TXShare
Your Public Sector Solutions Center

REQUEST FOR PROPOSALS
For
Advanced Traffic Signal Controller Systems
RFP # 2023-092

Sealed proposals will be accepted until **2:00 PM CT, Monday, November 6, 2023** and then publicly opened and read aloud thereafter.

Texas Highway Products, LTD.
Legal Name of Proposing Firm

Giovanni de Vivo — President
Contact Person — Title

(817) 709-3305 — gdevivo@trafficsignals.com
Telephone Number — E-Mail Address

1309 Clark st. — Round Rock, TX — 78681
Street Address of Principal Place of Business — City/State — Zip

1309 Clark st. — Round Rock, TX — 78681
Complete Mailing Address — City/State — Zip

Acknowledgment of Addenda: #1_____ #2 _____ #3 _____ #4 _____ #5 _____

By signing below, you hereby certify that the information contained in this proposal and any attachments is true and correct, and may be viewed as an accurate representation of proposed services to be provided by this organization. You agree that failure to submit all requested information may result in rejection of your company's proposal as non-responsive. You certify that no employee, board member, or agent of the North Central Texas Council of Governments has assisted in the preparation of this proposal. You acknowledge that you have read and understand the requirements and provisions of this solicitation and that the organization will comply with the regulations and other applicable local, state, and federal regulations and directives in the implementation of this contract. And furthermore that I certify that I am legally authorized to sign this offer and to submit it to the North Central Texas Council of Governments, on behalf of said offeror by authority of its governing body.

Giovanni de Vivo
Authorized Signature

TAB A – COVER SHEET

11/5/23

Craigan Johnson
Senior Purchasing Manager
North Central Texas Council of Governments
616 Six Flags Drive
Arlington, TX 76011

Dear Craigan Johnson:

I am writing on behalf of Texas Highway Products to formally submit our proposal in response to the RFP 2023-092, concerning the Advanced Traffic Controller Systems. We have meticulously reviewed the specifications and requirements outlined in the RFP documents and are excited about the opportunity to collaborate with TXShare and NCTCOG.

Over the past 30 years, Texas Highway Products has accumulated a wealth of experience in Traffic Industry by providing top tier solutions in Texas to manage our roadways. We believe that our expertise, combined with our commitment to innovation and excellence, aligns perfectly with the goals and objectives of NCTCOG and their TXShare program.

Key highlights of our proposal include:

Proven Solutions: Our approach is rooted in understanding the unique challenges and requirements of furnishing the specialized equipment that is required to optimize our roadway networks. The solutions we will providing are already in use by various Participating Entities in the TXShare program and we look forward to expanding.

Training & Support: We recognize the importance of not just delivering the solution but also ensuring that the teams involved are well-equipped to utilize it to its maximum potential. Hence, our proposal incorporates comprehensive training, both in-person and virtual, tailored to different user groups.

Future-Proof Design: In line with the RFP's emphasis on future upgrades and scalability, our solution is designed to be agile, accommodating future technological advancements and

changes in traffic management paradigms as well as utilizing the latest technologies for futureproofing.

Compliance & Standards: We adhere strictly to industry standards, ensuring that our solutions are compliant with protocols such as NTCIP 1202 v03 and NTCIP 1211 v02.

Dedicated Support Team: Our commitment to TXShare Participating Entities extends beyond the initial delivery. We have a dedicated team ready to assist with any post-deployment issues, software upgrades, or additional training.

In closing, we are enthusiastic about the possibility of working closely with TXShare Participating Entities and NCTCOG on this endeavor. Our team has undertaken a detailed analysis of the RFP and is prepared to discuss our proposal in depth, address any queries, and make any necessary adjustments to ensure a successful partnership.

Please find attached our detailed proposal, references, and other requested documentation. We look forward to the opportunity to present our proposal in person and further discuss how Texas Highway Products can contribute to the success of the TXShare Program and all its partners.

Thank you for considering our submission. We are optimistic about the potential of this collaboration and await your feedback.

Warm Regards,

Sincerely,

Giovanni de Vivo
President
Texas Highway Products

Summary of Qualifications

Company Overview:

- Founded in 1998, Texas Highway Products has been at the forefront of technology in the Traffic Industry, serving a diverse range of clients across the state of Texas and Oklahoma.
- Our mission is to deliver efficient and innovative traffic solutions that enhance safety and reduce congestion while providing value for our partners and citizens.

Industry Experience:

- Over 25 years of experience in designing, implementing, and maintaining advanced traffic controller systems.
- Successfully completed numerous projects that deploy the technologies outlined in this RFP.
    - **Dallas**: City-wide ATC controller deployment (1400+ controllers)
    - **Fort Worth**: City-wide ATC controller deployment (1000+ controllers) and Advanced Traffic Management System (MaxView)
    - **Irving**: City-wide ATC controller deployment (200+ controllers) and Advanced Traffic Management System (MaxView and Kinetic Signals)
    - **Garland**: City-wide ATC controller deployment (100+ controllers)
    - **Richardson**: City-wide ATC controller deployment (130+ controllers) and Advanced Traffic Management System (Kinetic Signals)
    - **McKinney**: City-wide ATC controller deployment (70+ controllers)
    - **Coppell**: City-wide ATC controller deployment (35+ controllers) and Advanced Traffic Management System (Kinetic Signals)
    - **San Antonio:** City-wide ATC controller deployment (1000+ intersections)
    - **TxDOT Childress, Odessa, Laredo, Amarillo, Lubbock and San Angelo:** 300+ ATC Controllers

Technological Expertise:

- Proficiency in Relevant Technologies/Standards, e.g., NTCIP 1202 v03, NTCIP 1211 v02
- State-of-the-art virtual controller applications compatible with both web-based and windows-based platforms – Q-Free MaxTime for Windows.

- Knowledge of different cabinet environments such as NEMA TS-2, TS-1, ITS and ATCC
- Knowledge of traffic concepts (i.e.: phasing, offsets, splits, cycles, etc).
- Knowledge of various provider's local softwares such as Cubic's SCOUT, Yunex's SEPAC, Econolite's EOS and Q-Free's MaxTime.
- Knowledge of Advanced Traffic Management Systems such as MaxView and Kinetic Signals.
- Knowledge of cloud environments used to deploy highly available traffic solutions.

Training and Support:

- Comprehensive training programs tailored to various audiences, including traffic operations engineers, management center staff, and maintenance staff.
- Dedicated support team available for real-time troubleshooting, software updates, and user training.
- IMSA certified technicians

TAB B – EXECUTIVE SUMMARY

Texas Highway Products (THP) proudly brings forward a quarter-century legacy in the Traffic Industry in Texas, standing as a beacon of technological advancement and innovation. Our approach to the TXShare RFP is deeply rooted in our longstanding commitment to equip the state with state-of-the-art solutions, sourced from the most esteemed companies in the industry. This dedication to excellence has fortified our position as a trusted provider, leading to significant collaborations through cooperative contracts, including but not limited to, TXSmartBuy, BuyBoard, and HGAC.

A partnership with TXShare would be a seamless extension of our current operations, given that many Participating Agencies under TXShare are already beneficiaries of our trusted services and products. This existing relationship presents an invaluable advantage – ensuring smooth integration, familiarity, and a reduction in the learning curve for these agencies. The ease of access to products and services they are accustomed to can significantly streamline the operational processes, leading to enhanced efficiency.

Moreover, our expertise aligns perfectly with the services delineated in this RFP. Our experience, not just in providing equipment but also in rendering high-quality services, aligns congruently with the expectations and requirements of this proposal. We are poised to leverage our extensive industry knowledge, client relationships, and unparalleled technical expertise to meet and exceed the objectives of this RFP, further reinforcing our commitment to drive innovation and excellence in Texas.

TAB C – KEY PERSONNEL

At Texas Highway Products, we believe that our team is the foundation of our success. We have meticulously selected individuals who not only bring unique expertise but also share our commitment to excellence. Here are the key personnel that will be involved in the delivery of goods or services under this RFP:

1. Management Team:

Darold Cherry
Position: CEO
Email: dcherry@trafficsignals.com
Phone: 512-656-8851

Giovanni de Vivo
Position: President
Email: gdevivo@trafficsignals.com
Phone: 817-709-3305

Sharon Campbell
Position: COO
Email: sharon@trafficsignals.com
Phone: 214-693-0670

How does the Management Team interface with NCTCOG and Participating Entities?
The management team will be the primary point of contact for NCTCOG for nay contractual, administrative or other matters. We are the team responsible for issuing pricing and formally represent Texas Highway Products.

2. Sales & Support Team Members:

Tim Morehead
Position: Regional Sales Manager and Technical Support – South Region
Email: tmorehead@trafficsignals.com
Phone: 832-374-0783

Shawn Gould
Position: Regional Sales Manager and Technical Support – North Region
Email: sgould@trafficsignals.com
Phone: 469-216-9729

Robert Castillo
Position: Regional Sales Manager and Technical Support – Central Region
Email: rcastillo@trafficsignals.com
Phone: 512-633-5585

How does the Sales & Support Team interface with NCTCOG and Participating Entities?

Sales & Support Team Members are the primary point of contact for NCTCOG and Participating Entities. These Team Members will be regularly in touch to devise solutions for the Participating Agencies based on the products available through this contract. They will also act as the first layer of Technical Support and will be responsible for fielding requests from Participating Entities.

3. Purchasing, Operations and RMA Team

Mark Camp
Position: Purchasing and Operations
Email: mcamp@trafficsignals.com
Phone: 512-255-7633

TJ Foster
Position: RMA/Technician
Email: rma@trafficsignals.com
Phone: 512-255-7633

How does Purchasing, Operations and RMA Team interface with NCTCOG and Participating Entities?

These team members are responsible for order intake, shipping and logistical procedures for RMAs. They will be in touch with Participating Entities to field requests for shipping, delivery and proper documentation.

4. Finances and Estimating

Ray Mendoza
Position: General Manager and Finances
Email: rmendoza@trafficsignals.com
Phone: 512-255-7633

Xavier Martinez
Position: Senior Estimator
Email: xmartinez@trafficsignals.com
Phone: 512-255-7633

Rachel Hood
Position: Estimator
Email: rachel@trafficsignals.com
Phone: 512-255-7633

How does the Finance and Estimating Team interface with NCTCOG and Participating Entities?

This team's primary role is to provide quotes based on pricing through the TXShare Program and invoicing. If there are any questions or concerns regarding any invoices, they would be the primary point of contact.

Subcontractors and Third-Party Services:

We understand the importance of transparency and will be working in conjunction with the following third-party entities:

Q-Free

Services Provided: Manufacturer of ATC controllers and developers of Advanced Traffic Management Software and Local Controller Software.

Email: jeff.peterson@q-free.com

Phone: 214-543-1724

How does the Q-Free Team interface with NCTCOG and Participating Entities?

Q-Free lends support on technical and manufacturing requests. They may accompany Texas Highway Products to support and train Participating Entities.

TAB D – TECHNICAL PROPOSAL

1- Description of the services for which the proposer is able to provide.

Texas Highway Products is proposing to provide Advanced Traffic Signal Controller Software and Hardware that conforms to the specifications provided by NCTCOG under the following bid items:

- Bid Item #1: Software Solutions.
- Bid Item #2: Hardware Solutions.
- Bid Item #3: Services not anticipated.

Currently, our software and hardware complies with all specifications set forward by NCTCOG and are actively being used by Participating Entities is the Dallas-Fort Worth region and elsewhere in the state of Texas.

Our proposed solutions can be used piecemeal so that they can integrate with other systems or turn-key and are able to function on all different types of cabinets referenced in this RFP such as NEMA TS-1, NEMA TS-2, ITS, ATCC and Caltrans style (33x).

Our services and solutions are being used by major metro area such as Dallas, Fort Worth and San Antonio and have a proven track record of delivering reliable solutions for traffic. The way these solutions are delivered is two-fold:

Hardware: We provide three major types of controllers.

- NEMA: Q-Free XN-1 & XN-2
- Caltrans style: 2070LDX

These hardware solutions are highly flexible and the NEMA variants can run in any type of cabinet. Most Participating Entities have already settled on a specific cabinet environment and we have been confirmed independently by these agencies to operate in their environments.

Software: Our software come has been designed by traffic engineers for traffic engineers and it is built on a platform based on a rich set of industry standards including NTCIP, NEMA, MUTCD, and FHWA. With a web server built-in, all operations and management can be completed through a web browser without the need for special software on a computer, laptop, or mobile device. All of these features enable the following benefits:

- Operate standard signal timing with ease.
- Faster integration with 3rd party controllers and run multiple applications using ATC API
- Expand traffic control functionality with the intuitive user interface and menu structure.
- Manage devices remotely with built-in Web-based app for centrally scheduling software updates for all intersections – no app required.
- Reduce maintenance costs and boost interoperability with third parties and smart city applications using Q-Free's publicly available MIBs.

Additionally, MaxTime Adaptive can automatically adjusts traffic signal timing in response to demand, optimizing the traveler experience while improving road and travel safety. Contrary to black-box solutions, Q-Free's local MAXTIME adaptive solution utilizes widely-accepted algorithms developed jointly by Purdue University, Indiana, and Utah DOT.

Services not anticipated: Texas Highway Products can provide an app driven, cloud-based platform for delivering additional functionality without the need for additional hardware. These services encompass but are not limited to the following applications:

- Wrong-way driving
- ATSPMs
- Adaptive systems
- Connected Vehicle applications
- Vehicle detection
- Vehicle preemption
- Transit Signal Priority
- Near miss studies
- Red Light Running Awareness

All these applications are delivered through the NoTraffic Platform which is a combination of video and radar hardware, Artificial Intelligence and Cloud-based processing. This platform is already being used by Participating Entities in North Texas as well as the rest of the State.

2- Description of the Proposer's process for responding to an order for product.

Texas Highway Products processes all orders received within 24-48 hours of receipt. All orders should be sent to mcamp@trafficsignals.com, estimating@trafficsignals.com and gdevivo@trafficsignals.com. Upon processing of the order an order confirmation email will be sent to the Participating Entity along with an Order Confirmation PDF. The Participating Entity at this time has the opportunity to review the Order Confirmation. Any issues with the processing of the order can be brought up to our attention and we will promptly address it. Additionally, we reach out to the manufacturer and request lead-times which are also communicated to Participating Agencies.

3- Description of Proposer's process for delivering orders to respective clients.

Texas Highway Products has different delivery procedures depending on what the client is ordering.

Software orders: These types of orders are typically delivered digitally. Depending on what software the client is ordering it may be as simple as downloading from a secure online location, or Texas Highway Products would send staff on-premise to deliver and deploy the software.

Hardware orders: These types of orders can be delivered one of two ways:

- **Drop-ship**: These orders typically require no assembly and can be sent from the manufacturer directly to the client.
- **Shipped from THP warehouse**: Items including Cabinets and other assemblies which require testing and burn-in procedures before delivery.

Our Operations Team will also coordinate with the Participating Agency to work out logistics that are part of the client's processes such as calling ahead of delivery, lift-gate access, etc.

4- Description of the Proposer's customer satisfaction services, to include any warranty and/or repair capabilities.

Texas Highway Products has staff throughout the State of Texas to interface directly with Participating agencies. This team is highly capable and trained on providing Technical Support with all products, services and solutions that we offer. Most times, we can complete service calls on-site. If any situations arise that require equipment to be repaired off-site, we would typically provide a "hot-swap" so that the client does not incur any downtime while the equipment is being repaired. These items are issued an RMA number which we will provide to the client for tracking of their support or repair ticket. In-warranty items are repaired at no cost to the client. Out of warranty work is quoted to the client for approval prior to repair. If client chooses not to repair we can return the equipment or dispose of it at the client's request.

For software items, we can handle a lot of these service calls virtually or on-site.

5- Description of the proposer's invoicing process.

Texas Highway Products invoices customers when we have confirmation that the order was delivered to the customer. The invoice is emailed based on the participating agency's contact information based on their purchase order and our accounting systems. All invoicing terms are NET30 by default. ACH payment is preferred.

6- Any assumptions made in responding to requirements.

Texas Highway Products has made no assumptions in responding to the requirements.

7- Any exceptions to the requirements.

Texas Highway Products takes no exceptions to any part of this RFP.

8- Any special features or services the Proposer is proposing in response to the requirements that are included within the pricing provided.

We are additionally proposing multiple services to future-proof the contract given the advent of CV technology and regional monitoring capabilities. With that in mind we are submitting the NoTraffic Cloud Platform for features such as:

- Connected Vehicle RSU
- Wrong-way driving
- Ped detection and actuation
- Virtual BSM for non-cvs
- CV based preemption
- Vehicle detection
- Transit Signal Priority

Also, we are submitting adaptive cycle and coordination capabilities from Q-Free along with their ATMS software solution which can also be deployed on the cloud.

ATTACHMENT I:
INSTRUCTIONS FOR PROPOSALS COMPLIANCE AND SUBMITTAL

Compliance with the Solicitation

Submissions must be in strict compliance with this solicitation. Failure to comply with all provisions of the solicitation may result in disqualification.

Acknowledgment of Insurance Requirements

By signing its submission, Offeror acknowledges that it has read and understands the insurance requirements for the submission. Offeror also understands that the evidence of required insurance may be requested to be submitted within ten (10) working days following notification of its offer being accepted; otherwise, NCTCOG may rescind its acceptance of the Offeror's proposals. The insurance requirements are outlined in Section 6.04.

Name of Organization/Contractor(s):

Texas Highway Products

Signature of Authorized Representative:

Gianni deVivo

Date: 10/5/2023

ATTACHMENT II:
CERTIFICATIONS OF OFFEROR

I hereby certify that the information contained in this proposal and any attachments is true and correct and may be viewed as an accurate representation of proposed services to be provided by this organization. I certify that no employee, board member, or agent of the North Central Texas Council of Governments has assisted in the preparation of this proposal. I acknowledge that I have read and understand the requirements and provisions of the solicitation and that the organization will comply with the regulations and other applicable local, state, and federal regulations and directives in the implementation of this contract.

I also certify that I have read and understood all sections of this solicitation and will comply with all the terms and conditions as stated; and furthermore that I, (typed or printed name) certify that I am the President (title) of the corporation, partnership, or sole proprietorship, or other eligible entity named as offeror and respondent herein and that I am legally authorized to sign this offer and to submit it to the North Central Texas Council of Governments, on behalf of said offeror by authority of its governing body.

Name of Organization/Contractor(s):

Texas Highway Products

Signature of Authorized Representative:

Giovanni deVivo

Date: 10/5/2023

ATTACHMENT III:
CERTIFICATION REGARDING DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS

This certification is required by the Federal Regulations Implementing Executive Order 12549, Debarment and Suspension, 45 CFR Part 93, Government-wide Debarment and Suspension, for the Department of Agriculture (7 CFR Part 3017), Department of Labor (29 CFR Part 98), Department of Education (34 CFR Parts 85, 668, 682), Department of Health and Human Services (45 CFR Part 76).

The undersigned certifies, to the best of his or her knowledge and belief, that both it and its principals:

1. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency;

2. Have not within a three-year period preceding this contract been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or Local) transaction or contract under a public transaction, violation of federal or State antitrust statues or commission of embezzlement, theft, forgery, bribery, falsification, or destruction of records, making false Proposals, or receiving stolen property;

3. Are not presently indicated for or otherwise criminally or civilly charged by a government entity with commission of any of the offense enumerated in Paragraph (2) of this certification; and,

4. Have not within a three-year period preceding this contract had one or more public transactions terminated for cause or default.

Where the prospective recipient of federal assistance funds is unable to certify to any of the qualifications in this certification, such prospective recipient shall attach an explanation to this certification form.

Name of Organization/Contractor(s):

Texas Highway Products

Signature of Authorized Representative:

Giovanni de Vivo.-

Date: 10/5/2023

ATTACHMENT IV:
RESTRICTIONS ON LOBBYING

Section 319 of Public Law 101-121 prohibits recipients of federal contracts, grants, and loans exceeding $100,000 at any tier under a federal contract from using appropriated funds for lobbying the Executive or Legislative Branches of the federal government in connection with a specific contract, grant, or loan. Section 319 also requires each person who requests or receives a federal contract or grant in excess of $100,000 to disclose lobbying.

No appropriated funds may be expended by the recipient of a federal contract, loan, or cooperative agreement to pay any person for influencing or attempting to influence an officer or employee of any federal executive department or agency as well as any independent regulatory commission or government corporation, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered federal actions: the awarding of any federal contract, the making of any federal grant, the making of any federal loan the entering into of any cooperative agreement and the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative agreement.

As a recipient of a federal grant exceeding $100,000, NCTCOG requires its subcontractors of that grant to file a certification, set forth in Appendix B.1, that neither the agency nor its employees have made, or will make, any payment prohibited by the preceding paragraph.

Subcontractors are also required to file with NCTCOG a disclosure form, set forth in Appendix B.2, if the subcontractor or its employees have made or have agreed to make any payment using nonappropriated funds (to include profits from any federal action), which would be prohibited if paid for with appropriated funds.

LOBBYING CERTIFICATION
FOR CONTRACTS, GRANTS, LOANS, AND COOPERATIVE AGREEMENTS

The undersigned certifies, to the best of his or her knowledge or belief, that:

1. No federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an officer or employee of a Member of Congress in connection with the awarding of any federal contract, the making of any federal loan, the entering into of any cooperative Contract, and the extension, continuation, renewal, amendment, or modification or any federal contract, grant, loan, or cooperative contract; and

2. If any funds other than federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this federal contract, grant, loan, and or cooperative contract, the undersigned shall complete and submit Standard Form – LLL, "Disclosure Form to Report Lobbying", in accordance with the instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers and that all sub-recipients shall certify accordingly.

Name of Organization/Contractor(s):

Texas Highway Products

Signature of Authorized Representative:

Giovanni de Vivo.-

Date: 10/5/2023

ATTACHMENT V:
DRUG-FREE WORKPLACE CERTIFICATION

The Texas Highway Products (company name) will provide a Drug Free Work Place in compliance with the Drug Free Work Place Act of 1988. The unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited on the premises of the Texas Highway Products (company name) or any of its facilities. Any employee who violates this prohibition will be subject to disciplinary action up to and including termination. All employees, as a condition of employment, will comply with this policy.

