



William Cass, P.E.
Assistant Commissioner

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

5B



Andre Briere
Deputy Commissioner

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

Bureau of Highway Design
November 22, 2022

REQUESTED ACTION

The Department of Transportation requests placing this item on the Consent Calendar.

Authorize the Department of Transportation to amend a Contract (DOT Project #40818) with AECOM Technical Services, Inc., Manchester, NH, Vendor #263436, for preliminary engineering, environmental services, financial plan development, public involvement services, and preliminary design to meet the requirements of an FTA Section 5309 Capital Investment Grant Program (CIG) Project Development/Engineering phase for the extension of MBTA commuter rail services from Lowell, MA to Nashua and Manchester, NH, by extending the completion date from January 31, 2023 to September 30, 2023, effective upon Governor and Council approval. The original Agreement was approved by Governor and Council on December 18, 2020. Time extension only, no additional funding.

EXPLANATION

On December 18, 2020, the Governor and Council authorized the subject agreement (Item # 20; copy of Resolution and Agreement attached) in the amount of \$5,448,607.89 for preliminary engineering, environmental services, financial plan development, public involvement services, and preliminary design. The objective of the project is to meet the requirements of an FTA Section 5309 Capital Investment Grant Program (CIG) Project Development/Engineering phase for the extension of MBTA commuter rail services from Lowell, MA to Nashua and Manchester, NH.

The purpose of this time extension amendment is to allow the consultant sufficient time to coordinate with local stakeholders, including the City of Manchester and the City of Nashua, coordinate and seek necessary approvals from the Federal Transit Administration, and coordinate with the new, yet unnamed, owners of large land parcels for the preferred South Nashua Station location at the Pheasant Lane Mall. The work is approximately 72% complete and of the original \$5,448,607.89 amount for this contract, there is a balance of approximately \$1,527,955.49 remaining (100% Federal Funds).

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

It is respectfully requested that authority be given to amend this Agreement for consulting services as outlined above.

Sincerely,

William Cass, P.E.
Assistant Commissioner

Attachments



THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION



Victoria F. Sheehan
Commissioner

William Cass, P.E.
Assistant Commissioner

NASHUA-MANCHESTER, 40818
NH-2020-012 (FTA GRANT)
NH Capitol Corridor Project Development
Time Extension Amendment
(Agreement Dated December 18, 2020)

Bureau of Highway Design
Room 200
Tel. (603) 271-1592
Fax: (603) 271-7025

November 22, 2022

Mr. James A. Doyle, AICP
Vice President
AECOM Technical Services, Inc.
1155 Elm Street, Suite 401
Manchester, NH 03101

Dear Mr. Doyle:

This letter amends Article I, Section H (Date of Completion) in the above-referenced Agreement. The original and amended dates are as follows:

Original Completion Date	January 31, 2023
By this letter, amended to	September 30, 2023

This no-additional-cost change order for the extension is as requested by your letter dated November 21, 2022 and as discussed in project meetings.

This amendment becomes effective upon approval by the Governor and Council.

Sincerely,

Michelle L. Winters
Director of Aeronautics, Rail & Transit

Approved: Peter E. Stamnas, P.E.
Director of Project Development

We concur in the above Amendment.

AECOM TECHNICAL SERVICES, INC.

By: James A. Doyle

Title: Vice President 11/22/2022

AGREEMENT AMENDMENT

NASHUA-MANCHESTER, NH-2020-012, 40818

AECOM TECHNICAL SERVICES, INC.

IN WITNESS WHEREOF the parties hereto have executed this amended AGREEMENT on the day and year first above written.

Consultant

WITNESS TO THE CONSULTANT

CONSULTANT

By: Jillian Brodeur Jillian Brodeur
Project Controls Analyst

By: James A. Doyle James A. Doyle
Vice President (Title)

Dated: 11/22/2022

Dated: 11/22/2022

Department of Transportation

WITNESS TO THE STATE OF NEW HAMPSHIRE

THE STATE OF NEW HAMPSHIRE

By: Notasha Field

By: William Carr

DOT ASSISTANT COMMISSIONER

Dated: 11/30/2022

Dated: 11/30/2022

Attorney General

This is to certify that the above-amended AGREEMENT has been reviewed by this office and is approved as to form and execution.

Dated: 12/2/22

By: Samuel Berger
Assistant Attorney General

Secretary of State

This is to certify that the GOVERNOR AND COUNCIL on _____ approved this amended AGREEMENT.

Dated: _____

Attest:

By: _____
Secretary of State

Certificate of Authority # 2

(Corporation, Non-Profit Corporation)

Corporate Bylaws

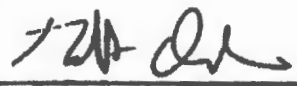
I, Robert Orlin, hereby certify that I am duly elected Clerk/^{Asst}Secretary/Officer of
(Name)
AECOM Technical Services, Inc. I hereby certify the following is a true copy of the
(Name of Corporation)

current Bylaws or Articles of Incorporation of the Corporation and that the Bylaws or
Articles of Incorporation authorize the following officers or positions to bind the
Corporation for contractual obligations Vice President
(list officer titles or position)

I further certify that the following individuals currently hold the office or positions
authorized: James A. Doyle
(list individuals holding positions authorized)

I further certify that it is understood that the State of New Hampshire will rely on this
certificate as evidence that the person listed above currently occupies the position indicated
and that they have full authority to bind the corporation. This authority shall remain valid
for thirty (30) days from the date of this certificate.

DATED: 11-18-2022

ATTEST: 
(Name & Title)
Robert Orlin
VP & Asst. Secretary

State of New Hampshire

Department of State

CERTIFICATE

I, David M. Scanlan, Secretary of State of the State of New Hampshire, do hereby certify that AECOM TECHNICAL SERVICES, INC. is a California Profit Corporation registered to transact business in New Hampshire on September 27, 1995. I further certify that all fees and documents required by the Secretary of State's office have been received and is in good standing as far as this office is concerned.

Business ID: 237154

Certificate Number: 0005899358



IN TESTIMONY WHEREOF,

I hereto set my hand and cause to be affixed
the Seal of the State of New Hampshire,
this 21st day of November A.D. 2022.

A handwritten signature in black ink, appearing to read "David M. Scanlan".

David M. Scanlan
Secretary of State



ADDITIONAL REMARKS SCHEDULE

AGENCY Marsh Risk & Insurance Services		NAMED INSURED AECOM AECOM Technical Services, Inc. 1155 Elm Street, Suite 401 Manchester, NH 03101	
POLICY NUMBER		EFFECTIVE DATE:	
CARRIER	NAIC CODE		

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,
 FORM NUMBER: 25 FORM TITLE: Certificate of Liability Insurance

Workers Compensation/Employer Liability cont.

Policy Number	Insurer	States Covered
WLR C68926361	Indemnity Insurance Company of North America - NAIC # 43575	AOS, Including California
WLR C68926324	ACE American Insurance Company - NAIC # 22667	MA
SCF C68926440	ACE Fire Underwriters Insurance Company - NAIC # 20702	WI Retro



Victoria F. Sheehan
Commissioner

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

G+C #20
Date 12/18/20



William Cass, P.E.
Assistant Commissioner

Bureau of Rail and Transit
November 17, 2020

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

REQUESTED ACTION

Authorize the Department of Transportation to enter into an agreement with AECOM Technical Services, Inc., Manchester, NH, Vendor #263436, for an amount not to exceed \$5,448,607.89, for preliminary engineering, environmental services, financial plan development, public involvement services, and preliminary design to meet the requirements of the FTA Section 5309 Capital Investment Grant Program (CIG) Project Development/Engineering phase for the extension of MBTA commuter rail services from Lowell, MA to Nashua and Manchester, NH., effective upon Governor and Council approval through January 31, 2023. 100% Federal Funds.

Funds to support this request are available in the following account in State FY 2021, and funding is contingent upon the availability and continued appropriation of funds in FY 2022 and FY 2023, with the ability to adjust encumbrances between State Fiscal Years through the Budget Office if needed and justified:

	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>
04-096-096-964010-2916 Public Transportation			
072-509073 Grants Federal	\$1,000,000.00	\$3,000,000.00	\$1,448,607.89

EXPLANATION

The Department requires consulting engineering and environmental services to study improvements to the NH Capitol Corridor. NHDOT refers to the Lowell-Nashua-Manchester railroad corridor, which extends to Concord, as the NH Capitol Corridor. Consistent with NH Chapter Law 289 (2019), this project will extend to Manchester, and any study tasks between Manchester and Concord will be the subject of a future study. The full corridor extends from Boston to Concord, a distance of 78 miles, and includes the following rail segments: Boston-Lowell, 25 miles; Lowell-Nashua, 10 miles; Nashua-Manchester, 25 miles; and Manchester-Concord, 18 miles. The railroad corridor includes existing MBTA commuter rail service to Lowell and Pan Am Railways freight service from Lowell to Concord. Alternative highway corridors include the US Route 3/Everett Turnpike corridor and the I-93 corridor in Massachusetts and New Hampshire. Both of these highway corridors are served by commuter and intercity bus service.

This project involves preliminary engineering, environmental services, financial plan development, public involvement services, and final design needed to meet the requirements of the FTA Section 5309 Capital Investment Grant Program (CIG) Project Development/Engineering phase for the extension of MBTA commuter rail services from Lowell, MA to Nashua and Manchester, NH. Improvements to be considered will be developed based upon the 2014 Capitol Corridor Rail & Transit Alternatives Analysis Plan, however there is still a need to identify a locally preferred alternative to improve mobility in the corridor. This phase is required and must be approved by the Federal Transit Administration (FTA) for Capital Investment Grant (CIG) Program funding to extend MBTA commuter rail service.

The consultant selection process employed by the Department for this qualifications-based contract is in accordance with RSAs 21-I:22, 21-I:22-c, 21-I:22-d, 228:4 and 228:5-a, and all applicable Federal laws and the Department's "Policies and Procedures for Consultant Contract Procurement, Management, and Administration"

dated August 25, 2017. The Department's Consultant Selection Committee is a standing committee that meets regularly to administer the process and make determinations. The Committee is comprised of the Assistant Director of Project Development (Chair), the Chief Project Manager, the Administrators of the Bureaus of Highway Design, Bridge Design, Environment, and Materials and Research, and the Municipal Highways Engineer.

The consultant selection process for this qualifications-based contract was initiated by a solicitation for consultant services for Nashua-Manchester 40818, improvements to NH Capitol Corridor. The assignment was listed as a "Project Soliciting for Interest" on the Department's website on October 24, 2019 asking for letters of interest from qualified firms. From the list of firms that submitted letters of interest, the Committee prepared a long and then short list of Consultants on November 12, 2019 for consideration and approval by the Assistant Commissioner. Upon receipt of that approval, four shortlisted firms were notified on December 10, 2019 through a technical "Request for Proposal" (RFP). Committee members individually rated the firms on January 23, 2020 using a written ballot to score each firm on the basis of comprehension of the assignment, clarity of the proposal, capacity to perform in a timely manner, quality and experience of the project manager and the team, previous performance, and overall suitability for the assignment. (A compilation of the completed individual rating ballots and the ranking summary form is attached.) The individual rankings were then totaled to provide an overall ranking of the four firms, and the Committee's ranking was submitted to the Assistant Commissioner for consideration and approval. Upon receipt of that approval, the short listed firms were notified of the results and the highest-ranking firm was asked to submit a fee proposal for negotiations.

The long list of four (4) consultant firms that were considered for this assignment, with the four (4) short-listed firms shown in bold, is as follows:

Consultant Firm

AECOM Technical Services, Inc.
HDR Engineering, Inc.
HNTB Corporation
STV Incorporated

Office Location

Manchester, NH
Manchester, NH
Concord, NH
Boston, MA

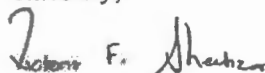
The firm of AECOM Technical Services, Inc. was recommended for this contract. This firm has an excellent reputation and has demonstrated their capability to perform the required services. Background information on this firm is attached.

AECOM Technical Services, Inc. has agreed to furnish the professional engineering services for an amount not to exceed \$5,448,607.89. This is a reasonable fee and is commensurate with the complexity of the project and the scope of the engineering and technical services to be furnished. This project funding is 80% Federal funds with 20% State match. Pursuant to RSA 228:12-a, Use of Toll Credits, Turnpike toll credit is being utilized for New Hampshire's match requirement, effectively using 100% Federal Funds.

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

It is respectfully requested that authority be given to enter into an Agreement for consulting services as outlined above.

Sincerely,



Victoria F. Sheehan
Commissioner

Attachments

January 23, 2020

PROJECT: Nashua-Manchester 40818

DESCRIPTION: Preliminary engineering, environmental services, financial plan development, public involvement services, and final design are needed to meet the requirements of the FTA Section 5309 Capital Investment Grant Program (CIG) Project Development/Engineering phase for the extension of MBTA commuter rail services from Lowell, MA to Nashua and Manchester, NH. Improvements to be considered will be developed based upon the 2014 Capitol Corridor Rail & Transit Alternatives Analysis Plan, available under the "Rail and Transit" section of the Department's website. This phase is required and must be approved by the Federal Transit Administration (FTA) for Capital Investment Grant (CIG) Program funding to extend MBTA commuter rail service. The scope of work may include: Oversee process to select a locally preferred alternative (LPA) as necessary; Conduct sufficient engineering to complete the Environmental Assessment and complete all appropriate environmental documentation and permitting, to satisfy NEPA, State, and Federal requirements; Refine cost through value engineering so that the true cost of the project will be known and carried forward to the Construction phase; Determine which CIG category ("New Starts or "Small Starts") the project is subject to and preparation of the appropriate submission packages to FTA; Geotechnical, safety and accessibility reviews – corridor condition, ADA and Federal Railroad Administration (safety) compliance; Develop realistic financial plan showing federal, state, local, and private funding sources, including refining the benefit cost analysis detailing the financial and economic benefit for the Manchester Regional Alternative from the 2014 Capitol Corridor Rail & Transit Alternatives Analysis Plan; Obtain firmly-committed matching funds per program requirements; Identify and draft all necessary third party agreements; Develop a strategy to address evaluation criteria in order to maximize the project's rating to successfully compete for CIG funding; Complete final construction documents to advertise for construction, including all rail, station, layover designs and specifications; The Consultant will also be required to assist the Department with any public involvement processes required for selection of the preferred alternative or presenting Project Development/Engineering information to legislative or municipal officials. This work will require Professional Engineer and Land Surveyor licensure in the State of New Hampshire.

SERVICES REQUIRED: : R&T, STRC, RDWY, BRDG, CIVL, ENV, AIR, ARCY, HIST, NOIS, WET, HAZ, ROW, TRAF, PINV, SURV, GEOT, FINANCIAL PLANNING

SUMMARY

AECOM Technical Services, Inc.	1	1	1	1	1	1	1	7	1
HDR Engineering, Inc.	3	3	3	3	3	3	3	21	3
HNTB Corporation	2	2	2	2	2	2	2	14	2
STV Incorporated	4	4	4	4	4	4	4	28	4

EVALUATION OF TECHNICAL PROPOSALS

Rating Considerations	WEIGHT	Scoring of Firms			
		AECOM	HDR Engineering, Inc.	HNTB Corporation	STV Incorporated
Comprehension of the Assignment	20%	17	12	15	10
Clarity of the Proposal	20%	20	10	20	5
Capacity to Perform in a Timely Manner	20%	15	5	15	10
Quality & Experience of Project Manager/Team	20%	20	15	17	10
Previous Performance	10%	10	7	8	5
Overall Suitability for the Assignment	10%	10	7	10	5
Total	100%	92	56	85	45

Ranking of Firms:
 1. AECOM
 2. HNTB

3. HDR
 4. STV

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Overall Suitability for the Assignment	10%	10	7	10	5
Total	100%	92	56	85	45

Ranking of Firms:
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ATTACHMENTS

1. CERTIFICATION WITH REGARD TO THE PERFORMANCE OF PREVIOUS CONTRACTS OR SUBCONTRACTS, ETC.
2. CONSULTANT DISCLOSURE STATEMENT FOR PREPARATION OF ENVIRONMENTAL EVALUATIONS
3. CERTIFICATION OF CONSULTANT/SUBCONSULTANT
4. CERTIFICATION OF STATE DEPARTMENT OF TRANSPORTATION
5. CERTIFICATION FOR FEDERAL-AID CONTRACTS EXCEEDING \$100,000 IN FEDERAL FUNDS
6. CERTIFICATION OF GOOD STANDING
7. CERTIFICATION OF INSURANCE
8. CERTIFICATION OF AUTHORITY / VOTE
9. FTA FEDERAL CLAUSES (11 PAGES)
10. SIGNATURE PAGE

**AGREEMENT
FOR PROFESSIONAL SERVICES**

PREAMBLE

THIS AGREEMENT made this 16th day of November in the year 2020 by and between the STATE OF NEW HAMPSHIRE, hereinafter referred to as the STATE, acting by and through its COMMISSIONER OF THE DEPARTMENT OF TRANSPORTATION, hereinafter referred to as the COMMISSIONER, acting under Chapter 228 of the Revised Statutes Annotated, and AECOM Technical Services, Inc., with principal place of business at 515 S. Flower Street, in the City of Los Angeles, State of California, and local office at 1155 Elm Street in the City of Manchester, State of New Hampshire, and hereinafter referred to as the CONSULTANT, witnesses that:

The Department of Transportation, State of New Hampshire, hereinafter referred to as the DEPARTMENT, proposes to provide preliminary engineering, environmental services, financial plan development, public involvement services, and preliminary design to meet the requirements of the FTA Section 5309 Capital Investment Grant Program (CIG) Project Development/Engineering phase for the extension of MBTA commuter rail services from Lowell, MA to Nashua and Manchester, NH. Improvements to be considered will be developed based upon the 2014 Capitol Corridor Rail & Transit Alternatives Analysis Plan. This required phase must be approved by the Federal Transit Administration (FTA) for Capital Investment Grant (CIG) Program funding to extend MBTA commuter rail service.

The DEPARTMENT requires professional services for the preparation of engineering plans and detailed documents for this project. These services are outlined in the CONSULTANT'S technical proposal dated January 10, 2020, and revised fee proposal dated November 13, 2020, which are hereby adopted by reference and considered to be part of this AGREEMENT along with the following attachments:

- AECOM's Scope
- NHDOT's Survey Task Matrix

This AGREEMENT becomes effective upon approval by the Governor and Council.

ARTICLE I

ARTICLE I - DESCRIPTION OF PROFESSIONAL SERVICES TO BE RENDERED

NOW THEREFORE, in consideration of the undertakings of the parties hereinafter set forth, the DEPARTMENT hereby engages the CONSULTANT, who agrees to render services to the DEPARTMENT which shall include, but not be restricted to, the following items, in accordance with conditions and terms hereinafter set forth:

A. LOCATION AND DESCRIPTION OF PROJECT

NHDOT refers to the Lowell-Nashua-Manchester railroad corridor, which extends to Concord, as the NH Capitol Corridor. Consistent with Congressional intent, this project will extend to Manchester, and any study tasks between Manchester and Concord will be the subject of a future study. The full corridor extends from Boston to Concord, a distance of 78 miles, and includes the following rail segments: Boston-Lowell, 25 miles; Lowell-Nashua, 10 miles; Nashua-Manchester, 25 miles; and Manchester-Concord, 18 miles. The railroad corridor includes existing MBTA commuter rail service to Lowell and Pan Am Railways freight service from Lowell to Concord. Alternative highway corridors include the US Route 3/Everett Turnpike corridor and the I-93 corridor in Massachusetts and New Hampshire. Both of these highway corridors are served by commuter and intercity bus service.

This project involves preliminary engineering, environmental services, financial plan development, public involvement services, and final design needed to meet the requirements of the FTA Section 5309 Capital Investment Grant Program (CIG) Project Development/Engineering phase for the extension of MBTA commuter rail services from Lowell, MA to Nashua and Manchester, NH. Improvements to be considered will be developed based upon the 2014 Capitol Corridor Rail & Transit Alternatives Analysis Plan, however there is still a need to identify a locally preferred alternative to improve mobility in the corridor. This phase is required and must be approved by the Federal Transit Administration (FTA) for Capital Investment Grant (CIG) Program funding to extend MBTA commuter rail service.

Some existing features and conditions to be aware of include:

- The corridor passes through known areas of Per- and Polyfluoroalkyl Substances (PFAS).
- The corridor passes through known areas of Limited Reuse Soils (LRS).
- The corridor passes through known floodplains.

The objective of the project is to develop the project to the 30% design phase and further if possible.

Assuming successful entry into the Engineering phase, and upon completion of this agreement, the DEPARTMENT reserves the right to either negotiate a scope and fee for completing the design, or terminate the contract.

B. SCOPE OF WORK

The scope of work for this project includes the following work by the CONSULTANT:

1. Overseeing the process to select and confirm a locally preferred alternative (LPA), including having it entered into a fiscally constrained metropolitan transportation plan.

ARTICLE 1

2. Conducting sufficient engineering to complete the Environmental Assessment and complete all appropriate environmental documentation and permitting, to satisfy all NEPA, State, and Federal requirements including the Federal Rail Administration (FRA) and Federal Transit Administration (FTA) in cooperation with the resource agencies.
 - a) Verifying of the Purpose and Need Statement.
 - b) Receiving the final FTA environmental decision (e.g. categorical exclusion, finding of no significant impact, record of decision, etc.).
 - c) Flood Plains:

Final estimates of impacts to flood storage and final design of flood storage mitigation to compensate for flood storage impacts, including the incorporation of minimization methods to further reduce impacts. This shall require the CONSULTANT to perform coordination with FEMA and the Army Corps of Engineers (ACOE).

Flood mapping revisions will be suggested, if required, such as a Conditional Letters of Map Revision (CLOMR), however if a CLOMR is needed it will be part of a separate agreement.
 - d) Limited Reuse Soils (LRS):

The CONSULTANT shall determine the quantity of LRS to be generated during construction, by phase if applicable, and determine the ability, due to quantities and any applicable construction phasing, to reuse the LRS within the project limits. The CONSULTANT shall determine and provide figures for potential temporary on-construction-site stockpile locations for excavated LRS.
 - e) Railroad Impacted Soils:

The CONSULTANT shall determine the quantity and location of Railroad Impacted Soils to be generated during by construction, by phase if applicable, and determine, in coordination with the DEPARTMENT and the railroad corridor owner, the appropriate reuse or disposal method for this material.
 - f) Per- and Polyfluoroalkyl Substances (PFAS):

The CONSULTANT shall perform a NHDES database search (NHDES OneStop and PFAS datamapper) to identify any sites with records of PFAS sampling and any NHDES requests to sample for any media type (soil, groundwater, surface water) within 1,000 feet of the project limits. This information will be described in a summary report that includes a list of all parcels with potential PFAS contamination concerns. The CONSULTANT will coordinate with the DEPARTMENT on evaluating the risk of PFAS results and in determining any future investigation requirements of the project.

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The CONSULTANT is advised that the preliminary design alignment for this passes through the Saint-Gobain Groundwater Management Zone (GMZ) for PFAS.

g) Stream Passage Improvement Program (SPIP):

Additional mitigation opportunities will be identified through the Stream Passage Improvement Program (SPIP), a newly established process of evaluating and identifying state and municipally owned crossings within the vicinity of the project to be upgraded as permittee responsible mitigation.

The SPIP process entails identifying culverts that have been assessed through the NH Stream Crossing Assessment Initiative and displayed through the NHDES Aquatic Restoration Mapper that impede aquatic organism passage, are not geomorphically compatible with the stream, and are in poor condition. Through coordination with the resource agencies the candidate culverts are narrowed down. Stream crossing assessments and preliminary design and cost analysis is then conducted for each of these crossings. From this point, the project team must identify the feasibility and constructability of upgrading a potential candidate culvert using the mitigation funds generated by the stream impacts of the project.

If it is anticipated that the project will not cumulatively impact greater than or equal to 500 linear feet of permanent channel and bank, the SPIP process will not be initiated.

Assuming the linear impacts to banks and channels are greater than 500 linear feet the CONSULTANT will utilize the online NH Aquatic Restoration Mapper to identify up to eight (8) stream crossings to assess for potential consideration under the SPIP. Crossings will be prioritized in the following order: culverts within the same watershed and within the respective town/city of the impacts, culverts within the same watershed but not within the respective town/city. Town/City owned culverts will be considered if fewer than 8 State-owned culverts are identified within these parameters. Culverts within the adjacent watersheds will be considered if fewer than 8 culverts are identified in the impacted watershed.

h) Rare, Threatened and Endangered Species

1) Rare, Threatened and Endangered Wildlife Species

- a. Update IPaC list and NHB Report
- b. Northern Long Eared Bat Review- Considering the project has anticipated impacts more than 300' from rail and road surfaces and the court ruling on January 28, 2020 and the ongoing review of the species status by USFWS, consider the best means of review for this species and include it in the

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Environmental Assessment as a future action, to be performed during the next phase of design, not a part of this agreement.

1. Plan for winter tree clearing, if possible, in the construction phasing.
 - c. SB200 (RSA 228:26-c Wildlife Corridors and Habitat Strongholds) requires that the Department consider wildlife corridors and habitat strongholds, where feasible, and incorporate them into project planning and mitigation. Review the Connect the Coast data (available on the NH Coastal Viewer) and current NH Fish & Game Department Wildlife Action Plan data (available on GRANIT) for corridors, habitat blocks, and highly ranked terrestrial and aquatic habitat and consider this information in project planning and discussions with NH Fish & Game.
- 2) Fisheries
- a. Essential Fish Habitat Assessments for streams/rivers that are EFH and might be impacted by the project. Coordination with NOAA NMFS.
3. Developing a full cost estimate for engineering, right of way (based upon the assessed value of impacted property) and construction (including construction engineering and inspection), and capital & operational costs. This cost shall be refined through value engineering so that the true cost of the project will be known and carried forward to the Construction phase. This cost will be locked in at the start of the Engineering phase, so it is critical to the success of the project to obtain, support and maintain this cost through construction.
 4. Determining which CIG category ("New Starts or "Small Starts") the project is subject to and preparation of the appropriate submission packages to FTA. This includes the request letter and documentation to enter into Project Development. This also includes developing a strategy to address the evaluation criteria in order to maximize the project's rating to successfully compete for CIG funding.
 - a) If determined eligible for FTA New Starts funding, the locally preferred alternative will be the subject of a New Starts submittal. This submittal will address the project justification and local financial commitment, consistent with FTA requirements. Documentation and reporting templates will include:
 - 1) "Making the Case"
 - 2) Local Financial Commitment
 - 3) Before and After Study Plan
 - 4) Project Management Plan
 - 5) Demonstration that other FTA requirements have been met

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5. Completing geotechnical, bridge, drainage, safety and accessibility reviews such as corridor condition, bridge condition, ADA and FRA (safety) compliance. This includes all necessary reports and documentation such as the geotechnical report and constructability review report.
 - a) The geotechnical task shall also include taking periodic measurements of any newly CONSULTANT installed groundwater monitoring wells. It is required to follow the NH Stormwater Manual for the design of the BMPs. The manual specifies many items such as well installation and monitoring. For example, it is anticipated that 2 monitoring wells will be required for each proposed Best Management Practice (BMP). The groundwater elevations at each of these new wells will be needed at a minimum of four times during the duration of this contract where at least two readings will be taken during high ground water (spring) and at least two during low ground water (summer).
6. Developing and providing a realistic financial plan showing federal, state, local, and private funding sources, including refining the benefit cost analysis detailing the financial and economic benefit for the Manchester Regional Alternative from the 2014 Capitol Corridor Rail & Transit Alternatives Analysis Plan. This plan shall be in accordance with the requirements of the FTA "Guidance for Transit Financial Plans" dated June 2000.
7. Developing and providing a Service Development Plan.
8. Identifying firmly committed matching funds per program requirements.
9. Identifying and drafting all necessary third party agreements. This includes identifying and drafting technical content necessary for the design and implementation of the infrastructure upgrades and operations associated with the Locally Preferred Alternative (LPA), as it is confirmed and defined during this phase of the project. The services will be provided in three steps: (1) Outline of key issues, participants, and content of third party agreements; (2) Review and comment by NHDOT and other relevant agencies; and (3) Draft of third party agreement technical content. There will be no legal services provided under this Task and it is assumed any legal reviews and legal input to the third party agreements will be provided by NHDOT.
10. Developing a strategy to address evaluation criteria in order to maximize the project's rating to successfully compete for Capital Investment Grant (CIG) funding.
11. Completing 30% design construction documents and plans in enough detail to qualify for a federal Capital Investment Grant, including all rail (track signals, power, etc.), stations, layover designs, bridge designs, grade crossing designs, drainage designs, etc. supported by the appropriate calculations, estimates and specifications.
 - a) The design shall consider; erosion control measures and Best Management Practices (BMPs) consistent with National Pollutant Discharge Elimination System (NPDES) 2017 NH Small MS4 General Permit and New Hampshire Department of Environmental

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Services (NHDES) guidelines, traffic control measures, drainage, hydraulic studies/reports (see the NHDOT Bridge Design Manual Section 2.7), treatments to minimize environmental impacts, traffic counts, traffic analysis, highway signs, traffic control signals, and pavement markings. The CONSULTANT shall incorporate into the design plans any DEPARTMENT provided materials and designs such as lighting, Smart Work Zone (SWZ) devices, or Intelligent Transportation Systems (ITS) devices.

- b) The quantity and location of signs, sign structures, pavement markings, construction signs and warning devices, and traffic signals will be as required by the Manual of Uniform Traffic Control Devices (MUTCD 2009 Edition) and current Bureau of Traffic and City practices as may be warranted for consistency and to accommodate maintenance constraints as applicable to development of grade crossing plans, stations and layover facilities.
 - c) The CONSULTANT shall develop plans at the scale of 1" = 50', unless otherwise noted, inclusive of the local road connections. All stations will be at a reasonable architectural scale to ensure an accurate design. All grade crossing, station design plans, and layover facilities shall be at a scale of 1" = 20'.
12. Assisting the Department with any public involvement processes required for selection of the preferred alternative or presenting Project Development/Engineering/Financial Plan information to legislative or municipal officials.
- a) It is anticipated that the public outreach process will be limited as much of that occurred during the Alternatives Analysis (A/A) phase with the exception of the Financial Plan which will require outreach to the stakeholders identified for that deliverable.
 - b) The CONSULTANT will need to provide clear and understandable information at each step of the project, and selection of a locally preferred alternative. It is envisioned that most of this will be through a website with limited public outreach; however, outreach to the host communities for the stations and the layover facility will be needed.
 - c) Stakeholders, including FTA and public agencies at all levels, private transportation providers and property owners, and others, will need to be kept informed as the project progresses, it is envisioned that this will be accomplished through limited public presentations and the DEPARTMENT's website with materials provided by the CONSULTANT.
 - d) Deliverables: updated public involvement plan, materials for public presentations and materials for posting to the DEPARTMENT's website.
13. Completing all survey work including base plan preparation, and survey updates. As survey data is collected the Consultant is alerted that part of the next design phase, not part of this

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current scope, will require recording a right-of-way (ROW) plan at the registry of the existing ROW conditions, so all survey collection should consider this future need. (Prior to the recording of this ROW plan, the consultant must submit this plan to the Bureau of Right of Way for review and approval. Following the recording of this ROW plan, the consultant shall be responsible for delivering a copy of the plan in both .pdf and .dwg format to the Bureau of Right of Way.)

14. Preparation of all plans to enable the DEPARTMENT to acquire the necessary ROW (easements or acquisitions), although ROW acquisitions will not be a part of this contract or this phase of the work. Any demolitions are to be completed by the CONSULTANT and added into the construction project.
15. Traffic Engineering:
 - a) Completing all traffic engineering sufficient to complete the design of the layover facilities and the stations; this includes; traffic counts, detours, traffic control plans, signals, signs, supports, markings, ridership counts, and a safety analysis (i.e. Positive Train Control). Forecasting should include project opening year and a 20-year horizon.
 - b) Completing all grade crossing related traffic engineering sufficient to complete the design, this includes; signal pre-emption, signs, markings, and a diagnostic evaluation.
16. Completing all applicable utility coordination, including verification of existing utilities, identifying any potential relocations, obtaining utility relocation plans and cost estimates. Completing draft Utility Agreements documenting the utility relocation plan, relocation time, relocation cost, and who is responsible for work effort and cost is required.
17. Providing a Project Management Plan and sub-plans as well as monthly schedules, work plans staffing, budgets and agreements.
18. This work will require Professional Engineer and Land Surveyor licensure in the States of New Hampshire and Massachusetts.
19. Work will conform to FTA requirements for transit projects and should be informed by FTA technical guidance.
20. The CONSULTANT shall be responsible for preparing and finalizing all meeting minutes for meetings in which they are in attendance.
21. The CONSULTANT shall be responsible, as part of this AGREEMENT, to secure and pay for the necessary railroad protection and flaggers during any site inspections, surveys, etc. when the CONSULTANT or any sub consultant is within the Railroad Right-of-Way.
22. Deliverables noted herein should not be considered a comprehensive list; other products may be required to comply with FTA requirements.

