

AGREEMENT FOR PROFESSIONAL SERVICES

THIS AGREEMENT FOR PROFESSIONAL SERVICES (“**Agreement**”) is made and entered into as of the date stated on the City’s signature page below (the “**Effective Date**”) by and between the **CITY AND COUNTY OF DENVER**, a municipal corporation of the State of Colorado acting on behalf of its Department of Aviation (the “**City**”), and **UNIVERSITY CORPORATION FOR ATMOSPHERIC RESEARCH** (“**UCAR**”), a nonprofit corporation authorized to conduct business in the state of Colorado, (“**Consultant**”) (collectively the “**Parties**”).

WITNESSETH:

WHEREAS, the City owns, operates, and maintains Denver International Airport (“**DEN**”); and

WHEREAS, the City desires to obtain professional services regarding the Maintenance Decision Support System (“**MDSS**”) product. The MDSS product helps DEN make sound tactical decisions during snow events; and

WHEREAS, the broad needs met by the current MDSS include the following: Centralized Weather Support, Enhanced Strategic Planning Capability, Improved Tactical Response Capability, Improved Adverse Airfield Condition Weather Notification, and Operation- Specific Decision Support. The NSF National Center for Atmospheric Research (“**NSF NCAR**”), which is operated by UCAR created a custom version of the Federal Highway Administration MDSS for Colorado with a specific focus on DEN runway operations. This project will be enhancing the MDSS DEN forecasts with better models and some new algorithms related to better precipitation and snow forecasting; and

WHEREAS, Consultant has been providing these critical, specialized weather prediction services to DEN since 2008 and thus, due to the specialization of the MDSS product qualifies for the Sole Source exception under Memorandum 8B; and

WHEREAS, Consultant is qualified, willing, and able to perform the services, as set forth in this Agreement in a timely, efficient, and economical manner; and

NOW, THEREFORE, for and in consideration of the premises and other good and valuable consideration, the Parties agree as follows:

1. **LINE OF AUTHORITY:**

The Chief Executive Officer of the Department of Aviation or their designee or successor in function (the “**CEO**”), authorizes and directs all work performed under this Agreement. Until otherwise notified in writing by the CEO, the CEO has delegated the authority granted herein to **DEN OPERATIONS**. The relevant Senior Vice President (the “**SVP**”), or their designee (the “**Director**”), will designate a Project Manager to coordinate professional services under this Agreement. Reports, memoranda, correspondence, and other submittals required of Consultant hereunder shall be processed in accordance with the Project Manager’s directions.

2. SCOPE OF WORK AND CONSULTANT RESPONSIBILITIES:

A. Scope of Services. Consultant shall provide professional services and deliverables for the City as designated by the CEO, from time to time and as described in the attached *Exhibit A* (“**Scope of Work**”), in accordance with the schedules and budgets set by the City. Without requiring amendment to this Agreement, the City may, through an authorization or similar form issued by the CEO and signed by Consultant, make minor changes, additions, or deletions to the Scope of Work and other exhibits without change to the Maximum Contract Amount.

B. Standard of Performance. Consultant shall faithfully perform the work required under this Agreement in accordance with the standard of care, skill, efficiency, knowledge, training, and judgment provided by highly competent professionals who perform work of a similar nature to the work described in this Agreement.

C. Time is of the Essence. Consultant acknowledges that time is of the essence in its performance of all work and obligations under this Agreement. Consultant shall perform all work under this Agreement in a timely and diligent manner.

D. Subcontractors.

i. In order to retain, hire, and/or contract with an outside subcontractor that is not identified in this Agreement for work under this Agreement, Consultant must obtain the prior written consent of the CEO. Consultant shall request the CEO’s approval in writing and shall include a description of the nature and extent of the services to be provided; the name, address and professional experience of the proposed subcontractor; and any other information requested by the City.

ii. The CEO shall have the right to reject any proposed outside subcontractor deemed by the CEO to be unqualified or unsuitable for any reason to perform the proposed services. The CEO shall have the right to limit the number of outside subcontractors and/or to limit the percentage of work to be performed by them.

iii. Any final agreement or contract with an approved subcontractor must contain a valid and binding provision whereby the subcontractor waives any and all rights to make any claim of payment against the City or to file or claim any lien or encumbrance against any City property arising out of the performance or non-performance of this Agreement and/or the subcontract.

iv. This Section, or any other provision of this Agreement, shall not create any contractual relationship between the City and any subcontractor. The City’s approval of a subcontractor shall not create in that subcontractor a right to any subcontract. The City’s

approval of a subcontractor does not relieve Consultant of its responsibilities under this Agreement, including the work to be performed by the subcontractor.

E. Personnel Assignments.

i. Consultant or its subcontractor(s) shall assign all key personnel identified in this Agreement to perform work under this Agreement (“**Key Personnel**”). Key Personnel shall perform work under this Agreement, unless otherwise approved in writing by the SVP or their authorized representative. In the event that replacement of Key Personnel is necessary, the City in its sole discretion shall approve or reject the replacement, if any, or shall determine that no replacement is necessary.

ii. It is the intent of the Parties that all Key Personnel perform their specialty for all such services required by this Agreement. Consultant and its subcontractor(s) shall retain Key Personnel for the entire Term of this Agreement to the extent practicable and to the extent that such services maximize the quality of work performed.

iii. If, during the Term of this Agreement, the Project Manager determines that the performance of any Key Personnel or other personnel, whether of Consultant or its subcontractor(s), is not acceptable or that any such personnel is no longer needed for performance of any work under this Agreement, the Project Manager shall notify Consultant and may give Consultant notice of the period of time which the Project Manager considers reasonable to correct such performance or remove the personnel, as applicable.

iv. If Consultant fails to correct such performance, then the City may revoke its approval of the Key Personnel or other personnel in question and notify Consultant that such Key Personnel or other personnel will not be retained on this Project. Within ten (10) days of receiving this notice, Consultant shall use its best efforts to obtain adequate substitute personnel who must be approved in writing by the Project Manager. Consultant’s failure to obtain the Project Manager’s approval shall be grounds for Termination for Cause in accordance with this Agreement.

3. OWNERSHIP AND DELIVERABLES:

Upon payment to Consultant, all records, data, deliverables, and any other work product prepared by Consultant or any custom development work performed by Consultant for the purpose of performing this Agreement on or before the day of the payment, whether a periodic or final payment, shall become the sole property of the City. Upon request by the City or based on any schedule agreed to by Consultant and the City, Consultant shall provide the City with copies of the data/files that have been uploaded to any database maintained by or on behalf of Consultant or otherwise saved or maintained by Consultant as part of the services provided to the City under this Agreement. All such data/files shall be provided to the City electronically in a format agreed to by the Parties. Consultant also agrees to allow the City to review any of the procedures Consultant uses in performing any work or other obligations under this Agreement, and to make available for inspection any and all notes, documents, materials, and devices used in the preparation for or performance of any of the scope of work, for up to three (3) years after termination of this Agreement. Upon written request from the City, Consultant shall deliver any information

requested pursuant to this Section within ten (10) business days in the event a schedule or otherwise agreed-upon timeframe does not exist.

4. TERM AND TERMINATION:

A. Term. The Term of this Agreement shall commence on January 1, 2025 and shall expire Three Years from the commencement date, unless terminated in accordance with the terms stated herein (the “**Expiration Date**”). The Term of this Agreement may be extended for two additional years, on the same terms and conditions, by written notice from the SVP to Consultant. However, no extension of the Term shall increase the Maximum Contract Amount stated below.

B. If the Term expires prior to Consultant completing the work under this Agreement, subject to the prior written approval of the CEO, this Agreement shall remain in full force and effect until the completion of any services commenced prior to the Expiration Date. Consultant has no right to compensation for services performed after the Expiration Date without such express approval from the CEO.

C. Suspension and Termination.

i. Suspension. The City may suspend performance of this Agreement at any time with or without cause. Upon receipt of notice from the SVP, Consultant shall, as directed in the notice, stop work and submit an invoice for any work performed but not yet billed. Any milestones or other deadlines contained in this Agreement shall be extended by the period of suspension unless otherwise agreed to by the City and Consultant. The Expiration Date shall not be extended as a result of a suspension.

ii. Termination for Convenience. The City may terminate this Agreement at any time without cause upon written notice to Consultant.

iii. Termination for Cause. In the event Consultant fails to perform any provision of this Agreement, the City may either:

- a. Terminate this Agreement for cause with ten (10) days prior written notice to Consultant; or
- b. Provide Consultant with written notice of the breach and allow Consultant an Opportunity to Cure.

iv. Opportunity to Cure. Upon receiving the City’s notice of breach pursuant to Section 4(C)(iii)(b), Consultant shall have five (5) days to commence remedying its defective performance. If Consultant diligently cures its defective performance to the City’s satisfaction within a reasonable time as determined by the City, then this Agreement shall not terminate and shall remain in full force and effect. If Consultant fails to cure the breach to the City’s satisfaction, then the City may terminate this Agreement pursuant to Section 4(C)(iii)(a).

v. Compensation for Services Performed Prior to Suspension or Termination

Notice. If this Agreement is suspended or terminated, the City shall pay Consultant the reasonable cost of only those services performed to the satisfaction of the CEO prior to the notice of suspension or termination. Consultant shall submit a final invoice for these costs within thirty (30) days of the date of the notice. Consultant has no right to compensation for services performed after the notice unless directed to perform those services by the City as part of the suspension or termination process or as provided in Section 4(C)(vi) below.

vi. Reimbursement for Cost of Orderly Termination. In the event of Termination for Convenience of this Agreement pursuant to Section 4(C)(ii), Consultant may request reimbursement from the City of the reasonable costs of orderly termination associated with the Termination for Convenience as part of its submittal of costs pursuant to Section 4(C)(v). In no event shall the total sums paid by the City pursuant to this Agreement, including Sections 4(C)(v) and (C)(vi), exceed the Maximum Contract Amount.

vii. No Claims. Upon termination of this Agreement, Consultant shall have no claim of any kind against the City by reason of such termination or by reason of any act incidental thereto. Consultant shall not be entitled to loss of anticipated profits or any other consequential damages as a result of termination.

