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THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION



Victoria F. Sheehan
Commissioner

William Cass, P.E.
Assistant Commissioner

His Excellency, Governor Christopher T. Sununu
 and the Honorable Council
 State House
 Concord, New Hampshire 03301

Bureau of TSMO
 April 25, 2018

REQUESTED ACTION

Authorize the Department of Transportation to enter into contract with Tilson Technology Management, Inc. (Vendor #265209), Portland, ME, in the amount of \$253,130.00 for the purpose of providing Statewide Intelligent Transportation System (ITS) repairs, from the date of Governor and Council approval through June 30, 2020. By mutual agreement and future Governor and Council approval there is an option for a two-year extension, at the current bid rates, and would be subject to continued appropriation of funds. 44% Highway Funds, 31% Intra-Agency Transfer, 23% Federal Funds and .2% Agency Income.

Funding is available as follows for FY 2018 & FY 2019 and is contingent upon the availability and continued appropriation of funds for FY 2020, with the ability to adjust encumbrances through the Budget Office between State Fiscal Years if needed and justified.

	<u>FY2018</u>	<u>FY2019</u>	<u>FY2020</u>
04-96-96-960515-3052 Trans Sys Mgmt & Operations 024-500225 Contract Repairs; Machine-Equip	\$7,741.25	\$85,153.75	\$92,895.00
04-96-96-960515-3009 Traffic Operations Bureau 024-500225 Contract Repairs; Machine-Equip		\$7,125.00	\$7,125.00
04-96-96-964010-2050 State Bus Services & Facilities 024-500225 Contract Repairs; Machine-Equip	\$26,545.00	\$26,545.00	

EXPLANATION

The Department of Transportation operates a Statewide ITS program used to gather and disseminate information about road and weather conditions to the public and other State agencies. This statewide ITS system is operated and managed from the Bureau of Transportation Systems Management and Operations (TSMO), Transportation Management Center located within the Incident Planning and Operations Center (IPOC) in Concord.

A variety of ITS field devices ranging from closed circuit television (CCTV), roadway weather information system (RWIS) stations, dynamic message signs (DMS), and variable speed limit signs (VSL), underground fiber optics, as well as the microwave radio system used to communicate with the field devices is used to gather and disseminate information about current travel conditions.

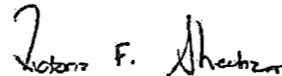
All the field devices have been in continuous duty service for varying amounts of time and were originally placed into service through various road construction projects. All devices are originally covered by limited time maintenance and warranty agreements for repair services, but those service agreements expire after a period of time. This contract is established to provide repairs to all non-warranty devices, and associated communications systems as needed, at contract prices bid.

A bid invitation was advertised in the Manchester Union Leader on March 28, 2018 and the newspaper advertisement was mailed to four service providers that had expressed interest to the Department for these contracted services. Tilson Technology Management, Inc. of Portland, ME and Green Mountain Communications Inc., of Pembroke, NH responded to the request for bids. The successful bid was received from Tilson Technology Management, Inc., and was lower than estimated by \$23,350/year. Attached is a copy of the bid tabulation. The Department is satisfied that the bid prices are reasonable and that Tilson Technology Management, Inc. is capable of performing the required work.

This contract has been approved by the Attorney General as to form and execution and the Department has verified that the necessary funds are available. Copies of the fully executed contract are on file at the Secretary of State office and the Department of Administrative Services office, and subsequent to Governor and Council approval will be on file at the Department of Transportation.

Your approval of this contract is respectfully requested.

Sincerely,



Victoria F. Sheehan
Commissioner

Attachments

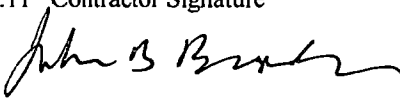
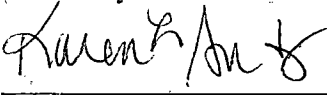
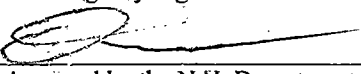
Notice: This agreement and all of its attachments shall become public upon submission to Governor and Executive Council for approval. Any information that is private, confidential or proprietary must be clearly identified to the agency and agreed to in writing prior to signing the contract.

AGREEMENT

The State of New Hampshire and the Contractor hereby mutually agree as follows:

GENERAL PROVISIONS

1. IDENTIFICATION.

1.1 State Agency Name New Hampshire, Department of Transportation		1.2 State Agency Address Seven Hazen Drive, PO Box 483, Concord NH 03301-0483	
1.3 Contractor Name Tilson Technology Management, Inc.		1.4 Contractor Address 16 Middle Street, 4 th Floor, Portland ME, 04101	
1.5 Contractor Phone Number (207) 591-6427	1.6 Account Number 04-96-96-960515-3052 04-96-96-960515-3009 04-96-96-964010-2050	1.7 Completion Date June 30, 2020	1.8 Price Limitation \$253,130.00
1.9 Contracting Officer for State Agency David M. Rodrigue, PE, Director of Operations		1.10 State Agency Telephone Number 603-271-6862	
1.11 Contractor Signature 		1.12 Name and Title of Contractor Signatory Joshua B. Broder, CEO	
1.13 Acknowledgement: State of <u>Maine</u> , County of <u>Cumberland</u> On <u>4/18/18</u> , before the undersigned officer, personally appeared the person identified in block 1.12, or satisfactorily proven to be the person whose name is signed in block 1.11, and acknowledged that s/he executed this document in the capacity indicated in block 1.12.			
1.13.1 Signature of Notary Public or Justice of the Peace  [Seal]		Karen L. Simonds Notary Public Commission Expires May 13, 2018	
1.13.2 Name and Title of Notary or Justice of the Peace			
1.14 State Agency Signature  Date: <u>5/8/18</u>		1.15 Name and Title of State Agency Signatory David Rodrigue Director of Operations	
1.16 Approval by the N.H. Department of Administration, Division of Personnel (if applicable) By: _____ Director, On: _____			
1.17 Approval by the Attorney General (Form, Substance and Execution) (if applicable) By: <u>Allen B. Greenstein</u> On: <u>5/15/18</u>			
1.18 Approval by the Governor and Executive Council (if applicable) By: _____ On: _____			

2. EMPLOYMENT OF CONTRACTOR/SERVICES TO BE PERFORMED. The State of New Hampshire, acting through the agency identified in block 1.1 ("State"), engages contractor identified in block 1.3 ("Contractor") to perform, and the Contractor shall perform, the work or sale of goods, or both, identified and more particularly described in the attached EXHIBIT A which is incorporated herein by reference ("Services").

3. EFFECTIVE DATE/COMPLETION OF SERVICES.

3.1 Notwithstanding any provision of this Agreement to the contrary, and subject to the approval of the Governor and Executive Council of the State of New Hampshire, if applicable, this Agreement, and all obligations of the parties hereunder, shall become effective on the date the Governor and Executive Council approve this Agreement as indicated in block 1.18, unless no such approval is required, in which case the Agreement shall become effective on the date the Agreement is signed by the State Agency as shown in block 1.14 ("Effective Date").

3.2 If the Contractor commences the Services prior to the Effective Date, all Services performed by the Contractor prior to the Effective Date shall be performed at the sole risk of the Contractor, and in the event that this Agreement does not become effective, the State shall have no liability to the Contractor, including without limitation, any obligation to pay the Contractor for any costs incurred or Services performed. Contractor must complete all Services by the Completion Date specified in block 1.7.

4. CONDITIONAL NATURE OF AGREEMENT.

Notwithstanding any provision of this Agreement to the contrary, all obligations of the State hereunder, including, without limitation, the continuance of payments hereunder, are contingent upon the availability and continued appropriation of funds, and in no event shall the State be liable for any payments hereunder in excess of such available appropriated funds. In the event of a reduction or termination of appropriated funds, the State shall have the right to withhold payment until such funds become available, if ever, and shall have the right to terminate this Agreement immediately upon giving the Contractor notice of such termination. The State shall not be required to transfer funds from any other account to the Account identified in block 1.6 in the event funds in that Account are reduced or unavailable.

5. CONTRACT PRICE/PRICE LIMITATION/PAYMENT.

5.1 The contract price, method of payment, and terms of payment are identified and more particularly described in EXHIBIT B which is incorporated herein by reference.

5.2 The payment by the State of the contract price shall be the only and the complete reimbursement to the Contractor for all expenses, of whatever nature incurred by the Contractor in the performance hereof, and shall be the only and the complete compensation to the Contractor for the Services. The State shall have no liability to the Contractor other than the contract price.

5.3 The State reserves the right to offset from any amounts otherwise payable to the Contractor under this Agreement those liquidated amounts required or permitted by N.H. RSA 80:7 through RSA 80:7-c or any other provision of law.

5.4 Notwithstanding any provision in this Agreement to the contrary, and notwithstanding unexpected circumstances, in no event shall the total of all payments authorized, or actually made hereunder, exceed the Price Limitation set forth in block 1.8.

6. COMPLIANCE BY CONTRACTOR WITH LAWS AND REGULATIONS/ EQUAL EMPLOYMENT OPPORTUNITY.

6.1 In connection with the performance of the Services, the Contractor shall comply with all statutes, laws, regulations, and orders of federal, state, county or municipal authorities which impose any obligation or duty upon the Contractor, including, but not limited to, civil rights and equal opportunity laws. This may include the requirement to utilize auxiliary aids and services to ensure that persons with communication disabilities, including vision, hearing and speech, can communicate with, receive information from, and convey information to the Contractor. In addition, the Contractor shall comply with all applicable copyright laws.

6.2 During the term of this Agreement, the Contractor shall not discriminate against employees or applicants for employment because of race, color, religion, creed, age, sex, handicap, sexual orientation, or national origin and will take affirmative action to prevent such discrimination.

6.3 If this Agreement is funded in any part by monies of the United States, the Contractor shall comply with all the provisions of Executive Order No. 11246 ("Equal Employment Opportunity"), as supplemented by the regulations of the United States Department of Labor (41 C.F.R. Part 60), and with any rules, regulations and guidelines as the State of New Hampshire or the United States issue to implement these regulations. The Contractor further agrees to permit the State or United States access to any of the Contractor's books, records and accounts for the purpose of ascertaining compliance with all rules, regulations and orders, and the covenants, terms and conditions of this Agreement.

7. PERSONNEL.

7.1 The Contractor shall at its own expense provide all personnel necessary to perform the Services. The Contractor warrants that all personnel engaged in the Services shall be qualified to perform the Services, and shall be properly licensed and otherwise authorized to do so under all applicable laws.

7.2 Unless otherwise authorized in writing, during the term of this Agreement, and for a period of six (6) months after the Completion Date in block 1.7, the Contractor shall not hire, and shall not permit any subcontractor or other person, firm or corporation with whom it is engaged in a combined effort to perform the Services to hire, any person who is a State employee or official, who is materially involved in the procurement, administration or performance of this

Agreement. This provision shall survive termination of this Agreement.

7.3 The Contracting Officer specified in block 1.9, or his or her successor, shall be the State's representative. In the event of any dispute concerning the interpretation of this Agreement, the Contracting Officer's decision shall be final for the State.

8. EVENT OF DEFAULT/REMEDIES.

8.1 Any one or more of the following acts or omissions of the Contractor shall constitute an event of default hereunder ("Event of Default"):

8.1.1 failure to perform the Services satisfactorily or on schedule;

8.1.2 failure to submit any report required hereunder; and/or

8.1.3 failure to perform any other covenant, term or condition of this Agreement.