CERTIFICATION REGARDING DRUG-FREE WORKPLACE

This certification is required by the Federal Regulations Implementing Sections 5151-5160 of the Drug-Free Workplace Act, 41 U.S.C. 701, for the Department of Agriculture (7 CFR Part 3017), Department of Labor (29 CFR Part 98), Department of Education (34 CFR Parts 85, 668 and 682), Department of Health and Human Services (45 CFR Part 76).

The undersigned subcontractor certifies it will provide a drug-free workplace by:

Publishing a policy Proposal notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the workplace and specifying the consequences of any such action by an employee;

Establishing an ongoing drug-free awareness program to inform employees of the dangers of drug abuse in the workplace, the subcontractor's policy of maintaining a drug-free workplace, the availability of counseling, rehabilitation and employee assistance programs, and the penalties that may be imposed on employees for drug violations in the workplace;

Providing each employee with a copy of the subcontractor's policy Proposal;

Notifying the employees in the subcontractor's policy Proposal that as a condition of employment under this subcontract, employees shall abide by the terms of the policy Proposal and notifying the subcontractor in writing within five days after any conviction for a violation by the employee of a criminal drug abuse statue in the workplace;

Notifying the Board within ten (10) days of the subcontractor's receipt of a notice of a conviction of any employee; and,

Taking appropriate personnel action against an employee convicted of violating a criminal drug statue or requires such employee to participate in a drug abuse assistance or rehabilitation program.

Name of Organization/Contractor(s):

Texas Highway Products

Signature of Authorized Representative:

Giovanni deVivo

Date: 10/5/2023

ATTACHMENT VI:
CERTIFICATION REGARDING DISCLOSURE OF CONFLICT OF INTEREST

The undersigned certifies that, to the best of his or her knowledge or belief, that:

"No employee of the contractor, no member of the contractor's governing board or body, and no person who exercises any functions or responsibilities in the review or approval of the undertaking or carrying out of this contract shall participate in any decision relating to this contract which affects his/her personal pecuniary interest.

Executives and employees of contractor shall be particularly aware of the varying degrees of influence that can be exerted by personal friends and associates and, in administering the contract, shall exercise due diligence to avoid situations which give rise to an assertion that favorable treatment is being granted to friends and associates. When it is in the public interest for the contractor to conduct business with a friend or associate of an executive or employee of the contractor, an elected official in the area or a member of the North Central Texas Council of Governments, a permanent record of the transaction shall be retained.

Any executive or employee of the contractor, an elected official in the area or a member of the NCTCOG, shall not solicit or accept money or any other consideration from a third person, for the performance of an act reimbursed in whole or part by contractor or Department. Supplies, tools, materials, equipment or services purchased with contract funds shall be used solely for purposes allowed under this contract. No member of the NCTCOG shall cast a vote on the provision of services by that member (or any organization which that member represents) or vote on any matter which would provide a direct or indirect financial benefit to the member or any business or organization which the member directly represents".

No officer, employee or paid consultant of the contractor is a member of the NCTCOG.

No officer, manager or paid consultant of the contractor is married to a member of the NCTCOG.

No member of NCTCOG directly owns, controls or has interest in the contractor.

The contractor has disclosed any interest, fact, or circumstance that does or may present a potential conflict of interest.

No member of the NCTCOG receives compensation from the contractor for lobbying activities as defined in Chapter 305 of the Texas Government Code.

Should the contractor fail to abide by the foregoing covenants and affirmations regarding conflict of interest, the contractor shall not be entitled to the recovery of any costs or expenses incurred in relation to the contract and shall immediately refund to the North Central Texas Council of Governments any fees or expenses that may have been paid under this contract and shall further be liable for any other costs incurred or damages sustained by the NCTCOG as it relates to this contract.

Name of Organization/Contractor(s):

Texas Highway Products

Signature of Authorized Representative:

Giovanni de Vivo

Date: 10/5/2023

CONFLICT OF INTEREST QUESTIONNAIRE

For vendor doing business with local governmental entity

FORM CIQ

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

OFFICE USE ONLY

Date Received

1 **Name of vendor who has a business relationship with local governmental entity.**

Texas Highway Products.

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.** (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 **Name of local government officer about whom the information is being disclosed.**

_____

Name of Officer

4 **Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.**

A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?

☐ Yes ☐ No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

5 **Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.**

6 ☐ Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).

7 Giovanni de Vivo - 10/5/2023

Signature of vendor doing business with the governmental entity — Date

ATTACHMENT VII:
CERTIFICATION OF FAIR BUSINESS PRACTICES

That the submitter has not been found guilty of unfair business practices in a judicial or state agency administrative proceeding during the preceding year. The submitter further affirms that no officer of the submitter has served as an officer of any company found guilty of unfair business practices in a judicial or state agency administrative during the preceding year.

Name of Organization/Contractor(s):

Texas Highway Products

Signature of Authorized Representative:

Giovanni de Vivo

Date: 10/5/2023

ATTACHMENT VIII:
CERTIFICATION OF GOOD STANDING
TEXAS CORPORATE FRANCHISE TAX CERTIFICATION

Pursuant to Article 2.45, Texas Business Corporation Act, state agencies may not contract with for profit corporations that are delinquent in making state franchise tax payments. The following certification that the corporation entering into this offer is current in its franchise taxes must be signed by the individual authorized on Form 2031, Corporate Board of Directors Resolution, to sign the contract for the corporation.

The undersigned authorized representative of the corporation making the offer herein certified that the following indicated Proposal is true and correct and that the undersigned understands that making a false Proposal is a material breach of contract and is grounds for contract cancellation.

Indicate the certification that applies to your corporation:

✓ The Corporation is a for-profit corporation and certifies that it is not delinquent in its franchise tax payments to the State of Texas.

_____ The Corporation is a non-profit corporation or is otherwise not subject to payment of franchise taxes to the State of Texas.

Type of Business (if not corporation):

☐ Sole Proprietor

☐ Partnership

☐ Other

Pursuant to Article 2.45, Texas Business Corporation Act, the North Central Texas Council of Governments reserves the right to request information regarding state franchise tax payments.

Giovanni de Vivo
(Printed/Typed Name and Title of Authorized Representative)

Giovanni de Vivo
Signature

Date: 10/5/2023

ATTACHMENT IX:
HISTORICALLY UNDERUTILIZED BUSINESSES, MINORITY OR WOMEN-OWNED OR DISADVANTAGED BUSINESS ENTERPRISES

Historically Underutilized Businesses (HUBs), minority or women-owned or disadvantaged businesses enterprises (M/W/DBE) are encouraged to participate in the solicitation process. Representatives from HUB companies should identify themselves and submit a copy of their certification.

NCTCOG recognizes the certifications of both the State of Texas Program and the North Central Texas Regional Certification Agency. Companies seeking information concerning HUB certification are urged to contact:

State of Texas HUB Program
Texas Comptroller of Public Accounts
Lyndon B. Johnson State Office Building
111 East 17th Street
Austin, Texas 78774
(512) 463-6958
http://www.window.state.tx.us/procurement/prog/hub/

Local businesses seeking M/W/DBE certification should contact:

North Central Texas Regional Certification Agency
624 Six Flags Drive, Suite [illegible]0
Arlington, TX 76011
(817) 640-0606
http://www.nctrca.org/certification.html

Not Applicable

Submitter must include a copy of its minority certification documentation as part of this solicitation.
If your company is already certified, attach a copy of your certification to this form and return with your proposal.

Indicate all that apply:

_____Minority-Owned Business Enterprise

_____Women-Owned Business Enterprise

_____Disadvantaged Business Enterprise

ATTEST TO Attachments of Certification:

_____
Authorized Signature

_____ _____
Typed Name Date

Subscribed and sworn to before me this _____day of _____ (month), 20__ in

_____ (city), _____ (county), _____ (state).

_____ **SEAL**

Notary Public in and for _____ (County),
State of _____ Commission expires: _____

ATTACHMENT X
NCTCOG FEDERAL AND STATE OF TEXAS REQUIRED PROCUREMENT PROVISIONS

The following provisions are mandated by Federal and/or State of Texas law. Failure to certify to the following will result in disqualification of consideration for contract. Entities or agencies that are not able to comply with the following will be ineligible for consideration of contract award.

PROHIBITED TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT CERTIFICATION

This Contract is subject to the Public Law 115-232, Section 889, and 2 Code of Federal Regulations (CFR) Part 200, including §200.216 and §200.471, for prohibition on certain telecommunications and video surveillance or equipment. Public Law 115-232, Section 889, identifies that restricted telecommunications and video surveillance equipment or services (e.g., phones, internet, video surveillance, cloud servers) include the following:

A) Telecommunications equipment that is produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliates of such entities).

B) Video surveillance and telecommunications equipment produced by Hytera Communications Corporations, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliates of such entities).

C) Telecommunications or video surveillance services used by such entities or using such equipment.

D) Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, Director of the National Intelligence, or the Director of the Federal Bureau of Investigation reasonably believes to be an entity owned or controlled by the government of a covered foreign country.

The entity identified below, through its authorized representative, hereby certifies that no funds under this Contract will be obligated or expended to procure or obtain telecommunication or video surveillance services or equipment or systems that use covered telecommunications equipment or services as a substantial or essential component of any system, or as a critical technology as part of any system prohibited by 2 CFR §200.216 and §200.471, or applicable provisions in Public Law 115-232 Section 889.

☑ **The Contractor or Subrecipient hereby certifies that it does comply with the requirements of 2 CFR §200.216 and §200.471, or applicable regulations in Public Law 115-232 Section 889.**

SIGNATURE OF AUTHORIZED PERSON: _____

NAME OF AUTHORIZED PERSON: RAY MENDOZA

NAME OF COMPANY: TEXAS HIGHWAY PRODUCTS

DATE: 11/6/2023

-OR-

☐ **The Contractor or Subrecipient hereby certifies that it cannot comply with the requirements of 2 CFR §200.216 and §200.471, or applicable regulations in Public Law 115-232 Section 889.**

SIGNATURE OF AUTHORIZED PERSON: _____

NAME OF AUTHORIZED PERSON: _____

NAME OF COMPANY: _____

DATE: _____

DISCRIMINATION AGAINST FIREARMS ENTITIES OR FIREARMS TRADE ASSOCIATIONS

This contract is subject to the Texas Local Government Code chapter 2274, Subtitle F, Title 10, prohibiting contracts with companies who discriminate against firearm and ammunition industries.

TLGC chapter 2274, Subtitle F, Title 10, identifies that "discrimination against a firearm entity or firearm trade association" includes the following:

A) means, with respect to the entity or association, to:

I. refuse to engage in the trade of any goods or services with the entity or association based solely on its status as a firearm entity or firearm trade association; and

II. refrain from continuing an existing business relationship with the entity or association based solely on its status as a firearm entity or firearm trade association; or

III. terminate an existing business relationship with the entity or association based solely on its status as a firearm entity or firearm trade association.

B) An exception to this provision excludes the following:

I. contracts with a sole-source provider; or

II. the government entity does not receive bids from companies who can provide written verification.

The entity identified below, through its authorized representative, hereby certifies that they have no practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and that they will not discriminate during the term of the contract against a firearm entity or firearm trade association as prohibited by Chapter 2274, Subtitle F, Title 10 of the Texas Local Government Code.

☑ **The Contractor or Subrecipient hereby certifies that it does comply with the requirements of Chapter 2274, Subtitle F, Title 10.**

SIGNATURE OF AUTHORIZED PERSON: R Mendoza

NAME OF AUTHORIZED PERSON: RAY MENDOZA

NAME OF COMPANY: TEXAS HIGHWAY PRODUCTS

DATE: 11/6/2023

-OR-

☐ **The Contractor or Subrecipient hereby certifies that it cannot comply with the requirements of Chapter 2274, Subtitle F, Title 10.**

SIGNATURE OF AUTHORIZED PERSON: _____

NAME OF AUTHORIZED PERSON: _____

NAME OF COMPANY: _____

DATE: _____

BOYCOTTING OF CERTAIN ENERGY COMPANIES

This contract is subject to the Texas Local Government Code chapter 809, Subtitle A, Title 8, prohibiting contracts with companies who boycott certain energy companies.

TLGC chapter Code chapter 809, Subtitle A, Title 8, identifies that "boycott energy company" means, without an ordinary business purpose, refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations with a company because the company:

I. engages in the exploration, production, utilization, transportation, sale, or manufacturing of fossil fuel-based energy and does not commit or pledge to meet environmental standards beyond applicable federal and state law; and

II. does business with a company described by paragraph (I).

The entity identified below, through its authorized representative, hereby certifies that they do not boycott energy companies, and that they will not boycott energy companies during the term of the contract as prohibited by Chapter 809, Subtitle A, Title 8 of the Texas Local Government Code.

☑ The Contractor or Subrecipient hereby certifies that it does comply with the requirements of Chapter 809, Subtitle A, Title 8.

SIGNATURE OF AUTHORIZED PERSON: E Mendoza

NAME OF AUTHORIZED PERSON: RAY MENDOZA

NAME OF COMPANY: TEXAS HIGHWAY PRODUCTS

DATE: 11/10/2023

-OR-

☐ The Contractor or Subrecipient hereby certifies that it cannot comply with the requirements of Chapter 809, Subtitle A, Title 8.

SIGNATURE OF AUTHORIZED PERSON: _____

NAME OF AUTHORIZED PERSON: _____

NAME OF COMPANY: _____

DATE: _____

APPENDIX A

NTCIP 1202 Protocol Requirements List

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
2.3	Reference Physical Architecture [Informative]					
2.3.1	ASC Characteristics – Cabinet Specifications			M	Yes	
2.3.1.a (332)	Model 332 Cabinet			O.1 (1)	Yes / No	
2.3.1.b (TS1)	NEMA TS 1 Cabinet			O.1 (1)	Yes / No	
2.3.1.c (TS2-2)	NEMA TS 2 Type 2 Cabinet			O.1 (1)	Yes / No	
2.3.1.d (TS2-1)	NEMA TS 2 Type 1 Cabinet			O.1 (1)	Yes / No	
2.3.1.e (ITS)	ITS Cabinet			O.1 (1)	Yes / No	
2.3.2	ASC Characteristics – Controller Types			M	Yes	
2.3.2.a	Phase-based controller			M	Yes	
2.3.2.b	Interval-based controller			NA	NA	Interval-based controllers are not supported by NTCIP 1202 v03
2.4	Architectural Needs					
2.4.1	Provide Live Data			M	Yes	
		3.4.1.1	Retrieve Data	M	Yes	
		3.4.1.2	Deliver Data	M	Yes	
		3.4.1.3	Explore Data	M	Yes	
		3.6.1	Response Time for Requests	M	Yes	The Response Time for all requests shall 25 be milliseconds (5-500: Default=25).
2.4.2	Provide Dynamic Object Data			O	Yes / No	
		H.1.1.9.1.1	Configure Dynamic Object Persistence Time	M	Yes / NA	
		H.1.1.9.1.2	Configure Dynamic Object Configuration ID	M	Yes / NA	
		H.1.2.5.1.1	Determine Dynamic Object Persistence Time	M	Yes / NA	
		H.1.2.5.1.2	Determine Dynamic Object Configuration ID	M	Yes / NA	
		H.1.2.5.2.1.1	Monitor Incoming and Outgoing STMP Packet Exchanges	M	Yes / NA	
		H.1.2.5.2.1.2	Monitor Incoming and Outgoing STMP Packet Types	M	Yes / NA	
		H.1.2.5.2.2.1	Monitor Incoming and Outgoing STMP Error Exchanges - Too Big Error	M	Yes / NA	
		H.1.2.5.2.2.2	Monitor Incoming and Outgoing STMP Error Exchanges - No Such Name	M	Yes / NA	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		H.1.2.5.2.2.3	Monitor Incoming and Outgoing STMP Error Exchanges - Bad Value	M	Yes / NA	
		H.1.2.5.2.2.4	Monitor Incoming and Outgoing STMP Error Exchanges - Read-Only	M	Yes / NA	
		H.1.2.5.2.2.5	Monitor Incoming and Outgoing STMP Error Exchanges - General Error	M	Yes / NA	
2.4.3	Provide Block Data			O	Yes / No	
		3.5.2.1.14.1.1.1	Configure Block Object Get Control - Phase Data	O	Yes / No	
		3.5.2.1.14.1.1.2	Configure Block Object Get Control - Vehicle Detector Data	O	Yes / No	
		3.5.2.1.14.1.1.3	Configure Block Object Get Control - Pedestrian Detector Data	O	Yes / No	
		3.5.2.1.14.1.1.4	Configure Block Object Get Control - Pattern Data	O	Yes / No	
		3.5.2.1.14.1.1.5	Configure Block Object Get Control - Split Data	O	Yes / No	
		3.5.2.1.14.1.1.6	Configure Block Object Get Control - Time Base Data	O	Yes / No	
		3.5.2.1.14.1.1.7	Configure Block Object Get Control - Preempt Data	O	Yes / No	
		3.5.2.1.14.1.1.8	Configure Block Object Get Control - Sequence Data	O	Yes / No	
		3.5.2.1.14.1.1.9	Configure Block Object Get Control - Channel Data	O	Yes / No	
		3.5.2.1.14.1.1.10	Configure Block Object Get Control - Overlap Data	O	Yes / No	
		3.5.2.1.14.1.1.11	Configure Block Object Get Control - Port 1 Data	O	Yes / No	
		3.5.2.1.14.1.1.12	Configure Block Object Get Control - Schedule Data	O	Yes / No	
		3.5.2.1.14.1.1.13	Configure Block Object Get Control - Day Plan Data	O	Yes / No	
		3.5.2.1.14.1.1.14	Configure Block Object Get Control - Event Configuration Data	O	Yes / No	
		3.5.2.1.14.1.1.15	Configure Block Object Get Control - Event Class Data	O	Yes / No	
		3.5.2.1.14.1.1.16	Configure Block Object Get Control - Dynamic Object Configuration Data	O	Yes / No	
		3.5.2.1.14.1.1.17	Configure Block Object Get Control - Dynamic Object Owner Data	O	Yes / No	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.1.14.1.1.18	Configure Block Object Get Control - Dynamic Object Status Data	O	Yes / No	
		3.5.2.1.14.1.1.19	Configure Block Object Get Control - Miscellaneous ASC Data	O	Yes / No	
		3.5.2.1.14.1.1.20	Configure Block Object Get Control - Version 3 Additional Phase Data	O	Yes / No	
		3.5.2.1.14.1.1.21	Configure Block Object Get Control - Version 3 Additional Vehicle Detector Data	O	Yes / No	
		3.5.2.1.14.1.1.22	Configure Block Object Get Control - Version 3 Vehicle Detector Volume Occupancy Report Data	O	Yes / No	
		3.5.2.1.14.1.1.23	Configure Block Object Get Control - Version 3 Additional Pedestrian Detector Data	O	Yes / No	
		3.5.2.1.14.1.1.24	Configure Block Object Get Control - Version 3 Pedestrian Detector Report Data	O	Yes / No	
		3.5.2.1.14.1.1.25	Configure Block Object Get Control - Version 3 Pedestrian Push Button Configuration Data	O	Yes / No	
		3.5.2.1.14.1.1.26	Configure Block Object Get Control - Version 3 Additional Pattern Data	O	Yes / No	
		3.5.2.1.14.1.1.27	Configure Block Object Get Control - Version 3 Additional Split Data	O	Yes / No	
		3.5.2.1.14.1.1.28	Configure Block Object Get Control - Version 3 Additional Preempt Data	O	Yes / No	
		3.5.2.1.14.1.1.29	Configure Block Object Get Control - Version 3 Preempt Queue Delay Data	O	Yes / No	
		3.5.2.1.14.1.1.30	Configure Block Object Get Control - Version 3 Additional Channel Data	O	Yes / No	
		3.5.2.1.14.1.1.31	Configure Block Object Get Control - Version 3 Additional Overlap Data	O	Yes / No	
		3.5.2.1.14.1.1.32	Configure Block Object Get Control - Communications Port Definition Data	O	Yes / No	

