maintenance of the electronic circuits.
 - A. An alphanumeric liquid crystal display (LCD) must be used to show program and status information. For ease of viewing, backlighting and multiple levels of contrast adjustment must be provided.
 - B. Front-panel operator inputs must be via clearly labeled and environmentally sealed electrometric keys.
 - viii. Data Key: A data key must be available for use as a database storage device (backup) or as a database transfer module. It must be capable of storing a complete database.
 - A. The data key must be hot swappable, so that it can be inserted and removed without powering down the controller.
 - B. The data key must be capable of storing the entire controller database and must retain the information without use of battery or capacitor backup.
 - C. The controller must not require this key to be present during normal operation.
 - ix. Computer Database: A Windows computer software program must be available for use as a database storage device and database transfer.



City of Glendale
Solicitation Number: IFB 24-54 /42400072
TRAFFIC OPERATIONS EQUIPMENT
EXHIBITS PACKAGE

CITY OF GLENDALE
Procurement Division
5970 West Brown Street,
Suite 210
Glendale, Arizona 85302

The software program must be capable of storing timing data from multiple controllers. The software must be able to upload and download while the controller is in operation.

- x. Connectors: All interface connectors must be accessible from the front of the controller. Controller model must be offered to accommodate both NEMA TS2 Type 1 and NEMA TS2 Type 2 cabinets. To facilitate special applications the controller must have the capability of assignment of any input or output function to any input or output pin respectively on the interface connectors, with the exception of Flashing Monitor, Controller Voltage Monitor, AC+, AC-, Chassis Ground, 24VDC, Logic Ground and TS2 Mode bits.
- xi. Serviceability: All electronic modules including the power supply must be easily removable from the front of the controller using a screwdriver as the only tool. All power and signal connections to the circuit boards must be via plug-in connectors.
- xii. The controller layout must allow the removal and replacement of any circuit board without unplugging or removing other circuit boards, except for the power supply. No more than two boards must be attached together to form a circuit assembly.
- xiii. The controller enclosure must be designed so that one side of any circuit board is accessible for troubleshooting and testing while the controller is still in operation. This capability must be accomplished without the use of extender cards or card pullers.

20. Malfunction Monitor Unit (MMU)

Equipment must conform to the following material requirements:

- a. The MMU must satisfy the requirements of Section 4 of the NEMA TS2 -2003 Standard.
- b. Acceptable MMU are EDI MMU-16LEip with 10/100 Mbps Ethernet Port, or Reno A&E MMU- 1600G with Ethernet Port or Econolite MMU-16LE or approved equivalent.
- c. The MMU must include two high contrast liquid crystal displays that continuously show full RYG(W) intersection status. A separate graphic LCD must provide a menu driven user interface for status, signal voltages, configuration, event logs, and the Help system.
- d. The MMU must provide a time-stamped nonvolatile event log recording the complete intersection status as well as the AC line events, configuration changes, monitor resets, temperature and true RMS voltages.
- e. The MMU must support the MUTCD flashing yellow arrow PPLT operation with two different mode for either TS-2 or TS-1 cabinet configurations.
- f. A minimum of one set of manuals for the MMU must be supplied with each cabinet.
- g. Warranty:
 - i. The MMU must be warranted by the manufacturer against mechanical and electrical defects for a period of two years from date of shipment.

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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The manufacturer's warranty must be supplied in writing with MMU. Second party extended warranties are not acceptable.

A. Replacement Coverage:

1. If a malfunction occurs during the warranty period, the supplier must, within two weeks after notification furnish a like unit for use while the warranted unit is being repaired.

ii. Reliability Clause:

- A. While under warranty, the isolation and repair of any unit malfunction must be the responsibility of the supplier. Any unit experiencing a total of three failures that has twice been returned to the supplier for repair must be replaced with a new unit of the same type at no charge to the City. The replacement unit's warranty must be that of a new unit.
- B. Malfunctions do not include damage caused by lightning, power surges, negligence, acts of God, or use of equipment in a manner not originally intended by its manufacturer.

21. **TS2 Bus Interface Unit (BIU)**

Equipment must consist of the following brands or approved equal:

- a. Eberle Design Inc. BIU-700

22. TS2 Load Switch

Equipment must consist of the following brands or approved equal:

- a. Eberle Design Inc Model 510

23. TS2 Flasher Unit

Equipment must consist of the following brands or approved equal:

- a. Eberle Design Inc. Model 810

24. Flash Transfer Relay - 120 VAC

Equipment must consist of the following brands or approved equal:

- a. Struthers-Dunn 21XBXP (120 VAC)

25. **Electrical Meter Pedestal**

Equipment must consist of the following brands or approved equal:

- a. Milbank CP3B11115A22

26. **12" Red Circular LED Indication**

27. **12" Yellow Circular LED Indication**

28. **12" Green Circular LED Indication**

29. **12" Red Arrow LED Indication**

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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30. **12" Yellow Arrow LED Indication**

31. **12" Green Arrow LED Indication**

32. **16" x 18" Pedestrian Countdown LED Indication Module**

Equipment must conform to the following material requirements:

Each traffic signal head must consist of a number of complete identical signal sections fastened together to present a continuous appearance. The polycarbonate signal head must be molded from clear polycarbonate resins.

a. **Signal Head Housing (Non-Metal):**

The housing of each section must be one-piece injection molded from polycarbonate resins. Two integrally cast hinge lugs must be on the left of each section, and two integrally cast latch screw lugs must be on the right side of the housing. The top and bottom of the housing must have an opening to accommodate a standard 1-1/2 inch pipe bracket. Each signal section must be capable of being attached one above the other. The top and bottom opening of the signal housing must have a Shurlock boss integrally cast into the housing and must have an ornamental cap installed in the openings at the time of delivery. The radial angular grooves of the Shurlock boss must provide a positive five-degree increment positioning of the entire signal head to eliminate rotation of misalignment of the signal head.

b. **Housing Door (Non-Metal):**

The housing door of each section must be a one-piece, injection, molded from polycarbonate resins. Two hinge lugs must be cast on the left of each door, and two latch jaws must be cast on the right side of each door. Two hinge pins must attach the doors. Two latch screws and wing nuts on the right side of the housing must provide for opening and closing the signal door without the use of any special tools. The door must accommodate a weatherproof and mildew-proof closed-cell resilient, neoprene gasket. The outer face of the door must accommodate the signal head visor. All hinges, bolts, screws and other metal in the signal head must be stainless steel or other corrosion resistant material.

c. **Painting:**

- i. All surfaces interior and exterior of the housing, door and visors must be finished with two coats of best quality oven baked paint before assembly.
- ii. First coat-primer: Must be Epoxy Oxide Baking Primer or equivalent and must meet Federal Specifications TT-P-636.
- iii. Second coat-enamel: Must be Traffic Signal Black Exterior Baking Enamel and Must meet Federal Specifications TT-C-595-1415.