8.2 Upon the occurrence of any Event of Default, the State may take any one, or more, or all, of the following actions:

8.2.1 give the Contractor a written notice specifying the Event of Default and requiring it to be remedied within, in the absence of a greater or lesser specification of time, thirty (30) days from the date of the notice; and if the Event of Default is not timely remedied, terminate this Agreement, effective two (2) days after giving the Contractor notice of termination;

8.2.2 give the Contractor a written notice specifying the Event of Default and suspending all payments to be made under this Agreement and ordering that the portion of the contract price which would otherwise accrue to the Contractor during the period from the date of such notice until such time as the State determines that the Contractor has cured the Event of Default shall never be paid to the Contractor;

8.2.3 set off against any other obligations the State may owe to the Contractor any damages the State suffers by reason of any Event of Default; and/or

8.2.4 treat the Agreement as breached and pursue any of its remedies at law or in equity, or both.

9. DATA/ACCESS/CONFIDENTIALITY/PRESERVATION.

9.1 As used in this Agreement, the word "data" shall mean all information and things developed or obtained during the performance of, or acquired or developed by reason of, this Agreement, including, but not limited to, all studies, reports, files, formulae, surveys, maps, charts, sound recordings, video recordings, pictorial reproductions, drawings, analyses, graphic representations, computer programs, computer printouts, notes, letters, memoranda, papers, and documents, all whether finished or unfinished.

9.2 All data and any property which has been received from the State or purchased with funds provided for that purpose under this Agreement, shall be the property of the State, and shall be returned to the State upon demand or upon termination of this Agreement for any reason.

9.3 Confidentiality of data shall be governed by N.H. RSA chapter 91-A or other existing law. Disclosure of data requires prior written approval of the State.

10. TERMINATION. In the event of an early termination of this Agreement for any reason other than the completion of the Services, the Contractor shall deliver to the Contracting Officer, not later than fifteen (15) days after the date of termination, a report ("Termination Report") describing in detail all Services performed, and the contract price earned, to and including the date of termination. The form, subject matter, content, and number of copies of the Termination Report shall be identical to those of any Final Report described in the attached EXHIBIT A.

11. CONTRACTOR'S RELATION TO THE STATE. In the performance of this Agreement the Contractor is in all respects an independent contractor, and is neither an agent nor an employee of the State. Neither the Contractor nor any of its officers, employees, agents or members shall have authority to bind the State or receive any benefits, workers' compensation or other emoluments provided by the State to its employees.

12. ASSIGNMENT/DELEGATION/SUBCONTRACTS. The Contractor shall not assign, or otherwise transfer any interest in this Agreement without the prior written notice and consent of the State. None of the Services shall be subcontracted by the Contractor without the prior written notice and consent of the State.

13. INDEMNIFICATION. The Contractor shall defend, indemnify and hold harmless the State, its officers and employees, from and against any and all losses suffered by the State, its officers and employees, and any and all claims, liabilities or penalties asserted against the State, its officers and employees, by or on behalf of any person, on account of, based or resulting from, arising out of (or which may be claimed to arise out of) the acts or omissions of the Contractor. Notwithstanding the foregoing, nothing herein contained shall be deemed to constitute a waiver of the sovereign immunity of the State, which immunity is hereby reserved to the State. This covenant in paragraph 13 shall survive the termination of this Agreement.

14. INSURANCE.

14.1 The Contractor shall, at its sole expense, obtain and maintain in force, and shall require any subcontractor or assignee to obtain and maintain in force, the following insurance:

14.1.1 comprehensive general liability insurance against all claims of bodily injury, death or property damage, in amounts of not less than \$1,000,000 per occurrence and \$2,000,000 aggregate; and

14.1.2 special cause of loss coverage form covering all property subject to subparagraph 9.2 herein, in an amount not less than 80% of the whole replacement value of the property.

14.2 The policies described in subparagraph 14.1 herein shall be on policy forms and endorsements approved for use in the State of New Hampshire by the N.H. Department of Insurance, and issued by insurers licensed in the State of New Hampshire.

14.3 The Contractor shall furnish to the Contracting Officer identified in block 1.9, or his or her successor, a certificate(s) of insurance for all insurance required under this Agreement. Contractor shall also furnish to the Contracting Officer identified in block 1.9, or his or her successor, certificate(s) of insurance for all renewal(s) of insurance required under this Agreement no later than thirty (30) days prior to the expiration date of each of the insurance policies. The certificate(s) of insurance and any renewals thereof shall be attached and are incorporated herein by reference. Each certificate(s) of insurance shall contain a clause requiring the insurer to provide the Contracting Officer identified in block 1.9, or his or her successor, no less than thirty (30) days prior written notice of cancellation or modification of the policy.

15. WORKERS' COMPENSATION.

15.1 By signing this agreement, the Contractor agrees, certifies and warrants that the Contractor is in compliance with or exempt from, the requirements of N.H. RSA chapter 281-A ("*Workers' Compensation*").

15.2 To the extent the Contractor is subject to the requirements of N.H. RSA chapter 281-A, Contractor shall maintain, and require any subcontractor or assignee to secure and maintain, payment of Workers' Compensation in connection with activities which the person proposes to undertake pursuant to this Agreement. Contractor shall furnish the Contracting Officer identified in block 1.9, or his or her successor, proof of Workers' Compensation in the manner described in N.H. RSA chapter 281-A and any applicable renewal(s) thereof, which shall be attached and are incorporated herein by reference. The State shall not be responsible for payment of any Workers' Compensation premiums or for any other claim or benefit for Contractor, or any subcontractor or employee of Contractor, which might arise under applicable State of New Hampshire Workers' Compensation laws in connection with the performance of the Services under this Agreement.

16. WAIVER OF BREACH. No failure by the State to enforce any provisions hereof after any Event of Default shall be deemed a waiver of its rights with regard to that Event of Default, or any subsequent Event of Default. No express failure to enforce any Event of Default shall be deemed a waiver of the right of the State to enforce each and all of the provisions hereof upon any further or other Event of Default on the part of the Contractor.

17. NOTICE. Any notice by a party hereto to the other party shall be deemed to have been duly delivered or given at the time of mailing by certified mail, postage prepaid, in a United States Post Office addressed to the parties at the addresses given in blocks 1.2 and 1.4, herein.

18. AMENDMENT. This Agreement may be amended, waived or discharged only by an instrument in writing signed by the parties hereto and only after approval of such amendment, waiver or discharge by the Governor and Executive Council of the State of New Hampshire unless no

such approval is required under the circumstances pursuant to State law, rule or policy.

19. CONSTRUCTION OF AGREEMENT AND TERMS.

This Agreement shall be construed in accordance with the laws of the State of New Hampshire, and is binding upon and inures to the benefit of the parties and their respective successors and assigns. The wording used in this Agreement is the wording chosen by the parties to express their mutual intent, and no rule of construction shall be applied against or in favor of any party.

20. THIRD PARTIES. The parties hereto do not intend to benefit any third parties and this Agreement shall not be construed to confer any such benefit.

21. HEADINGS. The headings throughout the Agreement are for reference purposes only, and the words contained therein shall in no way be held to explain, modify, amplify or aid in the interpretation, construction or meaning of the provisions of this Agreement.

22. SPECIAL PROVISIONS. Additional provisions set forth in the attached EXHIBIT C are incorporated herein by reference.

23. SEVERABILITY. In the event any of the provisions of this Agreement are held by a court of competent jurisdiction to be contrary to any state or federal law, the remaining provisions of this Agreement will remain in full force and effect.

24. ENTIRE AGREEMENT. This Agreement, which may be executed in a number of counterparts, each of which shall be deemed an original, constitutes the entire Agreement and understanding between the parties, and supersedes all prior Agreements and understandings relating hereto.

EXHIBIT-A

Section-1, Scope of Services

The New Hampshire Department of Transportation (NHDOT) owns, operates and maintains an extensive infrastructure of Intelligent Transportation System (ITS) and a private communications network needed to collect traffic and weather data and remotely control ITS devices.

The system devices or subsystems are deployed statewide and include Closed Circuit Television Cameras (CCTV), Dynamic Message Signs (DMS), both trailer-mounted and fixed-location types, variable Speed Limit Signs (VSL), Roadway Weather Information Systems (RWIS), and motor vehicle detection systems (MVDS). The communications network consists of private long-haul microwave radio, private short-haul microwave radio, private fiber optic cable, leased fiber, and leased cellular data service.

NHDOT, Division of Operations, Bureau of Transportation Systems Management and Operations (TSMO) retains a qualified Contractor to assist in the maintenance, repair, and installation, of subcomponents, structural components, communications equipment, and communication network equipment under this contract. There is also need for technical assistance with ITS (device) site development and system change management.

The Contractor shall provide all resources such as, but not limited to, qualified and trained support staff, equipment, tools, transportation, safety equipment, and sub contracted services required to meet the needs of the NHDOT ITS operations and the requirements of the Contract.

The Contractor shall be assigned work through electronic service requests issued by a TSMO representative or automated message delivery via email. The Contractor shall be responsible for all aspects of service request, including but not limited to; coordinating with the Department bureaus, scheduling of contracted staff, scheduling of equipment, traffic control, permits, and notification to affected entities, repair, documentation and follow-up. The Contractor is required to provide a written resolution report per Service Request within 24-hours of completion. Resolution report(s) shall include what action(s) were undertaken to affect repairs and listed contracted service provided, including but not limited to; travel, contractor staff involved in the repair, troubleshooting, removal and replacement, reconfiguration, adjustment and or alignment. Contractor shall be responsible for accurate and timely invoicing. Invoicing shall be presented to the Department in accordance with Exhibit-B.

NOTE: The term *failed* shall be used to identify devices, subassemblies, and components that no longer function for their intended purpose or operate per original manufacture's specification.

All failures shall be addressed / remedied within the following schedule:

- Subsystem Failures – defined as a failure within an individual device or field subsystem (such as the loss of use of a CCTV, MVDS or DMS)
 - On-site response during the morning of the next workday (Monday-Friday excluding holidays).
 - Twenty-four (24) hour or next work day restoration or repair from original arrival on-site.
 - In excess of 24 – hours, and in the absence of restoration, a failure report and work plan shall be submitted identify all needed resources time needed to affect repair
- System Failures – defined as those failures that impact the DOT's ability to view/control multiple ITS subsystems (such as a failure of the wireless communications backhaul or a backhaul hub).
 - Four (4) hour on-site response.
 - Twenty-four (24) hour repair from arrival on-site
 - Forty-eight (48) hour failure report (identifying failure/response) submission

A current list ITS devices and locations can be found in **Table-1 of Exhibit-A**. Table is sorted by Road. These types, quantities, and locations may change during the contract period of two (2) years. NHDOT is seeking services for all items in the table. Services shall be limited to those activities and tasks not otherwise covered an existing warranty. A more comprehensive list of device information and communications hubs shall be made available to the successful bidder.

A current list ITS Cabinets and locations can be found in **Table-2 of Exhibit-A**. Some cabinet locations are not located on highways but are drive to locations while a few are located at non-drive to sites.

Winter Maintenance: Many of the ITS devices, hubs, and battery cabinets are in locations where snow and ice removal (by hand) after storms may be necessary to gain access to interior of the cabinets. To what extent it can, the Department will assist in keeping the sites clear, but it will remain the responsibility of the contractor to gain access to cabinets under difficult conditions.

A current list Transit Center locations with can be found in **Table-3 of Exhibit-A**

1) Contractor shall be required to coordinate self provided highway *shoulder closures* with NHDOT Transportation Management Center (603) 271- 6862 and Contractor shall use self-owned traffic control devices (i.e. signage) in quantities and locations and distances recommended by the most current version of the Manual on Uniform Traffic Control Devices (MUTCD) for all state routes and divided highways with the exception of NH Turnpikes. Please see item #2 with regard to Turnpike shoulder closures.

All contractor vehicles engaged in maintenance on state highways and turnpikes shall be outfitted with permanently installed amber warning light. Roadside work shall *not* be scheduled on business days adjacent to or on holidays when heavy traffic volumes are anticipated. Exceptions to this shall only be if an urgent Service Request has been conveyed to the Contractor by the Department.