Protocol Requirements List (PRL)						
User Need ID	User Need	FR ID	Functional Requirement	Conformance	Support	Additional Specifications
		3.5.2.1.14.1.1.33	Configure Block Object Get Control – Ethernet Communications Port Definition Data	O	es / No	
		3.5.2.1.14.1.1.34	Configure Block Object Get Control – SIU Communications Port 1 Definition Data	O	Yes / No	
		3.5.2.1.14.1.1.35	Configure Block Object Get Control - Version 3 Additional Miscellaneous ASC Data	O	Yes / No	
		3.5.2.1.14.1.1.36	Configure Block Object Get Control – User-Defined Backup Timer Content Data	O	Yes / No	
		3.5.2.1.14.1.1.37	Configure Block Object Get Control – ASC Location Data	O	Yes / No	
		3.5.2.1.14.1.1.38	Configure Block Object Get Control – Global Set ID Data	O	Yes / No	
		3.5.2.1.14.1.1.39	Configure Block Object Get Control – ASC Environmental Monitoring Data	O	Yes / No	
		3.5.2.1.14.1.1.40	Configure Block Object Get Control – ASC Cabinet Temperature Sensor Data	O	Yes / No	
		3.5.2.1.14.1.1.41	Configure Block Object Get Control – ASC Cabinet Humidity Sensor Data	O	Yes / No	
		3.5.2.1.14.1.1.42	Configure Block Object Get Control - I/O Input Mapping Data	O	Yes / No	
		3.5.2.1.14.1.1.43	Configure Block Object Get Control - I/O Input Mapping Status Data	O	Yes / No	
		3.5.2.1.14.1.1.44	Configure Block Object Get Control – I/O Output Mapping Data	O	Yes / No	
		3.5.2.1.14.1.1.45	Configure Block Object Get Control - I/O Output Mapping Status Data	O	Yes / No	
		3.5.2.1.14.1.1.46	Configure Block Object Get Control - I/O Mapping Description Data	O	Yes / No	
		3.5.2.1.14.1.1.47	Configure Block Object Get Control – Connected Vehicle Configuration Data	O	Yes / No	
		3.5.2.1.14.1.1.48	Configure Block Object Get Control – Connected Vehicle RSU Port Configuration Data	O	Yes / No	
		3.5.2.1.14.1.1.49	Configure Block Object Get Control - SPaT Lanes Concurrency Data	O	Yes / No	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.1.14.1.1.50	Configure Block Object Get Control – Connected Vehicle SPaT RSU Port Configuration Data	O	Yes / No	
		3.5.2.1.14.1.1.51	Configure Block Object Get Control – Connected Vehicle Detector Configuration Data	O	Yes / No	
		3.5.2.1.14.1.1.52	Configure Block Object Get Control – Connected Vehicle Detection Zone Configuration Data	O	Yes / No	
		3.5.2.1.14.1.1.53	Configure Block Object Get Control – Connected Vehicle Detection Report Data	O	Yes / No	
		3.5.2.1.14.1.2	Configure Block Data	M	Yes	
		3.5.2.1.14.2.1	Monitor Block Object Get Control	M	Yes	
		3.5.2.1.14.2.2	Monitor Block Data	M	Yes	
		3.5.2.1.14.2.3.1	Monitor Block Error Status - STMP Set/Get Command Attempt	M	Yes	
		3.5.2.1.14.2.3.2	Monitor Block Error Status - Configuration Validity Check Error	M	Yes	
		3.5.2.1.14.2.3.3	Monitor Block Error Status - Value Set Validity Check Error	M	Yes	
		3.5.2.1.14.2.3.4	Monitor Block Error Status - Error-causing Data Element	M	Yes	
		3.5.2.1.14.1.1.1	Configure Block Object Get Control Requirements	O	Yes / No	
2.4.4	Provide for Log Data Local Storage and Retrieval			O	Yes / No	
		3.5.1.6.1	Configure ASC Clock Source	O	Yes / No	
		3.5.1.6.2	Determine ASC Clock Status	O	Yes / No	
		3.5.1.6.3	Determine Current ASC Clock Source	O	Yes / No	
		3.5.1.6.4	Determine Available ASC Clock Sources	O	Yes / No	
		H.1.1.5.1	Configure Time	M	Yes / NA	
		H.1.1.5.2	Configure Time Zone	TimeZone: O	Yes / No / NA	Note: Users are cautioned that this object definition has been revised to address interoperability issues in version 01, but remains at the same ObjectID. Pay close attention to the implementation, and
		H.1.1.5.3	Configure Daylight Saving Mode	DST:O	Yes / No / NA	
		H.1.1.5.4	Determine Time Setting	M	Yes / NA	
		H.1.1.5.5 (TimeZone)	Determine Time Zone Setting	O	Yes / No / NA	
		H.1.1.5.6 (DST)	Determine Daylight Saving Mode Setting	O	Yes / No / NA	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		H.1.1.5.7	Monitor Current Time	M	(Yes) / NA	interoperability of this object. Place a checkmark below, if the ASC is NOT required to support the major version that is checked. Version v01 X Version v02 X
		H.1.3.1.1	Retrieve Current Configuration of Logging Service	M	(Yes) / NA	
		H.1.3.1.2	Configure Event Logging Service	M	(Yes) / NA	
		H.1.3.1.3	Retrieve Event Logged Data	M	(Yes) / NA	
		H.1.3.1.4	Configure Clearing of Event Class Log	M	(Yes) / NA	
		H.1.3.1.5	Determine Capabilities of Event Logging Service	M	(Yes) / NA	
		H.1.3.1.6	Determine Number of Logged Events per Event Class	M	(Yes) / NA	
		H.1.3.1.7	Support a Number of Events to Store in Log	M	(Yes) / NA	The ASC shall be capable of storing at least 200 events in the event log file (up to 65535).
		H.1.3.1.8	Configure Clearing of Global Log	O	(Yes) / No / NA	
		H.1.3.1.9	Determine Total Number of Logged Events	O	(Yes) / No / NA	
		H.1.3.1.10	Determine Number of Events within a Class	M	(Yes) / NA	
		H.1.3.1.11	Determine Event Logging Resolution	M	(Yes) / NA	
		H.1.3.1.12	Clear Event Configuration	M	(Yes) / NA	
		H.1.3.1.13	Clear Event Classes	M	(Yes) / NA	
		H.1.3.1.14	Clear Event Class Log	M	(Yes) / NA	
		H.1.3.1.15	Retrieve Non-Sequential Clock Changes	O	(Yes) / No / NA	
		H.1.3.2.1	Record and Timestamp Events	M	(Yes) / NA	
		H.1.3.2.2	Support a Number of Event Classes	M	(Yes) / NA	The ASC shall support at least 10 event classes.
		H.1.3.2.3	Support a Number of Events to Log	M	(Yes) / NA	The ASC shall be able to log at least 20 events.
		H.1.3.2.4.1	Support On-Change Events	M	(Yes) / NA	
		H.1.3.2.4.2	Support Greater Than Events	M	(Yes) / NA	
		H.1.3.2.4.3	Support Less Than Events	M	(Yes) / NA	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		H.1.3.2.4.4	Support Hysteresis Events	M	Yes / NA	
		H.1.3.2.4.5	Support Periodic Events	M	Yes / NA	
		H.1.3.2.4.6	Support Bit Flag Events	M	Yes / NA	
		H.1.3.2.4.7	Support Event Monitoring on Any Data	M	Yes / NA	
		3.6.1	Response Time for Requests	M	Yes / NA	The Response Time for all requests shall be 25 milliseconds (5-500: Default=25).
2.4.5	Provide for Database Management			M	Yes	
		H.1.2.2.1	Monitor Database Operation	M	Yes	
		H.1.2.2.2	Monitor Database Operation Status	M	Yes	
		H.1.2.2.3	Monitor Database Operation Error Status	M	Yes	
		H.1.4.2.1	Control Database Access	M	Yes	
		H.1.4.2.2	Perform Database Consistency Check	M	Yes	
		H.1.4.2.3	Enforce Consistency Check Parameters	M	Yes	
2.4.6 (Traps)	Condition-based Exception Reporting			O	Yes / No	
		3.6.2	Condition-based Maximum Transmission Start Time	M	Yes	The Maximum Transmission Start Time for all reports shall be 500 milliseconds (Default=10000).
		H.1.1.10.1	Enable/Disable Exception Reporting	M	Yes	
		H.1.1.10.2.1	Configure a Monitored (Watch) Object	M	Yes	
		H.1.1.10.2.2 (Watch)	Configure a Monitored Group of Objects (Watch Block)	M	Yes	
		H.1.1.10.3.1	Configure a Report Object	M	Yes	
		H.1.1.10.3.2 (Report)	Configure a Report Group of Objects (Block)	M	Yes	
		H.1.1.10.4	Configure Exception Reporting Destination	M	Yes	
		H.1.1.10.5	Configure Exception Reporting Community	M	Yes	
		H.1.1.10.6.1 (TrapAck)	Configure Exception Reporting Acknowledgement	O.2 (1..*)	Yes / No	
		H.1.1.10.6.2	Configure Exception Reporting Aggregation	O.2 (1..*)	Yes / No	
		H.1.1.10.6.3 (TrapQueue)	Configure Exception Reporting Queue	O.2 (1..*)	Yes / No	
		H.1.1.10.6.4	Configure Exception Reporting (Forced)	O.2 (1..*)	Yes / No	
		H.1.1.10.6.5	Configure Exception Reporting Communications	M	Yes	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		H.1.1.10.6.6 (AntiStream)	Configure Exception Reporting - Maximum Rate	O	Yes / No	
		H.1.1.10.7	Determine Watch Block Capabilities	Watch:M	Yes / NA	
		H.1.1.10.8	Determine Report Block Capabilities	Report:M	Yes / NA	
		H.1.1.10.9	Determine Exception Reporting Trap Channel Capabilities	M	Yes	
		H.1.1.10.10	Determine Exception Reporting Aggregation Capabilities	M	Yes	
		H.1.1.10.11	Determine Event Reporting Latency	M	Yes	
		H.1.1.10.12	Monitor Communications Link State	M	Yes	
		H.1.1.10.13.1	Monitor Exception Based Communications Link Error	M	Yes	
		H.1.1.10.13.2	Monitor Exception Based Maximum Rate Exceeded	AntiStream:M	Yes / NA	
		H.1.1.10.13.3	Monitor Exception Based Queue Full Error	TrapQueue:M	Yes / NA	
		H.1.1.10.14	Monitor Exception Based Transmissions	M	Yes	
		H.1.1.10.15	Monitor Number of Lost Queued Exception Based Reports	TrapQueue:M	Yes / NA	
		H.1.1.10.16	Monitor Number of Exception Based Events	M	Yes	
		H.1.1.10.17	Monitor Exception Based Data	M	Yes	
		H.1.1.10.18	Clear Event Class	O	Yes / No	
		H.1.1.10.19	Clear Event Configuration	O	Yes / No	
		H.1.1.10.20	Clear Event Log Table	O	Yes / No	
		H.1.1.10.21	Clear Report Objects	O	Yes / No	
		H.1.1.10.22	Clear Report Blocks	O	Yes / No	
		H.1.1.10.23	Clear Watch Objects	O	Yes / No	
		H.1.1.10.24	Clear Watch Blocks	O	Yes / No	
		H.1.1.10.25	Clear Exception Based Reporting Tables	O	Yes / No	
		H.1.1.10.26	Reset a Communications Link	TrapAck:O	Yes / No / NA	
		H.1.5.1	Atomic Operations	M	Yes	
2.5	Features					
2.5.1	Manage the ASC Configuration			M	Yes	
2.5.1.1	Retrieve Device Identity			M	Yes	
		3.5.1.1.1	Configure ASC Location	O	Yes / No	Only needed if no external GNSS device is attached to the ASC

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.1.1.2	Configure ASC Location - Antenna Offset	O	Yes / No	Only needed if an external GNSS device is attached to the ASC
		H.1.1.1	Determine Device Component Information	M	Yes	
		H.1.1.2.1	Determine Unique Deployment Configuration Identifier	M	Yes	
		H.1.1.2.2	Determine Configuration Identifier Parameter Content	O	Yes / No	
		H.1.1.3	Determine Supported Standards	M	Yes	Note: was optional in NTCIP 1202 v02
		H.1.1.4	Manage Unique System Name	O	Yes / No	
2.5.1.2	Manage Communications			O	Yes / No	
		3.5.1.2.1.1	Enable/Disable Communications Port	M	Yes	The ASC shall not be allowed to enable/disable the following ports numbers: _____
		3.5.1.2.1.2	Configure ASC Ethernet Ports	O	Yes / No	The ASC shall not be allowed to configure the following ports:
		3.5.1.2.1.3	Configure ASC Asynchronous Serial Ports	O	Yes / No	The ASC shall not be allowed to configure the following ports:
		3.5.1.2.1.4	Configure ASC Synchronous Serial Ports	O	Yes / No	The ASC shall not be allowed to configure the following ports:
		3.5.1.2.1.5	Configure ASC Communications Protocol - Serial Ports	O	Yes / No	The ASC shall not be allowed to configure the following ports:
		3.5.1.2.2.1	Determine Number of ASC Communications Ports	M	Yes	
		3.5.1.2.3.1	Monitor Response Timeout - Ethernet	O	Yes / No	
		3.5.1.2.3.2	Monitor Response Timeout - Serial	O	Yes / No	
		3.5.1.2.3.3	Monitor Data Link Errors - Ethernet	O	Yes / No	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.1.2.3.4	Monitor Data Link Errors - Serial	O	Yes / No	
		3.5.1.2.3.5	Monitor Polling Timeout - Port 1	TS1:O, TS2-2:O, TS2-1:O	Yes / No / NA	
		3.5.1.2.3.6	Monitor Polling Timeout - Serial Bus	ITS:O	Yes / No / NA	
		3.5.1.2.4.1	Set Communications Port to Loopback Mode	O	Yes / No	
		3.5.1.2.4.2	Set Communications Port to Echo Mode	O	Yes / No	
2.5.1.3	Manage Cabinet Environment			O	Yes / No	
		3.5.1.3.1	Monitor Cabinet Door Status	M	Yes	
		3.5.1.3.2	Monitor Cabinet Fan Status	O	Yes / No	
		3.5.1.3.3	Monitor Cabinet Heater Status	O	Yes / No	
		3.5.1.3.4	Monitor Cabinet Float Switch Status	O	Yes / No	
		3.5.1.3.5 (Temp)	Monitor ASC Temperature	O	Yes / No	
		3.5.1.3.6 (Humidity)	Monitor ASC Humidity	O	Yes / No	
		3.5.1.3.7	Configure ASC Temperature Threshold	Temp:O	Yes / No / NA	
		3.5.1.3.8	Configure ASC Humidity Thresholds	Humidity:O	Yes / No / NA	
		3.5.1.3.9	Configure ATC Cabinet Device LEDs	O	Yes / No	
2.5.1.4 (Power)	Monitor Power			O	Yes / No	
		3.5.1.4.1	Determine Power Source	M	Yes	
		3.5.1.4.2	Monitor AC Power Status	O	Yes / No	
		3.5.1.4.3 (UPS)	Monitor UPS Battery Charge	O	Yes / No	
		3.5.1.4.4	Monitor UPS Battery Voltage	UPS:O	Yes / No / NA	
		3.5.1.4.5	Monitor UPS Battery Current	UPSO	Yes / No / NA	
2.5.1.5 (Perform)	Retrieve Operational Performance Data			O	Yes / No	
		3.5.1.5.1.1	Enable/Disable Collection of Operational Performance Data	M	Yes	
		3.5.1.5.1.2	Start Collection of Operational Performance Data on Specific Date/Time	O	Yes / No	
		3.5.1.5.1.3	End Collection of Operational Performance Data on Specific Date/Time	O	Yes / No	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.1.5.1.4	Configure Collection of Operational Performance Data	O	Yes / No	
		3.5.1.5.2.1	Determine Collection of Operational Performance Data	M	Yes	The ASC shall allow the recording of at least 5 days' worth of data for each event code at a recording interval of 1/10 seconds (maximum 7 days).
		3.5.1.5.2.2	Determine Operational Performance Data Collection Capabilities	M	Yes	
		3.5.1.5.3.1	Monitor Operational Performance Data	O	Yes / No	
		3.5.1.5.3.2	Retrieve Operational Performance Data	O	Yes / No	
		3.5.1.5.3.3	Retrieve Operational Performance Data - Time Range	O	Yes / No	
		3.5.1.5.3.4	Retrieve Operational Performance Data - Event Code	O	Yes / No	
		3.5.1.5.4.1	Clear Operational Performance Data - All	O	Yes / No	
		3.5.1.5.4.2	Clear Operational Performance Data - Time Range	O	Yes / No	
		3.5.1.5.4.3	Clear Operational Performance Data - Event Code	O	Yes / No	
		3.5.1.5.4.4	Clear Operational Performance Data - Event Class	O	Yes / No	
		3.5.1.5.4.5	Clear Operational Performance Data - Configuration	O	Yes / No	
2.5.1.6	Manage Auxiliary External Inputs/Outputs			O	Yes / No	
		H.1.1.6.1	Determine External Port Information	M	Yes	
		H.1.1.6.2	Configure Port Information	M	Yes	
		H.1.1.6.3	Required Number of Auxiliary Ports	O	Yes / No	The ASC shall support at least ____ analog Auxiliary Ports. The ASC shall support at least ____ digital Auxiliary Ports.
		H.1.2.1	Monitor Status of External Device	O	Yes / No	
		H.1.4.1	Control External Device	O	Yes / No	
2.5.1.7	Manage Database			M	Yes	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.1.1.6	Configure Parameters for Creation of an Alternate Device Configuration Identifier	O	Yes / No	
		H.1.1.2.1	Determine Unique Deployment Configuration Identifier	M	Yes	
		H.1.1.2.2	Determine Configuration Identifier Parameter Content	O	Yes / No	
2.5.2	Manage Signal Operations			M	Yes	
2.5.2.1	Manage Signal Configuration			M	Yes	
2.5.2.1.1	Manage Controller Startup Functions			M	Yes	
		3.5.2.1.1.1.1	Configure Startup All-Red Flash Mode	O	Yes / No	
		3.5.2.1.1.1.2	Configure Startup Flash Time	M	Yes	
		3.5.2.1.1.1.3	Enable/Disable Automatic Pedestrian Clearance Setting	M	Yes	
		3.5.2.1.1.2	Configure Backup Time	M	Yes	
		3.5.2.1.1.3 (BackupUD)	Configure Backup Time - User-Defined	O	Yes / No	
		3.5.2.1.1.4	Configure Backup Time - User-Defined Functions	BackupUD: M	Yes / NA	The user shall provide a list of all objects to be contained in the Backup timer monitoring. Alternatively, user could require vendor to provide a list.
		3.5.2.1.1.5	Determine Maximum Number of Functions Supported for Backup Time	BackupUD: M	Yes / NA	
2.5.2.1.2	Manage Phase Configurations			M	Yes	
		3.5.2.1.2.1.1	Enable/Disable Phase	M	Yes	
		3.5.2.1.2.1.2	Configure Vehicle Phase Minimum Green Time	M	Yes	
		3.5.2.1.2.1.3	Configure Vehicle Phase Passage Time	M	Yes	
		3.5.2.1.2.1.4	Configure Vehicle Phase Maximum Green Times	M	Yes	
		3.5.2.1.2.1.5	Configure Vehicle Phase Third Maximum Green Times	O	Yes / No	
		3.5.2.1.2.1.6	Configure Phase Yellow Time	M	Yes	
		3.5.2.1.2.1.7	Configure Red Clearance Time	M	Yes	
		3.5.2.1.2.1.8	Configure Phase Red Revert Time	O	Yes / No	
		3.5.2.1.2.1.9	Configure Unit Red Revert Time	Unit:M	Yes / NA	
		3.5.2.1.2.1.10	Configure Added Initial Time	M	Yes	
		3.5.2.1.2.1.11	Configure Maximum Initial Time	M	Yes	

