Texas SHARE
Your Public Sector Solutions Center

MASTER SERVICES AGREEMENT #2023-092
Advanced Traffic Controller Systems

THIS MASTER SERVICES AGREEMENT ("**Agreement**"), effective the last date of signed approval ("**Effective Date**"), is entered into by and between the **North Central Texas Council of Governments** ("**NCTCOG**"), a Texas political subdivision and non-profit corporation, with offices located at 616 Six Flags Drive, Arlington, TX 76011, and

Paradigm Traffic Systems, Inc.. ("Contractor")
2201 E. Division Street
Arlington, Tx, 76011

ARTICLE I
RETENTION OF THE CONTRACTOR

1.1 This Agreement defines the terms and conditions upon which the Contractor agrees to provide **Advanced Traffic Controller Systems** (hereinafter, "Services") to governmental entities participating in the TXShare program (hereinafter "Participating Entities"). The Contractor is being retained to provide services described below to Participating Entities based on the Contractor's demonstrated competence and requisite qualifications to perform the scope of the services described herein and in the Request for Proposals **#2023-092** (hereinafter, "RFP"). The Contractor demonstrated they have the resources, experience, and qualifications to perform the described services, which is of interest to Participating Entities and was procured via the RFP. NCTCOG agrees to and hereby does retain the Contractor, as an independent contractor, and the Contractor agrees to provide services to Participating Entities, in accordance with the terms and conditions provided in this Agreement and consistent with Contractor's response to the RFP.

ARTICLE II
SCOPE OF SERVICES

2.1 The Contractor will provide Services described in a written Purchase Order issued by NCTCOG or a TXShare Participating Entity. Any such Purchase Order is hereby incorporated by reference and made a part of this Agreement and shall be subject to the terms and conditions in this Agreement. In the event of a conflict between any term or provision in this Agreement and any term or provision in a Purchase Order, the term or provision in this Agreement shall control unless the conflicting term or provision in this Agreement is referenced, and expressly stated not to apply, in such Purchase Order.

2.2 All Services rendered under this Agreement will be performed by the Contractor: i) with due care; ii) in accordance with generally prevailing industry standards; iii) in accordance with Participating Entities' standard operating procedures and applicable policies, as may be amended from time to time; and iv) in compliance with all applicable laws, government regulatory requirements, and any other written instructions, specifications, guidelines, or requirements provided by NCTCOG and/or Participating Entities.

2.3 Any agreed-upon changes to a Purchase Order shall be set forth in a subsequent Purchase Order amendment. Contractor will not implement any changes, or any new Services until a Purchase Order has been duly executed by Participating Entity. For the avoidance of doubt, the Contractor acknowledges that

Participating Entity is under no obligation to execute a Purchase Order. Participating Entity shall not be liable for any amounts not included in a Purchase Order in the absence of a fully executed amendment of Purchase Order.

2.4 Pricing for items in Appendix A represent the maximum cost for each item offered by the Contractor. Contractor and Participating Entity may mutually agree to a lower cost for any item covered under this agreement.

2.5 **NCTCOG Obligations**

2.5.1 NCTCOG shall make available a contract page on its TXShare.org website which will include contact information for the Contractor(s).

2.6 **Participating Entity Obligations.**

2.6.1 In order to utilize the Services, Participating Entities must have executed a Master Interlocal Agreement for TXShare with NCTCOG. This agreement with the Participating Entity will define the legal relationship between NCTCOG and the Participating Entity.

2.6.2 In order to utilize the Services, Participating Entities must execute a Purchase Order with the Contractor. This agreement with the Participating Entity will define the Services and costs that the Participating Entity desires to have implemented by the Contractor.

2.7 **Contractor Obligations.**

2.7.1 Contractor must be able to deliver, perform, install, and implement services with the requirements and intent of RFP #**2023-092.**

2.7.2 If applicable, Contractor shall provide all necessary material, labor and management required to perform this work. The scope of services shall include, but not be limited to, items listed in Appendix A.

2.7.3 Contractor agrees to market and promote the use of the TXSHARE awarded contract whenever possible among its current and solicited customer base. Contractor shall agree to follow reporting requirements in report sales made under this Master Services Agreement in accordance with Section 4.2.

ARTICLE III
TERM

3.1 This Agreement will commence on the Effective Date and remain in effect for an initial term ending on February 28, 2025 (the "**Term**"), unless earlier terminated as provided herein. This Agreement will automatically be renewed, unless NCTCOG explicitly desires otherwise, for up to four (4) additional one (1) year terms through February 28, 2029.

3.2 **Termination.** NCTCOG and/or Participating Entities may terminate this Agreement and/or any Purchase Order to which it is a signatory at any time, with or without cause, upon thirty (30) days' prior written notice to Contractor. Upon its receipt of notice of termination of this Agreement or Purchase Order, Contractor shall follow any instructions of NCTCOG respecting work stoppage. Contractor shall cooperate with NCTCOG and/or Participating Entities to provide for an orderly conclusion of the Services. Contractor shall use its best efforts to minimize the amount of any non-cancelable obligations and shall assign any contracts related thereto to NCTCOG or Participating Entity at its request. If NCTCOG or Participating Entity elects to continue any activities underlying a terminated Purchase Order after termination, Contractor shall cooperate with NCTCOG or Participating Entity to provide for an orderly transfer of Contractor's responsibilities with respect to such Purchase Order to NCTCOG or Participating Entity. Upon the effective date of any such termination, the Contractor shall submit a final invoice for payment in accordance with Article IV, and NCTCOG or Participating Entity shall pay such amounts as are due to Contractor through the effective date of termination. NCTCOG or Participating Entity shall only be liable for payment of services rendered before the effective date of termination. If Agreement is terminated, certain reporting requirements identified in this Agreement shall survive termination of this Agreement.

3.2.1 Termination for Cause: Either party may immediately terminate this Agreement if the other party breaches its obligations specified within this Agreement, and, where capable of remedy, such breach has not been materially cured within thirty (30) days of the breaching party's receipt of written notice describing the breach in reasonable detail.

3.2.2 Breach: Upon any material breach of this Agreement by either party, the non-breaching party may terminate this Agreement upon twenty (20) days written notice to the breaching party. The notice shall become effective at the end of the twenty (20) day period unless the breaching party cures such breach within such period.

ARTICLE IV
COMPENSATION

4.1 **Invoices.** Contractor shall submit an invoice to the ordering Participating Entity upon receipt of an executed Purchase Order and after completion of the work, with Net 30 payment terms. Costs incurred prior to execution of this Agreement are not eligible for reimbursement. There shall be no obligation whatsoever to pay for performance of this Agreement from the monies of the NCTCOG or Participating Entities, other than from the monies designated for this Agreement and/or executed Purchase Order. Contractor expressly agrees that NCTCOG shall not be liable, financial or otherwise, for Services provided to Participating Entities.

4.2 **Reporting.** NCTCOG intends to make this Agreement available to other governmental entities through its TXShare cooperative purchasing program. Contractor shall submit to NCTCOG on a calendar quarterly basis a report that identifies any new client Participating Entities, the date and order number, and the total contracted value of services that each Participating Entity has purchased and paid in full under this Master Service Agreement. Reporting and invoices should be submitted to:

NCTCOG
ATTN: TXShare
PO Box 5888
Arlington, TX 76005-5888
Email: TXShare@nctcog.org

ARTICLE V
SERVICE FEE

5.1 **Explanation.** NCTCOG will make this Master Service Agreement available to other governmental entities, Participating Entities, and non-profit agencies in Texas and the rest of the United States through its TXShare cooperative purchasing program. The Contractor is able to market the Services under this Agreement to any Participating Entity with emphasis that competitive solicitation is not required when the Participating Entity purchases off of a cooperative purchasing program such as TXShare. However, each Participating Entity will make the decision that it feels is in compliance with its own purchasing requirements. The Contractor realizes substantial efficiencies through their ability to offer pricing through the TXShare Cooperative and that will increase the sales opportunities as well as reduce the need to repeatedly respond to Participating Entities' Requests for Proposals. From these efficiencies, Contractor will pay an administrative fee to TXShare calculated as a percentage of sales processed through the TXShare Master Services Agreement. This administrative fee is not an added cost to TXShare participants. This administrative fee covers the costs of solicitation of the contract, marketing and facilitation, as well as offsets expenses incurred by TXShare.

5.2 **Administrative Fee.** NCTCOG will utilize an administrative fee, in the form of a percent of cost that will apply to all contracts between awarded contractor and NCTCOG or participants resulting from this solicitation. The administrative fee will be remitted by the contractor to NCTCOG on a quarterly basis, along with required quarterly reporting. The remuneration fee for this program will be 2% on sales.

5.3 **Setup and Implementation.** NCTCOG will provide instruction and guidance as needed to the Contractor to assist in maximizing mutual benefits from marketing these Services through the TXShare purchasing program.

ARTICLE VI
RELATIONSHIP BETWEEN THE PARTIES

6.1 **Contractual Relationship.** It is understood and agreed that the relationship described in this Agreement between the Parties is contractual in nature and is not to be construed to create a partnership or joint venture or agency relationship between the parties. Neither party shall have the right to act on behalf of the other except as expressly set forth in this Agreement. Contractor will be solely responsible for and will pay all taxes related to the receipt of payments hereunder and shall give reasonable proof and supporting documents, if reasonably requested, to verify the payment of such taxes. No Contractor personnel shall obtain the status of or otherwise be considered an employee of NCTCOG or Participating Entity by virtue of their activities under this Agreement.

ARTICLE VII
REPRESENTATION AND WARRANTIES

7.1 **Representations and Warranties**. Contractor represents and warrants that:

7.1.1 As of the Effective Date of this Agreement, it is not a party to any oral or written contract or understanding with any third party that is inconsistent with this Agreement and/or would affect the Contractor's performance under this Agreement; or that will in any way limit or conflict with its ability to fulfill the terms of this Agreement. The Contractor further represents that it will not enter into any such agreement during the Term of this Agreement;

7.1.2 NCTCOG is prohibited from making any award or permitting any award at any tier to any party which is debarred or suspended or otherwise excluded from, or ineligible for, participation in federal assistance programs under Executive Order 12549, Debarment and Suspension. Contractor and its subcontractors shall include a statement of compliance with Federal and State Debarment and suspension regulations in all Third-party contracts.

7.1.3 Contractor shall notify NCTCOG if Contractor or any of the Contractor's sub-contractors becomes debarred or suspended during the performance of this Agreement. Debarment or suspension of the Contractor or any of Contractor's sub-contractors may result in immediate termination of this Agreement.

7.1.4 Contractor and its employees and sub-contractors have all necessary qualifications, licenses, permits, and/or registrations to perform the Services in accordance with the terms and conditions of this Agreement, and at all times during the Term, all such qualifications, licenses, permits, and/or registrations shall be current and in good standing.

7.1.5 Contractor shall, and shall cause its representatives to, comply with all municipal, state, and federal laws, rules, and regulations applicable to the performance of the Contractor's obligations under this Agreement.

ARTICLE VIII
CONFIDENTIAL INFORMATION AND OWNERSHIP

8.1 **Confidential Information.** Contractor acknowledges that any information it or its employees, agents, or subcontractors obtain regarding the operation of NCTCOG or Participating Entities, its products, services, policies, customer, personnel, and other aspect of its operation ("Confidential Information") is proprietary

and confidential, and shall not be revealed, sold, exchanged, traded, or disclosed to any person, company, or other entity during the period of the Contractor's retention hereunder or at any time thereafter without the express written permission of NCTCOG or Participating Entity.

Notwithstanding anything in this Agreement to the contrary, Contractor shall have no obligation of confidentiality with respect to information that (i) is or becomes part of the public domain through no act or omission of Contractor; (ii) was in Contractor's lawful possession prior to the disclosure and had not been obtained by Contractor either directly or indirectly from the NCTCOG or Participating Entity; (iii) is lawfully disclosed to Contractor by a third party without restriction on disclosure; (iv) is independently developed by Contractor without use of or reference to the NCTCOG's Participating Entity's Confidential Information; or (v) is required to be disclosed by law or judicial, arbitral or governmental order or process, provided Contractor gives the NCTCOG or Participating Entity prompt written notice of such requirement to permit the NCTCOG or Participating Entity to seek a protective order or other appropriate relief. Contractor acknowledges that NCTCOG and Participating Entities must strictly comply with applicable public information laws, in responding to any request for public information. This obligation supersedes any conflicting provisions of this Agreement.