2) Contractor shall coordinate with the respective highway maintenance district, Turnpike Bureau and or Bridge Maintenance Bureau for ITS maintenance that requires full travel lane closure(s). Additionally, Bureau of Turnpikes maintenance will provide traffic control for shoulder closures. Coordination with Rail & Transit Bureau will be required for unrestricted access to camera poles at transit centers. Contractor shall be prepared to work 2nd and or 3rd shift for temporary highway travel lane closures when directed by TSMO based on traffic volumes of roadway. These locations are typically in the Manchester area or portions of Interstate-93 south of Manchester. Time of day temporary lane closures shall be determined by the applicable NHDOT District / Turnpike Engineer. Contractor shall notify NHDOT, Transportation Management Center of scheduled travel lane closures (603) 271-6862.

3) Travel allowances shall be calculated for person(s) and vehicle(s) only after travel time(s) exceed 2-hours round trip to an ITS or communication device location from contractor's closest company location. *At a rate specified in Exhibit-B, Section- 5.* Travel rates shall not be calculated and invoiced for preventive maintenance inspections.

4) Contractor shall be required to provide 24-7-365 point of contact for priority system failures that require repair.

5) As requested, and on a mutually agreed schedule, provide for preventive maintenance inspections (PMI) of **Portable Solar Powered DMS** on site, completing all necessary tasks at the *fixed price* per site, as identified in *Exhibit-B, Section-5*, Portable Solar Powered DMS. The minimum required preventive maintenance inspection task list is included in Exhibit-A, Section-2.

6) As requested, and on a mutually agreed schedule, provide for preventive maintenance inspections (PMI) of a **RWIS system field site**, completing all necessary tasks to meet equipment specifications at the *fixed price* per site, as identified in *Exhibit-B, Section-5*, RWIS PMI. The minimum required PMI task list is included in Exhibit-A, Section-3.

7) As requested, and on a mutually agreed schedule, provide for preventive maintenance inspections (PMI) to ITS cabinets on site, completing all necessary tasks at the *fixed price* per site, as identified in *Exhibit-B, Section-5*, ITS Cabinet. The minimum required PMI task list is included in Exhibit-A, Section-4.

8) As requested, and on a mutually agreed schedule, provide for preventive maintenance inspections (PMI) CCTV Camera on site, completing all necessary tasks at the *fixed price* per site, as identified in *Exhibit-B, Section-5*, CCTV Camera PMI. The minimum required PMI task list is included in Exhibit-A, Section-5.

9) As requested provide repairs to a failed *ITS Subsystem (on-site)* at a cost per hour specified in *Exhibit - B, Section - 1*. Subsystems such as Close Circuit Television camera (CCTV), *variable speed limit (VSL) sign, portable dynamic message sign (DMS) fixed-location dynamic message sign (DMS)* and Roadway Weather Information Systems (RWIS) has failed and cannot be serviced on-site, contractor shall deploy working CCTV camera through the use a Department provided new stock or new-used stock during the first site visit.

10) As requested, provide component repairs to failed ITS device components off- site at an *offsite shop rate* identified as cost per hour specified in *Exhibit -B, Section- 1*. No travel would be associated with these repairs

11) As requested provide for repairs to failed tower and pole mounted ITS *microwave RF systems* on site at a cost per hour specified in *Exhibit -B, Section- 2*.

12) As identified through Department and Contactor change management practices, provide for *documentation and reports* for FCC CFR-47, Part-101 license frequency coordination, as well as license modifications of current Part-101 and Part-90 Department authorizations at cost per hour as identified in *Exhibit-B, Section-6*.

13) As requested, provide for preparation and installation of new, used, and or replacement communications components such as but not limited to; Ethernet radios, cellular data modems, ethernet switches, media converters, and housings and cabinetry at a cost per hour specified in *Exhibit-B, Section- 2, ITS Comm' Hub Equipment*

14) As requested, provide repairs to failed ITS Communication hubs to reestablish commercial or back-up power, and or re-establish communication with other device(s), ITS microwave or Fiber backbone at the cost per hour as specified in *Exhibit - B, Section - 2, labeled ITS Comm' Hub Equipment*.

15) As requested, provide repairs to failed commercial electric service to ITS devices by retention of a NH licensed electrician at a cost per hour as identified in *Exhibit - B, Section - 2, Commercial electric service (repair)*

16) As requested, provide repairs to failed solar power plant at cost per hour as identified in **Exhibit – B, Section – 2, Solar Power Plant repair**.

17) As requested, provide repairs to failed battery backup system UPS at cost per hour as identified in **Exhibit – B, Section – 2, Battery Backup System UPS repair. Identifying**

18) As requested assist in identifying suitable roadside location sites for new proposed ITS devices and provide site marking layout for device, commercial electrical service, and wireless communications as identified in **Exhibit-B, Section-6, Site marking, layout and Commercial Power Planning and Coordination.**

19) As requested, provide assistance with *network monitoring* system maintenance at a cost per hour as identified in **Exhibit – B, Section – 2,**

20) As requested provide technical support for ITS communication hubs development to establish commercial or back-up power, and communication connectivity with either ITS device(s) or ITS communications such as wireless or fiber optic cable at a cost per hour as specified in **Exhibit – B Section – 6, ITS Communications Study.**

21) As requested, provide technical assistance and review of the Department's Statewide ITS Network Architecture to ensure continuity through change management of ITS systems, subsystems, and communications as those elements transition from design, construction, and or warranty maintenance to contracted maintenance at a cost per hour as specified in **Exhibit – B, Section –6, Documentation and Reports**

22) As requested, provide for repairs and maintenance of ITS buried fiber optic infrastructure including but not limited to; fiber optic cable, conduit, pull boxes, splice enclosures, and vaults at a cost per hour as identified in **Exhibit-B, Section-2, Fiber Optic Systems.**

23) As requested, provide for new, and or replacement buried fiber optic connectivity by installation of fiber optic infrastructure related to retrofitting ITS (device) sites at a cost per hour as identified in **Exhibit-B Section-6, fiber optic retrofitting.** Service shall include fiber testing, commissioning documentation, and or as-built documentation.

24) As requested, provide for repairs to ITS communication tower, pole, or water tank-mounted ITS microwave antenna systems or Ethernet radio at a *cost per hour, per person*, specified in **Exhibit –B, Section-3.** It is not anticipated that each of the persons listed in Exhibit-B will not be necessary for each and every case of communications repair, but a predefined rate for each shall be established through this contract. Contractor will be required to identify person needed for such repairs at the time of repair request by NHDOT.

25) All repair services associated with ITS equipment shall comply with the requirements contained herein. Service shall be limited to those that are requested through work requests and those problems conveyed to the Department by the Contractor as needing to be done and approved by Department prior to work effort. Repairs shall be in accordance with the ITS system(s) as originally designed, original manufacturer's service and repair instructions, industry best practices and the current National Electric Code, whichever is more stringent.

26) Repairs made to equipment and installation parameters regulated by CFR-47; Part 90 and or Part-101 devices shall be done such a way that the Department is in compliance with applicable and current Federal Communications Commission (FCC) authorizations and the Communications System Design, as engineered, and (currently) installed. Exceptions to this may only be granted by the Department's ITS Engineer or their designee.

27) NHDOT shall issue a work request description and number for each device repair, subsystem repair, off-site repair, and contractor identified replacement part or combination of the aforementioned of each occurrence. Individual parts or a combination of parts with a value of less than \$250.00 per occurrence do not need to be authorized by additional Department work request when already associated with a work request.

28) The Department reserves the right to make additions and or deletions to this Scope of Services, Exhibit-A as required by budgetary restraints, State and or Federal regulation or unrealized requirements. Changes implemented by the Department shall be limited to those that do not require rate increases to contracted rates.

29) Problems inherent to the NH facilities or problems caused by Contractor shall be communicated to NHDOT, Communications Supervisor, per occurrence before close of business 16:00 (local) of each business day while work is in progress and at the beginning of each business day 08:00 (local) for work that occurred during 2nd and 3rd shift. See contact information.

30) Contractor shall be responsible for securing and disposing of all waste and packing materials generated by work. Reusable containers shall be returned to the Department.

31) Contractor shall be required to make available on timely basis, the company owner or general manager, project manager(s) and accounts receivable personnel for resolution of problems. Contractor shall designate a *service manager* apart from field personnel engaged in field repairs to be the primary contact for requested services and problem resolution.

32) Termination of this agreement may be accomplished by either party. Agreement termination shall be accomplished by written and dated letter and further sent by certified mail to contact information listed in Exhibit-A (below). Termination shall be effective thirty (30) calendar days after date of letter.

Department: Attention TSMO Administrator
NHDOT, Bureau of TSMO
PO BOX 483
Concord, NH 03302-0483

Contractor: Joshua B. Broder
16 Middle St. 4th Floor
Portland, ME 04101

33) In cases where the Contractor terminates the contract agreement, NHDOT may at its own discretion, have the repairs already identified and reported to the contractor at the time of termination completed by a third party at the contractor's expense.

34) In cases where NHDOT terminates this agreement prior to all existing work requests completion, both parties shall determine a mutually agreeable amount compensation at the contracted rates for all work performed by contractor as of the date of termination.

35) Contractor shall provide personal and subcontractors assigned to work at the Transportation Management Center (TMC) that are able pass a National Fingerprint-based criminal history record.

Contractor shall identify all individuals assigned to work at the TMC. All Contractor and subcontractors will be required to submit to a Criminal Justice Applicant (CJAP) national fingerprinting. NHDOT reserves the right to deny facility access to individual personnel based on the results of the CJAP. The Vendor shall not file a claim against the NHDOT for failure to provide facility access. Individuals passing the CJAP shall maintain a clean record enforced during the contract term or alternatively report noncompliance to the Bureau of Transportation Systems Management and Operations, Administrator. All costs associated with conducting the CJAP shall be the responsibility of the Vendor. Information to schedule a CJAP is available on the

NHDOS Website:

<https://www.nh.gov/safety/divisions/nhsp/ssb/crimrecords/index.html#finger>

Bureau of TSMO Administrator shall make final determination about the suitability of all Contractor personnel working at TMC

36) Contractor's representative shall be required to participate monthly (new) ITS construction meetings to review changes, additions, and deletions to the DOT ITS communications system. The meeting duration shall be approximately 1-hour and shall be scheduled at mutually agreed time and is contractor time that will not be compensated for.