City of Glendale
Solicitation Number: IFB 24-54 /42400072
TRAFFIC OPERATIONS EQUIPMENT
EXHIBITS PACKAGE

CITY OF GLENDALE
Procurement Division
5970 West Brown Street,
Suite 210
Glendale, Arizona 85302

- d. **Visors:**
Visors must be tunnel visors and formed from corrosion resistant aluminum alloy sheet or molded from polycarbonate resins. Tunnel visors must have a four-inch open slot at the bottom and twist-on attaching ears to facilitate installation. On a standard 12-inch traffic signal head the visor must be nine to ten inches long.
- e. **Weight:**
The weight of each 12-inch signal section must not exceed 13 pounds, less framework.
- f. **Backplates (Metal):**
All backplates must be one-piece, anodized aluminum sheet metal 16 gauge. The color must be flat black.
- g. **LEDs:**
 - i. LEDs are required to be installed in all signal heads.
 - ii. The operating voltages for LEDs must have a range of 80 VAC to 135 VAC on 60 Hz AC line.
 - iii. Maximum wattage for standard LED traffic signal lamp (ball) must be 24 watts for a 12" at 25C. Maximum wattage for 12" arrow lamp must be 12 watts at 120 VAC at 25C. Operating current measured across each LED must not exceed an average of 30mA at normal voltage (120 VAC).
 - iv. In a standard "approved" (COG) Signal housing, the installation of the LED lamps must be a "NO TOOL" installation and must not require the removal of any of any components of the traffic signal except the removal of the replaced incandescent bulb.
 - v. Transient voltage suppression must be rated at 1,500 watts for 1 millisecond and fusing with a maximum rating of 2 AMPS. LED's must be arranged in no less than six (6) loaded circuits. The LED signal lamp must have a diode string failure rate of no more than "1 for 5" (20%), that is, for any individual diode failure no more than five (5) diodes must be extinguished. Power Factor must meet (or exceed) FCC title 47, part 15, sub part B, Class A (section 15.07(b)) Standard, in accordance with ANSI C63-4-1992, and must be no more than 0.90. Total harmonic distortion must be no more than 20%. Electrical connection must be wireless and made via an Edison type screw in device and must be capable of corrective alignment to ensure correct orientation to accurately match the dominant wavelength of existing signal house lens. Beam of color, each LED lamp must meet ITE specifications (VTCSH-July 1998). Beam intensity, each LED lamp must meet (or exceed) ITE specifications (VTCSH- July 1998, Table 1). LED must use TS-AlInGaP (Aluminum Gallium Indium Phosphide) technology for Red and Yellow lamps and InGaN (Indium Gallium nitride) technology for Green lamps. LED lamps must be rated for 100,000 or more hours of operation at the specified amperage and operating temperature. Each LED lamp must have a Low temperature compensation circuit with a range of 40F (40C) and must have a high temperature compensation circuit with a of up to + 74C

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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(+165F). LED lamps must be dust and moisture tight to protect internal LED electrical components and must allow for safe handling in all weather conditions. LED lamps must retain a minimum of 85% of its luminous intensity for at least 36 months as per the value specified in Section 1.04 of the VTCSH. Each lamp must be marked with an arrow denoting the “UP” position for correct orientation when installed. Each LED must be marked with its own serial number.

h. LED Ped Head:

- i. The pedestrian head must overlay the “HAND” and “MAN” symbols on the left side of the signal face. On the right side of the signal face must be a two-digit countdown “TIMER”. The “HAND”, “MAN” and “TIMER” symbols must have an “incandescent look”. Symbols with an LED look and “outline figures” are not acceptable. The “HAND” symbol and “TIMER” numerals must be Portland Orange. The “MAN” symbol must be Lunar White.
- ii. The “TIMER” numerals must be a minimum of 9 inches in height. The “TIMER” must begin counting down at the beginning of the flashing “HAND” stage and must reach zero at the beginning of the solid “HAND” phase. The “TIMER” must be self-programmable so that it determines the length of the flashing “HAND” phase automatically with no additional programming from the user. The “TIMER” numerals must turn off after the zero numeral is reached and must remain off until the next countdown sequence. The “TIMER” numerals must remain solid during the countdown period; flashing “TIMER” numerals are not acceptable.
- iii. The LEDs must be rated for a minimum of 100,000 hours of continuous operations. The housing for the countdown pedestrian heads must be flat black; die cast aluminum alloy signal sections. For LED's the operating voltages must have a range of 80 VAC to 135 VAC on a 60 HZ AC line. Maximum wattage for a standard LED countdown pedestrian head must not be greater than 12 watts at 120 VAC @ 25 C. Operating temperature for the LED countdown pedestrian head must be from -40C (-40F) to +74C (165F)

33 2” Pedestrian Push Button with 9" x 15" Sign

Equipment must consist of the following brands or approved equal:

- a. Polara Bulldog

34 4 Wire Accessible Pedestrian Push Button with 9" x 15" Sign

Equipment must consist of the following brands or approved equal:

- a. Polara iNS/iDS

35 No. 14 19-1 IMSA Signal Conductor Cable (21 conductor) Stranded

36 No. 14 19-1 IMSA Signal Conductor Cable (12 conductor) Stranded

37 No. 14 19-1 IMSA Signal Conductor Cable (7 conductor) Stranded

38 No. 14 19-1 IMSA Signal Conductor Cable (4 conductor) Stranded

Equipment must conform to the following material requirements:

- a. IMSA cable must be stranded. IMSA signal cables must be polyethylene insulated copper conductors, polyvinyl chloride jacketed, rated at 600 volts for use in

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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underground conduit or as aerial cable conforming to International Municipal Signal Association Specification No. 19-1.

- b. The cable must use the standard IMSA colors for conductor insulation. The colors and tracers must be permanent and an integral part of the insulation, and must not be painted, surface coated, or adhered to surface.

39 No. 14 50-2 IMSA Loop Lead-In Cable Stranded

14 gauge stranded loop lead-in cable must comply with International Municipal Signal Association (IMSA) specification 50-2.

40 No. 12, Tray Cable (4 conductor: black, white, red, green)

41 No. 8 Conductor, Bare Copper, Solid

42 No. 6 Conductor, Bare Copper, Solid

Conductors must comply with ADOT Standard Specifications for Road and Bridge Construction Section 732-2.

43 No. 1 Pull Box

44 No. 1.5 Pull Box

45 No. 3.5 Pull Box

46 No. 5 Pull Box

47 No. 7 Pull Box

48 No. 7 Pull Box Extension

49 No. 1 Pull Box Lid

50 No. 1.5 Pull Box Lid

51 No. 3.5 Pull Box Lid

52 No. 5 Pull Box Lid

53 No. 7 Pull Box Lid

Equipment must conform to the following material requirements:

- a. The pull box, extension, and lid must meet the requirements of the COG Standards and Specifications for the type of pull boxes. Concrete pull boxes are not permitted. Concrete polymer boxes must be used. Other materials may be approved by the Engineer. Dimensions shown on the pull box standards are approximate. Boxes similar in size and function may be approved by the Engineer.
- b. The lid must be supplied with all bolts and washers required to secure the lid.