Protocol Requirements List (PRL)						
User Need ID	User Need	FR ID	Functional Requirement	Conformance	Support	Additional Specifications
		3.5.2.1.2.1.12	Configure Time Before Reduction	M	Yes	
		3.5.2.1.2.1.13	Configure Phase Time to Reduce	M	Yes	
		3.5.2.1.2.1.14	Configure Cars Before Reduction	O	Yes / No	
		3.5.2.1.2.1.15	Configure Phase Reduce By Time	O	Yes / No	
		3.5.2.1.2.1.16	Configure Phase Minimum Gap Time	M	Yes	
		3.5.2.1.2.1.17	Configure Phase Dynamic Maximum Limit	O	Yes / No	
		3.5.2.1.2.1.18	Configure Phase Dynamic Maximum Step	O	Yes / No	
		3.5.2.1.2.1.19.1	Configure Phase Startup - Initialize in a Red State	O.3 (1..*)	Yes / No	
		3.5.2.1.2.1.19.2	Configure Phase Startup - Initialize at Beginning of Min Green and Walk	O.3 (1..*)	Yes / No	
		3.5.2.1.2.1.19.3	Configure Phase Startup - Initialize at Beginning of Min Green	O.3 (1..*)	Yes / No	
		3.5.2.1.2.1.19.4	Configure Phase Startup - Initialize at Beginning of Yellow	O.3 (1..*)	Yes / No	
		3.5.2.1.2.1.19.5	Configure Phase Startup - Initialize at Beginning of Red Clearance	O.3 (1..*)	Yes / No	
		3.5.2.1.2.1.20	Configure Automatic Flash Entry Phase	O	Yes / No	
		3.5.2.1.2.1.21	Configure Automatic Flash Exit Phase	O	Yes / No	
		3.5.2.1.2.1.22	Configure Call to Non-Actuated 1	O	Yes / No	
		3.5.2.1.2.1.23	Configure Call to Non-Actuated 2	O	Yes / No	
		3.5.2.1.2.1.24	Configure Non-Lock Detector Memory	O	Yes / No	
		3.5.2.1.2.1.25	Configure Minimum Vehicle Recall	O	Yes / No	
		3.5.2.1.2.1.26	Configure Maximum Vehicle Recall	O	Yes / No	
		3.5.2.1.2.1.27	Configure Soft Vehicle Recall	O	Yes / No	
		3.5.2.1.2.1.28	Configure Dual Phase Entry	O	Yes / No	
		3.5.2.1.2.1.29	Configure Simultaneous Gap Disable	O	Yes / No	
		3.5.2.1.2.1.30	Configure Guaranteed Passage	O	Yes / No	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.1.2.1.31	Configure Actuated Rest-in-Walk	O	Yes / No	
		3.5.2.1.2.1.32	Configure Conditional Service Enable	O	Yes / No	
		3.5.2.1.2.1.33	Configure Added Initial Calculation	O	Yes / No	
		3.5.2.1.2.1.34	Configure Phase-to-Ring Association	M	Yes	
		3.5.2.1.2.1.35	Configure Phase Concurrency	M	Yes	
		3.5.2.1.2.1.36	Configure Yellow Change Time Before End of Ped Clearance	O	Yes / No	
		3.5.2.1.2.1.37	Enable/Disable Ped-only Phase	O	Yes / No	
		3.5.2.1.2.1.38	Configure Pedestrian Green Time	M	Yes	
		3.5.2.1.2.1.39	Configure Pedestrian Clearance Time	M	Yes	
		3.5.2.1.2.1.40	Configure Ped Phase Walk Recycle Time	M	Yes	
		3.5.2.1.2.1.41	Configure Ped Phase Don't Walk Revert Time	M	Yes	
		3.5.2.1.2.1.42	Configure Non-Lock Ped Detector Memory	M	Yes	
		3.5.2.1.2.1.43	Configure Pedestrian Recall	M	Yes	
		3.5.2.1.2.1.44	Configure Alternate Pedestrian Clearance Time	O	Yes / No	
		3.5.2.1.2.1.45	Configure Alternate Pedestrian Walk Time	O	Yes / No	
		3.5.2.1.2.1.46	Configure Vehicle Phase Walk Offset Time	O	Yes / No	
		3.5.2.1.2.1.47 (AdvGrWarn)	Configure Advanced Green Warning - Associated Vehicle Phase	O	Yes / No	
		3.5.2.1.2.1.48	Configure Advanced Green Warning - Start Delay Time	AdvGrWarn:M	Yes / NA	
		3.5.2.1.2.1.49 (AdvRdWarn)	Configure Advanced Red Warning - Associated Vehicle Phase	O	Yes / No	
		3.5.2.1.2.1.50	Configure Red Indication Advanced Warning - Start Delay Time	AdvRdWarn:M	Yes / NA	
		3.5.2.1.2.1.51	Configure Flashing Yellow Arrow Associated Vehicle Phase	O	Yes / No	
		3.5.2.1.2.1.52	Configure Flashing Red Arrow Associated Vehicle Phase	O	Yes / No	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.1.2.1.53 (Bicycle)	Configure Bicycle Phase Minimum Green Time	O	Yes / No	
		3.5.2.1.2.1.54	Configure Bicycle Phase Yellow Time	Bicycle:M	Yes / NA	
		3.5.2.1.2.1.55	Configure Bicycle Phase Red Clearance Time	Bicycle:M	Yes / NA	
		3.5.2.1.2.1.56	Configure Bicycle Phase Red Revert Time	Bicycle:O	Yes / No / NA	
		3.5.2.1.2.1.57	Enable/Disable Bicycle Phase	Bicycle:O	Yes / No / NA	
		3.5.2.1.2.1.58	Configure Non-Lock Bicycle Detector Memory	Bicycle:O	Yes / No / NA	
		3.5.2.1.2.1.59	Configure Bicycle Phase Recall	Bicycle:O	Yes / No / NA	
		3.5.2.1.2.1.60	Configure Soft Bicycle Phase Recall	Bicycle:O	Yes / No / NA	
		3.5.2.1.2.1.61	Configure Bicycle Phase-to-Ring Association	Bicycle:M	Yes / NA	
		3.5.2.1.2.1.62	Configure Bicycle Phase Concurrency	Bicycle:M	Yes / NA	
		3.5.2.1.2.1.63 (Transit)	Configure Transit Phase Minimum Green Time	O	Yes / No	
		3.5.2.1.2.1.64	Configure Transit Phase Maximum Green Time	Transit:M	Yes / NA	
		3.5.2.1.2.1.65	Configure Transit Phase Third Maximum Green Time	Transit:O	Yes / No / NA	
		3.5.2.1.2.1.66	Configure Transit Phase Yellow Time	Transit:M	Yes / NA	
		3.5.2.1.2.1.67	Configure Transit Phase Red Clearance Time	Transit:M	Yes / NA	
		3.5.2.1.2.1.68	Configure Transit Phase Red Revert Time	Transit:O	Yes / No / NA	
		3.5.2.1.2.1.69	Configure Transit Phase Added Initial Time	Transit:M	Yes / NA	
		3.5.2.1.2.1.70	Configure Transit Phase Maximum Initial Time	Transit:M	Yes / NA	
		3.5.2.1.2.1.71	Enable/Disable Transit Phase	Transit:M	Yes / NA	
		3.5.2.1.2.1.72	Configure Non-Lock Transit Detector Memory	Transit:O	Yes / No / NA	
		3.5.2.1.2.1.73	Configure Transit Phase Recall	Transit:O	Yes / No / NA	
		3.5.2.1.2.1.74	Configure Soft Transit Phase Recall	Transit:O	Yes / No / NA	
		3.5.2.1.2.1.75	Configure Dual Transit Phase Entry	Transit:O	Yes / No / NA	
		3.5.2.1.2.1.76	Configure Transit Phase-to-Ring Association	Transit:M	Yes / NA	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.1.2.1.77	Configure Transit Phase Concurrency	Transit:M	Yes / NA	
		3.5.2.1.2.1.78	Enable/Disable Vehicle Phase Omit	PhsCtrl:M	Yes / NA	
		3.5.2.1.2.1.79	Enable/Disable Vehicle Phase Omit during Transition	O	Yes / No	
		3.5.2.1.2.1.80	Enable/Disable Ped-only Phase Omit	PhsCtrl:M	Yes / NA	
		3.5.2.1.2.1.81	Enable/Disable Ped-only Phase Omit during Transition	O	Yes / No	
		3.5.2.1.2.1.82	Enable/Disable Bicycle-only Phase Omit	Bicycle, PhsCtrl:M	Yes / NA	
		3.5.2.1.2.1.83	Enable/Disable Bicycle-only Phase Omit during Transition	Bicycle:O	Yes / No / NA	
		3.5.2.1.2.1.84	Enable/Disable Transit Phase Omit	Transit, PhsCtrl:M	Yes / NA	
		3.5.2.1.2.1.85	Enable/Disable Transit Phase Omit during Transition	Transit:O	Yes / No / NA	
		3.5.2.1.2.1.86	Configure Alternate Minimum Vehicle Green Time during Transition	O	Yes / No	
		3.5.2.1.2.1.87	Configure Alternate Minimum Pedestrian Walk Time during Transition	O	Yes / No	
		3.5.2.1.2.1.88	Configure Alternate Minimum Bicycle Green Time during Transition	Bicycle:O	Yes / No / NA	
		3.5.2.1.2.1.89	Configure Alternate Minimum Transit Green Time during Transition	Transit:O	Yes / No / NA	
		3.5.2.1.2.1.90.1	Configure Phase-level Force Mode for Coordination - Floating	Coord:O.4 (1..*)	Yes / No / NA	
		3.5.2.1.2.1.90.2	Configure Phase-level Force Mode for Coordination - Fixed	Coord:O.4 (1..*)	Yes / No / NA	
		3.5.2.1.2.2.1	Determine Maximum Number of Phases	M	Yes	The ASC shall support at least 40 phases.
2.5.2.1.3 (Coord)	Manage Coordination Configurations			O	Yes / No	
		3.5.2.1.3.1.1	Configure Operational Mode for Coordination - Automatic	O.5 (1..*)	Yes / No	
		3.5.2.1.3.1.2	Configure Operational Mode for Coordination - Manual Pattern	O.5 (1..*)	Yes / No	
		3.5.2.1.3.1.3	Configure Operational Mode for Coordination - Manual Free	O.5 (1..*)	Yes / No	
		3.5.2.1.3.1.4	Configure Operational Mode for Coordination - Manual Flash	O.5 (1..*)	Yes / No	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.1.3.2.1	Configure Correction Mode for Coordination - Dwell	O.6 (1..*)	Yes / No	
		3.5.2.1.3.2.2	Configure Correction Mode for Coordination - Shortway	O.6 (1..*)	Yes / No	
		3.5.2.1.3.2.3	Configure Correction Mode for Coordination - AddOnly	O.6 (1..*)	Yes / No	
		3.5.2.1.3.2.4	Configure Correction Mode for Coordination - SubtractOnly	O.6 (1..*)	Yes / No	
		3.5.2.1.3.3.1	Configure Correction Mode for Coordination - Maximum 1	O.7 (1..*)	Yes / No	
		3.5.2.1.3.3.2	Configure Correction Mode for Coordination - Maximum 2	O.7 (1..*)	Yes / No	
		3.5.2.1.3.3.3	Configure Correction Mode for Coordination - Maximum Inhibit	O.7 (1..*)	Yes / No	
		3.5.2.1.3.3.4	Configure Correction Mode for Coordination - Maximum 3	O.7 (1..*)	Yes / No	
		3.5.2.1.3.4.1	Configure Unit-level Force Mode for Coordination - Floating	O.8 (1..*)	Yes / No	
		3.5.2.1.3.4.2	Configure Unit-level Force Mode for Coordination - Fixed	O.8 (1..*)	Yes / No	
		3.5.2.1.3.5.1	Configure Unit Coordination Point - First Phase Green Begin	O.9 (1..*)	Yes / No	
		3.5.2.1.3.5.2	Configure Unit Coordination Point - Last Phase Green Begin	O.9 (1..*)	Yes / No	
		3.5.2.1.3.5.3	Configure Unit Coordination Point - First Phase Green End	O.9 (1..*)	Yes / No	
		3.5.2.1.3.5.4	Configure Unit Coordination Point - Last Phase Green End	O.9 (1..*)	Yes / No	
		3.5.2.1.3.5.5	Configure Unit Coordination Point - First Phase Yellow End	O.9 (1..*)	Yes / No	
		3.5.2.1.3.5.6	Configure Unit Coordination Point - Last Phase Yellow End	O.9 (1..*)	Yes / No	
		3.5.2.1.3.6.1	Configure Coordination Point - First Phase Green Begin	O.10 (1..*)	Yes / No	
		3.5.2.1.3.6.2	Configure Coordination Point - Last Phase Green Begin	O.10 (1..*)	Yes / No	
		3.5.2.1.3.6.3	Configure Coordination Point - First Phase Green End	O.10 (1..*)	Yes / No	
		3.5.2.1.3.6.4	Configure Coordination Point - Last Phase Green End	O.10 (1..*)	Yes / No	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.1.3.6.5	Configure Coordination Point - First Phase Yellow End	O.10 (1..*)	Yes / No	
		3.5.2.1.3.6.6	Configure Coordination Point - Last Phase Yellow End	O.10 (1..*)	Yes / No	
		3.5.2.1.3.7	Configure Omit Phases During Transitions	O	Yes / No	
		3.5.2.1.3.8	Configure Minimum Green Times During Transitions	O	Yes / No	
		3.5.2.1.3.9	Configure Minimum Pedestrian Times During Transitions	O	Yes / No	
		3.5.2.1.3.10.1	Configure Transit Correction Mode for Coordination - Maximum 1	O.11 (1..*)	Yes / No	
		3.5.2.1.3.10.2	Configure Transit Correction Mode for Coordination - Maximum 2	O.11 (1..*)	Yes / No	
		3.5.2.1.3.10.3	Configure Transit Correction Mode for Coordination - MaxInhibit	O.11 (1..*)	Yes / No	
		3.5.2.1.3.10.4	Configure Transit Correction Mode for Coordination - Maximum 3	O.1 (1..*)	Yes / No	
2.5.2.1.4	Manage Timing Patterns			Coord:M	Yes / NA	
		3.5.2.1.4.1.1	Configure Pattern Cycle Time	M	Yes	
		3.5.2.1.4.1.2	Configure Pattern Offset Time	M	Yes	
		3.5.2.1.4.1.3	Configure Pattern Split Association	M	Yes	
		3.5.2.1.4.1.4	Configure Pattern Sequence Association	M	Yes	
		3.5.2.1.4.1.5	Configure Pattern Maximum Mode	O	Yes / No	
		3.5.2.1.4.2.1	Determine Maximum Number of Phase-based Timing Pattern	M	Yes	The ASC shall support at least 32 timing patterns.
		3.5.2.1.4.2.2	Determine Phase-based Timing Pattern Type	M	Yes	The ASC shall support one of the following types of signal patterns (Select one only): X Each pattern is unique ____ Each pattern consists of a plan with 3 different offsets ____ Each pattern consists of a plan with 5 different offsets
2.5.2.1.5	Manage Splits Configurations			O	Yes / No	
		3.5.2.1.5.1.1	Configure Phase Split Time	M	Yes	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.1.5.1.2.1	Configure Phase Split Mode - None	O.12 (1..*)	Yes / No	
		3.5.2.1.5.1.2.2	Configure Phase Split Mode - Minimum Vehicle Recall	O.12 (1..*)	Yes / No	
		3.5.2.1.5.1.2.3	Configure Phase Split Mode - Maximum Vehicle Recall	O.12 (1..*)	Yes / No	
		3.5.2.1.5.1.2.4	Configure Phase Split Mode - Pedestrian Recall	O.12 (1..*)	Yes / No	
		3.5.2.1.5.1.2.5	Configure Phase Split Mode - Maximum Vehicle and Pedestrian Recall	O.12 (1..*)	Yes / No	
		3.5.2.1.5.1.2.6	Configure Phase Split Mode - Phase Omit	O.12 (1..*)	Yes / No	
		3.5.2.1.5.1.2.7	Configure Phase Split Mode - Bicycle Recall	O.12 (1..*)	Yes / No	
		3.5.2.1.5.1.2.8	Configure Phase Split Mode - Transit Recall	O.12 (1..*)	Yes / No	
		3.5.2.1.5.1.2.9	Configure Phase Split Mode - Non-Actuated	O.12 (1..*)	Yes / No	
		3.5.2.1.5.1.3	Configure Split Coordination Phase	M	Yes	
		3.5.2.1.5.1.4	Configure Pre-timed Split	O	Yes / No	
		3.5.2.1.5.2.1	Determine Maximum Number of Phase Splits	M	Yes	The ASC shall support at least 24 splits
2.5.2.1.6 (Ring)	Manage Ring Configurations			O	Yes / No	
		3.5.2.1.6.1.1	Configure Sequence Data	M	Yes	
		3.5.2.1.6.2.1	Determine Maximum Number of Rings	M	Yes	The ASC shall support at least 16 rings
		3.5.2.1.6.2.2	Determine Maximum Number of Sequences	M	Yes	The ASC shall support at least 16 sequences
2.5.2.1.7 (Channel)	Manage Channel Configurations			O	Yes / No	
		3.5.2.1.7.1.1	Configure Channel Control Source	M	Yes	
		3.5.2.1.7.1.2.1	Configure Channel Control Type - Vehicle Phase	O.13 (1..*)	Yes / No	
		3.5.2.1.7.1.2.2	Configure Channel Control Type - Vehicle Overlap Phase	O.13 (1..*)	Yes / No	
		3.5.2.1.7.1.2.3	Configure Channel Control Type - Pedestrian Phase	O.13 (1..*)	Yes / No	
		3.5.2.1.7.1.2.4	Configure Channel Control Type - Pedestrian Overlap Phase	O.13 (1..*)	Yes / No	
		3.5.2.1.7.1.2.5	Configure Channel Control Type - Bicycle Phase	O.13 (1..*)	Yes / No	
		3.5.2.1.7.1.2.6	Configure Channel Control Type - Bicycle Overlap Phase	O.13 (1..*)	Yes / No	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.1.7.1.2.7	Configure Channel Control Type - Transit Phase	O.13 (1..*)	(Yes) / No	
		3.5.2.1.7.1.2.8	Configure Channel Control Type - Transit Overlap Phase	O.13 (1..*)	(Yes) / No	
		3.5.2.1.7.1.2.9	Configure Channel Control Type - Queue Jump Phase	O.13 (1..*)	(Yes) / No	
		3.5.2.1.7.1.3.1	Enable/Disable Channel Flash - Yellow	O.14 (1..*)	(Yes) / No	
		3.5.2.1.7.1.3.2	Enable/Disable Channel Flash - Red	O.14 (1..*)	(Yes) / No	
		3.5.2.1.7.1.3.3	Enable/Disable Channel Flash - Alternate Half Hertz	O.14 (1..*)	(Yes) / No	
		3.5.2.1.7.1.4.1	Enable/Disable Channel Dim - Green	Dimming:O	Yes / No / (NA)	
		3.5.2.1.7.1.4.2	Enable/Disable Channel Dim - Yellow	Dimming:O	Yes / No / (NA)	
		3.5.2.1.7.1.4.3	Enable/Disable Channel Dim - Red	Dimming:O	Yes / No / (NA)	
		3.5.2.1.7.1.4.4	Enable/Disable Channel Dim - Alternate Half Hertz	Dimming:O	Yes / No / (NA)	
		3.5.2.1.7.2.1	Determine Maximum Number of Channels	M	(Yes)	The ASC shall support at least 32 channels (See appropriate hardware specification such as NEMA TS 2 to determine maximum number of supported channels)
2.5.2.1.8 (Overlap)	Manage Overlap Configurations			O	(Yes) / No	
		3.5.2.1.8.1.1.1	Configure Overlap Type - Vehicle Normal	O.15 (1..*)	(Yes) / No	
		3.5.2.1.8.1.1.2	Configure Overlap Type - Vehicle Minus Green and Yellow	O.15 (1..*)	(Yes) / No	
		3.5.2.1.8.1.1.3	Configure Overlap Type - Pedestrian Normal	O.15 (1..*)	(Yes) / No	
		3.5.2.1.8.1.1.4	Configure Overlap Type - Bicycle Normal	O.15 (1..*)	(Yes) / No	
		3.5.2.1.8.1.1.5	Configure Overlap Type - Transit Normal	O.15 (1..*)	(Yes) / No	
		3.5.2.1.8.1.1.6	Configure Overlap Type - Flashing Yellow Arrow - 3 Section Head	O.15 (1..*)	(Yes) / No	
		3.5.2.1.8.1.1.7	Configure Overlap Type - Flashing Yellow Arrow - 4 Section Head	O.15 (1..*)	(Yes) / No	
		3.5.2.1.8.1.1.8	Configure Overlap Type - Flashing Yellow Arrow for Pedestrians	O.15 (1..*)	(Yes) / No	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.1.8.1.1.9	Configure Overlap Type - Flashing Red Arrow - 3 Section Head	O.15 (1..*)	Yes / No	
		3.5.2.1.8.1.1.10	Configure Overlap Type - Flashing Red Arrow - 4 Section Head	O.15 (1..*)	Yes / No	
		3.5.2.1.8.1.1.11	Configure Overlap Type - Transit Specific Signal Head	O.15 (1..*)	Yes / No	
		3.5.2.1.8.1.1.12	Configure Overlap Type - 2 Section Transit Specific Signal Head	O.15 (1..*)	Yes / No	
		3.5.2.1.8.1.2	Configure Overlap Included Phases	M	Yes	
		3.5.2.1.8.1.3	Configure Overlap Modifier Phases	O	Yes / No	
		3.5.2.1.8.1.4	Configure Pedestrian Modifier Phases	O	Yes / No	
		3.5.2.1.8.1.5	Configure Overlap Trailing Green	M	Yes	
		3.5.2.1.8.1.6	Configure Overlap Trailing Yellow	M	Yes	
		3.5.2.1.8.1.7	Configure Overlap Trailing Red Clearance	M	Yes	
		3.5.2.1.8.1.8	Configure Overlap Walk	O	Yes / No	
		3.5.2.1.8.1.9	Configure Overlap Pedestrian Clearance	O	Yes / No	
		3.5.2.1.8.2.1	Determine Maximum Number of Overlaps	M	Yes	The ASC shall support at least 16 overlaps
2.5.2.1.9 (Preempt)	Manage Preempt Configurations			O	Yes / No	
		3.5.2.1.9.1.1	Enable/Disable Preempt Inputs	O	Yes / No	
		3.5.2.1.9.1.2.1	Configure Preempt Control - Non-Locking Memory	O.16 (1..*)	Yes / No	
		3.5.2.1.9.1.2.2	Configure Preempt Control - Preempt Override Flash	O.16 (1..*)	Yes / No	
		3.5.2.1.9.1.2.3	Configure Preempt Control - Preempt Override Priority	O.16 (1..*)	Yes / No	
		3.5.2.1.9.1.2.4	Configure Preempt Control - Flash Dwell	O.16 (1..*)	Yes / No	
		3.5.2.1.9.1.3	Configure Preempt Link	M	Yes	
		3.5.2.1.9.1.4	Configure Preempt Delay	M	Yes	
		3.5.2.1.9.1.5	Configure Preempt Minimum Duration	M	Yes	
		3.5.2.1.9.1.6	Configure Preempt Enter Minimum Green Time	O	Yes / No	
		3.5.2.1.9.1.7	Configure Preempt Enter Minimum Walk Time	O	Yes / No	
		3.5.2.1.9.1.8	Configure Preempt Enter Pedestrian Clearance Time	O	Yes / No	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.1.9.1.9	Configure Preempt Track Clearance Time	M	Yes	
		3.5.2.1.9.1.10	Configure Preempt Minimum Dwell Time	M	Yes	
		3.5.2.1.9.1.11	Configure Preempt Maximum Presence Time	M	Yes	
		3.5.2.1.9.1.12	Configure Preempt Track Clearance Phases	M	Yes	
		3.5.2.1.9.1.13	Configure Preempt Dwell Phases	M	Yes	
		3.5.2.1.9.1.14	Configure Preempt Dwell Pedestrian Movements	O	Yes / No	
		3.5.2.1.9.1.15 (preemptExit)	Configure Preempt Exit Phases	O	Yes / No	
		3.5.2.1.9.1.16.1	Configure Preempt Exit Phase Strategy - Exit to Normal Operation	preemptExit:O.17 (1..*)	Yes / No / NA	
		3.5.2.1.9.1.16.2	Configure Preempt Exit Phase Strategy - Exit to Coordination	preemptExit:O.17 (1..*)	Yes / No / NA	
		3.5.2.1.9.1.16.3 (preemptQueue)	Configure Preempt Exit Phase Strategy - Exit to Queue Delay Recovery	preemptExit:O.17 (1..*)	Yes / No / NA	
		3.5.2.1.9.1.16.4	Configure Preempt Exit Phase Strategy - Exit to Short Service Phase	preemptExit:O.17 (1..*)	Yes / No / NA	
		3.5.2.1.9.1.17	Configure Preempt Track Overlap	O	Yes / No	
		3.5.2.1.9.1.18	Configure Preempt Dwell Overlap	O	Yes / No	
		3.5.2.1.9.1.19	Configure Preempt Cycling Phases	M	Yes	
		3.5.2.1.9.1.20	Configure Preempt Cycling Pedestrian Movements	O	Yes / No	
		3.5.2.1.9.1.21	Configure Preempt Cycling Overlaps	O	Yes / No	
		3.5.2.1.9.1.22	Configure Preempt Enter Yellow Change Time	O	Yes / No	
		3.5.2.1.9.1.23	Configure Preempt Enter Red Clearance Time	O	Yes / No	
		3.5.2.1.9.1.24	Configure Preempt Track Yellow Change Time	O	Yes / No	
		3.5.2.1.9.1.25	Configure Preempt Track Red Clearance Time	O	Yes / No	
		3.5.2.1.9.1.26	Configure Preempt Exit Priority Levels	preemptQueue:O	Yes / No / NA	
		3.5.2.1.9.1.27.1	Configure Preempt Max Presence Exceeded - Normal	M	Yes	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.1.9.1.27.2	Configure Preempt Max Presence Exceeded - All Flash Red	O	Yes / No	
		3.5.2.1.9.1.28	Configure Preempt Cycling Phases Sequence	M	Yes	
		3.5.2.1.9.1.29	Configure Preempt Enter Minimum Bicycle Time	O	Yes / No	
		3.5.2.1.9.1.30	Configure Preempt Enter Bicycle Clearance Time	O	Yes / No	
		3.5.2.1.9.1.31	Configure Preempt Cycling Bicycle Phases	O	Yes / No	
		3.5.2.1.9.1.32	Configure Preempt Enter Minimum Transit Time	O	Yes / No	
		3.5.2.1.9.1.33	Configure Preempt Enter Transit Clearance Time	O	Yes / No	
		3.5.2.1.9.1.34	Configure Preempt Cycling Transit Phases	O	Yes / No	
		3.5.2.1.9.2.1	Determine Maximum Number of Preempts	M	Yes	The ASC shall support at least 12 preempts
2.5.2.1.10 (Scheduler)	Manage Timing Pattern Scheduler			O	Yes / No	
		3.5.2.1.10.1.1	Configure Timebase Pattern Synchronization Time	M	Yes	
		H.1.1.5.1	Configure Time	M	Yes	
		H.1.1.5.2	Configure Time Zone	TimeZone: O	Yes / No / NA	Note: Users are cautioned that this object definition has been revised to address interoperability issues in version 01, but remains at the same ObjectID. Pay close attention to the implementation, and interoperability of this object. Place a checkmark below, if the ASC is NOT required to support the major version that is checked. Version v01 ✓ Version v02
		H.1.1.5.3	Configure Daylight Saving Mode	DST:O	Yes / No / NA	
		H.1.1.5.4	Determine Time Setting	M	Yes	
		H.1.1.5.5 (TimeZone)	Determine Time Zone Setting	O	Yes / No	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		H.1.1.5.6 (DST)	Determine Daylight Saving Mode Setting	O	Yes / No	
		H.1.1.7.1	Configure Timebased Scheduler Month-Day-Date	M	Yes	The ASC shall support at least 1000 Schedule Entries (between 1 and 65535).
		H.1.1.7.2	Configure Timebased Scheduler Day Plans and Timebased Actions	M	Yes	The ASC shall support at least 40 Day Plans (between 1 and 255). The ASC shall support at least 64 Events per Day Plans (between 1 and 255). Note: This requirement also appears under User Need ID 2.5.2.1.12 in the PRL.
		H.1.2.3.1	Monitor Timebased Scheduler Month-Day-Date	M	Yes	
		H.1.2.3.2	Monitor Timebased Scheduler Day Plans and Timebased Actions	M	Yes	
		H.1.2.3.3	Monitor Active Timebased Schedule	M	Yes	
		H.1.2.3.4	Monitor Active Timebased Schedule Day Plan and Timebased Actions	M	Yes	
2.5.2.1.11	Manage Action Scheduler			Scheduler: M	Yes / NA	
		3.5.2.1.10.1.1	Configure Timebase Pattern Synchronization Time	M	Yes	
		3.5.2.1.10.1.2	Configure Timebased Action - Pattern	M	Yes	
		3.5.2.1.10.1.3.1	Configure Timebased Action - Auxiliary Function 1	O.18 (1..*)	Yes / No	
		3.5.2.1.10.1.3.2	Configure Timebased Action - Auxiliary Function 2	O.18 (1..*)	Yes / No	
		3.5.2.1.10.1.3.3	Configure Timebased Action - Auxiliary Function 3	O.18 (1..*)	Yes / No	
		3.5.2.1.10.1.3.4	Configure Timebased Action - Dimming	Dimming: O.18 (1..*)	Yes / No / NA	
		3.5.2.1.10.1.4.1	Configure Timebased Action - Special Function 1	O.19 (1..*)	Yes / No	
		3.5.2.1.10.1.4.2	Configure Timebased Action - Special Function 2	O.19 (1..*)	Yes / No	
		3.5.2.1.10.1.4.3	Configure Timebased Action - Special Function 3	O.19 (1..*)	Yes / No	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.1.10.1.4.4	Configure Timebased Action - Special Function 4	O.19 (1..*)	Yes / No	
		3.5.2.1.10.1.4.5	Configure Timebased Action - Special Function 5	O.19 (1..*)	Yes / No	
		3.5.2.1.10.1.4.6	Configure Timebased Action - Special Function 6	O.19 (1..*)	Yes / No	
		3.5.2.1.10.1.4.7	Configure Timebased Action - Special Function 7	O.19 (1..*)	Yes / No	
		3.5.2.1.10.1.4.8	Configure Timebased Action - Special Function 8	O.19 (1..*)	Yes / No	
		3.5.2.1.10.2.1	Determine Maximum Number of Timebased Actions	M	Yes	The ASC shall support at least 1000 Timebased Actions (between 1 and 65535).
		3.5.2.1.10.2.2	Determine Action In Effect	M	Yes	
		H.1.1.7.1	Configure Timebased Scheduler Month-Day-Date	M	Yes	The ASC shall support at least 1000 Schedule Entries (between 1 and 65535). Note: This requirement also appears under User Need ID 2.5.2.1.11 in the PRL.
		H.1.1.7.2	Configure Timebased Scheduler Day Plans and Timebased Actions	M	Yes	The ASC shall support at least 40 Day Plans (between 1 and 255). The ASC shall support at least 64 Events per Day Plans (between 1 and 255). Note: This requirement also appears under User Need ID 2.5.2.1.11 in the PRL.
		H.1.2.3.1	Monitor Timebased Scheduler Month-Day-Date	M	Yes	
		H.1.2.3.2	Monitor Timebased Scheduler Day Plans and Timebased Actions	M	Yes	
		H.1.2.3.3	Monitor Active Timebased Schedule	M	Yes	
		H.1.2.3.4	Monitor Active Timebased Schedule Day Plan and Timebased Actions	M	Yes	
2.5.2.1.12	Manage I/O Mapping			O	Yes / No	
		3.5.2.1.11.1.1	Set Active I/O Map	M	Yes	
		3.5.2.1.11.1.2.1	Configure I/O Map Description	M	Yes	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.1.11.1.2.2.1	Configure I/O Map Input Device	M	Yes	
		3.5.2.1.11.1.2.2.2	Configure I/O Map Input Device Pin	M	Yes	
		3.5.2.1.11.1.2.2.3	Configure I/O Map Input Function	M	Yes	
		3.5.2.1.11.1.2.3.1	Configure I/O Map Output Device	M	Yes	
		3.5.2.1.11.1.2.3.2	Configure I/O Map Output Device Pin	M	Yes	
		3.5.2.1.11.1.2.3.3	Configure I/O Map Output Function	M	Yes	
		3.5.2.1.11.2.1	Retrieve Maximum Number of I/O Maps	M	Yes	
		3.5.2.1.11.2.2	Retrieve Maximum Number of I/O Map Inputs	M	Yes	
		3.5.2.1.11.2.3	Retrieve Maximum Number of I/O Map Outputs	M	Yes	
		3.5.2.1.11.2.4	Retrieve I/O Mapping Activate Conditions	M	Yes	The following conditions shall be satisfied before a new I/O map can be activated: ___ Cabinet Door Open X__ in any flash state ___ programmed all red flash ___ in CVM flash ASC restart
		3.5.2.1.11.2.5	Retrieve I/O Mapping Input Functions	M	Yes	
		3.5.2.1.11.2.6	Retrieve I/O Mapping Output Functions	M	Yes	
		3.5.2.1.11.2.7	Retrieve I/O Map Input Device Pin Status	M	Yes	
		3.5.2.1.11.2.8	Retrieve I/O Map Output Device Pin Status	M	Yes	
		3.5.2.1.11.2.9.1	Enumerate I/O Map - FIO Inputs	332:M	Yes / NA	
		3.5.2.1.11.2.9.2	Enumerate I/O Map - FIO Outputs	332:M	Yes / NA	
		3.5.2.1.11.2.9.3	Enumerate I/O Map - TS1 Inputs	TS1, TS2-2:M	Yes / NA	
		3.5.2.1.11.2.9.4	Enumerate I/O Map - TS1 Outputs	TS1, TS2-2:M	Yes / NA	
		3.5.2.1.11.2.9.5	Enumerate I/O Map - TS2 BIU Inputs	TS2-1:M	Yes / NA	
		3.5.2.1.11.2.9.6	Enumerate I/O Map - TS2 BIU Outputs	TS2-1:M	Yes / NA	
		3.5.2.1.11.2.9.7	Enumerate I/O Map - ITS Cabinet SIU Inputs	ITS:M	Yes / NA	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.1.11.2.9.8	Enumerate I/O Map - ITS Cabinet SIU Outputs	ITS:M	Yes / NA	
		3.5.2.1.11.2.9.9	Enumerate I/O Map - Auxiliary Device Inputs	O	Yes / No	
		3.5.2.1.11.2.9.10	Enumerate I/O Map - Auxiliary Device Outputs	O	Yes / No	
2.5.2.1.13 (Intra)	Manage Intra-Cabinet Communications Configuration			O	Yes / No	
		3.5.2.1.12.1	Determine Serial Bus 1 Device Present	ITS:M	Yes / NA	The ASC shall support at least 10 Serial Bus 1 Addresses (between 1 and 255).
		3.5.2.1.12.2.1	Determine TS2 Port 1 Device Present	TS2-2:M	Yes / NA	The ASC shall support at least 10 TS2 Port1 Addresses (between 1 and 255).
		3.5.2.1.12.2.2	Determine TS2 Port 1 Frame 40 Enable	TS2-2:M	Yes / NA	
2.5.2.1.14	Manage ADA Support			O	Yes / No	
		3.5.2.1.13.1.1	Configure APS Push Button Minimum Press Time	M	Yes	
		3.5.2.1.13.1.2	Configure APS Push Button to Phase Association	M	Yes	
		3.5.2.1.13.1.3	Configure APS Extra Crossing Time	M	Yes	
		3.5.2.1.13.2	Determine Maximum Number of Pedestrian Buttons	M	Yes	The ASC shall support at least 16 Pedestrian Push Button inputs (between 1 and 16).
2.5.2.2	Monitor Signal Operations Status					
2.5.2.2.1	Determine Controller Health			M	Yes	
		3.5.2.2.1.1.1	Monitor Preempt Active	Preempt:M	Yes / NA	
		3.5.2.2.1.1.2	Monitor Terminal and Facilities Flash	M	Yes	
		3.5.2.2.1.1.3	Monitor Local Cycle Zero Alarm	M	Yes	
		3.5.2.2.1.1.4	Monitor Local Override	M	Yes	
		3.5.2.2.1.1.5	Monitor Coordination Alarm	Coord:M	Yes / NA	
		3.5.2.2.1.1.6	Monitor Detector Fault	Detector:M	Yes / NA	
		3.5.2.2.1.1.7	Monitor Non-Critical Alarm	M	Yes	
		3.5.2.2.1.1.8	Monitor Stop Time Input Alarm	M	Yes	
		3.5.2.2.1.1.9	Monitor Cycle Fault Alarm	M	Yes	
		3.5.2.2.1.1.10	Monitor Coordination Fault	Coord:M	Yes / NA	
		3.5.2.2.1.1.11	Monitor Coordination Fail Alarm	Coord:M	Yes / NA	
		3.5.2.2.1.1.12	Monitor Cycle Fail Alarm	M	Yes	