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The purpose of this project more fully described in the scope of work included in this AGREEMENT as Appendix A.

C. MATERIAL FURNISHED BY THE DEPARTMENT OF TRANSPORTATION

The DEPARTMENT will furnish any available applicable data to the CONSULTANT, including any prior studies and reports, if available, and if requested. The DEPARTMENT will also provide utility contacts for utilities within each municipality.

D. WORK SCHEDULE AND PROGRESS REPORTS

The CONSULTANT shall begin performance of the services designated in the Contract promptly upon receipt from the DEPARTMENT of a Notice to Proceed and the material to be furnished as herein described. The CONSULTANT shall complete these services without delay unless unable to do so for causes not under the CONSULTANT'S control.

The CONSULTANT'S sequence of operation and performance of the work under the terms of this AGREEMENT shall be varied at the direction of the DEPARTMENT in order to give priority in critical areas so that schedules and other STATE commitments, either present or future, can be met.

The CONSULTANT shall report progress to the DEPARTMENT in conjunction with DEPARTMENT'S Standardized Invoicing process. Invoices shall be submitted for each month that there has been more than \$10,000 in cumulative billable work since the last invoice, and at least quarterly. For months with no progress or less than \$10,000 cumulative work since the last invoice, a status report briefly describing the reasons for little or no progress shall be submitted.

E. SUBMISSION OF REPORTS, PLANS AND DOCUMENTS

During the prosecution of this AGREEMENT, the CONSULTANT shall prepare and submit to the DEPARTMENT separate submissions as described hereinafter. All work submitted by the CONSULTANT to the DEPARTMENT shall be in US Customary units.

The CONSULTANT shall submit, for each submittal, a Presentation Plan, an estimate, an Engineering Report and a Design Report describing the "design issues" addressed in that submission. The report shall include reference materials used, design criteria and controls, specific items and issues of interest, design calculations (e.g. superelevation, guardrail, etc.), drainage information (including back-up calculations, and a copy of the drainage software model), traffic analyses and a construction cost estimate. In addition, the report shall include anticipated or outstanding issues and the CONSULTANT'S recommendations on a resolution. All issues shall be noted as to whether the CONSULTANT feels that the issue is within the scope of work described in Article I. Meetings between the CONSULTANT and the DEPARTMENT shall be held prior to submissions to discuss design issues and recommendations as well as for comment resolutions after the submission.

The submissions shall be as necessary in accordance with the study process and environmental analysis as outlined above. The CONSULTANT shall supplement each submission with such paper and electronic

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copies of MicroStation drawings, Excel Files, drainage models, illustrations and descriptive matter as are necessary to facilitate a comprehensive understanding and review of proposed concepts.

Submissions shall be as described in the "Final Interim Policy Guidance Federal Transit Administration Capital Investment Grant Program" dated June 2016, the NHDOT Highway Design Manual, and the NHDOT Bridge Design Manual (for bridge work and hydraulic work only). It is intended that the submissions for the rail road will be similar to those presented in the Highway Design Manual for the following submissions Pre-Preliminary, Preliminary Plans and Utility Plans.

The CONSULTANT will be expected to support their design proposals and any issues resulting from review by the DEPARTMENT or in the public participation phase (including agency coordination), with alternative studies and reasonably itemized cost comparisons for alternate concepts.

All plan drawings, including size of sheets, lettering, symbols and scale of said drawings, shall conform to the requirements and standards of the DEPARTMENT. Any and all CAD/D-related work completed during the course of this project shall be performed in conformance with the DEPARTMENT'S CAD/D Procedures and Requirements in effect at the time of execution of this AGREEMENT. In addition, the CONSULTANT'S final submission shall include hard copy plans, etc. as well as electronic CAD/D or GIS files in accordance with the current DEPARTMENT CAD/D Procedures and Requirements. The CAD/D files shall consist of the base plans with enhancements in MicroStation format, using DEPARTMENT naming conventions, line styles and character styles. The CONSULTANT shall also furnish a coordinate summary of all survey control points with a corresponding plot of controls and alignments (including all curve data) superimposed over the detail plan.

In addition to the final reproducible plans being furnished as noted herein, the CONSULTANT shall provide electronic file copies of all railroad, highway grade crossing, highway and bridge project plan sheets (including layover and station facilities) with real State plane coordinates, including, but not limited to, final quantity sheets, typical and detail sheets, general plans and profiles, traffic-signal sheets, and cross sections. In addition to these plan sheets, an electronic file of the entire project's final design shall be submitted in an "uncut" format showing all design features in a real State plane coordinate system, un-rotated. These final electronic files shall be indexed with file name, description of the contents of the file and project sheet number as applicable. All files shall be submitted in conformance with the DEPARTMENT'S CAD/D Procedures and Requirements. Any plans or calculations (e.g. quantity summary sheets) produced from a spreadsheet (e.g. Excel, or equivalent) shall be submitted in ASCII file or format suitable for incorporation into Microsoft Office or the current DEPARTMENT software. The final Special Provisions(s) and other documents, as requested, shall be submitted in both electronic format (Microsoft Word-compatible) and hard copy. The CONSULTANT shall also be prepared to submit separate electronic files of all alignments, bound locations and other project features, as requested, in a format acceptable to the DEPARTMENT, throughout the design contract, in conformance with the

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DEPARTMENT'S CAD/D Procedures and Requirements. The CONSULTANT shall also provide a hard copy of all proposed alignments (25-foot minimum station interval and curve control points) with associated State plane coordinates (x, y, z).

Designs shall conform to the current standards, specifications, policies and guidelines enumerated in the Federal Aid Policy Guide, Subchapter G, Part 625, or to 23 Code of Federal Regulations, Part 625 and the DEPARTMENT'S Design Manual, and Standard Plans for Road Construction (2010), except as approved. Design plan check lists shall be provided with each formal submission, see Section K.1. below for additional details.

Multiple visits to the site shall be made during the design to visually observe and detect changed field conditions and, if required, additional surveys will be performed by the CONSULTANT who will process additional survey requests to the extent necessary to ensure continuity between detail model files and shall be responsible for the incorporation of these files into the current detail base plans and digital terrain models (DTM).

All plotting, drafting and calculations performed by the CONSULTANT shall be independently checked by members of the CONSULTANT'S staff other than those who performed the original work. The work of each stage submission (including quantity estimates) shall have been appropriately checked.

The CONSULTANT shall verify all computations and design calculations. The CONSULTANT shall furnish two (2) permanent, legible copies of the design calculations, suitably bound, and when directed, all study plans, work plans, alternate studies, and estimates indexed in accordance with DEPARTMENT procedures.

The CONSULTANT'S Licensed Professional Engineer stamp for the State of New Hampshire and State of Massachusetts shall appear on the plans, reports and any other documents that will be submitted to the DEPARTMENT. Stamps shall be those of the professional engineers who prepared them or under whose direct supervisory control they were prepared.

Electronic copies of all submissions to be provided. Specifically:

1. Electronic Transfer of Data: The DEPARTMENT requires the following to ensure compatibility with software used by the DEPARTMENT and to ensure the efficient and timely exchange of computer files between the DEPARTMENT and the CONSULTANT.
 - a. All files submitted must be fully compatible with the formats listed in this document without any conversion or editing by the DEPARTMENT. Any files requiring conversion and/or editing by the DEPARTMENT will not be accepted. All files shall be virus free. All files shall use the DEPARTMENT'S file naming convention.
2. Computer Aided Design/Drafting (CAD/D) files: All CAD/D files shall be in accordance with the Deliverable Requirements described in the DEPARTMENT'S CAD/D Procedures and Requirements in effect at the time this AGREEMENT was executed, or any later version. All files

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submitted must be fully compatible with the current version of MicroStation being used by the DEPARTMENT. (The DEPARTMENT'S CAD/D Procedures and Requirements document can be found on the CAD/D website by following the "Downloads" link at www.nh.gov/dot/cadd/.)

3. Approved action deliverables: The CONSULTANT'S final submission shall include hard copies of plans, as well as electronic CAD/D files. The CAD/D files shall consist of the base plans with enhancements in MicroStation format, using DEPARTMENT naming conventions, line styles and character styles. The CAD/D files shall also contain a proposed 3D top line model, complete out to the slope limits. The horizontal, vertical, and section layout (including layovers stations) and shall be complete and in a condition to allow further development toward final design.
4. Word Processing, Spreadsheet, and Database Files: For each Phase, all relevant files shall be provided in a format fully compatible, as appropriate, with the following:
 - Word Processing: Microsoft Word 2010 or NHDOT compatible version
 - Spreadsheets: Microsoft Excel 2010 or NHDOT compatible version
 - Databases: Microsoft Access 2003 or NHDOT compatible versionThese specifications will be updated as necessary to reflect changes in DEPARTMENT software such as adding new software or updating to new versions of existing software. In such instances, the CONSULTANT will be promptly notified.
5. Computer File Exchange Media: Electronic files shall be exchanged between the DEPARTMENT and the CONSULTANT using the following media as appropriate for Windows Operating Systems:
 - FTP: Files posted to the DEPARTMENT'S FTP site can be actual size or compressed. Contact the Project Manager for instructions for accessing the FTP site.
 - Compact Disc (CD): Files on CD(s) should be actual size, not compressed.
 - DVD: Files on DVD(s) should be actual size, not compressed.
 - E-mail: Files 10 MB or smaller may be transferred via Email. If compressed, the files should be self-extracting and encrypted based on content.
6. Copies: The CONSULTANT shall provide hard (paper) and electronic copies of the deliverables for each Phase of Work. For all deliverables, provide electronic copies in two electronic versions; an electronic version in the original electronic file format (i.e., MicroStation (*.dgn), Microsoft Word (*.docx), Microsoft Excel (*.xlsx), etc.) and an electronic version in Adobe Acrobat (*.pdf) file format.

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7. Website Information:

- Website Content: All NHDOT websites created for this project shall meet the ADA Section 508 requirements as stated in the NH DoIT Website Standards. Those standards are outlined in <https://www.nh.gov/doit/vendor/documents/nh-website-standards.pdf>.
- Website Documents: All documents posted to a website created for this project, or that are submitted to be posted to a NHDOT website, shall meet ADA Section 508 accessibility requirements. A checklist for document compliance is provided in <https://www.section508.gov/content/build/create-accessible-documents> (go to second link down, under "Checklists").

F. DATE OF COMPLETION

In accordance with the Governor and Council Resolution authorizing this AGREEMENT, the date of completion for the professional services rendered under this AGREEMENT is January 31, 2023.

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ARTICLE II - COST PLUS FIXED FEE COMPENSATION OF CONSULTANT

A. GENERAL FEE

In consideration of the terms and obligations of this AGREEMENT, the STATE, through the DEPARTMENT, hereby agrees to pay and the CONSULTANT agrees to accept as full compensation for all services rendered to the satisfaction of the DEPARTMENT under this AGREEMENT (except as otherwise herein provided) an amount equal to the sum of the following costs:

1. Actual salaries* approved by the DEPARTMENT paid technical and other employees by the CONSULTANT, including salaries to principals, for the time such employees are directly utilized on work necessary to fulfill the terms of this AGREEMENT.

*In accordance with DEPARTMENT policy, the maximum direct-labor rate allowed for all positions under this AGREEMENT, including subconsultants, shall be \$60.00 per hour unless a waiver to the salary cap has been specifically approved for specialty services. A waived rate shall remain fixed at that rate for the life of the AGREEMENT unless a subsequent waiver is requested and approved.

An overtime premium of one and one half times the direct labor rate for non-exempt employees working beyond the standard 40 hours per workweek may be allowed for special circumstances when approved by the DEPARTMENT in writing in advance. The overhead portion of non-exempt employees' salary rates shall not be adjusted. Engineers are not eligible for overtime premium rates.

Direct salary costs are estimated at: \$719,338.37

2. Overhead costs that are applicable to the salary costs. The audited indirect cost rate, as submitted to and approved by the DEPARTMENT, will be applied to the direct salary costs. The CONSULTANT'S audited indirect cost rate for fiscal year ending September 27, 2019, which expires March 31, 2021, 131.94%, shall be used for invoicing for the life of the AGREEMENT.

Overhead costs are estimate at: \$949,095.05

3. A fixed fee amount based on the estimated risk to be borne by the CONSULTANT [maximum 10.00% of Labor Costs (including overhead costs)] for profit and non-reimbursed costs.

The fixed fee is: \$166,843.34

4. Reimbursement for direct expenses, including, but not limited to, subconsultants with a subcontract value of less than \$200,000, printing,

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reproductions and travel not included in normal overhead expenses. The reimbursable costs for mileage and for per diem (lodging and meals) shall be that allowed by the CONSULTANT'S established policy but shall not exceed that allowed in the Federal Acquisition Regulations (Subpart 31.205-46) and in the Federal Travel Regulation. Mileage and per diem costs shall be subject to approval by the DEPARTMENT. Subconsultants with a subcontract value of less than \$200,000 shall be invoiced as direct expenses and do not require individual invoices, unless the subcontract is more than 25% of the contract total.

	Direct expenses are estimated at:	<u>\$199,626.50</u>
5.	Reimbursement for actual cost of subconsultants is estimated as follows:	
	Jacob's Engineering Group, Inc.	<u>\$1,933,048.81</u>
	WSP USA, Inc.	<u>\$253,884.89</u>
	Nobis Engineering, Inc.	<u>\$472,798.36</u>
	GM2 Associates, Inc.	<u>\$607,559.23</u>
	Fitzgerald & Halliday, Inc.	<u>\$51,213.34</u>
	Richmond Hill Consulting, LLC.	<u>\$95,200.00</u>
	AGREEMENT NOT-TO-EXCEED TOTAL	<u>\$5,448,607.89</u>

The amount payable under categories 1), 2), 4), and 5) may be reallocated within the not-to-exceed total upon mutual agreement of the DEPARTMENT and the CONSULTANT. Reallocations shall be properly documented for Final Audit purposes, but do not require a formal amendment.

All costs as described in the foregoing paragraphs are to be determined by actual records kept during the term of the AGREEMENT which are subject to audit by the STATE and Federal Governments. The final payment and all partial payments made may be adjusted to conform to this final audit. In no case will any adjustments exceed the total amount to be paid shown in the following paragraph and in Article II, Section C.1. All Subconsultant costs may also be subject to audit by the STATE and Federal Governments.

The total amount to be paid under this AGREEMENT shall not exceed \$5,448,607.89, the sum of the amounts shown in Article II, Section B (which amount is based on the CONSULTANT'S fee and man hour estimates of November 13, 2020), except by agreement of all parties made after supplemental negotiations and documented by a formal amendment to the AGREEMENT. Should circumstances beyond the control of the CONSULTANT require extension of the time of completion more than one (1) year, the general fee may be renegotiated; however, the fixed fee (b) shall not change for reasons of work duration alone. The fixed fee (b) shall only change when there has been a significant increase or decrease in the scope of work outlined in this AGREEMENT.

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All salaries and increases thereof paid to technical or other employees assigned to this project shall be the result of a company-wide evaluation of all employees and shall not be restricted to employees assigned to this project.

If, in the opinion of the DEPARTMENT, any salary or increase thereof of engineering or technical personnel assigned to this project is unreasonable, it shall notify the CONSULTANT of its opinion with regard thereto and request the CONSULTANT to justify said salary or increase thereof. In the event that the CONSULTANT furnishes justification satisfactory to the DEPARTMENT for said salary or increase thereof, then such salary or increase thereof shall be approved as a payroll expense.

The DEPARTMENT shall have the right to exercise the power of review and approval of salary increases thereof, for a period of thirty (30) days after the submission of a monthly invoice by the CONSULTANT. Unless the DEPARTMENT notifies the CONSULTANT in writing during the thirty-day period that such salary increase thereof is, in its opinion, unreasonable, such lack of notice shall constitute approval of said salary increase thereof from the first day of the preceding month.

B. LIMITATION OF COSTS

1. Costs incurred against this AGREEMENT shall not exceed the total amount specified in Article II, Section A unless otherwise authorized. The CONSULTANT shall give the DEPARTMENT a ninety (90)-day written notice when it appears that this limit will be exceeded.
2. It is expected that the total cost to the STATE shall be the not-to-exceed amount specified in Article II, Section A, and the CONSULTANT agrees to use best efforts to perform the work specified in the AGREEMENT and all obligations under this contract within this not-to-exceed amount.
3. The STATE shall not be obligated to reimburse the CONSULTANT for costs incurred in excess of the not-to-exceed amount specified in Article II, Section A.
4. Changes to the scope of work shall not be considered an authorization to the CONSULTANT to exceed the not-to-exceed amount specified in Article II, Section A.

C. PAYMENTS

Monthly payments on account of services rendered under this AGREEMENT may be made upon submission of invoices by the CONSULTANT to the DEPARTMENT. The CONSULTANT shall follow the DEPARTMENT'S Standardized Invoicing format. The fixed fee shall be invoiced during the billing period based upon the overall percent complete calculated within the approved progress report found in the DEPARTMENT'S Standardized Invoicing. Invoices shall be submitted for each month that there has been more than \$10,000 in cumulative billable work since the last invoice, and at least quarterly.

Actual salaries paid and the indirect cost rate shown in Article II, Section A, shall be used until such time as true costs of salary burden and overhead are fixed by Final Audit. At that time, payments shall be adjusted to agree with the indirect cost rates as determined by Final Audit for the period in which the work was performed, as approved by the DEPARTMENT.

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D. ANNUAL INDIRECT COST RATE SUBMISSIONS

The CONSULTANT and all subconsultants with a subcontract value of \$200,000 or greater shall submit their audited indirect cost rate and related documents annually for the life of this AGREEMENT as follows:

To comply with the Federal Acquisition Requisitions (FAR), the CONSULTANT'S Indirect Cost Rate Audit must meet the following requirements:

- Be conducted by an independent Certified Public Accountant (CPA), a Federal government agency, or another state transportation agency.
- Be conducted in accordance with Generally Accepted Government Auditing Standards (GAGAS) issued by the U.S. Government Accountability Office (GAO) and with the cost principles and procedures set forth in Part 31 of the FAR.
- Follow the guidance of the most recent American Association of State Highway Transportation Officials Uniform Audit and Accounting Guide for Audits of Architectural and Engineering Consulting Firms (AASHTO Audit Guide).

In addition to the Indirect Cost Rate Audit, CONSULTANTS shall submit the following documentation:

- AASHTO Internal Control Questionnaire (ICQ) for Consulting Engineers form with the required attachments.
- Certification of Final Indirect Costs as required pursuant to 23 CFR 172.11 and FHWA Order 4470.1A.
- Complete copy of the CONSULTANT'S annual audited financial statements.
- Analysis of reasonableness of executive compensation as outlined in the AASHTO Audit Guide.
- Cognizant letter, if available.
- A listing of all contracts, with dollar amounts, the CONSULTANT has currently with the DEPARTMENT as a prime consultant or subconsultant.

Annual indirect cost rate submissions are due within 6 months of the CONSULTANT'S fiscal year end and shall be submitted to the DEPARTMENT'S Internal Audit Office electronically to DOT-InternalAudit@dot.nh.gov or in writing.

E. RECORDS, REPORTS, AND FINAL AUDIT

The CONSULTANT shall maintain adequate cost records for all work performed under this AGREEMENT. All records and other evidence pertaining to cost incurred shall be made available at all reasonable times during the AGREEMENT period and for three (3) years from the date of final expenditure report for examination by the STATE, Federal Highway Administration, or other authorized representatives of the Federal Government, and copies thereof shall be furnished if requested. Applicable cost principles are contained in the Federal Acquisition Regulations (FAR) in Title 48 of the Code of Federal Regulations

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(Subpart 31.2 and Subpart 31.105).

The DEPARTMENT shall have the right, at the time of Final Audit, to review all items charged on this project. If, in the opinion of the DEPARTMENT, such payment is unreasonable, the CONSULTANT shall be required to justify such payment or payments before they will be approved as direct or indirect costs.

All costs as described in Article II Section A.1 through A.5 are to be determined by actual records kept during the term of the AGREEMENT, which are subject to Final Audit by the STATE and Federal Governments. The final payment, and all partial payments made, may be adjusted to conform to this Final Audit. In no case will any adjustments exceed the not-to-exceed amount specified in Article II, Section A. All Subconsultant costs may also be subject to Final Audit by the STATE and Federal Governments.

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ARTICLE III - GENERAL PROVISIONS

A. HEARINGS, ETC.

The DEPARTMENT will make all arrangements for and hold all necessary hearings in connection with the project.

B. CONTRACT PROPOSALS

(Not applicable to this AGREEMENT)

ARTICLE IV

ARTICLE IV - STANDARD PROVISIONS

A. STANDARD SPECIFICATIONS

The CONSULTANT agrees to follow the provisions of the American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering, the Design Manuals, Standard Specifications for Road and Bridge Construction, and Standard Plans for Road and Bridge Construction of the DEPARTMENT; A Policy on Geometric Design of Highways and Streets and LRFD Bridge Design Specifications, pertinent specifications of the American Association of State Highway and Transportation Officials (AASHTO), and guidance published by the Federal Transit Administration for alternatives analysis and Federal Railroad Administration for High Speed-Intercity Passenger Rail service development plans and amendments thereto, and/or other professional codes or standards applicable to the services to be performed under this AGREEMENT. When a publication (including interim publications) is specified, it refers to the most recent date of issue in effect at the time of execution of this AGREEMENT.

B. REVIEW BY STATE AND FTA/FRA - CONFERENCES - INSPECTIONS

It is mutually agreed that all portions of the work covered by this AGREEMENT shall be subject to the inspection by duly-authorized representatives of the STATE, the State of Massachusetts (MADOT), and Federal Transit Administration and Federal Railroad Administration, United States Department of Transportation, at such time or times as the STATE, MADOT or FTA/FRA deems appropriate.

The location of the office where the work will be available for inspection by STATE, MADOT, and Federal representatives is at 1155 Elm Street in the City of Manchester, State of New Hampshire.

It is further mutually agreed that any party, including the duly-authorized representatives of the STATE, MADOT, FTA or FRA, may request and obtain conferences, visits to the site, and inspection of the work at any reasonable time.

C. EXTENT OF CONTRACT

1. Contingent Nature of AGREEMENT

Notwithstanding anything in this AGREEMENT to the contrary, all obligations of the STATE, including, without limitation, the continuance of payments, are contingent upon the availability and continued appropriation of funds, and in no event shall the STATE be liable for any payments in excess of such available appropriated funds. In the event of a reduction or termination of those funds, the STATE shall have the right to terminate this AGREEMENT.

2. Termination

The DEPARTMENT shall have the right at any time, and for any cause, to terminate the work required of the CONSULTANT by this AGREEMENT by written notice of such termination provided to the CONSULTANT by the DEPARTMENT, and, in the event of such a termination of this AGREEMENT without fault on the part of the CONSULTANT, the CONSULTANT shall be entitled to compensation for all work theretofore satisfactorily performed, pursuant to this

ARTICLE IV

AGREEMENT, such compensation to be fixed, insofar as possible, based upon the work performed prior to termination. If no contract or contracts for construction of the project contemplated by this AGREEMENT is (are) entered into within two (2) years after satisfactory completion of the services outlined in Article I, all of the services contemplated by this AGREEMENT shall be deemed to have been completed.

It shall be a breach of this AGREEMENT if the CONSULTANT shall fail to render timely the services required under this AGREEMENT, in accordance with sound professional principles and practices, to the reasonable satisfaction of the DEPARTMENT, or shall be in such financial condition as to be unable to pay its just debts as they accrue, or shall make an assignment for the benefit of creditors, or shall be involved in any proceeding, voluntary or involuntary, resulting in the appointment of a receiver or trustee over its affairs, or shall become dissolved for any cause. In the event of the happening of any one or more of the foregoing contingencies, or upon the substantial breach of any other provisions of this AGREEMENT by the CONSULTANT, its officers, agents, employees, and subconsultants, the DEPARTMENT shall have the absolute right and option to terminate this AGREEMENT forthwith, and, in addition, may have and maintain any legal or equitable remedy against the CONSULTANT for its loss and damages resulting from such breach or breaches of this AGREEMENT; provided, however, that as to all plans, drawings, tracings, estimates, specifications, reports, proposals, sketches, diagrams, and calculations, together with all material and data theretofore furnished to the DEPARTMENT by the CONSULTANT, of a satisfactory nature in accordance with this AGREEMENT, which plans, drawings, tracings, etc., are of use to the DEPARTMENT, the CONSULTANT shall be entitled to a credit, based on the contract rate for the work so performed in a satisfactory manner and of use and benefit to the DEPARTMENT.

D. REVISIONS TO REPORTS, PLANS OR DOCUMENTS

The CONSULTANT shall perform such additional work as may be necessary to correct errors in the work required under the AGREEMENT caused by errors and omissions by the CONSULTANT without undue delays and without additional cost to the DEPARTMENT.

Furthermore, prior to final approval of plans, specifications, estimates, reports, or documents by the DEPARTMENT, the CONSULTANT shall make such revisions of them as directed by the DEPARTMENT, without additional compensation therefor, except as hereinafter provided:

1. If, after its written approval thereof, the DEPARTMENT shall require changes to the plans or documents that revise engineering or other factors specifically approved, thereby necessitating revisions of the contract plans or documents, or,
2. When applicable, if during the term of this AGREEMENT, a revision of the alignment is ordered by the DEPARTMENT to the extent that the revised alignment will lie completely or partially

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outside the limit of the survey data plotted by the CONSULTANT (this does not apply to those adjustments and refinements to the alignments anticipated under the scope of work), or,

3. If, after approval by the DEPARTMENT of the final contract plans or documents, the CONSULTANT shall be ordered in writing by the DEPARTMENT to make revisions, or to perform services other than those necessary to adapt said plans, reports, or documents to conditions observed during field inspections and encountered during construction; the CONSULTANT shall be entitled to compensation therefor in accordance with Article II, Section A, such compensation to be in addition to the fee specified in Article II, Section A, for its original work on the plans, reports or documents.

E. ADDITIONAL SERVICES

If, during the term of this AGREEMENT, additional professional services are required due to a revision in the limits of the project, or it becomes necessary to perform services not anticipated during negotiation, the DEPARTMENT may, in writing, order the CONSULTANT to perform such services, and the CONSULTANT shall be paid a fee in accordance with the provisions of Article II, Section B.

If, during the term of this AGREEMENT, additional professional services are performed by the CONSULTANT due to the fact that data furnished by the DEPARTMENT are not usable or applicable, the STATE will, upon written approval by the DEPARTMENT, reimburse the CONSULTANT for such additional design services in accordance with the provisions of Article II, Section B.

If additional services are performed by the CONSULTANT through its own acts, which are not usable or applicable to this project, the cost of such additional services shall not be reimbursable.

F. OWNERSHIP OF PLANS

All data, plans, drawings, tracings, estimates, specifications, proposals, sketches, diagrams, calculations, reports, or other documents collected, prepared, or undertaken either manually or electronically by the CONSULTANT under the provisions of this AGREEMENT, immediately shall become the property of the DEPARTMENT, and, when completed, shall bear the CONSULTANT'S endorsement. The CONSULTANT shall surrender to the DEPARTMENT, upon demand at any time, or submit to its inspection, any data, plan, drawing, tracing, estimate, specification, proposal, sketch, diagram, calculation, report, or document which shall have been collected, prepared, or undertaken by the CONSULTANT pursuant to this AGREEMENT, or shall have been hitherto furnished to the CONSULTANT by the DEPARTMENT. The CONSULTANT shall have the right, with the written approval of the DEPARTMENT, to use any of the data prepared by it and hitherto delivered to the DEPARTMENT at any later stage of the project contemplated by this AGREEMENT.

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G. SUBLETTING

The CONSULTANT shall not sublet, assign, or transfer any part of the CONSULTANT'S services or obligations under this AGREEMENT without the prior approval and written consent of the DEPARTMENT.

All subcontracts shall be in writing and those exceeding \$10,000 shall contain all provisions of this AGREEMENT, including "Certification of CONSULTANT/Subconsultant". For subconsultants working on design, hazardous materials, geotechnical services, etc., the minimum limits of their professional liability (errors and omissions) insurance coverage shall be not less than \$2,000,000 in the aggregate, with a deductible of not more than \$75,000. For subconsultant contracts with less risk, e.g., wetland evaluations, materials inspection and testing, structural steel fabrication inspection, underwater bridge inspection, research, bridge deck condition surveys, land surveying, mapping, noise studies, air-quality studies, etc., the minimum limits of their professional liability (errors and omissions) insurance coverage shall be not less than \$1,500,000 in the aggregate, with a deductible of not more than \$50,000. For subconsultant contracts with no risk, e.g., archaeology, cultural resources, data gathering, traffic counting etc., professional liability insurance shall not be required. Subconsultants completing field exploration for geotechnical, hazardous materials/environmental, and subsurface exploration shall also have pollution liability insurance coverage not less than \$2,000,000 in the aggregate, with a deductible of not more than \$75,000. If coverage is claims made, the period to report claims shall extend for not less than three years from the date of substantial completion of the construction contract. A copy of each subcontract shall be submitted for the DEPARTMENT'S files.

H. GENERAL COMPLIANCE WITH LAWS, ETC.

The CONSULTANT shall comply with all Federal, STATE, MADOT, and local laws and ordinances applicable to any of the work involved in this AGREEMENT and shall conform to the requirements and standards of STATE, MADOT, municipal, railroad, and utility agencies whose facilities and services are directly affected by the construction of this project. The services shall be performed so as to cause minimum interruption to said facilities and services.

I. BROKERAGE

The CONSULTANT warrants that it has not employed or retained any company or person, other than a bona fide employee working solely for the CONSULTANT, to solicit or secure this Contract, and that it has not paid or agreed to pay any company or person, other than a bona fide employee working solely for the CONSULTANT, any fee, commission, percentage, brokerage fee, gift, or any other consideration, contingent upon or resulting from the award or making of this Contract. For breach or violation of this warranty, the STATE shall have the right to annul this Contract without liability, or, at its discretion, to deduct from the contract price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift, or contingent fee.

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J. CONTRACTUAL RELATIONS

1. Independent Contractor

The CONSULTANT agrees that its relation to the STATE is as an independent contractor and not as an agent or employee of the STATE.

2. Claims and Indemnification

a. Non-Professional Liability Indemnification

The CONSULTANT agrees to defend, indemnify and hold harmless the STATE and all of its officers, agents, and employees from and against any and all claims, liabilities, or suits arising from (or which may be claimed to arise from) any (i) acts or omissions of the CONSULTANT or its subconsultants in the performance of this AGREEMENT allegedly resulting in property damage or bodily injury, and/or, (ii) misconduct or wrongdoing of the CONSULTANT or its subconsultants in the performance of this AGREEMENT.

b. Professional Liability Indemnification

The CONSULTANT agrees to indemnify and hold harmless the STATE and all of its officers, agents, and employees from and against any and all claims, liabilities, or suits arising from (or which may be claimed to arise from) any negligent acts or omissions of the CONSULTANT or its subconsultants in the performance of professional services covered by this AGREEMENT.

c. These covenants shall survive the termination of the AGREEMENT. Notwithstanding the foregoing, nothing herein contained shall be deemed to constitute a waiver of the sovereign immunity of the STATE, which immunity is hereby reserved by the STATE.

3. Insurance

a. Required Coverage

The CONSULTANT shall, at its sole expense, obtain and maintain in force the following insurance:

1. Commercial or comprehensive general liability insurance, including contractual coverage, for all claims of bodily injury, death, or property damage, in policy amounts of not less than \$250,000 per occurrence and \$2,000,000 in the aggregate (STATE to be named as an additional insured); and
2. comprehensive automobile liability insurance covering all motor vehicles, including owned, hired, borrowed, and non-owned vehicles, for all claims of bodily injury, death, or property damage, in policy amounts of not less than \$500,000 combined single limit; and
3. professional liability (errors and omissions) insurance coverage of not less than \$2,000,000 in the aggregate. If coverage is claims made, the period to report claims shall extend for

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not less than three years from the date of substantial completion of the construction contract. No retention (deductible) shall be more than \$75,000; and

4. workers' compensation and employer's liability insurance as required by law.

b. Proof of Insurance

The policies described in paragraph (a) of this section and Section G shall be in the standard form employed in the STATE, issued by underwriters licensed or approved by the Department of Insurance of the STATE. Each policy shall contain a clause prohibiting cancellation or modifications of the policy earlier than 30 days, or 10 days in cases of non-payment of premium, after written notice thereof has been received by the STATE. The CONSULTANT shall provide to the STATE a certificate of insurance evidencing the required coverages, retention (deductible), and cancellation clause prior to submittal of the AGREEMENT to Governor and Council for approval and shall have a continuing duty to provide new certificates of insurance as the policies are amended or renewed.