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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- 54 **Type F Signal Head**
- 55 **Type R Signal Head**
- 56 **Type Q Signal Head**
- 57 **Type G Signal Head**
- 58 **Type T Signal Head**
See Glendale specification for Items Number 26 to 31.
- 59 **Traffic Signal Head Backplate Retroreflective, Fluorescent Yellow Tape, Type XI, 3"**
Equipment must consist of the following brands or approved equal:
a. 3M 4081 Series 75-0001-1544-6
- 60 **Pedestrian Signal Head Housing**
- 61 **Type II Signal Mount**
- 62 **Type V Signal Mount**
- 63 **Type VII Signal Mount**
- 64 **Vertical Hanger Signal Mount**
See specification for Items Number 26 to 31
- 65 **Type A Signal Structure - 10'**
- 66 **Type A Signal Structure - 12'**
- 67 **Type A Signal Structure - 15'**
- 68 **Type G Signal Structure - 25'**
- 69 **Signal Pole, Type Q104**
- 70 **Signal Pole, Type Q106**
- 71 **Signal Pole, Type Q108**
- 72 **Signal Pole, Type Q114**
- 73 **Signal Pole, Type Mod. Q114 - 30'**
- 74 **Signal Pole, Type Q116**

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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- 75 **Signal Pole, Type Mod. Q116 - 30'**
- 76 **Not Used**
- 77 **Not Used**
- 78 **Signal Pole, Type W**
- 79 **Luminaire Mast Arm, Type Q104**
- 80 **Luminaire Mast Arm, Type Q106/Q108**
- 81 **Luminaire Mast Arm, Type Q114/Q116/V/Mod. R/W (8x12)**
- 82 **Signal Mast Arm, Type Q104 25 Foot**
- 83 **Signal Mast Arm, Type Q106 30 Foot**
- 84 **Signal Mast Arm, Type Q106 35 Foot**
- 85 **Signal Mast Arm, Type Q106 40 Foot**
- 86 **Signal Mast Arm, Type Q108 40 Foot**
- 87 **Signal Mast Arm, Type Q108 45 Foot**
- 88 **Signal Mast Arm, Type Q108 50 Foot**
- 89 **Signal Mast Arm, Type Q108 55 Foot**
- 90 **Signal Mast Arm, Type Q114 30 Foot**
- 91 **Signal Mast Arm, Type Q114 35 Foot**
- 92 **Signal Mast Arm, Type Q114 40 Foot**
- 93 **Signal Mast Arm, Type Q114 45 Foot**
- 94 **Signal Mast Arm, Type Q116 50 Foot**
- 95 **Signal Mast Arm, Type Q116 55 Foot**
- 96 **Not Used**
- 97 **Not Used**

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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98 **Signal Mast Arm, Type W 70 Foot**

99 **Signal Mast Arm, Type W 75 Foot**

100 **Pedestrian Push Button Pole, 5'-6"**

Equipment must conform to the following material requirements:

a. Supports for traffic signals, mast arms and poles must comply with the current "2001 Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals" by the American Association of State Highway and Transportation Officials (AASHTO). The structures must comply with the 80 mph wind load criteria and detail requirements of the AASHTO specification.

i. **Poles and Mast Arms:**

A. Poles and self-supporting mast arms must be a true continuous tapered circular tube. Steel material used must conform with the minimum strength requirements of ASTM A595 Grade A. There must not be more than one longitudinal welded seam. Longitudinal seams must be automatically electrically welded. All welds must conform to the current "American Welding Society" structural welding code. Weld seams must be neat and uniform in appearance and must have thickness not less than 1/16 inch. The number of sections and welds on signal mast arms must be limited so that no section is less than ten feet in length and that the first section of the largest diameter near the pole connection plates must be a minimum of 20 feet in length. A reduction in size or thickness may be permitted on the "Q" series poles, 12 inches above the mast arm connection, to complete the full length of the pole.

B. Poles must be fitted with a weld-on base plate manufactured from structural steel, which meets or exceeds ASTM A36 minimum strength requirements. Each pole must include a reinforced steel hand hole frame and cover, oriented opposite the direction of the mast arm and at the base of the pole. In addition, "Q" series poles must have an additional reinforced hand hole frame and cover mounted opposite the mast arm connection plate. Details of hand hole are on Specification Sheet T 5-10. Captive hardware for the hand hole cover must be stainless steel, plated or galvanized steel and be equipped with a stainless-steel small link high strength chain connected to the pole and cover. The chain must be six inches in length.

C. Mast arms requiring guy rods, truss framing or under bracing must not be permitted. Signal mast arms must be provided with a four-bolt attachment plate. The pole attached assembly must consist of suitable plates with gussets forming a box at the specified angle to accept the mast arm. Assembly of the mast arm to the pole must be by high strength plated or galvanized bolts. The connection must accept the full moment resisting capability of the arm with load as specified on the drawings. The butt diameter of the mast arm must not exceed the nominal diameter of the pole at the point of attachment.

ii. **Anchor Bolts:**

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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High strength anchor bolts, washers and nuts must be fabricated from steel which meets or exceeds ASTM A325 minimum strength requirements and elector-galvanized, the entire length of the bolt, in accordance with ASTM B633. Welding must not be performed on any portion of the body of the high strength anchor bolt. All anchor bolts must be 2 x 90 and have a six-inch L bend at the bottom and must be threaded to six times the diameter at the top end. Four anchor bolts with double nuts and washers must be supplied with each pole. Specifications must be supplied with each set of anchor bolts.

iii. **Incidentals:**

- A. Each pole and mast arm must be furnished with a suitable pole cap with captive set screws. Each pole must be furnished with four suitable mast arm bolts screwed into the mast arm base plate holes and three suitable luminary mast arm bolts screwed into the luminary mast arm base plate.
- B. All steel metal products must be galvanized after fabrication in accordance with the current ASTM specifications. The manufacturer must identify the ASTM method on the shop drawings for approval.
- C. All poles and mast arms supplied must carry the name of the manufacturer and/or fabricator and dimensions of the device on a permanent metal tag attached by rivets above the base hand hole cover on poles and near the mounting base, on the bottom side, for mast arms. All dimensions must be given in feet and inches.

101 1 Camera Video Detection System Item Number

102 2 Camera Video Detection System Item Number

103 3 Camera Video Detection System Item Number

104 4 Camera Video Detection System

Equipment must consist of the following brands or approved equal:

- a. Autoscope Vision
- b. MioVision

105 Time Activated School Zone Flasher

Equipment must conform to the following material requirements:

- a. Time activated school zone flasher must meet NEMA Standards.
- b. Each time activated school zone flashers must have 15" Amber LED Vehicle Indications and include spare 15" Amber LED Vehicle Indications. Assemblies must include poles, anchor bolts and any additional hardware required for installation.
- c. Flashers must display speed limit and SLOW DOWN message in 6" digits for 15" display, or 7" digits for 18" display; using red or amber LEDs.
- d. Each unit must include Programmable Time Clocks with the following capabilities:
 - i. Set operation hours by time of day and day of week with unlimited schedules and modes on perpetual calendar; include two-year exception list.

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
--	--	--

- ii. Schedule times of day for on and off control, view current schedule and speed settings modes, edit exceptions by date and time, and download pre-configured schedules to City devices.
- iii. Collect date, time and speed for over 200,000 individual target vehicles and provide access to the raw data file for further analysis.
- iv. Program ON or OFF times, download and erase data in device, select stop-when-full or FIFO data storage.
- v. Generate easy pre-defined speed compliance reports; includes advanced data windowing and statistics.
- vi. Must have a cloud base service for remote programming.
- e. The time activated school zone flasher must operate with a solar power unit to power of 12VDC.
- f. Solar panels must be mounted on the side of flasher pole.
- g. The manufacturer must guarantee that mechanical and electrical equipment and material are free from any defects or imperfections in workmanship and material for a period of three (3) years. Amber LED panels must have a minimum ten (10) year warranty.
- h. During the warranty period of three (3) years, technical support by toll-free telephone must be provided by the manufacturer 24 hours per day, 365 days per year, and request for support by telephone must be answered by manufacturer personnel within one (1) hour.