D. Remedies. In the event Consultant breaches this Agreement, Consultant shall be liable to the City for all costs of correcting the work without additional compensation, including but not limited to additional costs incurred by the City, its tenants, or its other contractors arising out of Consultant's defective work. These remedies are in addition to, and do not limit, the remedies available to the City in law or in equity. These remedies do not amend or limit the requirements of Section 8 and Section 9 otherwise provided for in this Agreement.

5. COMPENSATION AND PAYMENT:

A. Maximum Contract Amount. Notwithstanding any other provision of this Agreement, the City shall not be liable under any theory for payment for services rendered and expenses incurred by Consultant under the terms of this Agreement for any amount in excess of the sum of **Eight Hundred Ten Thousand Eight Hundred Thirty-Three Dollars and Zero Cents (\$810,833.00)** ("Maximum Contract Amount"). Consultant shall perform the services and be paid for those services as provided for in this Agreement up to the Maximum Contract Amount.

B. Limited Obligation of City. The obligations of the City under this Agreement shall extend only to monies appropriated and encumbered for the purposes of this Agreement. Consultant acknowledges and understands the City does not by this Agreement irrevocably pledge present cash reserves for payments in future fiscal years, and this Agreement is not intended to create a multiple-fiscal year direct or indirect debt or financial obligation of the City. The City is not under any obligation to make any future encumbrances or appropriations for this Agreement nor is the City under any obligation to amend this Agreement to increase the Maximum Contract Amount above.

C. Payment Source. For payments required under this Agreement, the City shall make payments to Consultant solely from funds of the Airport System Fund and from no other fund or source. The City has no obligation to make payments from any other source.

D. Basis for Consultant's Fee. Consultant's fee is based on the time required by its professionals to complete the services under this Agreement. Individual hourly rates are set forth in *Exhibit B* ("Rates").

E. Payment Schedule. Subject to the Maximum Contract Amount, for payments required under this Agreement, the City shall pay Consultant's fees and expenses in accordance with this Agreement. Unless otherwise agreed to in writing, Consultant shall invoice the City on a regular basis in arrears and the City shall pay each invoice in accordance with Denver's Prompt Payment Ordinance, D.R.M.C. § 20-107, *et seq.*, subject to the Maximum Contract Amount.

F. Invoices. On or before the fifteenth (15th) day of each month, Consultant shall submit to the City a monthly progress invoice containing reimbursable costs and receipts from the previous month for professional services rendered under this Agreement to be audited and approved by the City ("**Invoice**"). Each Invoice shall provide the basis for payments to Consultant under this Agreement. In submitting an Invoice, Consultant shall comply with all requirements of this Agreement and:

- i. Include an executive summary and status report(s) that describe the progress of the services and summarize the work performed during the period covered by the Invoice;
- ii. Include a statement of recorded hours that are billed at an hourly rate;
- iii. Include the relevant purchase order ("**PO**") number related to the Invoice;
- iv. Ensure that amounts shown on the Invoices comply with and clearly reference the relevant services, indicate the hourly rate and multiplier where applicable, and identify the allowable reimbursable expenses;
- v. For only those reimbursable costs incurred in the previous month, submit itemized business expense logs and, where billing is based upon receipts, include copies of receipts for all allowable reimbursable expenses;
- vi. Include the signature of an authorized officer of Consultant, along with such officer's certification they have examined the Invoice and found it to be correct; and
- vii. Submit each Invoice via email to ContractAdminInvoices@flydenver.com.
- viii. Late Fees. Consultant understands and agrees interest and late fees shall be payable by the City only to the extent authorized and provided for in the City's Prompt Payment Ordinance.

G. Travel Expenses. Travel and any other expenses are not reimbursable unless such expenses are related to and in furtherance of the purposes of Consultant's engagement, are in accordance with this Agreement, and Consultant receives prior written approval of the SVP or their authorized representative.

H. Timesheets. Consultant shall maintain all timesheets kept or created in relation to the services performed under this Agreement. The City may examine such timesheets and any other related documents upon the City's request.

I. Disputed Invoices. The City reserves the right to reject and not pay any Invoice or part thereof, including any final Invoice resulting from a Termination of this Agreement, where the SVP or their authorized representative determines the amount invoiced exceeds the amount owed based upon the work satisfactorily performed. The City shall pay any undisputed items contained in an Invoice. Disputes concerning payments under this provision shall be resolved in accordance with procedures set forth in Section 9.

J. Carry Over. If Consultant's total fees for any of the services provided under this Agreement are less than the amount budgeted for, the amount remaining in the budget may be used for additional and related services rendered by Consultant if the CEO determines such fees are reasonable and appropriate and provides written approval of the expenditure.

K. Prevailing Wage. To the extent required by law, Consultant shall comply with, and agrees to be bound by, all requirements, conditions and City determinations regarding the Payment of Prevailing Wages Ordinance, D.R.M.C. §§ 20-76 through 20-79, including, but not limited to, the requirement that every covered worker working on a City owned or leased building or on City-owned land shall be paid no less than the prevailing wages and fringe benefits in effect on the Effective Date of this Agreement.

i. Prevailing wage and fringe rates will adjust on the yearly anniversary of the actual date of bid or proposal issuance, if applicable, or the date of the written encumbrance if no bid/proposal issuance date is applicable.

ii. Consultant shall provide the Auditor with a list of all subcontractors providing any services under the Agreement.

iii. Consultant shall provide the Auditor with electronically-certified payroll records for all covered workers employed under this Agreement.

iv. Consultant shall prominently post at the work site the current prevailing wage and fringe benefit rates. The posting must inform workers that any complaints regarding the payment of prevailing wages or fringe benefits may be submitted to the Denver Auditor by calling (720) 913-5000 or emailing: auditor@denvergov.org.

v. If Consultant fails to pay workers as required by the Prevailing Wage Ordinance, Consultant will not be paid until documentation of payment satisfactory to the Auditor has been provided. The City may, by written notice, suspend or terminate work if Consultant fails to pay required wages and fringe benefits.

L. Compliance with Denver Wage Laws. To the extent applicable to the Consultant's provision of Services hereunder, the Consultant shall comply with, and agrees to be bound by, all rules, regulations, requirements, conditions, and City determinations regarding the City's Minimum Wage and Civil Wage Theft Ordinances, Sections 58-1 through 58-26 D.R.M.C., including, but not limited to, the requirement that every covered worker shall be paid all earned

wages under applicable state, federal, and city law in accordance with the foregoing D.R.M.C. Sections. By executing this Agreement, the Consultant expressly acknowledges that the Consultant is aware of the requirements of the City's Minimum Wage and Civil Wage Theft Ordinances and that any failure by the Consultant, or any other individual or entity acting subject to this Agreement, to strictly comply with the foregoing D.R.M.C. Sections shall result in the penalties and other remedies authorized therein.

M. City Prompt Pay.

i. The City will make monthly progress payments to Consultant for all services performed under this Agreement based upon Consultant's monthly invoices or shall make payments as otherwise provided in this Agreement. The City's Prompt Payment Ordinance, D.R.M.C. §§ 20-107 to 20-118 applies to invoicing and payment under this Agreement.

ii. Final Payment to Consultant shall not be made until after the Project is accepted, and all certificates of completion, record drawings, reproducible copies, and other deliverables are delivered to the City, and the Agreement is otherwise fully performed by Consultant. The City may, at the discretion of the SVP, withhold reasonable amounts from billing and the entirety of the final payment until all such requirements are performed to the satisfaction of the SVP.

6. INSURANCE REQUIREMENTS:

A. Consultant shall obtain and keep in force all of the minimum insurance coverage forms and amounts set forth in *Exhibit C* ("**Insurance Requirements**") during the entire Term of this Agreement, including any extensions of the Agreement or other extended period stipulations stated in *Exhibit C*. All certificates of insurance must be received and accepted by the City before any airport access or work commences.

B. Consultant shall ensure and document that all subcontractors performing services or providing goods hereunder procure and maintain insurance coverage that is appropriate to the primary business risks for their respective scopes of performance. At minimum, such insurance must conform to all applicable requirements of DEN Rules and Regulations Part 230 and all other applicable laws and regulations.

C. The City in no way warrants or represents the minimum limits contained herein are sufficient to protect Consultant from liabilities arising out of the performance of the terms and conditions of this Agreement by Consultant, its agents, representatives, employees, or subcontractors. Consultant shall assess its own risks and maintain higher limits and/or broader coverage as it deems appropriate and/or prudent. Consultant is not relieved of any liability or other obligations assumed or undertaken pursuant to this Agreement by reason of its failure to obtain or maintain insurance in sufficient amounts, duration, or types.

D. In no event shall the City be liable for any of the following: (i) business interruption or other consequential damages sustained by Consultant; (ii) damage, theft, or destruction of

Consultant's inventory, or property of any kind; or (iii) damage, theft, or destruction of an automobile, whether or not insured.

E. The Parties understand and agree that the City, its elected and appointed officials, employees, agents and volunteers are relying on, and do not waive or intend to waive by any provisions of this Agreement, the monetary limitations and any other rights, immunities and protections provided by the Colorado Governmental Immunity Act, C.R.S. §§ 24-10-101 to 120, or otherwise available to the City, its elected and appointed officials, employees, agents and volunteers.

7. DEFENSE AND INDEMNIFICATION:

A. Consultant hereby agrees to defend, indemnify, reimburse and hold harmless the City, its appointed and elected officials, agents and employees for, from and against all liabilities, claims, judgments, suits or demands for damages to persons or property arising out of, resulting from, or relating to the work performed under this Agreement ("**Claims**"), unless such Claims have been specifically determined by the trier of fact to be the sole negligence or willful misconduct of the City. This indemnity shall be interpreted in the broadest possible manner to indemnify the City for any acts or omissions of Consultant or its subcontractors either passive or active, irrespective of fault, including the City's concurrent negligence whether active or passive, except for the sole negligence or willful misconduct of the City.