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EXHIBIT-A, Tabel-1, ITS DEVICE LIST

DEVICE_TYPE	DEVICE_NAME		CITY_TOWN	ROUTE	LAST MILE COMM.
CCTV	FEE S 8.0 CCTV AX T	T	Nashua	FEE TPK	Cell Modem
CCTV	FEE M 2.4 CCTV T	T	Nashua	FEE TPK	Cell Modem
DMS	FEE N 18.8 FS V T	T	Bedford	FEE TPK	Cell Modem
DMS	FEE S 8.6 FS P T	T	Nashua	FEE TPK	Cell Modem
DMS	FEE N 1.2 FS V T	T	Nashua	FEE TPK	Cell Modem
DMS WD	FEE N 5.2 PS V T	T	Nashua	FEE TPK	Cell Modem
RWIS	FEE S 8.0 RWIS T	T	Nashua	FEE TPK	Cell Modem
RWIS	FEE M 2.4 RWIS T	T	Nashua	FEE TPK	Cell Modem
CCTV	293 N 10.4 CCTV AX T	T	Hooksett	I-293	Cell Modem
CCTV	293 S 1.4 CCTV AX 5	T	Manchester	I-293	Microwave 4.9 Ghz
DMS	293 S 4.8 FS V T	T	Bedford	I-293	Cell Modem
DMS	293 N 8.8 FS P T	T	Manchester	I-293	Cell Modem
DMS	293 S 1.4 FS D 5	H	Manchester	I-293	Microwave 4.9 Ghz
RWIS	293 N 10.4 RWIS T	T	Hooksett	I-293	Cell Modem
RWIS	293 W 2.2 RWIS LX 0	T	Manchester	I-293	Cell Modem
VSL	293 S 1.4 VSL D 5	T	Manchester	I-293	Microwave 4.9 Ghz
DMS	393 W 1.9 PS V 5	H	Concord	I-393	Cell Modem
CCTV	89 N 39.6 CCTV AX 2	H	Springfield	I-89	Cell Modem
CCTV	89 S 20.2 CCTV AX 5	H	Warner	I-89	Microwave 4.9 Ghz
DMS	89 S 3.4 FS V 5	H	Concord	I-89	Cell Modem
DMS	89 N 1.6 FS V 5	H	Concord	I-89	Cell Modem
DMS	89 S 10.8 FS V 5	H	Hopkinton	I-89	Cell Modem
DMS	89 S 55.0 PS V 2	H	Lebanon	I-89	Cell Modem
DMS	89 N 55.0 PS V 2	H	Lebanon	I-89	Cell Modem
DMS	89 S 58.0 PS V 2	H	Lebanon	I-89	Cell Modem
DMS	89 N 35.5 FS V 2	H	New London	I-89	Cell Modem
DMS	89 N 18.4 FS V 5	H	Warner	I-89	Cell Modem
DMS	89 S 57.5 PS V 2	H	Lebanon	I-89	Cell Modem
DMS WD	89 N 43.8 PS P 5	H	Grantham	I-89	Cell Modem
DMS WD	89 S 42.6 PS V 2	H	Grantham	I-89	Cell Modem
DMS WD	89 N 28.8 PS V 2	H	Sutton	I-89	Cell Modem
DMS WD	89 S 31.4 PS V 2	H	Sutton	I-89	Cell Modem
RWIS	89 N 39.6 RWIS LX 2	H	Springfield	I-89	Cell Modem
RWIS	89 S 20.2 RWIS LX 5	H	Warner	I-89	Microwave 4.9 Ghz
CCTV	93 S 76.2 CCTV AX 3	H	Ashland	I-93	Cell Modem
CCTV	93 S 35.6 CCTV AX T	T	Bow	I-93	Fiber
CCTV	93 N 33.8 CCTV AX T	T	Bow	I-93	Fiber
CCTV	93 N 34.8 CCTV AX T	T	Bow	I-93	Cell Modem
CCTV	93 N 50.8 CCTV AX 5	T	Canterbury	I-93	Cell Modem
CCTV	93 NS 36.2 CCTV AX T	T	Concord	I-93	Fiber
CCTV	93 NN 36.2 CCTV AX T	T	Concord	I-93	Fiber
CCTV	93 S 11.0 CCTV AX 5	H	Derry	I-93	Cell Modem
CCTV	93 S 111.4 CCTV AX 1	H	Franconia	I-93	Microwave 900 Ghz
CCTV	93 S 27.8 CCTV AX T	T	Hooksett	I-93	Fiber
CCTV	93 N 105.6 CCTV AX 1	H	Lincoln	I-93	Cell Modem
CCTV	93 N 102.6 CCTV AX 1	H	Lincoln	I-93	Cell Modem

EXHIBIT-A, Tabel-1, ITS DEVICE LIST

CCTV	93 S 108.2 CCTV AX 1	H	Lincoln	I-93	Microwave 4.9 Ghz
CCTV	93 S 130.4 CCTV AX 1	H	Littleton	I-93	Cell Modem
CCTV	93 S 11.7 CCTV AX 5	H	Londonderry	I-93	Microwave 4.9 Ghz
CCTV	93 S 15.3 CCTV AX 5	H	Londonderry	I-93	Microwave 4.9 Ghz
CCTV	93S 14.4 CCTV AX.5	H	Londonderry	I-93	Fiber
CCTV	93 M 18.4 CCTV AX 5	H	Manchester	I-93	Microwave 4.9 Ghz
CCTV	93 N 2.6 CCTV A 5	H	Salem	I-93	Microwave 4.9 Ghz
CCTV	93 SN 2.1 CCTV AX 5	H	Salem	I-93	Fiber to Microwave
CCTV	93 SS 2.1 CCTV AX 5	H	Salem	I-93	Fiber to Microwave
CCTV	93 N 0.8 CCTV AX 5	H	Salem	I-93	Microwave 4.9 Ghz
CCTV	93 N 1.8 CCTV AX 5	H	Salem	I-93	Microwave 4.9 Ghz
CCTV	93 N 0.3 CCTV AX 5	H	Salem	I-93	Microwave 4.9 Ghz
CCTV	93 S 3.8 CCTV A 5	H	Salem	I-93	Microwave 4.9 Ghz
CCTV	93 S 60.0 CCTV AX 3	H	Sanbornton	I-93	Cell Modem
CCTV	93 S 117.6 CCTV AX 1	H	Sugar Hill	I-93	Microwave 4.9 Ghz
CCTV	93 S 7.2 CCTV AX 5	H	Windham	I-93	Microwave 4.9 Ghz
CCTV	93 N 4.2 CCTV AX 5	H	Windham	I-93	Fiber
CCTV	93 S 4.7 CCTV A 5	H	Windham	I-93	Fiber
CCTV	93 N 7.5 CCTV AX 5	H	Windham	I-93	Microwave 4.9 Ghz
CCTV	93 S 6.0 CCTV AX 5	H	Windham	I-93	Microwave 4.9 Ghz
CCTV	93 N 5.4 CCTV AX 5	H	Windham	I-93	Fiber
CCTV	93 N 99.6 CCTV AX 3	H	Woodstock	I-93	Microwave 4.9 Ghz
CCTV	93 S 95.9 CCTV AX 3	H	Woodstock	I-93	Cell Modem
DMS	93 S 32.4 FS V T	T	Bow	I-93	Cell Modem
DMS	93 N 32.4 FS V T	T	Bow	I-93	Cell Modem
DMS	93 S 85.4 FS V 3	H	Campton	I-93	Cell Modem
DMS	93 N 82.6 FS V 3	H	Campton	I-93	Cell Modem
DMS	93 S 48.0 FS V 5	H	Canterbury	I-93	Cell Modem
DMS	93 S 39.0 FS V 5	H	Concord	I-93	Cell Modem
DMS	93 S 43.3 PS V 5	H	Concord	I-93	Cell Modem
DMS	93 N 36.2 FS V T	T	Concord	I-93	Cell Modem
DMS	93 S 27.8 FS D T	T	Hooksett	I-93	Fiber - I93
DMS	93 S 122.2 FS V 1	H	Littleton	I-93	Cell Modem
DMS	93 N 23.4 FS D 5	H	Manchester	I-93	Microwave 4.9 Ghz
DMS	93 S 23.4 FS D 5	H	Manchester	I-93	Microwave 4.9 Ghz
DMS	93 S 68.8 FS V 3	H	New Hampton	I-93	Cell Modem
DMS	93 N 0.3 FS D 5	H	Salem	I-93	Microwave 4.9 Ghz
DMS	93 S 117.6 FS A 1	H	Sugar Hill	I-93	Cell Modem
DMS	93 N 57.6 FS V 3	H	Tilton	I-93	Cell Modem
DMS	93 N 7.2 FS D 5	H	Windham	I-93	Microwave 4.9 Ghz
DMS	93 S 7.2 FS D 5	H	Windham	I-93	Microwave 4.9 Ghz
DMS	93 N 99.6 FS A 3	H	Woodstock	I-93	Cell Modem
DMS WD	93 N 43.8 PS P 5	H	Concord	I-93	Cell Modem
DMS WD	93 S 36.0 PS V T	T	Concord	I-93	Cell Modem
DMS WD	93 S 99.2 FS A 3	H	Woodstock	I-93	Cell Modem
RWIS	93 S 76.2 RWIS LX 3	H	Ashland	I-93	Cell Modem
RWIS	93 N 34.8 RWIS T	T	Bow	I-93	Cell Modem

EXHIBIT-A, Tabel-1, ITS DEVICE LIST

RWIS	93 N 50.8 RWIS LX 5	H	Canterbury	I-93	Cell Modem
RWIS	93 S 11.0 RWIS LX 5	H	Derry	I-93	Cell Modem
RWIS	93 S 111.4 RWIS LX 1	H	Franconia	I-93	Microwave Cambium 900
RWIS	93 N 105.6 RWIS LX 1	H	Lincoln	I-93	Cell Modem
RWIS	93 S 108.2 RWIS LX 1	H	Lincoln	I-93	Microwave 4.9 Ghz
RWIS	93 N 102.6 RWIS LX 1	H	Lincoln	I-93	Cell Modem
RWIS	93 S 130.4 RWIS LX 1	H	Littleton	I-93	Cell Modem
RWIS	93 N 0.8 RWIS 5	H	Salem	I-93	Microwave 4.9 Ghz
RWIS	93 S 60.0 RWIS LX 3	H	Sanbornton	I-93	Cell Modem
RWIS	93 S 95.9 RWIS LX 3	H	Woodstock	I-93	Cell Modem
VSL	93 S 14.4 VSL D5	H	Londonderry	I-93	Fiber
VSL	93 SM 14.4 VSL D5	H	Londonderry	I-93	Fiber
VSL	93 NM 16.0 VSL D5	H	Londonderry	I-93	Fiber
VSL	93 N 16.0 VSL D5	H	Londonderry	I-93	Fiber
VSL	93 SM 19.8 VSL D 5	H	Manchester	I-93	Fiber
VSL	93 S 19.8 VSL D 5	H	Manchester	I-93	Fiber
VSL	93 NM 2.3 VSL D 5	H	Salem	I-93	Microwave 4.9 Ghz
VSL	93 N 3.8 VSL D5	H	Salem	I-93	Microwave 4.9 Ghz
VSL	93 S 2.2 VSL D 5	H	Salem	I-93	Microwave 4.9 Ghz
VSL	93 N 0.3 VSL D 5	H	Salem	I-93	Microwave 4.9 Ghz
VSL	93 NM 3.8 VSL D5	H	Salem	I-93	Fiber
VSL	93 N 2.3 VSL D 5	H	Salem	I-93	Microwave 4.9 Ghz
VSL	93 SM 2.2 VSL D 5	H	Salem	I-93	Microwave 4.9 Ghz
VSL	93 SM 5.2 VSL D 5	H	Windham	I-93	Fiber
VSL	93 S 5.2 VSL D 5	H	Windham	I-93	Fiber
VSL	93 NM 6.6 VSL D 5	H	Windham	I-93	Fiber
VSL	93 N 6.6 VSL D 5	H	Windham	I-93	Fiber
CCTV	95 SS 10.0 CCTV AX T	T	Greenland	I-95	Microwave 4.9 Ghz
CCTV	95 SN 10.0 CCTV AX T	T	Greenland	I-95	Microwave 4.9 Ghz
CCTV	95 SS 5.6 CCTV AX T	T	Hampton	I-95	Microwave 4.9 Ghz
CCTV	95 SN 5.6 CCTV AX T	T	Hampton	I-95	Microwave 4.9 Ghz
CCTV	95 N 4.0 CCTV AX 8	T	Hampton	I-95	Microwave
CCTV	95 S 6.0 CCTV AX T	T	North Hampton	I-95	Microwave 4.9 Ghz
CCTV	95 HL NW CCTV AD T	T	Portsmouth	I-95	Microwave 4.9 Ghz
CCTV	95 HL SE CCTV AX T	T	Portsmouth	I-95	Microwave 4.9 Ghz
CCTV	95 MN 14.6 CCTV AX T	T	Portsmouth	I-95	Microwave 4.9 Ghz
CCTV	95 HL NE CCTV AX T	T	Portsmouth	I-95	Microwave 4.9 Ghz
CCTV	95 SS 15.4 CCTV AX T	T	Portsmouth	I-95	Microwave 4.9 Ghz
CCTV	95 SN 15.4 CCTV AX T	T	Portsmouth	I-95	Microwave 4.9 Ghz
CCTV	95 MS 14.6 CCTV AX T	T	Portsmouth	I-95	Microwave 4.9 Ghz
CCTV	95 SS 12.6 CCTV AX T	T	Portsmouth	I-95	Microwave 4.9 Ghz
CCTV	95 SN 12.6 CCTV AX T	T	Portsmouth	I-95	Microwave 4.9 Ghz
CCTV	95 N 13.4 CCTV AX T	T	Portsmouth	I-95	Microwave 4.9 Ghz
CCTV	95 HL SW CCTV AD T	T	Portsmouth	I-95	Microwave 4.9 Ghz
CCTV	95 SN 1.0 CCTV AX T	T	Seabrook	I-95	Microwave 4.9 Ghz
CCTV	95 SS 1.0 CCTV AX T	T	Seabrook	I-95	Microwave 4.9 Ghz
DMS	95 N 10.6 FS V T	T	Greenland	I-95	Cell Modem