8.2 **Ownership.** No title or ownership rights to any applicable software are transferred to the NCTCOG by this agreement. The Contractor and its suppliers retain all right, title and interest, including all copyright and intellectual property rights, in and to, the software (as an independent work and as an underlying work serving as a basis for any improvements, modifications, derivative works, and applications NCTCOG may develop), and all copies thereof. All final documents, data, reports, information, or materials are and shall at all times be and remain, upon payment of Contractor's invoices therefore, the property of NCTCOG or Participating Entity and shall not be subject to any restriction or limitation on their future use by, or on behalf of, NCTCOG or Participating Entity, except otherwise provided herein. Subject to the foregoing exception, if at any time demand be made by NCTCOG or Participating Entity for any documentation related to this Agreement and/or applicable Purchase Orders for the NCTCOG and/or any Participating Entity, whether after termination of this Agreement of otherwise, the same shall be turned over to NCTCOG without delay, and in no event later than thirty (30) days after such demand is made. Contractor shall have the right to retain copies of documentation, and other items for its archives. If for any reason the foregoing Agreement regarding the ownership of documentation is determined to be unenforceable, either in whole or in part, the Contractor hereby assigns and agrees to assign to NCTCOG all rights, title, and interest that the Contractor may have or at any time acquire in said documentation and other materials, provided that the Contractor has been paid the aforesaid.

ARTICLE IX
GENERAL PROVISIONS

9.1 **Notices.** All notices from one Party to another Party regarding this Agreement shall be in writing and delivered to the addresses shown below:

If to NCTCOG:

North Central Texas Council of Governments
P.O. Box 5888
Arlington, TX 76005-5888
Attn: Charlie Oberrender
(817) 695-9289
coberrender@nctcog.org

If to Contractor: Paradigm Traffic Systems, Inc.
Attn: Ryan Zenzen
2201 E. Division Streed
Arlington, TX, 76011
(817) 831-9406
estimating@paradigmtraffic.com

The above contact information may be modified without requiring an amendment to the Agreement.

9.2 **Tax.** NCTCOG and several participating entities are exempt from Texas limited sales, federal excise and use tax, and does not pay tax on purchase, rental, or lease of tangible personal property for the organization's use. A tax exemption certificate will be issued upon request.

9.3 **Indemnification.** Contractor shall defend, indemnify, and hold harmless NCTCOG and Participating Entities, NCTCOG's affiliates, and any of their respective directors, officers, employees, agents, subcontractors, successors, and assigns from any and all suits, actions, claims, demands, judgments, liabilities, losses, damages, costs, and expenses (including reasonable attorneys' fees and court costs) (collectively, "Losses") arising out of or relating to: (i) Services performed and carried out pursuant to this Agreement; (ii) breach of any obligation, warranty, or representation in this Agreement, (iii) the negligence or willful misconduct of Contractor and/or its employees or subcontractors; or (iv) any infringement, misappropriation, or violation by Contractor and/or its employees or subcontractors of any right of a third party; provided, however, that Contractor shall have no obligation to defend, indemnify, or hold harmless to the extent any Losses are the result of NCTCOG's or Participating Entities' gross negligence or willful misconduct.

9.4 **Limitation of Liability.** In no event shall either party be liable for special, consequential, incidental, indirect or punitive loss, damages or expenses arising out of or relating to this Agreement, whether arising from a breach of contract or warranty, or arising in tort, strict liability, by statute or otherwise, even if it has been advised of their possible existence or if such loss, damages or expenses were reasonably foreseeable.

Notwithstanding any provision hereof to the contrary, neither party's liability shall be limited by this Article with respect to claims arising from breach of any confidentiality obligation, arising from such party's infringement of the other party's intellectual property rights, covered by any express indemnity obligation of such party hereunder, arising from or with respect to injuries to persons or damages to tangible property, or arising out of the gross negligence or willful misconduct of the party or its employees.

9.5 **Insurance.** At all times during the term of this Agreement, Contractor shall procure, pay for, and maintain, with approved insurance carriers, the minimum insurance requirements set forth below, unless otherwise agreed in a Purchase Order between Contractor and Participating Entities. Further, Contractor shall require all contractors and sub-contractors performing work for which the same liabilities may apply under this Agreement to do likewise. All subcontractors performing work for which the same liabilities may apply under this contract shall be required to do likewise. Contractor may cause the insurance to be effected in whole or in part by the contractors or sub-contractors under their contracts. NCTCOG reserves the right to waive or modify insurance requirements at its sole discretion.

Workers' Compensation:
Statutory limits and employer's liability of $100,000 for each accident or disease.

Commercial General Liability:
Required Limits:
$1,000,000 per occurrence;
$3,000,000 Annual Aggregate

Commercial General Liability policy shall include:

Coverage A: Bodily injury and property damage;
Coverage B: Personal and Advertising Injury liability;
Coverage C: Medical Payments;
Products: Completed Operations;
Fire Legal Liability;
Policy coverage must be on an "occurrence" basis using CGL forms as approved by the Texas State Board of Insurance.

Business Auto Liability: Coverage shall be provided for all owned hired, and non-owned vehicles. Required Limit: $1,000,000 combined single limit each accident.

Professional Errors and Omissions liability:
Required Limits:
$1,000,000 Each Claim
$1,000,000 Annual Aggregate

9.5 **Conflict of Interest.** During the term of this Agreement, and all extensions hereto and for a period of one (1) year thereafter, neither party, shall, without the prior written consent of the other, directly or indirectly, whether for its own account or with any other persons or entity whatsoever, employ, solicit to employ or endeavor to entice away any person who is employed by the other party.

9.6 **Force Majeure.** It is expressly understood and agreed by both parties to this Agreement that, if the performance of any provision of this Agreement is delayed by force majeure, defined as reason of war, civil commotion, act of God, governmental restriction, regulation or interference, fire, explosion, hurricane, flood, failure of transportation, court injunction, or any circumstances which are reasonably beyond the control of the party obligated or permitted under the terms of this Agreement to do or perform the same, regardless of whether any such circumstance is similar to any of those enumerated herein, the party so obligated or permitted shall be excused from doing or performing the same during such period of delay, so that the period of time applicable to such requirement shall be extended for a period of time equal to the period of time such party was delayed. Each party must inform the other in writing within a reasonable time of the existence of such force majeure.

9.7 **Ability to Perform.** Contractor agrees promptly to inform NCTCOG of any event or change in circumstances which may reasonably be expected to negatively affect the Contractor's ability to perform its obligations under this Agreement in the manner contemplated by the parties.

9.8 **Availability of Funding.** This Agreement and all claims, suits, or obligations arising under or related to this Agreement are subject to and limited by the receipt and availability of funds which are received from the Participating Entities by NCTCOG dedicated for the purposes of this Agreement.

9.9 **Governing Law.** This Agreement will be governed by and construed in accordance with the laws of the State of Texas, United States of America. The mandatory and exclusive venue for the adjudication or resolution of any dispute arising out of this Agreement shall be in Tarrant County, Texas.

9.10 **Waiver.** Failure by either party to insist on strict adherence to any one or more of the terms or conditions of this Agreement, or on one or more occasions, will not be construed as a waiver, nor deprive that party of the right to require strict compliance with the same thereafter.

9.11 **Entire Agreement.** This Agreement and any attachments/addendums, as provided herein, constitutes the entire agreement of the parties and supersedes all other agreements, discussions, representations or understandings between the parties with respect to the subject matter hereof. No amendments hereto, or waivers or releases of obligations hereunder, shall be effective unless agreed to in writing by the parties hereto.

9.12 **Assignment.** This Agreement may not be assigned by either Party without the prior written consent of the other Party.

9.13 **Severability.** In the event any one or more of the provisions contained in this Agreement shall for any reason be held to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not affect any other provision(s) hereof, and this Agreement shall be revised so as to cure such invalid, illegal, or unenforceable provision(s) to carry out as near as possible the original intents of the Parties.

9.14 **Amendments.** This Agreement may be amended only by a written amendment executed by both Parties, except that any alterations, additions, or deletions to the terms of this Agreement, which are required by changes in Federal and State law or regulations or required by the funding source, are automatically incorporated into this Agreement without written amendment hereto and shall become effective on the date designated by such law or regulation.

9.15 **Dispute Resolution.** The parties to this Agreement agree to the extent possible and not in contravention of any applicable State or Federal law or procedure established for dispute resolution, to attempt to resolve any dispute between them regarding this Agreement informally through voluntary mediation, arbitration or any other local dispute mediation process, including but not limited to dispute resolution policies of NCTCOG, before resorting to litigation.

9.16 **Publicity.** Contractor shall not issue any press release or make any statement to the media with respect to this Agreement or the services provided hereunder without the prior written consent of NCTCOG.

9.17 **Survival.** Rights and obligations under this Agreement which by their nature should survive will remain in effect after termination or expiration hereof.

ARTICLE X
ADDITIONAL REQUIREMENTS

10.1 **Equal Employment Opportunity**. Contractor shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, sexual orientation, gender identity, or national origin. Contractor shall take affirmative actions to ensure that applicants are employed, and that employees are treated, during their employment, without regard to their race, religion, color, sex, sexual orientation, gender identity, or national origin. Such actions shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

10.2 **Davis-Bacon Act.** Contractor agrees to comply with all applicable provisions of 40 USC § 3141 – 3148.

10.3 **Contract Work Hours and Selection Standards.** Contractor agrees to comply with all applicable provisions of 40 USC § 3701 – 3708 to the extent this Agreement indicates any employment of mechanics or laborers.

10.4 **Rights to Invention Made Under Contract or Agreement.** Contractor agrees to comply with all applicable provisions of 37 CFR Part 401.

10.5 **Clean Air Act, Federal Water Pollution Control Act, and Energy Policy Conservation Act.** Contractor agrees to comply with all applicable provisions of the Clean Air Act under 42 USC § 7401 – 7671, the Energy Federal Water Pollution Control Act 33 USC § 1251 – 1387, and the Energy Policy Conservation Act under 42 USC § 6201.

10.6 **Debarment/Suspension.** Contractor is prohibited from making any award or permitting any award at any tier to any party which is debarred or suspended or otherwise excluded from or ineligible for participation in federal assistance programs under Executive Order 12549, Debarment and Suspension. Contractor and

its subcontractors shall comply with the Certification Requirements for Recipients of Grants and Cooperative Agreements Regarding Debarments and Suspensions.

10.7 **Restrictions on Lobbying.** Byrd Anti-Lobbying Amendment (31 U.S.C. 1352)—Contractors that apply or bid for an award exceeding $100,000 must file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award.

10.8 **Procurement of Recovered Materials**. Contractor agrees to comply with all applicable provisions of 2 CFR §200.322.

10.9 **Drug-Free Workplace.** Contractor shall provide a drug free workplace in compliance with the Drug Free Work Place Act of 1988.

10.10 **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.

10.11 **Civil Rights Compliance**

Compliance with Regulations: Contractor will comply with the Acts and the Regulations relative to Nondiscrimination in Federally assisted programs of the U.S. Department of Transportation (USDOT), the Federal Highway Administration (FHWA), as they may be amended from time to time, which are herein incorporated by reference and made part of this agreement.

Nondiscrimination: Contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, sex, or national origin in the selection and retention of subcontractors, including procurement of materials and leases of equipment. Contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 45 CFR Part 21.

Solicitations for Subcontracts, Including Procurement of Materials and Equipment: In all solicitations either by competitive bidding or negotiation made by Contractor for work to be performed under a subcontract, including procurement of materials or leases of equipment, each potential subcontractor or supplier will be notified by Contractor of obligations under this contract and the Acts and Regulations relative to Nondiscrimination on the grounds of race, color, sex, or national origin.

Information and Reports: Contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto, and will permit access to its books, records, accounts, other sources of information, and facilities as may be determined by the State or the FHWA to be pertinent to ascertain compliance with such Acts, Regulations or directives. Where any information required of Contractor is in the exclusive possession of another who fails or refuses to furnish this information, Contractor will so certify to NCTCOG, the Texas Department of Transportation ("the State") or the Federal Highway Administration, as appropriate, and will set forth what efforts it has made to obtain the information.

Sanctions for Noncompliance: In the event of Contractor's noncompliance with the Nondiscrimination provisions of this Agreement, NCTCOG will impose such sanctions as it or the State or the FHWA may determine to be appropriate, including, but not limited to: withholding of payments to the Contractor under

this Agreement until the Contractor compiles and/or cancelling, terminating or suspension of this Agreement, in whole or in part.

Incorporation of Provisions: Contractor will include the provisions of the paragraphs listed above, in this section 10.11, in every subcontract, including procurement of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. Contractor will take such action with respect to any subcontract or procurement as NCTCOG, the State, or the FHWA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if Contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier because of such direction, Contractor may request the State to enter into such litigation to protect the interests of the State. In addition, Contractor may request the United States to enter into such litigation to protect the interests of the United States.

10.12 **Disadvantaged Business Enterprise Program Requirements**

Contractor shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of any U.S. Department of Transportation (DOT)-assisted contract or in the administration of its DBE program or the requirements of 49 CFR Part 26. Contractor shall take all necessary and reasonable steps under 49 CFR Part 26 to ensure non-discrimination in award and administration of DOT-assisted contracts. Each sub-award or sub-contract must include the following assurance: *The Contractor, sub-recipient, or sub-contractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Agreement. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this agreement, which may result in the termination of this agreement or such other remedy as the recipient deems appropriate*.