B. Consultant's duty to defend and indemnify the City shall arise at the time written notice of the Claim is first provided to the City regardless of whether Claimant has filed suit on the Claim. Consultant's duty to defend and indemnify the City shall arise even if the City is the only party sued by claimant and/or claimant alleges that the City's negligence or willful misconduct was the sole cause of claimant's damages.

C. Consultant will defend any and all Claims which may be brought or threatened against the City and will pay on behalf of the City any expenses incurred by reason of such Claims including, but not limited to, court costs and attorney fees incurred in defending and investigating such Claims or seeking to enforce this indemnity obligation, including but not limited to time expended by the City Attorney Staff, whose costs shall be computed at the rate of two hundred dollars and no cents (\$200.00) per hour of City Attorney time. Such payments on behalf of the City shall be in addition to any other legal remedies available to the City and shall not be considered the City's exclusive remedy.

D. Insurance coverage requirements specified in this Agreement shall in no way lessen or limit the liability of Consultant under the terms of this indemnification obligation. Consultant shall obtain, at its own expense, any additional insurance that it deems necessary for the City's protection.

E. This defense and indemnification obligation shall survive the expiration or termination of this Agreement.

8. DISPUTES:

All disputes arising under or related to this Agreement shall be resolved by administrative hearing under the procedures described in D.R.M.C. § 5-17 and all related rules and procedures. The determination resulting from said administrative hearing shall be final, subject only to the right to appeal the determination under Colorado Rule of Civil Procedure, Rule 106.

9. GENERAL TERMS AND CONDITIONS:

A. Status of Consultant. Parties agree that the status of Consultant shall be an independent contractor retained on a contractual basis to perform professional or technical services for limited periods of time as described in § 9.1.1(E)(x) of the Charter of the City and County of Denver (the “**City Charter**”). It is not intended, nor shall it be construed, that Consultant or its personnel are employees or officers of the City under D.R.M.C. Chapter 18 for any purpose whatsoever.

B. Assignment. Consultant shall not assign, pledge or transfer its duties, obligations, and rights under this Agreement, in whole or in part, without first obtaining the written consent of the CEO. Any attempt by Consultant to assign or transfer its rights hereunder without such prior written consent shall, at the option of the CEO, automatically terminate this Agreement and all rights of Consultant hereunder.

C. Americans with Disabilities Act (“ADA”). Consultant shall provide the services specified in this Agreement in a manner that complies with the ADA (42 USC § 12101, *et. seq*) and other federal, state, and local accessibility requirements. Consultant shall not discriminate against disabled persons in the provision of services, benefits or activities provided under this Agreement and further agrees that any violation of this prohibition on the part of Consultant, its employees, agents or assigns may constitute a material breach of this Agreement. If requested by City, Consultant shall engage a qualified disability consultant to review Consultant’s work for compliance with the ADA (and any subsequent amendments to the statute) and all other related federal, state, and local disability requirements, and Consultant shall remedy any noncompliance found by the qualified disability consultant as soon as practicable.

D. Compliance with all Laws and Regulations. Consultant and its subcontractor(s) shall perform all work under this Agreement in compliance with all existing and future applicable laws, rules, regulations, and codes of the United States, and the State of Colorado and with the City Charter, ordinances, Executive Orders, and rules and regulations of the City.

E. Compliance with Patent, Trademark and Copyright Laws.

i. Consultant agrees that all work performed under this Agreement shall comply with all applicable patent, trademark and copyright laws, rules, regulations and codes of the United States, as they may be amended from time to time. Consultant will not utilize any protected patent, trademark or copyright in performance of its work unless it has obtained proper permission, all releases, and other necessary documents. If Consultant prepares any documents which specify any material, equipment, process or procedure

which is protected, Consultant shall disclose such patents, trademarks and copyrights in such documents.

ii. Pursuant to Section 8, Consultant shall indemnify and defend the City from any and all claims, damages, suits, costs, expenses, liabilities, actions or proceedings resulting from, or arising out of, directly or indirectly, the performance of work under this Agreement which infringes upon any patent, trademark or copyright protected by law.

F. Notices.

i. Notices of Termination. Notices concerning termination of this Agreement, shall be made as follows:

by Consultant to:

Chief Executive Officer
Denver International Airport
Airport Office Building
8500 Peña Boulevard, 9th Floor
Denver, Colorado 80249-6340

And by the City to:

University Corporation for Atmospheric Research (“UCAR”)
3090 Center Green Drive
Boulder, CO 80301
ATTN: Seth Linden

ii. Delivery of Formal Notices. Formal notices of the termination of this Agreement shall be delivered personally during normal business hours to the appropriate office above or by prepaid U.S. certified mail, return receipt requested; express mail (FedEx, UPS, or similar service) or package shipping or courier service; or by electronic delivery directed to the person identified above and copied to the Project Manager through the electronic or software system used at the City’s direction for any other official communications and document transmittals. Mailed notices shall be deemed effective upon deposit with the U.S. Postal Service and electronically transmitted notices by pressing “send” or the equivalent on the email or other transmittal method sufficient to irretrievably transmit the document. Either party may from time to time designate substitute addresses or persons where and to whom such notices are to be mailed, delivered or emailed, but such substitutions shall not be effective until actual receipt of written or electronic notification thereof through the method contained in Subsection (E)(ii).

iii. Other Correspondence. Other notices and day-to-day correspondence between the Parties may be done via email directed to the Project Manager or through the electronic or software system used for work-related communications and transmittals at the City’s direction.

G. Rights and Remedies Not Waived. In no event shall any payment by the City hereunder constitute or be construed to be a waiver by the City of any breach of covenant or default which may then exist on the part of Consultant. The City making any such payment when any breach or default exists shall not impair or prejudice any right or remedy available to the City with respect to such breach or default. The City's assent, expressed or implied, to any breach of any one or more covenants, provisions or conditions of this Agreement shall not be deemed or taken to be a waiver of any other breach.

H. No Third-Party Beneficiaries. The Parties agree that enforcement of the terms and conditions of this Agreement and all rights of action relating to such enforcement shall be strictly reserved to the City and Consultant, and nothing contained in this Agreement shall give or allow any such claim or right of action by any third party. It is the express intention of the Parties that any person or entity other than the City or Consultant receiving services or benefits under this Agreement shall be deemed an incidental beneficiary and shall not have any interest or rights under this Agreement.

I. Governing Law. This Agreement is made under and shall be governed by the laws of the State of Colorado. Each and every term, provision and condition herein is subject to the provisions of Colorado law, the City Charter, and the ordinances and regulations enacted pursuant thereto, as may be amended from time to time.

J. Bond Ordinances. This Agreement is in all respects subject and subordinate to any and all the City bond ordinances applicable to the Airport System and to any other bond ordinances which amend, supplement, or replace such bond ordinances.

K. Venue. Venue for any action arising hereunder shall be in the City and County of Denver, Colorado.

L. Cooperation with Other Contractors.

i. The City may award other contracts for additional work, and Consultant shall fully cooperate with such other contractors. The City, in its sole discretion, may direct Consultant to coordinate its work under this Agreement with one or more such contractors.

ii. Consultant shall have no claim against the City for additional payment due to delays or other conditions created by the operation of other contractors. The City will decide the respective rights of the various contractors in order to secure the completion of the work.

M. Inurement. The rights and obligations of the Parties herein set forth shall inure to the benefit of and be binding upon the Parties hereto and their respective successors and assigns permitted under this Agreement.

N. Force Majeure. The Parties shall not be liable for any failure to perform any of its obligations hereunder due to or caused by, in whole or in part, fire, strikes, lockouts, unusual delay by common carriers, unavoidable casualties, war, riots, acts of terrorism, acts of civil or military authority, acts of God, judicial action, or any other causes beyond the control of the Parties. The

Parties shall have the duty to take reasonable actions to mitigate or prevent further delays or losses resulting from such causes.

O. Coordination and Liaison. Consultant agrees that during the term of this Agreement it shall fully coordinate all services that it has been directed to proceed upon and shall make every reasonable effort to fully coordinate all such services as directed by the SVP or their authorized representative, along with any City agency, or any person or firm under contract with the City doing work which affects Consultant's work.

P. No Authority to Bind City to Contracts. Consultant has no authority to bind the City on any contractual matters. Final approval of all contractual matters which obligate the City must be by the City as required by the City Charter and ordinances.

Q. Information Furnished by the City. The City will furnish to Consultant information concerning matters that may be necessary or useful in connection with the work to be performed by Consultant under this Agreement. The Parties shall make good faith efforts to ensure the accuracy of information provided to the other Party; however, Consultant understands and acknowledges that the information provided by the City to Consultant may contain unintended inaccuracies. Consultant shall be responsible for the verification of the information provided to Consultant.

R. Severability. In case any one or more of the provisions contained in the Agreement shall for any reason be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provision hereof, and this Agreement shall be construed as if such invalid, illegal or unenforceable provision had never been contained herein.

S. Taxes and Costs. Consultant shall promptly pay, when due, all taxes, bills, debts and obligations it incurs performing work under this Agreement and shall allow no lien, mortgage, judgment or execution to be filed against land, facilities or improvements owned by the City.