4. No Third-Party Rights

It is not intended by any of the provisions of the AGREEMENT to make the public, or any member thereof, a third-party beneficiary of the AGREEMENT, or to authorize anyone not a party to this AGREEMENT to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of this Contract. The duties, obligations, and responsibilities of the parties to this AGREEMENT with respect to third parties shall remain as imposed by law. No portion of this AGREEMENT shall be understood to be a waiver of the STATE'S sovereign immunity.

5. Construction of AGREEMENT

This AGREEMENT is executed in a number of counterparts, each of which is an original and constitutes the entire AGREEMENT between the parties. This AGREEMENT shall be construed according to the laws of the STATE.

K. AGREEMENT MODIFICATION

The assignment of the CONSULTANT, generally established by the scope of work in this AGREEMENT and APPENDIX A, shall not be modified in any way without prior approval of the Governor and Council.

L. EXTENSION OF COMPLETION DATE(S)

If, during the course of the work, the CONSULTANT anticipates that one or more of the completion dates specified in this AGREEMENT cannot be met, it shall be the CONSULTANT'S responsibility to notify the DEPARTMENT in writing at least ninety (90) days prior to the completion date(s) in question. The CONSULTANT shall state the reasons that a completion date(s) cannot be met and request a revised date(s) for consideration by the DEPARTMENT.

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M. TITLE VI (NONDISCRIMINATION OF FEDERALLY-ASSISTED PROGRAMS)

COMPLIANCE

During the performance of this AGREEMENT, the CONSULTANT, for itself, its assignees and successors in interest agrees as follows:

- (1) Compliance with Regulations: The CONSULTANT shall comply with Title VI of the Civil Rights Act of 1964 regulations relative to nondiscrimination in federally-assisted programs of the DEPARTMENT, such regulations entitled Title 49 Code of Federal Regulations, Part 21, as they may be amended from time to time (hereinafter referred to as the REGULATIONS), and which are herein incorporated by reference and made a part of this AGREEMENT.
- (2) Nondiscrimination: The CONSULTANT, with regard to the work performed by it during the AGREEMENT, shall not discriminate on the grounds of race, color, religion, age, sex, handicap, sexual orientation, or national origin in the selection and retention of subconsultants, including procurements of materials and leases of equipment specific to this project. The CONSULTANT shall not participate either directly or indirectly in the discrimination prohibited by Section 21.5 of the REGULATIONS, including employment practices when the AGREEMENT covers a program set forth in Appendix B of the REGULATIONS.
- (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 specific to the project, each potential subconsultant or supplier shall be notified by the CONSULTANT of the CONSULTANT'S obligations under this AGREEMENT and the REGULATIONS relative to nondiscrimination on the grounds of race, color, religion, age, sex, handicap, sexual orientation, or national origin.
- (4) Information and Reports: The CONSULTANT shall provide all information and reports required by the REGULATIONS or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information and its facilities as may be determined by the DEPARTMENT, the Federal Transit Administration, or the Federal Railroad Administration to be pertinent to ascertain compliance with such REGULATIONS, orders and instructions. Where any information required of a CONSULTANT is in the exclusive possession of another who fails or refuses to furnish this information, the CONSULTANT shall so certify to the DEPARTMENT, the Federal Transit Administration or Federal Railroad Administration, as appropriate, and shall set forth what efforts it has made to obtain the information.
- (5) Sanctions for Noncompliance: In the event of the CONSULTANT'S noncompliance with nondiscrimination provisions of this AGREEMENT, the DEPARTMENT shall impose sanctions

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

- (a) withholding of payments to the CONSULTANT under the AGREEMENT until the CONSULTANT complies; and/or
 - (b) cancellation, termination, or suspension of the AGREEMENT, in whole or in part.
- (6) The CONSULTANT shall take such action with respect to any subcontract or procurement as the DEPARTMENT, Federal Transit Administration or Federal Railroad Administration may direct as a means of enforcing such provisions, including sanctions for noncompliance, provided, however, that in the event a CONSULTANT becomes involved in, or is threatened with, litigation with a subconsultant or supplier as a result of such direction, the CONSULTANT may request the DEPARTMENT to enter into such litigation to protect the interests of the STATE, and, in addition, the CONSULTANT may request the United States to enter into such litigation to protect the interests of the United States.
- (7) 23 CFR 710.405(b) and Executive Order 11246 entitled "Equal Employment Opportunity," as amended by Executive Order 11375 and as supplemented in Department of Labor REGULATIONS (41 CFR Part 60), shall be applicable to this AGREEMENT and any subagreements hereunder.
- (8) Incorporation of Provisions: The CONSULTANT shall include the provisions of paragraphs (1) through (7) in every subcontract, including procurements of materials and leases of equipment specific to the project, unless exempt by the REGULATIONS, or directives issued pursuant thereto.

In accordance with EXECUTIVE ORDER 11246, the DEPARTMENT has the authority and responsibility to notify the Office of Federal Contract Compliance Programs of the United States Department of Labor if they become aware of any possible violations of Executive Order 11246 and 41 CFR Part 60. The Office of Federal Contract Compliance Programs is solely responsible for determining compliance with Executive Order 11246 and 41 CFR Part 60 and the CONSULTANT should contact them regarding related compliance issues.

N. DISADVANTAGED BUSINESS ENTERPRISE POLICY REQUIREMENTS

1. Policy. It is the policy of the United States Department of Transportation (USDOT) to ensure nondiscriminatory opportunity for Disadvantaged Business Enterprises (DBE's), as defined in 49 Code of Federal Regulations (CFR) Part 26, to participate in the performance of agreements and any subagreements financed in whole or in part with Federal funds. Consequently, the DBE requirements of 49 CFR Part 26 apply to this AGREEMENT.
2. Disadvantaged Business Enterprise (DBE) Obligation. The STATE and its CONSULTANTS agree to ensure nondiscriminatory opportunity for disadvantaged business enterprises, as defined in 49 CFR Part 26, to participate in the performance of agreements and any subagreements financed in whole or in part with Federal funds. In this regard, the STATE and its CONSULTANTS shall

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take all necessary and reasonable steps in accordance with 49 CFR Part 26 to ensure that disadvantaged business enterprises have the opportunity to compete for and perform work specified in the agreements. The STATE and its CONSULTANTS shall not discriminate on the basis of race, color, religion, age, sex, handicap, sexual orientation, or national origin in the award and performance of agreements financed in whole or in part with Federal funds.

3. Sanctions for Non-Compliance. The CONSULTANT is hereby advised that failure of the CONSULTANT, or any Subconsultant performing work under this AGREEMENT, to carry out the requirements set forth in paragraphs 1 and 2 above, shall constitute a breach of agreement and, after the notification of the United States Department of Transportation, may result in termination of this AGREEMENT by the STATE or such remedy as the STATE deems appropriate.

O. DOCUMENTATION

The CONSULTANT shall document the results of the work to the satisfaction of the DEPARTMENT, the Federal Transit Administration, and Federal Railroad Administration. This shall include preparation of progress reports, plans, specifications, and estimates and similar evidences of attainment of objectives called for in this AGREEMENT.

P. CLEAN AIR AND WATER ACTS

If the amount of the AGREEMENT or subcontract thereunder exceeds \$100,000, the CONSULTANT or subconsultant shall comply with applicable standards, orders, or requirements issued under Section 306 of the Federal Clean Air Act (43 U.S.C. 1857(h)), Section 508 of the Federal Clean Water Act (33 U.S.C. 1368), Executive Order 11738, and Environmental Protection Agency regulations (40 CFR Part 15), which prohibit the use under non-exempt Federal contracts, grants, or loans of facilities included on the EPA List of Violating Facilities. The CONSULTANT or subconsultant shall report violations to the FHWA and to the U. S. Environmental Protection Agency Assistant Administrator for Enforcement (EN-329).

ATTACHMENT A

Special Contract Provisions for COVID-19

The CONSULTANT acknowledges and agrees that this AGREEMENT was entered into following the coronavirus disease 2019 (COVID-19) outbreak. The CONSULTANT agrees that to the extent the COVID-19 outbreak, or any federal, state or local orders, regulations, rules, restrictions, or emergency declarations relating to COVID-19, disrupt, delay, or otherwise impact the Scope of Services to be performed by the CONSULTANT as set forth in Article I of this AGREEMENT, any such disruption, delay, or other impact was foreseeable at the time this AGREEMENT was entered into by the Parties and does not excuse the Contractor's performance under this AGREEMENT. The CONSULTANT agrees that any such impact, including any disruption to supply chains, workforce reductions, delays or interruptions in performance, or other effects on businesses, are not the fault of the STATE and the CONSULTANT may not seek damages against the STATE for any such impacts.

If the CONSULTANT experiences or anticipates any such COVID-19-related impacts to this AGREEMENT, the CONSULTANT shall immediately notify the DEPARTMENT'S Contract Manager. In the event of any COVID-19-related impact or anticipated impact to this AGREEMENT, the Contract Manager shall have the right to temporarily modify, substitute, or decrease the services, without the approval of the Governor and Executive Council, upon giving written notice to the CONSULTANT. The STATE'S right to modify includes, but is not limited to the right to modify service priorities, including how and when services are delivered, and expenditure requirements under this AGREEMENT so as to achieve compliance therewith, provided such modifications are within the Scope of Services and cost limitations of this AGREEMENT. By exercising any of the rights described within this subsection, the STATE does not waive any of its right under this AGREEMENT.

In the event that a modification by the STATE under this subsection would result in a permanent reduction of services that cannot be supplemented during the remaining term of this AGREEMENT with either replacement or substituted services of substantially similar value, the Parties shall submit a formal amendment to this AGREEMENT with a commensurate reduction in the price. This amendment will require the approval of the Governor and Executive Council. In order to facilitate reconciliation of services performed under this AGREEMENT, the CONSULTANT shall submit weekly reports detailing the following for any service not fully performed pursuant to the terms of the AGREEMENT:

- 1) The services required to be performed under the terms of this AGREEMENT as written;
- 2) The services actually performed;
- 3) Any replacement or substituted services performed with reference to the associated unperformed contracted services.

NASHUA-MANCHESTER 40818 (CAPITOL CORRIDOR)

To Provide Engineering Services for Preliminary Engineering, Environmental Services, Financial Plan Development, Public Involvement Services, and Final Design

Scope of Services

Prepared for:

NHDOT

Prepared by:

AECOM

1155 Elm Street, Suite 401

Manchester, NH 03101

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November 13, 2020

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Statement of Understanding

AECOM Technical Services, Inc. (AECOM) proposes to provide professional engineering services to the New Hampshire Department of Transportation (NHDOT) for the preliminary engineering, environmental services, financial plan development, public involvement services, and final design to meet the requirements of the Federal Transit Administration (FTA) Section 5309 Capital Investment Grant Program (CIG) Project Development / Engineering phase for the extension of MBTA commuter rail services from Lowell, MA to Nashua and Manchester, NH.

AECOM will expand upon the successful Alternatives Analysis, Environmental Assessment (EA), and Service Development Plan prepared in 2014, which defined an attractive and workable plan to offer commuter rail service in the Granite State. Key goals in this next stage of the project include expedited confirmation of the Locally Preferred Alternative (LPA), development of the engineering design to a level sufficient for reliable capital and operating cost estimates as inputs to a feasible financial plan and competitive application to the FTA Capital Investment Grant (CIG) program, development of draft third party agreements and the preparation of necessary environmental documentation to permit construction in the subsequent phase. AECOM will work with the NHDOT to leverage prior work and conduct new analysis in a focused and efficient approach as detailed in the scope of services.

A feasible and sustainable financial plan is central to project success. Building upon the 2014 work, the financial plan will be developed in two stages. In the first stage, AECOM will apply a financial sketch planning model to rapidly explore alternative funding sources, cost sharing with Massachusetts, financing mechanisms, and opportunities for private sector participation. The model supports “what-if” analysis of cost sharing among a range of sources including Federal grants, local government funding (diversion of existing revenue sources or new sources), and private equity. For example, the 2014 work identified a number of potential in-kind and soft costs incurred by the Commonwealth of Massachusetts, such as its purchase of passenger rights on the line from Pan Am. The analysis will explore the extent to which these and other recent investments might help reduce the non-federal share of capital cost borne by New Hampshire. AECOM will explore alternative funding sources applied to debt and private equity financing, including value capture (based on parcel-level analysis of existing and proposed assessments of value for properties within the watershed of proposed stations), and other potential sources identified in coordination with the NHDOT.

We will assess the potential for Transit Oriented Development (TOD)) to generate value capture that could help pay for related project costs, such as the stations and their interface with the surrounding land use. In particular, we will explore the potential for: (i) joint development (TOD developed on transit property or through some other real estate transaction in which the transit sponsor or its institutional partners are involved), and (ii) New Hampshire’s Tax Increment Financing (TIF) mechanism, which several municipalities (including Nashua) have utilized.

In the second stage, our AECOM financial planning cash flow model will integrate year-by-year projections of expenses and revenues, both capital and operating, to provide the platform to rapidly examine alternative project implementation schedules, funding sources, financing structures, and project delivery methods. The financial plan will be structured to assess the impact of uncertainty concerning future construction costs, inflation and interest rates, ridership, grant funding levels, supplemental revenues, and market response to fare increases.

The Manchester Regional Commuter Rail Service Option, in the 2014 study, extends MBTA Lowell train service 30 miles to Manchester using 10 miles of MBTA railway to Nashua and 20 miles of MBTA trackage rights on Pan Am’s Northern Branch on to Manchester. Pan Am freight is the only current user of these 30 railway miles. Plans for the new service would be operated in cooperation with the MBTA using MBTA crews and rolling stock. The service design will seek to minimize infrastructure upgrades and operating expense

while providing service reliability. Key engineering actions include approximately 30 miles of new and renewed track; signal system upgrades as well as federally mandated Positive Train Control (PTC); upgrading 20 roadway grade crossings, upgrading 15 bridges; relocating utilities, design of four passenger stations and a layover facility. The engineering will be tailored to meet FTA standards for a CIG grant application. It is anticipated that additional engineering design (and construction) services would be funded under the FTA CIG grant.

The AECOM team will collaborate with the MBTA and Pan Am to revise the 2014 train operating plan to harmonize with current schedules making necessary adjustments to infrastructure requirements. Once approved by NHDOT, MBTA and Pan Am the team will prepare the 30% designs necessary for the CIG application and potential tender to a Design-Build vendor or Railroad Force Account contract package. Work includes updating the proposed timetables, coordination with Pan Am regarding the frequency and timing of freight operations and revising the track configuration to respond to new requirements. Work also includes assessing the track conditions, culverts, bridges, and grade-crossings in detail. Surveyors will establish right-of-way boundaries for the corridor as well as facility and utility locations on the Right-Of-Way (ROW). This may require the creation of and recording of an existing conditions ROW plan. Subject to the constraints of ROW, utilities, bridges, roadways and other features the track engineers will lay out how the railway could be most economically renewed and replaced to satisfy the performance required by the operations planners.

It will be necessary to inspect and rate all the route's 15 bridges and prepare a program of rehabilitations consistent with AREMA and FRA design criteria. A summary list of the bridges is included in Task 12 below. Pan Am recently replaced the route's weakest bridge in Tyngsboro, MA at MP 32.46 and the MBTA recently removed and backfilled an old pedestrian underpass at MP 25.62 in Lowell. The work will also define the necessary signal upgrades including system plans, automatic block and grade crossing layouts and specifications for new interlockings for sidings and crossovers. Diagnostic reviews of the 20 roadway grade crossings will recommend the appropriate warning systems at each location. The upgraded signal system must support PTC and tie-in to the MBTA Lowell line.

There are currently no rail passenger stations on the line north of Lowell, MA. The work will design up to four new passenger stations to meet ADA accessibility and MBTA design standards in conformance with FRA and Pan Am requirements. Typical station configurations will employ low-level platforms with "mini-highs" for level boarding where freight trains pass by, and full-length high-level ADA compliant platforms at Depot Street in Manchester and Crown Street in Nashua. The team will evaluate and recommend the location and configuration of the proposed train layover facility. The station and layover facility work will leverage prior work to the maximum extent possible. Project cost estimating will engage up-to-date material and labor costs and realistic project upgrades to satisfy the FTA CIG requirements while meeting all applicable codes, laws and regulations. One Value Engineering workshop will systematically confirm that the project meets service requirements at the lowest possible cost.

An Environmental Assessment (EA) will be prepared using the following approach:

- Establish the criteria and process required to quickly determine a Locally Preferred Alternative (LPA);
- Update/confirm the results of the 2014 "Service-level" EA; and
- Confirm the appropriate "Project-level" NEPA Class of Action (CE, EA or EIS).

Given the results of the 2014 Service-level EA, it appears that the potential impacts will not rise to the level of "significant". The preparation of an EA is the most likely path, and it is expected that mitigation for minor impacts can be achieved sufficient to receive a Finding of No Significant Impact (FONSI). We will then update the detailed studies necessary to clarify the potential impacts identified in the 2014 EA and identify potential mitigation. These are expected to include: Noise assessment; Phase I Environmental Site Assessments; Wetland delineation; Floodplain analysis; Air Quality modeling; Right-of-way / property acquisition; Open space and recreation / Section 4(f) determination; and Cultural resource assessment / Section 106 concurrence. One of the first tasks will be to field-delineate wetlands within and adjacent to the

proposed impact areas for the project. Maps and data will confirm and update the 2014 findings, as necessary.

Updates on threatened and endangered species from the NH Natural Heritage Bureau (NHNHB), the Massachusetts Natural Heritage and Endangered Species Program (NHESP), and the US Fish and Wildlife Service will be reviewed. In 2014, several listed species were identified within the project corridor. The team met with NHNHB, the NH Fish and Game Department, and NHESP. Additional coordination with these agencies will be required. NHESP indicated that project review under the Massachusetts Endangered Species Act (MESA) will be required. Since most of the project will be located on existing rail embankments, natural resource impacts will likely be associated with bridge and culvert rehabilitations and replacements, relocation of utilities, station/ layover construction, ditch maintenance, and vegetation clearing. Impacts to wetlands and surface waters in New Hampshire will require permits primarily from the NH Department of Environmental Services (NHDES) and the US Army Corps of Engineers (ACOE). Impacts to wetlands and surface waters in Massachusetts will require approval from the municipal Conservation Commissions and/or the Massachusetts Department of Environmental Protection (MassDEP) and the ACOE. Culvert and bridge replacements on perennial streams will need to be designed in accordance with the NHDES stream crossing rules and the MA Stream Crossings Handbook. The project will also require coordination with the Local River Advisory Committees for the three NH Designated Rivers (Lower Merrimack, Souhegan, and Piscataquog) located within ¼ mile of the project corridor.

In addition, a NHDES Shoreland Permit will need to be obtained since large portions of the project are located within 250 feet of the Merrimack River and other protected surface waters. Fill within floodplain areas will require compensation to offset any loss of flood storage. The project must also comply with the NHDES Alteration of Terrain Rules. Stormwater treatment will need to meet Municipal Separate Storm Sewer System (MS4) requirements since the project is located within MS4 regulated communities. Coordination with the US Coast Guard is recommended to confirm permit requirements for the Merrimack River Bridge in Manchester-Bedford. An outline of all required permits will be prepared. Permitting applications are not included in the work.

As part of the EA, the work will update the 2014 economic benefits analysis to estimate the jobs and earnings associated with the project. We recommend using IMPLAN to maintain consistency with past project work. The work will update and refine the benefit cost analysis for the LPA consistent with current USDOT and FTA guidance.

A Public Involvement Plan (PIP) will be developed and implemented, building upon the strong foundation of outreach established in the 2014 work. The PIP will adhere to NHDOT's outreach policies and meet the Department's objectives. Multiple communication tools will be used to engage the public – websites, email lists and direct outreach. Communication with the public will focus on issues not resolved in the 2014 work rather than re-opening matters previously resolved. Our approach will be to respectfully listen to and hear concerns while being prepared to offer information that responds to issues that may be of particular concern to the public.

The general services to be provided by AECOM will consist primarily of the following:

- Provide management, coordination, and communications pertaining to the project;
- Oversee process to confirm the locally preferred alternative (LPA);
- Conduct sufficient engineering to complete the Environmental Assessment (EA) and complete all environmental documentation and permitting to satisfy NEPA, State, and Federal requirements;
- Refine costs through value engineering (VE);
- Determine which FTA Capital Investment Grant (CIG) category ("New Starts" or "Small Starts") the project is subject to and prepare associated grant application submission package to FTA;
- Prepare geotechnical, safety, and accessibility reviews related to corridor condition, ADA, and Federal Railroad Administration (FRA safety) compliance;

- Develop realistic financial plan showing federal, state, local, and private funding sources, including refining the benefit-cost analysis detailing the financial and economic benefit for the Manchester Regional Alternative from the 2014 Capitol Corridor Rail & Transit Alternatives Analysis Plan;
- Identify firmly committed matching funds per FTA program requirements;
- Identify and draft all necessary third-party agreements;
- Develop a strategy to address evaluation criteria in order to maximize the project's rating to successfully compete for CIG funding;
- Complete design plans and specifications sufficient to support potential NHDOT alternative project delivery mechanism, such as Design-Build; and
- Assist the NHDOT with public involvement processes required for confirmation of the LPA or presenting Project Development/Engineering information, such as location and layout of the proposed stations and layover facility to legislative or municipal officials.

Scope of Services

The AECOM scope of services is as follows in conjunction with the NHDOT Agreement:

Task 1: Project Management, Coordination, Communications (PMCC)

AECOM will lead the project management task and will prepare a Project Management Plan, including an update to the Project Work Plan for the Federal Transit Administration (FTA). The Project work plan will include information on the Project team organization, team decision-making, roles and responsibilities and interaction with FTA, communication standards, invoicing and progress reporting methods and procedures, and the scope of work. The work plan shall identify studies to be conducted as part of the NEPA evaluation process for the Construction Project.

The PMCC and administrative tasks anticipated for the project include:

1. Project initiation, planning, and internal staff mobilization;
2. Project Kick-off Meeting with NHDOT, AECOM PM & design staff (4);
3. Detail scheduling in Microsoft Project (Gant Chart) & monthly updates (assume 24);
4. Invoicing & Monthly Progress Reporting (assume 24);
5. Ongoing Coordination and Communications with NHDOT & Project Team at a frequency and in a format defined in the PMCC plan;
6. Project Safety Plan (covering site visits); and
7. QA/QC oversight.

Task 2: Public and Stakeholder Involvement

This task will be led by the AECOM subconsultant Fitzgerald & Halliday (FHI). FHI shall support a public participation process that addresses applicable FTA requirements for public engagement in rail planning projects and enhances NHDOT practices as stated in the guidance document, "Public Involvement Process for New Hampshire Transportation Improvement Projects." In addition, public and stakeholder involvement activities will be conducted in accordance with the National Environmental Policy Act (NEPA) and Section 106 requirements. Activities specific to NEPA and Section 106 will be listed under the environmental tasks of the scope. Services under this task do not include provision of a translator, formal stenographer, or audio recording.

2.1 Public Outreach and Communications Plan

Within sixty (60) days of project initiation, FHI will develop a draft Public Outreach and Communications Plan. The draft plan will identify stakeholders, key issues, and existing communications networks, such as newspapers, newsletters, radio stations, and electronic communication/social media tools, and will be submitted to NHDOT for review. Based on direction from NHDOT in response to questions during the RFP process the Public Advisory Committee (PAC) from the prior phase of work will not continue and therefore is not part of this scope.

2.2 Public Information Meeting

The purpose of this meeting is to inform and to obtain input from the public regarding the development of the project recommendations. It is anticipated that there will be one (1) Public Information Meeting held when the draft recommendations are developed, but not yet approved or adopted. The public information meeting will be general "open house" style with a brief presentation. This meeting is expected to last up to two hours. The meeting format will be virtual, as determined by COVID-19 related constraints.

FHI and the Consultant will be responsible for:

- Scheduling the date, time and meeting location;
- Developing an agenda for NHDOT approval;
- Developing handout material, including display graphics for NHDOT review and approval prior to publication;
- Conducting a dry run of presentation for NHDOT before meeting;
- Presenting the project materials at the meeting;
- Developing draft meeting minutes and summary of the comments and making changes based on NHDOT review and comments;
- Publishing/posting the approved meeting minutes on the project webpage;
- Maintaining a contact database of attendance; and
- Providing the PowerPoint presentation to NHDOT for posting to the project webpage.

2.3 Stakeholder Meetings

While FHI will develop a formal outreach process with the establishment of Public Outreach and Communications Plan, and public information meeting, additional public engagement is anticipated, especially during development of the financial plan and siting of the proposed stations and layover facility. Members of the Consultant team will, in conjunction with NHDOT, meet one-on-one with stakeholders at up to ten (10) meetings. The meeting format will be virtual, as determined by COVID-19 related constraints.

Initial individual meetings with key stakeholders, including:

1. Massachusetts Bay Transportation Authority
2. Massachusetts Department of Transportation
3. PanAm Railway (Boston and Maine)
4. Federal Transit Administration (FTA)
5. Nashua Regional Planning Commission
6. Southern New Hampshire Regional Planning Commission
7. Central New Hampshire Regional Planning Commission
8. City of Nashua
9. City of Manchester
10. Manchester-Boston Airport (MHT)

For each one-on-one stakeholder meeting FHI will be responsible for:

- Scheduling the date, time and meeting location;
- Reviewing the agenda and handout material and/or presentation with NHDOT prior to the meeting;
- Presenting the project materials at the meeting; and
- Developing minutes and summary of the comments received at each meeting and distributing to NHDOT.

2.4 Public Communications

Several communication methods will be employed (e.g. factsheets, a contact list, postcard, webpage content, and other communication activities) to inform the potential partners, public, and area stakeholders of the project throughout the duration of the design process.

Fact Sheet

The Consultant will develop two (2) fact sheets about the project. The first will be developed within four months of project initiation to publicize the beginning of the project, its goals and objectives, and anticipated timing of the public meeting. It will also provide an email address to sign up for email notification of the public meeting. The other fact sheet will be developed during the development of the Financial Plan for the proposed rail service. This second fact sheet can be used as an introductory piece/handout when the Project Team is looking to secure potential partners and financing.

The Consultant will:

- Design and develop, in collaboration with NHDOT a one-page, (up to 2-sided) 8 x 11 ½ fact sheet to be used for stakeholder and potential partnership meetings. It can also be distributed electronically to area municipalities, planning agencies and government officials, and posted to the NHDOT project webpage.

Contact List

The Consultant will maintain an email distribution list of interested parties throughout the project process. This list will serve to inform interested parties of project materials (e.g. fact sheets, reports on the webpage) and other updates (e.g. meeting notification). The interested parties mailing list shall include, but may not be limited to:

- Legislators from U.S. Congress, Executive Council, State Representative and Senate;
- Individuals or organizations that have indicated an interest in this project in previous outreach efforts;
- Stakeholders;
- Media;
- Local municipal officials; and
- Others.

Media Relations

The Consultant will provide supportive materials to NHDOT communications staff to assist with publicizing the public meeting in newspapers, radio, and TV stations that cover the Capitol Corridor area. FHI will provide a draft media advisory to NHDOT for the public meeting with pertinent information on the date, time, location and purpose of the public meeting and project status. Outreach to media outlets will occur within two weeks in advance of the public meeting. NHDOT will be responsible for initiating all media contact.

Postcard

A postcard will be developed and distributed to advertise the public meeting. It will be distributed electronically to elected officials, municipalities, regional planning agencies, abutters to proposed rail stations the proposed layover facility, and interested parties on the email contact list in advance of the meeting.

Website

FHI will provide NHDOT relevant project information in the form of electronically formatted files for the agency to post on the NHDOT website. Information provided may include plans, reports, environmental documents, all project documents, notices of the upcoming public meeting, meeting presentations, fact sheets, project reports and the point of contact information at the Department.

FHI will also review the project page on the NHDOT website and provide new or updated content at least quarterly, for the duration of the project.

Other Communication Activities

Throughout the course of the project, miscellaneous communication activities will occur with members of the public, especially during the periods leading up to meetings. A sampling of communication tasks anticipated are:

- Coordination with municipalities and regional planning agencies to email postcards and webpage links to their constituents in advance of the public meeting;
- Directly respond to comments or coordinate a response from another member of the study team;
- Develop and track all comments and responses in a database; and
- Provide reports of comments for NHDOT.

Deliverables

- Public Outreach and Communication Plan (Draft & Final)
- Draft and Final Minutes for each meeting:
- One(1) Public Information Meeting
- Up to ten (10) Stakeholder Meetings
 - One (1) contact list
 - Two (2) fact sheets
 - One (1) press release
 - Three (3) flyers
 - One (1) Postcard
 - One (1) comment/response database

Task 3: Survey & Right-of-Way Services

3.1 Data Collection

The survey and right-of-way tasks will be led by AECOM subconsultant GM2 Associates, Inc. (GM2). Upon notice to proceed, GM2 will compile a list of record abutting property owners throughout the corridor.

Notification letters will be drafted and sent to each abutting parcel owners as a courtesy at least two weeks prior to field crew mobilization.

GM2 field crews will mobilize to the site in no-snow conditions to establish geodetic survey control throughout the corridor. The survey will have the units of U.S. Survey Feet, reference New Hampshire State Plan Coordinate System NAD83(2011) for the horizontal datum and NAVD88 for the vertical datum. The survey will conform to the current version of the NHDOT Survey Technical Standards Manual. The base plan will be a product of aerial mapping completed by a GM2 subconsultant utilizing LiDAR and photogrammetry collected from a fixed-wing, manned aircraft. This data will be combined with supplemental conventional survey data where necessary.

The southerly limits of the survey will be the northerly face of the Lowell Station, in Lowell, MA. The northerly limits of the survey will be a point 1000' northerly of the Granite Street crossing, in Manchester, NH. The width of the survey will be variable, centered upon the existing main line track. At a minimum, in areas where no additional tracks are proposed, the survey will include the existing rail prism. The areas that are obscured by foliage or coniferous trees at the time of the flight will be supplemented as necessary by conventional ground survey.

At each grade crossing, the survey will extend 200' both left and right of the existing rail for a width encompassing the apparent limits of right-of-way. Should a distance of 200' left or right turn into a driveway or intersection, the survey will project through the intersection or driveway. The exception to this is at Granite Street in Manchester. At this crossing, the survey will be 100' wide, centered upon the existing tracks. There may be cases where it is necessary to survey up to 500' from grade crossings. These areas will be covered by aerial LiDAR and supplemented as necessary.

There are three instances throughout the corridor where survey will include data significantly outside of the existing rail prism. At the Crown Street Park and Ride in Nashua, between stations 2040+25 and 2045+75, data will be collected 100' left of the existing rail. At MHT in Bedford between stations 2650+25 and 2655+80, data will be collected up to 400' left of the existing rail but generally 100' beyond the limits of the proposed improvements. At the proposed Granite Street Station and layover facility, between stations 2910+60 and 2940+60, data will be collected up to 200' right of the existing rail but generally 100' beyond the limits of the proposed improvements. The location of the proposed layover facility will be ascertained by WSP prior to the supplemental ground survey being performed for that facility. Should any of the above described data be incomplete based on the aerial LiDAR data, conventional ground survey will supplement it as necessary.

Beyond these limits at the three above-described sites, as well as at the former Dow Chemical Site adjacent to East Spit Brook Road in Nashua, NH, photogrammetrically collected data will be used to populate the survey. Should the quality or intensity of this data not be sufficient for design due to canopy, conventional ground survey will be used as a supplement.

The survey will include environmental resource flagging placed by GM2 regardless of whether said flags fall within the limits of the engineering survey described above or not.

It is anticipated that up to five stream crossings will require additional survey relative to hydraulics and the existing bridge structure. For these areas, bathymetric survey will be collected 500' both upstream and downstream of the existing crossings. The above-water survey in these 1000' foot stream sections will be limited to 50' beyond the top of bank. It is assumed that this level of effort will not be required at the three largest crossings, the Pawtucket Canal, the Nashua River or the Merrimack River.

3.2 Base Plan Preparation

GM2 will develop a survey base plan that conforms to NHDOT standards utilizing the software version specified by the Department. The survey files that will be developed include 40818erl.dgn, 40818ert.dgn, 40818exd.dgn, 40818txt.dgn, 40818env.dgn, 40818ctr3d.dgn and 40818og.dtm. The base plan will be developed at 50 scale.

3.3 Survey Updates

If in reviewing the base plan as presented, the design team requires additional data collection to supplement the survey, GM2 will mobilize during no-snow conditions to collect the additional data, totaling up to 10 acres in area. Once the data has been collected, the files that the base plan is comprised of, including the original ground surface, will be updated and resubmitted. In addition to the 80 acres that may require conventional ground survey, it is anticipated that up to 5 linear miles of existing rail prism may need to be surveyed conventionally and incorporated into the base plan. The survey update requests are anticipated to occur on up to six separate occasions. The base plan and associated surfaces will be updated up to six different times.

