ATTACHMENT A

Scope of Work

SCOPE OF WORK

I. OVERVIEW

A. The intent of this solicitation and resulting Contracts is to obtain on-call professional planning, environmental, concept/preliminary design, final design, construction administration, and construction management services in support of VRE's system planning program, project development, projects leading directly to construction or repair of new or existing facilities, rolling stock, equipment, infrastructure, and services. The selected consulting firms are referred to herein as either the "Consultant" or the "Contractor." If the firms choose to use the services of Subconsultant(s), they will be referred to either as the "Subconsultant(s)" or "Subcontractor(s)."

B. The General Planning and Engineering Consulting (GPEC) Services Contract will not be separated into program areas; each Consultant will have the opportunity to compete for all GPEC Task Orders initiated by VRE through a prescribed evaluation process defined by VRE.

C. The Consultant shall furnish all facilities, labor, materials, and equipment necessary to perform the work as stated herein. The work will be divided into individual projects, Task Orders, with each task representing a logical package based upon the size and location of the work, as well as operational requirements. A separate Scope of Work (SOW) and Notice-To-Proceed (NTP) will be issued for each Task Order.

D. The selected on-call Consultants shall be the principal source providing consulting services to VRE on an as-needed basis to support system planning and project development for VRE infrastructure, including: short- and long-range strategic or system planning; service and operational planning; feasibility studies and other planning or pre-design studies and investigations; conceptual design; preliminary engineering design; environmental review including National Environmental Policy Act (NEPA) or Virginia Environmental Impact Review (EIR) compliance and/or other regulatory permitting analyses; real estate acquisition support services; data collection and analysis; project implementation for VRE infrastructure design and construction, including pre-design analysis and investigations, conceptual design, preliminary engineering, final design, preparation of design and contract documents for the implementation of individual construction projects; procurement support services; full construction management services; project

closeout documentation; National Transit Database (NTD) sampling and reporting support; GIS mapping and spatial data management; and where applicable, ensure compliance with state or federal environmental and/or regulatory permitting requirements and other services as may be requested by VRE.

E. A general description of the services to be performed is provided in this Scope of Work. The term "railroad" is referred to herein as pertaining to operations or facilities under the regulatory jurisdiction of the Federal Railroad Administration (FRA). The term "railway" is referred to herein as pertaining to operations or facilities under the regulatory jurisdiction of the Federal Transit Administration (FTA). The term "rail" shall pertain equally to "railroad" and "railway."

II. GENERAL REQUIREMENTS

A. The Consultant shall furnish all labor (including all required professional disciplines), supervision, materials, supplies, equipment and transportation to provide a range of services to include planning studies, surveying, related studies, investigations, pre-design programming, concept design, design development, construction drawings and specifications, design scheduling, construction phasing and scheduling, cost estimating, value engineering, procurement support, construction administration, construction management and construction inspection (special inspection) services as may be requested by VRE.

B. The Consultant's work shall be managed at VRE's Headquarters Office under the direction of VRE's designated GPEC Project Manager(s) responsible for respective Task Orders.

C. The Consultant shall assign a Project Manager who will be responsible for VRE/Consultant coordination on all individual Task Order assignments. The Project Manager shall be responsible for all project matters for the Consultant and shall be available for all required project meetings.

D. The Consultant shall ensure that tasks are accomplished and managed by qualified planning, design, engineering, and construction management professionals.

E. VRE will assume full and complete ownership of all deliverables and all final documents under this Contract. All source files associated with deliverables

enumerated in Task Orders shall be delivered to VRE in their native source format(s) as soon as practicable at the close of each Task Order.

F. The Consultant shall be responsible for, but not be limited to, the following work activities on a Task Order basis:

1. Plan, design, and manage construction of projects in compliance with VRE guidelines for design, and specifications for construction, and other guidance and practices.

2. Execute tasks in accordance with VRE policies and procedures for project management, including the use of project controls software (e.g. e-Builder/Trimble Unity Construct). Confirm the agreed upon procedures and platform with the VRE Project Manager.