T. Environmental Requirements. Consultant, in conducting its activities under this Agreement, shall comply with all existing and future applicable local, state and federal environmental rules, regulations, statutes, laws and orders (collectively "**Environmental Requirements**"), including but not limited to Environmental Requirements regarding the storage, use and disposal of Hazardous or Special Materials and Wastes, Clean Water Act legislation, Centralized Waste Treatment Regulations, and DEN Rules and Regulations.

i. For purposes of this Agreement the terms "Hazardous Materials" shall refer to those materials, including without limitation asbestos and asbestos-containing materials, polychlorinated biphenyls (PCBs), per – and polyfluoroalkyl substances (PFAS), oil or any other petroleum products, natural gas, source material, pesticide, and any hazardous waste, toxic substance or related material, including any substance defined or treated as a "hazardous substance," "hazardous waste" or "toxic substance" (or comparable term) in the Comprehensive Environmental Response, Compensation and Liability Act (42 U.S.C. Sec. 9601 *et seq.* (1990)), the Toxic Substances Control Act (15 U.S.C. Sec. 2601 *et seq.* (1990)), and any rules and regulations promulgated pursuant to such statutes or any other applicable federal or state statute.

ii. Consultant shall acquire all necessary federal, state and local environmental permits and comply with all applicable federal, state and local environmental permit requirements.

iii. Consultant agrees to ensure that its activities under this Agreement are conducted in a manner that minimizes environmental impact through appropriate preventive measures. Consultant agrees to evaluate methods to reduce the generation and disposal of waste materials.

iv. In the case of a release, spill or leak as a result of Consultant's activities under this Agreement, Consultant shall immediately control and remediate the contaminated media to applicable federal, state and local standards. Consultant shall reimburse the City for any penalties and all costs and expenses, including without limitation attorney's fees, incurred by the City as a result of the release or disposal by Consultant of any pollutant or hazardous material.

U. Non-Exclusive Rights. This Agreement does not create an exclusive right for Consultant to provide the services described herein at DEN. The City may, at any time, award other agreements to other contractors or consultants for the same or similar services to those described herein. In the event of a dispute between Consultant and any other party at DEN, including DEN itself, as to the privileges of the parties under their respective agreements, CEO shall determine the privileges of each party and Consultant agrees to be bound by CEO's decision.

10. RECORD RETENTION AND OTHER STANDARD CITY PROVISIONS:

A. Diversity and Inclusiveness. The City encourages the use of qualified small businesses doing business within the metropolitan area that are owned and controlled by economically or socially disadvantaged individuals. Consultant is encouraged, with respect to the goods or services to be provided under this Agreement, to use a process that includes small businesses when considering and selecting any subcontractors or suppliers.

B. No Discrimination in Employment. In connection with the performance of work under the Agreement, the Consultant may not refuse to hire, discharge, promote, demote, or discriminate in matters of compensation against any person otherwise qualified, solely because of race, color, religion, national origin, ethnicity, citizenship, immigration status, gender, age, sexual orientation, gender identity, gender expression, marital status, source of income, military status, protective hairstyle, or disability. The Consultant shall insert the foregoing provision in all subcontracts.

C. Advertising and Public Disclosures. Consultant shall not include any reference to this Agreement or to work performed hereunder in any of its advertising or public relations materials without first obtaining the written approval of the SVP or their authorized representative. Any oral presentation or written materials related to DEN shall include only presentation materials, work product, and technical data which have been accepted by the City, and designs and renderings, if any, which have been accepted by the City. Consultant shall notify the SVP in advance of the date and time of any such presentations. Nothing herein, however, shall preclude

Consultant's transmittal of any information to officials of the City, including without limitation, the Mayor, the CEO, any member or members of Denver City Council, and the Auditor.

D. Colorado Open Records Act.

i. Consultant acknowledges that the City is subject to the provisions of the Colorado Open Records Act ("CORA"), C.R.S. §§ 24-72-201 *et seq.*, and Consultant agrees that it will fully cooperate with the City in the event of a request or lawsuit arising under such act for the disclosure of any materials or information which Consultant asserts is confidential or otherwise exempt from disclosure. Any other provision of this Agreement notwithstanding, all materials, records, and information provided by Consultant to the City shall be considered confidential by the City only to the extent provided in CORA, and Consultant agrees that any disclosure of information by the City consistent with the provisions of CORA shall result in no liability of the City.

ii. In the event of a request to the City for disclosure of such information, time and circumstances permitting, the City will make a good faith effort to advise Consultant of such request in order to give Consultant the opportunity to object to the disclosure of any material Consultant may consider confidential, proprietary, or otherwise exempt from disclosure. In the event Consultant objects to disclosure, the City, in its sole and absolute discretion, may file an application to the Denver District Court for a determination of whether disclosure is required or exempted. In the event a lawsuit to compel disclosure is filed, the City may tender all such material to the court for judicial determination of the issue of disclosure. In both situations, Consultant agrees it will either waive any claim of privilege or confidentiality or intervene in such legal process to protect materials Consultant does not wish disclosed. Consultant agrees to defend, indemnify, and hold harmless the City, its officers, agents, and employees from any claim, damages, expense, loss, or costs arising out of Consultant's objection to disclosure, including prompt reimbursement to the City of all reasonable attorney's fees, costs, and damages the City may incur directly or may be ordered to pay by such court, including but not limited to time expended by the City Attorney Staff, whose costs shall be computed at the rate of two hundred dollars and no cents (\$200.00) per hour of City Attorney time.

E. Examination of Records and Audits.

i. Any authorized agent of the City, including the City Auditor or his or her representative, has the right to access and the right to examine, copy and retain copies, at City's election in paper or electronic form, any pertinent books, documents, papers and records related to Consultant's performance pursuant to this Agreement, provision of any goods or services to the City, and any other transactions related to this Agreement. Consultant shall cooperate with City representatives and City representatives shall be granted access to the foregoing documents and information during reasonable business hours and until the latter of three (3) years after the final payment under the Agreement or expiration of the applicable statute of limitations. When conducting an audit of this Agreement, the City Auditor shall be subject to government auditing standards issued by the United States Government Accountability Office by the Comptroller General of the United States, including with respect to disclosure of information acquired during the

course of an audit. No examination of records and audit pursuant to this paragraph shall require Parties to make disclosures in violation of state or federal privacy laws. Parties shall at all times comply with D.R.M.C. 20-276.

ii. Additionally, Consultant agrees until the expiration of three (3) years after the final payment under the Agreement, any duly authorized representative of the City, including the CEO, shall have the right to examine any pertinent books, documents, papers and records of Consultant related to Consultant's performance of this Agreement, including communications or correspondence related to Consultant's performance, without regard to whether the work was paid for in whole or in part with federal funds or was otherwise related to a federal grant program.

iii. In the event the City receives federal funds to be used toward the services performed under this Agreement, the Federal Aviation Administration ("FAA"), the Comptroller General of the United States and any other duly authorized representatives shall have access to any books, documents, papers and records of Consultant which are directly pertinent to a specific grant program for the purpose of making audit, examination, excerpts and transcriptions. Consultant further agrees that such records will contain information concerning the hours and specific services performed along with the applicable federal project number.

F. Use, Possession or Sale of Alcohol or Drugs. Consultant shall cooperate and comply with the provisions of Denver Executive Order 94 and Attachment A thereto concerning the use, possession or sale of alcohol or drugs. Violation of these provisions or refusal to cooperate with implementation of the policy can result in the City barring Consultant from City facilities or participating in City operations.

G. City Smoking Policy. Consultant and its officers, agents and employees shall cooperate and comply with the provisions of Denver Executive Order No. 99 and the Colorado Indoor Clean Air Act, prohibiting smoking in all City buildings and facilities.

H. Conflict of Interest.

i. Consultant and its subsidiaries, affiliates, subcontractors, principals, or employees shall not engage in any transaction, work, activity or conduct which would result in a conflict of interest. A conflict of interest occurs when, for example, because of the relationship between two individuals, organizations or one organization (including its subsidiaries or related organizations) performing or proposing for multiple scopes of work for the City, there is or could be in the future a lack of impartiality, impaired objectivity, an unfair advantage over one or more firms competing for the work, or a financial or other interest in other scopes of work.

ii. The City, in its sole discretion, shall determine the existence of a conflict of interest and may terminate this Agreement if such a conflict exists, after it has given Consultant written notice which describes such conflict. If, during the course of the Agreement, the City determines that a potential conflict of interest exists or may exist,

Consultant shall have thirty (30) days after the notice is received in which to eliminate or cure the conflict of interest in a manner which is acceptable to the City.

iii. Consultant has a continuing duty to disclose, in writing, any actual or potential conflicts of interest including work Consultant is performing or anticipates performing for other entities on the same or interrelated project or tasks. Consultant must disclose, in writing, any corporate transactions involving other companies that Consultant knows or should know also are performing or anticipate performing work at DEN on the same or interrelated projects or tasks. In the event that Consultant fails to disclose in writing actual or potential conflicts, the CEO in their sole discretion, may terminate the Agreement for cause or for its convenience.

11. SENSITIVE SECURITY INFORMATION:

Consultant acknowledges that, in the course of performing its work under this Agreement, Consultant may be given access to Sensitive Security Information (“**SSI**”), as material is described in the Code of Federal Regulations, 49 C.F.R. Part 1520. Consultant specifically agrees to comply with all requirements of the applicable federal regulations, including but not limited to, 49 C.F.R. Parts 15 and 1520. Consultant understands any questions it may have regarding its obligations with respect to SSI must be referred to DEN’s Security Office.

12. DEN SECURITY:

A. Consultant, its officers, authorized officials, employees, agents, subcontractors, and those under its control, shall comply with safety, operational, or security measures required of Consultant or the City by the FAA or Transportation Security Administration. If Consultant, its officers, authorized officials, employees, agents, subcontractors or those under its control, fail or refuse to comply with said measures and such non-compliance results in a monetary penalty being assessed against the City, then, in addition to any other remedies available to the City, Consultant shall fully reimburse the City any fines or penalties levied against the City, and any attorney fees or related costs paid by the City as a result of any such violation. Consultant must pay this amount within fifteen (15) days from the date of the invoice or written notice. Any fines and fees assessed by the FAA or TSA against the City due to the actions of Consultant and/or its agents will be deducted directly from the invoice for that billing period.

B. Consultant is responsible for compliance with Airport Security regulations and 49 C.F.R. Parts 1542 (Airport Security) and 14 C.F.R. Parts 139 (Airport Certification and Operations). Any and all violations pertaining to Parts 1542 and 139 resulting in a fine will be passed on to and borne by Consultant. The fee/fine will be deducted from the invoice at time of billing.

13. FEDERAL RIGHTS:

This Agreement is subject and subordinate to the terms, reservations, restrictions and conditions of any existing or future agreements between the City and the United States, the execution of which has been or may be required as a condition precedent to the transfer of federal rights or property to the City for airport purposes and the expenditure of federal funds for the

extension, expansion or development of the Airport System. As applicable, Consultant shall comply with the Standard Federal Assurances identified in Appendix.