EXHIBIT-A, Tabel-1, ITS DEVICE LIST

DMS	95 S 3.4 FS P T	T	Hampton Falls	I-95	Cell Modem
DMS	95 N 3.0 FS D T	T	Hampton Falls	I-95	Microwave 4.9 Ghz
DMS	95 S 7.6 FS D T	T	North Hampton	I-95	Microwave 4.9 Ghz
DMS	95 N 14.8 FS D T	T	Portsmouth	I-95	Microwave 4.9 Ghz
DMS	95 S 15.4 FS D T	T	Portsmouth	I-95	Microwave 4.9 Ghz
DMS	95 MN 13.0 FS V T	T	Portsmouth	I-95	Cell Modem
DMS	95 N 0.4 FS V T	T	Seabrook	I-95	Microwave 4.9 Ghz
MVDS	95 N 13.4 MVDS W T	T	Portsmouth	I-95	Microwave 4.9 Ghz
MVDS	95 S 15.6 MVDS W T	T	Portsmouth	I-95	Microwave 4.9 Ghz
MVDS	95 S 1.0 MVDS W T	T	Seabrook	I-95	Cell Modem
CCTV	101 E 116.5 CCTV AX 6	H	Epping	NH 101	Microwave 4.9 Ghz
CCTV	101 W 128.2 CCTV AX 6	H	Exeter	NH 101	Microwave 4.9 Ghz
CCTV	101 W 130.8 CCTV AX 6	H	Hampton	NH 101	Microwave 4.9 Ghz
CCTV	101 W 101.0 CCTV AX 5	H	Manchester	NH 101	Cell Modem
CCTV	101 E 127.0 CCTV AX 6	H	Stratham	NH 101	Microwave 4.9 Ghz
DMS	101 W 102.6 FS V 5	H	Auburn	NH 101	Cell Modem
DMS	101 E 53.4 FS V 5	H	Bedford	NH 101	Cell Modem
DMS	101 E 130.0 FS A 6	H	Hampton	NH 101	Microwave Digi Modem 900
DMS	101 E 114.8 FS V 6	H	Raymond	NH 101	Cell Modem
DMS WD	101 E 102.0 PS P 5	H	Auburn	NH 101	Cell Modem
DMS WD	101 W 128 PS V 6	H	Exeter	NH 101	Cell Modem
DMS WD	101 W 115.0 PS P 5	H	Raymond	NH 101	Cell Modem
RWIS	101 E 116.5 RWIS LX 6	H	Epping	NH 101	Cell Modem
VSL	101 WM 100.5 VSL D 5	H	Manchester	NH 101	Cell Modem
VSL	101 W 100.5 VSL D 5	H	Manchester	NH 101	Cell Modem
CCTV	106 N 5.6 CCTV AX 3	H	Loudon	NH 106	Cell Modem
CCTV	112 W 14.8 CCTV AX 1	H	Woodstock	NH 112	Cell Modem
RWIS	112 W 14.8 RWIS LX 1	H	Woodstock	NH 112	Cell Modem
CCTV	NH 124 N 4.2 CCTV AX 5	H	New Ipswich	NH 124	Cell Modem
RWIS	NH 124 N 4.2 RWIS LX 5	H	New Ipswich	NH 124	Cell Modem
CCTV	9 W 10.6 CCTV AX 4	H	Westmoreland	NH 9	Cell Modem
RWIS	9 W 10.6 RWIS LX 4	H	Westmoreland	NH 9	Cell Modem
DMS	ST S 11.6 FS A T	T	Dover	Spaulding	Microwave 900 Mhz
DMS WD	FEE S 17.8 PS V T	T	Bedford	Spaulding	Cell Modem
CCTV	ST S 5.0 CCTV AX T	T	Dover	Spaulding	Microwave 4.9 Ghz
CCTV	ST N 4.4 CCTV AX T	T	Dover	Spaulding	Microwave 4.9 Ghz
CCTV	ST N 12.4 CCTV AX T	T	Dover	Spaulding	Microwave 4.9 Ghz
CCTV	ST LB HN N AX T	T	Dover	Spaulding	Fiber
CCTV	ST N 9.0 CCTV AX T	T	Dover	Spaulding	Microwave 4.9 Ghz
CCTV	ST LB BN N AX T	T	Dover	Spaulding	Fiber
CCTV	ST N 12.0 CCTV AX T	T	Dover	Spaulding	Microwave 4.9 Ghz
CCTV	ST S 5.8 CCTV AX T	T	Dover	Spaulding	Microwave 4.9 Ghz
CCTV	ST SS 3.4 CCTV AX T	T	Newington	Spaulding	Fiber
CCTV	ST SN 3.4 CCTV AX T	T	Newington	Spaulding	Fiber
CCTV	ST N 2.6 CCTV AX T	T	Newington	Spaulding	Microwave, Part 101
CCTV	ST LB BS S AX T	T	Newington	Spaulding	Microwave, Part 101
CCTV	ST LB HS S AX T	T	Newington	Spaulding	Microwave, Part 101

EXHIBIT-A, Tabel-1, ITS DEVICE LIST

CCTV	ST SS 1.6 CCTV AX T	T	Portsmouth	Spaulding	Fiber
CCTV	ST SN 1.6 CCTV AX T	T	Portsmouth	Spaulding	Fiber
CCTV	ST S 22.0 CCTV AX T	T	Rochester	Spaulding	Microwave 4.9 Ghz
CCTV	ST N 17.0 CCTV AX T	T	Rochester	Spaulding	Microwave 4.9 Ghz
CCTV	ST S 15.9 CCTV AX T	T	Rochester	Spaulding	Microwave 4.9 Ghz
CCTV	ST N 18.0 CCTV AX T	T	Rochester	Spaulding	Microwave 4.9 Ghz
DMS	ST S 7.8 FS A T	T	Dover	Spaulding	Microwave 4.9 Ghz
DMS	ST S 11.2 PS V T	T	Dover	Spaulding	Cell Modem
DMS	ST S 3.4 FS D T	T	Newington	Spaulding	Fiber
DMS	ST N 1.0 FS A T	T	Portsmouth	Spaulding	Microwave 4.9 Ghz
DMS	ST S 23.2 FS V T	T	Rochester	Spaulding	Cell Modem
DMS WD	FEE N 16.2 PS V T	T	Merrimack	Spaulding	Cell Modem
DMS WD	ST N 19.2 PS V T	T	Rochester	Spaulding	Cell Modem
DMS WD	ST S 34.4 PS V T	T	Wakefield	Spaulding	Cell Modem
MVDS	ST N 12.0 MVDS W T	T	Dover	Spaulding	Cell Modem
MVDS	ST N 2.6 MVDS W T	T	Newington	Spaulding	Cell Modem
RWIS	ST S 3.7 RWIS V T	T	Newington	Spaulding	Fiber
CCTV	1 MB North CCTV AX 6	H	Portsmouth	US 1	Fiber to Microwave
CCTV	1 MB South CCTV AX 6	H	Portsmouth	US 1	Fiber to Microwave
CCTV	3 S 163.1 CCTV AX 1	H	Lancaster	US 3	Cell Modem
RWIS	3 S 163.1 RWIS VIA 1	H	Lancaster	US 3	Cell Modem
CCTV	4 W 101.6 CCTV AX 6	H	Dover	US 4	Microwave 4.9 Ghz
DMS	4 E 98.0 FS A 6	H	Durham	US 4	Cell Modem

EXHIBIT-A, Tabel-1, ITS DEVICE LIST

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EXHIBIT-A, Table-2, ITS CABINET LIST

CABINET_NAME	CITY_TOWN	ROUTE	AC Power
93N 23.4 ICAB 5	H Manchester	93	Yes
93S 19.8 ICAB 5	H Manchester	93	Yes
93MN 18.4 ICAB 5	H Manchester	93	Yes
93MN 18.4 FCAB 5	H Manchester	93	Yes
93S 35.6 ICAB T	T Bow	93	Yes
93N 36.2 ICAB T	T Concord	93	Yes
93S 27.8 ICAB T	T Hooksett	93	Yes
93S 14.4 ICAB 5	H Londonderry	93	Yes
93S 11.7 ICAB 5	H Londonderry	93	Yes
93S 7.2 ICAB 5	H Windham	93	Yes
93N 6.6 ICAB 5	H Windham	93	Yes
93N 1.8 ICAB 5	H Salem	93	Yes
93S 15.3 ICAB 5	H Londonderry	93	Yes
93S 6.0 ICAB 5	H Windham	93	Yes
93S 3.8 ICAB 5	H Salem	93	Yes
93N 3.8 ICAB 5	H Salem	93	Yes
93N 4.2 ICAB 5	H Windham	93	Yes
93N 99.6 ICAB 3	H Lincoln	93	Yes
93S 117.6 ICAB 1	H Sugar Hill	93	Yes
93N 0.3 ICAB 5	H Salem	93	Yes
93S 2.1 ICAB 5	H Salem	93	Yes
93S 2.2 ICAB 5	H Salem	93	Yes
93N 5.4 ICAB 5	H Windham	93	Yes
93N 7.5 ICAB 5	H Windham	93	Yes
93N 16.0 ICAB 5	H Londonderry	93	Yes
93N 2.3 ICAB 5	H Salem	93	Yes
93N 2.6 ICAB 5	H Salem	93	Yes
93N 33.8 ICAB T	T Bow	93	Yes
93S 4.7 ICAB 5	H Windham	93	Yes
93S 5.2 ICAB 5	H Windham	93	Yes
93N 20.6 FCAB 5	H Manchester	93	Yes
93N 25.8 FCAB 5	H Hooksett	93	Yes
93N 28.8 FCAB T	T Hooksett	93	Yes
93N 37.2 FCAB T	T Concord	93	Yes
95N 3.0 ICAB T	T Hampton Falls	95	Yes
95S 5.6 ICAB T	T Hampton Falls	95	Yes
95S 1.0 ICAB T	T Seabrook	95	Yes
95N 13.4 ICAB T	T Portsmouth	95	Yes
95N 14.8 ICAB T	T Portsmouth	95	Yes
95S 15.4 ICAB T	T Portsmouth	95	Yes
95S 12.6 ICAB T	T Portsmouth	95	Yes
95S 10.0 ICAB T	T Greenland	95	Yes
95S 7.6 ICAB T	T N. Hampton	95	Yes
95S 6.0 ICAB T	T N. Hampton	95	Yes
95MN 14.6 ICAB T	T Portsmouth	95	Yes
101W 130.8 ICAB 6	H Hampton Falls	101	No