3. Comply with applicable federal, state and local grant requirements.

4. Ensure all applicable environmental, procurement, design and construction regulations and guidelines are adhered to based on the project scope, funding source(s), and other relevant factors.

III. STRATEGIC AND OPERATIONS PLANNING

A. The services to be provided under strategic and operations planning may cover the full range of activities required by federal, state, regional and local processes for rail and public transportation planning. Potential services to be provided may include, but are not limited to, the following.

1. Prepare or update VRE strategic and system planning documents including the long-range System Plan, Transit Development Plan, Rail Fleet Management Plan, and other system-level planning documents.

2. Review and conduct service and operations planning and analysis including ridership demand or market forecasts using travel demand models, sketch planning, or other methods. Develop or evaluate service/operating scenarios utilizing operational models, simulations, or other tools to estimate service feasibility, operating costs and revenues.

3. Conduct financial analysis, including fare analysis, estimation of operating costs and revenues or cost-benefit analysis, and prepare financial plans to support VRE planning, operations, and decision-making.

4. Develop federal, state, or regional grant applications.

5. Perform data collection, general population and targeted surveys, general research, and analysis of travel markets and behavior, demographic and economic trends, Title VI compliance, transportation system performance measurement or evaluation, and emerging planning areas, such as sustainability and resiliency, to inform VRE planning and decision making.

6. Provide public involvement and stakeholder coordination support in conjunction with the above services.

7. Provide GIS mapping support, perform geospatial analyses, prepare data and graphic visualizations, and provide other graphic design support for printed and web-based documents and materials in conjunction with the above services.

8. Conduct field (including onboard VRE trains) collection of service data and statistical analysis to support VRE monthly and annual National Transit Database (NTD) reporting consistent with established guidelines and procedures.

9. Conduct monitoring and testing, update plans or other documents, and other services in support of VRE environmental compliance activities, such as Virginia Pollutant Discharge Elimination System (VPDES) Industrial Stormwater General Permits or other permits or regulatory requirements.

IV. STATION AND FACILITIES PLANNING AND PRELIMINARY DESIGN

A. The services to be provided under station and facility planning and preliminary design may cover the full range of activities required by federal, state, regional and local processes for rail and public transportation project development, including planning, environmental review, and preliminary design. Services may be requested in support of the following facility categories:

1. Passenger stations, to include platforms and canopies, surface or structured parking, vehicle, pedestrian and bicycle access, utilities, and stormwater management.

2. Equipment storage and maintenance facilities, to include storage and lead tracks, shops and support facilities, laydown areas, utilities, and stormwater management.

3. Tracks, structures, and signals, to include utilities and stormwater management.

4. Conduct feasibility studies, site master plans, alternatives analysis, or other pre-design studies and investigations in support of new or rehabilitated VRE facilities.

5. Develop incremental architectural/engineering designs (i.e., schematic design, conceptual design, preliminary design (up to 30%) to advance project development for new or rehabilitated VRE facilities, including plans, renderings, construction phasing and field investigations to confirm design requirements such as traffic studies (e.g., auto, pedestrian, bicycle, local transit, etc.), geotechnical investigations, and property, topographic, utility or other site surveys.

6. Prepare project or construction cost estimates for new or rehabilitated VRE facilities based on project plans at various levels of design. Apply available industry cost indices, including but not limited to, location factors, historical factors, size factors, complexity factors, and escalation factors to reflect current local market conditions.

7. Prepare project or construction schedules for new or rehabilitated VRE facilities based on project plans at various levels of design.

8. Conduct, in whole or in part, environmental analysis of the above facility types as required by the National Environmental Policy Act (NEPA) Virginia Code, and other federal, state, and local laws or regulations (e.g., Section 106, Section 4(f), threatened and endangered species, wetlands determinations or permits, etc.), and/or agency need. Prepare all necessary technical reports, appendices, memoranda, and required environmental permits.

9. Conduct analysis and prepare documentation to ensure compliance with Americans with Disabilities Act Accessibility Guidelines (ADAAG) and U.S. Department of Transportation (USDOT) requirements for transportation facilities.