106 Solar Power Radar Speed Feedback Signs (Black and White)

Equipment must conform to the following material requirements:

- a. Solar power radar speed feedback signs must meet NEMA Standards.
- b. Each sign must be a 15" Radar Speed Feedback Signs with a white background and black lettering. Signs must be mountable on a 15-foot A-pole or Streetlight pole.
- c. Assemblies must include poles, anchor bolts and any additional hardware required for installation.
- d. Radar speed feedback signs must display speed limit and SLOW DOWN message in 6" digits for 15" display, or 7" digits for 18" display, using red or amber LEDs.
- e. Each unit must include the following capabilities:
 - i. Set operation hours by time of day and day of week with unlimited schedules and modes on perpetual calendar; include two-year exception list.
 - ii. Schedule times of day for on and off control, view current schedule and speed settings modes, edit exceptions by date and time, and download pre-configured schedules to City devices.
 - iii. Collect date, time and speed for over 200,000 individual target vehicles and provide access to the raw data file for further analysis.
 - iv. Program ON or OFF times, download and erase data in device, select stop-when-full or FIFO data storage.
 - v. Generate easy pre-defined speed compliance reports; includes advanced data windowing and statistics.
 - vi. Must be able to operate a minimum of 48 hours without being recharged.

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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- f. The solar power radar speed feedback signs must operate with a solar power unit to power each assembly with solar control and 12VD power. Batteries and a banding mount for a cabinet must be included.
- g. Solar panels must be mounted on the side of sign pole.
- h. The manufacturer must guarantee mechanical and electrical equipment and material are free from any defects or imperfections in workmanship and material for a period of three (3) years. Amber LED panels must have a minimum ten (10) year warranty.
- i. During the warranty period of three (3) years, technical support by toll-free telephone must be provided by the manufacturer 24 hours per day, 365 days per year, and request for support by telephone must be answered by manufacturer personnel within one (1) hour

107 **Solar Power Radar Speed Feedback Signs (Fluorescent Green and Black)**

Equipment must conform to the following material requirements:

- a. Solar power radar speed feedback signs must meet NEMA Standards.
- b. Each sign must be a 15" Radar Speed Feedback Signs with a Fluorescent Green background and black lettering. Signs must be mountable on a 15-foot A-pole or Streetlight pole
- c. Assemblies must include poles, anchor bolts and any additional hardware required for installation.
- d. Radar speed feedback signs must display speed limit and SLOW DOWN message in 6" digits for 15" display, or 7" digits for 18" display, using red or amber LEDs.
- e. Each unit must include the following capabilities:
 - i. Set operation hours by time of day and day of week with unlimited schedules and modes on perpetual calendar; include two-year exception list.
 - ii. Schedule times of day for on and off control, view current schedule and speed settings modes, edit exceptions by date and time, and download pre-configured schedules to City devices.
 - iii. Collect date, time and speed for over 200,000 individual target vehicles and provide access to the raw data file for further analysis.
 - iv. Program ON or OFF times, download and erase data in device, select stop-when- full or FIFO data storage.
 - v. Generate easy pre-defined speed compliance reports; includes advanced data windowing and statistics.
 - vi. Must be able to operate a minimum of 48 hours without being recharged.
- f. The solar power radar speed feedback signs must operate with a solar power unit to power each assembly with solar control and 12VD power. Batteries and a banding mount for a cabinet must be included.
- g. Solar panels must be mounted on the side of sign pole.
- h. The manufacturer must guarantee mechanical and electrical equipment and material are free from any defects or imperfections in workmanship and material for a period of three (3) years. Amber LED panels must have a minimum ten (10) year warranty.
- i. During the warranty period of three (3) years, technical support by toll-free telephone must be provided by the manufacturer 24 hours per day, 365 days per year, and

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
--	--	--

request for support by telephone must be answered by manufacturer personnel within one (1) hour.

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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EXHIBIT 1: SPECIAL NOTICES

By signing on the Offer/Bid page, solicitation Amendment(s), or cover letter accompanying the submittal documents, Offerors are certifying that they understand the following notices and agree to comply with all required terms and conditions.

1. RETURN OF OFFER The Offeror shall submit the Response Workbook electronically in Vendor Self Service (VSS)

Offeror is required to register in VSS prior to submitting a proposal if they have not already registered. <https://glendaleazvendors.munisselfservice.com/Vendors/default.aspx>

Guide to Register as a new vendor:

https://www.glendaleaz.com/your_government/city_finances/procurement/vendor_self_service_v_s_s
(This is a PDF document "Vendor Registration Instructions" at the bottom of page.)

- a. The Offeror must complete all sections of the solicitation in the format given and the spaces provided. Proposals that do not conform to the above format may be rejected.
- b. The Offeror must bear all costs associated with submitting the proposal, including proposal preparation, site visitation or any travel connected with submission of the proposal. The City shall have no liability whatsoever for such costs.

2. PREPARATION OF BID PACKAGE

The following items must be completed and returned. Failure to include all the items may result in a bid being rejected. Bid packages shall be submitted in the following order:

- A. BIDDER SHEET
- B. PRICING WORKBOOK
- C. ADDENDUM, Return all addenda (if applicable).

3. NO CONTACT, NO INFLUENCE DURING THE IFB PROCESS

The City is conducting a competitive IFB process for the contract, free from improper influence or lobbying. There must be no contact concerning this IFB from Offerors submitting a Bid with any member of the City Council, IFB Evaluation Committee Members, or anyone connected with the process for or on behalf of the City. Contact includes direct or indirect contact by the Offeror, its employees, attorneys, lobbyists, surrogates, etc. in an attempt to influence the IFB process.

From the time the IFB is issued until the expiration of the protest period or the resolution of any protest, whichever is later (the "Silent Period"), Offerors, directly or indirectly through others, are restricted from attempting to influence in any manner the decision making process through, including but not limited to, the use of paid media; contacting or lobbying the City Council or City Manager or any other City employee (other than Procurement employees); the use of any media for the purpose of influencing the outcome; or in any other way that could be construed to influence any part of the decision-making process about this IFB. This provision shall not prohibit an Offeror from petitioning an

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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elected official or engaging in any other protected first amendment activity after the protest period has run or any protest has been resolved, whichever is later.

Violation of this provision will cause the proposal or offer of the Bidder to be found in violation and to be rejected.

4. CONFLICT OF INTEREST

Contractor must disclose the following: 1) the name(s) and position(s) of each Contractor's employee or subcontractor that participated in the preparation of the submittal or who will be involved, directly or indirectly, with performing the contract, if awarded; 2) the name(s) of any City of Glendale employee who is a relative of persons identified pursuant to No. 1; 3) the name(s) and position(s) of Contractor's personnel that have a financial or proprietary interest in the contract; 4) the name(s) of any City of Glendale employee who is a relative of persons identified pursuant to No. 3.

Providing such disclosure will not necessarily disqualify a Contractor. Failure to disclose the requested information or any potential conflict of interest pursuant to A.R.S. § 38-511 et seq. may result in rejection of the proposal or bid or any contract being void or terminated.

For purposes of this provision, the following definitions apply:

"Employee" means all persons who are employed on a full-time, part-time or contract basis by the City of Glendale.

"Relative" means the spouse, child, child's child, parent, grandparent, brother or sister of the whole or half blood and their spouses and the parent, brother, sister or child of a spouse.

5. INQUIRIES

Any question related to the Invitation to Bid must be directed to the Contract Analyst whose name appears above. An Offeror shall not contact or ask questions of the department for whom the requirement is being procured. The Contract Officer may require any and all questions be submitted in writing. Offerors are encouraged to submit written questions via electronic mail or facsimile, no later than **FIVE days** prior to the proposal due date. Any correspondence related to a solicitation should refer to the appropriate Invitation to Bid number, page and paragraph number. An envelope containing questions should be identified as such; otherwise, it may not be opened until after the official proposal due date and time. Oral interpretations or clarifications will be without legal effect. Only questions answered by a formal written amendment to the Invitation to Bid will be binding.