14. CONTRACT DOCUMENTS; ORDER OF PRECEDENCE:

A. Attachments. This Agreement consists of Section 1 through 15 which precede the signature page, and the following attachments which are incorporated herein and made a part hereof by reference:

Appendix: Standard Federal Assurances
Exhibit A: Scope of Work
Exhibit B: Rates
Exhibit C: Insurance Requirements

B. Order of Precedence. In the event of an irreconcilable conflict between a provision of Section 1 through 15 and any of the listed attachments or between provisions of any attachments, such that it is impossible to give effect to both, the order of precedence to determine which document shall control to resolve such conflict, is as follows, in descending order:

Appendix
Section 1 through Section 15 hereof
Exhibit A
Exhibit B
Exhibit C

15. CITY EXECUTION OF AGREEMENT:

A. City Execution. This Agreement is expressly subject to, and shall become effective upon, the execution of all signatories of the City and, if required, the approval of Denver City Council. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same.

B. Electronic Signatures and Electronic Records. The Agreement, and any other documents requiring a signature hereunder, may be signed electronically by the City and/or Consultant in the manner specified by the City. The Parties agree not to deny the legal effect or enforceability of the Agreement solely because it is in electronic form or because an electronic record was used in its formation. The Parties agree not to object to the admissibility of the Agreement in the form of an electronic record, or a paper copy of an electronic document, or a paper copy of a document bearing an electronic signature, on the ground that it is an electronic record or electronic signature or that it is not in its original form or is not an original.

[SIGNATURE PAGES FOLLOW]

Contract Control Number: PLANE-202472583-00

Contractor Name: UNIVERSITY CORPORATION FOR ATMOSPHERIC RESEARCH (“UCAR”)

IN WITNESS WHEREOF, the parties have set their hands and affixed their seals at
Denver, Colorado as of:

SEAL

CITY AND COUNTY OF DENVER:

ATTEST:

By:

APPROVED AS TO FORM:

REGISTERED AND COUNTERSIGNED:

Attorney for the City and County of Denver

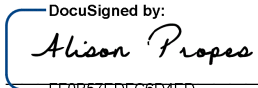
By:

By:

By:

Contract Control Number: PLANE-202472583-00

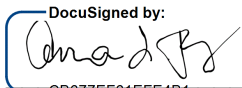
Contractor Name: UNIVERSITY CORPORATION FOR ATMOSPHERIC RESEARCH (“UCAR”)

By: 
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Name: Alison Propes
(please print)

Title: Contracts Director
(please print)

ATTEST: [if required]

By: 
CB077EF01EFE4B1...

Name: Anna Thomas
(please print)

Title: Manager of Direct Awards, UCAR Contracts
(please print)

EXHIBIT A SCOPE OF WORK

The following is a general description and Scope of Work for proposed contract between DEN and UCAR:

Purpose:

DEN is pursuing a new contract with UCAR for services currently being provided by UCAR. UCAR provides consulting services to DEN which include weather forecasting and pavement condition treatment recommendations for runways, taxiways, ramp areas and roadways at DEN and the use of the Maintenance Decision Support System (MDSS). UCAR will also perform pre-agreed upon Weather Forecasting Research and Development (R&D) specifically for DEN.

Scope of Work for Year 2025-2027:**Task 1: Maintain ongoing real-time demonstration of the MDSS for DEN**

NCAR will continue to run and maintain the operational prototype MDSS system for Denver International Airport. MDSS output will continue to be delivered through the mobile phone application display (desktop compatible as well).

Task 2: Add Radar to the MDSS Display

NCAR will add weather radar imagery to the MDSS display (phone application / desktop). The radar data will help DEN with situational awareness when a storm is approaching or ongoing.

Task 3: RWIS Camera machine learning to identify weather and pavement conditions

NCAR will add DEN airport camera images to the observation tab in the display (phone app / desktop) and will apply some existing machine learning techniques to the camera images in order to identify current weather and pavement conditions.

Task 4: Add Forecast vs Observation history to MDSS display

NCAR will provide access to forecast vs observation plots via the display (phone app / desktop). The forecast vs observation plots will help DEN personnel get a better understanding on how the MDSS forecast evolved leading up to an event.

Task 5: Add system playback to the MDSS display

NCAR will add a system playback capability to the MDSS display (phone app / desktop). The user will be able to select a previous forecast date and time and the display will snap back to that exact forecast generation time. This will allow DEN personnel to review a past MDSS forecast exactly how it showed up during real-time.

Task 6: Add total liquid precipitation to the MDSS display

NCAR will add a new forecast plot under the Weather Forecast tab and the Event Summary tab in the MDSS display (phone app / desktop). This will give DEN personnel better situational awareness during rain events or rain/snow events (where the precipitation falls more as rain versus snow).

Task 7: System Maintenance and Modernization of MDSS components

This task is related to maintaining the MDSS system during the period of performance and making improvements to the system infrastructure.

Task 8: Weathernet Forecast and Additional Research and Development Enhancing the MDSS

NCAR will continue to provide the daily Weathernet forecast to DEN as well as ongoing Research & Development to enhance the capabilities of the MDSS display.



Denver International Airport MDSS Demonstration, Research and Development

Prepared for: Mike Carlson / Denver International Airport

Prepared by: Seth Linden, Software Engineer

December 22, 2023

Proposal number: 2024-0053

EXECUTIVE SUMMARY

Introduction

Denver International Airport (DEN) experiences several rounds of adverse winter weather during the cold season that can significantly disrupt airport operations. Runways along with access roads must be maintained and cleared of snow and ice. Safety and efficiency of airport operations hinges on timely and accurate weather forecasts. In the past the airport maintenance community has relied on conventional methods for acquiring and applying weather-related information in the runway treatment and operations decision process, usually from multiple sources. Managing winter storms at an airport requires collaboration in a complex decision-making environment between inter-dependent stakeholders with different objectives. Therefore having a centralized forecast decision support system is ideal for maintenance managers to get a handle on when and where to treat the runways during winter storms. In the mid-2000's NCAR created a custom maintenance decision support system (MDSS) for Colorado with a specific focus on Denver International Airport (DIA) runway operations. The system was specifically configured for all major DIA runways, using known pavement as-builts and rules of practice for treating runways. NCAR has been running an operational prototype system for DIA since 2008.

Background

In an effort to mitigate the challenges associated with winter maintenance decisions, the Federal Highway Administration (FHWA) initiated a program in 2001 aimed at developing a winter road Maintenance Decision Support System (MDSS). The primary goal of the MDSS program was to construct a functional prototype MDSS that could provide objective guidance to winter road maintenance decision-makers concerning the appropriate treatment strategies to employ to control roadway snow and ice during adverse winter weather events.

The FHWA MDSS prototype utilizes current weather observations and numerical model predictions from multiple sources to produce route-specific or runway-specific analyses and forecasts of environmental conditions. Output from this process is used to drive an energy balance model to generate predictions of pavement conditions along each route of interest. Together, environmental and road condition information is used to construct recommended treatments, which are based on standard rules of practice for effective deicing and anti-icing operations. An interactive mobile compatible display is used to visualize graphic and text-based treatment recommendations, as well as diagnostic and prognostic atmosphere and road condition data.

The broad needs met by the current MDSS include the following:

- Centralized Weather Support
- Enhanced Strategic Planning Capability
- Improved Tactical Response Capability
- Improved Adverse Road Weather Notification
- Operation-Specific Decision Support

The National Center for Atmospheric Research (NCAR), which is operated by the University Corporation for Atmospheric Research (UCAR), created a custom version of the FHWA MDSS for Colorado with a specific focus on Denver International Airport (DEN) runway operations. Over the last 15 years NCAR and the City and County of Denver, which operates DEN, entered into an agreement for the provision of MDSS services and support to DEN. This is a continuation of the MDSS project. This phase of the project would be used to further enhance the MDSS system with better forecast and observation components. The new work includes but is not limited to adding radar to the phone app map display, adding RWIS camera images to the display, adding capability to look at past forecast vs observation and modernizing the MDSS app to produce better tactical alerts.

The work breakdown structure provided below outlines the tasks and subtasks for this project.

WORK BREAKDOWN STRUCTURE

Task 1: Maintain ongoing real-time demonstration of the MDSS for DEN

NCAR will continue to run and maintain the operational prototype MDSS system for Denver International Airport. MDSS output will continue to be delivered through the mobile phone application display (desktop compatible as well).

MDSS SYSTEM DESCRIPTION

The MDSS shall have core components including, but not limited to, a fuzzy logic-based weather forecast system, a pavement condition and treatment module, and a data server, which will be operated centrally at NCAR in Boulder, Colorado. The weather forecast system will use advanced data fusion technology developed at NCAR called the Dynamic Integrated foreCast system (DICast™®). The MDSS web server at NCAR will communicate (via the Internet) with the display application, which is available to all DEN personnel. Weather data from DEN's sensors (atmospheric and surface condition data within the airport environment), as well as other key data, will be provided

to NCAR via the Meteorological Assimilation Data Ingest System (MADIS) program or acquired directly from DEN via common data transmission methods (e.g., ftp).

MDSS RUNWAYS AND ROAD SEGMENTS:

The MDSS will be configured to provide weather and pavement condition forecasts and treatment recommendations (i.e., forecast data regarding the state of the atmosphere, surface, and subsurface, which will be made available in real-time) for each DEN instrumented runway and/or roadway of interest. DEN representatives, working with NCAR personnel, will select the runways and routes to be used in the MDSS. The runways and routes within DEN's area of responsibility will be characterized using general characteristics (pavement type, subsurface characteristics, etc.). Separate winter maintenance treatment plans will be generated by the MDSS for each of the chosen runways and routes. NCAR will ensure that MDSS is delivering the same types of forecast products for the same runways and road segments as it has been over the last six years. New runway locations, RWIS and other road segments can be added to the system if it's agreed upon by both parties.