10.13 **Pertinent Non-Discrimination Authorities**

During the performance of this Agreement, Contractor, for itself, its assignees, and successors in interest agree to comply with the following nondiscrimination statutes and authorities; including but not limited to:

a. Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21.
b. The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects).
c. Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 et seq.), as amended, (prohibits discrimination on the basis of sex).
d. Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 et seq.) as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27.
e. The Age Discrimination Act of 1975, as amended, (49 U.S.C. § 6101 et seq.), (prohibits discrimination on the basis of age).
f. Airport and Airway Improvement Act of 1982, (49 U.S.C. Chapter 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex).
g. The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, subrecipients and contractors, whether such programs or activities are Federally funded or not).
h. Titles II and III of the Americans with Disabilities Act, which prohibits discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131-12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38.
i. The Federal Aviation Administration's Nondiscrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex).

j. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations.

k. Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, the parties must take reasonable steps to ensure that LEP persons have meaningful access to the programs (70 Fed. Reg. at 74087 to 74100).

i. Title IX of the Education Amendments of 1972, as amended, which prohibits the parties from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq.).

10.14 **Ineligibility to Receive State Grants or Loans, or Receive Payment on State Contracts**

In accordance with Section 231.006 of the Texas Family Code, a child support obligor who is more than thirty (30) days delinquent in paying child support and a business entity in which the obligor is a sole proprietor, partner, shareholder, or owner with an ownership interest of at least twenty-five (25) percent is not eligible to:

a. Receive payments from state funds under a contract to provide property, materials or services; or

b. Receive a state-funded grant or loan.

By signing this Agreement, the Contractor certifies compliance with this provision.

10.15 **House Bill 89 Certification**

If contractor is required to make a certification pursuant to Section 2270.002 of the Texas Government Code, contractor certifies that contractor does not boycott Israel and will not boycott Israel during the term of the contract resulting from this solicitation. If contractor does not make that certification, contractor state in the space below why the certification is not required.

_____

_____

_____

_____

10.16 **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.

10.17 **Certification of Fair Business Practices**
That the submitter affirms 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.

10.18 **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 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.

10.19 **Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment.** Pursuant to Public Law 115-232, Section 889, and 2 Code of Federal Regulations (CFR) Part 200, including §200.216 and §200.471, NCTCOG is prohibited from using federal funds to procure, contract with entities who use, or extend contracts with entities who use certain telecommunications and video surveillance equipment or services provided by certain Chinese controlled entities. The Contractor agrees that it is not providing NCTCOG with or using telecommunications and video surveillance equipment and services as prohibited by 2 CFR §200.216 and §200.471. Contractor shall certify its compliance through execution of the "Prohibited Telecommunications and Video Surveillance Services or Equipment Certification," which is included as Appendix D of this Contract. The Contractor shall pass these requirements down to any of its subcontractors funded under this Agreement. The Contractor shall notify NCTCOG if the Contractor cannot comply with the prohibition during the performance of this Contract.

10.20 **Discrimination Against Firearms Entities or Firearms Trade Associations**
Pursuant to Texas Local Government Code Chapter 2274, Subtitle F, Title 10, prohibiting contracts with companies who discriminate against firearm and ammunition industries. NCTCOG is prohibited from contracting with entities, or extend contracts with entities who have practice, guidance, or directive that discriminates against a firearm entity or firearm trade association. Contractor shall certify its compliance through execution of the "Discrimination Against Firearms Entities or Firearms Trade Associations Certification," which is included as Appendix D of this Contract. The Contractor shall pass these requirements down to any of its subcontractors funded under this Agreement. The Contractor shall notify NCTCOG if the Contractor cannot comply with the prohibition during the performance of this Contract.

10.21 **Boycotting of Certain Energy Companies**
Pursuant to Texas Local Government Code Chapter 2274, Subtitle F, Title 10, prohibiting contracts with companies who boycott certain energy companies. NCTCOG is prohibited from contracting with entities or

extend contracts with entities that boycott energy companies. Contractor shall certify its compliance through execution of the "Boycotting of Certain Energy Companies Certification," which is included as Appendix D of this Contract. The Contractor shall pass these requirements down to any of its subcontractors funded under this Agreement. The Contractor shall notify NCTCOG if the Contractor cannot comply with the prohibition during the performance of this Contract.

10.22 **Domestic Preference**

As appropriate and to the extent consistent with law, the Contractor should, to the greatest extent practicable, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). Consistent with §200.322, the following items shall be defined as: "Produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States. "Manufactured products" means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the Effective Date.

Paradigm Traffic Systems, Inc.

Ryan Zenzen **1-31-2024**

Signature Date

Ryan Zenzen

Printed Name

North Central Texas Council of Governments

DocuSigned by:
Mike Eastland 2/20/2024
A4E72C1BEF0F426...

Signature Date

Michael Eastland
Executive Director

APPENDIX A
Statement of Work

The Contractor shall provide or implement one or more of the following Contract deliverables for Advanced Traffic Signal Controller Services for existing TXShare Member Entities.

The following selection of anticipated tasks is **not all-encompassing,** and additional Advanced Traffic Signal Controller Systems may be requested by TXShare Members; if desired.

Product Category #1: Provide *Advanced Traffic Signal Controller Systems Software* through a contract on the TXShare Cooperative Purchasing Program.

Product Category #2: Provide *Advanced Traffic Signal Controller Systems Hardware* through a contract on the TXShare Cooperative Purchasing Program.

Product Category #3: Provide *Advanced Traffic Signal Controller* Systems *Products and Services Otherwise Not Anticipated in the RFP* through a contract on the TXShare Cooperative Purchasing Program.

11.0 Compatibility with Traffic Signal Controller Hardware

The selected software shall be fully functional on a wide variety of ATC hardware, regardless of manufacturer. Proposers should recognize that over the course of the life of the software, the ATC could be provided by multiple vendors. It shall be the responsibility of the selected vendor to provide detailed hardware requirements for proper functionality of the local controller software, including but not limited to, minimum processor speed, memory and cache requirements, on-board storage requirements, and supported display screen configurations.

11.1 Commercially Available Off-The-Shelf Software

TXShare expects that commercially available Off-The-Shelf (COTS) software will meet a vast majority, if not all, of the requirements contained in this specification. Minor software enhancements will be allowed to existing COTS software packages to meet all requirements. Any required software enhancements to comply with this specification must be identified and detailed in the responder's submittal. To be considered as COTS software, the proposed software should be currently available and operating in the field at a minimum of 200 intersections.

11.2 Cabinet Types

11.2.1 The Software must be configurable to operate in the following cabinet types:
(1) Caltrans Model 332
(2) Advanced Transportation Controller Cabinet (based on ATC Cabinet Standard ATC5301 v02.02)
(3) NEMA TS 1
(4) NEMA TS 2

11.3 Software License

11.3.1 TXShare Participating Entities will consider the following licensing options for the software:
(1) Per individual controller installed on hardware provided by the vendor.
(2) Per individual controller installed on hardware not provided by the vendor.
(3) City-wide (i.e., enterprise) license installed on hardware provided by the vendor.
(4) City-wide i.e., enterprise) license installed on hardware not provided by the vendor.

11.3.2 The software licensing agreements shall indicate:
(1) Perpetual use of the software.
(2) The conditions in which the software applications may be used and any restrictions regarding the use of the software.
(3) The maintenance and support period for the software applications including software updates and

upgrades.

(4) The cost of the rights for a TXShare Participating Entity to use the software.
(5) TXShare Participating Entity's rights to obtain access to source code generated through the development of any custom functionality.
(6) Any warranty terms as well as any liabilities relating to the TXShare Entity's use of software.

11.4 Product Life

The selected local controller software product shall have a minimum product life of 10 years. During the life of the product, the provider shall maintain and upgrade the product to prevent the software from becoming obsolete, provide technical support, and maintain security against existing and future external threats as defined in the licensing agreement.

11.5 Warranty

11.5.1 Warranty Period

The selected provider shall warrant that the software will perform in accordance with this specification for a period of ten (10) years from the initial delivery and acceptance of the software by a TXShare Participating Entity. During the initial warranty period, the selected provider will, at no cost to the TXShare Participating Entity, rectify any faults in the software identified by the TXShare Participating Entity and communicated to the selected vendor, provide software upgrades, and conduct initial and major version update training.

11.6 Failure to Maintain and Support

Should the vendor discontinue support and/or fail to maintain the selected software system during the product life, the TXShare Participating Entity may elect to implement either of the following remedies:

11.6.1 Alternative Vendor-Supplied Software

Replace the originally supplied software with a vendor-supplied alternate system that meets or exceeds the requirements defined in this specification. Under this remedy, the vendor shall be required to demonstrate that the new software meets all requirements by repeating the acceptance tests. If the TXShare Participating Entity selects this option, the vendor shall be responsible for all costs incurred by the TXShare Participating Entity to replace the software.

11.6.2 Acquire and Install New Local Controller Software

The TXShare Participating Entity shall have the right to select, acquire, and install local controller software provided by another Vendor that meets or exceeds the TXShare Participating Entity's requirements defined in this specification. If the TXShare Participating Entity selects this option, the existing vendor shall be responsible for all costs to the TXShare Participating Entity to purchase, install, and test the new software as well as cost incurred in training staff to operate and maintain the new system.

11.7 Industry Standard Nomenclature

All names, labels, data elements, and other descriptions within the software shall be defined in English using industry standard, easily understood nomenclature. All nonstandard nomenclature shall be approved by the TXShare Participating Entity. Hexadecimal numbers are not permitted.

11.8 Security

11.8.1 Passwords

The software shall be configurable to enable/deny access to the controller through user passwords. User access and passwords shall be definable by the software administrator.

(1) Security levels shall include view only, access to change timing parameters only, access to change controller unit configuration, and access to on-board software administration functions.
(2) As security levels increase, the user will be able to access and change more features in the software and each level shall include access to all lower levels.
(3) The software shall log the user ID, date, and time of log-in and log-out and any changes the user made.

(4) The software shall automatically log out the last user after a user specified amount of time has passed where there was no front panel activity or activity from a remote connection.

11.9 Accessibility

11.9.1 Accessibility Options

All controller objects and functions shall be accessible for configuration, editing, and saving through any of the following means:

(1) Direct keyboard entry on the local controller front panel
(2) Authorized remote device connected directly to the Ethernet port on the local controller front panel.
(3) Supported web browsers via the Local Controller's built-in web server.
(4) Central Traffic Management System

11.9.2 Exceptions

Exceptions to this requirement include the following objects which should be configurable via the controller front panel only:

(1) IP Address and local controller network configuration
(2) Unit or Station ID Number

11.9.3 Web Browsers

The software shall support accessibility to all software objects and functions through any current or future versions of Google Chrome, Safari, Microsoft Edge, and Firefox throughout the duration of the product life as described above.

(1) Access using a Web Browser shall comply with the security requirement defined in Section 3.10 of this specification.
(2) The Software shall support web browser access and all functionality through any of the following devices:
    (a) Computer
    (b) Smartphone
    (c) Tablet
(3) All status objects shall be refreshed by the web browser automatically. The refresh shall have a latency of less than 2/10 of a second after a value change occurs.
(4) The software shall be accessible from a web browser on any device without the need for additional software or browser plugins (i.e., Flash, Java, or Silverlight).

11.10 User Manuals

11.10.1 Updates

The Vendor shall maintain user manuals updated to the latest released software version. The TXShare Participating Entity shall receive electronic notification when an updated user manual is published.

11.10.2 Format

User manuals shall be provided in electronic format, downloadable from a vendor provided web page.

11.10.3 Local Controller

User manuals and/or help screens shall be resident in the controller and accessible through the controller front panel.

11.11 Software Upgrades

11.11.1 Notification

(1) The TXShare Participating Entity shall be automatically notified by the vendor when software upgrades are available.
(2) The automatic notice should include a link to a vendor's web page with release notes, including a detailed description of all changes to the software and any bug fixes included in the update.

11.11.2 Remote Software Downloads

(1) The software shall allow users to download upgrades to the local controller software from a remote location (i.e., central management system or remote device) without requiring the traffic

signal to be placed in flashing operation.

11.11.3 Flash Memory

(1) The upgraded software shall reside in flash memory in the local controller unit and not automatically replace the existing software in the controller unit.

11.11.4 Implementation Options

(1) Once downloaded, the user shall have the ability to activate the software at the beginning of the next signal cycle, upon next reboot, or schedule the time and date when the software will be activated.
(2) If the software upgrade is considered minor, the user shall be able to remotely replace the existing software while the controller is still operating and shall not require a controller restart.
(3) If the software upgrade is considered major, a controller restart may be required to replace the existing software.
(4) Any scheduled upgrades shall not take place before their scheduled time and date (if any) due to either a controller reboot or in the event of a power failure.
(5) The software provider shall submit their definition of minor and major upgrades for City approval.

11.11.5 Installation verification

(1) The controller software download utility software shall verify that the upgraded software was successfully downloaded to the controller unit without errors.

11.12 Management Information Base (MIB)

11.12.1 Documentation

(1) Software documentation shall include all NTCIP standard MIBs and extensions, developer-specific MIBs, and all SNMP/STMP data elements.