6. PUBLIC RECORD REQUIREMENTS

Offeror acknowledges that the City is a public agency and must comply with all Public Records laws and proposals submitted become the property of the City and are subject to public disclosure requirements in accordance with Arizona Public Records Law. Any portion of the proposal that the bidder deems confidential or proprietary must be clearly labeled as such. Labeling material does not automatically preclude the material from public disclosure, as the City is required to make an appropriate determination as to the confidentiality of the material in accordance with Arizona Public Records Law. It is the

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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offeror's sole responsibility and cost to take action, including legal actions, to protect such material. Price is not confidential and will not be withheld

7. PERMITS AND LICENSES

It is the offeror's sole responsibility to determine and secure any and all licenses and permits the contractor needs to operate the facility, from any regulatory body having jurisdiction related to the services being provided. Such costs are the exclusive responsibility of the operator, operator must also ensure appropriate licensing of any sub-contractors, operator shall notify the City in writing within two (2) working days of any suspension, revocation or renewal.

8. NO COLLUSION OR ANTI-COMPETITIVE PRACTICES

The submission of the offer did not involve collusion, and without any agreement, understanding or planned common course of action with, any other vendor of materials, supplies, equipment or services described in the invitation to bid, designed to limit independent bidding or competition or other anti-competitive practices.

9. NON-DISCRIMINATION

Contractor agrees not to discriminate against any employee or applicant for employment on the basis of race, color, religion, sex, national origin, age, marital status, sexual orientation, gender identity or expression, genetic characteristics, familial status, U.S. military veteran status or any disability. Contractor will require any Sub-contractor to be bound to the same requirements as stated within this section. Contractor, and on behalf of any subcontractors, warrants compliance with this section.

10. NO CONSIDERATIONS

The Contractor has not given, offered to give, nor intends to give at any time hereafter, any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor, meal or service to a public servant in connection with the submitted offer.

11. AUTHORIZED AGENT

The individual signing the submittal is an authorized agent and has the authority to bind the Offeror to the proposal and subsequent contract if awarded.

12. KEY PERSONNEL

If awarded, Offeror shall assign a specific individual as the key point of contact for the management of the contract, subject to specific notification requirements to be included in the final contract.

13. SITE INSPECTION

It is the responsibility of the Offeror to become familiar with any conditions which may affect the performance and cost of providing the service and this submission will serve as evidence that the Offeror did, in fact, make a site inspection and is aware of all conditions.

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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14. OFFICIAL TIME CLOCK

The official time clock used to verify the date and time an offer is received is in the online bid system.

15. DEFINITIONS For purposes of this Invitation to Bid and Resultant contract, the following definitions apply:

- a. **"City"** means the municipal corporation of the City of Glendale, Arizona
- b. **"Contract"** means the agreement for the procurement of goods, services and work.
- c. **"Contractor"** means an Offeror responding to a Invitation to Bid who has been awarded a Contract with the City.
- d. **"Invitation for Bid"** means a competitive solicitation issued by the City for the procurement of goods, services, work, materials and/or construction.
- e. **"Offer"** means a written offer to furnish goods, services, work, materials and/or construction to the City, in conformity with the standards, specifications, delivery terms and conditions, and all other requirements established in a competitive solicitation.
- f. **"Offeror"** means the business, entity or person who submits an Offer in response to a competitive solicitation.
- g. **"Public Record"** means proposals and all other documents submitted in response to this solicitation shall become the property of the City and shall be a matter of public record available for review following the Contract award.
- h. **"Purchase Order"** means a document issued by the City Procurement Office directing the Contractor to deliver goods, services, work, materials and/or construction.

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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EXHIBIT 2: SPECIAL TERMS AND CONDITIONS

By signing on the Offer/Bid page, solicitation Amendment(s), or cover letter accompanying the submittal documents, Offerors are certifying that they understand the following notices and agree to comply with all required terms and conditions. [Standard Terms and Conditions](#)

1. **TYPE OF AWARDS** The City reserves the right to make multiple awards or to award by individual line items, by group of line items, or to make an aggregate award, whichever is deemed most advantageous to the City. If the City determines that an aggregate award to one offeror is not in the City's best interest, "all or none" offers shall be rejected.
2. **ALTERNATE OFFERS** Offers submitted as alternates, or on the basis of exceptions to specific conditions of purchase and/or required specifications, must be submitted as an attachment referencing the specific paragraph number(s) and adequately defining the alternate or exception submitted. Detailed product brochures and/or technical literature, suitable for evaluation, must be submitted with the offer. If no exceptions are taken, City will expect and require complete compliance with the specifications and all Conditions of Purchase.
3. **EFFECTIVE PERIOD OF OFFER** Offers shall be valid for a minimum of 120 days following the deadline for submitting offers. If an award is not made during that period, all offers shall be automatically extended for another 120 days. Offers will be automatically renewed until such time as either an award is made or proper Notice is given to the Procurement Officer of Offeror's intent to withdraw its offer. Offers may only be withdrawn by submitting Notice at least 15 days before the expiration of the then current 120-day period.
4. **PAYMENT TERMS** If payment terms are not indicated, terms of NET 30 days shall be applied by the City. Payment terms to apply after receipt of invoice or final acceptance of the products/services, whichever is later. Payment terms offering less than 20 days for payment will not be considered.
5. **UNIT PRICE TO PREVAIL** In the event of a price disparity between the unit and extended price, the unit price shall prevail unless judged obviously in error by the City.
6. **OFFER ERRORS OMISSIONS AND CORRECTIONS** The City will not be responsible for any offeror errors or omissions. All prices and notations shall be written in ink or typed. Changes or corrections made on the offer form must be initialed in ink by the individual signing the offer. No corrections will be permitted after the offers have been opened.
7. **BRAND NAME REFERENCES AND TECHNICAL SPECIFICATIONS** Brand names or manufacturer's references shall be construed as a quality or performance level and does not indicate the item cited is mandatory. Technical specifications define the acceptable standard.
8. **RESTRICTIVE OFFER PROVISIONS** If specifications preclude an otherwise qualified offeror from submitting an offer, a written request for modification must be received by

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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the Buyer at least seven (7) calendar days prior to the proposal due date. All offerors will be notified by a written addendum to the solicitation of any approved changes.

9. **DEFAULT** In case of default by the contractor, the City may, by written notice, cancel this contract and repurchase from another source and may recover the excess costs by (1) deduction from an unpaid balance due; (2) collection against the bid and/or performance bond; or (3) a combination of the aforementioned remedies or other remedies as provided by law.
10. **TERMINATION FOR CONVENIENCE** The City reserves the right to terminate any order or contract upon thirty days written notice. The City will be responsible only for those standard items which have been delivered and accepted. If the items are unique and not saleable or useable for any other application, the City will reimburse the Seller for actual labor, material, and burden costs, plus a profit not to exceed 8%. Title to all materials, work-in-process, and completed but undelivered goods will pass to the City after costs are claimed and allowed.
11. **SUB-CONTRACTING** The contract or any portion thereof, shall not be sub-contracted without the prior written approval of the Materials Manager. No such approval will be construed as making the City a party of or to such sub-contract or subjecting the City to liability of any kind to any sub-contractor. No sub-contract shall, under any circumstances, relieve the contractor of liability and obligation under this contract; and despite any such subletting the City shall deal through the contractor. Sub-contractors will be dealt with as workmen and representatives of the contractor.
12. **SAFETY DATA SHEETS (SDS).** Contractor is to supply SDS) in accordance with Federal requirements for The Globally Harmonized System of Classification and Labeling of Chemicals (GHS). Contractor entering the City workplace with hazardous materials will supply the City with a Safety Data Sheets (SDS) covering those particular products the contractor may expose City employees or the general public to while working at the site.
13. **GENERAL INDEMNIFICATION:** Contractor shall indemnify, defend, save and hold harmless the City of Glendale and its officers, officials, agents, and employees (hereinafter referred to as "Indemnatee") from and against any and all claims, actions, liabilities, damages, losses, or expenses (including court costs, attorneys' fees, and costs of claim processing, investigation and litigation) (hereinafter referred to as "Claims") for bodily injury or personal injury (including death), or loss or damage to tangible or intangible property caused, or alleged to be caused, in whole or in part, by the negligent or willful acts or omissions of Contractor or any of its owners, officers, directors, agents, employees or subcontractors. This indemnity includes any claim or amount arising out of or recovered under the Workers' Compensation Law or arising out of the failure of such Contractor to conform to any Federal, State or local law, statute, ordinance, rule, regulation or court decree. It is the specific intention of the parties that the Indemnatee shall, in all instances, except for Claims arising solely from the negligent or willful acts or omissions of the Indemnatee, be indemnified by Contractor from and against any and all claims. It is agreed that Contractor will be responsible for primary loss investigation, defense and judgment costs where this indemnification is applicable. In consideration of