Protocol Requirements List (PRL)						
User Need ID	User Need	FR ID	Functional Requirement	Conformance	Support	Additional Specifications
		3.5.2.2.1.1.13	Monitor SMU Flash Alarm	M	Yes	
		3.5.2.2.1.1.14	Monitor Local Flash Alarm	M	Yes	
		3.5.2.2.1.1.15	Monitor Local Free Alarm	M	Yes	
		3.5.2.2.1.1.16	Monitor Coordination Active Alarm	Coord:M	Yes / NA	
		3.5.2.2.1.1.17	Monitor Power Restart Alarm	Power:M	Yes / NA	
		3.5.2.2.1.1.18	Monitor Low Battery Alarm	Power:O	Yes / No / NA	
		3.5.2.2.1.1.19	Monitor Response Fault Alarm	M	Yes	
		3.5.2.2.1.1.20	Monitor External Start	M	Yes	
		3.5.2.2.1.1.21	Monitor Stop Time Alarm	M	Yes	
		3.5.2.2.1.1.22	Monitor Offset Transitioning Alarm	M	Yes	
		3.5.2.2.1.1.23	Monitor Stall Condition	M	Yes	The vendor shall list the ASC processes or services where a watchdog timer is maintained and is considered critical to the safe operation of the ASC.
		3.5.2.2.1.1.24	Monitor Memory Fault	M	Yes	
		3.5.2.2.1.1.25	Monitor Process Failure	M	Yes	
		3.5.2.2.1.1.26	Monitor Communications Timeout	M	Yes	
		3.5.2.2.1.1.27	Monitor Power Problems	Power:M	Yes / NA	
		3.5.2.2.1.1.28	Monitor UPS Errors	UPS:O	Yes / No / NA	
		3.5.2.2.1.1.29	Monitor Scheduler Errors	Scheduler: M	Yes / NA	
		3.5.2.2.1.1.30	Monitor Signal Monitor Communications Error	O	Yes / No	
		3.5.2.2.1.1.31	Monitor Signal Monitor Unit Presence	O	Yes / No	
		3.5.2.2.1.1.32	Monitor USB Memory Device	O	Yes / No	
		3.5.2.2.1.1.33	Monitor ASC Cabinet Temperature Alarm	Temp:M	Yes / NA	
		3.5.2.2.1.1.34	Monitor ASC Cabinet Humidity Alarm	Humidity:M	Yes / NA	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.2.1.1.35	Monitor Clock Failure	M	Yes	
		3.5.2.2.1.1.36	Monitor Preempt Maximum Presence Alarm	Preempt:O	Yes / No / NA	
		3.5.2.2.1.1.37	Monitor RSU Watchdog Timer	CV:M	Yes / NA	
		3.5.2.2.1.1.38	Monitor CV Certificate Faults	CV:O	Yes / No / NA	
		3.5.2.2.1.2	Monitor Alarm Group State	M	Yes	The ASC shall support at least 48 Alarm Groups (between 1 and 255).
2.5.2.2.2	Determine Mode of Operation					
2.5.2.2.2.1 (Unit)	Monitor Unit-wide General Operations			O	Yes / No	
		3.5.2.2.2.1	Monitor Unit Control Status	M	Yes	
		3.5.2.2.2.2	Monitor External Minimum Recall	O	Yes / No	
		3.5.2.2.2.3	Monitor Call to Non-Actuated 1	O	Yes / No	
		3.5.2.2.2.4	Monitor Call to Non-Actuated 2	O	Yes / No	
		3.5.2.2.2.5	Monitor Walk Rest Modifier	O	Yes / No	
		3.5.2.2.2.6	Monitor Interconnect	O	Yes / No	
		3.5.2.2.2.7 (Dimming)	Monitor Dimming Enabled	O	Yes / No	
2.5.2.2.2.2	Monitor Flashing			Unit:M	Yes / NA	
		3.5.2.2.2.8	Monitor Unit Flash Status	M	Yes	
2.5.2.2.2.3	Monitor Current Timing Pattern			Coord:M	Yes / NA	
		3.5.2.2.2.9.1	Monitor Current Pattern Status	M	Yes	
		3.5.2.2.2.9.2	Monitor Local Free Status	M	Yes	
		3.5.2.2.2.9.3	Monitor Current Mode of Operation	M	Yes	
		3.5.2.2.2.9.4	Monitor Programmed Pattern	M	Yes	
2.5.2.2.2.4	Monitor Current Cycle			Coord:M	Yes / NA	
		3.5.2.2.2.10.1	Monitor Coordination Cycle Status	M	Yes	
		3.5.2.2.2.10.2	Monitor Coordination Synchronization Status	M	Yes	
		3.5.2.2.2.10.3	Monitor Current Split	M	Yes	
		3.5.2.2.2.10.4	Monitor Current Offset	M	Yes	
2.5.2.2.3	Monitor Signal Indication			M	Yes	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.2.3.1	Determine Maximum Number of Phase Groups	M	Yes	The ASC shall support at least 5 Phase Groups (between 1 and 255).
		3.5.2.2.3.2	Monitor Phase Group Reds	M	Yes	
		3.5.2.2.3.3	Monitor Phase Group Yellows	M	Yes	
		3.5.2.2.3.4	Monitor Phase Group Greens	M	Yes	
		3.5.2.2.3.5	Monitor Phase Group Don't Walks	M	Yes	
		3.5.2.2.3.6	Monitor Phase Group Pedestrian Clearance	M	Yes	
		3.5.2.2.3.7	Monitor Phase Group Walks	M	Yes	
		3.5.2.2.3.8	Monitor Phase Group Flashing Yellow Arrow	O	Yes / No	
		3.5.2.2.3.9	Monitor Phase Group Flashing Red Arrow	O	Yes / No	
2.5.2.2.4	Monitor Phase Status			M	Yes	
		3.5.2.2.4.1	Monitor Phase Group Phase Ons	M	Yes	
		3.5.2.2.4.2	Monitor Phase Group Phase Nexts	M	Yes	
		3.5.2.2.4.3	Monitor Phase Group Vehicle Call	M	Yes	
		3.5.2.2.4.4	Monitor Phase Group Pedestrian Call	M	Yes	
		3.5.2.2.4.5	Monitor Phase Group Bicycle Call	Bicycle:M	Yes / NA	
		3.5.2.2.4.6	Monitor Phase Group Transit Call	Transit:M	Yes / NA	
2.5.2.2.5	Monitor Ring Status			Ring:M	Yes / NA	
		3.5.2.2.5.1	Monitor Ring Status	M	Yes	
		3.5.2.2.5.2	Monitor Ring Termination Cause	M	Yes	
2.5.2.2.6	Monitor Channel Status			Channel:M	Yes / NA	
		3.5.2.2.6.1	Determine Maximum Number of Channel Status Groups	M	Yes	
		3.5.2.2.6.2	Monitor Channel Status Group Reds	M	Yes	
		3.5.2.2.6.3	Monitor Channel Status Group Yellows	M	Yes	
		3.5.2.2.6.4	Monitor Channel Status Group Greens	M	Yes	
2.5.2.2.7	Monitor Overlap Status			Overlap:M	Yes / NA	
		3.5.2.2.7.1	Determine Maximum Number of Overlap Status Groups	M	Yes	
		3.5.2.2.7.2	Monitor Overlap Status Group Reds	M	Yes	
		3.5.2.2.7.3	Monitor Overlap Status Group Yellows	M	Yes	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.2.7.4	Monitor Overlap Status Group Greens	M	Yes	
		3.5.2.2.7.5	Monitor Overlap Status Group Flashing Yellow Arrows	O	Yes / No	
		3.5.2.2.7.6	Monitor Overlap Status Group Flashing Red Arrows	O	Yes / No	
2.5.2.2.8	Monitor Preempt Input State			Preempt:M	Yes / NA	
		3.5.2.2.8.1	Monitor Currently Active Preempt	M	Yes	
		3.5.2.2.8.2	Monitor Current Preempt Inputs	M	Yes	
2.5.2.2.9	Monitor Preempt State			Preempt:O	Yes / NA	
		3.5.2.2.8.3	Monitor Current Preempt State	M	Yes	
		3.5.2.2.8.4	Monitor Current Gate Status	O	Yes / No	
2.5.2.2.10 (SpecialFunc)	Monitor Special Function Outputs			O	Yes / No	
		3.5.2.2.9.1	Determine Maximum Number of Special Functions	M	Yes	The ASC shall support at least 16 Special Functions (between 1 and 255).
		3.5.2.2.9.3	Monitor Special Function Status	M	Yes	
		3.5.2.2.9.4	Monitor Special Function Control Source	O	Yes / No	
2.5.2.2.11	Monitor Timebase Action Status			Scheduler: M	Yes / NA	
		3.5.2.2.10.1	Monitor Timebase Action Status	M	Yes	
		3.5.2.2.10.2	Monitor Timebase Timing Pattern Status	M	Yes	
2.5.2.2.12	Monitor Intra-Cabinet Communications Configuration			O	Yes / No	
		3.5.2.2.11.1	Monitor TS2 Port 1 Status	TS2-2:M	Yes / NA	
		3.5.2.2.11.2	Monitor TS2 Port 1 Fault Frame	TS2-2:M	Yes / NA	
		3.5.2.2.11.3	Monitor Serial Bus 1 Status	ITS:M	Yes / NA	
2.5.2.3	Control Signal Operations			M	Yes	
2.5.2.3.1	Control ASC-wide General Operations			M	Yes	
		3.5.2.3.1.1	Control External Minimum Recall	M	Yes	
		3.5.2.3.1.2	Control Call to Non-Actuated 1	M	Yes	
		3.5.2.3.1.3	Control Call to Non-Actuated 2	O	Yes / No	
		3.5.2.3.1.4	Control Walk Rest Modifier	M	Yes	
		3.5.2.3.1.5	Control Interconnect	O	Yes / No	
		3.5.2.3.1.6	Control Dimming Enabled	Dimming:M	Yes / NA	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.2.3.1.7	Control Disable Remote Commands	O	Yes / No	
		3.5.2.3.1.8	Acknowledge Local Cycle Zero Alarm	M	Yes	
		3.5.2.3.1.9	Control Weather-based Signal Operation Changes	O	Yes / No	
2.5.2.3.2	Command Timing Pattern			Coord:M	Yes / NA	
		3.5.2.3.2.1	Command System Timing Pattern	M	Yes	
		3.5.2.3.2.2	Command System Timing Pattern System Reference Point	M	Yes	
2.5.2.3.3 (PhsCtrl)	Phase Requests			O	Yes / No	
		3.5.2.3.3.1	Control Phase Group Phase Omits	M	Yes	
		3.5.2.3.3.2	Control Phase Group Pedestrian Omits	M	Yes	
		3.5.2.3.3.3	Control Phase Group Holds	M	Yes	
		3.5.2.3.3.4	Control Phase Group Force Offs	O	Yes / No	
		3.5.2.3.3.5	Control Phase Group Vehicle Calls	M	Yes	
		3.5.2.3.3.6	Control Phase Group Pedestrian Calls	M	Yes	
		3.5.2.3.3.7	Control Phase Group Bicycle Calls	Bicycle:M	Yes / NA	
		3.5.2.3.3.8	Control Phase Group Transit Calls	Transit:M	Yes / NA	
2.5.2.3.4	Activate Preempt			Preempt:O	Yes / No	
		3.5.2.3.4.1	Command Preempt Remote Activation	M	Yes	
2.5.2.3.5	Control Ring Operations			Ring:O	Yes / No / NA	
		3.5.2.3.5.1	Control Ring Stop Time	M	Yes	
		3.5.2.3.5.2	Control Ring Force Offs	M	Yes	
		3.5.2.3.5.3	Control Ring Maximum 2 Time Settings	M	Yes	
		3.5.2.3.5.4	Control Ring Maximum 3 Time Settings	O	Yes / No	
		3.5.2.3.5.5	Control Ring Maximum Inhibit Settings	M	Yes	
		3.5.2.3.5.6	Control Ring Pedestrian Recycle Settings	M	Yes	
		3.5.2.3.5.7	Control Ring Red Rest Settings	M	Yes	
		3.5.2.3.5.8	Control Ring Red Clearance Omit Settings	M	Yes	
		3.5.2.3.5.9	Determine Maximum Number of Ring Control Groups	M	Yes	The ASC shall support at least 2 ring control groups.