EXHIBIT-A, Table-2, ITS CABINET LIST

101W 128.2 ICAB 6	H Hampton Falls	101	Yes
101E 127.0 ICAB 6	H Stratham	101	Yes
293S 1.4 ICAB 5	H Manchester	293	Yes
ST N 18.0 ICAB T	T Rochester	Spaulding TP	Yes
ST N 17.0 ICAB T	T Rochester	Spaulding TP	Yes
ST N 2.6 ICAB T	T Newington	Spaulding TP	Yes
ST N 1.0 ICAB T	T Portsmouth	Spaulding TP	Yes
ST N 4.4 ICAB T	T Dover	Spaulding TP	Yes
ST S 5.0 ICAB T	T Dover	Spaulding TP	Yes
ST S 3.4 ICAB T	T Newington	Spaulding TP	Yes
ST S 1.6 ICAB T	T Newington	Spaulding TP	Yes
ST S 5.8 ICAB T	T Dover	Spaulding TP	Yes
ST S 15.9 ICAB T	T Rochester	Spaulding TP	Yes
ST S 22.0 ICAB T	T Rochester	Spaulding TP	Yes
ST S 4.0 ICAB T	T Newington	Spaulding TP	Yes
ST S 3.8 ICAB T	T Newington	Spaulding TP	Yes
ST N 12.0 ICAB T	T Dover	Spaulding TP	Yes
ST N 9.0 ICAB T	T Dover	Spaulding TP	Yes
ST S 7.8 ICAB T	T Dover	Spaulding TP	Yes
ST N 12.4 ICAB T	T Dover	Spaulding TP	Yes
ST S 11.6 ICAB T	T Dover	Spaulding TP	Yes
4W 101.6 ICAB 6	H Durham	US 4	No

ICABs Microwave Comm. Off Highway Sites

193 Salem, Governor Densmore Road

193 Londonderry, Independence Drive

193 Manchester, Veteran's Administration (VA) Hospital, Mammoth Road

193 Loudon, Oak Hill access Rd., Oak Hill Road

195, N. Hampton, Falcone Circle

195 Portsmouth, Hobbs Hill Water Tank (Pease) International Dr.

Mount Bluejob, Strafford NH, 1st Crown Point Road

193 Cannon Mountain

189 Mount Kearsage

List of Abbreviations used in ITS Device Names

A	ADDCO Inc., Sign
AX	Axis Inc., Camera
CCTV	Closed Circuit Television (Camera)
D	Daktronics Inc., (DMS)
DMS	Dynamic Message Sign
DMS WD	DMS Winter Deployment
E	East
FEE	Frederick E. Everett Turnpike
FS	Fixed Location Sign
Ghz	Giga-Hertz
H	Highway Maintenance District, non Turnpike
ICAB	ITS Cabinet
ITS	Intellegent Transportation System
LX	Linux Remote Processing Unit (RPU)
VSL	Variable Speed Limit Sign
LB	Little Bay Bridge
MB	Memorial Bridge
N	North
NN	Northbound side with South view CCTV Camera
NS	Northbound side with North view CCTV Camera
NM	Northbound Median
NH	New Hampshire
LB	Little Bay Bridge
RWIS	Roadway Weather Information System
S	South
SS	Southbound side with South view CCTV Camera
SN	Southbound side with North view CCTV Camera
ST	Spaulding Turnpike
SLB	Sara Long Bridge
SM	Southbound Median
T	Turnpike
TPK	Turnpike
US	United States (Route)
V	Vermac (DMS)
W	West

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TABLE-3 Transit Centers with CCTV cameras

Location	City / Town	Physical Address	Facility Operator
I-93, Exit-14	Concord	30 Stickney Ave	Concord Coach Lines
RTE 16, Exit-9	Dover	23 Indian Brook Drive	Jalbert Leasing (dba C&J Bus)
I-93, Exit-5	Londonderry	4 Symmes Drive	Boston Express Bus
I-93, Exit- 4	Londonderry	2 Garden Lane	Boston Express Bus
FEE Turnpike, Exit-8	Nashua	8 North Southwood Drive	Boston Express Bus
I-89, Exit-12	New London	31 Route 103A	Dartmouth Coach
I-95, Exit-3A	Portsmouth	185 Grafton Drive	Jalbert Leasing (dba C&J Bus)
I-93, Exit-2	Salem	10 Raymond Avenue	Boston Express Bus

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EXHIBIT A

SECTION-2 Portable Solar Powered DMS Preventive Maintenance Inspection

The ITS sub-system (as of January 1, 2018) is composed of Vermac Inc., PSC, See Exhibit-A, Table-1 for complete DMS sign list. Only 26-units Statewide are being called out for annual preventive maintenance inspection under this contract

1. Site Check, DMS Trailer Hardware inspection
 - a) **Record** sign message status as found on sign upon arrival.
 - b) String trim all vegetation from under and around portable DMS trailer.
 - c) **Inspect** the area around semi-permanent located portable DMS board. Look for any signs of erosion that may cause undermining of the sign pad or jack stands. Note and report any actions that should be taken.
 - d) **Inspect** electric meter pedestal, electric cut off switch, and conduit associated with main commercial electric feed for DMS. Note, record, and report deficiencies. Verify documented electric meter number. This is only for two (2) commercially powered Ver-mac signs one located on I89 N in Bow and the other on I89 S, Concord.
 - e) **Inspect** the condition of the concrete foundations. Look for large cracks and delaminating concrete. Note, record and report any problems.
 - f) Lubricate all moving mechanical parts with white lithium grease
 - g) **Check** to make sure trailer is level. Do a visual check of the signboard to make sure display is level as seen from 100 feet.
 - h) **Inspect** leveling jacks-apply a light coating of motor oil heavy weight SEA 30 on legs and if capable inject Multi -Purpose Grease into grease fittings on jacks
 - i) **Replace** Department provided padlocks as needed.

- j) **Inspect** hinges and cabinet doors should for corrosion and lubricated. Handle with care if door is seized shut. Forcing the door open will break the hinge welds.
- k) **Lower Sign display** all the way and check the hydraulic fluid level in the reserve tank. Level should be 3/4 full with Dexron III Transmission Fluid. **Document** need for fluid.
- l) **Remove** any insect, rodent, or bee nests from sign
- m) **Verify** that all conduit entry and exit points are sealed with steel wool to prevent rodent entry install steel wool if necessary.

2. DC Battery Power System

- a) **Fill** battery cells with distilled water (only) as needed. **Note** any exposed cores on PMI report. Fluid level should be right up to the bottom edge of the fill hole.
- b) **Inspect** battery terminals and ring terminal connections for tightness. Clean and tighten if needed. Check for corrosion and apply terminal protector as needed.
- c) **Inspect** all battery cables for Knicks, breaks, corrosion or chew marks. Replace if needed.
- d) **Measure and record** battery bank voltage. Fully charged batteries should read 13.4 (Sunny) 12.5 (Cloudy) volts. Discharged batteries should not drop below 12.0 volts. Isolate individual batteries as needed to evaluate current state of battery bank if normal battery bank terminal voltage(s) are not observed.
- e) **Measure and record** solar panel voltage output. Panels should put out 20.0 volts (nominal) on a bright sunny day. Check charging current using clamp meter, or with on-board, original manufacturer metering.
- f) **Inspect** solar panel surface(s) for cleanliness and **clean** as needed.
- g) **Remove** snow and ice from solar panels and trailer as needed.
- h) **Check** tilt angle of solar panels and set for 45-degree nominal angle to the horizontal plane. Panels should face southwest for maximum performance. Or alternatively panels may face to the most exposed portion of the southerly horizon depending upon road alignment and tree line. Adjust as needed.
- i) **Verify** brake system for solar panels, display are engaged and not loose. **Tighten** if needed.

3. Display and Display Electronics

- a) **Clean** Display as needed. The plastic sign face should be cleaned (using dishwashing liquid and water) **IMPORTANT NOTE:** Do not use window cleaner (Windex) to clean Lexan panel.
- b) Perform a visual pixel test on the message sign using the Chessboard or Sign Test function. Inspect display for anomalies in display. **Record** results
- c) **Inspect** display and housings for rodent damage and/or any insect nests inside or on the message sign.
- d) Perform sign self-diagnostics (if supported) and **record** any error codes.
- e) **Verify** display alignment using sight tube, adjust to allow for maximum view time to on-coming traffic. Check original manufactures literature for optimization.

4. Communication Mounts, Cabling, and remote functionality

- a) **Inspect** the coaxial cable for damage. Look for kinks, nicks crush points, or damaged insulation. Ensure cables are secured to the tower. Correct as necessary
- b) **Inspect** connections for proper fittings and correct weather sealing.
- n) **Verify** the cable is attached to a Polyphaser, lightning arresting device and that Polyphaser is properly tightened and attached to a place bonded to the central earth terminal ground. (if applicable)
- o) **Verify** remote operation after all inspection activates are completed and access doors are secured. **Verify** operation by calling TMC to send a test message. Verify that the message is correct and that the sign can also be remotely blanked. Have TMC restore previous message if applicable and **Record** results of remote test message operations by TMC. Record Message status as left prior to departure from site.

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EXHIBIT A

SECTION-3 RWIS Preventive Maintenance Inspection

The system (as of January 1, 2018) is composed of Vaisala, formerly Surface System Incorporated (SSI), RWIS Stations, Guardian Ice Watch equipment and LX remote processing units and Lufft pavement sensors. See Exhibit-A, Table-1

1. Site Check
 - a) Trim all vegetation from around RWIS base. Be careful not to damage exposed elements of the earth electrical ground system.
 - b) *Inspect* the area around the tower base. Look for any erosion of the soil that may cause undermining of the tower base or the concrete pad. Replace any missing soil. Note what may be causing the erosion and anything that may be done to prevent it. Such as gravel or re-grading the area around the site.
 - c) *Note* any trees that are hanging over the station and causing interference with the anemometer or the present weather detector. Provide detail as to amount, distance, height, photographs, etc.
 - d) Inspect electric meter pedestal, pole, wires, conduit associated with main commercial electric feed for RWIS station or instrumentation. Note, record and report deficiencies. Verify documented electric meter number.

2. Mounting Structure Mechanical Check
 - a) *Inspect* the condition of the concrete of mounting structure base. Look for large cracks and delaminating concrete. Note, record and report any problems.
 - b) *Inspect* the connections of the mounting structure to foundation. Look for missing, damaged, or extremely corroded nuts and bolts. Remove and replace as needed.
 - c) *Inspect* the lightning ground system. Ensure the system is properly connected to all system components. Check the wire for breaks and corrosion. Check that the connectors or cad welds are attached to the structure securely. Check for tightness, corrosion, damage and verify that the wire is secure in their respective lugs.

- d) *Verify* that all anti-climb panels are secured to the tower. *Note* any problems.
- e) *Check* the stability and attachment of the RPU cabinet, WIVIS enclosure, and any other cabinets attached to the tower. Ensure all mounting hardware is present and tight.
- f) *Inspect* tower folding mechanism. Check condition of all mounting hardware replace any damaged or missing nuts, bolts or u-bolts. Check condition of tower wench. Winch should operate freely, lubricate with lithium grease if necessary. Inspect the lowering cable for fray damage and or corrosion. Schedule replacement of cable if necessary.
- g) *Check* condition of all padlocks. Clean with a solvent and lubricate with a **DRY LUBE, DO NOT USE ANY TYPE OF GREASE**. Replace with Department provided Master lock #2882 if necessary.
- h) *Inspect* the physical mounting of all sensors mounted to the tower. *Inspect* all sensor cables for damage including ultra violet light damage. Ensure that cables are securely connected to the tower in a manner that prevents damage from icing, wind or rain.
- i) *Inspect* the condition of all conduits. Ensure they are properly terminated to the RPU or other device. Check for broken or cracked PVC, and damaged fittings.
- j) *Remove* any insect, rodent, or bird nests from tower, base and or cabinets. *Impliment or recommend* prevention or deterants methods.
- k) *Verify* that all conduit entry and exit points are sealed with steel wool to prevent rodent entry install steel wool if necessary.

3. Enclosures, and RPU hardware

- a) *Inspect* mounting hardware, door hinges, and cable thimbles for proper installation. Replace or repair as necessary. *Seal* any abandoned conduit or hardware holes.
- b) *Verify* that steel wool is place inside all conduits entering from the ground. Replace if necessary.
- c) *Verify* that all mounting hardware is securely fastened to the back plate.
- d) Visually *inspect* that all cards and cables are completely seated in their respective sockets.