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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the award of this contract, the Contractor agrees to waive all rights of subrogation against the City, its officers, officials, agents, and employees for losses arising from the work performed by the Contractor for the City.

14. **RESPONSIBILITY FOR COMPLIANCE WITH LEGAL REQUIREMENTS** The offeror's products, services, and facilities shall be in full compliance with all applicable Federal, State, and local health, environmental, and safety laws, regulations, standards, and ordinances, regardless of whether or not they are referred to by the City.
15. **RESPONSIBILITY FOR CORRECTION** It is agreed that the offeror shall be fully responsible for making any correction, replacement, or modification necessary for specification or legal compliance. In the event of a call back, Offeror agrees to give the City first priority. Offeror agrees that if the product or service offered does not comply with the written specification, the Materials Manager has the right to cancel the sale at any time with full refund within thirty (30) calendar days after notice of noncompliance and offeror further agrees to be fully responsible for any consequential damages suffered by the City.
16. **WARRANTY** Unless otherwise specified, all items shall be guaranteed for a minimum period of one year against defects in material and workmanship. During the period, if a defect should occur, that item shall be repaired or replaced by the Seller at no obligation to the City, except where it be shown that the defect was caused by misuse and not by faulty manufacture. The offeror expressly warrants all items to be new, free from defects in design, materials, and workmanship, and to be fit and sufficient for their intended purpose. Any sample submitted shall create an expressed warranty that the whole of the goods shall conform to the sample or model.
17. **REJECTION OF OFFERS** The City reserves the right to reject any or all offers, or any part thereof; to accept any offer or any part thereof; or to waive any informalities when it is deemed to be in the City's best interest.
18. **DELAY IN EXERCISING CONTRACT REMEDY** Failure or delay by the City to exercise any right, power, or privilege shall not be deemed a waiver thereof.
19. **ORDER OF PRECEDENCE** In the event of conflict, the following precedence shall prevail: (1) Special Terms and Conditions incorporated by attachment; (2) Special Terms and Conditions; (3) Drawings and Specifications; (4) referenced documents; and (5) the Standard Terms and Conditions.
20. **CHANGES** The City reserves the right to make changes in any of the following: (a) specifications; (b) methods of shipment; (c) place of delivery; (d) time of delivery; (e) quantities. If any change causes an increase or decrease in the cost of or the time required for performance, an equitable adjustment may be made in the price or delivery schedule, or both. Any claim for adjustment shall be deemed waived unless asserted in writing within thirty days from receipt of the change. Price increases or extensions of delivery time shall not be binding on the City unless in writing and approved by the Materials Manager prior to the institution of the change.

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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21. **PRICE ADJUSTMENTS** Price adjustments shall be addressed a minimum of ninety (90) days prior to the contract renewal date, shall be in writing and include supportive justification for the proposed increase. Supportive justification means that the request shall include detailed information and calculations that make it clear how the claimed increase has an impact on the contract unit prices. The requested price increase must be based upon a cost increase that was clearly unpredictable at the time of the offer and can be shown to directly affect price of the item concerned. The rate increase shall only be considered at time of contract extension. The City will review the request and shall determine if the increase shall be granted or if an alternate option is in the best interest of the City. The price increase adjustment, if approved, will be effective and executed via a contract amendment.
22. **LATE SUBMISSION OF CLAIM** The City will not honor any invoices or claims which are tendered one year after the last item of the account accrued.
23. **PROTEST OF AWARD** Any person who has an objection to the awarding of a solicitation by the City, pursuant to competitive solicitation procedures, shall lodge that protest, in writing, with the Materials Manager. The protest should specifically identify the objection to the award, pursuant to the formal purchase procedure. The protest must be submitted no later than seven (7) calendar days after the notice of intent to award is posted on the City's Procurement Internet home page at:
https://www.glendaleaz.com/your_government/city_finances/procurement/notice_of_intent_to_award.
 Untimely protests will not be considered.
24. **REMEDIES** City shall have, in addition to the remedies provided herein, all remedies afforded by the Uniform Commercial Code as adopted by the State of Arizona. Contractor shall have, subject to the limitation imposed by the terms of this agreement, all remedies afforded by the Uniform Commercial Code as adopted by the State of Arizona.
25. **ASSIGNMENT** Neither an order nor monies due thereunder shall be assigned in whole or in part without the City's prior written consent.
26. **ADDENDA** Any change to the solicitation will be in the form of a numbered addendum issued by the Procurement Division. The addendum will be furnished to all who received the solicitation. The City will not be responsible for any oral or written instructions made by any employees, officers, contracted consultant or agent of the City in regard to the solicitation. The City will not be responsible for offerors adjusting their offer based on oral or written instructions.
27. **SPECIAL ACCOMMODATIONS** Please contact Procurement at 930-2862 at least 3 days prior to the meeting for special accommodation. Hearing impaired persons, please use the Arizona Relay Service (1-800-367-8939).

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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28. **OFFER IDENTIFICATION** The City is not responsible for the pre-opening of, post-opening of, or the failure to open, an offer not properly addressed or identified.
29. **OFFER TABULATION** An electronic copy of the scoring may be requested by e-mailing the Procurement office at procurement@glendaleaz.com and referencing the solicitation title and number. The information will be available for distribution when the City has completed its evaluation process of the offers received.
30. **LIABILITY** Except for the sole negligence of the City, its officers, managers, employees, or agents, Contractor shall be liable to the City for any physical damage to City property or for the death of, or personal injury to, City personnel arising out of Contractor's occupancy, maintenance, repair, replacement, installation and/or any other work performed pursuant to the contract. Contractor agrees to indemnify, defend and hold the City harmless from any claim or loss arising from such damage or injury.
31. **OSHA GUIDELINES** The contractor shall be familiar with and operate within the guidelines set forth by the Occupational Safety and Health Act.
32. **PATENTS** Seller agrees to defend City at seller's own expense, in all suit, actions, or proceedings in which City is made a defendant for actual or alleged infringement of any United States of America or foreign letters patent resulting from City's use of the goods purchased as a result of this IFB. Seller further agrees to pay and discharge any and all judgments or decrees, which may be rendered in any such suit, action or proceedings against City. Seller agrees to indemnify and hold harmless the City from any and all license, royalty and proprietary fees or costs, including legal costs, which may arise out of City's purchase and use of goods supplied by the seller. It is expressly agreed by seller, that these covenants are irrevocable and perpetual.
33. **VENDOR PERFORMANCE** Prior offeror performance in regard to product, service, or representation of/from the offeror may be used in evaluation of this offer. Unsatisfactory performance to the City may be considered sufficient grounds for rejection of this offer. No offer will be awarded to any offeror who is in default on any contract with the City.
34. **PERFORMANCE SURETY REQUIREMENTS** The performance sureties shall be in the form of a bond, cashier's check, certified check or money order. Personal or company checks are not acceptable unless certified. Letters of credit are not acceptable. Individual sureties are not acceptable.