3.4 ROW Survey

GM2 will ascertain the limits of the existing railroad ROW only in areas adjacent to the proposed stations and layover facilities detailed above. Though no ROW acquisition will occur under this contract, it will be prudent to determine the extents of the proposed impacts at this phase. The development of any recordable ROW plans or the monumentation of boundaries is excluded from this scope of work. The private abutting boundary lines that intersect the ROW will be shown as approximate throughout the corridor. The 40818ert.dgn will clearly show which areas of ROW were ascertained and which are shown as approximate.

Task 4: Geotechnical Services

4.1 Subsurface Exploration Plans

The geotechnical tasks will be led by AECOM's subconsultant Nobis Group (Nobis). Nobis will research and review subsurface data available from on-line records, in-house, or provided by AECOM, municipalities, and NHDOT for the stations, the layover facility and other locations where explorations will be required by the design team. This information will be used to support the development of a subsurface exploration program that will outline the extent of explorations, required depth, and proposed locations.

Nobis will conduct a site visit to visually evaluate each site area for drill rig/excavator access including the presence of overhead and apparent underground utilities, track and structural features.

Nobis will coordinate with team members and prepare a Subsurface Exploration Plan for the four stations, the layover facility and up to five other sites, including potential BMP locations and well installations. Nobis will assist with the coordination and scheduling of the railroad flagging crew to complete the pre-marking task, if required. Nobis will coordinate access with public or private landowners, if required, through the NHDOT.

4.2 Drilling Subcontractor Procurement, Utility Clearance, Flagger Coordination

Nobis will prepare a Site-Specific Safety and Health Plan (SSHP) for the geotechnical subsurface exploration phase for each site where explorations are required. This will include reference to NHDOT Article I regarding LRS and PFAS, as applicable. The SSHP's will be intended for use by Consultant field personnel.

Nobis will procure and retain a drilling and excavation subcontractor (New England Boring Contractors of Derry, Hampshire) who will be responsible for DigSafe notification, and for contacting the respective local municipalities where the explorations are being performed to request the mark-out of existing utilities. We assume that the railroad owners/operators will mark their own utilities such as signal and communication lines, drainage pipes, etc. We understand that there are fiber optic lines in the railroad right-of-way between Nashua and Manchester. Therefore, we are including five (5) days of vacuum excavation to pre-clear

borings in these areas, as necessary. Additional vacuum excavation and associated fee could be necessary in other areas, if utility locations cannot be clearly marked in the field by the respective owners/operator.

4.3 Geotechnical Subsurface Exploration

Nobis will coordinate and perform the following geotechnical subsurface explorations:

- **Stations:** A total of up to twelve (12) borings will be performed at the stations with an ATV-mounted or hi-rail drill rig. We anticipate that five (5) (5 of the test borings will be drilled to a depth of approximately 40 feet below ground surface (bgs) and the other seven (7) will be advanced to a depth of approximately 80 feet. If refusal is encountered in the borings, a 15- to 20-foot NX-size rock core will be collected in up to four of the borings. Depths of the borings may require adjustment depending upon the subsurface conditions encountered and the type of foundations anticipated for the platforms.

Up to eight (8) test pits will be performed throughout proposed parking and roadway areas to a depth of up to 10 feet bgs.

The station borings and test pits will be approximately broken down as follows for each site:

- Nashua Spit Brook Road – assumes single low-level platform on west side of track with a mini-high
 - 1 boring (deep) for the mini-high platform
 - 1 boring (shallow) for the at grade portion of platform
 - 2 test pits for proposed parking lot
- Nashua Crown Street – assumes single high-level platform on west side of track
 - 2 borings (deep) – one at each end of platform
 - 1 test pit at connection point between existing parking lot and proposed platform
 - 1 additional test pit (if needed)
- Bedford/Manchester Airport – assumes single low-level platform on west side of track with a mini-high
 - 1 boring (deep) for the mini-high platform
 - 1 boring (shallow) for the at grade portion of platform
 - 2 test pits for proposed parking lot
- Manchester Granite Street – assumes single high-level platform on east side of track
 - 2 borings (deep) – one at each end of platform
 - 2 borings (shallow) in the existing parking lot
- Additional Station Borings and Test Pits as Needed
 - 2 borings (1 deep and 1 shallow)
 - 2 test pits
- **Layover Facility:** Four (4) test borings are proposed at the layover facility. Borings will be performed at the proposed maintenance and substation buildings, along the proposed 400-foot-long retaining walls, and a few in the proposed track areas. Borings will be performed with an ATV- or truck-mounted drill rig to depths ranging from 15 feet in proposed track areas to up to 80 feet in proposed structure areas. If refusal is encountered in the borings, a 15- to 20-foot NX-size rock core will be collected in up to four of the borings.
- **Other structures (to be determined):** Up to ten (10) borings and up to five (5) test pits are planned at up to two structures or sites (such as BMP locations) that are to be determined. The boring depths will be determined once the proposed structure is known, but, we have anticipated the borings will average 60 feet and will include up to ten (10) 10- to 20-foot-long rock cores. Test pits will be excavated to a depth of up to 10 feet.

Boreholes performed within 5 feet from rail tracks will be backfilled with cement powder in a dry form, otherwise boreholes will be backfilled with soil cuttings and supplemented with sand as needed. Bituminous pavement penetrations will be repaired with cold patch asphalt and concrete penetrations will be repaired with concrete mix. Test pits will be backfilled with excavated materials and compacted in lifts with the excavator bucket. No dewatering will be performed during test pit excavation.

Nobis will observe and prepare field logs of the subsurface conditions encountered in the test borings and test pits. Ground elevations at the exploration locations will be estimated by interpolation between contours on an existing conditions survey provided to Nobis by AECOM through GM2. Groundwater levels will be measured in the explorations once the termination depth is reached.

4.4 Geotechnical Laboratory Testing

Geotechnical laboratory testing will be completed to assist with classifying the soils/rock and evaluating engineering properties in support of the design of the stations, layover facility, and other undetermined structures. We have included thirty (30) grain size analyses, up to five (5) Atterberg Limits and moisture content tests, eight (8) organic content tests, and up to eight (8) unconfined compressive strength tests on retrieved rock cores.

We have not included any consolidation or strength testing on cohesive soils, as these soils are generally not anticipated at the sites.

4.5 Boring Logs and Geotechnical Analyses

Nobis will prepare test boring logs in typical format using gINT software. Test pits logs will be prepared in Excel format. Nobis will evaluate the subsurface data with respect to foundation design for the proposed station improvements and to the pavement design for the proposed parking and roadways and as the other structures or sites require. Nobis plans to evaluate shallow foundations to support the proposed station platforms, maintenance and substation structures at the layover facility as well as other unknown structures, as possible. Shallow foundation recommendations will include bearing capacity and anticipated settlement and any required over-excavation, if necessary. However, if shallow foundations are not feasible due to unfavorable subsurface conditions, deep foundations such as micropiles or ground improvement will be evaluated. Deep foundation evaluation will include:

- Determine minimum required foundation lengths (or tip elevations) based on the provided axial load demand for each proposed structure; and,
- Perform lateral analyses to estimate deflection, shear force, and bending moments based on loads and foundation layouts for each station, building or other structure. We assume that two iterations of the lateral analyses need to be performed to optimize the foundation layout and/or for revised loads.

Consultant will review the estimated deflections to confirm that they meet the project requirements and perform the structural analyses as well as the design of the deep foundations based on the moment and shear force diagrams.

4.6 Geotechnical Reports

Nobis will prepare and provide a geotechnical report for each of the four stations, the layover facility, and up to five structures or sites to be determined. Each report will include:

- Summary of the subsurface condition including completed explorations, subsurface conditions, seismic design category, and liquefaction potential;
- Foundation recommendations;
- Construction considerations such as estimated design groundwater level, groundwater control, excavations, obstructions, protection of adjacent structures and utilities, recommendations for subgrade

preparation and backfill including removal of unsuitable soils, load testing, and geotechnical monitoring and instrumentation recommendations; and,

- Appendices including figures showing the exploration locations and subsurface profiles, test boring and test pit logs, geotechnical laboratory test results, and the geotechnical analyses.

The reports will be submitted in an electronic (PDF) format. The Quality Assurance documentation for the geotechnical reports will be prepared and submitted.

4.7 Geotechnical Consulting Services

Nobis will provide geotechnical consulting services. We anticipate that the following services will be required:

- Provide responses to review comments regarding the geotechnical reports as well as foundation elements on the design drawings;
- Update the geotechnical report to incorporate additional project information as it becomes available;
- Prepare technical specifications or review/modify MBTA standard specification sections for the platform foundation if specialty foundations are required;
- Meet with NHDOT, MassDOT and/or MBTA for reviews, revisions, and advancement of project submittals. Costs for up to two (2) meetings in the project site or Greater Boston areas or via conference calls have been allocated;
- Review one (1) set of foundation drawings for each station, the layover facility and up to five other structures from a geotechnical perspective to verify that geotechnical recommendations were interpreted correctly.

Task 5: Confirm and Update Alternatives

AECOM (Consultant) will develop and lead the process of confirming and updating the alternatives considered for the project. It is assumed that this task will build upon the Alternatives Analysis process completed by NHDOT in 2014 for the project, which evaluated a wide range of alternatives and options leading to detailed analysis of the following three alternatives:

- Manchester Regional Commuter Rail;
- Nashua Minimum Commuter Rail; and
- Concord "Intercity 8" Rail.

The Alternatives Analysis (AA) developed and compared ridership, costs, economic impacts and other key characteristics of the alternatives. While the AA did not formally recommend an LPA, the results of that work showed the highest ridership and economic benefits were associated with the Manchester Regional Commuter Rail Alternative. Under this task AECOM will review and update the key planning level inputs to this alternative, including:

- Purpose and Need and
- Alternative Definition.

5.1 Confirm/Update Purpose and Need Statements

The Purpose and Need (P/N) Statements set the stage for consideration of the alternatives. They have three parts: Purpose, Need, and Goals and Objectives. The Purpose defines the transportation problem to

be solved. The Need provides data to support the problem statement. The Goals and Objectives describe other issues that should be resolved as part of a successful solution to the problem.

The P/N Statements clarifies the expected outcome of public expenditure and justify that expenditure. They are used to guide the development of alternatives. They are fundamental elements when developing criteria for selection among alternatives.

The P/N Statements from the 2014 AA will be reviewed, confirmed, and updated if necessary, based on the following subtasks.

Market Analysis

Under this subtask, we will confirm the study corridor and update relevant demographic data including existing and future No-Build population, employment, and key census indicators such as Journey to Work data.

Transportation Facilities and Services

Consultant will confirm and update the 2014 AA description of highway, rail and bus services and facilities in the corridor, with focus on rail services on the MBTA Lowell Commuter Rail Line and the associated Pan Am freight line between the end of MBTA ownership and Manchester, NH. For rail services, we will identify schedules, stations, parking facilities and utilization, travel speeds, ridership origins/destinations, fares, operating cost, fleet, passenger revenue, and subsidy, plus infrastructure conditions including track, signal, structures, freight customers, freight services and train starts. Existing bus services and highway facilities will be described to the extent that such information is needed as inputs to ridership forecasting for the LPA and No-Build Alternatives.

Consultant will also confirm and update the overview of current and future airport passenger services and operations at Manchester-Boston Regional Airport (MHT). We will consider the number of inbound and outbound passengers and flights by time of day, parking availability and costs, other passenger ground access services. We will coordinate with MHT to document current and forecast air passenger volumes using MHT to document existing and future no-build conditions and calibrate/verify inputs to the rail ridership forecasting model.

Forecasting

Consultant will review previous forecasting studies for the corridor and provide a brief overview of the findings of these studies.

As part of the existing and future conditions, a market analysis will be performed. The market analysis will consist of determining the definition and size of the Capitol Corridor market. Population and employment characteristics will be reviewed and documented, and housing and jobs relationships will be established. Travel patterns from the Census journey to work data will be analyzed and supplemented with survey data as available to determine the corridor travel patterns. The baseline forecasts which are to be developed under task 6 will be summarized to confirm the need within the corridor.

Consultant will work with the Department to establish the forecasting criteria under which the alternatives will be analyzed.

FTA Region 1 Coordination

At the initiation of this effort, we propose to meet, virtually as necessary, with FTA Region 1 officials to continue the strategic process of confirming and updating the Purpose and Need and the Locally Preferred Alternative (LPA) given the available data and determining what additional data inputs, if any, might be required to gain approval.

5.2 Alternatives Definition

Consultant will confirm and update the Manchester Regional Commuter Rail Alternative as the LPA Build Alternative along with a Baseline and future No-Build alternatives. The Build alternative for the corridor will be based upon previous work including primarily the 2014 Alternatives Analysis, as well as the Nashua commuter rail study, the I-93 study and the several Manchester passenger rail studies. The Build alternative would likely function as an extension of the MBTA Commuter Rail Lowell service. Alternative variations will be defined to reflect different station and stopping patterns, daily trips, service frequencies, hours of service and connecting services. These conceptual alternatives will address the conditions, problems, goals and objectives described in the Purpose and Need Statement.

We will produce a Technical Memorandum describing:

- The definition of conceptual alternatives;
- The characterization of each alternative using qualitative and quantitative measures based on the evaluation measures described in the Purpose and Need; and
- The results of the analysis.

We will review service designs and infrastructure requirements for the Build alternative. The work will confirm and update the feasibility assessment and preliminary cost estimate for the Build alternative, considering signal and track upgrades, bridges and culverts, and cost estimates. We will evaluate the suitability of up to 4 station sites identified by previous studies and/or existing conditions analyses for Nashua (2), Bedford/Manchester Airport, and Downtown Manchester. We will also identify and assess potential for up to 3 potential sites in Manchester, NH for a vehicle layover facility based on previous studies and existing conditions analysis.

Task 6: Evaluation Criteria and Methods

A travel demand forecasting model will be used to evaluate the LPA's potential ridership.

AECOM (Consultant) will lead the evaluation task. Consultant will apply the FTA STOPS (Simplified Trips-On-Project Software) method in order to evaluate the ridership and revenue potential for the alternative being considered. STOPS was developed specifically to produce the ridership results and reports necessary for applying to FTA New Starts and Small Starts programs and is well suited for commuter rail applications. Additionally, STOPS includes the functionality of a traditional four-step model, while simplifying the trip generation and distribution steps to take advantage of available data and make the modeling process more efficient. The model will consider zone-to-zone travel markets stratified by household auto-ownership and predict zone-to-zone travel characteristics of the transit and roadway networks, and then assign the trips predicted to use fixed guideways onto the Capitol Corridor and MBTA rapid transit, Bus Rapid Transit (BRT) and commuter rail facilities in the transit network. The model generates many outputs (particularly focused on transit), and the Study Team will work with NHDOT to determine the desired results metrics. Here is a sample of what might be of interest:

- Station to station ridership;
- Route level ridership;
- District to district ridership by transit mode, purpose, access mode, auto ownership; and
- District to district auto Vehicle Miles Traveled (VMT).

The Consultant will update the current version of the STOPS tool to match the study area and incorporate the required input data. This data will include the following:

- Census Transportation Planning Package (CTPP) data used for representing travel patterns. This is available on the FTA website.
- Transit timetables in General Transit Feed Specification (GTFS) format. These are publicly available.
- Geographic zone system, population and employment, and highway travel times and distances. We will coordinate with the Boston and Southern New Hampshire MPOs and RPCs in order to obtain the necessary data.
- Rail station locations and attributes, including station boardings. This is available in the MBTA Blue Book.
- Alternatives definitions. This will be developed as part of the project, building upon previous work.

Consultant will coordinate with NHDOT, the Boston Regional MPO (BOSMPO), the Southern New Hampshire Planning Commission (SNHPC), and Nashua Regional Planning Commission (NRPC) to collect all the necessary input data and develop the final list of ridership evaluation metrics.

Ridership forecasts for the LPA will be updated using the STOPS Model. To update the ridership and revenue forecasts, the base model will be calibrated to existing ridership counts in the study area for a base year of 2020. As the Capitol Corridor encompasses the BOSMPO modeling area and the SNHPC and NRPC modeling areas, we will combine the available data into a cohesive STOPS application. Once the base model is calibrated to station boardings, the LPA will be coded into STOPS for an analysis year of 2040. The ridership forecasting will be performed on up to four options for the LPA to test different operating plans and fare structures.

Deliverables

Technical memorandum:

- Travel Forecasting Methodology Report, including graphics; and
- Evaluation Criteria and Methods Memorandum.

Task 7: Evaluation and Confirmation of LPA

The LPA will be evaluated and compared against the detailed evaluation criteria. These criteria will consist of economic development, land use, and environmental (natural, social and economic) impacts, as well as financial considerations and mobility impacts. Consultant Team members will provide insight on expected changes in this area.

Ridership forecasts for the LPA will be developed as part of the evaluation. To develop these forecasts the LPA and its options to be tested will be coded into the travel demand model such that they interact with the existing transportation system. Once coded, the LPA will be run through the modeling system to develop ridership forecasts. The impacts of the LPA on the transportation system will be quantified using the model output data.

The ridership, revenue, and other ridership metrics determined in coordination with NHDOT will be summarized in a final ridership report.

The Consultant will summarize estimates of capital and O&M costs for the LPA, Baseline, and future No-Build using information developed under Task 12.

Deliverables

- Final Ridership Evaluation/Projections;
- Final Alternatives Report.

Task 8: Locally Preferred Alternative

AECOM (Consultant) will lead the process of confirming the locally preferred alternative (LPA) for the project. Under this task, the Consultant will assist the Department in confirming the definition of the LPA to meet Department and stakeholder objectives, is likely to achieve state and local financial support, and is likely to qualify for federal capital funding. Based on the evaluation criteria and the technical assessments completed in Task 6, the Consultant team will rate the LPA according to:

- Ridership;
- Capital cost;
- O&M cost;
- Environmental impacts (based on analysis completed for the EA);
- Environmental justice;
- Cost Effectiveness;
- Benefit Cost;
- Operational enhancement,
- Transport enhancements;
- Other Economic benefits; and
- Transit supportive land use and economic development.

After the LPA is confirmed and forecasted, a risk analysis will be undertaken. This will establish a range of reasonable forecast values if the planning assumptions, such as socioeconomic forecasts, differ from the anticipated values.

Deliverables

- Technical Memorandum: Evaluation of the LPA; and
- Risk Analysis.

Task 9: Environmental Assessment

AECOM will update and complete the Environmental Assessment (EA) published in December 2014, for the preferred alternative in cooperation with relevant resource agencies. The EA will be written in accordance with current NEPA rules (Part 1500) and effective U. S. Department of Transportation policies. GM2 will lead the tasks pertaining to wetlands, the various categories of water resources, floodplains, and ecological systems and species. The EA will once again provide for scoping, public outreach, agency coordination and preparation of required NEPA documentation for submission by the Department. We recommend that a consultation meeting with the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) be scheduled upon project commencement to begin the process of coordinating the environmental work in Massachusetts and determine the appropriate filing requirements. We also recommend the formation of an Interagency Coordination Group as a forum for regulatory agencies and permit-granting authorities to participate in technical discussions related to relevant resource issues, permits and project documents with the goal of streamlining the EA process.

The EA will be designed to meet the following objectives:

- Confirm which aspects of the proposed action have potential for social, economic, or environmental impact;

- Confirm alternatives and measures which might mitigate adverse environmental impacts;
- Identify other environmental review and consultation requirements which should be performed concurrently with the EA; and
- Summarize the results of agency coordination and public outreach.

Specific tasks consist of:

- Project Restart - Update Contact Letters;
- Development of Impact Analysis Methodology Report;
- Office Database Reviews;
- Environmental Issues Mapping;
- Section 4(f) evaluation (DOT Act), if needed;
- Section 6(f) review and coordination, if needed
- Confirmation of the NEPA class of action; and
- Performance of technical studies and field assessments to more clearly identify potential impacts.

9.1 Wetland Delineation

The service-level EA identified the need to provide detailed wetland delineation should the project move forward. The proposed level of effort for that work is provided below.

Wetlands will be delineated for the following areas within the project corridor:

- Four proposed stations and one layover facility;
- The segments of the project corridor with new/realigned track or optional second track, based on the 2014 project plans. For the NH portion of the project, this is estimated to include approximately 7 miles. For the MA portion of the project, this is estimated to include approximately 8 miles (the entire corridor in MA);
- Bridge crossings (assume 9 in NH and 7 in MA, refer to table below); and
- Grade crossings (assume 16 in NH and 6 in MA, refer to table below)

Bridge Crossings			
Bridge No.	Approx. Station	Crossing	State
25.62	1353	Unknown	MA
25.69	1355	Pawtucket Canal	MA
26.20	1384	Pawtucket Canal	MA
28.65	1512	Stony Brook	MA
29.10	1535	Deep Brook	MA
32.46	1713	Unnamed stream/wetland	MA
32.56	1718	Unnamed stream	MA
37.87	1998	Salmon Brook	NH
39.22	2071	Nashua River	NH
39.39	2080	Lock St.	NH
41.77	2205	Pennichuck Brook	NH
44.76	2364	Griffin St. boat launch trail	NH
44.92	2373	Naticook Brook	NH
46.22	2441	Souhegan River	NH
47.80	2524	Depot St. boat launch	NH
51.84	2740	Merrimack River	NH

Grade Crossings		
Approx. Station	Crossing	State
1535	Wotton St.	MA
1560	Wellman Ave.	MA
1577	Private drive	MA
1599	Private drive	MA
1748	Farm crossing	MA
1759	River Road (private)	MA
1940	E. Glenwood St. (private crossing)	NH
2048	Crown St.	NH
2053	E. Hollis St. (Rt. 111)	NH
2062	Bridge St.	NH
2150	Hills Ferry Rd.	NH
2245	Mast Rd.	NH
2314	Private road	NH
2332	Private road	NH
2413	Wright Ave.	NH
2751	Manchester Wastewater Treatment Plant	NH
2773	Winston St.	NH
2852	W. Mitchell St.	NH
2882	Sundial Ave.	NH
2891	Byron St.	NH
2941	Depot St.	NH
2944	Granite St.	NH

Wetland delineation will be completed during the growing season (April through October). For the 15 miles of the corridor where no new/realigned track or optional second track is proposed, approximate wetland limits will be obtained from GIS mapping and aerial photos. It is assumed that work within these 15 miles will not extend beyond the existing tracks.

In NH, wetlands within the study area will be delineated in accordance with the US Army Corps of Engineers (ACOE) 1987 Methodology and the ACOE Northcentral and Northeast Region Supplement (2012). Ordinary high water (OHW) and top of bank (TOB) will also be delineated. Individually-labeled flags will be

placed in the field to designate the wetland boundaries. GM2 will survey wetland flagging using appropriate technology to locate flagging.

In MA, wetlands within and adjacent to the study area will be identified and/or delineated in accordance with the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00), "Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act" (MassDEP, 1995), and applicable local wetlands ordinances and bylaws. Wetland resources within the study area are anticipated to include Bordering Vegetated Wetland (BVW), Bank, Land Under Water Bodies and Waterways (LUWW), Land Subject to Flooding (LSF), and Riverfront Area (RFA). Individually-labeled flags will be placed in the field to designate BVW and Bank boundaries, as well as the mean annual high-water line for perennial streams. GM2 will survey wetland flagging using appropriate technology to locate flagging. LUWW and LSF boundaries will be determined from available mapping (FEMA floodplain maps, survey plans, and aerial photographs). Riverfront Area will be determined based on the delineated mean annual high-water line, or from available mapping where access to the river can not be obtained. In accordance with 310 CMR 10.58(2)a.3.a, the Riverfront Area within Lowell is 25 feet. In addition, the Pawtucket Canal in Lowell does not have a Riverfront Area (as identified in 310 CMR 10.58(2)a.1.g). Since BVWs and Banks have a 100-foot buffer zone, the study area for the wetland delineation will extend 100 feet beyond the anticipated project impact limits.

During the wetland delineation, GM2 will generally identify the presence/absence of invasive species within the areas of proposed impact (including vegetation clearing). Detailed mapping of invasive species locations and types is not included. Unusual features, such as disturbed areas or vernal pools, will be identified. GM2 will also identify Prime Wetlands located within the project corridor.

Federal wetland classifications will be assigned in accordance with "Classification of Wetlands and Deepwater Habitats of the United States" (Federal Geographic Data Committee, 2013). Wetland delineation data forms (paired wetland and upland data plots) will be completed for each wetland community delineated in NH and BVW field data forms will be completed for each BVW community delineated in MA. Wetland functions and values will be determined based on state and federal criteria for wetlands that may be directly impacted by the project. In addition, representative photographs of the study area and wetland resources will be taken.

Work completed under this task will be summarized in wetland delineation reports (one for NH and one for MA). The report will include a description of the wetland resources delineated, wetland delineation maps, representative photographs, data forms, and wetland functional assessment forms. The report and plans will be stamped by a NH Certified Wetland Scientist. All work will comply with NHDES Wetland rules effective December 15th, 2019.

9.2 Stream Crossings

GM2 will identify the intermittent and perennial stream crossings within the project corridor. Stream crossing field data collection assessments will be completed for any stream identified as Tier 2 or Tier 3 where a culvert or bridge will be replaced. It is assumed that stream crossing assessments will not be required for culverts and bridges that will be rehabilitated. The stream crossing field data collection in NH will be completed in accordance with Env-Wt 900 effective December 15, 2019. Wetland delineations at stream crossings will be a minimum of 100 feet upstream and downstream of the crossing. GM2 will also provide a longitudinal profile through each crossing with relative inlet and outlet invert elevations and upstream and downstream streambed elevations. A NHDES Stream Crossing Worksheet NHDES-W-06-071 will be completed for each stream crossing assessment in NH and the Rosgen classification of the stream will be identified. The project fee estimate assumes that stream crossing assessments will be completed for up to 10 stream crossings.

9.3 Wetland/Stream Mitigation

GM2 will identify potential wetland mitigation opportunities either within the project corridor or the surrounding area. This will include coordination with the Department and municipalities/conservation commissions.

If it is anticipated that the project will cumulatively impact greater than or equal to 500 linear feet of permanent stream channel or bank in NH, additional mitigation will be identified through the NH Stream Passage Improvement Program (SPIP), a newly established process of evaluating and identifying state and municipally owned crossings within the vicinity of the project to be upgraded as permittee-responsible mitigation.

Assuming the linear impacts to banks and channels are greater than 500 linear feet, GM2 will utilize the online NH Aquatic Restoration Mapper to identify up to eight (8) stream crossings to assess for potential consideration under the SPIP. Crossings will be prioritized in the following order: culverts within the same HUC-12 watershed and municipality, culverts within the same HUC-12 watershed but not within the same municipality. Town-owned culverts will be considered if fewer than 8 State-owned culverts are identified within these parameters. Culverts within the HUC-10 watershed will be considered if fewer than 8 culverts are identified in the HUC-12 watershed.

A table will be prepared to summarize the following for each of the 8 crossings:

Information obtained from the Aquatic Restoration Mapper:

- Stream and roadway name;
- Crossing condition;
- Aquatic Organism Passage Score;
- Geomorphic Compatibility Score;
- Presence of predicted cold water fishery; and
- Hydraulic vulnerability (10, 25, 50, 100-year flood).

Information obtained from GIS:

- Stream order;
- Distance to existing conservation lands;
- Distance to Designated Rivers;
- Distance to NH Wildlife Action Plan highest quality wildlife habitat, Connect the Coast wildlife corridors and habitat strongholds, and conservation focal areas;
- Presence of FEMA mapped flood hazard areas;
- Existing surface water impairments;
- Description of adjacent habitat and land use (based on aerial imagery); and
- Length of stream channel that could be restored (linear feet).

Photographs available on the Aquatic Restoration Mapper will be downloaded for each culvert. The information summarized above will be provided to NHDOT and GM2 will attend one meeting with the project team to discuss potential SPIP culverts.

This scope of work does not include field review of the 8 culverts.

In-Lieu Fee calculations will also be conducted for all impacts to wetlands and streams using the NHDES ARM fund payment calculator. If vernal pools are impacted, calculation shall be in accordance with USACE New England District Compensatory Mitigation Guidance.

9.4 Wildlife and Endangered Species

GM2 will identify wildlife resources within and adjacent to the project corridor using information from the NH Wildlife Action Plan, and The Nature Conservancy's Connect the Coast, MassGIS, and the Massachusetts Division of Fisheries and Wildlife (MassWildlife), supplemented by data obtained from field reviews. Information on fisheries will be obtained from the NH Fish and Game Department (NHF&G), MassWildlife, US Fish and Wildlife Service (USF&WS) and the National Marine Fisheries Service (NMFS).

The Merrimack River, Souhegan River, Horseshoe Pond/Naticook Brook, Nashua River, Baker Brook, and Stony Brook are identified as Essential Fish Habitat (EFH) for Atlantic salmon. GM2 will determine if the project has the potential to impact EFH and will coordinate with National Oceanic and Atmospheric Administration (NOAA) as appropriate. An EFH Assessment will be completed if necessary.

The NH Natural Heritage Bureau's DataCheck tool and the US Fish and Wildlife Service's IPaC website will be used to obtain information on threatened and endangered species within the project corridor. Information will also be requested from NHESP regarding threatened and endangered species in MA. It is assumed that follow-up coordination with the NH Natural Heritage Bureau (NHB), NHF&G, USFWS, and NHESP will be required since there are several listed plant and animal species in the vicinity of the project corridor. Based on previous coordination efforts during the 2014 Alternatives Analysis and updated DataCheck results received from NHB in 2020, it is assumed that the following surveys may be required:

- Spring bird survey at Spit Brook Road station in Nashua (if proposed);
- Rare plants & Exemplary Natural Communities – 4 plant species and 1 community identified near project corridor; and

The project fee estimate assumes two separate rare plant and exemplary natural community surveys (one in spring and one in fall) for seven specific locations along the project corridor. In addition, any rare plants encountered during the wetland delineation will also be noted. If necessary, GM2 will also conduct a spring bird survey at the Spit Brook Road station in Nashua. The anticipated level of effort for the surveys includes visual observations within the project study area. More detailed surveys involving netting or trapping, if required, would be completed under a separate agreement. The results of the field surveys, including a description of suitable habitat and photographs, will be documented in a summary report.

Since the 2014 Capitol Corridor study, Northern long eared bat (NLEB) was listed as a federally-protected species. Construction of the stations will likely involve work that is more than 300 feet from the existing rail ballast, so it is anticipated that the project will not be covered by the Range-wide Programmatic Consultation for Indiana Bat and Northern Long-eared Bat.

Since the 2014 Capitol Corridor study SB200 (RSA 228:26-c Wildlife Corridors and Habitat Strongholds) has passed, which requires that the Department consider wildlife corridors and habitat strongholds, where feasible, and incorporate them into project planning and mitigation.

9.5 Wetlands, Shoreland, and Stream Crossings

Wetland and stream resources will be identified during the wetland delineation and stream crossing assessments (Tasks 9.1 and 9.2) and through review of available GIS maps and data. Protected Shoreland areas will be identified based on review of online mapping and project plans.

GM2 will assess impacts to wetlands, streams, and shoreland resources. The identification of mitigation opportunities will be completed under Task 9.3.

GM2 will summarize current regulatory requirements and constraints associated with wetland resources, Protected Shoreland, and stream crossings and will provide a general description of the resources located within the project corridor. GM2 will discuss the wetland, stream crossing, and shoreland impacts resulting from the Proposed Action and project alternatives.

9.6 Water Quality

Data will be obtained and summarized covering groundwater and surface waters.

Groundwater

Data regarding aquifers, public water supplies and wells within the study area will be gathered from appropriate sources such as the GRANIT GIS database, NHDES mapping, NHDES Drinking Water and Groundwater Bureaus inventory data, MassGIS, and municipal data or municipal mapping. For the NEPA document, GM2 will provide a summary of the groundwater resources present and the potential impacts resulting from the Proposed Action and project alternatives.

Surface Waters

Information obtained from the wetland delineation, stream crossing assessment, and online mapping will be used to identify the surface waters located within the project corridor. GM2 will review the most recently approved State 303(d) list to identify water quality impairments and TMDLs within the project area. Since the project is located near several NH Designated Rivers, GM2 will contact the appropriate Local Advisory Committees for input on the project.

In support of the NEPA document, GM2 will summarize current regulatory requirements and constraints associated with surface water resources and will provide a general description of the surface waters located within the project corridor. GM2 will discuss the surface water impacts resulting from the Proposed Action and project alternatives.