- e) Visually *inspect* all (instrument) wire terminations on both input / output boards. Look for loose, frayed, broken, or un-terminated wires. **Record** as found condition
- f) Visually *inspect* LEDS located on the analog data board, CPU board, and octal board. All LEDS should be flashing green. If these are not flashing, or are amber in color, refer to the LX repair manual.
- g) *Verify* that all drain, shields or ground wires are securely connected to the ground buss. **Record** any exceptions

4. Communication Mounts and Cabling

- a) *Inspect* the coaxial cable for damage. Look for kinks, nicks crush points, or damaged insulation. Ensure cables are secured to the tower. Correct as necessary
- b) *Inspect* connections for proper fittings and correct weather sealing.
- c) *Verify* that the RF cable is attached to a Polyphaser, lightning arresting device and that Polyphaser is properly tightened and attached to a place that is bonded to the central earth terminal ground.

5. Electrical Service

- a) *Locate* source of Commercial electrical power. If the service is located in a building record the panel location, panel identifier, and breaker number on the RWIS information spread sheet. If it is connected to a standalone service, record the location of the PED, meter number, and supplying utility on the spread sheet. Record any problems with supplying service gear.
- b) *Measure and record* voltage at electric service disconnect.
- c) Shut off AC power at source of commercial electric power. *Inspect* service disconnect and associated power distribution wiring. *Verify* all wire terminations are correctly terminated and tight. Inspect wire for damage due to overheating or shorting. Look for any damage to internal mechanisms and enclosure. *Verify* that disconnect mechanism works correctly.

6. Battery Backup System

- a) **Inspect** stability of cabinet(s), and connecting conduits. **Record** any problems on site spread sheet.
- b) **Inspect** vents, clear debris if necessary and insure all filters are in place.
- c) **Locate** fusible link or breaker on load-side of the batteries. Ensure fuse or breaker is present, sized correctly, and connected correctly.
- d) **Inspect** all wire connections to Batteries. Check for corrosion on battery terminals. Clean terminals and wire if corrosion is found. **Record** original in-service date of batteries.
- e) Disconnect input power to charger. Isolate battery terminals, then **measure and record** each battery's terminal voltage. Reconnect wires to complete normal battery configuration, and load test all batteries with a battery tester.
- f) Reconnect battery connection to charger and **record** float voltage after a period of five (5) minutes

7. Cell Modem Signal Strength

- a) **Quantify** signal strength of the cell modem service using a web browser. **Record** the RF level on the site spread sheet. **Record** Ec /Io ratio.
- b) Compare the present signal strengths with previously recorded readings. **Record** any significant differences.
- c) **Verify** antenna azimuth matches previously documented heading.

8. RPU Voltage Measurements

- h) **Measure and record** the 12 volt, minus 12 volt, and 5-volt test points from the A and B board. NOTE: If the 5 Volt is lower than 4.8 volt the power supply needs to be adjusted or replaced to prevent damage to the CPU and flash card.

- i) In cases where the RPU is equipped with a 12-volt DC to DC power supply, **measure and record** voltage at the test point(s) on the power supply.

9. RPU Software

- a) log in to RPU. **Record** current firmware version. **Recommend** updates to the firmware version as necessary, if it is not current.
- b) **Perform** station configuration back-up and save .TGZ file to your laptop hard drive. This will allow for easy restoration of the station in case of flash card failure. **Transmit** .TGZ file to the attention RWIS Technician, NHDOT, Bureau56@dot.nh.gov
- d) **Verify** the correct GPS coordinates are entered, and the station name is correct.

10. FP2000 pavement sensor (Littleton RWIS only)

NOTE: Traffic control to include a lane closure shall be required for these tests and shall be provided by the Department on a mutually agreed schedule

- a) **Inspect** condition of epoxy sealing compound around the sensor and in the saw kerf for the cable. **Reseal** if damaged or missing.
- b) Clean the surface of the sensor with simple green and a nylon bristle brush. Clean any debris out of the well.
- c) **Measure** surface temperature of sensor with a laser temperature measuring tool. **Compare** the test reading with that of the RPU surface temperature reading and **record** difference. Comparison should be no more than 4 degrees.
- d) Verify data voltages displayed in RPU surface display detail are within range for the current state of the sensor. For example voltages for wet or dry conditions. Refer to LX manual for typical voltage ranges.

11. Guardian System

a) DST 111

- I. Verify DST 111 is properly aimed at the desired area of the road surface by looking along the straight part of the covers lower edge.
- II. Functional Check
- III. Refer to DST 111 user's guide Page-46. Follow instructional commands for a functional check.
- IV. Disassemble and clean detector window and hood with mild detergent and soft lint free cloth. A non streaking glass cleaner may also be used.

b) Checking the HMP50

- I. **Remove and replace** membrane filter from tip of the HMP50 with a clean spare. Save the old filter and clean it for use on the next HMP50.
- II. **Verify** the performance of the HMP50 by comparing the air temperature and relative humidity readings with those derived from a calibrated temperature and humidity meter.
- III. Maximum difference allowed between the HMP50 and the reference instrument is approximately +/- 1 degree C and +/- 6 % RH. **Record** comparison reading.

c) DSC 111

- I. **Inspect** DSC 111 device, cables, and connectors for noticeable damage. Record findings
- II. **Verify** the device is aimed at the desired area of the road surface, by looking along the straight part of the covers lower edge.

Continued: For visual description of the aiming procedure refer to Page 23 of the DSC111 State sensor manual

- III. Follow the procedure on Page-82 of the DSC111 State Sensor manual.
- IV. If cleaning is necessary please refer to Page-84 of the DSC111 State Sensor manual for commands and procedures. Note: In most cases cleaning will not be necessary due to the protection provided by the hoods.
- V. **Calibrate** as needed if the color of the road surface has dramatically changed since the time of original installation, for example a resurfacing or a seal. Refer to Page-86 of the DSC111 State Sensor manual for detailed calibration procedure.

12. Sub surface temperature probe.

- a) **Verify** temperature is displayed in the RPU.
- b) With an ohm meter, **measure and record** the resistance between the two white wires going to the sub probe. Compare the resistance readings to the conversion chart in the LX manual. The temp display in the RPU should match the converted ohm reading. **Record** difference in reading

13. RM Young RH & Air Temp Sensor

- a) **Remove** the temperature and RH probe from the radiation shield by loosening the compression nut on the bottom of the radiation shield and sliding the sensor assembly out
- b) Remove the twist off filter cap from the tip of the sensor. **Clean** the cap with water and mild soap. Do not use any solvents.
- c) **Clean** the dirt and or spider webs from the radiation shield

d) *Reassemble* the sensor and allow it to dry before testing temp and RH.

e) Verify the temp and RH in the RPU, *compare* the readings to the Vaisala AT/RH hand held meter. The temp measurements should be within +/- 3 degrees. The RH should be within +/- 5%. If these reading exceed those limits, the sensor needs to be calibrated. Record any problems found on the site spread sheet.

14. Met One Barometric Pressure Sensor

a) *Verify* data is being displayed in the RPU.

15. OSi WIVIS 130 and OSi WIVIS model

a) *Inspect* lens heaters, touch each lens next to the disc shaped heaters that are bonded to the upper and lower inside surface of the lenses. The lenses should be warm to the touch when operational.

b) *Clean* the lenses on the sensor head with a lint free cloth and common glass cleaner. Remove all spider webs and bird droppings from the head.

c) *Visually inspect* the inside of the electronics enclosure. The inside should be clean and free of moisture and or debris. *Clean* as needed.

d) *Calibrate* as needed, for Model 130, follow the procedure in the WIVIS Calibration kit to calibrate the precipitation and visibility operation of the WIVIS. Use the sheet supplied to record cal values.

e) *Calibrate* as needed, for model 430, connect your laptop to the serial cable going to the WIVIS head. Using hyper terminal set at 8, N, 1 9600 baud. Send the "C" poll command and observe the response. Using Optical Scientific Inc. technical manual for OWI-430 WIVIS. Refer to Page 5-1 under the "quick check of data fields" and *verify* appropriate value ranges of the polling string. If the values are outside of the ranges listed contact OSI technical support for help in determining if the WIVIS needs to be sent to factory for recalibration.

16) PWD 12

- a) *Clean* the transmitter and receiver lenses and hood. Use a lint free cloth and common house hold glass cleaner.
- b) Before cleaning the rain cap, Technician *shall* prevent electrostatic discharge through instrument by use of a static wrist strap. *Clean* the rain cap sensor with a lint free cloth and mild detergent. Be careful not to scratch the surface.
- c) Use manual provided with PWA 11 calibration kit for directions on how to calibrate the visibility function.

17) RM Young Ultrasonic Anemometer

- a) *Verify* wind data is present in the RPU.
- b) *Verify* there are bits in the received data fields under the serial link in the maintenance menu.
- c) *Clean* any spider webs or debris from the sensor. Be careful not to damage the transducers.
- d) *Inspect* each transducer probe to insure it is not damaged.
- e) Place a plastic bag over the sensor and *verify* that the wind speed reading in the RPU goes to zero.
- f) *Measure and record* the voltage of the heater power supply.

18) Video Camera

- a) *Clean* camera dome or housing window, with glass cleaner and towel.
- b) *Verify* that a current Image is being sent to the RPU.

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EXHIBIT A

SECTION-4 ITS Cabinet Preventive Maintenance Inspection

The Statewide system is composed of a variety of ground and pole-mounted NEMA rated cabinets with various options including, but not limited to; front and rear access doors, single sided access, thermostatically controlled heater, ventilation fans, commercial power management modules, surge suppression, backup generator hookup, and un-interruptible power supplies. Task list may not be applicable to all cabinet and or cabinet configurations.

I. Cabinet

- a) Note cabinet *name* or location on PMI report. Road, road side direction, mile marker.
- b) Confirm standard access through operation of all door locks, doors latches, handles and hinges. Lubricate as needed, and note any deficiencies on PMI report
- c) Inspect door seal(s) for integrity and condition. Treat seals with moisturizer or *Note* if replacement is required.
- d) *Measure and record* earth ground bond resistance of cabinet through use of clamp Ohm meter
- e) *Note* present style, quantity of door air filter, *note* height and width in inches for replacement filters. Paper filters shall be phased out.
- f) Inspect wire minders; look for missing hardware, and cable dressing. Check bending radius of fiber optic cables.
- g) Check for rodent intrusion and insect infestation, note presence of either on PMI report. Seal conduit openings inside cabinet to prevent rodent intrusion.
- h) Clean debris, dust and pollen from cabinet by forced air, vacuum, or combination of both.
- i) Test GFI AC outlet breaker for trip and reset action.
- j) Test heater operation by operation of thermostat.
- k) Test ventilation fan by operation thermostat.

- l) Test cabinet light by operation of cabinet doors.
- m) *Inspect* all rack mounted equipment for alarms lights and indicators. Check for alarms condition, manually clear alarms if not relevant and report continuous alarms to Communication Supervisor for unscheduled maintenance job tracking.
- n) Remove commercial power from cabinet by operation of electric breaker and confirm proper operation / take over by UPS. *Verify* continued power condition of applicable devices. Measure and record total system current draw in DCA on common battery cable. Verify consistency with any local indications of current draw and voltage of applicable UPS models with display and or remote diagnostics.
- o) *Measure and record* commercial power quality. Voltage, phase, and harmonic distortion
- p) Identify if subject cabinet is associated with a pre-existing or planned fiber optic connection path. *Note* if (locating) tracer wire and Trace-Safe terminal connection points is *present or needed* on outside of cabinet.