PERFORMANCE SURETY The successful proposer shall, at the time of entering into the contract, furnish a performance surety in the form of a bond, money order or certified or cashier's check, in the amount of 10 percent of the contract amount guaranteeing the faithful performance of the contract by the proposer.

If a bond is submitted, it shall be written on the form provided by the City as an attachment to the proposal documents. The attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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power of attorney. The bond must be written by a surety with a Best Rating no less than an A and must be authorized and licensed to do business in this State by the Arizona Department of Insurance. Individual sureties and letters of credit are not acceptable.

35. **FUND APPROPRIATION CONTINGENCY** The Contractor and the City recognize that the continuation of any contract after the close of any given fiscal year of the City, which ends on June 30, shall be subject to the approval of the budget of the City providing the contract item is an expenditure therein. The City does not guarantee that the budget item will be actually adopted, as it is the determination of the City Council at the time of the adoption of the budget.
36. **NOTIFICATION OF AWARD** The successful offeror(s) will be notified that their offer has been accepted by the City Council as recommended for award.
37. **NON-EXCLUSIVITY** The City, in its sole discretion, reserves the right to request the materials or services set forth herein from other sources when deemed necessary and appropriate. No exclusive rights are included in this Agreement.
38. **COOPERATIVE USE OF CONTRACT** This agreement may be extended for use by other governmental agencies and political subdivisions of the State. Any such usage by other entities must be in accord with the ordinances, charter, rules and regulations of the respective entity and the approval of the Contractor and City. For a list of SAVE members, click on the following link: <http://www.mesaaz.gov/business/purchasing/save>
39. **PROHIBITIONS** - Contractor, and on behalf any subcontractor, certifies, to the extent applicable under A.R.S. §§ 35-391 *et seq* and 35-393 *et seq*, that neither has "scrutinized" business operations, as defined in the proceeding statutes, in the countries of Sudan or Iran.
40. **IMMIGRATION LAW COMPLIANCE** Contractor, and on behalf any subcontractor, warrants, to the extent applicable under A.R.S. § 41-4401, compliance with all federal immigration laws and regulations that relate to their employees as well as compliance with A.R.S. § 23-214(A) which requires registration and participation with the E-Verify Program. Any breach of warranty described above is considered a material breach of this Agreement and is subject to penalties up to and including termination of this Agreement. City of Glendale ("City") retains the legal right to inspect the papers of Contractor or subcontractor employee who performs work under this Agreement to ensure that Contractor or any subcontractor is compliant with the warranty described above. City may conduct random inspections, and upon request of the City, Contractor shall provide copies of papers and records demonstrating continued compliance with the warranty described above. Contractor agrees to keep papers and records available for inspection by the City during normal business hours and will cooperate with City in exercise of its statutory duties and not deny access to its business premises or applicable papers or records for the purposes of enforcement of this Section. Contractor agrees to incorporate into any subcontracts under this Agreement the same obligations

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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imposed upon itself and expressly accrue those obligations directly to the benefit of the City. Contractor also agrees to require any subcontractor to incorporate into each of its own subcontracts under this Agreement the same obligations above and expressly accrue those obligations to the benefit of the City. Contractor's warranty and obligations under this Section I to the City is continuing throughout the term of this Agreement or until such time as the City determines, in its sole discretion, that Arizona law has been modified in that compliance with this section is no longer a requirement. The "E-Verify Program" above means the employment verification program administered by the United States Department of Homeland Security, the Social Security Administration, or any successor program.

41. CONTRACT ADMINISTRATOR The staff member identified as the Contract Administrator for a solicitation serves as the liaison between Procurement, the city and the successful contractor. The Contract Administrator manages the contract, overseeing the daily operations, scheduling, performance and compliance of the agreement by all parties. The Contract Administrator is responsible for:

- a. Establishing and maintaining records and documentation
- b. Monitoring the contractor's performance
- c. Handling issues and disputes
- d. Exercising extension options
- e. Initiating contract modifications
- f. Initiating rebids or new solicitations

42. FORCE MAJEURE

a. Except for payment of sums due, neither party shall be liable to the other nor deemed in default under this contract if and to the extent that such party's performance of this Contract is prevented by reason of force majeure. The term "force majeure" means an occurrence that is beyond the control of the part affected and occurs without its fault or negligence. Without limiting the foregoing, force majeure includes acts of God; acts of the public enemy; war; riots; strikes; mobilization; labor disputes; civil disorders, fire; flood; lockouts; injunctions-interventions-acts; or failures or refusals to act by government authority; and other similar occurrences beyond the control of the party declaring force majeure which such party is unable to prevent by exercising reasonable diligence.

b. Force majeure shall not include the following circumstances:

- i. Late delivery of equipment or materials caused by congestion at a manufacturer's plant or elsewhere, or an oversold condition of the market.
- ii. Late performance by a subcontractor unless the delay arises out of a force majeure occurrence in accordance with this force majeure term and condition; or
- iii. Inability of either the Contractor or any subcontractor to acquire or maintain any required insurance, bonds, licenses or permits.

43. SUSPENSION AND DEBARMENT (APPLIES TO ALL PURCHASES.)

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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- a. This contract is a covered transaction for purposes of 2 CFR pt. 180 and 2 CFR pt. 3000. As such, the Contractor is required to verify that none of Contractor's principals (defined at 2 CFR § 180.995) or its affiliates (defined at 2 CFR § 180.905) are excluded (defined at 2 CFR § 180.940) or disqualified (defined at 2 CFR § 180.935).
- b. The Contractor must comply with 2 CFR pt. 180, subpart C and 2 CFR pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.
- c. This certification is a material representation of fact relied upon by the City of Glendale. If it is later determined that the contractor did not comply with 2 CFR pt. 180, subpart C and 2 CFR pt. 3000, subpart C, in addition to remedies available to the City, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.
- d. The Contractor agrees to comply with the requirements of 2 CFR pt. 180, subpart C and 2 CFR pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The Contractor further agrees to include a provision requiring such compliance in its lower tier covered transactions.

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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EXHIBIT 3: Insurance Requirements

By signing on the Offer/Bid page, solicitation Amendment(s), or cover letter accompanying the submittal documents, Offerors are certifying that they understand the following notices and agree to comply with all required terms and conditions.

1) INSURANCE REQUIREMENTS. OFFEROR shall procure and maintain until all their obligations have been discharged, insurance against claims for injury to persons or damage to property that may arise from or in connection with this Solicitation. The *insurance requirements* herein are minimum requirements for this Solicitation and in no way limit the indemnity covenants contained herein. The City of Glendale in no way warrants that the minimum limits contained herein is sufficient to protect the OFFEROR from liabilities that might arise. OFFEROR is free to purchase such additional insurance as OFFEROR determines necessary.

a) **Minimum Scope and Limits of Insurance:** OFFEROR shall provide coverage with limits of liability not less than those stated below.

i) **Commercial General Liability – Occurrence Form**

Policy shall include bodily injury, property damage, personal and advertising injury and broad form contractual liability coverage.