10. Provide real estate acquisition services and support including title search, appraisals, appraisal review, negotiation support, relocation support, utility location, survey, and plats in compliance with federal (FTA) and state real estate acquisition laws and regulations.

11. Provide public involvement and stakeholder coordination support in conjunction with the above services.

12. Provide GIS mapping support, prepare graphic visualizations and presentations, and provide other graphic design support for printed and web-based documents and materials in conjunction with the above services.

V. CONSTRUCTION MANAGEMENT

A. The Consultant shall provide full construction management services to make certain that work is performed in conformity to the construction contract plans, specifications, and applicable codes, regulations, and standards.

1. Construction management services include services necessary to oversee construction of the project, including consultation during all phases of construction.

2. Construction management services may include pre-construction services, providing review of project documents and site conditions to assess and mitigate potential construction risks. Services may include, but are not limited to, review of plans and specifications, evaluation of project phasing, staging and scheduling, and development of independent cost estimates.

3. Projects may include, but are not limited to, station and yard projects (e.g., platforms, canopies, station stairs, parking (surface lots and/or structured), elevators, lighting, security, and fencing) and new track or building facilities.

B. Construction Management services may include, but are not limited to, the following:

1. On-site construction management support for facility, track and station construction or repair projects.

2. Conduct constructability reviews with attention to railroad operations, utilities and other major factors influencing construction.

3. Provide construction project administration and schedule review.

4. Review, process, and approve submittals, shop drawings, product data, samples, and test reports for compliance with project requirements.

5. Review and process Requests for Information (RFI).

6. Provide on-site construction inspection and management, involving part-time or full-time resident engineering and inspection (e.g., inspection of work for conformance with contract documents, conformance with safety requirements, other field services, and reporting) and construction administration.

7. Observe and review performance tests as required by specifications.

8. Coordinate material testing, including facilities, equipment and devices.

9. Perform construction surveying to validate/verify work performed by others.

10. Coordinate multiple one-location or adjacent contractor activities.

11. Review and oversee contractor activities and safety programs at a single worksite or multiple worksites.

12. Ensure that necessary clearances and safety measures are maintained.

13. Conduct on-site noise and vibration monitoring.

14. Provide change order management and resolution.

15. Review and validate invoices from contractors, subcontractors, and vendors.

16. Conduct final inspections, including verifying punch list completion.

17. Assist with the acceptance of beneficial use and commissioning of projects.

18. Perform project closeout and coordination, including record documents and final reports.

19. Monitor the performance of host railroad-led construction projects.

20. Conduct constructability reviews.

21. Review construction phasing plans.

22. Monitor project schedule and costs

23. Monitor the quality of workmanship.

24. Coordinate and advise the VRE Project Manager of construction progress (schedule), unusual disruptions, potential changes, and potential Change Orders.

25. In conjunction with, and following approval from the VRE Project Manager, take action to mitigate actions that may lead to claims and/or stop work orders and resolve potential conflicts as promptly as possible.

26. Attend and participate in the construction contract pre-bid meeting and site visit and pre-construction conference (if applicable).

27. Assist the VRE Project Manager and Contract Administrator with review and evaluation of bid submittal materials from contractors for compliance and completeness.

VI. ENGINEERING SERVICES

A. **General Services:** Enumerated below are services the VRE may request for any one of the specific Service Categories listed in Section VI.B below.

1. Perform engineering calculations and prepare sealed final design and construction documents (100% Plans and Specifications).

2. Architectural/engineering support for construction or repairs of VRE facilities/infrastructure.

3. Develop incremental designs (i.e., 30%, 60% and 90%) and review designs by others.

4. Develop construction phasing and maintenance of traffic plans for trains, automobiles, bicycles, pedestrians, local transit, and emergency vehicles during construction.

5. Provide project level planning/environmental/engineering support through the completion of design activities such as NEPA compliance, permitting, or stakeholder engagement.

B. **Service Categories:** The Consultant shall provide design services under the following seven (7) service categories plus ancillary support.