Design of water quality treatment Best Management Practices (BMPs) will be completed under Task 12 Engineering/Design. Stormwater treatment will need to meet MS4 requirements since the project is located within MS4 regulated communities. A technical memorandum shall be completed by the Consultant, and added as an appendix to the EA, and shall include a section to document compliance with Part 2.3.6 of the MS4 permit to include to the following:

- Project area.
- Existing pavement area.
- Proposed pavement area.
- A pavement area analysis, as outlined in Part 2.3.6 of the MS4 Permit, and description of proposed structural treatment by catchment.
- A plan of the proposed structural stormwater treatment by catchment including necessary ROW or easements.
- A statement on responsible parties for operation and maintenance of the proposed structural treatment as described in Part 2.3.7 of the MS4 permit.
- A Copy of US Fish and Wildlife Service and/or National Marine Fisheries correspondence including a current IPaC search and concurrences to listed species, unless submitted as part of National Environmental Policy Act (NEPA) document
- A copy of any National Historic Preservation Act correspondence including an effects memo and MOA if necessary, unless submitted as part of NEPA document.
- A signed statement of compliance in accordance with Appendix B B.11.D of the MS4 permit.

9.7 Ecological Systems, Threatened and Endangered Species, and Wildlife

Information on ecological systems, threatened and endangered species, candidate species, and wildlife will be collected under Task 9.4. GM2 will summarize current regulatory requirements and constraints associated with threatened and endangered species and will provide a general description of the wildlife and fisheries resources, threatened and endangered species, and ecological systems located within the project corridor. GM2 will discuss the impacts resulting from the Proposed Action and project alternatives.

9.8 Flood Hazards and Floodplain Mitigation

GM2 will review Federal Emergency Management Agency (FEMA) floodplain and floodway maps for the project corridor and provide a summary of the resources present. Impacts to floodplains and floodways will be evaluated for the Proposed Action and project alternatives and potential floodplain mitigation opportunities/areas will be identified. GM2 will coordinate with the NH Floodplain Manager, the MA Flood Hazard Management Program, ACOE, municipalities, and FEMA, if necessary, regarding any proposed impacts within flood hazard areas. GM2 will identify if a Conditional Letter of Map Revision (CLOMR) through FEMA is necessary for any sections of the project. CLOMRs, if needed, will be completed under a separate agreement. If it is determined that the project will not increase the base flood elevation (based on engineering judgement), a memo will be prepared and signed by a P.E. from Jacobs.

9.9 Invasive Species

General information on the presence or absence of invasive species within the proposed clearing limits of the project will be obtained during the wetland delineation field reviews. For the NEPA document, GM2 will generally describe the invasive species present and any commitments or constraints related to construction of the project.

9.10 Hazardous Waste Sites / ESA Evaluations/ Contamination Inventory

The 2014 EA noted that Phase I Environmental Site Assessments (ESAs) should be completed for each property acquired as part of the project in order to be eligible for Landowner Liability Protections (LLPs). The following effort is anticipated for each property:

Contaminated Properties:

For the Manchester layover, Manchester Granite Street, Bedford/Manchester Airport, Crown Street, and E. Spit Brook Road proposed facilities (project limits), a database search will be undertaken to identify areas with records of hazardous materials or contamination within 1,000 feet of the project limits and landfills within 4,000 feet of the project limits. This work will also require a review of historic aerial photographs to evaluate past and current land use, and field surveys of the project area to look for observable physical evidence of contamination or potential contamination sources. This information will be described in a summary report that includes a list of all parcels with potential contamination concerns. AECOM will populate the NHDOT's RASCAL database, will coordinate with the NHDOT's hazardous materials program to confirm findings, and will assess measures required to conduct geotechnical investigations within areas of potential contamination which will be described in the summary report. AECOM will coordinate with the NHDOT on evaluating the presence of asbestos or lead paint on existing bridges and in determining future investigation requirements of the project. A Soils Management Plan, if required, will be completed under a separate agreement.

Limited Reuse Soils (LRS):

For the preliminary design, AECOM will estimate the quantity of LRS to be generated during construction based on limited information obtained, by phase if applicable, and estimate if additional soil analysis would be required in order to evaluate the reuse of LRS within the project limits.

Per and Polyfluoroalkyl Substances (PFAS):

AECOM shall perform a NHDES database search (NHDES OneStop and PFAS datamapper) to identify any sites with records of PFAS sampling and any NHDES requests to sample for any media type (soil, groundwater, surface water) within 1,000 feet of the project limits. This information will be described in a summary report that includes a list of all parcels with potential PFAS contamination concerns. AECOM will coordinate with the NHDOT on evaluating the risk of PFAS results and in determining any future investigation requirements of the project.

9.11 Noise & Vibration

The following services and steps are anticipated in order to address potential noise and vibration impacts and identify appropriate mitigation, if warranted:

- **Background sound level monitoring.** We will visit the project corridor and set up ANSI Type 1 or Type 2 sound level meters at up to 10 representative noise-sensitive locations in accordance with industry-accepted practices. These meters will record background sound level data continuously for at least 24 hours to document the background sound levels in the area. The data will be recorded in terms of noise descriptors associated with the relevant noise criteria for the project. We are assuming we will be given access to any properties for monitoring, which will be coordinated through the project manager;
- **Noise and Vibration Modeling.** We will predict the construction and operational noise levels associated with the Locally Preferred Alternative in the project study area using the latest version of FTA's Transit Noise and Vibration Impact Assessment guidelines. We will provide and utilize scaled mapping to the closest residences and other noise-sensitive land uses including topography and the new rail, station, and grade-crossing locations. We will also use operational data for existing and future (with the project) train operations (in terms of average daytime and nighttime hourly volumes) and specifications (locomotive types, number of locomotives, number of cars, and speeds) from the work performed in Task 12;
- **Impact Evaluation.** We will compare the modeled noise and vibration levels with the FTA criteria to determine where potential impacts would occur. If impacts are identified, practical mitigation options will be determined, including noise barriers and quiet zones; and
- **Documentation.** The results of our analyses and recommendations will be documented in a noise and vibration study report and the draft and final EA noise and vibration sections.

9.12 Cultural Resources

The 2014 EA noted that no impacts to Historic Architectural Resources were anticipated, but that impacts may occur to Archaeological Resources. . Technical studies completed for the 2014 EA will not be sufficient for reliance for the current proposed project, as the APE has changed, and new regulations and guidance can be included within the process. The following effort is expected to be necessary to document issues associated with cultural resources:

- **Prepare and Submit the Request for Project Review.** We will prepare the NHDHR's 'Request for Project Review (RPR) for Transportation Projects' form and accompanying package. The RPR will delineate a revised and appropriate APE, identify already-identified historic properties within or adjacent to the APE, provide a narrative project description and appropriate accompaniments (including plans, photographs, mapping, and the results of the records search and field review) as required by NHDHR.

- We will prepare MHC's 'Project Notification Form' (PNF) for and accompanying package. The PNF will delineate a revised and appropriate APE, identify already-identified historic properties within or adjacent to the APE, provide a narrative project description and appropriate accompaniments (including plans, photographs, mapping, and the results of the records search and field review) as required by the MHC.

Per 36 CFR 800.16(d), the APE is "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking." This includes both direct and indirect effects. We anticipate that delineating an appropriate APE will involve close coordination with NHDOT CR staff, the MASSDOT CR staff as well as SHPOs for both states. As such, we anticipate up to two (2) meetings with NHDOT CR staff, MASSDOT CR staff and SHPOs, as well as additional efforts to be conducted by video or teleconference. This task will involve one mobilization for limited site visits by both archaeological and architectural historian staff to the proposed project area to make initial recommendations regarding the APE based on the project's potential physical and visual impacts.

- Review relevant regulations. We will review the 2018 ACHP Program Comment to Exempt Consideration of Effects to Rail Properties within Rail Rights-of-Way to determine whether specific project elements may be considered exempt. This task will consist of preparation of a technical memorandum providing detail on project activities and an opinion and recommendation for consideration by relevant federal agencies as to whether they wish to apply the Program Comment. Preparation of the memorandum will assume the Activities-based approach under the Program comment, and assessment of its applicability will require that a sufficient level of detail on planned activities be available in order to generate a recommendation. Anticipate up to two (2) teleconference meetings with NHDOT and relevant federal agency staff to discuss the potential application of the Program Comment to the proposed project. Anticipate at least one of the two meetings will include representative staff from NHDHR.
- Agency Coordination. In addition to the two meetings above, we will provide relevant information, such as PowerPoint presentations, project plans, or other documents to share at up to two (2) Cultural Resources Agency Coordination Meetings, facilitated by NHDOT. In consultation with NHDOT, we will also identify and perform initial outreach to Tribes and Consulting Parties.
- Phase IA Archaeological Sensitivity. As the Program Comment does not apply to archaeological resources, it is anticipated that a Phase IA Archaeological Sensitivity Assessment will be required. The Sensitivity Assessment will be undertaken in accordance with relevant state standards, and AECOM staff will work closely with NHDOT, MASSDOT and SHPO(s) staff during phases of data collection and development of the sensitivity recommendations. The study will build on the previously conducted research completed in 2014 and will seek only to augment the prior research. Limited field investigation to visually inspect the APE and potentially to perform hand-powered soil cores, if warranted, to characterize site soils. The field investigation will be performed as a single mobilization. Phase IA field investigations will be limited to potential station locations, rail sidings, and areas of widened track where ground disturbing activities are likely. The Sensitivity Assessment will provide recommendations for low-moderate-high archaeological sensitivity for both precontact and historic period archaeological resources, with recommendations for additional studies, avoidance/protection measures, construction monitoring, and other actions, as deemed appropriate.
- Historic Architectural Survey. The proposed project has the potential to effect newly-identified historic properties and historic districts, including both physical and visual direct impacts. The survey will focus on inventorying the previously identified historic properties and districts that occur within the defined APE. An NHDHR/MHC records search will be conducted to locate resources within the project area identified between 2014 and the present. For areas of the project corridor not previously surveyed, AECOM will undertake a targeted reconnaissance-level field survey to identify properties over 50 years of age that may be eligible for listing in the National Register of Historic Places (NRHP) within the APE. This will be used to augment the 2014 field reconnaissance data collected within the APE. The Phase 1A report will contain the results of these surveys and will be presented in a Project Area Form (PAF) or other form deemed most appropriate by NHDOT and the NHDHR or MASSDOT/MHC, and note

important themes or contexts that relate to the history and development of the APE., For the purposes of estimating level of effort, we anticipate up to 200 properties may be identified during the survey.

Survey forms for newly-identified resources deemed potentially NRHP eligible will be prepared for up to five (5) properties. The decision of which resources will have forms will be determined in consultation with NHDOT, MASSDOT, and the SHPOs and will take into account the type and intensity of potential project effects.

- **Section 106 Assessment and Resolution of Effects.** After the identification phase, we will assess the effects of the proposed undertaking on the NRHP listed and eligible resources within the APE via preparation of a Determination of Effects submittal. The determination of effects will apply the National Register Criteria of Effect and include text, figures, photographs, and plan sheets, in order to adequately document the effect on each resource. The submittal will also define the alternatives considered to avoid and/or minimize the adverse effect. If adverse effects are found, we will draft a Memorandum of Agreement (MOA) that will define agreed-upon mitigation stipulations. The stipulations will be defined through consultation between NHDOT, MASSDOT, the NHDHR, the MHC, and Consulting Parties. AECOM will draft the MOA for review by all signatories, make any necessary revisions, and then submit to the aforesaid parties for signatures. Completion of the mitigation stipulations will require a separate scope of work.
- **EA section.** We will prepare the cultural resources section of the EA document and appendices with relevant supporting documentation.

9.13 Air Quality

The successful implementation of the project is expected to result in reduced vehicle-miles travelled (VMT) and reduced vehicle-hours travelled (VHT), as drivers shift modes from passenger vehicles to rail. The following scope of work is proposed in order to document the effects of the project on local and regional air quality:

- An update of current conditions (Affected Environment) and Environmental Consequences will be provided;
- Confirmation of attainment status as previously reported;
- An applicability analysis will be conducted to determine if a general conformity analysis will be required;
- Mesoscale and microscale analyses will be performed using the MOVES model and other approved software as determined in conjunction with NHDOT. Analysis will be performed only on the Preferred Alternative in the Environmental Assessment;
- Update Greenhouse Gas emissions analysis;
- Preparation of the EA's air quality sections (i.e., affected environment, environmental consequences, mitigation); and
- A formal technical report of the air emissions analysis will be updated to be incorporated as an appendix to the EA. A brief discussion of the analysis to provide a summary will be included in the air quality environmental consequences section.

9.14 Environmental Justice & Title VI Compliance/ Equity Analysis

The project is expected to provide beneficial impacts to Environmental Justice (EJ) communities by providing increased mobility options and access to employment opportunities. The following tasks will be undertaken to confirm these anticipated benefits and ensure that there are no disproportionate negative impacts to disadvantaged populations:

- Review of latest available Title VI and Environmental Justice reporting by NHDOT, MassDOT and the appropriate MPOs, RPCs of the affected communities to confirm the existence and location of EJ communities within the study area;
- Identification of EJ communities, other than those identified in the first bullet, in proximity to proposed station locations and layover facility; and
- Analysis of potential impacts to EJ communities sufficient to confirm that there are no disproportionate effects.

9.15 Transportation

In addition to the rail operations and service analyses, a review of the potential transportation impacts associated with travel to and from the proposed four stations and one layover facility, and at the locations themselves, will be conducted. Vehicle traffic to and from the proposed stations is a function of ridership and schedule: the order-of-magnitude of potential traffic impacts will be based upon the distribution of trips over the course of the day. Vehicle traffic to and from the proposed layover facility will be associated with the employees of the facility and associated services/deliveries.

Passenger peaking characteristics will be developed as part of new ridership and service. The intersections identified for analysis assume that the primary influence of project-related traffic will be at intersections immediately adjacent to the station locations, and that traffic will dissipate away from those locations. Collection of traffic count information, crash data and intersection characteristics sufficient to perform intersection capacity analysis for existing and forecast years with and without the project will be performed at the following locations:

- Layover facility, location to be determined: Once the layover facility has been sited, a review of the adjacent intersections and access will be conducted to determine if traffic associated with employees and service/deliveries are likely to have noticeable impacts;

- Granite Street, Manchester: The intersection of Granite Street and Canal Street is the critical intersection serving the Granite Street station site. The intersection of Canal Street and Depot Street will also be included given the proposed access to and from the station parking area. It should be noted that the proposed elimination of the Depot Street at-grade crossing will eliminate access to South Bedford Street unless access can be gained via South Commercial Street and the WMUR parcel;

- Manchester Airport, Bedford: Critical intersections proposed for study include South River Road (Route 3) / Raymond Wieczorek Drive EB ramps, South River Road / Somerville Drive, and South River Road / East Point Drive.;

- Crown Street, Nashua: Critical intersections proposed for study include the intersections of East Hollis Street (Route 111)/Arlington Street, East Hollis Street / Chase Street, Arlington Street / Crown Street and Crown Street / Chase Street; and

- Spit Brook Road, South Nashua: The intersection of Spit Brook Road and Daniel Webster Highway is the critical intersection serving the South Nashua station location. This is a major signalized intersection serving a dense retail and commercial area. Given that the intersection has been designed to accommodate major retail traffic during peak shopping periods, it is likely that commuters using the proposed station, particularly in the morning period, will likely not have noticeable impacts on operating conditions at this location.

Intersection turning movement counts will be conducted from 6:00 AM – 9:00 AM and 3:30 PM – 6:30 PM. ATR counts are not recommended at this time. It should be noted that use of historic data and/or alternative data collection methods (Streetlight, INRIX, etc., based on ITE and other industry guidance) may be required due to the effect of COVID-19 on current traffic volumes and travel patterns. Intersection capacity

analysis will be conducted using SYNCHRO analysis software. Analysis will include existing conditions, future year no-build conditions and future year build conditions. The forecast year and annual growth rate will be determined in conjunction with NHDOT.

Potential intersection improvements necessitated by projected volume increases at intersections serving the potential station locations will be identified based on the results of the SYNCHRO analysis.

Given the potential increased use of the rail line compared to existing limited freight use, an assessment of potential delay and impacts associated with crossing gate downtime will be provided. There are six at-grade crossings (three public, three private) between the existing terminal in Lowell and the MA/NH state line, and 16 at-grade crossings (ten public, six private) between the MA/NH state line and Granite Street in Manchester (including the Granite Street crossing).

Parking demand and needs assessment at potential station locations based upon projected station usage will be conducted. Circulation and access design will be analyzed to optimize safe and efficient traffic flow. Assessment of pedestrian and bicycle infrastructure and needs at potential station locations based upon projected station usage will be assessed and recommended improvements will be identified, as appropriate. An assessment of existing transit availability serving potential station locations, and needs assessment based on projected demand and coordination with regional transit authorities serving those locations, will be provided.

9.16 Socioeconomic

Economic impacts are generated through 1) the construction of the project; 2) the operation of the project; and 3) the market's response to the availability of this new transportation service. Past economic impact analysis for the Capitol Corridor Rail Project from Lowell, MA to Manchester, NH utilized the IMPLAN model to estimate the jobs and earnings associated with Project activities. We recommend using IMPLAN to maintain consistency with past project work. The IMPLAN model will provide a means to convert information on construction and operating costs into jobs and earnings supported. The market's response is captured in the long-term development focused around stations. The improved access is capitalized in the land values surrounding the stations, supporting higher values of land and greater development potential. This market response will be estimated using guidance from the literature and an analysis of peer rail stations, controlling for surrounding income, employment and household density. Understanding this value uplift is important as value capture could provide a funding contribution.

9.17 Other Resources as Appropriate

The 2014 EA acknowledged the existence of several other resource areas that would likely be unaffected by the proposed project or have negligible project-related impacts. Those resource areas and efforts to confirm the effects of the proposed project are listed below:

- **Energy Resources:** Estimates of fuel consumption increases associated with the extended rail service will be compared to anticipated decreases in fuel consumption associated with reductions in passenger vehicle VHT and VMT. Energy usage associated with the proposed stations and construction activities will also be identified;
- **Visual Resources:** Limited viewshed analysis associated with the proposed station locations and layover facility will be conducted to confirm that sensitive receptors or EJ populations are not negatively affected by the construction and placement of new stations. Representative before and after photo simulations will be provided;
- **Land Use Resources:** Land use and zoning within the study area, particularly in proximity to the proposed station locations and layover facility, will be updated. Farmland soils and potential impacts will be reviewed. Sensitive receptors along the corridor will be identified, and proposed changes to zoning and land development projects will be identified; and

- **Open Space and Recreation Resources:** Open space and recreation areas within the study area will be identified as part of the corridor mapping activities. Public open space, 4(f) and 6(f) properties will be identified, and potential effects to these properties will be addressed.

9.18 Mitigation

A summary of mitigation measures for impacts associated with all the aforementioned affected resources will be provided. Impacts will be categorized as none, negligible, minor or moderate as appropriate based on NEPA guidance.

A separate discussion regarding potential property acquisitions will be provided.

9.19 Indirect and Cumulative Effects

The EA will assess potential indirect and cumulative social, economic and environmental effects by taking into consideration how the proposed project, in combination with other planned and proposed developments within the overall study area, will be likely to affect development and existing residential, commercial, and institutional land uses. Using the results of the economic analysis modeling, indirect and cumulative effects analysis will identify project-related benefits to accessibility and mobility sufficient to affect changes in land use development and employment opportunities beyond those that are forecast to occur without the proposed action.

The indirect effects analysis will identify the following, based on accepted guidance documents:

1. Encroachment-Alteration Impacts – Alteration of the behavior and functioning of the affected environment caused by project encroachment (physical, biological, socioeconomics) on the environment;
2. Induced Growth Impacts – Project-influenced development effects (land use); and
3. Impacts Related to Induced Growth – Effects related to project-influenced development effects (impacts of the change of land use on the human and natural environment).

The cumulative effects analysis will identify the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

9.20 NEPA Documents

An updated EA will be prepared consistent with the National Environmental Policy Act of 1969 (NEPA), as amended, 42 U.S.C. §§ 4321 et. seq. and its implementing regulation, 40 Code of Federal Regulations (CFR) 1500-1508. The process for complying with the National Environmental Protection Act (NEPA) and federal surface transportation statutes is defined in the joint Federal Highway Administration/Federal Railroad Administration/Federal Transit Administration Environmental Impact and Related Procedures (23 C.F.R 771). The EA will also prepared in accordance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as revised in 36 CFR Part 800 (August 5, 2004).

The Federal Highway Administration, Federal Transit Administration, and Federal Railroad Administration joint NEPA regulations (23 CFR part 771) contain a process in 23 CFR 771.129 for re-evaluating environmental documents or decisions to determine whether the original document or decision remains valid, or a supplemental or new analysis (e.g., supplemental environmental impact statement (EIS) or environmental assessment (EA)) is needed. The agencies developed this guidance to provide clarity and consistency to the re-evaluation process consistent with their regulations. The following link provides details of this process (<https://www.transit.dot.gov/regulations-and-guidance/environmental-programs/nepa-re->

evaluation-guidance). We will work with NHDOT and FTA to determine the extent to which the re-evaluation guidelines apply in an effort to minimize duplication of effort from the 2014 EA.

As part of the EA process, an Impact Methodology Report will be prepared. This report will identify the regulatory context and proposed methodology for the technical studies required for each of the resource categories expected to be analyzed in the EA. The report will be provided for agency review and acceptance before the technical studies commence.

An annotated outline of the EA will be prepared and provided for agency review and approval prior to the development and compilation of the EA. Upon approval, the following activities will occur:

- An administrative draft EA will be provided for agency review and comment;
- A revised EA will be approved for public review;
- A draft Notice of Availability will be prepared for agency review and approval;
- Draft and final EAs will be prepared for agency review and approval;
- Response to comments will be prepared for agency review and approval; and
- Draft and final findings (FONSI) will be prepared for agency review and approval.

Deliverables

- Technical Memorandums:
 - Wetlands Mapping, Permit Applications and Local Decisions
 - Threatened and Endangered Species
 - Floodplain and Floodway Assessment
 - Environmental Site Assessments / Contamination Inventory
 - Noise & Vibration Assessment
 - Cultural Resources Assessment
 - Air Quality Assessment
 - Environmental Justice & Title VI / Equity Analysis Report
 - Document compliance with Part 2.3.6 of the MS4 Permit
- NEPA Documents
 - Impact Analysis Methodology for agency review and acceptance
 - Draft and Final EA and Draft and Final FONSI
 - Individual or Programmatic 4(f) Evaluation, if needed

Task 10: Permitting

10.1 Permitting Outline

GM2 will prepare an outline of the anticipated permits required for construction of the project. This scope does not include preparing applications and obtaining environmental permits.

10.2 MEPA

We recommend that a consultation meeting with the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) MEPA office be scheduled upon project commencement to begin the process of coordinating the environmental work in Massachusetts and determine the appropriate filing requirements. At this time, it is unclear if any MEPA thresholds will be met field studies will determine the extent of potential impacts to natural resources that may exceed thresholds.

If necessary, AECOM will prepare an Environmental Notification Form (ENF) for filing with the MEPA office. We will also arrange for and attend the MEPA site visit.

If potential impacts result in the need to file an Environmental Impact Report (EIR), we will work with the MEPA office to seek concurrence that a combined EA/EIR will be acceptable.

10.3 Meetings

GM2, AECOM and Jacobs, will prepare for and attend up to two NHDOT Natural Resource Agency Coordination Meetings and up to three other meetings with natural resource agencies. GM2 will prepare the minutes for these meetings.

Task 11: Financial Plan

11.1 Conduct Kick-Off Meeting

AECOM (Consultant) will lead the preparation of the Financial Plan. Consultant will participate in a kick-off meeting for the financial analysis with NHDOT and other stakeholders. The kick-off meeting will address the following agenda items:

- Introductions of project team members and public agency staff;
- Review of study objectives;
- Review of consultant scope of work, including demonstration of financial analysis methodology as applied in a similar project;
- Determination of the financial entity to be analyzed (the project(s), NHDOT, or some other implementing entity);
- Review of data requirements;
- Review of schedule and determination of target milestone and deadline dates, especially dates for the project financing and project delivery workshops in Task 11.15;
- Identification of stakeholders to participate in workshops;
- Discussion of protocols for arranging meetings and provision of data to support the financial analysis; and
- Identification of key contacts at stakeholders.

Consultant will prepare a technical memorandum summarizing the discussion and findings of the workshop and will provide a draft in electronic form to NHDOT. We discuss the draft with NHDOT and revise the draft as necessary.

11.2 Assemble Data

Consultant will assemble the data to be used as inputs to preparation of the financial plan.

11.2.1 Assemble Construction Expense Data

Consultant will assemble the capital costs of the project developed in Task 12.8, by geographic segment and by cost component (e.g., right-of-way, construction, equipment, soft costs), including total cost, and annual drawdown. It will be important to separate cost elements that might be financed differently (e.g., rolling stock and other equipment). Alternative annual drawdown schedules might be specified to represent alternative procurement approaches. In addition, construction schedules representing alternative phased implementation schemes will be considered.

11.2.2 Assemble Infrastructure Renewal Costs

Consultant will assemble data concerning the current and projected fleet and other components of the capital program. Fleet data will be based on the fleet management plan and will address rehabilitation and eventual retirement of the existing fleet, acquisition of new vehicles to replace the existing fleet, and additional cars for the proposed new services.

Consultant will also assemble information regarding the balance of the capital program. Much of this data will address continuing infrastructure reinvestment required to bring asset to and maintain them at a state of good repair.

11.2.3 Develop O&M Cost Models

Consultant will request the following off-the-shelf data from the operators of the transit modes considered in each physical alternative of the project:

- Detailed operating budget and the underlying level of service assumptions upon which the budget is based; and

Most recent report submitted to the National Transit Database for bus services in the corridor in NH and for the MBTA Lowell Line in MA. We will review the data provided by transit operators and identify additional data, as necessary. Consultant will then meet with NHDOT staff to discuss the objectives of the development of the O&M cost model, to identify key staff contacts, and to identify additional documentation that will be required to develop the O&M cost model.

Consultant will revise the model on the basis of the review, revise the technical memorandum, and provide a copy of the revised O&M cost model spreadsheet and technical memorandum to NHDOT.

11.2.4 Assemble Level of Service Data

Consultant will assemble transit level of service data to be applied in projecting operating and maintenance costs. This will include peak vehicles, vehicle revenue miles, vehicle hours, and other relevant cost drivers at the milestone years addressed in the travel demand analysis and interim years between the milestones. Of concern will be the scale of initial operations of new service, potential phased implementation, and potential linkages to existing services.

11.2.5 Assemble Debt Service Data

Consultant will assemble information regarding the debt program of the implementing entity including the debt retirement schedule of each existing series of bonds and other debt instruments. This will include a tabulation of principal outstanding, remaining interest and principal payments, and opportunities to decrease each series of debt.

11.2.6 Assemble Ridership and Fare Revenue Data

Consultant will assemble projections of ridership and fare revenue. This information will be the result of the travel demand analysis and will include projections for the opening year and design year and possibly for interim milestone years. The analysis will need to interpolate between these milestone years to apply the ridership and fare revenue data on an annual basis. Fare revenue projections will be applied to the operating budget to determine the extent of operating assistance required. Ridership data (annual unlinked trips and passenger-miles) will be applied in the 5307 Urbanized Area grant formula and the 5309 Fixed Guideway Modernization formula to project future grant revenues.

Consultant will summarize the data and manner in which it will be applied in the analysis in a technical memorandum and will provide a copy of the memorandum in electronic form to NHDOT.

11.2.7 Assemble Other Operating and Capital Revenue Data

Consultant will assemble projections of operating revenue sources other than fares and dedicated (tax) funding. This includes revenues from:

- Advertising: taking into consideration the strength of the outdoor advertising market nationally and in the local market;
- Concessions: including rentals for fiber optics and utilities;
- Rentals: for air rights and excess property; and
- Interest income: on cash balances.

Consultant will assemble information regarding known sources of local, state, and federal capital funding.

11.2.8 Assemble Economic Development Revenue Project

Consultant will assemble projections of economic development-related revenues that could be applied to the project. This will be based on the Economic Impact analysis.

11.3 Populate Financial Analysis Model with Assembled Data

Consultant will populate the model with the operating and capital expense, ridership and fare revenue, and other dedicated data assembled in Tasks 3 through 9. We will test the model with alternative project implementation schedules and financing structures.

We will summarize the input data and tabular and graphical reports of the model in a technical memorandum and will provide an electronic copy to NHDOT. The review in Task 11 will address this technical memorandum.

11.4 Review Initial Financial Analysis Model with NHDOT

Consultant will meet with NHDOT staff to review the financial analysis model developed in Task 10. We will review the overall financial analysis approach, the structure of the model, input screens, tabular computations and results, and graphical outputs underlying assumptions, and tabular and graphic reports. The focus of the review will be structuring the financial analysis to demonstrate the financial capacity of the implementing entity to successfully implement and operate the project.

We will document the findings of this review in a technical memorandum and will provide an electronic copy to NHDOT.

11.5 Revise Financial Analysis Model

On the basis of the comments received in the preceding tasks, Consultant will revise the financial analysis model structure, data, and computations, as necessary. We will also develop an initial set of assumptions to characterize the baseline scenario. These characteristics will address:

- Inflation rates;
- Construction drawdown schedule;
- Interest rates;
- Projected revenues from local sources;
- Detailed service plan, annual level of service statistics, and operating budgets; and
- Fixed guideway transit construction start date and date of initial revenue service.

The revised model structure will accommodate different service level, system capacity, and economic scenarios. For all scenarios, the model will project:

- Baseline available funding for operations and maintenance and debt capacity; and
- Annual capital and operating and maintenance costs.

The model will provide the capability to examine options for meeting funding shortfalls that might be caused by governmental funding or other sources lagging behind construction expenditures.

11.6 Run Initial Financial Plan Including Risk Analysis

Consultant will apply the financial analysis model and examine a series of alternative scenarios addressing:

- Alternative implementation schedules: including project initiation and completion dates, interim staging, and levels of transit service (for transit alternatives);
- Alternative transit fare pricing;
- Alternative dedicated funding sources: including increments of existing sources or new sources of funding;
- Alternative financing structures: including short- and long-term structures and innovative structures promoted by the US Department of Transportation; and
- Alternative implementation approaches: including design-build-operate-maintain and other structures that might provide for shifting risk to the private sector and speeding construction.

We will also undertake a risk analysis that addresses the inevitable uncertainties associated with funding and financing a massive public works project and the range of policy responses to those uncertainties. We will consider a range of possible inputs regarding underlying assumptions that are beyond the control of management. This includes inflation, interest rates, project costs (in base year dollars), ridership, grant funding levels and timing, and market response to fare increases.

We will examine various responses that management can take to preserve the financial viability of the project. These include adjusting the project implementation schedule and staging, service growth, fare increases, and financing structure.

We will determine where the financial plan is most vulnerable to uncertainty and what management actions will be the most effective in assuring that the project can be implemented. An outcome of the workshop will be a final implementation plan for the project, including the construction schedule and staging, growth in level of service, fare increases, and financing structure.

We will document the results of this task in a technical memorandum and submit it to NHDOT in electronic form.

11.7 Conduct Workshop on Alternative Revenue Sources

Consultant will prepare background materials for use in a stakeholder workshop and for eventual application in the financial analysis. A comprehensive menu of potential funding used in the US and throughout the world to fund projects similar to the options being studied in the proposed project will be identified, described and evaluated into the context of existing legal parameters. The research will center on the following areas:

- **National and peer experience in transit funding:** We will analyze the latest available information regarding the sources of non-federal funding supporting the construction and operation of fixed guideway systems. We will identify a peer group of transit agencies either currently operating such systems or who are in the advanced planning stage for such systems. The data sources to be examined include the FTA National Transit Database and the New Starts reports. We will summarize national experience in a series of pie charts that highlight the predominant sources of funding.
- **Potential non-Federal dedicated sources of funding:** We will assemble information regarding the historic growth in various tax bases that could be applied to provide a portion of the non-federal share of revenues for construction costs and to support operating costs. Representative tax bases could include retail sales, real property, income, motor fuels consumption, vehicle registration, rental car sales, and hotel occupancy sales. Opportunities for shared non-Federal funding with the State, counties, and cities will be examined.

We will document the findings of this subtask in a draft technical memorandum and submit it to NHDOT for review. The technical memorandum will be intended for distribution to the participants of the workshop in this task. We will meet with NHDOT to receive comments on the draft and will modify it accordingly.

We will assist staff in a workshop on potential revenue sources for the proposed commuter rail project. The workshop will include representatives of the various stakeholders in the planning process including NHDOT, municipal governments, regional planning agencies, MBTA, MassDOT, FTA, FHWA, and others.

In advance of the workshop we will develop draft PowerPoint presentation materials that address the following:

- Overview of the project
- Overview of the financial planning process, focusing on FTA's expectation in order to receive a "highly recommended" rating;
- Overview of national experience regarding transit funding sources; and
 Identification of potential local revenue sources, including size of tax base, historic and projected rates of growth, potential annual revenues at representative rates of taxation, and borrowing capacity against these revenue streams.

We will review the draft presentation materials with NHDOT and modify them as required.

Along with NHDOT staff, we will present the PowerPoint presentation and lead the workshop participants through a discussion of potential revenue sources. The goal of the discussion will be to develop a "short-list" of revenue sources to be investigated further in the financial analysis.