11.12.2 Re-distribution and Re-use rights

(1) The Vendor shall not place any limitations on the re-distribution and re-use of the MIB. The TXShare Participating Entity shall be able to re-distribute and/or re-use the MIBs as required to provide the required functionality defined in this specification.

11.12.3 MIB extensions

(1) All MIB extensions shall be clearly defined. Primarily, all extensions shall be accomplished by the following methods:
    (a) Extending the capabilities of existing standard features.
    (b) Defining new data elements or features under a developer-specific MIB extension.
(2) To the extent possible, the replacement of a partially complete feature with a complete custom feature shall be avoided.

11.12.4 Changes to the MIB

(1) An up-to-date electronic copy of the MIB shall be provided to the TXShare Participating Entity whenever changes are made due to changes to the standard, new software features, or bug fixes.

11.13 Virtual Controller Application

The Vendor shall provide a windows-based virtual controller application,

11.13.1 Appearance

(1) The virtual controller application shall duplicate the appearance and functionality of the web-based user interface.

11.13.2 Database Programming

(1) Users shall be able to create and/or edit controller databases in the virtual controller application.

11.13.3 Import/Export

(1) Users shall be able to import/export controller databases to/from the virtual controller application.

11.13.4 Software Upgrades

(1) Users shall be able to upload new versions of the software to the Virtual controller application or download an updated virtual controller application from the vendor's website. The vendor shall make updated versions of the virtual controller software available within 60 days of the release of the new local controller software.

11.14 Training

11.14.1 Initial Training

Following the initial delivery of the software, the selected Vendor shall provide a minimum of sixty (60) hours of initial training on the software. Training will be tailored to the specific audience and their roles in operating and/or maintaining the software. The Training audiences will include traffic operations engineers, traffic management center staff, and public works maintenance staff. Training may be provided through formal in-person sessions, online meeting platforms (i.e., Zoom, Teams), or through prerecorded video (i.e., YouTube). A minimum of 40 hours of training shall be provided in the in-person format.

11.14.2 Annual Training

Throughout the product life, the selected vendor shall annually provide an additional eight (8) hours of training for City personnel. Annual training may include, at a minimum, any of the following types of training.

(1) Training of new personnel
(2) Training specific to new software features
(3) Training specific to operational changes introduced in software upgrades.
(4) General refresher training.

11.14.3 Training Goals and Objectives

Each training session shall have established goals and objectives for the session.

11.14.4 Training Materials

The vendor shall provide electronic copies of all training materials required to facilitate effective and efficient training sessions.

11.14.5 Training Effectiveness

At the end of each training session, the vendor shall measure the effectiveness of the training session against the session's stated goals and objectives. The vendor shall identify the process that will be implemented to measure training effectiveness. Typical ways to measure training effectiveness could include post-training quizzes, one-to-one discussions with participants, surveys, and/or participant case studies.

11.15 NTCIP 1202 v03

11.15.1 Compliance

(1) The Software shall be compliant with NTCIP 1202 v03 as defined and extended in this specification, including all functional requirements marked as required in the Protocol Requirements List (PRL). Note: NTCIP 1202 v03 includes normative references (as presented in Section 1.2.1 of the 1202 standard) which are referenced in the standard and, in total, constitute the complete provisions of the standard.

11.15.2 Requirements Traceability Matrix (RTM)

(1) The RTM provided in Annex A of the NTCIP 1202 v03 Standard is included in this specification by reference.

11.15.3 NTCIP 1202 v03 Project Specific Protocol Requirements List

(1) Section 3 of NTCIP 1202 v03 defines the Functional Requirements based on user needs identified in Section 2 of the standard. Each user's need is mapped to one or more requirements in the Protocol Requirements List (PRL). The TXShare Participating Entity has selected the requirements defined in the PRL that meet their needs. These are identified in a TXShare Project Specific PRL attached as Appendix A to this Specification.

11.15.4 Future Upgrades

(1) If not currently available, The TXShare Participating Entity will allow functional requirements presented in the following sections of the PRL to be delivered as a future software upgrade, provided the upgrade is provided within two years of the initial software delivery.

User Need ID	User Need
2.5.4.1.1	Manage RSU Interface
2.5.4.1.2	Manage RSU Interface Watchdog
2.5.4.2.1	Manage Roadway Geometrics Information
2.5.4.2.2	Manage Movement Configuration for Connected Devices
2.5.4.2.3	Manage Collection of Connected Devices Data
2.5.4.2.4	Monitor Broadcasted MAP Messages

11.16 NTCIP 1211 v02

TXShare Participating Entities are implementing a pilot project to provide Transit Signal Priority (TSP) for buses along specific routes in their respective locales. The Centralized TSP System will collect data from buses and, if certain criteria are met, generate a TSP request that is transmitted to the TXShare Participating Entity's traffic management system for action.

The Centralized TSP system is based on NTCIP 1211 v02. NTCIP 1211 defines the management information base for signal control and prioritization (SCP) systems. It defines individual parameters that represent the configuration, status, and control information that is unique to SCP.

Within the standard, NCTIP 1211 defines the following three critical SCP components:

- Priority Request Generator (PRG)
- Priority Request Server (PRS)
- Coordinator (CO)

NTCIP 1211 defines the primary functions of these components as follows: Priority Request Generator (PRG)

- To produce an estimate of the arrival time at the intersection
- To produce an estimate of the time for departure from the intersection.
- To send a request for signal priority to the Priority Request Server.

- To send and receive the status of a priority request from the PRS. Priority Request Server (PRS)
- To receive priority requests from the PRG
- To send the status of priority requests back to the PRG.
- To prioritize multiple priority requests
- To exchange service requests with the coordinator.
- To exchange status information with the

coordinator. Coordinator

- To receive service requests from the PRS
- To transmit status information back to the PRS
- To implement the requested priority strategy

Based on the architecture of the Centralized TSP System, the PRS and CO will be located in the local controller.

11.16.1 Compliance

(1) The software shall be compliant to NTCIP 1211 v02 for all functional requirements, dialogs, and objects defined in the Standard for the Priority Request Server (PRS) and the coordinator (CO).

11.16.2 Existing Software Functionality

(1) The PRS and CO shall utilize existing software functionality for time synchronization, event logging, device identify and configuration.

11.16.3 Requirements Traceability Matrix

(1) The Requirements Traceability Matrix provided in Annex A of the NTCIP 1211 v02 is included in this specification by reference.

11.17 NTCIP 1211 v02 Project Specific Protocol Requirements List

Section 3 of NTCIP 1211 v02 defines the Functional Requirements based on user needs identified in Section 2 of the standard. Each user's need is mapped to one or more requirements in the Protocol Requirements List (PRL). Conformance to each functional requirement is identified as Mandatory, Optional, Conditional, Not Applicable, or Excluded as defined in Table 1 of Section 3.3.1.1. The TXShare Participating Entity has selected the requirements defined in the PRL that meet their needs. These are identified in a TXShare Specific PRL attached as Appendix B and incorporated into this Specification.

11.17.1 Compliance

(1) To be considered complaint to this NTCIP 1211 v02 and this specification, the software shall include all requirements marked as "Yes" (i.e., required) in the NTIP 1211 v02 PRL.

11.18 Extensions to NTCIP 1202 v03

11.18.1 Background

(1) The NTCIP 1202 v03 Standard does not define every traffic signal control feature, only addressing features in wide use. TXShare Participating Entities have identified additional user needs and functional requirements for the local controller software. This section provides the following information:
   (a) Defines new functional requirements not included in NTCIP 1202 v03.
   (b) Defines additional functional requirements for user needs identified in NTCIP 1202 v03.

11.18.2 General Information

(1) Users shall be able to enter the following general Intersection Information into the software.
   (a) Intersection ID Number
   (b) Major Street Name
   (c) Minor Street Name
(2) Users shall be able to view the current active software version from either the controller front panel display or through the web interface.

11.18.3 Labels

(1) The software shall allow users to enter, at a minimum, alpha-numeric labels for the following:

(a) Vehicle Phases
(b) Pedestrian Phases
(c) Overlaps
(d) Timing Plan Sets
(e) Preempts

(2) All labels shall be a minimum of six characters in length.

11.18.4 Peer-to-Peer Communication

(1) The local controller software shall support peer to peer communication between local intersection controllers exclusive of a central management system and along the most direct and reliable path allowable by the communication topology.
(2) The local controller software shall support transmission and reception of multiple peer messages simultaneously.
(3) The local controller software shall be able to transmit peer to peer messages to a minimum of five (5) intersections in all directions from the intersection transmitting the messages.
(4) The local controller software shall be able to receive peer to peer messages from a minimum of five (5) intersections in all directions from the intersections receiving the message.
(5) A peer message shall be generated and transmitted based on a user defined controller action, event, input, or output occurring at the transmitting intersection.
    (a) The user shall be able to select any local controller input, output, or event to initiate a peer-to-peer message.
    (b) Up to five (5) controller actions/events may be grouped together to generate a peer message.
(6) Receipt of a peer message at an intersection shall result in the initiation of a user defined action/event at the receiving intersection.
    (a) The user shall be able to select any internal control action/event available in the software.
    (b) Receipt of a peer message can result in the initiation of up to five (5) user defined controller actions/events.

11.18.5 Programmable Logic Gates and Statements

(1) The software shall support a minimum of sixty-four logic statements.

(2) The software shall support the following Boolean logic gates:

(a) OR – if either function is true, the logic channel will be true.

(b) AND – if both functions are true, the logic channel will be true.

(c) NOT- if the first function is NOT true, the logic channel will be true the second function is not used for this command.

(d) XOR- if either function is true the channel is true; if both are true the channel will be false.

(e) NOR – If either function is true, the logic channel will be false.

(f) NAND – if both functions are true, the logic channel will be false.

(g) ORNOT2 – if the first function is true OR the second function is not true, the logic channel will be true.

(h) ANDNOT2 – if the first function is true AND the second function is not true, the logic channel will be true.

(3) The software shall support the following Logic commands:

(a) LATCH – once the first function is true, the logic channel will be true until the second function is true.

(b) DELAY AND/OR EXTEND – once the function is true, the logic channel shall not be true until the amount of time in seconds defined by the user has elapsed. After the function changes from true to false, the logic channel shall remain true until the amount of time in seconds defined by the user has elapsed.

(i) The range of the delay time shall be from 0 to 255 seconds and defined separately.

(ii) The range of the extended time shall be from 0 to 255 seconds and defined separately.

(4) The software shall provide the ability to program the following outputs in logic statements:

(a) Phase green
(b) Phase yellow
(c) Phase red
(d) Phase omit.
(e) Overlap green.
(f) Overlap
(g) yellow.

(h) Overlap red.
(i) Walk
(j) Pedestrian clear Don't walk.
(k) Overlap walk.
(l) Overlap
(m) pedestrian clear.
(n) Overlap don't walk.
(o) Phase on
(p) Phase next
(q) Phase check
(r) Phase hold
(s) Virtual phase green

(t) Virtual phase yellow
(u) Virtual phase red
(v) LRV green
(w) LRV yellow
(x) LRV red
(y) Force off.
(z) Preempt on
(aa) Preempt entry one.

(319) Preempt entry two. (bb) Preempt dwell. (cc) Preempt off. (ee) Free
(ff) Special Function
(dd) Flash
(gg) Active plan
(hh) Special output/time of day

(5) The software shall provide the ability include the following inputs in logic statements:
(a) Vehicle detector
(b) Pedestrian detector/call
(c) Overlap detector.
(d) Overlap pedestrian detector.
(e) System detector
(f) Queue detector
(g) LRV detector
(h) Terminate detector.
(i) Vehicle omit.
(j) Pedestrian omit.
(k) Overlap omit.
(l) Overlap pedestrian omit.
(m) LRV Omit
(n) Phase hold
(o) Overlap hold.
(p) Walk hold.
(q) Overlap walk hold.
(r) Preempt train input.
(s) Preempt emergency vehicle input.
(t) Flash sense
(u) Manual control enable.
(v) Manual control advance
(w) Stop time.
(x) Minimum recall
(y) External start
(z) Walk rest modifier.
(aa) External coordination enable.
(319) Plan select enable.
(cc) External Time set.
(dd) Door open
(ee) Force off.
(ff)Red rest
(gg) Max inhibit.
(hh) Max 2
(ii) Max 3
(jj) Pedestrian recycle.
(kk) External plan select.
(ll) Master sync input
(mm) Free select input.
(nn) MMU flash
(oo) Local flash
(pp) Automatic flash
(qq) Gate down

(6) The software shall support a minimum of sixty-four user definable logic statements.
(7) The software shall not limit the number of items that can be linked together in logical statements.
(a) The software shall process the logic commands every 0.1 seconds.

11.18.6 Monitor Conflict Monitor/MMU
(1) The Software shall be able to report the status of the Cabinet's Conflict Monitor/MMU.
(2) The Software shall be capable of retrieving the Cabinet's Conflict Monitor/MMU logs.