1. **Shops and Yards**

Examples of potential task assignments include, but are not limited to, the following:

a. Design shop and yard renovations, expansions and repairs (e.g., storage and lead tracks, maintenance facilities, lighting, utilities, laydown areas, wayside air, water and power).

b. Shop configuration and layouts.

c. Design shop and yard safety improvements.

d. Mechanical and utility design.

2. **Passenger Facilities**

Examples of potential task assignments include, but are not limited to, the following:

a. Design of new/rehabilitated station buildings, platforms, canopies or passenger shelters and parking (surface lots and/or structured).

b. Americans with Disabilities Act (ADA) level boarding analysis.

c. Pedestrian walkway, bridge or tunnel design.

d. Station safety modifications.

e. Station lighting upgrades.

f. New/rehabilitated elevator design.

g. Drainage and stormwater management systems.

h. Mechanical selection, design, and repair details.

i. Structural inspection/condition assessment, and/or repair plans.

j. Utility protection/relocation coordination, design and details.

3. **Track, Structures and Signals**

Examples of potential task assignments include, but are not limited to, the following:

a. New track design or design review.

b. Lead track design or design review

c. Roadway civil improvements.

d. Track inspection.

e. Wayside utility design.

f. Drainage and stormwater management design.

g. Perimeter or right-of-way fencing design.

h. Signal design or design review including aspect charts.

i. Railroad bridge inspection and loading evaluation.

4. **Telecommunications, Security and Intelligent Transportation Systems (ITS)**

Examples of potential task assignments include, but are not limited to, the following:

a. Parking management system design and improvements.

b. Passenger information system design and improvements.

c. Security camera and lighting design and retrofits.

d. Design configuration management.

e. ITS technology consulting.

f. Ticket Vending Machine (TVM) or Variable Messaging System (VMS) design and detailing.

5. **Geotechnical and Permitting Services**

Examples of potential task assignments include, but are not limited to, the following:

a. Geotechnical and permitting support for VRE facilities to include design, construction, maintenance and repair projects for track, station, shop and yard improvements.

b. Verify geotechnical subsurface soil conditions by analyses and recommendations.

c. Prepare soil boring requests and completion.

d. Prepare drainage, stormwater management, and stormwater pollution prevention plans, permits and compliance coordination as required for the National and Virginia Pollutant Discharge Elimination Systems (N/VPDES), as well as stormwater prevention plans and Total Maximum Daily Load (TMDL) calculations.

e. Provide materials and laboratory testing services.

f. Perform geotechnical engineering and provide an expert opinion and recommendations.

g. Conduct soil borings for new pedestrian bridges, tunnels and platforms as well as roadway civil improvements.

h. Provide materials testing for foundation studies for new structures.

i. Test soils, asphalt, cement/concrete, aggregates, bituminous products, and industrial coatings at yard facilities.

j. Evaluate storm water modifications based on upgrade requirements.

k. Obtain permits and right-of-entry agreements for station and yard construction.

l. Provide permit compliance coordination.

6. **Land and Survey Services**

Examples of potential task assignments include, but are not limited to, the following:

a. Provide support for the design and construction of VRE facilities and design, construction, maintenance and repair projects, to include track, station, shop and yard improvements.

b. Obtain all necessary dimensions, property limits, physical, and functional data.

c. Conduct rail, drainage, or topographic and planimetric surveys.

d. Obtain utility identification and location.

e. Identify property limits, ownership, and prepare plats and deeds with property descriptions.

f. Verify topographic and boundary surveys.

g. Prepare as-built surveys, track profile surveys, property limit, right-of-way, and easement surveys.

h. Display information in electronic format as base mapping.

i. Conduct field survey and right-of-way services for storage yard expansion.

j. Conduct field survey for station platform extension.

k. Conduct utility locating for new track storage sidings.

l. Prepare survey requests for new train storage locations.

m. Identify ownership of affected properties for station expansion.