On the basis of the outcomes of the workshop, we will refine the projections of alternative revenue sources. This could include examination of additional revenue sources, modification of the assumed rate of growth of tax bases, and consideration of limitations on the rate of taxation or earliest implementation date.

We will document the findings of this subtask in a technical memorandum and submit it to NHDOT.

11.8 Conduct Workshop on Alternative Financing and Procurement Options

Consultant will prepare background materials for use in a stakeholder workshop and for eventual application in the financial analysis. A comprehensive menu of potential procurement and financing mechanisms used in the U.S. and throughout the world to fund projects similar to the options being studied will be identified, described and evaluated into the context of existing legal parameters. The research will center on the following:

- **Experience in alternative project delivery:** We will summarize national experience in various forms of innovative procurement. Turnkey contracting approaches such as DBOM and Master Developer will be considered. Sources of information will include reports by the Federal Transit Administration (FTA), Federal Highway Administration (FHWA), reports by transit agencies, and published professional papers.
- **Experience in innovative financing:** We will summarize national experience in various forms of innovative financing. Innovative approaches including TIFIA, RRIF, Grant Anticipation Revenue Vehicles (GARVEEs), and private sector participation will be addressed. Sources of information will include reports by the FTA and FHWA reports by transit agencies and published professional papers.

We will document the findings of this subtask in a draft technical memorandum and submit it to NHDOT for review. We will meet with NHDOT to receive comments on the draft and will modify it accordingly.

We will assist staff in a workshop on potential project implementation structures for the proposed project. The workshop will include representatives of the various stakeholders in the planning process including NHDOT, municipal governments, regional planning agencies, MBTA, MassDOT, FTA, FRA, FHWA, and others. This workshop could coincide with the Alternative Revenue Sources workshop.

In advance of the workshop we will develop draft PowerPoint presentation materials that address the following:

- Overview of the project;
- Overview of the project implementation and financing issues, focuses on questions of speed of implementation, cost reducing, and sharing of risk;
- Overview of national experience; and
- Description of specific examples/case studies.

We will review the draft presentation materials with NHDOT and modify them as required.

Along with staff, we will present the PowerPoint presentation and lead the workshop participants through a discussion of potential revenue sources. The goal of the discussion will be developing a "short-list" of revenue sources to be investigated further in the financial analysis.

On the basis of the outcomes of the workshop, we will refine the list of potential procurement and financing structures. This could include examination of additional structures, and further research on specific examples.

We will document the findings of this task in a technical memorandum and submit it to NHDOT.

It is recognized that the workshops on alternative revenue sources might be consolidated with this task into a single workshop, depending on how questions of institutional structure and procurement are resolved.

11.9 Revise Analysis and Prepare Financial Plan

On the basis of inputs received in the preceding workshops, Consultant will revise the financial analysis model and examine a series of alternative scenarios addressing:

- **Alternative implementation schedules:** including project initiation and completion dates, interim staging, and levels of transit service;
- **Alternative fare pricing:** including possibility of dedicating portions of fare revenues to support the capital and/or operations components of the project;
- **Alternative dedicated funding sources:** including increments of existing sources or new sources of funding;
- **Alternative financing structures:** including short- and long-term structures and innovative structures promoted by the US Department of Transportation and
- **Alternative implementation approaches:** including design-build-operate-maintain and other structures that might provide for shifting risk to the private sector and speeding construction.

We will also undertake a risk analysis that addresses the inevitable uncertainties associated with funding and financing a massive public works project and the range of policy responses to those uncertainties. We will consider a range of possible inputs regarding underlying assumptions that are beyond the control of management. This includes inflation, interest rates, project costs (in base year dollars), ridership, grant funding levels and timing, and market response to fare increases.

We will examine various responses that management can take to preserve the financial viability of the project. These include adjusting the project implementation schedule and staging, service growth, fare increases, and financing structure.

We will determine where the financial plan is most vulnerable to uncertainty and what management actions will be the most effective in assuring that the project can be implemented.

We will document the results of this task in a technical memorandum and submit it to NHDOT in electronic form.

11.10 Prepare and Present Financial Plan Report

Consultant will prepare a draft financial plan report. The draft financial plan report will meet the existing legal parameters, including requirement for federal, state, and local financial participation, including all necessary documentation and templates required by participating agencies.

A draft final report will be prepared documenting the data, assumptions, analytical methodology, results, and conclusions of the preceding tasks. We will submit a draft of the report to NHDOT for review. NHDOT will assemble comments and provide these comments to the Consultant. We will then meet with NHDOT to review the draft report and discuss the comments. We will then revise the draft and submit a final report.

We will prepare a presentation summarizing the data, assumptions, analytical methodology, results, and conclusions of the financial plan and will make one presentation to NHDOT and/or other stakeholders at the direction of NHDOT.

11.11 FTA Coordination

Consultant, as requested by NHDOT, will participate with NHDOT staff in routine coordination meetings and conference calls with the Federal Transit Administration regarding financial plan development, structure, data, assumptions, sources of information, status, findings, and conclusions.

11.12 Benefit/Cost Analysis

The Consultant will update and refine the benefit cost analysis for the Project. The analysis will be performed consistent with Federal Transit Administration and U.S. Department of Transportation guidance for project appraisals. The analysis will rely on cost, ridership and operations data and information developed elsewhere by the project team. The Benefit/Cost Analysis (BCA) will quantify the net change in value between two scenarios across a range of metrics. The two scenarios include:

- 1) a Baseline Scenario (business as usual that includes some future committed investment); and
- 2) an Implementation Scenario (the LPA) that describes the operation of the candidate investment.

The Consultant will develop and populate the BCA model with appropriate values for monetization. The list below summarizes the major benefit categories that will be estimated and included in the BCA by beneficiary.

- User: Safety
- User: Travel time savings for new and induced rail riders and those who shift from other modes
- User: Reliability
- User: Travel cost savings/penalty (as warranted) for rail riders, those who switch from other modes, and induced riders
- Agency: Pavement wear and tear costs avoided by shifting some travelers to rail
- General Public (users/non-users) Social and Environmental: Value of emissions avoided. [Note: The latest December 2018 USDOT BCA guidance directs that highway congestion avoided through the diversion of drivers to rail should not be estimated unless there are model results to support the analysis.].
- Agency: Residual value of assets at the end of the analysis period

The Consultant will develop a detailed technical memorandum that describes the assumptions that underpin the analysis. This technical memorandum will be supplemented by a shorter and less technical summary that describes the findings in a more concise and accessible manner to help make the business case for the Project to decisionmakers and funders.

11.13 Third Party Agreements

The Consultant and team member Jacobs will draft the technical content of third- party agreements necessary for the design and implementation of the infrastructure upgrades and operations associated with the LPA, as it is confirmed and defined during this phase of the project. The services will be provided in three steps:

- Outline of key issues, participants, and content of third- party agreements;
- Review and comment by NHDOT and other relevant agencies; and
- Draft of third- party agreement technical content

Up to four (4) draft third party agreements will be developed. There will be no legal services provided under this Task and it is assumed any legal reviews and legal input to the third- party agreements will be provided by NHDOT.

Task 12: Engineering / Design

AECOM's subconsultant Jacobs Engineering Group, Inc. (Jacobs) will lead the engineering tasks in coordination with AECOM (stations) and WSP (layover facility).

Scope of Work

The Engineering Scope of Services for this project shall be in accordance with the Department's scope of work checklist to rehabilitate 30 miles of freight railway to fully integrate MBTA operational and design standards while striving to maintain as much of the existing infrastructure as possible so that capital cost expenditures are contained. Jacobs' proposed Scope of Services is identified in the following sections.

12.1 Operations Planning

Jacobs will update and verify the proposed timetables for Manchester and Nashua commuter rail service. Since completion of the last phase, the schedule details for MBTA and Amtrak services using the MBTA's New Hampshire Main Line have changed. The team will need to modify the service proposals prepared in 2014 to reflect these new developments.

In order to develop support from Massachusetts and Amtrak (Downeaster) stakeholders and to minimize costs, it is critical to design the NHCC service options so that they integrate well with other scheduled operations using the shared track and terminal resources in Massachusetts. The team will also confer with Pan Am to learn of any changes in their use of their Freight Main Line between Lowell and North Chelmsford and their Northern Branch between North Chelmsford and Manchester. It may be problematic in the post-COVID environment to establish agreement on future operations on passenger service.

Updated schedule proposals for a full Manchester service and a potential interim Nashua service will be prepared for review and comment by NHDOT, MBTA, Pan Am and Amtrak. Proposals will be revised to reflect inputs from these service partners.

If required by the MBTA or Pan Am, Consultant can expand the MBTA's Rail Traffic Controller (RTC) simulation model of its North Side operations to include the proposed new expansion of services.

Once the revised schedule options are finalized, the team will:

- update the rolling stock requirements to reflect ridership growth since 2014; and
- update the track configuration diagrams necessary to support the proposed services.

These rolling stock requirements and updates to track configuration will feed into the engineering plan design and subsequent capital cost estimates. The proposed train operating details, rolling stock requirements and track configuration will be key inputs necessary to estimate operating costs for train operations, maintenance of rolling stock and maintenance of rail infrastructure.

12.2 Project Evaluation and Survey

Information determined from the initial Operations Planning analysis will be coordinated with the new ROW survey data gathered by the design team to form the basis of the proposed Engineering work plan and will be evaluated in concert with legacy data produced from the 2014 Study and additional facts gathered from stakeholders. The information gathered and reviewed by the team may include:

- Existing aerial imagery and LiDAR survey data from public domain (NH Granit);
- New survey data gathered by the design team;
- Record documents of the existing railroad line and related upgrades planned on the route from the 2014 Study;
- MBTA and PanAm Valuation maps, timetables, communications and signal system plans, track charts, utility easements, 3rd party agreements, etc.;
- Right-of-Way; and
- Culvert and Bridge Inspection reports.

This project is unique because NHDOT will be engineering and constructing facilities on property that they do not own. Consultant and NHDOT will need memoranda of understanding, permissions from MassDOT and PanAm Railway which own the railway assets that are the subject of this project. Consultant will work with NHDOT, MassDOT, MBTA, and PanAm to determine what rights of access, information and permissions will be provided to allow for progression of the preliminary engineering work.

Jacobs will incorporate electronic survey base map data and files gathered by the Design team to establish the file organization for engineering scope with CAD/D related efforts in accordance with the current Department CAD/D Procedures and Requirements.

Once the initial evaluation data are compiled Jacobs will organize and attend a project design meeting including appropriate Department and stakeholder staff to discuss the project issues and the details of the base Engineering plan prior to commencing the Preliminary Design effort. This scope proposal assumes the initial project design meeting will be attended by up to ten (10) personnel.

Additionally, attendance at up to ten (10) field site inspections conducted for verification of existing conditions and ground survey, and to become familiar with the project site will be coordinated with the Department and/or right-of-way (ROW) stakeholders (MBTA/Keolis/PanAm Railway/Municipalities). This proposal assumes that each field site review will be conducted by up to two (2) personnel per day.

Project Management effort includes task definition and coordination with design team, communication and coordination with the Department and Stakeholders, quality assurance reviews and overall verification of design effort completeness.

Jacobs has identified the following key stakeholders that will assist the design team's decision-making process leading to a cost-effective design and capital investment strategy. Select stakeholder meetings are anticipated with:

1. Massachusetts Bay Transportation Authority and MassDOT (Owner/Sponsor/Partner)
2. PanAm Railways (PAR) (Owner/Partner)
3. Keolis Commuter Service (Railway Operator)
4. Federal Transit Administration (Sponsor)
5. Federal Railroad Administration (Regulator)
6. NH Cities and Towns: Nashua, Merrimack, Bedford and Manchester (Stations, Layover, Crossings, Bridges)
7. MA Cities and Towns: Lowell, Chelmsford, and Tyngsboro (Crossings and Bridges)
8. Manchester-Boston Airport (MHT) (Operations Coordination/Station Design)
9. Property Owners (Stations and Layover)
10. Business and Neighborhood Groups (As necessary related to stations, crossings and layover)

12.3 Track, Civil and Utility Design

Track

Jacobs scope includes the design of up to a Class 4 commuter rail track, with special trackwork units such as new crossovers and turnouts at new or modified interlockings wherever necessary along the corridor based on the Operational assessment and Evaluation task results.

A project baseline developed from existing track survey data will be established for the corridor with mileposts and engineering stationing to locate all the planned work. The railway was constructed to support a maximum allowable speed of 70 mph where not restricted by tight curves. It is expected that the upgraded railway will be restored to its historic maximum allowable speeds. New geometric track design will be

developed through any areas of alignment and profile changes, bridges, new facilities, and at locations where double tracking is planned. This design includes track alignment modifications at grade crossings where an additional track or increased track super elevation may affect roadway profiles. In proposed work areas Track Plan and Profile drawings and Cross Sections at 100-foot intervals will be produced.

Track Typical Sections of the proposed work will be developed to reflect specific location variations at bridge approaches, interlockings, siding tracks, Maintenance-of-Way (MoW) access roads, stations, layovers, grade crossings and shall not total more than ten (10).

Track elements in coordination with Signal, Communications and PTC design will accommodate new wayside equipment along the right-of-way with proper clearances, support structures where necessary and accessibility for maintenance personnel will be included on the Track drawings.

Civil

Civil and drainage assets along the corridor will be evaluated and any proposed improvements coordinated with the overall proposed work plan to identify and design service reliability of the new Commuter Rail operations and to ensure that any new work provides for design criteria recommended offsets, clearances, and storm flow capacity of the system's infrastructure.

Culverts along the line will be identified and headwalls inspected and evaluated. We assume that up to one hundred and fifty (150) culverts will be inspected and that up to ten (10) will require replacement. Where new work is proposed it will include design assumptions, standard drawings, and typical details.

Drainage design will be in accordance with NHDOT, MassDOT and MBTA standards and guidelines and comply with applicable local, state and federal laws, regulations, codes, ordinances, statutes, orders and decrees.

Where areas of poor drainage or flooding of the ROW is found to occur, a localized assessment will take place to provide a remedy option for the issue. It is assumed that a significant length of ROW drainage ditches will be proposed for cleaning/reshaping to improve existing conditions and maintain a dry track substructure.

A corridor wide vegetation removal assessment will also be included in the Civil design program elements and be focused on areas of major proposed impacts such as double tracking, interlockings and signals, wayside equipment, stations, layover facilities, grade crossings, and bridges. This effort will also be coordinated with environmental resource areas.

Utilities

Jacobs will conduct an analysis of the ROW survey data gathered by the design team to identify existing utilities likely to impact the proposed improvements. We will coordinate within the design team to identify and resolve any utility conflicts and propose removal or relocation as appropriate. Buried fiber optic cables between Nashua and Manchester, and sewer lines in Merrimack, NH may impact the installation of proposed work within the ROW.

Proposed work that requires utility connections and/or relocations will be coordinated throughout the design team and shown collectively on the Plans so that all affected disciplines are aware. Wherever possible, avoidance of existing utilities will be the norm, so that project costs and construction durations are minimized.

As part of the overall proposed Track, Civil and Utility improvements, coordination will take place with other project elements, tasks and design team disciplines. This effort shall include:

- Design Criteria reviews;
- Track / Systemwide Improvements assessments;
- Grade Crossing assessments/design coordination with Signal/Comm/Power;

- Construction Cost Estimate quantity calculations and support;
- Assessment of Right-of-Way data, property lines and parcel owner information as applicable ; and
- ROW Accessibility issues and needs (for operations and Maintenance-of-Way).

12.4 Bridges

This scope includes in-depth inspection, bridge load rating capacity analysis, repair recommendations, load rating reports and 30% design where required to upgrade up to five (5) of the fifteen (15) bridges located on the Capitol Corridor route. This scope of work will provide a conceptual design to rehabilitate the bridges where necessary to ensure they have a safe load carrying capacity and the integrity of the structures are safe for live load traffic. At this time, it assumed that all fifteen (15) bridges will be evaluated for rehabilitation. No bridge replacements are anticipated. The rehabilitation will be better defined once the in-depth inspection and load ratings are completed to determine the condition of the bridges and the load carrying capacity of the specific bridge members. The bridges on the corridor are listed below:

Location		Bridge Information				
City/Town	Bridge MP	Name/Over	Length (Feet)	Bridge Structure	Deck Type	No. Spans
Lowell, MA	25.69	Pawtucket Canal	154'-6"	Deck Plate Girder	Open	4
	26.20	Red Bridge	163'-0"	Thru Truss	Open	1
Chelmsford, MA	28.65	Stony Brook	43'-8"	Stone Arch	Ballast	2
	29.10	Adams Pass	13'-0"	I-Beam	Open	1
Tyngsboro, MA	32.46	Ferry Road	45'-9"	Deck Plate Girder	Steel	1
	32.56	Mill Brook	12'-3"	Reinforced Concrete	Ballast	1
Nashua, NH	37.87	Salmon Bridge	17'-3"	Stone Arch	Ballast	1
	39.22	Nashua River	113'-2"	Thru Truss	Open	1
	39.39	Lock Street	35'-0"	RCS/UG	Ballast	2
	41.77	Pennichuck Brook	47'-6"	Deck Plate Girder	Ballast	1
Merrimack, NH	44.76	North Ferry Road	16'-0"	RCS/UG	RCS	1
	44.92	Naticook Brook	108'-8"	Deck Plate Girder	Ballast	3
	46.22	Souhegan River	111'-6"	Deck Plate Girder	Ballast	2
	47.80	Reeds Ferry Road	10'-0"	Reinforced Concrete	RCS	1
Bedford, NH	51.84	Goffs Falls/Merrimack River	655'-3"	Thru Truss	Ballast	4

Jacobs Bridge-Structural Scope of work will consist of the following primary tasks:

In-Depth Inspection

Inspections will be completed by a two-person inspection team consisting of a Railroad Bridge Inspector and a Railroad Bridge Supervisor. Because the inspection may recommend modifications to the bridge, the inspection will have the oversight of a Railroad Bridge Supervisor. Member assessments will consist of detailed and close-up examination of all structural elements including, but not limited to, bearings, cross braces, stringers, bracing, plate and rivet / bolt connections and pile bents. The assessment phase shall include a visual assessment of substructures' condition with general recommendations for repair.

All documented conditions will be summarized for each element. Overall bridge and specific individual member dimensions will be obtained during the in-depth inspection in sufficient detail to complete the load rating analysis. Existing plans or previous structure sketches have not been obtained to date. If existing plans become available, they will be verified during the in-depth inspections. Ladders will be utilized to

inspect the structure whenever possible; the use of a hi-rail snooper vehicle will be employed for locations inaccessible by ladder.

Load Rating Capacity Calculations and Reporting

The load rating reports will include developing a member designation diagram for the purpose of evaluating bridge components to compare the existing conditions with assumed original / as-built conditions. The existing condition assessment will result in a determination of section losses to be used in evaluating the existing load capacity analysis. The assessments of each component's condition will consider the severity of the deterioration or disrepair and the extent to which it is present throughout adjoining members.

Determination of the integrity of each component will be completed to assign an appropriate allowable stress and/or depreciation factor. Non-destructive field analysis or testing is not included in this scope of work but may be recommended.

All structural capacity analyses are to be performed utilizing the allowable stress method for evaluation consistency, utilizing an appropriate yield stress for the superstructure. Maximum moments for the safe load carrying capacity ratings will be determined. The capacity analysis will be conducted for both the normal and maximum load rating for the 286-kip Car, and GP or PH locomotives at operating speeds up to 70 mph. The live loads determined from the locomotive and various cars will be incorporated in customized software to facilitate load rating calculations. The load rating reports will contain photo documentation as well as an appendix including all input data and backup calculations to enable an independent confirmation of the load capacity analyses.

30% Design

The 30% design report and plans will be created with all proposed superstructure, substructure and track recommendations outlined in available plans and/or photos to relay the rehabilitation concepts. Rehabilitation design will consider a 25-year design life; replacement design will be developed based on a 75-year replacement design. The 30% design will include development of estimated construction costs, anticipated construction durations, as well as other construction considerations such as material lead times, site access, required construction equipment, phasing, staging areas, and resource impacts.

Hydraulic and geotechnical design is not part of Jacob's scope of work however, team coordination for this design aspect is required where a need for a major bridge rehabilitation is identified. In locations where a second track is being recommended and there is only a superstructure to support the main track, a feasibility study will be completed to compare up to two (2) superstructure types to determine the most appropriate and cost-effective bridge type.

Safety

Safety during inspections is paramount. Our safety policies and procedures will follow the guidelines as outlined in Bridge Worker Safety Standards contained in the Federal Railroad Administration Railroad Workplace Safety Compliance Manual, Chapter 2 – Bridge Worker Safety. An overall safety plan report will be developed for the bridges contained in this assignment. An addendum will be added to the report to address site specific hazards for every bridge.

Cost

A Preliminary design level cost estimate for each of the 15 bridges will be developed based upon actual rehabilitation recommendations developed specific to each bridge's condition and rating capacity. Estimate methods used will include the Slope-Intercept Method described in the NHDOT Bridge Design Manual v2.0 as a minimum, supplemented with recent project costs and additional cost information as required specific to the bridge's rehabilitation elements.

Geotechnical Coordination

Once the bridge design scope has been determined post inspection and load rating, Jacobs will coordinate with the Design Team to prepare a Boring Request Plan identifying the recommended locations for subsurface exploration borings to be used in development of the Geotechnical report and recommendations, only where necessary. The plan will be developed in accordance with NHDOT design and CAD/D standards with boring locations identified on the survey base map. A draft Boring Request Plan will be submitted for Department review.

Once the required subsurface exploration program has been completed by the design team, Jacobs will review boring logs for location and perform a check between ground elevations identified on the borings and the survey plan. Jacobs will review all available existing foundation plans and information, the Preliminary Geotechnical Data Report and foundation design recommendations.

Jacobs will coordinate design efforts with the geotechnical team during analyses of bridge structure alternatives and any necessary preliminary foundation design as deemed appropriate at each location.

12.5 Rail Signaling

Introduction

Jacobs signal engineers will define and document the signal upgrades necessary to operate the planned railway services. The existing signal system on the route has been discontinued by the operating railroad Pan Am Railways and is inoperable between N. Chelmsford and Manchester, NH and requires a complete system assessment prior to designing upgrades, especially on the Northern Branch, north of Chelmsford. The principal components of the signal system that will require review, renewal, or modifications include: Centralized Train Control (CTC) systems, wayside signaling, grade crossings, FRA mandated Positive Train Control, and operating rules.

This work requires coordination and cooperation with PanAm Railways, the freight rail operator, and Keolis, the MBTA's passenger rail operator on the Lowell Line, to provide reliable passenger service while upgrading the line to accommodate passenger train capacity and on-time performance.

The signal design work will provide for system upgrades that include upgrades to each of the signal interlockings from Control Point (CP) LO located in Lowell, MA to the CP located in Manchester, NH. The signal system will require reconfigurations and new interlockings, wayside signals, and supported communications and control center upgrades/modifications. The focus of the design will be to separate the project into two distinct segments; Lowell to North Chelmsford, and North Chelmsford to Manchester. Up to 2 new interlockings will be added to the first segment, and 4 additional interlockings are contemplated on the second segment. All existing interlockings will undergo renewal and improvements. Each control center (dispatch office) will be analyzed to determine the needed modifications to properly reflect and control any new or modified interlocking layout. In addition, highway-rail grade crossings will be analyzed with recommendations for each contained in the report provided at the end of the Preliminary design phase.

The line from CP LO up to CP Manchester is controlled by Pan Am Railways (PAR) in North Billerica. This segment was reported to have been equipped with a number of interlockings on the 2014 report. In September 2018, PAR submitted a letter requesting to discontinue its signal system between N. Chelmsford and Manchester, which was subsequently approved by the FRA in May 2019 (FRA Docket # FRA-2018-0078). Therefore, the status of this equipment is currently unknown. Based on this docket, the design team will assume new interlockings and wayside automatic signals will be required unless discussions and/or field observations reveal salvageable areas that can be modified in order to achieve the desired operational schemes.

Description of Work

This project proposes to upgrade the existing signal system. This will be accomplished through the use of electronic track circuits that utilizes the rails to convey track, block and aspect information, both to opposing

signal apparatus (interlocking or adjacent block) and cab-equipped trains. The PAR owned section will be reviewed to ascertain the most appropriate signaling interfaces to be applied. All interlockings will be reviewed for providing the most modern vital microprocessors and appropriate wayside controllers for PTC functionality where required.

The Consultant will provide the Preliminary design phase services to initiate signal system modifications. The design approach is predicated on delivering a Preliminary 30% Submittal package to the MBTA, including a report of findings. The design effort to the 30% level will also represent a decision point for the MBTA, where the project will be evaluated regarding how best to proceed toward the final design and construction phases.

Each interlocking will be comprised of redundant Vital Microprocessor Interlocking System (VMIS) and Non-Vital Programmable Logic Controllers (NVPLC). The NVPLCs will be linked to the MBTA's Commuter Rail Operations Control Center (CROCC) and Pan Am Railways' Dispatch Offices by a new data communications network.

Track circuits throughout the project area will be upgraded where necessary utilizing electronic track circuits. New and remaining electric lock locations shall be reviewed and revised as necessary to utilize either electronic units or direct buried cable depending upon its proximity to the nearest interlocking or cut section. Interlocking home- signals will utilize light emitting diode (LED) technology.

The overwhelming majority of the Automatic Highway Crossing Warning (AHCW) systems and associated ground equipment at Highway-Rail Grade Crossings are assumed near or at the end of their expected life cycle and are to be replaced with new ground equipment and constant warning devices where warranted. Each location will be evaluated based on operating characteristics and determination made as to the most cost-effective approach and functionality based on each geographical location.

It is anticipated that all existing Control Points (CPs) will require new AC power services, including snowmelter control and communications to the control center.

The new CPs along the first segment will be controlled through CROCC, and the proposed new CPs within the second segment will be controlled through PAR with MBTA/CROCC indications, and backup control capabilities.

Train Control and Highway-Rail Grade Crossings

Interlockings 30% Design

The design for each Interlocking will be developed and progressed containing the following plans:

- Line plans;
- Aspect charts;
- Cable and Conduit plans;
- Track Circuitry for track bi-directional signal system;
- Commercial Metered Power Service layouts;
- Integration onto the proposed fiber optic back-bone system where available;
- Typical layouts and Installation drawings;
- Long lead items material list;
- Project scope and specifications; and
- Project cost estimate, with back up information.

Interlocking Locations

- MP 25.8 Lowell;
- MP 26 Western Ave;
- MP 26.8 Middlesex (New);
- MP 28.2 N. Chelmsford (New);
- MP 29 N. Chelmsford North (New);
- MP 35 Stateline (New);
- MP 37.5 Nashua South (New);
- MP 39 Nashua (New);
- MP 41 Tie Plant (New);
- MP 45.5 Merrimack (New);
- MP 47.5 Reeds Ferry (New);
- MP 50 Bedford (New);
- MP 54 S. Manchester (New); and
- MP 55.5 Manchester (New).

Wayside Locations**Intermediate Cut-Section Locations**

The signal system outside of interlockings will consist of an automatic signal system, which will utilize electronic coded track circuits between each cut section and interlocking. The conceptual block layout will be analyzed to determine the proper location and spacing of each cut section based on maximum speeds for passenger and freight and safe braking calculations.

Deliverables for Automatic Locations

- Layouts; and
- Electronic track interface:
 - Repeater locations as needed

Defect Detector

- Design to include for new High-Wide Detector Location and Hot Box location; use and location(s) to be determined.

Deliverables for the Defect Detector location(s):

- Layout; and
- Talker type.

Electric Lock

Design for new Electric Lock location(s) and interface of existing electric locks into the new signal system

- Layout; and

- Line repeater or electronic interface (method to be determined by peer review).

Control Center

- Supervisory Control;
- Determine changes to CROCC; and
- Determine changes with Pan Am.

Design Assumptions

- MBTA CROCC will retain dispatching from Bo to CP LO - Sufficient capacity at the control center exists to provide effective control and or monitoring of the improvements; and
- Pan Am will retain dispatching from CP LO to CP MANCHESTER
 - MBTA CROCC will receive real time indications
 - PTC wayside base communications package is required from CP Lo to CP Manchester
 - It is anticipated that the new MBTA operations control center planned for North Billerica may allow for change in dispatching authority for the 30 route miles under consideration from PAR to MBTA. Any actual changes in dispatch responsibility will be determined by MBTA and PAR.

Consultant signal design will provide non-vital field logic and code system interface for the MBTA CROCC interface. Design shall include CROCC office Supervisory system modifications necessary for the new signal systems. Pan Am to program and implement their Office Supervisory system at North Billerica and assist in cutovers and placing system(s) in service.

Deliverables for Supervisory System:

- System block diagrams; and
- Specifications.

Grade Crossings

The design of the grade crossings will utilize constant warning times where practicable. Design will be based on the maximum authorized track speed for each crossing and be coordinated with Track & Civil design.

For each of the twenty (20) grade crossings a diagnostic inspection will be performed that covers the existing highway/roadway crossing layout, the horizontal and vertical alignments, driveway/intersection sight distances, inventory of train warning system controls, function and apparatus, advance warning signage and pavement markings, and regulatory needs against MBTA and NHDOT design standards.

At locations where changes in railroad geometry are planned the team will prepare a preliminary crossing layout design to reflect the changes, including plans for modified traffic (rail and vehicular) volume parameters as necessary to constitute an acceptable Automatic Highway Crossing Warning (AHCW) system design.

Where changes in geometry are substantial the team will coordinate with the Track & Civil design team to ensure warning system instrument houses and related equipment are duly sited and minimize impacts to the existing ROW and related systems.

For each crossing the team will evaluate and identify all utility and right of way impacts and likely relocations necessary during construction and services required to provide a complete warning system design layout.

Project Management effort includes and coordination with design team, communication and coordination with the Department and Stakeholders, quality assurance reviews and overall verification of design effort completeness.

Highway-Railroad Crossing Locations:

Grade Crossing Inventory		
City/State	Name	MP
Chelmsford, MA	Wotton Road	29.1
	Wellman Road	29.6
	Cross Street	30.0
Tyngsboro, MA	New England Marine	30.5
	Farm Crossing	33.1
	Helena Drive	33.5
Nashua, NH	East Glenwood	36.9
	Crown Street	38.8
	East Hollis Street	38.9
	Bridge Street	39.0
	Hills Ferry Road	40.8
Merrimack, NH	Mast Road	42.4
	Anheuser-Busch	43.7
	Star Drive	44.1
	Wright Avenue	45.7
Manchester, NH	Pine Island Road	52.1
	Winston Road	52.6
	West Mitchell Street	54.0
	Sundial Avenue	54.6
	Bryon Street	54.7
	Depot Street (to be closed)	55.6

Signal Deliverables for Crossings

- Typical crossing layout plans;
- Crossing diagnostic team findings report; and
- Pavement marking and signing plan.
- Signal plans

Assumptions

1. Roadway reconstruction design is limited to approximately 200 feet of approach roadway on each side of each at-grade rail crossing.
2. Existing Right-of-way information will be provided by the Railroad owner, as available.
3. Existing traffic data will be provided by the NHDOT. Traffic analysis, design, and preparation of traffic signal plans both temporary and permanent are included as warranted, or where existing pre-emption controls are in place or upon review and analysis it is deemed necessary.
4. Existing utility identification and coordination will be provided by the rail corridor owners PanAm, and MBTA or from survey gathered by the design team.
5. Proposed roadway lighting within at-grade crossings is not included in the project scope of work.

6. Roadway design work beyond 200' of railroad will not be included in the at-grade crossing plans, unless existing speed, volume or special conditions warrant further design and/or analysis.

Communications

Jacobs will develop a set of preliminary design documents for upgrades to the existing communications systems on the line. The Team will consider utilizing the existing fiber optic cable and communication network systems. This will include a conceptual analysis of the voice/data circuit requirements for the proposed service, as well as preliminary design of such. Design shall be progressed to a level, which enables the development of a high confidence construction cost estimate, as well as provide clear direction for the advancement toward final design.

New communications system elements will be integrated, compatible and consistent with the existing MBTA and PanAm systems and equipment. Further, the robustness and redundancy of the systems will be identified. The potential for single point failures will also be identified in effort to minimize or (alleviate) mitigate any potential single point failure.

Jacobs will provide supervisory and control system modification plans for the Wayside Telephone System to work with both the Commuter Rail Operations Control Center (CROCC) and the North Billerica Operations Control Center (OCC).

As part of the preliminary design and construction documents, the Team will develop drawings including, but not limited to, block diagram level drawings for potential new fiber optic systems, signal supervisory system, radio system, telephone system, equipment arrangement drawings, cable plans and conduit schedules. The Team will develop performance specifications that functionally describe the communications systems and define characteristics of major systems components. Develop outline specifications for major materials and develop a detailed communications systems construction cost estimate; including determining a list of major materials together with unit costs and supporting calculations as applicable. Also, provide input to Capital Cost Estimates, review O&M plan to confirm that costs applied to communications systems are appropriate.