11.18.7 Diagnostics
(1) The software shall include a diagnostic routine that conducts verification checks on edits and/or downloaded traffic signal controller databases.
(2) The verification routine shall automatically run prior to when either of the following criteria exist:
(a) A traffic signal controller database is downloaded from a remote management station or when copied from an approved external source.
(b) Before edits to a database are saved.
(c) Timing changes via the front panel result in a verification failure
(3) Any discrepancies identified during the verification check shall be clearly identified and displayed to the user.
(a) A description of the discrepancy shall also be displayed.

(4) The verification routines shall include, at a minimum, the following checks:
   (a) Out of range parameters
   (b) Overlap/phase is activated but yellow and red time below minimums.
   (c) Pedestrian overlap/phase activated but no detector input assigned.
   (d) Vehicle overlap/phase activated but no recall or detector input assigned.
   (e) Walk rest is called for, but the pedestrian minimum is violated.
   (f) The offset is greater than the cycle length.
   (g) Coordinated plan phase times do not add up to cycle length unless cycle length is set to zero.
   (h) Plan has coordination numbers, and transition parameters are not defined, unless cycle length is set to zero.
   (i) Coordination plan calls for phases with "0" minimum green and/or gap time.
   (j) Coordination plan calls for phases that are not in the overlap table referenced by the coordination plan.

11.18.8 Remote Commands: Definition of remote commands (remote devices directly to the controller's web interface and/or from the Central system.
   (1) Users shall be able to remotely change between TOD / FREEOP / Remote Flash / Remote Manual Command / Central System Command.
   (2) Users shall be able to remotely place a detector call and preempt inputs in real-time by checkbox (or similar implementation method) from a real-time status window.

11.18.9 Manage Phase Configuration (NTCIP 1202 – User ID 2.5.2.1.2
   (1) Users shall be able to configure phases for conditional inclusion in a sequence without requiring a programmed split.
   (2) Minimum and maximum green times shall be programmable by phase for each TOD plan.
   (3) Users shall be able to select start-up and programed flash entrance/exit phases/phase status/sequence.
   (4) The software shall provide a rapid transition between TOD plans and at any point when the coordinator is interrupted/preempted while running a coordinated TOD plan.
   (5) The Software shall support a minimum of twenty-five barrier groups.

11.18.10 Manage Coordination Configuration (NTCIP 1202 – User ID 2.5.2.1.3)
   (1) Coordinated phases shall be assignable for each ring and barrier (i.e., Dual Coordination)
   (2) The user shall be able to assign phases in different rings and/or barriers as coordinated / reference phases in different TOD plans.

11.18.11 Manage Overlap Configurations (NTCIP 1202 – User ID 2.5.2.1.8)
   (1) In addition to the overlap types identified in NTCIP 1202, the software shall include a configuration template for a Left Turn – Arlington Display overlap.
   (2) The software shall support a minimum of sixteen overlap included phases.
   (3) The software shall support a minimum of eight (8) modifier phases for all overlap types requiring such.
   (4) Users shall be able to configure the overlap clearance times to be driven by either of the following options:
      (a) Overlap Timing
      (b) Parent Phase Timing
   (5) Users shall be able to enable/disable flashing yellow arrow overlaps by time-of-day plan.
   (6) Users shall be able to able to configure flashing yellow right-turn overlaps to omit green or flashing yellow state(s) based on conflicting Walk and/or Flashing Don't Walk. The following options shall be available.
      (a) Conflicting Pedestrian Walk – Red or FYA
      (b) Conflicting Pedestrian Flashing Don't Walk – Red or FYA
      (c) Conflicting Pedestrian Don't Walk – FYA or Green Arrow

(7) Users shall be able to separate delay values for leading and lagging flashing yellow arrow sequences.
(8) The software shall support separate delay values for leading and lagging flashing yellow arrow sequences.
    (a) A lagging flashing yellow arrow sequence shall be configurable for any of the following:
        (i) Include the All-Red State
        (ii) Skip the All-Red State (no red-revert)
(9) The flashing yellow arrow delay shall be user configurable to suppress the delay upon the start of the opposing through phase.
(10) The software shall support the flashing yellow arrow delay/suppression by detector for the entire duration of the opposing phase split or maximum green.
(11) Pedestrian overlaps with walk/flashing don't walk times shall operate independently from parent phase pedestrian timing.
(12) Pedestrian overlaps shall operate independently from parent phase order as programmed for that overlap (i.e., parent phases 1,2,3 operate the same as parent phases 3,2,1)
(13) Users shall be able to program trailing green/green clearance times in one-tenth (1/10) second intervals.
(14) Users shall be able to program omits or suppression conditions by phase sequence/phase next.

11.18.12 Manage Preempt Configurations (NTCIP 1202 – User ID 2.5.2.1.9)
(1) The software shall be able to accept preempt requests from either local controller contact closures, remote management station, or central management or centralized vehicle preemption system.
(2) The user shall be able to configure overlap settings for each preempt.
(3) In addition to the exit phase strategies identified in NTCIP 1202 v03, the software shall support the following exit phase strategies:
    (a) Free
    (b) User-defined exit sequence
    (c) Longest unserved movement
    (d) Skipped movement(s)
    (e) Exit into coordination.
(4) Users shall be able to define minimum and maximum green times per phase for each preempt.
(5) Users shall be able to define specific sequences for preemption entry based on active phase condition when a preemption call is received.
(6) Phases shall honor detection input throughout preemption and during preempt exit.
(7) Preempt exit mode programmable by TOD. May be accomplished through either preemption configuration or via user logic programming.

11.18.13 Manage Timing Pattern Scheduler (NTCIP 1202 – User ID 2.5.2.1.10)
(1) The scheduler shall support a minimum of 40 day plans, with a minimum of sixty-four events per day plan.
(2) The scheduler shall support a minimum of three auxiliary functions and 16 special functions.

11.18.14 Manage Detector Configuration (NTCIP 1202 – User ID 2.5.3.1)
(1) The pedestrian detector failure behavior shall be user selectable to either "Fail On" or 'Fail Off."
    (a) Users shall be able to select by individual detector and/or detector set.
(2) Detectors shall be able to call phases or overlaps.
    (a) An overlap call shall call all parent phases for that overlap.
(3) The software shall allow users to assign more than one call/extend phase per detector.
(4) The software shall allow users to call/extend phases by overlap.

11.18.15 Monitor Detector Status (NTCIP 1202 – User ID 2.5.3.2)
(1) In addition to the number of 128 vehicle detectors identified in NTCIP 1202, The software shall support an additional 320 prioritor and preempt detectors)

11.18.16 Manage Split Configuration (NTCIP 1202 – User ID 2.5.2.1.5)

(1) The software shall allow oversized pedestrian splits to be accommodated through a "stop in walk" method where the controller adds time to the background cycle length or by "reallocating time" from other phases by modifying split times within a user-definable number of cycles to maintain coordination without requiring a coordination transition.

The awarded Contractor(s) shall provide all necessary field inspectors, vehicles, tools, equipment, traffic control and other services required to perform this work. No engineering services are available under this contact. Any activities that Participant and/or Contractor deem to require the service(s) of an engineer must be procured separately and are the sole responsibility of that party.

Contractor indicates the ability to provide the following Services under this Agreement:

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

APPENDIX A.1
Pricing for TXShare Cooperative Purchase Program Participants

For Advanced Traffic Signal Controller Services and implementation of the services specified by the RFP, Contractor's proposed rates for services are found below.

RFP#2023-092 # TXShare

Part Code	*Distributor*	*Description*	*QTY*	*UOM*	*Current TXShare*
PRODUCT CATEGORY #1					
EOSL	PARADIGM TRAFFIC	EOS Controller Software License	1	EA	$1,300.00
PRODUCT CATEGORY #2					
2070 Controller	PARADIGM TRAFFIC	2070C / 2070E Controller	1	EA	$5,334.00
COBSM 1100	PARADIGM TRAFFIC	Cobalt 1100 Shelf Mount	1	EA	$3,700.00
COBGSM 2100	PARADIGM TRAFFIC	Cobalt G Shelf Mount	1	EA	$5,200.00
COBCSM 2101	PARADIGM TRAFFIC	Cobalt C Shelf Mount	1	EA	$3,900.00
COBCRM	PARADIGM TRAFFIC	Cobalt C-Series Rackmount	1	EA	$5,775.00
COBGRM	PARADIGM TRAFFIC	Cobalt G-Series Rackmount	1	EA	$6,450.00
333S Hybrid Cabinet w/ Controller and Plug Ins	PARADIGM TRAFFIC	333S ATCC Cabinet Assembly w/o Controller and with Plug Ins (City of League City)	1	EA	$34,702.50
ATC 340 Cabinet	PARADIGM TRAFFIC	ITS 340 Cabinet	1	EA	$36,225.00
ATCC model 332 Cabinet No Controller 16/24	PARADIGM TRAFFIC	ATC model 332 Cabinet No Controller	1	EA	$31,500.00
ATCC model 332 Cabinet w/ Controller 16/24	PARADIGM TRAFFIC	ATC model 332 Cabinet w/ Controller	1	EA	$36,750.00
ATCC model 332 Cabinet No Controller 32/48	PARADIGM TRAFFIC	ATC model 332 Cabinet No Controller	1	EA	$34,650.00
ATCC model 332 Cabinet w/ Controller 32/48	PARADIGM TRAFFIC	ATC model 332 Cabinet w/ Controller	1	EA	$39,900.00
PRODUCT CATEGORY #3					
24 HR - AC, Flasher Cabinet Full Assembly	PARADIGM TRAFFIC	Complete AC Flasher Cabinet Assy	1	EA	$4,950.00
24 HR - DC, Solar Flasher Cabinet and components	PARADIGM TRAFFIC	Complete DC Flasher Cabinet Assy	1	EA	$5,900.00
AN22Y33BATT44ERY Level 1	PARADIGM TRAFFIC	Battery	1	EA	$525.00
AN22Y33BATT44ERY Level 2	PARADIGM TRAFFIC	Battery	1	EA	$2,100.00
AN22Y33BATT44ERY Level 3	PARADIGM TRAFFIC	Battery	1	EA	$5,250.00
BATTERY TESTER KIT	PARADIGM TRAFFIC	Battery Tester Kit w/Tester, Probes, Case	1	EA	$9,450.00
Uninterruptible Power Supply	PARADIGM TRAFFIC	UPS System	1	EA	$12,600.00
Uninterruptible Power Supply Miscellaneous Component	PARADIGM TRAFFIC	UPS System Components	1	EA	$3,675.00

Analytics System	PARADIGM TRAFFIC	Analytics System	1	EA	$78,750.00
Applicator	PARADIGM TRAFFIC	Applicator	1	EA	$761.25
ATCC Key Burner	PARADIGM TRAFFIC	ATCC Key Burner	1	EA	$1,260.00
ATC Rack Mount Controller	PARADIGM TRAFFIC	ATC Rack Mount Controller	1	EA	$5,250.00
Cable Level 1	PARADIGM TRAFFIC	Cable	1	FT	$2.10
Cable Level 2	PARADIGM TRAFFIC	Cable	1	FT	$5.25
Cable Level 3	PARADIGM TRAFFIC	Cable	1	FT	$15.75
Cellular Modem Device	PARADIGM TRAFFIC	Cellular Modem Device	1	EA	$5,000.00
Cellular Modem Connectivity	PARADIGM TRAFFIC	Modem Connectivity	1	YR	$2,100.00
COMPUTER Level 1	PARADIGM TRAFFIC	Computer Component	1	EA	$525.00
COMPUTER Level 2	PARADIGM TRAFFIC	Computer Component	1	EA	$5,250.00
COMPUTER Level 3	PARADIGM TRAFFIC	Computer Component	1	EA	$21,000.00
DATA KEY 8MB	PARADIGM TRAFFIC	Data Key/Jump Drive 8MB	1	EA	$126.00
DSRC Radio	PARADIGM TRAFFIC	5.9GHZ radio for V2V	1	EA	$5,985.00
Traffic Electrical Subcontracting	PARADIGM TRAFFIC	Traffic Electrical Subcontracting	1	HR	$500.00
Level 1 Ethernet Switch	PARADIGM TRAFFIC	Level 1 Ethernet Switch	1	EA	$1,155.00
Level 2 Ethernet Switch	PARADIGM TRAFFIC	Level 2 Ethernet Switch	1	EA	$1,732.50
Level 3 Ethernet Switch	PARADIGM TRAFFIC	Level 3 Ethernet Switch	1	EA	$3,675.00
Level 4 Ethernet Switch	PARADIGM TRAFFIC	Level 4 Ethernet Switch	1	EA	$8,400.00
Level 5 Ethernet Switch	PARADIGM TRAFFIC	Level 5 Ethernet Switch	1	EA	$29,400.00
Level 6 Ethernet Switch	PARADIGM TRAFFIC	Level 6 Ethernet Switch	1	EA	$57,750.00
Level 1 Miscellaneous Traffic Component	PARADIGM TRAFFIC	Miscellaneous Traffic Component	1	EA	$105.00
Level 2 Miscellaneous Traffic Component	PARADIGM TRAFFIC	Miscellaneous Traffic Component	1	EA	$367.50
Level 3 Miscellaneous Traffic Component	PARADIGM TRAFFIC	Miscellaneous Traffic Component	1	EA	$1,050.00
Level 4 Miscellaneous Traffic Component	PARADIGM TRAFFIC	Miscellaneous Traffic Component	1	EA	$6,300.00
Level 5 Miscellaneous Traffic Component	PARADIGM TRAFFIC	Miscellaneous Traffic Component	1	EA	$10,500.00
LED Component	PARADIGM TRAFFIC	LED Component	1	EA	$1,200.00
MISCANYCAB	PARADIGM TRAFFIC	Miscellaneous Cabinet Equipment	1	EA	$42,000.00
MISCSOL25	PARADIGM TRAFFIC	Miscellaneous Solar Equipment	1	EA	$5,250.00
MONITOR	PARADIGM TRAFFIC	Wall Mount Monitor	1	EA	$3,675.00
Nema Traffic Signal Cabinet Assembly	PARADIGM TRAFFIC	Nema Traffic Signal Cabinet Assembly	1	EA	$22,050.00
ON-SITE TRAINING	PARADIGM TRAFFIC	Training on-site	1	HR	$350.00
Powder Coating	PARADIGM TRAFFIC	Powder Coat	1	EA	$2,100.00
PTSI ATCC Cabinet No Controller	PARADIGM TRAFFIC	ATC Cabinet No Controller	1	EA	$36,750.00
PTSI ATCC Cabinet w/ Controller	PARADIGM TRAFFIC	ATC Cabinet w/ Controller	1	EA	$42,000.00
PTSI Cabinet Rehab	PARADIGM TRAFFIC	Cabinet Rehab	1	EA	$26,250.00
PTSI Pole Mount Cab	PARADIGM TRAFFIC	Pole Mount Cabinet	1	EA	$23,100.00
PTSI Ground Mount Cab	PARADIGM TRAFFIC	Ground Mount Cabinet	1	EA	$23,100.00