MDSS UPDATE RATE AND TEMPORAL RESOLUTION

MDSS weather and pavement condition forecast is updated every 1-hour with the latest observations and model data. MDSS produces forecast output out to 72-hours at 1-hour temporal resolution.

MDSS ELEMENTS AND PARAMETERS:

The MDSS system produces output variables that include but are not limited to the list below. Forecast data for these variables are available through the MDSS display (phone app / desktop).

- T (air temperature)
- Dewpt (dew point temperature)
- RH (relative humidity)
- Cloud Cov (total cloud-cover)
- Cprob Rain (conditional probability of rain)
- Cprob Snow (conditional probability of snow)
- Cprob Ice (conditional probability of ice)
- Prob Precip01 (probability of precipitation, 1 hour)
- Wind Speed (at surface: 10 meters above ground)
- Wind Dir (wind direction at surface)

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- Crosswind Potential (runway crosswind alert values)
- Precip Rate (liquid precipitation rate per interval, typically 1-hour rate)
- Precip Type (precipitation type)
- Precip Accum Total (liquid precipitation accumulation since start of forecast)
- Snow Rate (snowfall rate per interval, typically 1-hour rate)
- Snow Accum Total (total accumulation since start of forecast, off pavement)
- Blowing Snow Potential (blowing snow alert values)
- Road T (road surface temperature / runway surface temperature)
- Pavement Snow Depth (snow accumulation with treatment)
- Mobility Index (net mobility)
- Treatment Recommendations
 - Apply Treatment (0 or 1)
 - Treatment type (plow, chemical, pre-treat, etc.)
 - Chem form (chemical form)
 - Chem Type (chemical type)
 - Chemical Concentration
 - Do Plow (0 or 1)
 - Treatment amount (rate of application)
 - Treatment location

MDSS OPERATIONS:

The system will be hosted on an internal NCAR rack server. NCAR, Weathernet (human-in-the-loop weather forecast provider, a subcontractor to this work) and DEN staff shall interact as necessary throughout the demonstration period to discuss MDSS operations, configuration, and enhancement plans throughout each of the next three years. These activities may include face-to-face meetings, conducting telecons, or communicating via email.

A best effort will be made to ensure that the MDSS operates 24-hours per day, 7-days per week during this period. NCAR personnel will be available on an on-call basis between 0900 and 1700 MST, Monday through Friday (excluding holidays) if a critical failure occurs.

NCAR will provide DEN with point of contact information (e.g., cell phone numbers) prior to the start of MDSS operations.

HUMAN WEATHER FORECAST ADVISORIES:

Weathernet (the human-in-the-loop weather forecast provider) staff will provide text-based summaries via e-mail of the predicted weather and road conditions to designated DEN staff members. Weathernet staff will also be available to clarify the weather situation and can be reached using the point of contact information provided by NCAR. Throughout the winter seasons (October through April), Weathernet will provide a text forecast four times per day and will be available 24 hours per day for additional support. Weathernet may also provide incident meteorological support on-site during very high-impact winter weather situations. During the non-winter months (May through September), Weathernet will provide twice per day forecast updates but will still be available 24 hours per day to provide support over the phone or via email.

DELIVERABLES:

- Fully functioning MDSS forecast system
 - 1-hour updates, with 72-hour forecast data (as described earlier)
- MDSS output will be provided through the MDSS map display (phone app / desktop)
- Make sure Weathernet continues to deliver human-in-the-loop forecasted advisories for DEN

Task 2: Add Radar to the MDSS Display

In this task NCAR will add weather radar imagery to the MDSS display (phone application / desktop). The radar data will help DEN with situational awareness when a storm is approaching or ongoing. The radar data will be overlaid on top of the map display with the ability to toggle the radar on/off. NCAR will add basic looping capability in order to loop over the last 1-hour of radar data (with images at either 5 or 10 minute resolution depending on available bandwidth and speed). The work includes but is not limited to:

- Acquire dual-pol radar for KFTG or use National Radar Mosaic Data
- Prepare data image for looping
- Modify web-service layer to provide radar images to display
- Modify the map display to show the the radar images (via looping capability)

DELIVERABLES:

- Radar data images will be accessible through the map display (phone or desktop)
 - Includes a button to toggle the radar on/off
 - Include the ability to loop over the latest 1-hour of radar images

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Task 3: RWIS Camera machine learning to identify weather and pavement conditions

In this task NCAR will add DEN airport camera images to the observation tab in the display (phone app / desktop) and will apply some existing machine learning techniques to the camera images in order to identify current weather and pavement conditions. This includes potentially using RWIS cameras situated along the runways, cameras near/along airport access roads or any other airport related cameras. The camera based conditions will initially be used to label the images attached to the observation tab. The tasks below are contingent upon the ability of NCAR to retrieve camera images from DEN airport.

Task 3.A: Add DEN Runway RWIS Camera Image to display Observations

For this subtask NCAR will download runway RWIS camera images and add these static images to the RWIS observation tab on the display (phone app / desktop). The camera images will be placed below the text based observations associated with each RWIS.

Task 3.B: Classify DEN Camera Images based on Pavement Conditions

For this subtask NCAR will process the downloaded DEN airport camera images and classify them into current pavement condition categories (like snow-covered, partially snow-covered, wet, etc). NCAR will pass the images through an existing machine learning application based on the Amazon Rekognition model to acquire labels for each image. The pavement condition labels will be attached to the camera images that are available under the observation tab.

Task 3.C: Improve Camera Image recognition using DEN RWIS images

For this subtask NCAR will use DEN airport images to further train the Amazon Rekognition machine learning model. The work will include saving a history of camera images and then manually classifying the camera images into pavement conditions categories (wet, snow-covered roads, partially snow-covered, etc). NCAR will then use these images to train a new version of the machine learning model. Finally the new model will be applied to real-time RWIS camera images (in conjunction with Task 3.B).

DELIVERABLE:

- Runway RWIS camera images will be available via the display (phone app / desktop) on the observation tab
 - The latest images will be attached below the RWIS text observations
- The camera images will be labeled with a derived pavement conditions (based on the image recognition models) and this label will be attached to the camera images that are put in the observation tab
- Improved camera recognition (better derived pavement conditions) will be used to label the images (after re-training the image recognition models to be specific to DEN Airport)

Task 4: Add Forecast vs Observation history to MDSS display

In this task NCAR will provide access to forecast vs observation plots via the display (phone app / desktop). The forecast vs observation plots will help DEN personnel get a better understanding on how the MDSS forecast evolved leading up to an event. The plots will show a time-series that compares past MDSS forecasts to observations for certain weather forecast variables (in which the observations are available). A new tab will be added to the weather graphs section of the application, and when selected will show past MDSS forecast vs observation plots (forecasts from 3, 6 or 12, 24 hours ago). The observation time-series line will also be included to see how it compares to the previous forecasts.

- Forecast history variables would likely include but are not limited to: air-T, road-T, dewpt, wind-speed, cloud-cover, total liquid precipitation, total snowfall (if the observations can be acquired)
- The previous forecast times to show on the graphs will be agreed upon by both parties and will depend on bandwidth and data processing time

DELIVERABLE:

- A Forecast History tab will be added to the weather graphs section of the display (phone app / desktop)
- Forecast vs observation time-series graphs will be available under the Forecast history tab for agreed upon variables
 - The graphs will have the same look and feel as the weather graphics already on the display (with the ability to pan left or right to see additional parts of the time-series)

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Task 5: Add system playback to the MDSS display

In this task NCAR will add a system playback capability to the MDSS display (phone app / desktop). The user will be able to select a previous forecast date and time and the display will snap back to that exact forecast generation time. This will allow DEN personnel to review a past MDSS forecast exactly how it showed up during real-time. That is, all the alerts and graphs will snap back to the selected time. A date and time selection box will be added to the top left corner of the main display (from the default map view). The work includes but is not limited to:

- Storing a longer history of past forecast data and observations in the backend Mongo Database (or creating a new database that contains a longer history, separate from the real time data-base for speed considerations)
- The web-server code will be modified to take a date and time and retrieve appropriate files
- The display GUI layer will also be modified to use a historical date and time-stamp to prepare the correct graphics for the display

DELIVERABLE:

- A playback date / time selector will be added to the display (phone app / desktop)
- Once the date and time are selected the data on the display will look as if it did for that given date/time
 - The data under the observation tab (RWIS Obs) may or may not be available (but the rest of the display should look the same as it did for the selected date/time)

Task 6: Add total liquid precipitation to the MDSS display

In this task NCAR will add a new forecast plot under the Weather Forecast tab and the Event Summary tab in the MDSS display (phone app / desktop). This will give DEN personnel better situational awareness during rain events or rain/snow events (where the precipitation falls more as rain versus snow). The new plot will show total liquid precipitation (over the entire forecast period) and will be similar to the total snow accumulation plot. Under the Weather Forecast tab the new graph will be put below the precip rate graph. Under the Event Summary the new graph will also be added below the total snow accumulation graph.

DELIVERABLE:

- Forecast total liquid precipitation graphics will be available under the Weather Forecast tab and the Event Summary tab. The graphics will be similar to the existing variables with the ability to pan left and right to see later lead-times.

Task 7: System Maintenance and Modernization of MDSS components

This task is related to maintaining the MDSS system during the period of performance and making improvements to the system infrastructure. This includes but is not limited to: making sure the system is up and running in realtime on the new NCAR server, setting up a system monitor to monitor the health of the MDSS system, addressing any data outages, and addressing any reported bugs in the system. This includes making OS upgrades as needed and updates to the application within the system as needed.

The task also includes modernizing MDSS and modifying the backend system to be more like the NCAR Pikalert system which is an enhanced MDSS that has the ability to use mobile observations (if available) and more tactical observations like radar data and other analysis data sets such as the Real-Time Mesoscale Analysis (RTMA). Initially the tactical data would be used to provide better observation based alerts in MDSS (on the phone/desktop display).