General Aggregate	\$2,000,000
Products – Completed Operations Aggregate	\$1,000,000
Personal and Advertising Injury	\$1,000,000
Each Occurrence	\$1,000,000

(1) The policy shall be endorsed to include the following additional insured language: ***“The City of Glendale, and its departments, officers, officials, agents, employees and volunteers shall be named as additional insureds with respect to liability arising out of the solicitation.*** Such additional insured shall be covered to the full limits of liability purchased by the OFFEROR, even if those limits of liability are in excess of those required herein.

(2) Policy shall contain a waiver of subrogation endorsement in favor of the **“City of Glendale, and its departments, officers, officials, agents, employees and volunteers”**. This provision applies regardless of whether or not the City of Glendale has received a waiver of subrogation endorsement from the insurer.

ii) **Business Automobile Liability –**

Bodily Injury and Property Damage for any owned, hired, and/or non-owned vehicles used in the performance of this Agreement. Combined Single Limit (CSL) \$1,000,000.

(1) The policy shall be endorsed to include the following additional insured language: ***“The City of Glendale, and its departments, officers, officials, agents, employees and volunteers shall be named as additional insureds with respect to***

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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liability arising out of the activities performed by or on behalf of the OFFEROR, involving automobiles owned, Licensed, hired or borrowed by the OFFEROR." Such additional insured shall be covered to the full limits of liability purchased by the OFFEROR, even if those limits of liability are in excess of those required by this License.

- (2) Policy shall contain a waiver of subrogation endorsement in favor of the "City of Glendale, and its departments, officers, officials, agents, employees and volunteers" for losses arising from work performed by or on behalf of the OFFEROR. This provision applies regardless of whether or not the City of Glendale has received a waiver of subrogation endorsement from the insurer.

iii) Worker's Compensation and Employers' Liability

Workers' Compensation Statutory

Employers' Liability

Each Accident	\$1,000,000
Disease – Each Employee	\$1,000,000
Disease – Policy Limit	\$1,000,000

- (1) Policy shall contain a waiver of subrogation endorsement in favor of the "**City of Glendale, and its departments, officers, officials, agents, employees and volunteers**" for losses arising from OFFEROR activities. This provision applies regardless of whether or not the City of Glendale has received a waiver of subrogation endorsement from the insurer.

iv) Additional Insurance Requirements: The policies shall include, or be endorsed to include the following provisions:

- (1) Policies must stipulate that the insurance afforded by the organization must be primary insurance and that any insurance carried by the City of Glendale must be excess and not contributory insurance.
- (2) Coverage provided by the organization must not be limited to the liability assumed under the indemnification provisions of the license or contract.
- (3) If the Vendor maintains broader coverage and/or higher limits than the minimum shown, the City requires and shall be entitled to the broader coverage and/or the higher limits maintained by the Vendor. Any available insurance proceeds in excess of the specified minimum of insurance and coverage must be available to the City.
- (4) Vendor must require and verify that all subcontractors (subconsultants) maintain insurance meeting all the requirements stated herein, and Vendor shall ensure that City is an additional insured on insurance required from subcontractors (subconsultants).
- (5) If the Vendor is awarded the solicitation, the Vendor must furnish the City with original Certificates of Insurance including all required amendatory endorsements before the work begins. However, failure to obtain the required documents prior to the work beginning

	City of Glendale Solicitation Number: IFB 24-54 /42400072 TRAFFIC OPERATIONS EQUIPMENT EXHIBITS PACKAGE	CITY OF GLENDALE Procurement Division 5970 West Brown Street, Suite 210 Glendale, Arizona 85302
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shall not waive the Vendor's obligation to provide them. The City reserves the right to require complete, certified copies of all required insurance policies including endorsements required by these specifications, at any time.

EXHIBIT B
TRAFFIC OPERATIONS EQUIPMENT
COMPENSATION

METHOD AND AMOUNT OF COMPENSATION

The method of payment is provided in Section 4 of this Agreement. The amount of compensation and unit prices charged by the Contractor is provided in the attached IFB 24-54 bid response.

NOT-TO-EXCEED AMOUNT

The total amount of compensation paid to Contractor for full completion of all work required by the Project during the entire term of the Project must not exceed \$1,000,000.

DETAILED PROJECT COMPENSATION

Per attached IFB 24-54 bid response.

City of Glendale									
IFB 24-33 Traffic Operations Equipment									
TRAFFIC SIGNAL CONTROLS PRICING WORKBOOK									
Contractor must complete the Pricing Workbook below Any items not clearly listed on the Contractors submitted price proposal will be considered included in the Contractors price at no additional cost to the City. All pricing must contemplate compliance with the performance requirements as secified in the Scope of Work.									
Instructions: Offerors shall submit pricing, brand names and product number as completely as possible in the Core Products List below.									
Equipment Category	Item No.	Item Description	Unit of Measure	Annual Estimated Quantity (A)	Unit Price (B)	Extended Price (A X B)	Requested Brand Name	Brand Name Offered	Product No.
Traffic Signal	20	Malfunction Monitor Unit (MMU)	EACH	5	\$ 1,084.00	\$ 5,420.00	EDI	EDI	
Traffic Signal	21	TS2 Bus Interface Unit (BIU)	EACH	40	\$ 272.00	\$ 10,880.00	EDI	EDI	
Traffic Signal	101	1 Camera Video Detection System	EACH	16	\$ 10,109.00	\$ 161,744.00	Valmont	NoTraffic	
Traffic Signal	102	2 Camera Video Detection System	EACH	1	\$ 13,462.00	\$ 13,462.00	Wavetronix	NoTraffic	
Traffic Signal	103	3 Camera Video Detection System	EACH	1	\$ 17,207.00	\$ 17,207.00	MioVision	NoTraffic	
Traffic Signal	104	4 Camera Video Detection System	EACH	1	\$ 20,769.00	\$ 20,769.00	MioVision	NoTraffic	

City of Glendale						
Traffic Engineering and Operations Equipment						
Discount Off of Catalog Products List						
Instructions: Offerors shall also submit Discounts Off of their Catalog Products List for products which are NOT included in the City's Core Products List. Offerors shall submit copies of their published catalogs (which contains the manufacturer's suggested retail price (MSRP) or catalog prices, description, brand name, make and model of each product) with their proposal.						
Equipment Category		Category Description	Discount %	Catalog No. or Price List No.	Catalog or Price List Publication Date	Catalog Page Nos. Covered Under Discount %
ITS EQUIPMENT		ITS Equipment (Includes but not limited to, CCTV cameras, field switches, disbrubition switches, router, etc.)	%		/ /	
TRAFFIC SIGNAL EQUIPMENT		Traffic Signal Equipment (Includes but not limited to, cabinets, controllers, pull boxes, signal heads, signal poles and mast arms, etc.)	%		/ /	
ENGINEERING		Engineering Equipment (Includes but not limited to, school zone flashers, solar powered feed back signs, etc.)	%		/ /	
DISCOUNT PAYMENT TERMS: The City standard is 2% 20 days						
Comply:		☐ YES ☒ NO				
If your answer is NO, please state terms offered: Net30						
PAYMENT: The Contractor must provide monthly statemnts of itemized services. Payment will be reviewed and approved by the Contract Administrator or designee. The itemized statement must not exceed the proposal fee in this Section.						
Tax Amount: DO NOT include any use tax or federal tax in your proposal.						
OFFEROR NAME (Offeror must enter full company name): Traffic Signal Controls, Inc.						