PTSI-340 NEMA-TS-1	PARADIGM TRAFFIC	University Park Cabinet with 4 doors to include; controller, plug-ins, MMU2, BBU System	1	EA	$36,750.00
PTSI-340NEMA TS1	PARADIGM TRAFFIC	TS1 Cabinet Assy	1	EA	$24,150.00
PTSI-Duncanville P44 Cabinet Assembly	PARADIGM TRAFFIC	PTSI-Duncanville P44 Cabinet Assembly Double Door, No Controller, No Power Supply, No MMU, No Detectors, Only 2 BIU's	1	EA	$21,000.00
PTZ / CCTV CAMERA ASSEMBLY	PARADIGM TRAFFIC	PTZ / CCTV Camera	1	EA	$8,400.00
900 MHz to 5.8 GHz Radio	PARADIGM TRAFFIC	Radio	1	EA	$4,200.00
Radio Antenna	PARADIGM TRAFFIC	Radio Antenna	1	EA	$2,625.00
Radio Data Transciever	PARADIGM TRAFFIC	Radio Data Transciever	1	EA	$3,150.00
Radio Miscellaneous	PARADIGM TRAFFIC	Radio Miscellaneous	1	EA	$630.00
RRFB System	PARADIGM TRAFFIC	RRFB System	1	EA	$13,125.00
Screw in Anchor	PARADIGM TRAFFIC	Screw-In Anchor for Ped Poles	1	EA	$1,680.00
Signal Head, Complete, 3 Sec - No Hardware	PARADIGM TRAFFIC	3 Section Signal Head w/ Tunnel Visor, LED & Bkplt	1	EA	$750.75
Signal Head, Complete, 4 Sec - No Hardware	PARADIGM TRAFFIC	4 Section Signal Head w/ Tunnel Visor, LED & Bkplt	1	EA	$1,123.50
Signal Head, Complete, 5 Sec - No Hardware	PARADIGM TRAFFIC	5 Section Signal Head w/ Tunnel Visor, LED & Bkplt	1	EA	$1,543.50
Solar Panel - For SZF / RDSD FLSH BCN	PARADIGM TRAFFIC	Solar Panel	1	EA	$420.00
Solar Panel / Top of Pole Mount	PARADIGM TRAFFIC	Side of Pole Mount for Solar Panel	1	EA	$315.00
SYSTEM PROGRAMMER	PARADIGM TRAFFIC	System Programmer	1	EA	$5,250.00
TECH BUCKET	PARADIGM TRAFFIC	Certified Traffic Signal Technician with Bucket Truck	1	HR	$787.50
TECH CRTRLPROG	PARADIGM TRAFFIC	Traffic Signal Controllers programming and downloading	1	HR	$350.00
TECH FIELD SERVICES	PARADIGM TRAFFIC	Field Service Technician	1	HR	$315.00
TECH SYSTEM INTEGRATION	PARADIGM TRAFFIC	System Integration	1	HR	$315.00
TECH TMC TRAINING	PARADIGM TRAFFIC	Traffic Management Center Operator Training	1	HR	$315.00
TOWERCLIMB	PARADIGM TRAFFIC	Tower Climb with Equipment Installation	1	EA	$15,000.00
Traffic Controller	PARADIGM TRAFFIC	Traffic Controller	1	EA	$7,875.00
Video Monitor with Power Supply	PARADIGM TRAFFIC	Video Monitor with Power Supply	1	EA	$236.25
Side Fire Radar	PARADIGM TRAFFIC	Side Fire Radar	1	EA	$7,500.00
Traffic Detection System 1 Approach	PARADIGM TRAFFIC	Traffic Detection System 1 Approach	1	EA	$14,700.00
Traffic Detection System 2 Approach	PARADIGM TRAFFIC	Traffic Detection System 2 Approach	1	EA	$21,000.00
Traffic Detection System 3 Approach	PARADIGM TRAFFIC	Traffic Detection System 3 Approach	1	EA	$28,350.00
Traffic Detection System 4 Approach	PARADIGM TRAFFIC	Traffic Detection System 4 Approach	1	EA	$36,750.00
Traffic Detection System 5 Approach	PARADIGM TRAFFIC	Traffic Detection System 5 Approach	1	EA	$45,150.00
Traffic Detection System 6 Approach	PARADIGM TRAFFIC	Traffic Detection System 6 Approach	1	EA	$49,350.00

Traffic Detection System 7 Approach	PARADIGM TRAFFIC	Traffic Detection System 7 Approach	1	EA	$53,550.00
Traffic Detection System 8 Approach	PARADIGM TRAFFIC	Traffic Detection System 8 Approach	1	EA	$57,750.00
Traffic Detector	PARADIGM TRAFFIC	Traffic Detector	1	EA	$12,600.00
Traffic System Processor	PARADIGM TRAFFIC	Traffic System Processor	1	EA	$8,400.00
Advanced Traffic Management System	PARADIGM TRAFFIC	ATMS (25 Licenses)	1	EA	$105,000.00
Advanced Traffic Management System	PARADIGM TRAFFIC	ATMS (100 Licenses)	1	EA	$236,250.00
FTWSSFA	PARADIGM TRAFFIC	Ft Worth School Flasher- w/ clock, DFB, ped pole assy, screw-in anchor, and solar assembly	1	EA	$15,750.00
AI-500-020 Series	PARADIGM TRAFFIC	Street Light Monitoring Device	1	EA	$1,260.00
AI-500-030 Series	PARADIGM TRAFFIC	Low Power Monitoring - Includes C&S and 10 yr Connectivity	1	EA	$2,155.00
AI-500-050 Series	PARADIGM TRAFFIC	Remote Cellular Unit	1	EA	$950.00
AI-500-065	PARADIGM TRAFFIC	Vehicle Preemption Unit	1	EA	$7,000.00
AI-500-067	PARADIGM TRAFFIC	Test unit for VPU	1	EA	$380.00
AI-500-070 Series	PARADIGM TRAFFIC	AI-500-070 -Time Switch with Cell Modum	1	EA	$892.50
AI-500-085 Series	PARADIGM TRAFFIC	AI-500-085-02 - FMU, 4G Video, 4 port Ethernet Switch	1	EA	$2,467.50
AT-PT-07	PARADIGM TRAFFIC	Glance one time subscription, per device	1	EA	$593.25
AT-PT-08	PARADIGM TRAFFIC	Configuration charge, per device	1	EA	$49.35
School or RRFB Connectivity 5yr	PARADIGM TRAFFIC	School Beacon & RRFB Monitoring - 5yr plan	1	EA	$1,323.00
School or RRFB Connectivity 10yr	PARADIGM TRAFFIC	School Beacon & RRFB Monitoring - 10yr plan	1	EA	$1,953.00
FMU2 Connectivity without video passthrough 5yr	PARADIGM TRAFFIC	Preemption and Priority Systems Monitoring - 5yr plan	1	EA	$2,310.00
FMU2 Connectivity without video passthrough 10yr	PARADIGM TRAFFIC	Preemption and Priority Systems Monitoring - 10yr plan	1	EA	$3,570.00
FMU2 Connectivity with video passthrough 5yr	PARADIGM TRAFFIC	Preemption and Priority Systems Monitoring - 5yr plan	1	EA	$6,500.00
FMU2 Connectivity with video passthrough 10yr	PARADIGM TRAFFIC	Preemption and Priority Systems Monitoring - 10yr plan	1	EA	$9,000.00
Support Plan for devices w/ existing communitcations 5yr	PARADIGM TRAFFIC	School Beacon - 5yr plan (070)	1	EA	$661.50
Support Plan for devices w/ existing communitcations 10yr	PARADIGM TRAFFIC	School Beacon - 10yr plan (070)	1	EA	$974.40
Support Plan for devices w/ existing communitcations 5yr	PARADIGM TRAFFIC	Preemption and Priority Systems Monitoring - 5yr plan (085)	1	EA	$2,310.00
Support Plan for devices w/ existing communitcations 10yr	PARADIGM TRAFFIC	Preemption and Priority Systems Monitoring - 10yr plan (085)	1	EA	$3,559.50
ALICENSEAPP	PARADIGM TRAFFIC	FCC License Application per City License	1	EA	$3,860.00
AC or DC Panel	PARADIGM TRAFFIC	AC or DC Panel	1	EA	$414.75
High Water Detection Sys w/ RWIS	PARADIGM TRAFFIC	High Water Detection	1	EA	$47,250.00

Centracs Level 1 Server	PARADIGM TRAFFIC	Centracs Level 1 Server	1	EA	$15,000.00
Centracs Level 2 Server	PARADIGM TRAFFIC	Centracs Level 2 Server	1	EA	$30,000.00
Centracs SMA Basic	PARADIGM TRAFFIC	Centracs SMA Basic (25 License)	1	EA	$25,000.00
Centracs 25 Licenses	PARADIGM TRAFFIC	Centracs 25 Licenses	1	EA	$75,000.00
Centracs 50 Licenses	PARADIGM TRAFFIC	Centracs 50 Licenses	1	EA	$125,000.00
Centracs 100 Licenses	PARADIGM TRAFFIC	Centracs 100 Licenses	1	EA	$175,000.00
Centracs Advanced CCTV Module	PARADIGM TRAFFIC	CCTV Module - up to 50 cameras	1	EA	$60,000.00
Centracs BlueToad Module	PARADIGM TRAFFIC	Centracs BlueToad Module	1	EA	$33,000.00
Centracs C-2-C Module	PARADIGM TRAFFIC	Centracs C-2-C	1	EA	$60,500.00
Centracs Edaptive-10	PARADIGM TRAFFIC	10 License of Edaptive, Setup, Includes SPM 1yr	1	EA	$22,000.00
Centracs Edaptive-10-A	PARADIGM TRAFFIC	10 License Annual Service Fee	1	EA	$9,350.00
Centracs Edaptive-25	PARADIGM TRAFFIC	25 License of Edaptive, Setup, Includes SPM 1yr	1	EA	$42,350.00
Centracs Edaptive-25-A	PARADIGM TRAFFIC	25 License Annual Service Fee	1	EA	$23,100.00
Centracs Edaptive-50	PARADIGM TRAFFIC	50 License of Edaptive, Setup, Includes SPM 1yr	1	EA	$75,900.00
Centracs Edaptive-50-A	PARADIGM TRAFFIC	50 License Annual Service Fee	1	EA	$49,500.00
Centracs Edaptive-100	PARADIGM TRAFFIC	100 License of Edaptive, Setup, Includes SPM 1yr	1	EA	$143,000.00
Centracs Edaptive-100-A	PARADIGM TRAFFIC	100 License Annual Service Fee	1	EA	$90,200.00
Centracs Edaptive-200	PARADIGM TRAFFIC	200 License of Edaptive, Setup, Includes SPM 1yr	1	EA	$277,310.00
Centracs Edaptive-200-A	PARADIGM TRAFFIC	200 License Annual Service Fee	1	EA	$181,940.00
Centracs Local Edition 1 Module	PARADIGM TRAFFIC	Centracs L.E. 1 Module	1	EA	$5,500.00
Centracs MMS	PARADIGM TRAFFIC	Centracs MMS 100 or less intersections	1	EA	$60,500.00
Centracs MOE	PARADIGM TRAFFIC	Centracs MOE 1 Module	1	EA	$30,250.00
Centracs SPM-25	PARADIGM TRAFFIC	25 License of SPM, Service Setup, Intersection Setup 1yr.	1	EA	$31,900.00
Centracs SPM-25-A	PARADIGM TRAFFIC	25 License, Annual Service Fee	1	EA	$13,750.00
Centracs SPM-50	PARADIGM TRAFFIC	50 License of SPM, Service Setup, Intersection Setup 1yr.	1	EA	$55,000.00
Centracs SPM-50-A	PARADIGM TRAFFIC	50 License, Annual Service Fee	1	EA	$26,400.00
Centracs SPM-100	PARADIGM TRAFFIC	100 License of SPM, Service Setup, Intersection Setup 1yr.	1	EA	$101,200.00
Centracs SPM-100-A	PARADIGM TRAFFIC	100 License, Annual Service Fee	1	EA	$57,200.00
Centracs SPM-200	PARADIGM TRAFFIC	200 License of SPM, Service Setup, Intersection Setup 1yr.	1	EA	$192,500.00
Centracs SPM-200-A	PARADIGM TRAFFIC	200 License, Annual Service Fee	1	EA	$105,600.00
Centracs Mobility Essentials - 25	PARADIGM TRAFFIC	25 License of Essentials	1	EA	$8,000.00
Centracs Mobility Essentials - 50	PARADIGM TRAFFIC	50 License of Essentials	1	EA	$16,000.00
Centracs Mobility Essentials - 100	PARADIGM TRAFFIC	100 License of Essentials	1	EA	$32,000.00
Centracs Mobility Standard - 25	PARADIGM TRAFFIC	25 License of Standard	1	EA	$15,000.00
Centracs Mobility Standard - 50	PARADIGM TRAFFIC	50 License of Standard	1	EA	$30,000.00
Centracs Mobility Standard - 100	PARADIGM TRAFFIC	100 License of Standard	1	EA	$60,000.00
Centracs Add On	PARADIGM TRAFFIC	Centracs Add On	1	EA	$100,000.00
Centracs Mobility Timing	PARADIGM TRAFFIC	Centracs Mobility Timing - 25 Intersections	1	EA	$10,000.00