2. Communication Items

- a) *Inspect* the communications cables for damage. Look for kinks, nicks crush points, or ultraviolet light damaged insulation. Ensure cables are secured. Correct as necessary.
- b) *Inspect* connections for proper fittings and correct weather sealing. Note any deficiencies and correct as needed.
- c) *Verify* that RF cables are attached to Polyphaser(s), lightning arresting device. And further that the Polyphaser is properly tight and attached to a place that is bonded to the central earth terminal ground.
- d) *Verify* POE and surge suppression related to any associated device(s) is property mounted, wired, and bonded to earth ground.
- e) *Inspect* fiber patch panels, check vacant patch panel ports for missing dust caps. Replace as needed.
- f) *Verify* that active patch cables are seated, excess length stored or minded in a way that provides for proper system operation while reducing risk of accidental damage.

f) *Verify and record* inventory of replacement fiber patch cables in applicable cabinets.

g) *Verify* inventory information of ICAB as provided by Department. Redline corrections, omissions, and deletions.

h) Inspect Electric Meter, Breaker Panel for tampering and or damage. Especially those Meters located outside the limited access right of way of the highway.

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EXHIBIT A

SECTION-5 CCTV Camera Preventive Maintenance Inspection

The Statewide system is composed mainly of pole mounted Axis PTZ cameras with MG² lowering systems.

Some cameras are collocated with RWIS equipment and may be lowered by tilt-over tower.

Very few are located on poles that cannot be lowered and will require a bucket truck with a 30-foot reach.

- a) *Note* camera location on PMI report. Road, road side direction, mile marker.
- b) *Confirm* current operational status of camera prior to lowering with TMC 271-6862
- c) *Confirm* standard lowering access through (camera / comm') pole hand hole, and verify normal lower device action through operation.
- d) *Inspect* overall condition of camera housing and connector housing and contacts.
- e) *Clean* camera housing dome as needed with glass cleaner and soft lint free cloth.
- f) *Inspect* for scratches and apply plastic polish to remove light scratches as necessary. Remove and replace dome if damaged
- g) Apply Rain-X to camera dome
- h) *Verify* normal rising of camera or pole and locking of camera connector through operation.
- i) *Confirm* operational status of camera after PMI with TMC 271-6862

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EXHIBIT-B

Section-1, ITS Sub-System Unscheduled Maintenance

<u>Sub-system</u>	<u>Cost Per Hr.</u>		<u>Est # of Hours</u>	<u>Subtotal Yearly</u>
ITS Sub-system repair on-Site	\$95.00	X	250	\$23,750.00
Off site ITS repair Shop Rate	\$95.00	X	15	\$1,425.00
Subtotal cost for Sub-system Repairs				\$25,175.00

Example	\$2.00	x	8-hours	\$16.00
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EXHIBIT-B

Section-2, ITS System Unscheduled Maintenance Repairs

System	Hourly Cost			Est # of Hours	Subtotal Yearly
Microwave RF Systems	\$95.00	X	Hr.	105	\$9,975.00
Fiber Optic Systems	\$95.00	X	Hr.	65	\$6,175.00
ITS Comm' Hub Equipment	\$95.00	X	Hr.	70	\$6,650.00
Network Monitoring	\$95.00	X	Hr.	30	\$2,850.00
Commercial Electric Service (Repair)	\$95.00	X	Hr.	24	\$2,280.00
Solar Power Plant Repair	\$95.00	X	Hr.	21	\$1,995.00
Battery Backup System UPS repair	\$95.00	X	Hr.	8	\$760.00
Subtotal cost for System Maintenance Repairs					\$30,685.00

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EXHIBIT-B

SECTION-3 Tower / Pole Mounted Microwave Antenna Repair

Personnel	Estimated Hours Per Year	Cost per Hour	Total Cost Per Year
Tower Climber	15	\$85.00	\$1,275.00
Ground Crew Member	15	\$85.00	\$1,275.00
System Technician	14	\$95.00	\$1,330.00
Subtotal cost for Microwave Antenna System Repairs			\$3,880.00

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EXHIBIT-B

Section-4, Associated Maintenance Repair Cost

Travel Rate for Vehicle	Cost per Hour after 2-hrs Round Trip	Estimated number of Hours / Yearly	Extended Cost Price times Hours
	\$40.00	45	\$1,800.00
Travel Rate for Technician	Cost per Hour after 2-hrs Round Trip	Estimated number of Hours / Yearly	Extended (hourly) Cost Price times Hours
	\$40.00	45	\$1,800.00
Specialty Equipment rate	Cost per Hour on Site For lift or crane	Estimated Number of Hours / yearly	Extended (hourly) Cost Price times 10 Hours
	\$200.00	20	\$4,000.00
Replacement Parts	Estimated Yearly Parts Costs		Fixed Cost to be included in the bid
	\$35,000.00		\$35,000.00
Subtotal Associated Maintenance Repair Cost			\$42,600.00

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EXHIBIT-B

Section-5, Scheduled Preventative Maintenance Inspections

<u>Sub-system</u>	<u>Cost Per UNIT</u>		<u>Number of Units</u>	<u>Subtotal Yearly</u>
Portable, Solar Powered, DMS PMI	\$200.00	X	26	\$5,200.00
RWIS PMI	\$400.00	X	16	\$6,400.00
CCTV Camera PMI	\$85.00	X	50	\$4,250.00
ITS Cabinet	\$85.00	X	50	\$4,250.00
Subtotal cost for all Preventative Maintenance				\$20,100.00

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EXHIBIT-B

Section-6, ITS Device Site - Work

Sub-system	<u>Cost Per UNIT</u>		Est # of Hours	<u>Subtotal Yearly</u>
Site Marking, Layout	\$125.00	X	6	\$750.00
Communications Study	\$125.00	X	4	\$500.00
Commercial Power Planning and Coordination	\$125.00	X	4	\$500.00
Documentation and Reports including FCC license modification	\$125.00	X	3	\$375.00
Fiber Optic Retrofitting	\$125.00	X	16	\$2,000.00
Subtotal ITS Device Site Work				\$4,125.00

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EXHIBIT-B
Section-7, Tabulation Table

Subtotal from Section-1	Page 1 of 6	ITS Device Subsystem Unscheduled Maintenance	\$25,175.00
Subtotal from Section-2	Page 2 of 6	ITS System Unscheduled Maintenance	\$30,685.00
Subtotal from Section-3	Page 3 of 6	Tower Mounted Microwave Antenna Repair	\$3,880.00
Subtotal from Section-4	Page 4 of 6	Associated Maintenance Cost	\$42,600.00
Subtotal from Section-5	Page 5 of 6	Scheduled Preventive Maintenance	\$20,100.00
Subtotal from Section-6	Page 6 of 6	ITS Device Site - Work	\$4,125.00
Total Annual Contract bid amount			\$126,565.00
This is Your Bid ►			

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EXHIBIT-B

Section-8, Invoice and Billing Information

- I. Invoices shall be addressed as specified.

NHDOT, Susan Klasen
Bureau of TSMO
PO Box 483
Concord, NH 03302-0483

- II. Invoices shall be delivered by one of the following methods.

- A. Mailed via United States Postal Service
- B. Hand delivered to Bureau of TSMO, 110 Smokey Bear Boulevard, Concord NH.

- III. Invoice(s) for all work performed from *first* day of each month to *last* day of each month shall be combined onto a single invoice. In addition to a letterhead identifying the Contractor by name, the invoice(s) shall contain the following information in a table or column format

- A. A common invoice number for all corresponding DOT Issue numbers.
- B. Date of invoice
- C. DOT work request -- Issue numbers (for completed work only)
- D. A *basic* description of work performed with work *site* or equipment description.
- E. Contract cost per work request for *labor*
- F. Cost per work request for *materials*
- G. Contract cost per work request for *travel*, if applicable

- IV. The NHDOT, Bureau of TSMO, administrator shall make final determination of completed maintenance or work action, per work order (number). Requested changes, revisions, deletion, and or deferred payments by the Department shall be handled in writing by the Administrator or their designee.

- V. Contractor shall establish a NET-30 terms for the Department

- VI. Successful Contractor shall provide *accounts receivable* contact information and any subsequent changes to that information as referenced in Section-9 that includes; name, title, mailing address, e-mail, and telephone number for mailing purposes and the resolution of all invoicing discrepancies.

SECTION-9, Contractor Contact Information

Contractor Contact Information:

Name: Pat Dennis

Address: 79 Dow Rd, Bow, NH 03304

Telephone number: 1-978-989-3260

Email address: pdennis@tilsontech.com

For Invoicing:

Accounting Manager: Mark Usatch

Telephone number: 1-207-272-7900

Email address: ar@tilsontech.com

EXHIBIT-C

Section-14. Insurance and Bond

To insurance in an amount not less than a combined single limit of \$ 1,000,000.00 per occurrence and \$2,000,000.00 aggregate (amend 14.1.1).

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Exhibit-C, Page 2 of 2

Initials SB3 Date 4/1/18

State of New Hampshire

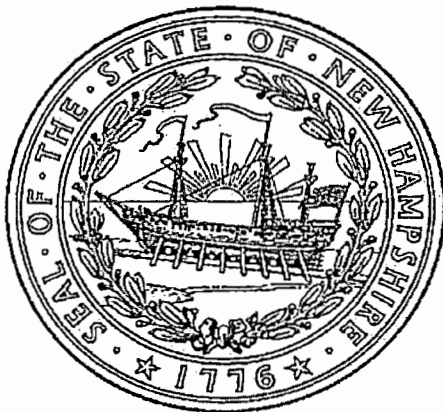
Department of State

CERTIFICATE

I, William M. Gardner, Secretary of State of the State of New Hampshire, do hereby certify that TILSON TECHNOLOGY MANAGEMENT, INC. is a Maine Profit Corporation registered to transact business in New Hampshire on December 02, 2015. I further certify that all fees and documents required by the Secretary of State's office have been received and is in good standing as far as this office is concerned.

Business ID: 735502

Certificate Number: 0004088776



IN TESTIMONY WHEREOF,

I hereto set my hand and cause to be affixed
the Seal of the State of New Hampshire,
this 26th day of April A.D. 2018.

A handwritten signature in cursive script, appearing to read "William M. Gardner".

William M. Gardner
Secretary of State

CERTIFICATE OF TILSON TECHNOLOGY MANAGEMENT, INC.

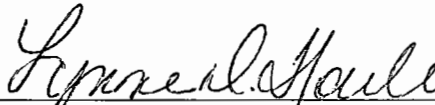
(Corporation Without Seal)

I, Lynne D. Houle, do hereby represent and certify that:

- (1) I am the Clerk of Tilson Technology Management, Inc., a Maine Corporation (the "Corporation").
- (2) I maintain and have custody of and am familiar with the minutes of the Corporation.
- (3) I am duly authorized to issue certificates with respect to the contents of such books.
- (4) The following statements are true and accurate based on the resolutions adopted by the Board of Directors of the Corporation via unanimous written consent in lieu of a meeting of the Board of Directors dated as of April 18, 2016, which written consent was duly adopted in accordance with Maine law and the Bylaws of the Corporation.
- (5) The signature of Joshua Broder, Chief Executive Officer of the Corporation, affixed to any contract, instrument or document shall bind the Corporation to the terms of such contract, instrument or document.
- (6) The foregoing signature authority has not been revoked, annulled or amended in any manner whatsoever, and remains in full force and effect as of the date hereof.
- (7) The Corporation has no seal.

IN WITNESS WHEREOF, I have hereunto set my hand as Clerk of the Corporation.

This document is dated the 10th day of April, 2018.



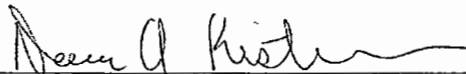
Lynne D. Houle, Clerk of Tilson Technology Management, Inc.

STATE OF MAINE,
COUNTY OF CUMBERLAND, ss.:

Personally appeared before me Lynne D. Houle, to me known to be the person described in and who executed the within and foregoing instrument, and acknowledged that she signed the same as her voluntary act and deed, for the uses and purposes therein mentioned.

Witness my hand and official seal hereto affixed.

Signed:



Donna A. Kistenmacher, Notary Public in and for the
State of Maine

My commission expires

5/20/2022

DONNA A. KISTENMACHER
NOTARY PUBLIC
State of Maine
My Commission Expires
May 20, 2022