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
2.5.2.3.6	Activate Special Function Output			SpecialFunc:O	Yes / No / NA	
		3.5.2.3.6.1	Activate Special Function	M	Yes	
		3.5.2.3.6.2	Release Special Function Control	M	Yes	
2.5.2.3.7	Control Frame 40			TS1:O TS2-2:O TS2-1:O	Yes / No / NA	
		3.5.2.3.7.1	Control TS2 Port 1 Frame 40 Messages	M	Yes	
2.5.2.3.8	Activate Action Plan			O	Yes / No	
		3.5.2.3.8	Activate Action Plan	M	Yes	
2.5.2.3.9	Remote Manual Control			O	Yes / No	
		3.5.2.3.9.1	Enable Manual Control	M	Yes	
		3.5.2.3.9.2	Remote Manual Control Advance Command	M	Yes	
		3.5.2.3.9.3	Configure Manual Control Timeout	M	Yes	
2.5.3	Manage Detectors					
2.5.3.1 (Detector)	Manage Detector Configuration			M	Yes	
		3.5.3.1.1.1.1	Configure Vehicle Volume Detectors	O	Yes / No	
		3.5.3.1.1.1.2	Configure Vehicle Occupancy Detectors	O	Yes / No	
		3.5.3.1.1.1.3 (Speed)	Configure Vehicle Speed Detectors	O	Yes / No	
		3.5.3.1.1.1.4	Configure Vehicle Detection Zone Length	O	Yes / No	
		3.5.3.1.1.1.5	Configure Vehicle Travel Mode	O	Yes / No	
		3.5.3.1.1.1.6	Configure Vehicle Detector Yellow Lock Call Enabled	O	Yes / No	
		3.5.3.1.1.1.7	Configure Vehicle Detector Red Lock Call Enabled	O	Yes / No	
		3.5.3.1.1.1.8	Configure Vehicle Detector Passage Enabled	O	Yes / No	
		3.5.3.1.1.1.9	Configure Vehicle Detector Added Initial Time Enabled	O	Yes / No	
		3.5.3.1.1.1.10	Configure Vehicle Detector Queue Enabled	O	Yes / No	
		3.5.3.1.1.1.11	Configure Vehicle Detector Call Enabled	M	Yes	
		3.5.3.1.1.1.12	Configure Vehicle Detector Call Phase	M	Yes	
		3.5.3.1.1.1.13	Configure Vehicle Detector Switch Phase	M	Yes	
		3.5.3.1.1.1.14	Configure Vehicle Detector Delay Time	M	Yes	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.3.1.1.1.15	Configure Vehicle Detector Extend Time	M	Yes	
		3.5.3.1.1.1.16	Configure Vehicle Detector Queue Limit Time	O	Yes / No	
		3.5.3.1.1.1.17	Configure Vehicle Detector No Activity Time	M	Yes	
		3.5.3.1.1.1.18	Configure Vehicle Detector Maximum Presence Time	M	Yes	
		3.5.3.1.1.1.19	Configure Vehicle Detector Erratic Counts	M	Yes	
		3.5.3.1.1.1.20	Configure Vehicle Detector Fail Time	O	Yes / No	
		3.5.3.1.1.1.21	Configure Single Detector Speed Mode	Speed:M	Yes / NA	
		3.5.3.1.1.1.22	Configure Paired Detector	Speed:M	Yes / NA	
		3.5.3.1.1.1.23	Configure Paired Detector Placement	Speed:M	Yes / NA	
		3.5.3.1.1.1.24	Configure Paired Detector Spacing	Speed:M	Yes / NA	
		3.5.3.1.1.1.25	Configure Average Vehicle Length	Speed:M	Yes / No	
		3.5.3.1.1.2.1	Configure Pedestrian Detector Call Phase	M	Yes	
		3.5.3.1.1.2.2	Configure Pedestrian Detector No Activity Time	M	Yes	
		3.5.3.1.1.2.3	Configure Pedestrian Detector Maximum Presence Time	M	Yes	
		3.5.3.1.1.2.4	Configure Pedestrian Detector Erratic Counts	M	Yes	
		3.5.3.1.1.2.5	Configure Pedestrian Detector Non-Lock Calls	O	Yes / No	
		3.5.3.1.1.2.6	Configure Pedestrian Detector Alternate Pedestrian Timing	O	Yes / No	
		3.5.3.1.1.2.7	Configure Pedestrian Detector Type	O	Yes / No	
2.5.3.2	Monitor Detector Status			O	Yes / No	
		3.5.3.1.2.1.1	Determine Maximum Number of Vehicle Detectors	M	Yes	The ASC shall support at least 128 vehicle detectors (between 1 and 255).
		3.5.3.1.2.2.1	Determine Maximum Number of Pedestrian Detectors	M	Yes	The ASC shall support at least 16 pedestrian detectors (between 1 and 255).
		3.5.3.2.1.1	Determine Maximum Number of Vehicle Detector Status Groups	M	Yes	The ASC shall support at least 5 vehicle detector status groups (between 1 and 255).

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.3.2.1.2	Monitor Vehicle Detector Status Group Active	M	Yes	
		3.5.3.2.1.3	Monitor Vehicle Detector Status Group Alarm Status	M	Yes	
		3.5.3.2.2.1	Determine Maximum Number of Pedestrian Detector Status Groups	M	Yes	The ASC shall support at least 5 Pedestrian detector status groups (between 1 and 255).
		3.5.3.2.2.2	Monitor Pedestrian Detector Status Active	O	Yes / No	
		3.5.3.2.2.3	Monitor Pedestrian Detector Alarm Status	M	Yes	
2.5.3.3	Monitor Detector Health			O	Yes / No	
		3.5.3.3.1.1	Monitor Vehicle Detector No Activity Fault	M	Yes	
		3.5.3.3.1.2	Monitor Vehicle Detector Max Presence Fault	M	Yes	
		3.5.3.3.1.3	Monitor Vehicle Detector Erratic Output Fault	M	Yes	
		3.5.3.3.1.4	Monitor Vehicle Detector Communications Fault	M	Yes	
		3.5.3.3.1.5	Monitor Vehicle Detector Configuration Fault	M	Yes	
		3.5.3.3.2.1	Monitor Loop Vehicle Detector Watchdog Failure	O	Yes / No	
		3.5.3.3.2.2	Monitor Loop Vehicle Detector Open Loop Failure	O	Yes / No	
		3.5.3.3.2.3	Monitor Loop Vehicle Detector Shorted Loop Fault	O	Yes / No	
		3.5.3.3.2.4	Monitor Loop Vehicle Detector Excessive Change Fault	O	Yes / No	
		3.5.3.3.3.1	Monitor Pedestrian Detector No Activity Fault	M	Yes	
		3.5.3.3.3.2	Monitor Pedestrian Detector Max Presence Fault	M	Yes	
		3.5.3.3.3.3	Monitor Pedestrian Detector Erratic Output Fault	M	Yes	
		3.5.3.3.3.4	Monitor Pedestrian Detector Communications Fault	M	Yes	
		3.5.3.3.3.5	Monitor Pedestrian Detector Configuration Fault	M	Yes	
2.5.3.4	Control Detectors			O	Yes / No	
		3.5.3.4.1	Control Vehicle Detector Reset	M	Yes	
		3.5.3.4.2	Control Pedestrian Detector Reset	M	Yes	
		3.5.3.4.3	Control Vehicle Detector Actuation	O	Yes / No	
		3.5.3.4.4	Control Pedestrian Detector Actuation	O	Yes / No	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
2.5.3.5	Manage Detector Data			O	Yes / No	
		3.5.3.5.1.1.1	Configure Detector Data Sample Period	M	Yes	
		3.5.3.5.1.1.2	Configure Detector Data Sample Period - Version 3	M	Yes	
		3.5.3.5.2.1.1	Monitor Detector Data Sequence	M	Yes	
		3.5.3.5.2.1.2	Determine Detector Data Active Detectors	M	Yes	
		3.5.3.5.2.1.3	Monitor Volume Data	O	Yes / No	
		3.5.3.5.2.1.4	Monitor Average Speed	Speed:M	Yes / NA	
		3.5.3.5.2.1.5	Monitor Occupancy Data	O	Yes / No	
		3.5.3.5.2.1.6	Monitor Vehicle Detector Data Alarms	M	Yes	
		3.5.3.5.2.1.7	Monitor Detector Data Sample Time	M	Yes	
		3.5.3.5.2.1.8	Monitor Detector Data Sample Duration	M	Yes	
		3.5.3.6.1.1	Configure Pedestrian Data Collection Sample Period	M	Yes / No	
		3.5.3.6.2.1	Monitor Pedestrian Counts	O	Yes / No	
		3.5.3.6.2.2	Monitor Pedestrian Detector Actuations	O	Yes / No	
		3.5.3.6.2.3	Monitor Pedestrian Detector Data Alarms	O	Yes / No	
		3.5.3.6.2.4	Monitor Pedestrian Services	O	Yes / No	
		3.5.3.6.2.5	Determine Pedestrian Detector Data Active Detectors	O	Yes / No	
		3.5.3.6.2.6	Monitor Pedestrian Detector Data Sample Time	O	Yes / No	
		3.5.3.6.2.7	Monitor Pedestrian Detector Data Sample Duration	O	Yes / No	
		3.5.3.6.2.8	Monitor Pedestrian Detector Data Sequence	O	Yes / No	
2.5.4 (CV)	Manage Connected Vehicles Interface			O	Yes / No	MaxTime CV has an interface to manage CV data
2.5.4.1	Connected Vehicle Manager: Management Station – ASC Interface			M	Yes / No	
2.5.4.1.1	Manage RSU Interface			M	Yes	
		3.5.4.1.1.1	Configure RSU Interface	M	Yes	
		3.5.4.1.1.2	Configure Logical RSU Ports	M	Yes	
		3.5.4.1.1.3	Configure RSU Interface Polling Period	O	Yes / No	
2.5.4.1.2	Manage RSU Interface Watchdog			O	Yes / No	
		3.5.4.1.2.1	Configure RSU Interface Watchdog	M	Yes	
		3.5.4.1.2.2	Monitor RSU Interface Watchdog Timer	M	Yes	
2.5.4.1.3	Manage Signal Phase and Timing Data			O	Yes / No	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.4.1.3.1	Enable Signal Phase and Timing Data	M	Yes	
		3.5.4.1.3.2	Retrieve Intersection Identifier	M	Yes	
		3.5.4.1.3.3	Retrieve Signal Phase and Timing Time Point	M	Yes	
		3.5.4.1.3.4	Retrieve Signal Phase and Timing Generation Time	M	Yes	
		3.5.4.1.3.5	Retrieve Signal Phase and Timing Intersection Status	M	Yes	
		3.5.4.1.3.6.1	Monitor Movement State	M	Yes	
		3.5.4.1.3.6.2.1	Monitor Movement Minimum End Time	O	Yes / No	
		3.5.4.1.3.6.2.2	Monitor Movement Maximum End Time	O	Yes / No	
		3.5.4.1.3.6.2.3	Monitor Movement Likely End Time	O	Yes / No	
		3.5.4.1.3.6.2.4	Monitor Movement Likely End Time Confidence	O	Yes / No	
		3.5.4.1.3.6.2.5	Monitor Movement Next Occurrence	O	Yes / No	
		3.5.4.1.3.6.3.1	Configure Queue Detectors for Movement Assistance	MvtQueue: M	Yes / NA	
		3.5.4.1.3.6.3.2	Configure Pedestrian Detectors for Movement Assistance	MvtConflict: O.13 (1..*)	Yes / No / NA	
		3.5.4.1.3.6.3.3	Configure Bicycle Detectors for Movement Assistance	MvtConflict: O.13 (1..*)	Yes / No / NA	
		3.5.4.1.3.6.4.1 (MvtQueue)	Monitor Lane Connection Queue Length	O	Yes / No	
		3.5.4.1.3.6.4.2	Monitor Lane Connection Available Storage Length	O	Yes / No	
		3.5.4.1.3.6.4.3	Monitor Lane Connection Stop Line Wait	O	Yes / No	
		3.5.4.1.3.6.4.4 (MvtConflict)	Monitor Lane Connection Traveler Detection	O	Yes / No	
		3.5.4.1.3.6.4.5	Monitor Lane Connection State	M	Yes	
		3.5.4.1.3.6.5.1 (SpdAdvice)	Configure Advisory Speed Type	O	Yes / No	
		3.5.4.1.3.6.5.2	Configure Advisory Speed	SpdAdvice: O	Yes / No / NA	
		3.5.4.1.3.6.5.3	Configure Advisory Speed Zone	SpdAdvice: O	Yes / No / NA	
		3.5.4.1.3.6.5.4	Configure Advisory Speed Vehicle Type	SpdAdvice: O	Yes / No / NA	
		3.5.4.1.3.6.5.5	Retrieve Advisory Speed Confidence Level	SpdAdvice: O	Yes / No / NA	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.4.1.3.6.6	Monitor Movement Status	O	Yes / No	
		3.5.4.1.3.6.7	Monitor Lane Connection Maneuver Status	O	Yes / No	
		3.5.4.1.3.7.1	Configure Concurrent Enabled Lanes	O	Yes / No	
		3.5.4.1.3.7.2	Configure Enabled Lanes for a Pattern	O	Yes / No	
		3.5.4.1.3.7.3	Command Enabled Lanes	O	Yes / No	
		3.5.4.1.3.8	Configure Movement Type	M	Yes	
		3.5.4.1.3.9	Configure Lane Connection Type	M	Yes	
		3.5.4.1.3.10	Enable Signal Phase and Timing Data Exchange	O	Yes / No	
2.5.4.1.4	Exchange Connected Devices Data for Operational Performance Data			Perform:O	Yes / No / NA	
		3.5.1.5.1.1	Enable/Disable Collection of Operational Performance Data	M	Yes	
		3.5.1.5.1.2	Start Collection of Operational Performance Data on Specific Date/Time	O	Yes / No	
		3.5.1.5.1.3	End Collection of Operational Performance Data on Specific Date/Time	O	Yes / No	
		3.5.1.5.1.4	Configure Collection of Operational Performance Data	O	Yes / No	
		3.5.1.5.2.1	Determine Collection of Operational Performance Data	M	Yes	
		3.5.1.5.2.2	Determine Operational Performance Data Collection Capabilities	M	Yes	
		3.5.1.5.3.1	Monitor Operational Performance Data	O	Yes / No	
		3.5.1.5.3.2	Retrieve Operational Performance Data	O	Yes / No	
		3.5.1.5.3.3	Retrieve Operational Performance Data - Time Range	O	Yes / No	
		3.5.1.5.3.4	Retrieve Operational Performance Data - Event Code	O	Yes / No	
		3.5.4.3.3.1.1	Retrieve Actuation Report (ASC)	ASC:M	Yes / NA	
		3.5.4.3.3.2.1	Provide Actuation Report	RSU:M	Yes / NA	
2.5.4.2	Connected Vehicle Manager: Management Station – CV Roadside Process Interface			O	Yes / No	
2.5.4.2.1	Manage Roadway Geometrics Information			O	Yes / No	
		3.5.4.2.1.1.1	Configure Intersection Identifier	M	Yes	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.4.2.1.1.2	Configure Intersection Location	M	Yes	
		3.5.4.2.1.1.3	Configure Intersection Name	O	Yes / No	
		3.5.4.2.1.1.4	Configure Intersection Default Lane Width	O	Yes / No	
		3.5.4.2.1.1.5.1	Configure Lane Identifier	M	Yes	
		3.5.4.2.1.1.5.2	Configure Lane Description	O	Yes / No	
		3.5.4.2.1.1.5.3	Configure Ingress Approach	O	Yes / No	
		3.5.4.2.1.1.5.4	Configure Egress Approach	O	Yes / No	
		3.5.4.2.1.1.5.5	Configure Allowed Lane Direction	M	Yes	
		3.5.4.2.1.1.5.6	Configure Vehicle Lane Attributes	M	Yes	
		3.5.4.2.1.1.5.7	Configure Crosswalk Attributes	M	Yes	
		3.5.4.2.1.1.5.8	Configure Bicycle Lane Attributes	O	Yes / No	
		3.5.4.2.1.1.5.9	Configure Sidewalk Attributes	O	Yes / No	
		3.5.4.2.1.1.5.10	Configure Barrier Attributes	O	Yes / No	
		3.5.4.2.1.1.5.11	Configure Striping Lane Attributes	O	Yes / No	
		3.5.4.2.1.1.5.12	Configure Tracked Lane Attributes	O	Yes / No	
		3.5.4.2.1.1.5.13	Configure Parked Lane Attributes	O	Yes / No	
		3.5.4.2.1.1.5.14	Configure Shared Lanes Attributes	M	Yes	
		3.5.4.2.1.1.5.15	Configure Allowed Maneuvers	O	Yes / No	
		3.5.4.2.1.1.5.16	Configure Lane Path	M	Yes	
		3.5.4.2.1.1.6.1	Configure Node Point Attributes	O	Yes / No	
		3.5.4.2.1.1.6.2	Configure Lane Segment Attributes	O	Yes / No	
		3.5.4.2.1.1.6.3	Configure Lane End Point Angle	O	Yes / No	
		3.5.4.2.1.1.6.4	Configure Lane Crown Angle - Center	O	Yes / No	
		3.5.4.2.1.1.6.5	Configure Lane Crown Angle - Left Edge	O	Yes / No	
		3.5.4.2.1.1.6.6	Configure Lane Crown Angle - Right Edge	O	Yes / No	
		3.5.4.2.1.1.6.7	Configure Lane Angle	O	Yes / No	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.4.2.1.1.6.8 (SpeedLimit)	Configure Speed Limit Type at Node	O	Yes / (No)	
		3.5.4.2.1.1.6.9	Configure Speed Limit at Node	SpeedLimit: O	Yes / No / (NA)	
		3.5.4.2.1.1.6.10	Configure Lane Width Delta	O	Yes / (No)	
		3.5.4.2.1.1.6.11	Configure Lane Elevation Delta	O	Yes / (No)	
		3.5.4.2.1.1.7.1 (Computed)	Configure Computed Lane Reference	O	Yes / (No)	
		3.5.4.2.1.1.7.2	Configure Computed Lane X Offset	Computed: M	Yes / (NA)	
		3.5.4.2.1.1.7.3	Configure Computed Lane Y Offset	Computed: M	Yes / (NA)	
		3.5.4.2.1.1.7.4	Configure Computed Lane Rotation	Computed: O	Yes / No / (NA)	
		3.5.4.2.1.1.7.5	Configure Computed Lane X Scale	Computed: O	Yes / No / (NA)	
		3.5.4.2.1.1.7.6	Configure Computed Lane Y Scale	Computed: O	Yes / No / (NA)	
		3.5.4.2.1.1.8	Configure Overlays	O	Yes / (No)	
		3.5.4.2.1.1.9 (RestrictClass)	Configure Applicable Users	O	Yes / (No)	
		3.5.4.2.1.2.1	Determine Maximum Number of Intersections Supported	M	(Yes)	The ASC shall support at least 255 (1-255) intersection definitions.
		3.5.4.2.1.2.2	Determine Maximum Number of Lanes Supported	M	(Yes)	The ASC shall support at least 255 (1-255) lane definitions.
		3.5.4.2.1.2.3	Determine Maximum Number of Computed Lanes Supported	Computed: M	(Yes)	The ASC shall support at least 255 (1-255) computed lanes.
		3.5.4.2.1.2.4	Determine Maximum Number of Node Points Supported	M	(Yes)	The ASC shall support at least 63 (2-63) node points for a lane.
		3.5.4.2.1.2.5	Determine Maximum Number of Speed Limits Supported	SpeedLimit: M	(Yes)	The ASC shall support at least 9 (1-9) speed limit types.
		3.5.4.2.1.2.6	Determine Maximum Number of Vehicle Type Definitions	RestrictClass:M	(Yes)	The ASC shall support at least 100 (1-255).
		3.5.4.2.1.3.1	Configure Roadway Geometry Plan Process Method	O	(Yes) / No	
		3.5.4.2.1.3.2	Configure Roadway Geometry Plan Process Agency	O	(Yes) / No	
		3.5.4.2.1.3.3	Configure Roadway Geometry Plan Date	O	(Yes) / No	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.4.2.1.3.4	Configure Roadway Geometry Plan Geoid	O	Yes / No	
		3.5.4.2.1.3.5	Configure Roadway Geometry Plan Layer Type	O	Yes / No	
		3.5.4.2.1.3.6	Configure Roadway Geometry Plan Layer Identifier	O	Yes / No	
2.5.4.2.2	Manage Movement Configuration for Connected Devices			O	Yes / No	
		3.5.4.2.2.1.1	Configure Connecting Lane	M	Yes	
		3.5.4.2.2.1.2	Configure Connecting Maneuver	M	Yes	
		3.5.4.2.2.1.3	Configure Remote Intersection Identifier	O	Yes / No	
		3.5.4.2.2.1.4	Configure Matching Signal Group	M	Yes	
		3.5.4.2.2.2	Configure Lane Connection Users	O	Yes / No	
		3.5.4.2.2.3	Configure Connection Identifier	O	Yes / No	
		3.5.4.2.2.4	Configure MAP Plans	O	Yes / No	
		3.5.4.2.2.5	Determine Maximum Number of Signal Groups Supported	M	Yes	
		3.5.4.2.2.6	Determine Maximum Number of Lane Connections Supported	M	Yes	
		3.5.4.2.2.7	Command MAP Plans	O	Yes / No	
2.5.4.2.3	Manage Collection of Connected Devices Data			O	Yes / No	
		3.5.4.2.3.1.1	Enable Connected Device Detection	M	Yes	
		3.5.4.2.3.1.2	Enable Connected Device Detector	M	Yes	
		3.5.4.2.3.1.3	Configure Connected Device Detector Reference Point	O	Yes / No	
		3.5.4.2.3.1.4	Configure Connected Device Detector Zone - Geographic	O	Yes / No	
		3.5.4.2.3.1.5	Configure Connected Device Detector Zone - Lane	O	Yes / No	
		3.5.4.2.3.1.6	Configure Connected Device Data Filters	O	Yes / No	
		3.5.4.2.3.1.7	Configure Connected Device Detector Assignments	Detector:O	Yes / No / NA	
		3.5.4.2.3.1.8	Determine Maximum Number of Connected Device Detectors Supported	M	Yes	The ASC shall support at least 255 connected (between 1 and 255).
		3.5.4.2.3.1.9	Determine Maximum Number of Connected Device Detectors Node Points Supported	M	Yes	at least 255 connected device detectors (between 2 and 255).