Communications Systems design will include:

- Backbone Communication Fiber System;
- CROCC Integration communication console;
- North Billerica communication and control integration;
- Wayside communication systems;
- Wayside telephone; and
- Intrusion detection for Signal Shelters.

Develop preliminary Communications plans as follows:

- Communications Front sheet;
- Symbol and Abbreviations sheets;
- General Notes Sheets;
- Fiber Optic Cable Plant Sheet;
- Wayside Telephone One-Line Diagram;
- Signal Shelter Intrusion Detection One-Line Diagram;
- CROCC Network Diagram;
- PAR functional and network block diagram; and

- CCTV Network Diagram.

Power Systems

Jacobs will evaluate the current signal power systems that are in place, review new elements planned to installation at new or renewed interlockings, blocks signals and crossing and recommend a cost-effective plan to reliably signal power at all necessary locations along the route.

The existing and proposed track plans developed as the conceptual design progresses will be reviewed and analyzed to determine approximate load locations and possible power supply locations. Existing plans that may provide existing meter sizes and locations will also be examined. Existing cable sizes from cable plans will also be examined to determine if the cables may be rated for temporary power requirements during construction phasing.

As the conceptual track plan design progresses, the signal design will analyze the resultant changes for the required power system modifications.

The conceptual signal power design is highly dependent upon the location and configuration of the signal equipment. Proposed reconfigurations and relocations of the tracks and signal equipment may change power supply sizes and locations and require reassessment of proposed maximum distances between meter locations and resultant voltage drops under normal and emergency transfer conditions.

To best coordinate with the planned upgrades to the existing track and signal configuration, the preliminary power design will be built on a modular concept. Initial loads for interlockings will be developed based on the number of turnouts. Initial typical loads will also be developed for automatic signals, cut sections, and highway crossings. The preliminary power schematic will then be developed based on these point loadings, with the loadings shown on the sheet, which will permit easier modifications should the size or location of the signal equipment be modified.

The design philosophy will be to minimize the quantity of meter service locations required from the utility however we will consider whether it is more cost efficient to use more power source/meter locations versus using long conduit runs with transformers. Fewer power sources will result in reduced maintenance costs associated with meter service charges. The installation of the meter locations must be balanced with power cable sizing due to amperage ratings and voltage drops, as well as available reliable locations from the utility for single phase and three phase installations.

As part of the conceptual design, a field inspection will be made to determine locations for power meter services for the signal, and snowmelter power loads. It is anticipated that this field inspection will include location of all pertinent power feeds at key work locations adjacent to the right of way, and notation of easements or obstacles, and a preliminary assessment of any additional equipment required for installation. A plan to supply power to all necessary signal, communication, track, and crossing facilities will be included in the 30% design submittal.

12.6 Stations

AECOM (Consultant) will lead the work pertaining to proposed stations, parking and related facilities. The objectives of the task are to confirm the site selections performed in the prior work, and to establish guidelines to help define and refine the station designs.

Site Reassessments

Develop a thorough understanding of existing site conditions at each of the four proposed station locations identified in the prior phase of work at South Nashua, Crown Street Nashua, Bedford, and Manchester.

- Review previous documents and note significant changes – if any - that have occurred and affect circulation, pedestrian and vehicular, utilities, grading, and abutter projects;
- Confirm site locations are compatible with proposed track alignment; and

- Conduct site visits and enhance site base plans with pertinent information.

Design Guidelines:

- Develop platform and site guidelines for stations; and
- Meet with NHDOT and stakeholders to establish design parameters and inputs by rail operator, local zoning and NHDOT.

Deliverables:

- Site Reassessment Report for each of the four (4) new station sites; and
- Station Design Guidelines.

Station Site Design Alternatives

Objectives:

- To determine the relative costs, benefits, and impacts of feasible options within each site, as compared to the Baseline Alternative;
- To define and refine alternative station configurations; and
- To evaluate and select a preferred station design concept for each of the four sites that will be advanced to preliminary engineering.

Work Elements:

- **Coordination Meetings:** prepare for and conduct station design coordination meetings with interested and affected parties, including:
 - NHDOT (up to 3);
 - MBTA (up to 2);
 - Other interested state agencies (up to 2);
 - Cities and towns (up to 4 assuming meetings with Nashua, Bedford, Manchester, and one other);
 - Abutters (up to 4);
 - Regional and metropolitan planning agencies (up to 3); and
 - Provide meeting summary of each meeting.
- **Station Concepts:** prepare conceptual alternative design plans for up to three per each site. Concepts will include:
 - Standardize station platforms (partial high-level of full high-level), and according to approved Design Criteria. Consider both Center Island and Side Platforms and a variety of canopy designs, Traffic and Pedestrian access and mode transfers such as Pick-up/Drop-off, taxis and Transportation Network Companies, (TNCs), buses and shuttles under a unified Architectural Concept per site;
 - Traffic and Pedestrian access and mode transfers such as Pick-up/Drop-off, taxis and TNCs, buses and shuttles;
 - Applicable code review;
 - Site analysis and determination of land use with local development plans;
 - Planning and urban design context;

- Environmental and physical constraints;
 - Functionality of station as a component of an intermodal transportation system;
 - Conceptual site design for access by buses, private automobiles, bicycles, and pedestrians;
 - Traffic Analysis: determine local traffic and parking impacts associated with station development, functionality of station as a component of an intermodal transportation system, and traffic mitigation requirements. Include Roadway and intersection issues that may affect site access (see more detailed discussion on section 9.15); and
 - Coordinate with ridership forecasting to size the station parking.
- **Preferred Site Report:** Analyze concepts for each site, evaluate them and arrive at preferred alternatives to be moved forward to Preliminary Engineering.
 - Perform a detailed analysis of each site concept comparing the beneficial and negative impacts of each alternative concept. Based on evaluation criteria, rank the alternative concepts in an Evaluation Report.
 - The report will also include a Rough-Order-of-Magnitude estimate and a recommendation for a preferred site configuration developed to a 15% level of design.

Deliverables:

- Station Alternatives Analysis Report - station plans, evaluation, and analysis;
- Operations Analysis Report for each of the Alternatives;
- Preferred Conceptual (15%) Plans and Alternatives Analysis Report; and
- One (1) rendering for each of the four (4) preferred station concepts.

Station Preliminary Engineering

Objectives:

- Refine the Preferred Station Design Concept to a level of completion that meets PE criteria per FTA guidance, with the goal of at least a 30% design.
- The Preliminary Design establishes the basis of design – the overall project design, including the forms, sizes and overall appearance through further development of the plans, sections, typical construction/fabrication details, and equipment layouts.
- Establish a realistic cost of each station.

Work Elements:

- **Design Development:** At each site, design a station configuration that provides accessible paths of travel between the platform, a station plaza that connects all site arrival points to the platform, and include a program of necessary supporting infrastructure, utilities, and station amenities. Incorporate into the design of the Station:
 - Operations and maintenance requirements, and community concerns by developing construction staging and Constructability strategies, including construction sequencing for the station work, addressing earth removal, storage, contractor lay-down areas, staging areas and work zones with construction access points.
 - Architectural program and solutions in circulation and in enclosures, such as ramps, roof structures, canopies, platforms, detectable warning strips, and other amenities such as surface materials, benches, bicycle racks, and signage.

- Planning strategies in streetscape/urban design for the station to address surface impacts from the project, with designs to be compatible with existing municipal master plans.
- Civil Engineering services for the conceptual design of the stations, including support for platform, access walkways, ramp, grading & drainage designs and address stormwater management, signage systems, and landscape requirements, as well as municipal infrastructure for water/sewer connections or septic provisions if the option of station restrooms is deemed feasible and preferred.
- Structural Engineering plans and calculations for passenger platforms decks and foundations, retaining walls, ramps, roof systems and other station structural elements.
- Mechanical and Electrical Engineering basic services in support of station and site for the conceptual stage of the project and in coordination with available utilities on site and other environmental solutions by Civil, including basic security, communication systems and site/station lighting design appropriate for each station setting.
- An interdisciplinary coordination effort confirming the design objectives are met and the design guidelines have been followed, resolving design interferences and review comments, and validating the technical completeness of the Preliminary Engineering Deliverable for submission to the Client.

Outreach material:

- One (1) rendering for each of the four (4) stations reflecting final (30%) design;
- Excerpts from the Basis of Design narratives outlining the Project's Objectives at each of the four station sites; and
- Circulation diagrams indicating site access, waiting areas, train boarding, developed to 30% design level of detail.

Deliverables:

- Basis of Design Report;
- 30% Design Plans, Preliminary Specifications, Project Schedule, Design and Construction Time Determination (CTD);
- 30% Construction Cost Estimate;
- 30% Code and Egress Analysis Report; and
- Design for the Environment Guidance Report.

12.7 Layover Facility

AECOM's subconsultant WSP will lead development of the layover facility. This scope addresses the planning, design, and coordination tasks associated with a siting study, the preparation of a concept design and preliminary contract documents (30%) for the new layover facility.

As currently anticipated the facility will encompass four (4) storage tracks, a support building to be used for ancillary facilities to accommodate daily service and maintenance functions, service roadways, layover tracks, 480-volt plug-ins, lighting, utilities (water, sewer, storm drain, power, communications, and gas), CCTV and security fencing. The general program will be based on the latest MBTA layover facilities on South Coast Rail but adapted to the project specific requirements for the Capitol Corridor.

Layover Program

Develop an outline program for the facility, addressing train storage capacity (based on the operating plan developed during the EA update) and ancillary facilities (building, site utilities, light maintenance capacities). The program will address each system, including track, civil/site, utility systems, building (architecture, structural, MEP), lighting, power, communications and security.

Siting Alternatives Study

Prepare a Siting Alternatives Report which will address the general program and layout requirements for the layover facility and compare the physical and functional merits of three (3) sites identified:

- Rail right-of-way adjacent to the Manchester Sewage Treatment plant, located about 3 miles south of the proposed station at Granite Street in Manchester.
- Jac Pac site (at the south end of the Pan Am Manchester Yard, about 0.5 miles south of the proposed station at Granite Street; and
- Pan Am Manchester yard (immediately south of the proposed station at Granite Street).

The report will compare the physical and functional merits of three sites based on the following criteria:

- Size and configuration of the site – would it accommodate the entire facility including support facilities?
- Operation considerations, namely "deadhead" between from layover yard to terminal station
- Compatibility with adjacent land uses (current and planned)
- Possible environmental impacts – a general, qualitative consideration of issues including wetlands, soils (including contaminated soils and groundwater), air quality, noise and vibrations.

As part of the Study, a meeting will be held with the City of Manchester to discuss existing and planned land uses in the vicinity of the alternative sites, as well as site access and existing and planned utility infrastructure. Consultation will also be made with the Southern New Hampshire Planning Commission (SNHPC) regarding planning for transit-oriented development (TOD) in the vicinity of the candidate sites. As all sites are located in developed areas, it will be assumed that adequate utility services are available.

Qualitative assessment of environmental issues will be made for each site. These include wetlands, soils (including contaminated soils and groundwater), air quality, noise and vibrations. A discussion of possible mitigation will be included.

The report will conclude with a recommendation for the preferred layover site. The reports findings will be discussed at a meeting with the City of Manchester and at one (1) public meeting (if requested).

Preliminary Concept Design Plan

Prior to the start of this task, confirm the overall configuration of the layover facility supports the proposed operations plan. Confirm that only four (4) layover tracks are necessary and assume maximum consist length of eight (8) cars.

Based on the selected site and layover facility program, develop a Concept Plan showing the layout of key facility elements including trackwork, trainset layover locations within the yard, site roadways, building footprint, parking and siting of ancillary facilities (e.g., substation, transformers, switchgear). Plan to use aerial image for base plan.

The building footprint will be assumed to be the same as for the two South Coast Rail layover facilities. Evaluate if any changes to the building floor plan would be needed to conform to NH building codes.

This task includes one (1) coordination meeting with NHDOT. The Preliminary Concept Design Plan will be submitted to NHDOT for review and comment.

Final Concept Design Plan

Update the program for layover facility based on update to operations plan, mitigation measures identified in the EA, and comments from NHDOT.

Utilize the work products from Task 3 to prepare the base plan and from Task 9 for environmental conditions at the site. WSP will assess the availability of local utilities (water, gas, sanitary sewer, stormwater, power, and communications) at the selected site and determine if sufficient capacity exists to serve the anticipated facility loadings. WSP will develop preliminary loads for power, heating, water and sewer. Identify any on-site utilities that would need to be relocated or installed to support the facility. Identify if any utility connections would require significant extensions beyond the site to connect to existing utility facilities with sufficient capacity to support the facility's demands. Evaluate if any changes to the building structure would be needed to conform to NH wind, snow and seismic requirements.

Update and refine the Preliminary Concept Plans. Develop a concept grading plan with preliminary track profiles and building or slab elevations for the major features. Include road connecting a public way to the layover facility. Concepts drawings will include a site plan and building plan. Mitigation measures (e.g., noise walls if needed) will be shown on the site plans. Develop an opinion of the estimated construction cost of the layover facility. Drawings to be included will be:

- Overall Layout Plan (1 sheet)
- Track Plans (2 sheets)
- Track Profiles (4 sheets)
- Site Plans (2 sheets)
- Grading and Utility Plan (2 sheets)
- Building Floor Plan (1 sheet)

Develop an opinion of the estimated construction cost of the layover facility.

Preliminary Engineering/30% Design

Obtain necessary data from the subsurface exploration program described in Task 4. Make initial contact with all utilities to confirm their capacity to serve the facility. Meet with the City of Manchester to discuss stormwater management, roadway connections and other issues.

Review FEMA flood maps and other available flood studies to determine the critical flood elevation in the vicinity of the facility. Develop a preliminary stormwater management plan including stormwater best management practices (BMPs) and propose outlets or connections to existing stormwater systems.

Prepare 30% drawings including Track, Civil/Site, Utilities, Architectural floor plan and exterior elevations (for building), and Retaining Wall (assume modular wall). Include offsite roadway/sidewalk improvements as well as mitigation measures as identified in the EA. Structural, Plumbing, HVAC, Electrical, Lighting, Communications and Security will not be included, as the SCR PS&E layover drawings will be used as the basis of the construction cost estimate.

Prepare Outline Specifications defining the scope of work for Civil, Track, and Structural (Retaining Wall, only). For Architectural, Structural (Building), MEP and Lighting, assume the Specifications for SCR will be referenced. For Civil/Sitework, assume the specifications will be based on the NHDOT Standard Specifications. For Trackwork, provide outline of materials with reference to MBTA Railroad Operations Standards and Specifications.

Update the opinion of the estimated construction cost of the layover facility per the 30% Drawings and Outline Specifications.

12.8 Cost of Project

Design development and costing of all the Project elements will entail a coordinated effort to produce a comprehensive yet timely summation of the true needs and costs to construct and initiate, and to operate and maintain the commuter rail service extension as defined in overall Project, including the following:

Estimating

AECOM and Jacobs will develop and estimate all project costs for engineering, right-of-way acquisition, construction (and inspection), and capital and operational costs. This effort will update and build upon the project costs determined during the prior 2014 Study and will engage up-to-date material and labor costs and realistic project upgrades to satisfy the FTA Capital Investment Grant (CIG) requirements, and meet all applicable codes, laws and regulations.

We assume that significant project team and stakeholder coordination will take place to accurately capture and depict the various elements of the Project improvements so that all associated costs are refined. A Draft Estimate will be prepared upon substantial completion of the Project for review and assessment by the Department and stakeholders. Upon receipt of comments and completion and final acceptance of Project improvements, a Final Draft Estimate will be delivered. Assume attendance at up to four (4) meetings.

Value Engineering

AECOM and Jacobs will initiate and conduct one Value Engineering (VE) workshop, with Certified Value Specialist (CVS) credentialed and multi-disciplined VE team members and key stakeholders, to review and evaluate plans, assess safety and reliability, determine overall operational efficiency and function, and make recommendations to improve value and quality by refining project costs and duration. The workshop will review the preliminary plans before they are assembled for the FTA grant application.

Consultant assumes that up to four (4) interdisciplinary staff will be required to prepare and participate in the workshops. Summarization of the VE results will be assessed by the design team and evaluated by the Department and our project partners for realistic incorporation into the design and final project costs.

Construction Documents

AECOM and Jacobs will develop and produce all Preliminary design documents relevant to the aforementioned engineering elements so that an appropriate Capital Investment Grant (CIG) or Full Funding Grant Agreement application can be submitted. Once funding is secured a construction procurement methodology can be determined and initiated. It is assumed that the documents prepared under this contract will include all Plans and Specifications necessary to form the basis of a future design-build or Railroad Force Account contract. This may require development of separate long lead material lists and Force Account packages to be procured by the two railroad owners.

12.9 Engineering Report

AECOM and Jacobs will prepare a Draft Engineering Report as required to support the project objectives. The report will include a discussion generally based on the following outline:

1. Introduction – Description of the project, its location and intent.
2. Existing Conditions – Identify condition and data associated with existing project features including headings such as bridge, roadway, rail crossings, geometrics, traffic, etc.
3. Problems and Solutions
4. Design Recommendations and Considerations – Listing of project-specific categories and a summary discussion documenting the preliminary design work associated with each, including recommended alternatives, conclusions, design criteria for final design and estimated costs.

5. Available Materials - List of materials, calculations, reports, CAD/D files that have been developed as part of the preliminary design.

A draft of the Engineering Report will be submitted to the Department prior to final submission. Department comments generated during review of the draft engineering report will be addressed. A final Engineering Report including updated information based on addressed comments will be prepared and submitted to the Department.

Task 13: FTA Capital Investment Grant (CIG) Program

AECOM (Consultant) will lead the FTA Capital Investment Grant (CIG) task. If determined eligible for the Capital Investment Grant (CIG) Program, the locally preferred alternative will be the subject FTA's acceptance into Project Development (PD) and evaluation and rating. This task will address all components of the FTA request to enter Project Development including preparation of the request to be evaluated and rated this includes:

13.1 Letter Requesting entry into Project Development

Prepare draft letter for NHDOT to send to FTA requesting entry into Project Development. Respond to one round of NHDOT questions and comments and provide final version of letter for NHDOT to transmit.

Demonstrate in letter that other FTA requirements have been met, including the programming of Project Development funding is in the TIP. Schedule adoption of the locally preferred alternative into the financially constrained long-range transportation plan, and completion on environmental reviews, (e.g. NEPA).

13.2 Evaluation and Rating

Prepare the FTA Project Justification Rating, including the following:

- Small Starts/New Starts Templates, reports and maps, land use plans and policies, Standard Cost Category (SCC) worksheets including supporting documentation and reports;
- Mobility improvements;
- Congestion relief;
- Existing land use;
- Economic development benefits;
- Environmental benefits; and
- Cost effectiveness.

Document the local financial commitment using information from the Financial Plan developed in Task 11 demonstrating the capacity of NHDOT to fund the capital and O&M costs of both the project and other existing commitments for 20-years.

13.3 Before and After Study Plan

Prepare the Before and After Study Plan documenting how ridership forecasts and other key project data/inputs will be preserved and reported at key phases of project development and upon introduction of revenue service. This would only be required if pursuing New Starts funding where it is part of readiness to enter engineering.

13.4 Project Management Plan and Required Sub-Plans

Prepare the Project Management Plan detailing the proposed management and technical capacity to undertake the Project. This will include all FTA required sub-plans.

Deliverables

- Draft and final Request to enter Project Development;
- New Starts/Small Starts Templates;
- 20 year-Financial Plan; and
- SCC workbook.

Assumptions

Survey/ROW:

- No boundary monumentation will be set, existing or proposed, as part of this survey;
- The data collection and survey update portion of the survey will occur in no-snow conditions;
- Individual trees will not be located when they fall within wooded areas;
- Construction layout of any kind is excluded from this scope of work, including the layout of proposed boring locations; and
- The existing sewer and drain structures within the corridor will not be opened to survey the below ground facilities.

Environmental

- The scope of work does not include review & permitting for stations or layovers in Massachusetts.
- Preparation of permit applications is not included.
- Brook floater mussel surveys are not included since it is assumed that no in-water work at the Merrimack River bridge will be required.
- Northern Long Eared Bat surveys are not included since it is assumed that tree clearing will not be required until the construction phase of the project.
- Cultural resource cost estimates are based on an estimated 500 ft buffer of the current rail corridor for the indirect APE and the direct LOD for the direct APE. APE size relative to proposed station locations will be developed in consultation with the NH DOT and NHDHR.

Geotechnical

- Subsurface exploration program as outlined above can be completed in daytime shifts (assuming borings and test pits). Costs for night-time and weekend work and additional subsurface explorations beyond the allotted days are excluded from this proposal;
- Nobis will retain a drilling subcontractor directly, and prevailing wage rates are applicable for the drilling subcontractor;
- All Nobis and drilling subcontractor personnel entering the railroad right-of-way will have current Keolis Roadway Worker Protection (RWP) or Pan Am training, as applicable;
- Utilization of vacuum excavation, Ground Penetration Radar (GPR), and retaining a private utility location company for utility clearance is excluded from this proposal;
- Off site management of surplus material is not anticipated or budgeted. Environmental sampling, chemical analyses, and storage, handling, and disposal of any Investigation Derived Waste (IDW) resulting from the explorations would cost extra and is not included in Nobis' scope of work and cost estimate. We could assist with these environmental services for an additional cost, if requested; and
- Environmental evaluations and construction-phase services are not included.

Engineering

- MBTA and Pan Am will agree to establish post-COVID service assumptions that will form the basis for NHCC service design and supporting infrastructure.
- Degree of accuracy will be Preliminary in nature whereas only areas required to be upgraded will have ground survey and detailed design performed.

ATTACHMENT C: Survey Task Matrix

Right-of-Way Boundary Control Survey and Project Right-of-Way Plans

1. ROW Facilitation Meeting.
 - 1.1. Project overview and past project review.
 - 1.2. Turnover of DOT project data and row files.
 - 1.3. Establish geographical limits.
2. Records Research.
 - 2.1. Town road and property records.
 - 2.2. State right-of way and archive records.
 - 2.3. County road, court, registry and probate records.
 - 2.4. Abutters' deeds and plans.
 - 2.5. Other research as needed to define existing right-of-way limits.
3. Survey.
 - 3.1. Field recovery of right-of-way and abutting boundary monuments.
 - 3.2. Establish geodetic control network on NH State Plane Coordinate System.
 - 3.3. Perform boundary survey of existing right-of-way.
 - 3.4. Process survey control data using least squares adjustment at 95% confidence level.
 - 3.4.1 Process side shot data on adjusted controls and verify.
 - 3.5. Develop legacy alignments and establish right-of-way limits based on survey and boundary control standards of practice and the current NHLSA Ethics and Standards.
4. Plan Review.
 - 4.1. Submit preliminary existing right-of-way plans for Department review.
 - 4.2. Right-of-way facilitation meeting to discuss right-of-way issues.
 - 4.3. Address comments from Department review.
 - 4.3.1. Provide written report explaining how items were addressed.
5. Develop final existing right-of-way plans.
 - 5.1. Provide Department with existing right-of-way plans in DWG/DGN file format and PDF plan files.
 - 5.2. Provide the Department with a plan showing the existing boundary monumentation and survey traverse in DWG/DGN file format and geodetic control data in ASCII file format.
6. Prepare Preliminary Project Registry and Purchase Plans.
 - 6.1. Develop project right-of-way plans from *approved* slope and drain, 60% design submittal.
 - 6.2. Submit preliminary plans for department/consultant review.
 - 6.3. Address department/consultant comments.
7. Provide Amended Registry and Purchase Plans.
 - 7.1. Plan submittal in DWG/DGN file format and PDF plan files for use in property acquisitions.

8. Right-of- Way Monumentation.
 - 8.1. Set right-of-way bounds and control monuments after completion of property acquisitions.

9. Prepare Final Right-of-Way Registry Plan.
 - 9.1. Revise right-of-way plans to reflect any changes made during acquisitions and final monument locations.
 - 9.2. Submit for final department review and approval.
 - 9.3. Record plan at County Registry of Deeds.
 - 9.4. Provide final plans in DWG/DGN file format and PDF plan files.

Attachment 1

**CERTIFICATION WITH REGARD TO THE PERFORMANCE OF
PREVIOUS CONTRACTS OR SUBCONTRACTS SUBJECT TO
THE EQUAL OPPORTUNITY CLAUSE AND THE FILING OF REQUIRED REPORTS**

The CONSULTANT X, proposed subconsultant _____, hereby certifies that it has X, has not _____, participated in a previous contract or subcontract subject to the equal opportunity clause, as required by Executive Order 11246 and that it has X, has not _____, filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

AECOM Technical Services, Inc.

(Company)

By: _____

Vice President

(Title)

Date: November 16, 2020

Note: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b)(1)), and must be submitted by consultants and proposed subconsultants only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts that are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally, only contracts or subcontracts of \$10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime consultants and subconsultants who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b)(1) prevents the award of contracts and subcontracts unless such consultant submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

(Revised: June, 1980) **NOTE: TO BE COMPLETED BY CONSULTANT WHEN SIGNING AGREEMENT.**

Attachment 2

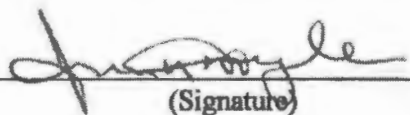
**CONSULTANT DISCLOSURE STATEMENT
FOR PREPARATION OF
ENVIRONMENTAL EVALUATIONS**

I hereby affirm that I have read and reviewed the Council on Environmental Quality (CEQ) regulation [40 CFR 1506.5(C)] and related guidance issued by CEQ and that pursuant thereto this firm has no financial or other interest in the outcome of this project.

I further hereby affirm that the information provided herein is true and correct and acknowledge that any knowingly false statement or false representation as to any material part contained herein may subject me to a fine and/or imprisonment, pursuant to pertinent provisions of the United States Code.

November 16, 2020

(Date)



(Signature)

Attachment 3

CERTIFICATION OF CONSULTANT/SUBCONSULTANT

I hereby certify that I am the Vice President and duly-authorized representative of the firm of AECOM Technical Services, Inc. and that neither I nor the above firm I here represent has:

- (a) employed or retained for a commission, percentage, brokerage, contingent fee, or other consideration, any firm or person (other than a bona fide employee working solely for me or the above CONSULTANT) to solicit or secure this Contract,
- (b) agreed, as an express or implied condition for obtaining this Contract, to employ or retain the services of any firm or person in connection with carrying out the Contract, or
- (c) paid, or agreed to pay, to any firm, organization or person (other than a bona fide employee working solely for me or the above CONSULTANT) any fee, contribution, donation or consideration of any kind for, or in connection with, procuring or carrying out the Contract:

I/WE do also, under penalty of perjury under the laws of the United States, certify that, except as noted below, the company or any person associated therewith in the capacity of (owner, partner, director, officer, principal investigator, project director, manager, auditor, or any position involving the administration of Federal funds): (a) is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any Federal agency; (b) has not been suspended, debarred, voluntarily excluded or determined ineligibility by any Federal agency within the past three years; (c) does not have a proposed debarment pending; and (d) has not been indicted, convicted or had a civil judgment rendered against (it) by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past three years.

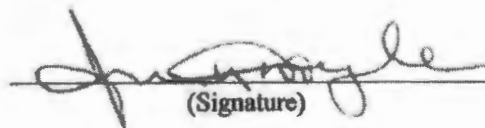
except as here expressly stated (if any):

Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted, indicate below to whom it applies, the initiating agency, and dates of action. Providing false information may result in criminal prosecution or administrative sanctions.

I acknowledge that this certificate is to be furnished to the State Department of Transportation and the Federal Highway Administration, U. S. Department of Transportation, in connection with this Contract involving participation of Federal-aid highway funds, and is subject to applicable State and Federal laws, both criminal and civil.

November 16, 2020

(Date)


(Signature)

Attachment 4

CERTIFICATION OF STATE DEPARTMENT OF TRANSPORTATION

I hereby certify that I am the Director of Project Development of the Department of Transportation of the State of New Hampshire, and the above consulting firm or its representatives has not been required, directly or indirectly, as an express or implied condition in connection with obtaining or carrying out this Contract, to:

- (a) employ or retain, or agree to employ or retain, any firm or person, or
- (b) pay, or agree to pay, to any firm, person, or organization, any fee, contribution, donation, or consideration of any kind:

except as here expressly stated (if any):

11/19/2020

(Date)



(Signature)

Attachment 5

**CERTIFICATION FOR FEDERAL-AID CONTRACTS
EXCEEDING \$100,000 IN FEDERAL FUNDS**

The prospective participant certifies, by signing and submitting this agreement, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

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

The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower-tier subcontracts which exceed \$100,000 and that all such subrecipients shall certify and disclose accordingly.

Attachment 6

IN WITNESS WHEREOF the parties hereto have executed this AGREEMENT on the day and year first above written.

Consultant

WITNESS TO THE CONSULTANT

By: Jillian Brodeur *Jillian Brodeur*
Project Controls Analyst

Dated: November 16, 2020

CONSULTANT

By: James A. Doyle *James A. Doyle*
Vice President
(TITLE)

Dated: November 16, 2020

Department of Transportation

WITNESS TO THE STATE OF NEW HAMPSHIRE

By: Talasha Lile *Talasha Lile*

Dated: November 23, 2020

THE STATE OF NEW HAMPSHIRE

By: Victor F. Sheehan *Victor F. Sheehan*

DOT COMMISSIONER

Dated: November 23, 2020

Attorney General

This is to certify that the above AGREEMENT has been reviewed by this office and is approved as to form and execution.

Dated: 11/24/2020

By: AMNB Greenstein
Assistant Attorney General

Secretary of State

This is to certify that the GOVERNOR AND COUNCIL on DEC 18 2020 approved this AGREEMENT.

Dated: DEC 18 2020

Attest:
By: [Signature]

DEPUTY SECRETARY OF STATE

Certificate of Authority # 2

(Corporation, Non-Profit Corporation)

Corporate Bylaws

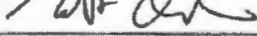
I, Robert Orlin, hereby certify that I am duly elected Clerk/^{Asst.}Secretary/Officer of
(Name)
AECOM Technical Services, Inc. I hereby certify the following is a true copy of the
(Name of Corporation)

current Bylaws or Articles of Incorporation of the Corporation and that the Bylaws or
Articles of Incorporation authorize the following officers or positions to bind the
Corporation for contractual obligations Vice President
(list officer titles or position)

I further certify that the following individuals currently hold the office or positions
authorized: James A. Doyle
(list individuals holding positions authorized)

I further certify that it is understood that the State of New Hampshire will rely on this
certificate as evidence that the person listed above currently occupies the position indicated
and that they have full authority to bind the corporation. This authority shall remain valid
for thirty (30) days from the date of this certificate.

DATED: 11-16-2020

ATTEST: 
(Name & Title)
Robert Orlin
VP & Asst. Secretary

State of New Hampshire

Department of State

CERTIFICATE

I, William M. Gardner, Secretary of State of the State of New Hampshire, do hereby certify that AECOM TECHNICAL SERVICES, INC. is a California Profit Corporation registered to transact business in New Hampshire on September 27, 1995. I further certify that all fees and documents required by the Secretary of State's office have been received and is in good standing as far as this office is concerned.

Business ID: 237154

Certificate Number: 0005043355



IN TESTIMONY WHEREOF,
I hereto set my hand and cause to be affixed
the Seal of the State of New Hampshire,
this 16th day of November A.D. 2020.

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

William M. Gardner
Secretary of State

AGENCY CUSTOMER ID: CN101348564

LOC #: Los Angeles



ADDITIONAL REMARKS SCHEDULE

Page 2 of 2

AGENCY Marsh Risk & Insurance Services		NAMED INSURED AECOM AECOM Technical Services, Inc. 1155 Elm Street, Suite 401 Manchester, NH 03101	
POLICY NUMBER		EFFECTIVE DATE:	
CARRIER	NAIC CODE		

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,
 FORM NUMBER: 25 FORM TITLE: Certificate of Liability Insurance

Workers Compensation/Employer Liability cont.

Policy Number	Insurer	States Covered
WLR C6692340A	Indemnity Insurance Company of North America - NAIC # 43575	AOS
WLR C66923320	ACE American Insurance Company - NAIC # 22667	CA, AZ, MA
SCF C66923368	ACE American Insurance Company - NAIC # 22667	WI Retro

NH Capitol Corridor Railroad Project

Architectural & Engineering

Paula.Devens@dot.nh.gov

New Hampshire DOT
7 Hazen Dr
Concord, New Hampshire 03301
(603) 271-3734

<https://www.nh.gov/dot/>

Federal Clauses

ACCESS TO RECORDS AND REPORTS

a. Record Retention. The Contractor will retain, and will require its subcontractors of all tiers to retain, complete and readily accessible records related in whole or in part to the contract, including, but not limited to, data, documents, reports, statistics, sub-Contracts, leases, subcontracts, arrangements, other third party Contracts of any type, and supporting materials related to those records.

b. Retention Period. The Contractor agrees to comply with the record retention requirements in accordance with 2 C.F.R. § 200.333. The Contractor shall maintain all books, records, accounts and reports required under this Contract for a period of at not less than three (3) years after the date of termination or expiration of this Contract, except in the event of litigation or settlement of claims arising from the performance of this Contract, in which case records shall be maintained until the disposition of all such litigation, appeals, claims or exceptions related thereto.

c. Access to Records. The Contractor agrees to provide sufficient access to FTA and its contractors to inspect and audit records and information related to performance of this contract as reasonably may be required.

d. Access to the Sites of Performance. The Contractor agrees to permit FTA and its contractors access to the sites of performance under this contract as reasonably may be required.