Centracs Mobility Edaptive	PARADIGM TRAFFIC	Centracs Mobility Edaptive - 25 Intersections	1	EA	$10,000.00
A700-1166-01 AVCM	PARADIGM TRAFFIC	Vision Comm Manager	1	EA	$4,567.50
A700-1172	PARADIGM TRAFFIC	AVISION Video Sensor	1	EA	$7,323.75
PELCO COMPONENT LEVEL 1	PARADIGM TRAFFIC	Micellaneous Hardware Component - Unspecified	1	EA	$183.75
PELCO COMPONENT LEVEL 2	PARADIGM TRAFFIC	Micellaneous Hardware Component - Unspecified	1	EA	$315.00
PELCO COMPONENT LEVEL 3	PARADIGM TRAFFIC	Micellaneous Hardware Component - Unspecified	1	EA	$630.00
PELCO COMPONENT LEVEL 4	PARADIGM TRAFFIC	Micellaneous Hardware Component - Unspecified	1	EA	$1,575.00
PELCO COMPONENT LEVEL 5	PARADIGM TRAFFIC	Micellaneous Hardware Component - Unspecified	1	EA	$3,150.00
Traffic Signal LED	PARADIGM TRAFFIC	8" LED	1	EA	$70.00
Traffic Signal LED	PARADIGM TRAFFIC	12" LED	1	EA	$85.00
LED - PEDESTRIAN COUNTDOWN	PARADIGM TRAFFIC	16"X18" LED Ped Incand Look man/hand	1	EA	$157.50
ILSN	PARADIGM TRAFFIC	INTERNAL ILLUMUNATED STREET NAME SIGN	1	EA	$3,700.00
STREETLIGHT LED	PARADIGM TRAFFIC	LED Cobrahead Roadway Lighting	1	EA	$800.00

APPENDIX A.2
Service Area Designation Forms

RFP 2023-092	**Texas Service Area Designation or Identification**		
Proposer Name:	**Paradigm Traffic Systems, Inc.**		
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	
	X		
	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:	Paradigm Traffic Systems, Inc.		
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	
		X	
	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		X
44.	Utah		
45.	Vermont		
46.	Virginia		
47.	Washington		
48.	West Virginia		

49.	Wisconsin		
50.	Wyoming		

APPENDIX B
DEBARMENT CERTIFICATION

I, Ryan Zenzen
(Name of certifying official)

being duly sworn or under penalty of perjury under the laws of the United States, certifies that neither

Paradigm Traffic Systems, Inc.,
(Name of lower tier participant)

nor its principals are presently:

- debarred, suspended, proposed for debarment,
- declared ineligible,
- or voluntarily excluded from participation in this transaction by any federal department or agency

Where the above identified lower tier participant is unable to certify any of the above statements in this certification, such prospective participant shall indicate below to whom the exception applies, the initiating agency, and dates of action.

Exceptions will not necessarily result in denial of award but will be considered in determining contractor responsibility. Providing false information may result in criminal prosecution or administrative sanctions.

EXCEPTIONS:

Ryan Zenzen
Signature of Certifying Official

President
Title

1-31-2024
Date of Certification

Form 1734
Rev.10-91
TPFS

APPENDIX C
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 and belief, that:

(1) No federal appropriated funds have been paid or will be paid by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with 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.

(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, or cooperative agreement, the undersigned shall complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, US Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Ryan Zenzen

Signature

President

Title

Paradigm Traffic Systems, Inc.

Agency

1-31-2024

Date

APPENDIX D
ATTESTATION OF CONTRACTS NULLIFYING ACTIVITY

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 r 2 Section 889.

SIGNATURE OF AUTHORIZED PERSON: Ryan Zenzen

NAME OF AUTHORIZED PERSON: Ryan Zenzen

NAME OF COMPANY: Paradigm Traffic Systems, Inc.

DATE: 1-31-2024

-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: Ryan Zenzen

NAME OF AUTHORIZED PERSON: Ryan Zenzen

NAME OF COMPANY: Paradigm Traffic Systems, Inc.

DATE: 1-31-2024

Continued on Next Page

-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: Ryan Zenzen

NAME OF AUTHORIZED PERSON: Ryan Zenzen

NAME OF COMPANY: Paradigm Traffic Systems, Inc.

DATE: 1-31-2024

-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: _____

Exhibit 1
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	

Exhibit 1
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	

Exhibit 1
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). te: This requirement also appears under User Need ID 2.5.2.1.12 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 2.5.2.1.12 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	Not required with initial software delivery. See procurement document for details
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 device detectors (between 1 and 255).
		3.5.4.2.3.1.9	Determine Maximum Number of Connected Device Detectors Node Points Supported	M	Yes	The ASC shall support 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 2

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.

Paradigm Traffic System's Exceptions to Appendix A -Statement of Work

NCTCOG NTCIP 1202 PRL – Objects not supported in Econolite EOS - Evaluated against EOS version 03.02.24

***NOTE* The majority of exceptions of requirement are only missed in lacking support for the NTCIP 1202 MIB Object. The functionality is already in our software and is covered by a proprietary MIB Object.**

Functional Requirements not yet compliant with 1202v03B:

2.5.1.2 – Manage Communications

- 3.5.1.2.1.1 Does Not Meet
- 3.5.1.2.1.2 Does Not Meet
- 3.5.1.2.1.3 Does Not Meet
- 3.5.1.2.1.4 Does Not Meet
- 3.5.1.2.1.5 Does Not Meet
- 3.5.1.2.2.1 Does Not Meet
- 3.5.1.2.3.4 Does Not Meet
- 3.5.1.2.3.5 Does Not Meet
- 3.5.1.2.3.6 Does Not Meet
- 3.5.1.2.4.1 Does Not Meet
- 3.5.1.2.4.2 Does Not Meet

2.5.1.3 – Manage Cabinet Environment

- 3.5.1.3.1 Does Not Meet
- 3.5.1.3.2 Does Not Meet
- 3.5.1.3.3 Does Not Meet
- 3.5.1.3.4 Does Not Meet
- 3.5.1.3.5 Does Not Meet
- 3.5.1.3.6 Does Not Meet
- 3.5.1.3.7 Does Not Meet
- 3.5.1.3.8 Does Not Meet
- 3.5.1.3.9 Does Not Meet

2.5.1.4 – Monitor Power

- 3.5.1.4.1 Does Not Meet
- 3.5.1.4.2 Does Not Meet
- 3.5.1.4.3 Does Not Meet
- 3.5.1.4.4 Does Not Meet
- 3.5.1.4.5 Does Not Meet

2.5.1.5 – Retrieve Operational Performance Data

- 3.5.1.5.1.1 Does Not Meet
- 3.5.1.5.1.2 Does Not Meet
- 3.5.1.5.1.3 Does Not Meet
- 3.5.1.5.1.4 Does Not Meet
- 3.5.1.5.2.1 Does Not Meet
- 3.5.1.5.2.2 Does Not Meet
- 3.5.1.5.3.1 Does Not Meet
- 3.5.1.5.3.2 Does Not Meet
- 3.5.1.5.3.3 Does Not Meet
- 3.5.1.5.3.4 Does Not Meet
- 3.5.1.5.4.1 Does Not Meet
- 3.5.1.5.4.2 Does Not Meet
- 3.5.1.5.4.3 Does Not Meet
- 3.5.1.5.4.4 Does Not Meet
- 3.5.1.5.4.5 Does Not Meet

2.6.4 – Log User Access

- 3.5.1.6.1 Does Not Meet
- 3.5.1.6.2 Does Not Meet
- 3.5.1.6.3 Does Not Meet
- 3.5.1.6.4 Does Not Meet

2.5.2.1.1 – Manage Controller Startup Functions

- 3.5.2.1.1.1.1 Does Not Meet
- 3.5.2.1.1.2 Does Not Meet
- 3.5.2.1.1.3 Does Not Meet
- 3.5.2.1.1.4 Does Not Meet
- 3.5.2.1.1.5 Does Not Meet

2.5.2.1.1.1 – Manage Action Scheduler

- 3.5.2.1.10.1.2 Does Not Meet

2.5.2.1.1.2 – Manage I/O Mapping

- 3.5.2.1.11.1.1 Does Not Meet
- 3.5.2.1.11.1.2.1 Does Not Meet
- 3.5.2.1.11.1.2.2.1 Does Not Meet
- 3.5.2.1.11.1.2.2.2 Does Not Meet
- 3.5.2.1.11.1.2.2.3 Does Not Meet
- 3.5.2.1.11.1.2.3.1 Does Not Meet

- 3.5.2.1.11.1.2.3.2 Does Not Meet
- 3.5.2.1.11.1.2.3.3 Does Not Meet
- 3.5.2.1.11.2.1 Does Not Meet
- 3.5.2.1.11.2.2 Does Not Meet
- 3.5.2.1.11.2.3 Does Not Meet
- 3.5.2.1.11.2.4 Does Not Meet
- 3.5.2.1.11.2.5 Does Not Meet
- 3.5.2.1.11.2.6 Does Not Meet
- 3.5.2.1.11.2.7 Does Not Meet
- 3.5.2.1.11.2.8 Does Not Meet
- 3.5.2.1.11.2.9.1 Does Not Meet
- 3.5.2.1.11.2.9.10 Does Not Meet
- 3.5.2.1.11.2.9.2 Does Not Meet
- 3.5.2.1.11.2.9.3 Does Not Meet
- 3.5.2.1.11.2.9.4 Does Not Meet
- 3.5.2.1.11.2.9.5 Does Not Meet
- 3.5.2.1.11.2.9.6 Does Not Meet
- 3.5.2.1.11.2.9.7 Does Not Meet
- 3.5.2.1.11.2.9.8 Does Not Meet
- 3.5.2.1.11.2.9.9 Does Not Meet

2.5.2.1.1.3 – Manage Intra-Cabinet Communications Configuration

- 3.5.2.1.12.1 Does Not Meet

2.5.2.1.1.4 – Manage ADA Support

- 3.5.2.1.13.1.1 Does Not Meet
- 3.5.2.1.13.1.3 Does Not Meet

2.4.3 – Provide Block Data

- 3.5.2.1.14.1.1.11 Does Not Meet
- 3.5.2.1.14.1.1.12 Does Not Meet
- 3.5.2.1.14.1.1.13 Does Not Meet
- 3.5.2.1.14.1.1.14 Does Not Meet
- 3.5.2.1.14.1.1.15 Does Not Meet
- 3.5.2.1.14.1.1.16 Does Not Meet
- 3.5.2.1.14.1.1.17 Does Not Meet
- 3.5.2.1.14.1.1.18 Does Not Meet
- 3.5.2.1.14.1.1.19 Does Not Meet
- 3.5.2.1.14.1.1.20 Does Not Meet
- 3.5.2.1.14.1.1.21 Does Not Meet
- 3.5.2.1.14.1.1.22 Does Not Meet