This work would also include examining differences between the MDSS and Pikalert alert modules (for the Weather, Road and Blowing Snow Alerts). Work would be done to improve / merge the alerting capabilities so they are the same between MDSS and Pikalert. The alert output would still be similar to the current Weather, Road and Blowing Snow Alerts in MDSS and would not impact the overall look and feel of the display (phone / desktop application).

DELIVERABLE:

- Ensure that the MDSS system is up and running in real time reliably on the new NCAR server (setup in 2023)
- Address bugs or forecast issues in the system
- Improve Observations Alerts based on new tactical data sets
- Improve MDSS forecast Alerts based on new techniques used in the NCAR Pikalert system

■

Task 8: Continue Improvements to MDSS Forecasting Capabilities and Display

This task is related to a continuation of work to improve the MDSS system during years 4 and 5 of the contract. NCAR will work to improve MDSS forecast capabilities along with upgrades and modification to the display, as agreed upon by both parties. NCAR will also continue to subcontract with WeatherNet to provide DEN with human-in-the-loop, daily weather forecasts as described in Task 1 above. Tasks for years 4 and 5 may include but not limited to: replacing the road-temperature model (METro) used within the MDSS with a new machine-learning (ML / AI) based model, producing 15-minute forecast output for the first 6-hours of the forecast using the new sub-hourly HRRR model (or using the new RFFS high-res model) and continued development and improvement of the runway friction prediction / RCAM prediction for DEN. Exact tasks for years 4 and 5 will be determined at the end of the first 3 years of the contract.

DELIVERABLES:

- Fully functioning MDSS forecast system
- New Work: TBD)
- Make sure WeatherNet continues to deliver human-in-the-loop forecasted advisories for DEN

TASK TIMELINE

The timeline is presented below.

Task	Begin Date	End Date
Task 1: Maintain ongoing real-time demonstration of the MDSS for DEN	January 1, 2025	December 31, 2027 (ongoing for 3 years)
Task 2: Add Radar to the MDSS Display	January 1, 2025	December 31, 2025 (year 1)
Task 3: RWIS Camera machine learning to identify weather and pavement conditions	January 1, 2026	December 31, 2026 (year 2)
Task 4: Add Forecast vs Observation history to MDSS display	January 1, 2026	December 31, 2026 (year 2)
Task 5: Add system playback to the MDSS display	January 1, 2027	December 31, 2027 (year 3)
Task 6: Add total liquid precipitation to the MDSS display	January 1, 2025	December 31, 2025 (year 1)
Task 7: System Maintenance and Modernization of MDSS components	January 1, 2025	December 31, 2027 (ongoing for 3 years, the modernization will be done in year 3)
Task 8: Continue Improvements to MDSS Forecasting Capabilities and Display	January 1, 2028	December 31, 2029

GENERAL CONTRACT INFORMATION

Yearly budget totals may be adjusted upon mutual agreement between the parties. Any adjustments cannot exceed the Contract Maximum Liability. Parties understand the end date of the tasks may take longer than anticipated.

COST PROPOSAL

Included separately.

PROJECT MANAGEMENT

Seth Linden will be the overall project lead. He will be assisted by Jim Cowie and other NCAR staff as required. Frequent communication with the sponsor will keep the project on track. NCAR staff will brief DEN personnel on project status as requested.

EXHIBIT B**COST PROPOSAL**

Year	Tasks	Cost
January 1, 2025 to December 31, 2025 Year 1	Task 1: Maintain ongoing real-time demonstration of the MDSS for DEN (ongoing) Task 2: Add Radar to the MDSS Display Task 6: Add total liquid precipitation to the MDSS display Task 7: System Maintenance (ongoing)	\$150,312 (Includes Weathernet costs plus UCAR overhead)
January 1, 2026 to December 31, 2026 Year 2	Task 1: see above (ongoing) Task 3: RWIS Camera machine learning to identify weather and pavement conditions Task 4: Add Forecast vs Observation history to MDSS display Task 7: see above (ongoing)	\$168,719 (Includes Weathernet costs plus UCAR overhead)
January 1, 2027 to December 31, 2027 Year 3	Task 1: see above (ongoing) Task 5: Add system playback to the MDSS display Task 7: System Maintenance (ongoing) and Modernization of MDSS components	\$159,802 (Includes Weathernet costs plus UCAR overhead)
January 1, 2028 to December 31, 2028	Task 8: TBD. May include replacing the road-temperature model (METro) used in	\$168,000

Year 4	<p>MDSS backend with a new machine-learning based model</p> <p>May include continued development of the runway friction prediction / RCAM prediction for DEN</p>	(Includes WeatherNet costs plus UCAR overhead)
<p>January 1, 2029 to December 31, 2029</p> <p>Year 5</p>	<p>Task 8 (cont): TBD. May include producing 15-minute forecast output for the first 6-hours of the forecast using the new sub-hourly HRRR model</p> <p>May include using the new NOAA high-resolution model: RFFS in the MDSS forecast engine</p>	<p>\$164,000</p> <p>(Includes WeatherNet costs plus UCAR overhead)</p>
Total for all 5 years		\$810,833

EXHIBIT C

**CITY AND COUNTY OF DENVER
INSURANCE REQUIREMENTS FOR DEPARTMENT OF AVIATION
PROFESSIONAL SERVICES AGREEMENT**

A. Certificate Holder and Submission Instructions

Contractor must provide a Certificate of Insurance as follows:

Certificate Holder: CITY AND COUNTY OF DENVER
Denver International Airport
8500 Peña Boulevard
Denver CO 80249
Attn/Submit to: contractadmininvoices@flydenver.com

- ACORD Form (or equivalent) certificate is required.
- Contractor must be evidenced as a Named Insured party.
- Electronic submission only, hard copy documents will not be accepted.
- Reference on the certificate must include the City-assigned Contract Number, if applicable.

The City may at any time modify submission requirements, including the use of third-party software and/or services, which may include an additional fee to the Contractor.

B. Defined Terms

1. “Agreement” as used in this exhibit refers to the contractual agreement to which this exhibit is attached, irrespective of any other title or name it may otherwise have.
2. “Contractor” as used in this exhibit refers to the party contracting with the City and County of Denver pursuant to the attached Agreement.

C. Coverages and Limits

1. Commercial General Liability

Contractor shall maintain insurance coverage including bodily injury, property damage, personal injury, advertising injury, independent contractors, and products and completed operations in minimum limits of \$1,000,000 each occurrence, \$2,000,000 products and completed operations aggregate; if policy contains a general aggregate, a minimum limit of \$2,000,000 annual policy aggregate must be maintained.

- a. Coverage shall include Contractual Liability covering liability assumed under this Agreement (including defense costs assumed under contract) within the scope of coverages provided.
- b. Coverage shall include Mobile Equipment Liability, if used to perform services under this Agreement.
- c. If a “per location” policy aggregate is required, “location” shall mean the entire airport premises.

2. Business Automobile Liability

Contractor shall maintain a minimum limit of \$1,000,000 combined single limit each occurrence for bodily injury and property damage for all owned, leased, hired and/or non-owned vehicles used in performing services under this Agreement.

- a. If operating vehicles unescorted airside at DEN, a \$10,000,000 combined single limit each occurrence for bodily injury and property damage is required.
- b. If Contractor does not have blanket coverage on all owned and operated vehicles and will require unescorted airside driving privileges, then a schedule of insured vehicles (including year, make, model and VIN number) must be submitted with the Certificate of Insurance.

- c. If transporting waste, hazardous material, or regulated substances, Contractor shall carry a Broadened Pollution Endorsement and an MCS 90 endorsement on its policy.
 - d. If Contractor does not own any fleet vehicles and Contractor's owners, officers, directors, and/or employees use their personal vehicles to perform services under this Agreement, Contractor shall ensure that Personal Automobile Liability including a Business Use Endorsement is maintained by the vehicle owner, and if appropriate, Non-Owned Auto Liability by the Contractor. This provision does not apply to persons solely commuting to and from the airport.
 - e. If Contractor will be completing all services to DEN under this Agreement remotely and not be driving to locations under direction of the City to perform services this requirement is waived.
3. Workers' Compensation and Employer's Liability Insurance
Contractor shall maintain the coverage as required by statute for each work location and shall maintain Employer's Liability insurance with limits no less than \$100,000 per occurrence for each bodily injury claim, \$100,000 per occurrence for each bodily injury caused by disease claim, and \$500,000 aggregate for all bodily injuries caused by disease claims.
 - a. Colorado Workers' Compensation Act allows for certain, limited exemptions from Worker's Compensation insurance coverage requirements. It is the sole responsibility of the Contractor to determine their eligibility for providing this coverage, executing all required documentation with the State of Colorado, and obtaining all necessary approvals. Verification document(s) evidencing exemption status must be submitted with the Certificate of Insurance.
4. Property Insurance
Contractor is solely responsible for any loss or damage to its real or business personal property located on DEN premises including, but not limited to, materials, tools, equipment, vehicles, furnishings, structures and personal property of its employees and subcontractors unless caused by the sole, gross negligence of the City. If Contractor carries property insurance on its property located on DEN premises, a waiver of subrogation as outlined in Section F will be required from its insurer.
5. Professional Liability (Errors and Omissions) Insurance
Contractor shall maintain a minimum limit of \$1,000,000 each claim and annual policy aggregate, providing coverage for all applicable professional services outlined in this Agreement.
6. Unmanned Aerial Vehicle (UAV) Liability:
If Contractor desires to use drones in any aspect of its work or presence on DEN premises, the following requirements must be met prior to commencing any drone operations:
 - a. Express written permission must be granted by DEN.
 - b. Express written permission must be granted by the Federal Aviation Administration (FAA).
 - c. Drone equipment must be properly registered with the FAA.
 - d. Drone operator(s) must be properly licensed by the FAA.
 - e. Contractor must maintain UAV Liability including flight coverage, personal and advertising injury liability, and hired/non-owned UAV liability for its commercial drone operations with a limit no less than \$1,000,000 combined single limit per occurrence for bodily injury and property damage.
7. Excess/Umbrella Liability
Combination of primary and excess coverage may be used to achieve minimum required coverage limits. Excess/Umbrella policy(ies) must follow form of the primary policies with which they are related to provide the minimum limits and be verified as such on any submitted Certificate of Insurance.