AMERICANS WITH DISABILITIES ACT(ADA)

The contractor agrees to comply with the requirements of 49 U.S.C. § 5301 (d), which states the Federal policy that the elderly and persons with disabilities have the same right as other persons to use mass transportation service and facilities, and that special efforts shall be made in planning and designing those services and facilities to implement that policy. The contractor also agrees to comply with all applicable requirements of section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. § 794, which prohibits discrimination on the basis of handicaps, with the Americans with Disabilities Act of 1990 (ADA), as amended, 42 U.S.C. §§ 12101 et seq., which requires that accessible facilities and services be made available to persons with disabilities, including any subsequent amendments to that Act, and with the Architectural Barriers act of 1968, as amended, 42 U.S.C. §§ 4151 et seq., which requires that buildings and public accommodations be accessible to persons with disabilities, including any subsequent amendments to that Act. In addition, the contractor agrees to comply with any and all applicable requirements issued by the FTA, DOT, DOJ, U.S. GSA, U.S. EEOC, U.S. FCC, any subsequent amendments thereto and any other nondiscrimination statute(s) that may apply to the Project.

BYRD ANTI-LOBBYING AMENDMENT

Contractors who apply or bid for an award of \$100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the Agency."

CIVIL RIGHTS LAWS AND REGULATIONS

The following Federal Civil Rights laws and regulations apply to all contracts.

1 Federal Equal Employment Opportunity (EEO) Requirements. These include, but are not limited to:

a) Nondiscrimination in Federal Public Transportation Programs. 49 U.S.C. § 5332, covering projects, programs, and activities financed under 49 U.S.C. Chapter 53, prohibits discrimination on the basis of race, color, religion, national origin, sex (including sexual orientation and gender identity), disability, or age, and prohibits discrimination in employment or business opportunity.

b) Prohibition against Employment Discrimination. Title VII of the Civil Rights Act of 1964, as amended, 42 U.S.C. § 2000e, and Executive Order No. 11246, "Equal Employment Opportunity," September 24, 1965, as amended, prohibit discrimination in employment on the basis of race, color, religion, sex, or national origin.

2 Nondiscrimination on the Basis of Sex. Title IX of the Education Amendments of 1972, as amended, 20 U.S.C. § 1681 et seq. and implementing Federal regulations, "Nondiscrimination on the Basis of Sex in Education Programs or Activities Receiving Federal Financial Assistance," 49 C.F.R. part 25 prohibit discrimination on the basis of sex.

3 Nondiscrimination on the Basis of Age. The "Age Discrimination Act of 1975," as amended, 42 U.S.C. § 6101 et seq., and Department of Health and Human Services implementing regulations, "Nondiscrimination on the Basis of Age in Programs or Activities Receiving Federal Financial Assistance," 45 C.F.R. part 90, prohibit discrimination by participants in federally assisted programs against individuals on the basis of age. The Age Discrimination in Employment Act (ADEA), 29 U.S.C. § 621 et seq., and Equal Employment Opportunity Commission (EEOC) implementing regulations, "Age Discrimination in Employment Act," 29 C.F.R. part 1625, also prohibit employment discrimination against individuals age 40 and over on the basis of age.

4 Federal Protections for Individuals with Disabilities. The Americans with Disabilities Act of 1990, as amended (ADA), 42 U.S.C. § 12101 et seq., prohibits discrimination against qualified individuals with disabilities in programs, activities, and services, and imposes specific requirements on public and private entities. Third party contractors must comply with their responsibilities under Titles I, II, III, IV, and V of the ADA in employment, public services, public accommodations, telecommunications, and other provisions, many of which are subject to regulations issued by other Federal agencies.

Civil Rights and Equal Opportunity

The Agency is an Equal Opportunity Employer. As such, the Agency agrees to comply with all applicable Federal civil rights laws and implementing regulations. Apart from inconsistent requirements imposed by Federal laws or regulations, the Agency agrees to comply with the requirements of 49 U.S.C. § 5323(h) (3) by not using any Federal assistance awarded by FTA to support procurements using exclusionary or discriminatory specifications. Under this Contract, the Contractor shall at all times comply with the following requirements and shall include these requirements in each subcontract entered into as part thereof.

1. Nondiscrimination. In accordance with Federal transit law at 49 U.S.C. § 5332, the Contractor agrees that it will not discriminate against any employee or applicant for employment because of race, color, religion, national origin, sex, disability, or age. In addition, the Contractor agrees to comply with

applicable Federal implementing regulations and other implementing requirements FTA may issue.

2. Race, Color, Religion, National Origin, Sex. In accordance with Title VII of the Civil Rights Act, as amended, 42 U.S.C. § 2000e et seq., and Federal transit laws at 49 U.S.C. § 5332, the Contractor agrees to comply with all applicable equal employment opportunity requirements of U.S. Department of Labor (U.S. DOL) regulations, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," 41 C.F.R. chapter 101, and Executive Order No. 11246, "Equal Employment Opportunity in Federal Employment," September 24, 1965, 42 U.S.C. § 2000e note, as amended by any later Executive Order that amends or supersedes it, referenced in 42 U.S.C. § 2000e note. The Contractor agrees to take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, national origin, or sex (including sexual orientation and gender identity). Such action shall include, but not be limited to, the following: employment, promotion, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

3. Age. In accordance with the Age Discrimination in Employment Act, 29 U.S.C. §§ 621-634, U.S. Equal Employment Opportunity Commission (U.S. EEOC) regulations, "Age Discrimination in Employment Act," 29 C.F.R. part 1625, the Age Discrimination Act of 1975, as amended, 42 U.S.C. § 6101 et seq., U.S. Health and Human Services regulations, "Nondiscrimination on the Basis of Age in Programs or Activities Receiving Federal Financial Assistance," 45 C.F.R. part 90, and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

4. Disabilities. In accordance with section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. § 794, the Americans with Disabilities Act of 1990, as amended, 42 U.S.C. § 12101 et seq., the Architectural Barriers Act of 1968, as amended, 42 U.S.C. § 4151 et seq., and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees that it will not discriminate against individuals on the basis of disability. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

The Contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Act (42 U.S.C. § 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. § 1251-1387). Violations must be reported to FTA and the Regional Office of the Environmental Protection Agency. The following applies for contracts of amounts in excess of \$150,000:

Clean Air Act

(1) The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.

(2) The contractor agrees to report each violation to the Agency and understands and agrees that the Agency will, in turn, report each violation as required to assure notification to the Agency, Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

(3) The contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance provided by FTA.

Federal Water Pollution Control Act

(1) The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.

(2) The contractor agrees to report each violation to the Agency and understands and agrees that the Agency will, in turn, report each violation as required to assure notification to the Agency, Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

(3) The contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance provided by FTA."

CONFORMANCE WITH ITS NATIONAL ARCHITECTURE

Intelligent Transportation Systems (ITS) projects shall conform to the National ITS Architecture and standards. Conformance with the National ITS Architecture is interpreted to mean the use of the National ITS Architecture to develop a regional ITS architecture in support of integration and the subsequent adherence of all ITS projects to that regional ITS architecture. Development of the regional ITS architecture should be consistent with the transportation planning process for Statewide and Metropolitan Transportation Planning (49 CFR Part 613 and 621).

DEBARMENT AND SUSPENSION

a. Applicability: This requirement applies to all FTA grant and cooperative agreement programs for a contract in the amount of at least \$25,000

(1) This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such the contractor is required to verify that none of the contractor, its principals (defined at 2 C.F.R. § 180.995), or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).

(2) C.F.R. pt. 3000, subpart C and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.

(3) The accompanying certification is a material representation of fact relied upon by the subrecipient. If it is later determined that the contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to the Agency and subrecipient, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

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

DISADVANTAGED BUSINESS ENTERPRISE (DBE)

The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 C.F.R. part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the Agency deems appropriate, which may include, but is not limited to:

(1) Withholding monthly progress payments; (2) Assessing sanctions; (3) Liquidated damages; and/or (4) Disqualifying the contractor from future bidding as non-responsible. 49 C.F.R. § 26.13(b).

Prime contractors are required to pay subcontractors for satisfactory performance of their contracts no later than 30 days from receipt of each payment the Agency makes to the prime contractor. 49 C.F.R. § 26.29(a).

Finally, for contracts with defined DBE contract goals, each FTA Recipient must include in each prime contract a provision stating that the contractor shall utilize the specific DBEs listed unless the contractor obtains the Agency's written consent; and that, unless the Agency's consent is provided, the contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the listed DBE. 49 C.F.R. § 26.53(f) (1).

It is the policy of the Agency and the United States Department of Transportation ("DOT") that Disadvantaged Business Enterprises ("DBE's"), as defined herein and in the Federal regulations published at 49 C.F.R. part 26, shall have an equal opportunity to participate in DOT-assisted contracts.

ENERGY CONSERVATION

The contractor agrees to comply with mandatory standards and policies relating to energy efficiency, which are contained in the state energy conservation

plan issued in compliance with the Energy Policy and Conservation Act.

EQUAL EMPLOYMENT OPPORTUNITY

During the performance of this contract, the contractor agrees as follows:

(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.

(2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

(3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.

(4) The contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under section 202 of Executive Order 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(6) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(7) In the event of the contractor's non-compliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be canceled, terminated or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(8) The contractor will include the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

FEDERAL CHANGES

49 CFR Part 18 Federal Changes - Contractor shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Master Agreement between Purchaser and FTA, as they may be amended or promulgated from time to time during the term of this contract. Contractor's failure to so comply shall constitute a material breach of this contract.

FLY AMERICA

a) Definitions. As used in this clause—

1) "International air transportation" means transportation by air between a place in the United States and a place outside the United States or between two places both of which are outside the United States. 2) "United States" means the 50 States, the District of Columbia, and outlying areas. 3) "U.S.-flag air carrier" means an air carrier holding a certificate under 49 U.S.C. Chapter 411.

b) When Federal funds are used to fund travel, Section 5 of the International Air Transportation Fair Competitive Practices Act of 1974 (49 U.S.C. 40118) (Fly America Act) requires contractors, Agencies, and others use U.S.-flag air carriers for U.S. Government-financed international air transportation of personnel and their personal effects) or property, to the extent that service by those carriers is available. It requires the Comptroller General of the United States, in the absence of satisfactory proof of the necessity for foreign-flag air transportation, to disallow expenditures from funds, appropriated or otherwise established for the account of the United States, for international air transportation secured aboard a foreign-flag air carrier if a U.S.-flag air carrier is available to provide such services.

c) If available, the Contractor, in performing work under this contract, shall use U.S.-flag carriers for international air transportation of personnel (and their personal effects) or property.

d) In the event that the Contractor selects a carrier other than a U.S.-flag air carrier for international air transportation, the Contractor shall include a statement on vouchers involving such transportation essentially as follows:

Statement of Unavailability of U.S.-Flag Air Carriers

International air transportation of persons (and their personal effects) or property by U.S.-flag air carrier was not available or it was necessary to use foreign-flag air carrier service for the following reasons. See FAR § 47.403. [State reasons]:

e) Contractor shall include the substance of this clause, including this paragraph (e), in each subcontract or purchase under this contract that may involve international air transportation.

INCORPORATION OF FEDERAL TRANSIT ADMINISTRATION (FTA) TERMS

Incorporation of Federal Transit Administration (FTA) Terms - The provisions within include, in part, certain Standard Terms and Conditions required by DOT, whether or not expressly set forth in the preceding contract provisions. All contractual provisions required by DOT, as set forth in the current FTA Circular 4220 are hereby incorporated by reference. Anything to the contrary herein notwithstanding, all FTA mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this Contract. The Contractor shall not perform any act, fail to perform any act, or refuse to comply with any request which would cause a violation of the FTA terms and conditions.

NO GOVERNMENT OBLIGATION TO THIRD PARTIES

The Agency and Contractor acknowledge and agree that, notwithstanding any concurrence by the Federal Government in or approval of the solicitation or award of the underlying Contract, absent the express written consent by the Federal Government, the Federal Government is not a party to this Contract and shall not be subject to any obligations or liabilities to the Agency, Contractor or any other party (whether or not a party to that contract) pertaining to any matter resulting from the underlying Contract. The Contractor agrees to include the above clause in each subcontract financed in whole or in part with Federal assistance provided by the FTA. It is further agreed that the clause shall not be modified, except to identify the subcontractor who will be subject to its provisions.

PATENT RIGHTS AND RIGHTS IN DATA

Intellectual Property Rights

This Project is funded through a Federal award with FTA for experimental, developmental, or research work purposes. As such, certain Patent Rights and Data Rights apply to all subject data first produced in the performance of this Contract. The Contractor shall grant the Agency intellectual property access and licenses deemed necessary for the work performed under this Contract and in accordance with the requirements of 37 C.F.R. part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by FTA or U.S. DOT. The terms of an intellectual property agreement and software license rights will be finalized prior to execution of this Contract and shall, at a minimum, include the following restrictions:

Except for its own internal use, the Contractor may not publish or reproduce subject data in whole or in part, or in any manner or form, nor may the Contractor authorize others to do so, without the written consent of FTA, until such time as FTA may have either released or approved the release of such data to the public. This restriction on publication, however, does not apply to any contract with an academic institution. For purposes of this Contract, the term "subject data" means recorded information whether or not copyrighted, and that is delivered or specified to be delivered as required by the Contract. Examples of "subject data" include, but are not limited to computer software, standards, specifications, engineering drawings and associated lists, process sheets, manuals, technical reports, catalog item identifications, and related information, but do not include financial reports, cost analyses, or other similar information used for performance or administration of the Contract.

1. The Federal Government reserves a royalty-free, non-exclusive and irrevocable license to reproduce, publish, or otherwise use, and to authorize others to use for "Federal Government Purposes," any subject data or copyright described below. For "Federal Government Purposes," means use only for the direct purposes of the Federal Government. Without the copyright owner's consent, the Federal Government may not extend its Federal license to any other party.

a. Any subject data developed under the Contract, whether or not a copyright has been obtained; and

b. Any rights of copyright purchased by the Contractor using Federal assistance in whole or in part by the FTA.

2. Unless FTA determines otherwise, the Contractor performing experimental, developmental, or research work required as part of this Contract agrees to permit FTA to make available to the public, either FTA's license in the copyright to any subject data developed in the course of the Contract, or a copy of the subject data first produced under the Contract for which a copyright has not been obtained. If the experimental, developmental, or research work, which is the subject of this Contract, is not completed for any reason whatsoever, all data developed under the Contract shall become subject data as defined herein and shall be delivered as the Federal Government may direct.

3. Unless prohibited by state law, upon request by the Federal Government, the Contractor agrees to indemnify, save, and hold harmless the Federal Government, its officers, agents, and employees acting within the scope of their official duties against any liability, including costs and expenses, resulting from any willful or intentional violation by the Contractor of proprietary rights, copyrights, or right of privacy, arising out of the publication, translation, reproduction, delivery, use, or disposition of any data furnished under that contract. The Contractor shall be required to indemnify the Federal Government for any such liability arising out of the wrongful act of any employee, official, or agents of the Federal Government.

4. Nothing contained in this clause on rights in data shall imply a license to the Federal Government under any patent or be construed as affecting the scope of any license or other right otherwise granted to the Federal Government under any patent.

5. Data developed by the Contractor and financed entirely without using Federal assistance provided by the Federal Government that has been incorporated into work required by the underlying Contract is exempt from the requirements herein, provided that the Contractor identifies those data in writing at the time of delivery of the Contract work.

6. The Contractor agrees to include these requirements in each subcontract for experimental, developmental, or research work financed in whole or in part with Federal assistance.

PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS AND RELATED ACTS

The contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the contractor's actions pertaining to this contract."

PROMPT PAYMENT

The contractor is required to pay its subcontractors performing work related to this contract for satisfactory performance of that work no later than 30 days after the contractor's receipt of payment for that work. In addition, the contractor is required to return any retainage payments to those subcontractors within 30 days after the subcontractor's work related to this contract is satisfactorily completed.

The contractor must promptly notify the Agency, whenever a DBE subcontractor performing work related to this contract is terminated or fails to complete its work and must make good faith efforts to engage another DBE subcontractor to perform at least the same amount of work. The contractor may not terminate any DBE subcontractor and perform that work through its own forces or those of an affiliate without prior written consent of the Agency.

SAFE OPERATION OF MOTOR VEHICLES

Seat Belt Use

The Contractor is encouraged to adopt and promote on-the-job seat belt use policies and programs for its employees and other personnel that operate company-owned vehicles, company rented vehicles, or personally operated vehicles. The terms "company-owned" and "company-leased" refer to vehicles owned or leased either by the Contractor or Agency.

Distracted Driving

The Contractor agrees to adopt and enforce workplace safety policies to decrease crashes caused by distracted drivers, including policies to ban text messaging while using an electronic device supplied by an employer, and driving a vehicle the driver owns or rents, a vehicle Contractor owns, leases, or rents, or a privately-owned vehicle when on official business in connection with the work performed under this Contract as so indicated in the FTA Master Agreement.

SEISMIC SAFETY

The contractor agrees that any new building or addition to an existing building will be designed and constructed in accordance with the standards for Seismic Safety required in Department of Transportation (DOT) Seismic Safety Regulations 49 C.F.R. part 41 and will certify to compliance to the extent required by the regulation. The contractor also agrees to ensure that all work performed under this contract, including work performed by a subcontractor, is in compliance with the standards required by the Seismic Safety regulations and the certification of compliance issued on the project.

SPECIAL NOTIFICATION REQUIREMENTS FOR STATES

Applies to States –

a. To the extent required under federal law, the State, as the Recipient, agrees to provide the following information about federal assistance awarded for its State Program, Project, or related activities:

- (1) The Identification of FTA as the federal agency providing the federal assistance for a State Program or Project;
- (2) The Catalog of Federal Domestic Assistance Number of the program from which the federal assistance for a State Program or Project is authorized; and
- (3) The amount of federal assistance FTA has provided for a State Program or Project.

b. Documents - The State agrees to provide the information required under this provision in the following documents: (1) applications for federal assistance, (2) requests for proposals or solicitations, (3) forms, (4) notifications, (5) press releases, and (6) other publications.

TERMINATION

Termination for Convenience (General Provision)

The Agency may terminate this contract, in whole or in part, at any time by written notice to the Contractor when it is in the Agency's best interest. The Contractor shall be paid its costs, including contract close-out costs, and profit on work performed up to the time of termination. The Contractor shall promptly submit its termination claim to Agency to be paid the Contractor. If the Contractor has any property in its possession belonging to Agency, the Contractor will account for the same, and dispose of it in the manner Agency directs.

Termination for Default [Breach or Cause] (General Provision)

If the Contractor does not deliver supplies in accordance with the contract delivery schedule, or if the contract is for services, the Contractor fails to perform in the manner called for in the contract, or if the Contractor fails to comply with any other provisions of the contract, the Agency may terminate this contract for default. Termination shall be effected by serving a Notice of Termination on the Contractor setting forth the manner in which the Contractor is in default. The Contractor will be paid only the contract price for supplies delivered and accepted, or services performed in accordance with the manner of performance set forth in the contract. If it is later determined by the Agency that the Contractor had an excusable reason for not performing, such as a strike, fire, or flood, events which are not the fault of or are beyond the control of the Contractor, the Agency, after setting up a new delivery or performance schedule, may allow the Contractor to continue work, or treat the termination as a Termination for Convenience.

Opportunity to Cure (General Provision)

The Agency, in its sole discretion may, in the case of a termination for breach or default, allow the Contractor [an appropriately short period of time] in which to cure the defect. In such case, the Notice of Termination will state the time period in which cure is permitted and other appropriate conditions

If Contractor fails to remedy to Agency's satisfaction the breach or default of any of the terms, covenants, or conditions of this Contract within [10 days] after receipt by Contractor of written notice from Agency setting forth the nature of said breach or default, Agency shall have the right to terminate the contract without any further obligation to Contractor. Any such termination for default shall not in any way operate to preclude Agency from also pursuing all available remedies against Contractor and its sureties for said breach or default.

Waiver of Remedies for any Breach

In the event that Agency elects to waive its remedies for any breach by Contractor of any covenant, term or condition of this contract, such waiver by Agency shall not limit Agency's remedies for any succeeding breach of that or of any other covenant, term, or condition of this contract.

Termination for Convenience (Professional or Transit Service Contracts)

The Agency, by written notice, may terminate this contract, in whole or in part, when it is in the Agency's interest. If this contract is terminated, the Agency shall be liable only for payment under the payment provisions of this contract for services rendered before the effective date of termination.

Termination for Default (Supplies and Service)

If the Contractor fails to deliver supplies or to perform the services within the time specified in this contract or any extension, or if the Contractor fails to comply with any other provisions of this contract, the Agency may terminate this contract for default. The Agency shall terminate by delivering to the Contractor a Notice of Termination specifying the nature of the default. The Contractor will only be paid the contract price for supplies delivered and accepted, or services performed in accordance with the manner or performance set forth in this contract. If, after termination for failure to fulfill contract obligations, it is determined that the Contractor was not in default, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the Agency.

Termination for Default (Transportation Services)

If the Contractor fails to pick up the commodities or to perform the services, including delivery services, within the time specified in this contract or any extension, or if the Contractor fails to comply with any other provisions of this contract, the Agency may terminate this contract for default. The Agency shall terminate by delivering to the Contractor a Notice of Termination specifying the nature of default. The Contractor will only be paid the contract price for services performed in accordance with the manner of performance set forth in this contract.

If this contract is terminated while the Contractor has possession of Agency goods, the Contractor shall, upon direction of the Agency, protect and preserve the goods until surrendered to the Agency or its agent. The Contractor and Agency shall agree on payment for the preservation and protection of goods. Failure to agree on an amount will be resolved under the Dispute clause.

If, after termination for failure to fulfill contract obligations, it is determined that the Contractor was not in default, the rights and obligations of the parties shall

be the same as if the termination had been issued for the convenience of the Agency.

Termination for Default (Construction)

If the Contractor refuses or fails to prosecute the work or any separable part, with the diligence that will ensure its completion within the time specified in this contract or any extension or fails to complete the work within this time, or if the Contractor fails to comply with any other provision of this contract, Agency may terminate this contract for default. The Agency shall terminate by delivering to the Contractor a Notice of Termination specifying the nature of the default. In this event, the Agency may take over the work and complete it by contract or otherwise, and may take possession of and use any materials, appliances, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to the Agency resulting from the Contractor's refusal or failure to complete the work within specified time, whether or not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the Agency in completing the work.

The Contractor's right to proceed shall not be terminated nor shall the Contractor be charged with damages under this clause if: 1. The delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include: acts of God, acts of Agency, acts of another contractor in the performance of a contract with Agency, epidemics, quarantine restrictions, strikes, freight embargoes; and 2. The Contractor, within [10] days from the beginning of any delay, notifies Agency in writing of the causes of delay. If, in the judgment of Agency, the delay is excusable, the time for completing the work shall be extended. The judgment of Agency shall be final and conclusive for the parties, but subject to appeal under the Disputes clause(s) of this contract. 3. If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been issued for the convenience of Agency.

Termination for Convenience or Default (Architect and Engineering)

The Agency may terminate this contract in whole or in part, for the Agency's convenience or because of the failure of the Contractor to fulfill the contract obligations. The Agency shall terminate by delivering to the Contractor a Notice of Termination specifying the nature, extent, and effective date of the termination. Upon receipt of the notice, the Contractor shall (1) immediately discontinue all services affected (unless the notice directs otherwise), and (2) deliver to the Agency's Contracting Officer all data, drawings, specifications, reports, estimates, summaries, and other information and materials accumulated in performing this contract, whether completed or in process. Agency has a royalty-free, nonexclusive, and irrevocable license to reproduce, publish or otherwise use, all such data, drawings, specifications, reports, estimates, summaries, and other information and materials.

If the termination is for the convenience of the Agency, the Agency's Contracting Officer shall make an equitable adjustment in the contract price but shall allow no anticipated profit on unperformed services.

If the termination is for failure of the Contractor to fulfill the contract obligations, the Agency may complete the work by contract or otherwise and the Contractor shall be liable for any additional cost incurred by the Agency.

If, after termination for failure to fulfill contract obligations, it is determined that the Contractor was not in default, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of Agency.

Termination for Convenience or Default (Cost-Type Contracts)

The Agency may terminate this contract, or any portion of it, by serving a Notice of Termination on the Contractor. The notice shall state whether the termination is for convenience of Agency or for the default of the Contractor. If the termination is for default, the notice shall state the manner in which the Contractor has failed to perform the requirements of the contract. The Contractor shall account for any property in its possession paid for from funds received from the Agency, or property supplied to the Contractor by the Agency. If the termination is for default, the Agency may fix the fee, if the contract provides for a fee, to be paid the Contractor in proportion to the value, if any, of work performed up to the time of termination. The Contractor shall promptly submit its termination claim to the Agency and the parties shall negotiate the termination settlement to be paid the Contractor.

If the termination is for the convenience of Agency, the Contractor shall be paid its contract close-out costs, and a fee, if the contract provided for payment of a fee, in proportion to the work performed up to the time of termination.

If, after serving a Notice of Termination for Default, the Agency determines that the Contractor has an excusable reason for not performing, the Agency, after setting up a new work schedule, may allow the Contractor to continue work, or treat the termination as a Termination for Convenience.

VIOLATION AND BREACH OF CONTRACT

Rights and Remedies of the Agency

The Agency shall have the following rights in the event that the Agency deems the Contractor guilty of a breach of any term under the Contract.

1. The right to take over and complete the work or any part thereof as agency for and at the expense of the Contractor, either directly or through other contractors; 2. The right to cancel this Contract as to any or all of the work yet to be performed; 3. The right to specific performance, an injunction or any other appropriate equitable remedy; and 4. The right to money damages.

For purposes of this Contract, breach shall include.

Rights and Remedies of Contractor

Inasmuch as the Contractor can be adequately compensated by money damages for any breach of this Contract, which may be committed by the Agency, the Contractor expressly agrees that no default, act or omission of the Agency shall constitute a material breach of this Contract, entitling Contractor to cancel or rescind the Contract (unless the Agency directs Contractor to do so) or to suspend or abandon performance.

Remedies

Substantial failure of the Contractor to complete the Project in accordance with the terms of this Contract will be a default of this Contract. In the event of a default, the Agency will have all remedies in law and equity, including the right to specific performance, without further assistance, and the rights to termination or suspension as provided herein. The Contractor recognizes that in the event of a breach of this Contract by the Contractor before the Agency takes action contemplated herein, the Agency will provide the Contractor with sixty (60) days written notice that the Agency considers that such a breach has occurred and will provide the Contractor a reasonable period of time to respond and to take necessary corrective action.

Disputes

Disputes arising in the performance of this Contract that are not resolved by agreement of the parties shall be decided in writing by an authorized representative of Agency. This decision shall be final and conclusive unless within [10] days from the date of receipt of its copy, the Contractor mails or otherwise furnishes a written appeal to the Agency's authorized representative. In connection with any such appeal, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of its position. The decision of the Agency's authorized representative shall be binding upon the Contractor and the Contractor shall abide by the decision.

In the event that a resolution of the dispute is not mutually agreed upon, the parties can agree to mediate the dispute or proceed with litigation. Notwithstanding any provision of this section, or any other provision of this Contract, it is expressly agreed and understood that any court proceeding arising out of a dispute under the Contract shall be heard by a Court de novo and the court shall not be limited in such proceeding to the issue of whether the Authority acted in an arbitrary, capricious or grossly erroneous manner.

Pending final settlement of any dispute, the parties shall proceed diligently with the performance of the Contract, and in accordance with the Agency's direction or decisions made thereof.

Performance during Dispute

Unless otherwise directed by Agency, Contractor shall continue performance under this Contract while matters in dispute are being resolved.

Claims for Damages

Should either party to the Contract suffer injury or damage to person or property because of any act or omission of the party or of any of its employees, agents or others for whose acts it is legally liable, a claim for damages therefor shall be made in writing to such other party within a reasonable time after the first observance of such injury or damage.

Remedies

Unless this Contract provides otherwise, all claims, counterclaims, disputes and other matters in question between the Agency and the Contractor arising out of or relating to this Contract or its breach will be decided by arbitration if the parties mutually agree, or in a court of competent jurisdiction within the State in which the Agency is located.

Rights and Remedies

The duties and obligations imposed by the Contract documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law. No action or failure to act by the Agency or Contractor shall constitute a waiver of any right or duty afforded any of them under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

Federal Certifications

CERTIFICATION AND RESTRICTIONS ON LOBBYING

James A. Doyle, Vice President hereby certify
(Name and title of official)

On behalf of AECOM Technical Services, Inc. that
(Name of Bidder/Company Name)

- No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative agreement.
- If any funds other than federal appropriated funds have been paid or will be paid to any person influencing or attempting to influence an officer or employee of any agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with the federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including sub-contracts, sub-grants and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The undersigned certifies or affirms the truthfulness and accuracy of the contents of the statements submitted on or with this certification and understands that the provisions of 31 U.S.C. Section 3801, et seq., are applicable thereto.

Name of Bidder/Company Name: AECOM Technical Services, Inc.

Type or print name: James A. Doyle

Signature of authorized representative: [Signature] Date 11 / 17 / 2020

Signature of notary and SEAL: [Signature]



**GOVERNMENT-WIDE DEBARMENT AND SUSPENSION
(NONPROCUREMENT)**

Instructions for Certification: By signing and submitting this bid or proposal, the prospective lower tier participant is providing the signed certification set out below.

(1) It will comply and facilitate compliance with U.S. DOT regulations, "Nonprocurement Suspension and Debarment," 2 CFR part 1200, which adopts and supplements the U.S. Office of Management and Budget (U.S. OMB) "Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement)," 2 CFR part 180,

(2) To the best of its knowledge and belief, that its Principals and Subrecipients at the first tier:

a. Are eligible to participate in covered transactions of any Federal department or agency and are not presently:

1. Debarred,
2. Suspended,
3. Proposed for debarment,
4. Declared ineligible,
5. Voluntarily excluded, or
6. Disqualified,

b. Its management has not within a three-year period preceding its latest application or proposal been convicted of or had a civil judgment rendered against any of them for:

1. Commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction, or contract under a public transaction,
2. Violation of any Federal or State antitrust statute, or,
3. Commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making any false statement, or receiving stolen property,

c. It is not presently indicted for, or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses listed in the preceding subsection 2.b of this Certification,

d. It has not had one or more public transactions (Federal, State, or local) terminated for cause or default within a three-year period preceding this Certification,

e. If, at a later time, it receives any information that contradicts the statements of subsections 2.a – 2.d above, it will promptly provide that information to FTA,

f. It will treat each lower tier contract or lower tier subcontract under its Project as a covered lower tier contract for purposes of 2 CFR part 1200 and 2 CFR part 180 if it:

1. Equals or exceeds \$25,000.,
2. Is for audit services, or,
3. Requires the consent of a Federal official, and

g. It will require that each covered lower tier contractor and subcontractor:

1. Comply and facilitate compliance with the Federal requirements of 2 CFR parts 180 and 1200, and
2. Assure that each lower tier participant in its Project is not presently declared by any Federal department or agency to be:

- a. Debarred from participation in its federally funded Project,
- b. Suspended from participation in its federally funded Project,
- c. Proposed for debarment from participation in its federally funded Project,
- d. Declared ineligible to participate in its federally funded Project,
- e. Voluntarily excluded from participation in its federally funded Project, or
- f. Disqualified from participation in its federally funded Project, and

3. It will provide a written explanation as indicated on a page attached in FTA's TrAMS platform or the Signature Page if it or any of its principals, including any of its first tier Subrecipients or its Third-Party Participants at a lower tier, is unable to certify compliance with the preceding statements in this Certification Group.

(3) It will provide a written explanation as indicated on a page attached in FTA's TrAMS platform or the Signature Page if it or any of its principals, including any of its first tier Subrecipients or its Third-Party Participants at a lower tier, is unable to certify compliance with the preceding statements in this Certification Group.

Certification

Contractor: AECOM Technical Services, Inc.

Signature of Authorized Official: _____ Date 11 / 17 / 2020

Name and Title of Contractor's Authorized Official: James A. Doyle, Vice President