7. **Ancillary Facilities and Project Management Support**

Examples of potential task assignments include, but are not limited to, the following:

a. Conduct station traffic circulation studies (e.g., auto, pedestrian, bicycle, local transit, etc.).

b. Develop and update guidelines, specifications, and standard drawings for stations, parking, maintenance and storage facilities, and track alignment.

c. Provide architectural, interior design, structural, electrical, and/or mechanical engineering design services for VRE offices.

d. Conduct constructability reviews with attention to railroad operations, utilities and other major factors influencing construction.

e. Update VRE's design guidelines.

f. Provide design support for fixed signage and wayfinding.

g. Perform conceptual or preliminary design for lighting and other security projects.

h. Prepare NEPA documentation for the proposed expansion of existing right-of-way to accommodate additional track for storage and operational flexibility.

C. **Specific Requirements:** If required by the Task Order, the Consultant shall perform and deliver services that satisfy the following requirements.

1. Ensure that plans and designs produced meet generally accepted architecture and engineering procedures and fully comply with Federal, State and Local requirements, as well as applicable rules, ordinances, regulations and building codes, including the American Railway Engineering and Maintenance-of-Way Association (AREMA), CSX Transportation (CSXT), Norfolk Southern Corporation (NS), Amtrak, FTA and FRA. Additionally, all jurisdictional guidelines for projects in that jurisdiction shall be complied with as applicable.

2. Conduct field investigations to evaluate existing facilities and structures, collect relevant data, and determine existing conditions affecting project design. Prepare photos, drawings, renderings, and schematics as necessary.

3. Establish design guidelines, specifications, and standard drawings. Prepare a basis-of-design documents.

4. Provide preliminary and/or final design and all necessary support services to conduct a traditional design-bid-build or alternate procurement method to include, but not limited to, Design-Build, Construction Manager at Risk (CMAR), Construction Manager/General Contractor (CM/GC), etc., Design documents shall be detailed to permit contractors to submit responsive bids.

5. Review third-party preliminary design documents to ensure compliance with applicable rules, ordinances, regulations and applicable building codes, and provide value engineering.

VII. COST ENGINEERING

A. It is imperative that VRE document anticipated project costs throughout the life of a project. For this reason, VRE is seeking Cost Engineering services as part of the GPEC Contract as enumerated below. VRE has developed a Project Cost Tool that employs prescribed pay items. All cost reports must be prepared and delivered in this format, however, it is at the GPEC Consultant's discretion as to how such costs are derived. The Consultant shall have

experience in a wide range of project types and an understanding of regional impacts on pricing. All work shall be performed in accordance with established industry standards and recommended practices, including but not limited to, Project Management Institute (PMI), Association for the Advancement of Cost Engineering International (AACEI) or a similar professional association.

B. Prepare a Probable Estimate of Anticipated Construction Costs. VRE prefers that the Consultant be familiar with the railway industry and its estimators be Certified Cost Estimator/Analyst (CCEA) or hold a similar professional certification.

C. Calculate and document estimated quantities based on project plans at various levels of design. Apply available industry cost indices, including but not limited to, location factors, historical factors, size factors, complexity factors, and escalation factors to reflect current local market conditions. Include overhead, profit, contingencies, general conditions, cost escalation based on project schedule, and similar required or normal expenses associated with a typical project to arrive at a final anticipated cost of construction.

    1. Document all methodologies and assumptions and identify major areas of potential change or risk.

D. Analyze bids, assess proposals, participate in negotiations, and support project coordination, pre-construction services and administration.

E. Conduct price and/or cost analyses as required.

F. Evaluate cost estimates prepared by others, including historical estimates by VRE.

G. Review other value engineering proposals prepared by others.

H. Perform value engineering analysis for VRE projects.

I. Prepare cost estimates for change orders and support change order negotiations.

J. Prepare change order cost analysis including establishing a fair and reasonable cost for authorized changes.

K. Prepare and update Independent Cost Estimates for capital construction project budget development and master planning estimates including life cycle costing, operational costs, and cash flow projections to ensure projects are accurately budgeted and funded. These estimates will serve as the basis of the capital project budget approvals required by VRE.