- 3.5.2.1.14.1.1.23 Does Not Meet
- 3.5.2.1.14.1.1.24 Does Not Meet
- 3.5.2.1.14.1.1.25 Does Not Meet
- 3.5.2.1.14.1.1.27 Does Not Meet
- 3.5.2.1.14.1.1.28 Does Not Meet
- 3.5.2.1.14.1.1.29 Does Not Meet
- 3.5.2.1.14.1.1.31 Does Not Meet
- 3.5.2.1.14.1.1.32 Does Not Meet
- 3.5.2.1.14.1.1.33 Does Not Meet
- 3.5.2.1.14.1.1.34 Does Not Meet
- 3.5.2.1.14.1.1.35 Does Not Meet
- 3.5.2.1.14.1.1.36 Does Not Meet
- 3.5.2.1.14.1.1.37 Does Not Meet
- 3.5.2.1.14.1.1.38 Does Not Meet
- 3.5.2.1.14.1.1.39 Does Not Meet
- 3.5.2.1.14.1.1.4 Does Not Meet
- 3.5.2.1.14.1.1.40 Does Not Meet
- 3.5.2.1.14.1.1.41 Does Not Meet
- 3.5.2.1.14.1.1.42 Does Not Meet
- 3.5.2.1.14.1.1.44 Does Not Meet
- 3.5.2.1.14.1.1.46 Does Not Meet
- 3.5.2.1.14.1.1.48 Does Not Meet
- 3.5.2.1.14.1.1.49 Does Not Meet
- 3.5.2.1.14.1.1.5 Does Not Meet
- 3.5.2.1.14.1.1.50 Does Not Meet
- 3.5.2.1.14.1.1.53 Does Not Meet
- 3.5.2.1.14.1.1.6 Does Not Meet
- 3.5.2.1.14.1.1.8 Does Not Meet
- 3.5.2.1.14.1.1.9 Does Not Meet
- 3.5.2.1.14.2.3.3 Does Not Meet
- 3.5.2.1.14.2.3.4 Does Not Meet

2.5.2.1.2 – Manage Phase Configurations

- 3.5.2.1.2.1.36 Does Not Meet
- 3.5.2.1.2.1.37 Does Not Meet
- 3.5.2.1.2.1.40 Does Not Meet
- 3.5.2.1.2.1.41 Does Not Meet
- 3.5.2.1.2.1.44 Does Not Meet
- 3.5.2.1.2.1.45 Does Not Meet
- 3.5.2.1.2.1.46 Does Not Meet
- 3.5.2.1.2.1.47 Does Not Meet
- 3.5.2.1.2.1.48 Does Not Meet
- 3.5.2.1.2.1.49 Does Not Meet

- 3.5.2.1.2.1.5 Does Not Meet
- 3.5.2.1.2.1.50 Does Not Meet
- 3.5.2.1.2.1.51 Does Not Meet
- 3.5.2.1.2.1.52 Does Not Meet
- 3.5.2.1.2.1.57 Does Not Meet
- 3.5.2.1.2.1.65 Does Not Meet
- 3.5.2.1.2.1.71 Does Not Meet
- 3.5.2.1.2.1.79 Does Not Meet
- 3.5.2.1.2.1.81 Does Not Meet
- 3.5.2.1.2.1.83 Does Not Meet
- 3.5.2.1.2.1.85 Does Not Meet
- 3.5.2.1.2.1.86 Does Not Meet
- 3.5.2.1.2.1.87 Does Not Meet
- 3.5.2.1.2.1.88 Does Not Meet
- 3.5.2.1.2.1.89 Does Not Meet

2.5.2.1.3 – Manage Coordination Configurations

- 3.5.2.1.3.10.4 Does Not Meet
- 3.5.2.1.3.2.4 Does Not Meet
- 3.5.2.1.3.3.4 Does Not Meet
- 3.5.2.1.3.5.1 Does Not Meet
- 3.5.2.1.3.5.2 Does Not Meet
- 3.5.2.1.3.5.3 Does Not Meet
- 3.5.2.1.3.5.4 Does Not Meet
- 3.5.2.1.3.5.5 Does Not Meet
- 3.5.2.1.3.5.6 Does Not Meet
- 3.5.2.1.3.6.1 Does Not Meet
- 3.5.2.1.3.6.2 Does Not Meet
- 3.5.2.1.3.6.3 Does Not Meet
- 3.5.2.1.3.6.4 Does Not Meet
- 3.5.2.1.3.6.5 Does Not Meet
- 3.5.2.1.3.6.6 Does Not Meet
- 3.5.2.1.3.7 Does Not Meet
- 3.5.2.1.3.8 Does Not Meet
- 3.5.2.1.3.9 Does Not Meet

2.5.2.1.4 – Manage Timing Patterns

- 3.5.2.1.4.1.3 Does Not Meet
- 3.5.2.1.4.1.4 Does Not Meet
- 3.5.2.1.4.1.5 Does Not Meet

2.5.2.1.5 – Manage Split Configurations

- 3.5.2.1.5.1.2.9 Does Not Meet

2.5.2.1.7 – Manage Channel Configurations

- 3.5.2.1.7.1.1 Does Not Meet
- 3.5.2.1.7.1.2.4 Does Not Meet
- 3.5.2.1.7.1.2.9 Does Not Meet
- 3.5.2.1.7.1.3.1 Does Not Meet
- 3.5.2.1.7.1.3.2 Does Not Meet
- 3.5.2.1.7.1.3.3 Does Not Meet
- 3.5.2.1.8.1.1.1 Does Not Meet

2.5.2.1.8 – Manage Overlap Configurations

- 3.5.2.1.8.1.4 Does Not Meet
- 3.5.2.1.8.1.8 Does Not Meet
- 3.5.2.1.8.1.9 Does Not Meet

2.5.2.1.9 – Manage Preempt Configurations

- 3.5.2.1.9.1.1 Does Not Meet
- 3.5.2.1.9.1.14 Does Not Meet
- 3.5.2.1.9.1.16.1 Does Not Meet
- 3.5.2.1.9.1.16.2 Does Not Meet
- 3.5.2.1.9.1.16.3 Does Not Meet
- 3.5.2.1.9.1.16.4 Does Not Meet
- 3.5.2.1.9.1.17 Does Not Meet
- 3.5.2.1.9.1.18 Does Not Meet
- 3.5.2.1.9.1.20 Does Not Meet
- 3.5.2.1.9.1.26 Does Not Meet
- 3.5.2.1.9.1.27.2 Does Not Meet
- 3.5.2.1.9.1.31 Does Not Meet
- 3.5.2.1.9.1.9 Does Not Meet

2.5.2.2.1 – Determine Controller Health

- 3.5.2.2.1.1.26 Does Not Meet
- 3.5.2.2.1.1.27 Does Not Meet
- 3.5.2.2.1.1.28 Does Not Meet
- 3.5.2.2.1.1.29 Does Not Meet
- 3.5.2.2.1.1.30 Does Not Meet
- 3.5.2.2.1.1.31 Does Not Meet
- 3.5.2.2.1.1.32 Does Not Meet

- 3.5.2.2.1.1.33 Does Not Meet
- 3.5.2.2.1.1.34 Does Not Meet
- 3.5.2.2.1.1.35 Does Not Meet
- 3.5.2.2.1.1.36 Does Not Meet
- 3.5.2.2.1.1.37 Does Not Meet
- 3.5.2.2.1.1.38 Does Not Meet
- 3.5.2.2.1.2 Does Not Meet

2.5.2.2.12 – Monitor Intra-Cabinet Communications Configuration

- 3.5.2.2.11.1 Does Not Meet
- 3.5.2.2.11.3 Does Not Meet

2.5.2.2.2.4 -Monitor Current Cycle

- 3.5.2.2.2.10.4 Does Not Meet

2.5.2.2.8 – Monitor Preempt Input State

- 3.5.2.2.8.1 Does Not Meet
- 3.5.2.2.8.2 Does Not Meet

2.5.2.2.9 – Monitor Preempt State

- 3.5.2.2.8.4 Does Not Meet

2.5.2.3.1 – Control ASC-wide General Operations

- 3.5.2.3.1.7 Does Not Meet

2.5.2.3.5 – Control Ring Operations

- 3.5.2.3.5.4 Does Not Meet

2.5.2.3.8 – Active Action Plan

- 3.5.2.3.8 Does Not Meet

2.5.2.3.9 – Remote Manual Controller

- 3.5.2.3.9.1 Does Not Meet
- 3.5.2.3.9.2 Does Not Meet
- 3.5.2.3.9.3 Does Not Meet

2.5.3.1 – Manage Detector Configuration

- 3.5.3.1.1.1.21 Does Not Meet
- 3.5.3.1.1.1.22 Does Not Meet
- 3.5.3.1.1.1.23 Does Not Meet
- 3.5.3.1.1.1.24 Does Not Meet
- 3.5.3.1.1.1.25 Does Not Meet
- 3.5.3.1.1.1.3 Does Not Meet
- 3.5.3.1.1.1.4 Does Not Meet
- 3.5.3.1.1.1.5 Does Not Meet
- 3.5.3.1.1.2.5 Does Not Meet
- 3.5.3.1.1.2.6 Does Not Meet
- 3.5.3.1.1.2.7 Does Not Meet

2.5.3.2 – Monitor Detector Status

- 3.5.3.2.2.1 Does Not Meet
- 3.5.3.2.2.2 Does Not Meet
- 3.5.3.2.2.3 Does Not Meet

2.5.3.4 – Control Detectors

- 3.5.3.4.2 Does Not Meet
- 3.5.3.4.3 Does Not Meet
- 3.5.3.4.4 Does Not Meet
- 3.5.3.5.1.1.2 Does Not Meet

2.5.3.5 – Manage Detector Data

- 3.5.3.5.2.1.7 Does Not Meet
- 3.5.3.5.2.1.8 Does Not Meet
- 3.5.3.6.1.1 Does Not Meet
- 3.5.3.6.2.1 Does Not Meet
- 3.5.3.6.2.2 Does Not Meet
- 3.5.3.6.2.3 Does Not Meet
- 3.5.3.6.2.4 Does Not Meet
- 3.5.3.6.2.5 Does Not Meet
- 3.5.3.6.2.6 Does Not Meet
- 3.5.3.6.2.7 Does Not Meet
- 3.5.3.6.2.8 Does Not Meet

2.5.4.1.1 -Manage RSU Interface

- 3.5.4.1.1.1 Does Not Meet
- 3.5.4.1.1.2 Does Not Meet
- 3.5.4.1.1.3 Does Not Meet

2.5.4.1.2 – Manage RSU Interface Watchdog

- 3.5.4.1.2.1 Does Not Meet
- 3.5.4.1.2.2 Does Not Meet

2.5.4.1.3 – Manage Signal Phase & Timing Data

- 3.5.4.1.3.1 Does Not Meet
- 3.5.4.1.3.10 Does Not Meet
- 3.5.4.1.3.7.1 Does Not Meet

2.5.4.1.4 – Exchange Connected Devices Data for Operational Performance Data

- 3.5.4.3.3.1.1 Does Not Meet

2.5.5.1 – Backward Capability with NTCIP 1202 v01

- 3.5.5.1 Does Not Meet

2.5.1.1 Retrieve Device Identity

- H.1.1.2.2 Does Not Meet

2.5.2.1.10 – Manage Timing Pattern Scheduler

- H.1.1.5.2 Does Not Meet
- H.1.1.5.3 Does Not Meet
- H.1.1.5.3.1 Does Not Meet
- H.1.1.7.1 Does Not Meet

2.5.1.6 – Manage Auxiliary External Inputs/Outputs

- H.1.1.6.1 Does Not Meet
- H.1.1.6.2 Does Not Meet
- H.1.1.6.3 Does Not Meet
- H.1.2.1 Does Not Meet
- H.1.4.1 Does Not Meet

2.6.4 – Log User Access

- H.1.3.1.1 Does Not Meet
- H.1.3.1.10 Does Not Meet

2.4.4 – Provide for Long Data Local Storage & Retrieval

- H.1.3.1.11 Does Not Meet
- H.1.3.1.12 Does Not Meet
- H.1.3.1.13 Does Not Meet
- H.1.3.1.14 Does Not Meet
- H.1.3.1.15 Does Not Meet
- H.1.3.1.2 Does Not Meet
- H.1.3.1.3 Does Not Meet
- H.1.3.1.4 Does Not Meet
- H.1.3.1.5 Does Not Meet
- H.1.3.1.6 Does Not Meet
- H.1.3.1.7 Does Not Meet
- H.1.3.1.8 Does Not Meet
- H.1.3.1.9 Does Not Meet

2.4.5 – Provide for Database Management

- H.1.4.2.2 Does Not Meet