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.4.2.3.2.1 (DetZoneOut)	Configure Connected Device Detector Outputs	O	Yes / No	
		3.5.4.2.3.2.2	Configure Actuation Sampling Period	DetZoneOut:O	Yes / No / NA	
		3.5.4.2.3.2.3	Retrieve Actuation Report	DetZoneOut:O	Yes / No / NA	
		3.5.4.2.3.2.4	Configure Detection Reports Data	DetZoneOut::O	Yes / No / NA	
		3.5.4.2.3.2.5	Configure Detection Report Sampling Period	DetZoneOut:O	Yes / No / NA	
		3.5.4.2.3.2.6	Retrieve Detection Report	DetZoneOut:O	Yes / No / NA	
2.5.4.2.4	Monitor Broadcasted MAP Messages			O	Yes / No	
		3.5.4.2.4.1	Monitor MAP Data Message Sequence	M	Yes	
		3.5.4.2.4.2	Monitor MAP Data Message Time	O	Yes / No	
		3.5.4.2.4.3	Monitor MAP Data Message Intersection Sequence	M	Yes	
		3.5.4.2.4.4	Monitor MAP Plan	O	Yes / No	
2.5.4.2.5	Monitor Broadcasted SPAT Messages			O	Yes / No	
		3.5.4.2.5.1	Monitor Signal Phase and Timing Message Sequence	M	Yes	
		3.5.4.2.5.2	Monitor Signal Phase and Timing Message Timestamp	O	Yes / No	
		3.5.4.2.5.3	Monitor Intersection SPaT Message Timestamp	O	Yes / No	
		3.5.4.2.5.4	Monitor Enabled Lanes	O	Yes / No	
2.5.4.3	Connected Vehicle Manager: ASC - CV Roadside Process Interface			CV:O	Yes / No	
		3.5.4.3.a (RSU)		O.20:(1)	Yes / No	
		3.5.4.3.b (ASC)		O.20:(1)	Yes / No	
2.5.4.3.1	Exchange Current and Next Movement Information			O	Yes / No	
		3.5.4.3.1.1.1	Provide Intersection Identifier	ASC:M	Yes / NA	
		3.5.4.3.1.1.2	Provide Signal Phase and Timing Intersection Status	ASC:M	Yes / NA	
		3.5.4.3.1.1.3.1	Provide Movement Time Point	ASC:M	Yes / NA	
		3.5.4.3.1.1.3.2	Provide Movement State	ASC:M	Yes / NA	
		3.5.4.3.1.1.3.3	Provide Movement Minimum End Time	ASC:O	Yes / No / NA	
		3.5.4.3.1.1.3.4	Provide Movement Maximum End Time	ASC:O	Yes / No / NA	
		3.5.4.3.1.1.3.5	Provide Movement Likely End Time	ASC:O	Yes / No / NA	
		3.5.4.3.1.1.3.6	Provide Movement Likely End Time Confidence	ASC:O	Yes / No / NA	

Protocol Requirements List (PRL)						
User Need ID	User Need	FR ID	Functional Requirement	Conformance	Support	Additional Specifications
		3.5.4.3.1.1.3.7	Provide Movement Next Occurrence	ASC:O	Yes / No / NA	
		3.5.4.3.1.1.3.8	Provide Movement Status	ASC:O	Yes / No / NA	
		3.5.4.3.1.1.4.1	Provide Lane Connection Queue Length	ASC:O	Yes / No / NA	
		3.5.4.3.1.1.4.2	Provide Lane Connection Available Storage Length	ASC:O	Yes / No / NA	
		3.5.4.3.1.1.4.3	Provide Lane Connection Stop Line Wait	ASC:O	Yes / No / NA	
		3.5.4.3.1.1.4.4	Provide Lane Connection Traveler Detection	ASC:O	Yes / No / NA	
		3.5.4.3.1.1.4.5	Provide Lane Connection State	ASC:O	Yes / No / NA	
		3.5.4.3.1.1.4.6	Provide Lane Connection Status	ASC:O	Yes / No / NA	
		3.5.4.3.1.1.5.1	Provide Advisory Speed Type	ASC:O	Yes / No / NA	
		3.5.4.3.1.1.5.2	Provide Advisory Speed	ASC:O	Yes / No / NA	
		3.5.4.3.1.1.5.3	Provide Advisory Speed Zone	ASC:O	Yes / No / NA	
		3.5.4.3.1.1.5.4	Provide Advisory Speed Vehicle Type	ASC:O	Yes / No / NA	
		3.5.4.3.1.1.5.5	Provide Advisory Speed Confidence Level	ASC:O	Yes / No / NA	
		3.5.4.3.1.1.6	Provide Intersection Channel Assignment	ASC:M	Yes / NA	
		3.5.4.3.1.2.1	Retrieve Intersection Identifier	RSU:M	Yes / NA	
		3.5.4.3.1.2.2	Retrieve Signal Phase and Timing Intersection Status	RSU:M	Yes / NA	
		3.5.4.3.1.2.3.1	Retrieve Movement Time Point	RSU:M	Yes / NA	
		3.5.4.3.1.2.3.2	Retrieve Movement Time Point - Milliseconds	RSU:O	Yes / No / NA	
		3.5.4.3.1.2.3.3	Retrieve Movement State	RSU:M	Yes / NA	
		3.5.4.3.1.2.3.4	Retrieve Movement Minimum End Time	RSU:O	Yes / No / NA	
		3.5.4.3.1.2.3.5	Retrieve Movement Maximum End Time	RSU:O	Yes / No / NA	
		3.5.4.3.1.2.3.6	Retrieve Movement Likely End Time	RSU:O	Yes / No / NA	
		3.5.4.3.1.2.3.7	Retrieve Movement Likely End Time Confidence	RSU:O	Yes / No / NA	
		3.5.4.3.1.2.3.8	Retrieve Movement Next Occurrence	RSU:O	Yes / No / NA	
		3.5.4.3.1.2.3.9	Retrieve Movement Status	RSU:O	Yes / No / NA	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.4.3.1.2.4.1	Retrieve Lane Connection Queue Length	RSU:O	Yes / No / NA	
		3.5.4.3.1.2.4.2	Retrieve Lane Connection Available Storage Length	RSU:O	Yes / No / NA	
		3.5.4.3.1.2.4.3	Retrieve Lane Connection Stop Line Wait	RSU:O	Yes / No / NA	
		3.5.4.3.1.2.4.4	Retrieve Lane Connection Traveler Detection	RSU:O	Yes / No / NA	
		3.5.4.3.1.2.4.5	Retrieve Lane Connection State	RSU:O	Yes / No / NA	
		3.5.4.3.1.2.4.6	Retrieve Lane Connection Status	RSU:O	Yes / No / NA	
		3.5.4.3.1.2.5.1	Retrieve Advisory Speed Type	RSU:O	Yes / No / NA	
		3.5.4.3.1.2.5.2	Retrieve Advisory Speed	RSU:O	Yes / No / NA	
		3.5.4.3.1.2.5.3	Retrieve Advisory Speed Zone	RSU:O	Yes / No / NA	
		3.5.4.3.1.2.5.4	Retrieve Advisory Speed Vehicle Type	RSU:O	Yes / No / NA	
		3.5.4.3.1.2.5.5	Retrieve Advisory Speed Confidence Level	RSU:O	Yes / No / NA	
		3.5.4.3.1.2.6	Retrieve Intersection Channel Assignment	RSU:M	Yes / NA	
		3.6.3.1	SPaT Maximum Transmission Start Time	ASC:M	Yes / NA	The Maximum Transmission Start Time for all SPAT data shall be 10 milliseconds (Default=10).
		3.6.3.2	Movement Time Point Minimum Transmission Rate	ASC:M	Yes / NA	The Movement Time Point Minimum Transmission Rate shall be once per 100 milliseconds (Default=100).
		3.6.3.3	SPaT-data Request Transmission Rate	RSU:M	Yes / NA	The nominal Rate to request SPAT-data from an ASC shall be once per ___ milliseconds (Default=100).
		3.6.3.4	Condition-based SPaT Maximum Transmission Start Time	RSU, Traps:O	Yes / No / NA	The Maximum Transmission Start Time for all SPAT reports shall be ___ milliseconds (Default=10).
		3.6.3.5	SPaT Latency	M	Yes	
2.5.4.3.2	Exchange Next Occurrence of a Movement			O	Yes / No	
		3.5.4.3.2.1	Provide Movement Next Occurrence	ASC:M	Yes / NA	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.4.3.2.2	Retrieve Movement Next Occurrence	RSU:M	Yes / NA	
		3.6.3.1	SPaT Maximum Transmission Start Time	ASC:M	Yes / NA	The Maximum Transmission Start Time for all SPAT data that changed shall be ___ milliseconds (Default=10).
		3.6.3.2	Movement Time Point Minimum Transmission Rate	ASC:M	Yes / NA	The Movement Time Point Minimum Transmission Rate shall be once per _____ milliseconds (Default=100).
		3.6.3.3	SPaT-data Request Transmission Rate	RSU:M	Yes / NA	The nominal Rate to request SPAT-data from an ASC shall be once per ___ milliseconds (Default=100).
		3.6.3.4	Condition-based SPaT Maximum Transmission Start Time	RSU, Traps:O	Yes / No / NA	The Maximum Transmission Start Time for all SPAT reports shall be ___ milliseconds (Default=10).
		3.6.3.5	SPaT Latency	M	Yes	
2.5.4.3.3	Exchange Presence of Connected Devices			O	Yes / No	
		3.5.4.3.3.1.1	Retrieve Actuation Report (ASC)	ASC:O.21(1..*)	Yes / No / NA	
		3.5.4.3.3.1.2	Retrieve Detection Report (ASC)	ASC:O.21(1..*)	Yes / No / NA	
		3.5.4.3.3.2.1	Provide Actuation Report	RSU:O.22(1..*)	Yes / No / NA	
		3.5.4.3.3.2.2	Provide Detection Report	RSU:O.22(1..*)	Yes / No / NA	
2.5.4.3.4	Exchange Roadway Geometrics Information			O	Yes / No	
		3.5.4.3.4.1.1	Retrieve MAP Plan in Effect	ASC:M	Yes / NA	
		3.5.4.3.4.2.1	Provide MAP Plan in Effect	RSU:M	Yes / NA	
		3.5.4.3.4.3	Confirm MAP Plan Compatibility	M	Yes	
2.5.5	Backward Compatibility Features					
2.5.5.1	Backward Compatible with NTCIP 1202 v01			O	Yes / No	.
		3.5.5.1	NTCIP 1202 v01 - Configure Special Function State	O	Yes / No	
2.5.5.2	Backward Compatible with NTCIP 1202 v02			NA	NA	
2.6	Security			M	Yes	
2.6.1	Manage Authentication			M	Yes	
		H.1.1.8.1	Configure Security Definitions	M	Yes	
		H.1.2.4.1	Determine Security Definitions	M	Yes	
2.6.2	Manage Accessibility			M	Yes	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.4.4.1	Configure Access	M	Yes	
		3.4.4.2	Determine Current Access Settings	M	Yes	
2.6.3	Manage Users			M	Yes	
		3.4.4.1	Configure Access	M	Yes	
		3.4.4.2	Determine Current Access Settings	M	Yes	
2.6.4	Log User Access			O	Yes/No	
		3.5.1.6.1	Configure ASC Clock Source	O	Yes / No	
		3.5.1.6.2	Determine ASC Clock Status	O	Yes / No	
		3.5.1.6.3	Determine Current ASC Clock Source	O	Yes / No	
		3.5.1.6.4	Determine Available ASC Clock Sources	O	Yes / No	
		H.1.1.5.1	Configure Time	M	Yes	
		H.1.1.5.2	Configure Time Zone	TimeZone: O	Yes / No / NA	
		H.1.1.5.3	Configure Daylight Saving Mode	DST:O	Yes / No / NA	
		H.1.1.5.4	Determine Time Setting	M	Yes	
		H.1.1.5.5 (TimeZone)	Determine Time Zone Setting	O	Yes / No	
		H.1.1.5.6 (DST)	Determine Daylight Saving Mode Setting	O	Yes / No	
		H.1.1.5.7	Monitor Current Time	M	Yes	
		H.1.3.1.1	Retrieve Current Configuration of Logging Service	M	Yes	
		H.1.3.1.2	Configure Event Logging Service	M	Yes	
		H.1.3.1.3	Retrieve Event Logged Data	M	Yes	
		H.1.3.1.5	Determine Capabilities of Event Logging Service	M	Yes	
		H.1.3.1.6	Determine Number of Logged Events per Event Class	M	Yes	
		H.1.3.1.7	Support a Number of Events to Store in Log	M	Yes	The ASC shall be capable of storing at least 200 events in the event log file (up to 65535).
		H.1.3.1.9	Determine Total Number of Logged Events	O	Yes / No	
		H.1.3.1.10	Determine Number of Events within a Class	M	Yes	
		H.1.3.2.1	Record and Timestamp Events	M	Yes	
		H.1.3.2.2	Support a Number of Event Classes	M	Yes	The ASC shall support at least 10 event classes.

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		H.1.3.2.3	Support a Number of Events to Log	M	Yes	The ASC shall be able to log at least 200 events.
		H.1.3.2.4.1	Support On-Change Events	M	Yes	
		H.1.3.2.4.6	Support Bit Flag Events	M	Yes	
		H.1.3.2.4.7	Support Event Monitoring on Any Data	M	Yes	
		3.6.1	Response Time for Requests	M	Yes	The Response Time for all requests shall be 25 milliseconds (5-500: Default=25).

EXHIBIT B

NTCIP 1211 Protocol Requirements List (PRL)

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
2.4	Architectural Needs					
2.4.1	Integral Entities			C	Yes / NA	Where two entities are integral to the same physical device, the interface between these entities is implementation-specific.
2.4.2	Provide Live Data			M	Yes	
		3.4.1.1	Provide Data	M	Yes	
		3.4.1.2	Receive Data	M	Yes	
		3.4.1.3	Explore Data	M	Yes	
		3.6.1	Response Time for Requests	M	Yes	The Response Time for all requests shall be ___ milliseconds (25-500: Default=100).
2.4.3	Support Multiple Instances of an Entity			M	Yes	
		3.4.1.1	Provide Data	M	Yes	An agent shall be capable of providing data to at least ___ (1-10:Default=10) managers at any time.
		3.4.1.2	Receive Data	M	Yes	An agent shall be capable of receiving data from at least ___ (1-10:Default=10) managers at any time.
		3.4.1.3	Explore Data	M	Yes	An agent shall be capable of dynamically providing data to at least ___ (1-10:Default=10) managers at any time.
2.4.4	Provide Compressed Data					
2.4.4.1	Provide Compressed Data between a Management Station and a PRS			M	Yes	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.1.1	Set Reservice Period	M	Yes	
		3.5.1.2	Set Time To Live Period	M	Yes	
		3.5.1.3.1	Retrieve Priority Request Settings	M	Yes	
2.4.4.2	Provide Compressed Data between a Management Station and a CO			M	Yes	
		3.5.2.1.1	Set Priority Strategy Configuration	M	Yes	
		3.5.2.2.1	Retrieve Priority Strategy Settings	M	Yes	
2.5	Features					
2.5.1	Interface – Management Station to PRS			M	Yes	
2.5.1.1	Manage the PRS			M	Yes	
2.5.1.1.1	Determine PRS Identity			C	Yes / No / NA	Note: This may be NA if the PRS is integral to the traffic signal controller and the traffic signal controller already supports Device Identity.
		H.2.1	Determine Device Component Information	M	Yes	
		H.2.3	Determine Supported Standards	M	Yes	
		H.2.4	Determine System Name	O	Yes / No	
2.5.1.1.2	Determine PRS Configuration			C	Yes / No / NA	Note: This may be NA if the PRS is integral to the traffic signal controller and the traffic signal controller already supports Device Configuration.
		H.2.2	Determine Device Configuration Identifier	M	Yes	
2.5.1.1.3	Configure Reservice Period			M	Yes	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		3.5.1.1	Set Reservice Period	M	Yes	
2.5.1.1.4	Configure Time To Live Period			M	Yes	
		3.5.1.2	Set Time To Live Period	M	Yes	
		3.6.2.2	Clear Expired Priority Requests	M	Yes	
2.5.1.1.5	PRS Clock Synchronization			C	Yes / No / NA	Note: This may be NA if the PRS is internal to the traffic signal controller and the traffic signal controller already supports clock synchronization.
		H.2.5.1	Set Time	M	Yes	
		H.2.5.2	Set Time Zone	M	Yes	
		H.2.5.3	Set Daylight Savings Mode	M	Yes	
		H.2.5.4	Verify Current Time	M	Yes	
2.5.1.2	Determine Priority Request Criteria			M	Yes	
		3.5.1.3.1	Retrieve Priority Request Settings	M	Yes	
		3.5.1.3.2	Retrieve Reservice Period for a Vehicle Class	M	Yes	
		3.5.1.3.3	Retrieve Priority Request Time To Live Value	M	Yes	
2.5.1.3	Monitor the PRS			O	Yes / No	
		3.5.1.4	Monitor the Status of the PRS	M	Yes	
2.5.1.4	Retrieve Log Data from the PRS			C	Yes / No / NA	Note: This may be NA if the PRS is integral to the traffic signal controller and the traffic signal controller already supports event logging.
		H.2.5.1	Set Time	M	Yes	
		H.2.5.2	Set Time Zone	M	Yes	
		H.2.5.3	Set Daylight Savings Mode	M	Yes	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		H.2.5.4	Verify Current Time	M	Yes	
		H.2.6.1	Retrieve Current Configuration of Logging Service	M	Yes	
		H.2.6.2	Configure Logging Service	M	Yes	
		H.2.6.3	Retrieve Logged Data	M	Yes	
		H.2.6.4	Clear Log	M	Yes	
		H.2.6.5	Determine Capabilities of Event Logging Service	M	Yes	
		H.2.6.6	Determine Total Number of Logged Events	M	Yes	
		H.2.7.1	Record and Timestamp Events	M	Yes	
		H.2.7.2	Support a Number of Event Classes	M	Yes	The PRS shall support at least ____ event classes.
		H.2.7.3	Support a Number of Event Types to Monitor	M	Yes	The PRS shall support at least ____ event types.
		H.2.7.4.1	Support On-Change Events	M	Yes	
		H.2.7.4.2	Support Greater Than Events	M	Yes	
		H.2.7.4.3	Support Less Than Events	M	Yes	
		H.2.7.4.4	Support Hysteresis Events	M	Yes	
		H.2.7.4.5	Support Periodic Events	M	Yes	
		H.2.7.4.6	Support Bit-flag Events	M	Yes	
		H.2.7.4.7	Support Event Monitoring on Any Data	M	Yes	
		H.2.8	Support a Number of Events to Store in Log	M	Yes	The PRS shall be capable of storing at least ____ events in the event log file.
2.5.2	Interface – Management Station to CO			M	Yes	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
2.5.2.1	Configure Priority Strategies			M	Yes	Note: The definition and selection of the strategy is system- and implementation-specific, and may vary from system to system. The user should be aware that differences in definition and selection may result in an interoperability issue.
		3.5.2.1.1	Set Priority Strategy Configuration	M	Yes	
		3.5.2.1.2	Define Default Coordination Pattern	M	Yes	
		3.5.2.1.3	Define Maximum Priority Strategies Supported	O	Yes / No	
		3.5.2.1.4	Define Maximum Service Requests To Consider	O	Yes / No	
2.5.2.2	Determine Priority Strategies			M	Yes	
		3.5.2.2.1	Retrieve Priority Strategy Settings	M	Yes	
		3.5.2.2.2	Retrieve Priority Strategies	M	Yes	
		3.5.2.2.3	Retrieve Priority Splits	M	Yes	
		3.5.2.2.4	Retrieve Default Coordination Pattern	M	Yes	
		3.5.2.2.5	Retrieve Maximum Priority Strategies Supported	O	Yes / No	
		3.5.2.2.6	Retrieve Maximum Service Requests To Consider	O	Yes / No	
2.5.2.3	Monitor the CO			M	Yes	
		3.5.2.3	Monitor the Status of the CO	M	Yes	
2.5.2.4	Retrieve Log Data from the CO			C	Yes / No / NA	Note: This may be NA if the traffic signal controller already supports event logging.

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
		H.2.5.1	Set Time	M	Yes	
		H.2.5.2	Set Time Zone	M	Yes	
		H.2.5.3	Set Daylight Savings Mode	M	Yes	
		H.2.5.4	Verify Current Time	M	Yes	
		H.2.6.1	Retrieve Current Configuration of Logging Service	M	Yes	
		H.2.6.2	Configure Logging Service	M	Yes	
		H.2.6.3	Retrieve Logged Data	M	Yes	
		H.2.6.4	Clear Log	M	Yes	
		H.2.6.5	Determine Capabilities of Event Logging Service	M	Yes	
		H.2.6.6	Determine Total Number of Logged Events	M	Yes	
		H.2.7.1	Record and Timestamp Events	M	Yes	
		H.2.7.2	Support a Number of Event Classes	M	Yes	The CO shall support at least ____ event classes.
		H.2.7.3	Support a Number of Event Types to Monitor	M	Yes	The CO shall support at least ____ event types.
		H.2.7.4.1	Support On-Change Events	M	Yes	
		H.2.7.4.2	Support Greater Than Events	M	Yes	
		H.2.7.4.3	Support Less Than Events	M	Yes	
		H.2.7.4.4	Support Hysteresis Events	M	Yes	
		H.2.7.4.5	Support Periodic Events	M	Yes	
		H.2.7.4.6	Support Bit-flag Events	M	Yes	
		H.2.7.4.7	Support Event Monitoring on Any Data	M	Yes	
		H.2.8	Support a Number of Events to Store in Log	M	Yes	The CO shall be capable of storing at least ____ events in the event log file.