D. Reference to Project and/or Contract

The City Project Name, Title of Agreement and/or Contract Number and description shall be noted on the Certificate of Insurance, if applicable.

E. Additional Insured

For all coverages required under this Agreement (excluding Workers' Compensation, Employer's Liability and Professional Liability, if required), Contractor's insurer(s) shall include the City and County of Denver, its elected and appointed officials, successors, agents, employees, and volunteers as Additional Insureds by policy endorsement.

F. Waiver of Subrogation

For all coverages required under this Agreement (excluding Professional Liability, if required), Contractor's insurer(s) shall waive subrogation rights against the City and County of Denver, its elected and appointed officials, successors, agents, employees, and volunteers by policy endorsement.

If Contractor will be completing all services to the City under this Agreement remotely and not be traveling to locations under direction of the City to perform services, this requirement is waived specific to Workers' Compensation coverage.

G. Notice of Material Change, Cancellation or Nonrenewal

Each certificate and related policy shall contain a valid provision requiring notification to the Certificate Holder in the event any of the required policies be canceled or non-renewed or reduction in required coverage before the expiration date thereof.

1. Such notice shall reference the DEN assigned contract number related to this Agreement.
2. Such notice shall be sent thirty (30) calendar days prior to such cancellation or non-renewal or reduction in required coverage unless due to non-payment of premiums for which notice shall be sent ten (10) calendar days prior.
3. If such written notice is unavailable from the insurer or afforded as outlined above, Contractor shall provide written notice of cancellation, non-renewal and any reduction in required coverage to the Certificate Holder within three (3) business days of receiving such notice by its insurer(s) and include documentation of the formal notice received from its insurer(s) as verification. Contractor shall replace cancelled or nonrenewed policies with no lapse in coverage and provide an updated Certificate of Insurance to DEN.
4. In the event any general aggregate or other aggregate limits are reduced below the required minimum per occurrence limits, Contractor will procure, at its own expense, coverage at the requirement minimum per occurrence limits. If Contractor cannot replenish coverage within ten (10) calendar days, it must notify the City immediately.

H. Cooperation

Contractor agrees to fully cooperate in connection with any investigation or inquiry and accept any formally tendered claim related to this Agreement, whether received from the City or its representative. Contractor's failure to fully cooperate may, as determined in the City's sole discretion, provide cause for default under the Agreement. The City understands acceptance of a tendered claim does not constitute acceptance of liability.

I. Additional Provisions

1. Deductibles or any type of retention are the sole responsibility of the Contractor.
2. Defense costs shall be in addition to the limits of liability. If this provision is unavailable that limitation must be evidenced on the Certificate of Insurance.
3. Coverage required may not contain an exclusion related to operations on airport premises.
4. A severability of interests or separation of insureds provision (no insured vs. insured exclusion) is included under all policies where Additional Insured status is required.
5. A provision that coverage is primary and non-contributory with other coverage or self-insurance maintained by the City under all policies where Additional Insured status is required.
6. If the Contractor procures or maintains insurance policies with coverages or limits beyond those stated herein, such greater policies will apply to their full effect and not be reduced or limited by the minimum requirements stated herein.

7. All policies shall be written on an occurrence form. If an occurrence form is unavailable or not industry norm for a given policy type, claims-made coverage will be accepted by the City provided the retroactive date is on or before the Agreement Effective Date or the first date when any goods or services were provided to the City, whichever is earlier, and continuous coverage will be maintained or an extended reporting period placed for three years (eight years for construction-related agreements) beginning at the time work under this Agreement is completed or the Agreement is terminated, whichever is later.
8. Certificates of Insurance must specify the issuing companies, policy numbers and policy periods for each required form of coverage. The certificates for each insurance policy are to be signed by an authorized representative and must be submitted to the City at the time Contractor signed this Agreement.
9. The insurance shall be underwritten by an insurer licensed or authorized to do business in the State of Colorado and rated by A.M. Best Company as A- VIII or better.
10. Certificate of Insurance and Related Endorsements: The City's acceptance of a certificate of insurance or other proof of insurance that does not comply with all insurance requirements shall not act as a waiver of Contractor's breach of this Agreement or of any of the City's rights or remedies under this Agreement. All coverage requirements shall be enforced unless waived or otherwise modified in writing by DEN Risk Management. Contractor is solely responsible for ensuring all formal policy endorsements are issued by their insurers to support the requirements.
11. The City shall have the right to verify, at any time, all coverage, information, or representations, and the insured and its insurance representatives shall promptly and fully cooperate in any such audit the City may elect to undertake including provision of copies of insurance policies upon request. In the case of such audit, the City may be subject to a non-disclosure agreement and/or redactions of policy information unrelated to verification of required coverage.
12. No material changes, modifications, or interlineations to required insurance coverage shall be allowed without the review and written approval of DEN Risk Management.
13. Contractor shall be responsible for ensuring the City is provided updated Certificate(s) of Insurance prior to each policy renewal.
14. Contractor's failure to maintain required insurance shall be the basis for immediate suspension and cause for termination of this Agreement, at the City's sole discretion and without penalty to the City.

J. Part 230 and the DEN Airport Rules and Regulations

If the minimum insurance requirements set forth herein differ from the equivalent types of insurance requirements in Part 230 of the DEN Airport Rules and Regulations, the greater and broader insurance requirements shall supersede those lesser requirements, unless expressly excepted in writing by DEN Risk Management. Part 230 applies to Contractor and its subcontractors of any tier.

Appendix

Standard Federal Provisions

GENERAL CIVIL RIGHTS PROVISIONS

The Consultant agrees to comply with pertinent statutes, Executive Orders and such rules as are promulgated to ensure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or disability be excluded from participating in any activity conducted with or benefiting from Federal assistance.

This provision binds the Consultant and subcontractors from the bid solicitation period through the completion of the contract. This provision is in addition to that required by Title VI of the Civil Rights Act of 1964.

COMPLIANCE WITH NONDISCRIMINATION REQUIREMENTS:

During the performance of this contract, the Consultant, for itself, its assignees, and successors in interest (hereinafter collectively referred to as the "Consultant"), agrees as follows:

1. **Compliance with Regulations:** The Consultant (hereinafter includes consultants) will comply with the Title VI List of Pertinent Nondiscrimination Acts and Authorities, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
2. **Nondiscrimination:** The Consultant, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Consultant will not participate directly or indirectly in the discrimination prohibited by the Nondiscrimination Acts and Authorities, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR part 21.
3. **Solicitations for Subcontracts, including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding or negotiation made by the Consultant for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the Consultant of the Consultant's obligations under this contract and the Nondiscrimination Acts and Authorities on the grounds of race, color, or national origin.
4. **Information and Reports:** The Consultant will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the sponsor or the Federal Aviation Administration to be pertinent to ascertain compliance with such Nondiscrimination Acts and Authorities and instructions. Where any information required of a Consultant is in the exclusive possession of another who fails or refuses to furnish the information, the Consultant will so certify to the sponsor or the Federal Aviation Administration, as appropriate, and will set forth what efforts it has made to obtain the information.
5. **Sanctions for Noncompliance:** In the event of a Consultant's noncompliance with the non-discrimination provisions of this contract, the sponsor will impose such contract

sanctions as it or the Federal Aviation Administration may determine to be appropriate, including, but not limited to:

- a. Withholding payments to the Consultant under the contract until the Consultant complies; and/or
 - b. Cancelling, terminating, or suspending a contract, in whole or in part.
6. **Incorporation of Provisions:** The Consultant will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations, and directives issued pursuant thereto. The Consultant will take action with respect to any subcontract or procurement as the sponsor or the Federal Aviation Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the Consultant becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the Consultant may request the sponsor to enter into any litigation to protect the interests of the sponsor. In addition, the Consultant may request the United States to enter into the litigation to protect the interests of the United States.

TITLE VI LIST OF PERTINENT NONDISCRIMINATION ACTS AND AUTHORITIES

During the performance of this contract, the Consultant, for itself, its assignees, and successors in interest (hereinafter referred to as the “Consultant”) agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

- Title VI of the Civil Rights Act of 1964 (42 USC § 2000d et seq., 78 stat. 252) (prohibits discrimination on the basis of race, color, national origin);
- 49 CFR part 21 (Non-discrimination in Federally-assisted programs of the Department of Transportation—Effectuation of Title VI of the Civil Rights Act of 1964);
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 USC § 4601) (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Section 504 of the Rehabilitation Act of 1973 (29 USC § 794 et seq.), as amended (prohibits discrimination on the basis of disability); and 49 CFR part 27;
- The Age Discrimination Act of 1975, as amended (42 USC § 6101 et seq.) (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982 (49 USC § 471, Section 47123), as amended (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987 (PL 100-209) (broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, the Age Discrimination Act

of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms “programs or activities” to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);

- Titles II and III of the Americans with Disabilities Act of 1990, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 USC §§ 12131 – 12189) as implemented by U.S. Department of Transportation regulations at 49 CFR parts 37 and 38;
- The Federal Aviation Administration’s Nondiscrimination statute (49 USC § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 USC 1681 et seq).

FEDERAL FAIR LABOR STANDARDS ACT (FEDERAL MINIMUM WAGE)

Consultant is responsible for complying with the Federal Fair Labor Standards Act and for monitoring compliance by its subcontractors. Consultant must address any claims or disputes that arise from this requirement directly with the U.S. Department of Labor – Wage and Hour Division.

OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970

All contracts and subcontracts that result from this solicitation incorporate by reference the requirements of 29 CFR Part 1910 with the same force and effect as if given in full text. Consultant must provide a work environment that is free from recognized hazards that may cause death or serious physical harm to the employee. Consultant retains full responsibility to monitor its compliance and their subcontractor’s compliance with the applicable requirements of the Occupational Safety and Health Act of 1970 (20 CFR Part 1910). Consultant must address any claims or disputes that pertain to a referenced requirement directly with the U.S. Department of Labor – Occupational Safety and Health Administration.