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
2.5.3	Interface – PRG to PRS			C	Yes / No / NA	If the PRG and PRS are integral to the same physical device, the interface between these entities is implementation-specific.
2.5.3.1	Exchange Priority Requests			M	Yes	
		3.5.3.1.1	Initiate a Priority Request	M	Yes	
		3.5.3.1.2	Send a Priority Request Update	M	Yes	
		3.5.3.1.3	Send a Cancel Priority Request	M	Yes	
		3.5.3.1.4	Send a Clear Priority Request	M	Yes	
		3.6.2.1	Support Multiple Priority Requests	M	Yes	The PRS shall be capable of supporting at least ___ (1-10:Default=10) and no more than ____ (1-10:Default=10) priority requests.
2.5.3.2	Exchange Priority Request Status			M	Yes	
		3.5.3.2	Receive Priority Request Status	M	Yes	
2.5.4	Interface – PRS to CO			C	Yes / No / NA	If the PRS and CO are integral to the same physical device, the interface between these entities is implementation-specific.
2.5.4.1	Exchange Service Requests			M	Yes	
		3.5.4.1	Exchange Service Request	M	Yes	The PRS or the CO shall poll each other no less than once per _____ milliseconds (100-1000: Default=100).
		3.6.3	Process Service Requests	M	Yes	
2.5.4.2	Exchange Service Request Status			M	Yes	
		3.5.4.2	Exchange Service Request Status	M	Yes	

Protocol Requirements List (PRL)						
User Need ID	**User Need**	**FR ID**	**Functional Requirement**	**Conformance**	**Support**	**Additional Specifications**
2.5.4	Backward Compatibility Needs					
2.5.5.1	Backward Compatible with NTCIP 1211 v01			O	Yes / No	Note: These object definitions have not been deprecated to address interoperability issues with NTCIP 1211 v01. The associated objects were deprecated and replaced by newer objects that have a wider scope or that have been changed to ease implementation. Pay close attention to the implementation and interoperability of these objects.
		3.5.3.1.5	Initiate a Priority Request—NTCIP 1211 v01	C	Yes / NA	If the PRG and PRS are integral to the same physical device, the interface between these entities is implementation-specific.
		3.5.3.1.6	Send a Priority Request Update—NTCIP 1211 v01	C	Yes / NA	If the PRS and CO are integral to the same physical device, the interface between these entities is implementation-specific.
		3.6.2.3	Support Multiple Priority Requests—NTCIP 1211 v01	M	Yes	The PRS shall be capable of supporting at least ___ (1-10:Default=10) and no more than ____ (1-10:Default=10) priority requests.

APPENDIX C
Service Questionnaire

Indicate the services you are able to provide:

SERVICE	YES	NO
Bid Item #1 Software solutions	✓	
Bid Item #2 Hardware solutions	✓	
Bid Item #3 Services not anticipated	✓	

Respondents should address the following items in Tab D: Technical Proposal if they are applicable for the service(s) being proposed.

- Respondents are asked to identify services that they are able to provide.
- Respondents are not required to be able to respond to all services in order to provide a proposal to this RFP.
- Those Respondents that are capable of providing more than a single service, indicate which in the table above, and provide an individual narrative relating to the needs of each Bid Item as described in Appendix C.
- Responses should consist of detailed descriptions of what a Respondent's firm is capable of providing to the TXSHARE Public Purchasing Cooperative. The bulleted points in each Bid Item must be addressed, but Respondents are encouraged to provide additional detail about their operation and capabilities.

Note: Respondent is not required to complete any questions that are not applicable to the services you are bidding.

APPENDIX D
Service Designation Forms

RFP 2023-092	Texas Service Area Designation or Identification		
Proposer Name:	Texas Highway Products		
Notes:	**Indicate in the appropriate box whether you are proposing to service the entire State of Texas**		
	Will service the entire State of Texas	Will not service the entire State of Texas	
	✓		
	If you are not proposing to service the entire State of Texas, designate on the form below the regions that you are proposing to provide goods and/or services to. By designating a region or regions, you are certifying that you are willing and able to provide the proposed goods and services.		

Item	Region	Metropolitan Statistical Areas	Designated Service Area
1.	North Central Texas	16 counties in the Dallas-Fort Worth Metropolitan area	
2.	High Plains	Amarillo Lubbock	
3.	Northwest	Abilene Wichita Falls	
4.	Upper East	Longview Texarkana, TX-AR Metro Area Tyler	
5.	Southeast	Beaumont-Port Arthur	
6.	Gulf Coast	Houston-The Woodlands-Sugar Land	
7.	Central Texas	College Station-Bryan Killeen-Temple Waco	
8.	Capital Texas	Austin-Round Rock	
9.	Alamo	San Antonio-New Braunfels Victoria	
10.	South Texas	Brownsville-Harlingen Corpus Christi Laredo McAllen-Edinburg-Mission	
11.	West Texas	Midland Odessa San Angelo	
12.	Upper Rio Grande	El Paso	

RFP 2023-092	Nationwide Service Area Designation or Identification Form		
Proposer Name:			
Notes:	**Indicate in the appropriate box whether you are proposing to provide service to all Fifty (50) States.**		
	Will service all Fifty (50) States	Will not service Fifty (50) States	
		✓	
	If you are not proposing to service to all Fifty (50) States, then designate on the form below the States that you will provide service to. By designating a State or States, you are certifying that you are willing and able to provide the proposed goods and services in those States. **If you are only proposing to service a specific region, metropolitan statistical area (MSA), or city in a State, then indicate as such in the appropriate column box.**		

Item	State	Region/MSA/City	Designated as a Service Area
1.	Alabama		
2.	Alaska		
3.	Arizona		
4.	Arkansas		
5.	California		
6.	Colorado		
7.	Connecticut		
8.	Delaware		
9.	Florida		
10.	Georgia		
11.	Hawaii		
12.	Idaho		
13.	Illinois		
14.	Indiana		
15.	Iowa		
16.	Kansas		
17.	Kentucky		
18.	Louisiana		
19.	Maine		
20.	Maryland		
21.	Massachusetts		

22.	Michigan		
23.	Minnesota		
24.	Mississippi		
25.	Missouri		
26.	Montana		
27.	Nebraska		
28.	Nevada		
29.	New Hampshire		
30.	New Jersey		
31.	New Mexico		
32.	New York		
33.	North Carolina		
34.	North Dakota		
35.	Ohio		
36.	Oregon		
37.	Oklahoma		✓
38.	Pennsylvania		
39.	Rhode Island		
40.	South Carolina		
41.	South Dakota		
42.	Tennessee		
43.	Texas		
44.	Utah		
45.	Vermont		
46.	Virginia		
47.	Washington		
48.	West Virginia		
49.	Wisconsin		
50.	Wyoming		

TAB E – REFERENCES

Company: City of Richardson
Contact name: Tiffany Hernandez
Phone number: (469) 355-5838
Email: tiffany.hernandez@cor.gov

Company: City of Garland
Contact name: Matt Holt
Phone number: (903) 268-6678
Email: mholt@garlandtx.gov

Company: City of McKinney
Contact name: Thuan Huynh
Phone number: (214) 336-4693
Email: thuynh@mckinneytexas.org

Company: City of Dallas
Contact name: Srinivasa Veeramallu
Phone number: (214) 670 5892
Email: s.veeramallu@dallas.gov

City of Fort Worth
Contact name: Aziz Rahman
Phone Number: 817-392-8653
Email: aziz.rahman@fortworthtexas.gov

City of Irving
Eugene Hollis
Phone number: 972 -721-2264
Email: ehollis@cityofirving.org

TAB F – COST PROPOSAL

Bid Item #1 – Advanced Traffic Controller Systems Software

Texas Highway Products

TXShare

Highway Safety and Traffic Control Products

Offering 3% OFF THP List Price

	Discounted Price	Part/Item Number	Item Description	LIST PRICE (before 3% Discount)
	Software Licenses			
1	$7,938	MAXTIME adaptive	QFREE-MAXTIME Adaptive Signal Application (ATC Software)	$8,184
2	$284	MAXTIME cv	QFREE-MAXTIME Connected Vehicle App. (ATC Software, Requires MAXTIME)	$293
3	$2,651	MAXTIME ramp meter	QFREE-MAXTIME Ramp Meter Application (ATC Software)	$2,733
4	$6,171	MAXTIME ITS	QFREE-MAXTIME Roadside ITS Control Application (ATC Software)	$6,362
5	$21,424	THPQF-Q-STD_HOST_FEE_16-50-1	Standard Hosting Fee for Kinetic Signals and / or Kinetic CV for 16-50 Devices for 1 year (3 year minimum)	$22,087
6	$5,400	THPQF-Q-YSW-KS-MAINT-1	Kinetic Signals and/or Kinetic CV Maintenance and Support per year (3 year minimum)	$5,567
7	$33,500	QF-INT-YSW-KS-MIANT_100-250	QFREE-Annual fee for KINETIC SIGNAL and/or KINETIC CV maintenance, support and extended warranty beyond 2 years for 100-250 intersections (excludes server hardware).	$34,536
8	$1,341	MAXTIME ic	QFREE Maxtime ic – Intersection Signal Control. (Q-FREE ATC hardware)	$1,383
	Kinetic Signals advanced traffic signal system			
9	$2,2296	KSig – 10-24	Kinetic Signals (UNIT Price for 10-24 Devices - License Only)	$2,367
10	$2,069	KSig – 25-49	Kinetic Signals (UNIT Price for 25-49 Devices - License Only)	$2,133
11	$1,859	KSig – 50-99	Kinetic Signals (UNIT Price for 50-99 Devices - License Only)	$1,917
12	$1,681	KSig – 100-499	Kinetic Signals (UNIT Price for 100-499 Devices - License Only)	$1,733
13	$1,519	KSig – 500-999	Kinetic Signals (UNIT Price for 500-999 Devices - License Only)	$1,567
14	$1,083	KSig – 1000+	Kinetic Signals (UNIT Price for >1000 Devices - License Only)	$1,117

TEXAS HIGHWAY PRODUCTS LTD

Texas Highway Products

TXShare

Highway Safety and Traffic Control Products

Q-FREE

Offering 3% OFF THP List Price

	Discounted Price	Part/Item Number	Item Description	LIST PRICE (before 3% Discount)
1	**$4,329**	THPQF-QF-YCT-2070LDX	QFREE-2070 CONTROLLER: 2070L Chassis, 1C, 2E+, 3DX, 4A	$4,463
2	**$4,159**	THPQF-QF-YCT-2070LX	QFREE-2070 CONTROLLER: 2070L Chassis, 1C, 2E+, 3B, 4A (Current CalTrans TEES)	$4,288
3	**$747**	THPQF-QF-YCT-1883	QFREE-2070 SUBMODULE/PARTS: 1883 Engine Board (Linux O/S, ATC v6 Compliant)	$770
4	**$1,375**	THPQF-QF-YCT-1C-CPU	QFREE-2070 SUBMODULE/PARTS: 2070 1C-CPU (Linux O/S, 4xENET, 1xUSB)	$1,418
5	**$1,052**	THPQF-QF-YCT-2070-2E+	QFREE-2070 SUBMODULE/PARTS: 2070-2E+ Module with NEMA Type 1 SDLC Port	$1,085
6	**$679**	THPQF-QF-YCT-3B	QFREE-2070 SUBMODULE/PARTS: 2070-3B Front Panel (8 Line Display)	$700
7	**$722**	THPQF-QF-YCT-3DX	QFREE-2070 SUBMODULE/PARTS: 2070-3DX Front Panel (16 Line Display, ENET, 3xUSB)	$744
8	**$493**	THPQF-QF-YCT-4A-PS	QFREE-2070 SUBMODULE/PARTS: 2070-4A Power Supply	$508
9	**$382**	THPQF-QF-YCT-7A-COMM	QFREE-2070 SUBMODULE/PARTS: 2070-7A Serial Comm. Module	$394
10	**$832**	THPQF-QF-YCT-7T-GPS	QFREE-2070 SUBMODULE/PARTS: 2070-7T-GPS Serial Comm Module with Single Band Antenna	$858
11	**$3,311**	THPQF-QF-YCT-XN-1	QFREE-NEMA CONTROLLER: NEMA 16-Line OLED Disp. TS-2 Type 1 (ATC Compl. - Exp. port)	$3,413
12	**$3,650**	THPQF-QF-YCT-XN-2	QFREE-NEMA CONTROLLER: NEMA 16-Line OLED Disp. TS-2 Type 2 (ATC Compl. - Exp. port)	$3,763
13	**$3,820**	THPQF-QF-YCT-XN-ITS	QFREE-NEMA CONTROLLER: Rack Mount for ATCC 16-Line OLED TS-2 Type 1 (ATC Compl. Exp. port)	$3,938
14	**$577**	THPQF-QF-YCT-NEMA-PS	QFREE-NEMA SUBMODULE/PARTS: NEMA Compliant Power Supply (Proprietary to Intelight Hardware)	$595
15	**$509**	THPQF-QF-CBL-DCONADPTR-S	QFREE-NEMA SUBMODULE/PARTS: Siemens to Intelight D-Connector Adapter Cable	$525
16	**$1,290**	THPQF-QF-CBL-ABCD-LOOPBACK-C	QFREE-NEMA SUBMODULE/PARTS: A,B,C,D Loopback harness for DAT testing	$1,330

Bid Item #3 – Advanced Traffic Signal Controller Systems Products and Services Otherwise Not Anticipated in the RFP

TEXAS HIGHWAY PRODUCTS, LLC

Texas Highway Products

TXShare

Highway Safety and Traffic Control Products

NOTRAFFIC

Offering 3% OFF THP List Price

	BuyBoard Discounted Price	Part/Item Number	Item Description	LIST PRICE (before 3% BuyBoard Discount)
1	**$237**	THPNT-AG-0175-74-96-PNC	NOTRAFFIC-NoTraffic Camera Bracket Stellar Cable Mount-GAL	$244
2	**$245**	THPNT-AG-0175-74-96-SS-PNC	NOTRAFFIC-NoTraffic Camera Bracket Stellar Cable Mount-SS	$253
3	**$12,000**	THPNT-AOM	NOTRAFFIC-NoTraffic AOM	$12,400
4	**$2,717**	THPNT-PRD-CU000100-03	NOTRAFFIC-Control Unit	$2,801
5	**$350**	THPNT-Cat5 VERT	NOTRAFFIC-NoTraffic Cat5E shielded (Gel Filled) (059-487/CMXF) (1000') p: vc059-487/S/CMXF	$361
6	**$22,735**	THPNT-DET	**NOTRAFFIC-NoTraffic Intersection Vehicle Detection and Sensing with System with Standard Analytics. Includes**: 1 x NoTraffic Control Unit with power supply and in-cabinet cables, 4 x NoTraffic Smart Sensors, and a Web Dashboard. **Services Include**: 5 Years Cellular Data Service, NOC Monitoring, Technical Support, Installation Support. 5 Year Hardware Warranty and Software Upgrades. Bracket not included	$23,438
7	**$4,375**	THPNT-SENSOR-HW	NOTRAFFIC-NoTraffic Additional NoTraffic Sensor Unit (without backet)	$4,510
8	**$6,125**	THPNT-SENSORRSU-HW	NOTRAFFIC-NoTraffic Sensor Unit Hardware w/RSU	$6,314
9	**$2,160**	THPNT-SVCRNW-1	NOTRAFFIC-NoTraffic One Year Additional Services includes Data Service, VMC, NOC Support, Alerts, Hardware Coverage (everything to keep cloud services and LTE connectivity active)	$2,227
10	**$1,050**	THPNT-WC PowerCable	NOTRAFFIC-NoTraffic 3 conductor wire 14AWG (1000 ft) Power Cable	$1,082
11	**$2,717**	THPNT-PRD-CU000100-03	NOTRAFFIC-Control Unit	$2,801
12	**$1,416**	THPNT-PRD-DR000001-00	NOTRAFFIC-Main DIN	$1,460
13	**$5,450**	THPNT-PRD-SU000100-02	NOTRAFFIC-Sensor Unit V2X	$5,619
14	**$4,500**	THPNT-PRD-SU000101-02	NOTRAFFIC-Sensor Unit	$4,639
15	**$817**	THPNT-PRD-DR000002-00	NOTRAFFIC-Power DIN	$842
16	**$900**	THPNT-PRD-DR000003-00	NOTRAFFIC-Power DIN 6 approaches	$928

17	**$260**	THPNT-ADP-00000001-00	NOTRAFFIC-Power Tap adapter, 3 Pin, 10ft, Pigtail	$268
18	**$300**	THPNT-ADP-00000002-00	NOTRAFFIC-Power Tap adapter, 7 Pin, 10ft, Pigtail	$309
19	**$200**	THPNT-ADP-00000003-00	NOTRAFFIC-Power Tap adapter, 3 Pin, With ground lug, 20ft, Pigtail	$206
20	**$300**	THPNT-ADP-00000004-00	NOTRAFFIC-Power Tap adapter, 7 Pin, With ground lug, 20ft, Pigtail	$309
21	**$180**	THPNT-ADP-00000005-00	NOTRAFFIC-Power Tap adapter, 3 Pin, With ground lug, 10ft, Pigtail	$186
22	**$280**	THPNT-ADP-00000006-00	NOTRAFFIC-Power Tap adapter, 7 Pin, With ground lug, 10ft, Pigtail	$289
23	**$350**	THPNT-ANT-00000001-00	NOTRAFFIC-Synergy 9 in 1 Antenna	$361
24	**$200**	THPNT-ANT-0000005G-AC	NOTRAFFIC-WiFi Repeater	$206
25	**$400**	THPNT-BRK-00000003-00	NOTRAFFIC-Camera Bracket, 2-Piece Extended Tilt & Pan, 74” Tube, 56” band	$412
26	**$400**	THPNT-BRK-00000004-00	NOTRAFFIC-Camera Bracket, 1-Piece Extended Tilt & Pan, 74” Tube, 29” band	$412
27	**$400**	THPNT-BRK-00000005-00	NOTRAFFIC-Camera Bracket, 1-Piece Extended Tilt & Pan, 74” Tube, 42” band	$412
28	**$400**	THPNT-BRK-00000006-00	NOTRAFFIC-Camera Bracket, 1-Piece Extended Tilt & Pan, 74” Tube, 56” band	$412
29	**$400**	THPNT-BRK-00000007-00	NOTRAFFIC-Camera Bracket, 1-Piece Extended Tilt & Pan, 74” Tube, 72” band	$412
30	**$400**	THPNT-BRK-00000008-00	NOTRAFFIC-Camera Bracket, 1-Piece Extended Tilt & Pan, 74” Tube, 114” band	$412
31	**$400**	THPNT-BRK-00000009-00	NOTRAFFIC-Camera Bracket, 1-Piece Extended Tilt & Pan, 74” Tube, 62” Cable	$412
32	**$400**	THPNT-BRK-00000010-00	NOTRAFFIC-Camera Bracket, 1-Piece Extended Tilt & Pan, 74” Tube, 84” Cable	$412
33	**$400**	THPNT-BRK-00000011-00	NOTRAFFIC-Camera Bracket, 1-Piece Extended Tilt & Pan, 74” Tube, 96” Cable	$412
34	**$400**	THPNT-BRK-00000012-00	NOTRAFFIC-Camera Bracket, 1-Piece Extended Tilt & Pan, 74” Tube, 110” Cable	$412
35	**$400**	THPNT-BRK-00000013-00	NOTRAFFIC-Camera Bracket, 1-Piece Extended Tilt & Pan, 74” Tube, 120” Cable	$412
36	**$400**	THPNT-BRK-00000014-00	NOTRAFFIC-Camera Bracket, 1-Piece Extended Tilt & Pan, 74” Tube, 132” Cable	$412
37	**$400**	THPNT-BRK-00000015-00	NOTRAFFIC-Camera Bracket, 1-Piece Extended Tilt & Pan, 74” Tube, 144” Cable	$412
38	**$400**	THPNT-BRK-00000016-00	NOTRAFFIC-Camera Bracket, 1-Piece Extended Tilt & Pan, 74” Tube, 220” Cable	$412
39	**$400**	THPNT-BRK-00000017-00	NOTRAFFIC-Camera Bracket, 1-Piece Extended Tilt & Pan, 74” Tube, 280” Cable	$412
40	**$380**	THPNT-BRK-00000018-00	NOTRAFFIC-Iteris Universal Mount Camera Bracket	$392
41	**$100**	THPNT-BRK-00000019-00	NOTRAFFIC-Camera Bracket, 1-Piece Tilt & Pan, Mast Arm Mount	$103
42	**$140**	THPNT-BRK-00000020-00	NOTRAFFIC-Camera Bracket, 1-Piece Extended Tilt & Pan, Mast Arm Mount	$144
43	**$84**	THPNT-CBL-AC000001-00	NOTRAFFIC-DB25 Cabinet outputs to interface board inputs 1-25	$87

44	**$72**	THPNT-CBL-AC000003-00	NOTRAFFIC-SDLC cable	$74
45	**$100**	THPNT-CBL-SDLC-DB25/DB15	NOTRAFFIC-SDLC DB25/DB15	$103
46	**$98**	THPNT-CBL-AC000004-00	NOTRAFFIC-DB37 Cabinet Outputs Harness	$101
47	**$84**	THPNT-CBL-AC000005-00	NOTRAFFIC-DB25 Cabinet outputs to interface board inputs 26-48	$87
48	**$1,400**	THPNT-CBL-AC000008-00	NOTRAFFIC-C1 to C4+C5 harness	$1,443
49	**$1,400**	THPNT-CBL-AC000010-00	NOTRAFFIC-C1 to C4 harness	$1,443
50	**$50**	THPNT-CLP-00000001-00	NOTRAFFIC-Interlocked Worm Gear Hose Clamp, 5/8" Wide, PK5	$52
51	**$60**	THPNT-CLP-00000002-00	NOTRAFFIC-Quick Release Worm Gear Hose Clamp, 9/16" Wide, PK10	$62
52	**$84**	THPNT-CLP-00000003-00	NOTRAFFIC-Quick Release Worm Gear Hose Clamp, 9/16" Wide, PK10	$87
53	**$20**	THPNT-KIT-AC000001-00	NOTRAFFIC-Connectors kit for ped/preemption 2/3/16	$21
54	**$260**	THPNT-PSU-00000002-00	NOTRAFFIC-30W 12-48V Input Industrial Gigabit PoE+ Injector	$268
55	**$500**	THPNT-SWT-00000003-00	NOTRAFFIC-Unmanaged Ethernet switch, 8x10/100 BaseT(X) ports	$515
56	**$600**	THPNT-ASM-DR000003-00	NOTRAFFIC-Router Box Assembly	$619
57	**$120**	THPNT-KIT-AC000002-00	NOTRAFFIC-DIN Mount for 19" Rack - Flange and Rail Kit	$124
58	**$200**	THPNT-MEC-AC000001-00	NOTRAFFIC-CU Shelf for 19" Rack	$206