RTA

New Orleans Regional Transit Authority

Zero-Emission, Resilient Fleet Planning

RTP #: 2024-01
Project #: 2023-FL-02

January 2024

MSMM ENGINEERING, LLC

Jacobs

MSMM
ENGINEERING, LLC

January 31, 2024

SUBMITTED VIA EMAIL

New Orleans Regional Transit Authority
2817 Canal St
New Orleans, LA 70119

Subject: Request for Technical Proposals (RTP) Zero-Emission, Resilient Fleet Planning

Dear Members of the Selection Committee:

Congratulations on successfully securing your $71.4 million Low/No Vehicle Emission Grant award from the Federal Transit Administration (FTA). Our team is excited about the opportunity to assist RTA as you begin your process of modernizing your zero-emission, resilient fleet, as well as developing the workforce required to support it.

MSMM, in partnership with Jacobs, is pleased to present this proposal for services related to your RTP 2024-01. Our team has reviewed your Low/No grant award and has developed a strong understanding of the work required to help you plan and program the critical decisions and first steps in implementing your project. Based on this understanding, we will leverage our significant expertise in transit fleet electrification and project implementation to help RTA select the best delivery method for the project and develop potential concept plans that can demonstrate the feasibility of utilizing existing sites for the project.

Our MSMM and Jacobs team provide the best combination of personnel to accomplish these tasks. Scott Chehardy (MSMM) will serve as our Principal-in-charge and partner with our Project Manager, Stefan Bourgeois (Jacobs), both of whom live and work in the New Orleans area. Scott and Stefan are uniquely familiar with RTA's mission, the local market conditions, and site constraints that would influence the decision-making for the project. These local insights will be matched by our team's national expertise in transit fleet electrification to ensure that best practices and lessons learned from across the nation are brought to RTA. Dieckmann Cogill, Marc Manning, and David Nyguen are leaders in the field of electrification and transit planning, and their knowledge will inform our team's efforts to define your project, layout a concept plan for each site, and then help you future-proof any decisions you may want to make for the project on each site. Through our team's deep knowledge of transit electrification and proven track record of project implementation, we know that this approach will provide RTA with the needed information to set a course for long-term success on this critical project.

Please feel free to contact me anytime if further discussions are needed regarding the attached.

Sincerely,
MSMM Engineering, LLC

Manish Mardia, P.E.
President

Enclosures

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1 – Contractor Information

As requested in the RTP, below is our contractor information.

Contractor Name: MSMM Engineering, LLC
Contractor Address: 4640 S. Carrollton Avenue, Suite 220, New Orleans, LA 70119
Name of Contact Person: Manish Mardia, P.E.
Contact Phone Number: 504-559-1897
Contact Email Address: mmardia@msmmeng.com
Date Submitted to RTA: January 31, 2024

2 – Project Understanding

Based on our review of your RTP and our additional research into your program, we understand that the goal of this scope of work is to move RTA toward execution of the $71.4 million FY2023 FTA Lo/No Vehicle Emission Grant award (the project). More specifically, the scope of this work will center on two primary objectives:

1. Assist RTA in evaluating and selecting the most advantageous and beneficial project delivery method for the project, and
2. Evaluate whether to deploy the charging infrastructure and the microgrid at RTA's A. Phillip Randolph Facility or at your New Orleans East Facility (or at both).

To effectively address and achieve these project objectives, our team has worked to understand the background and basis upon which RTA was awarded the grant and how RTA works each day to meet its obligation to provide safe, efficient, and reliable public transit services for our community. We have examined RTA's charter and its duty to provide safe, reliable public transportation for the New Orleans region; we have reviewed your Zero-Emission Fleet Transition Plan and its goal to achieve a 75% zero-emission bus fleet by 2030; and we have reviewed and evaluated your recent Lo/No grant award and its stipulations compared to your original submission. Based on our preliminary research and our past work with your RTA team, we offer the following understanding of our basic work program.

In terms of identifying, evaluating, and selecting the most beneficial project delivery method for RTA, we will leverage our extensive experience in the field of transit fleet electrification across the U.S. to help RTA select the best delivery method that meets their goals. In our experience, there is no inherently best model for all projects or circumstances and the best choice depends on a range of factors and RTA's objectives. We will focus our attention on the following factors that invariably dictate the delivery method:

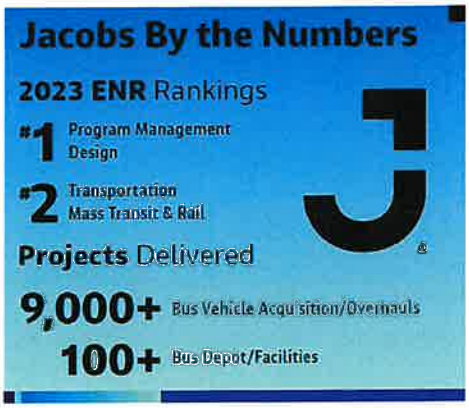
- Nature and complexity of the project
- Control of project costs
- Owner's staff availability and expertise
- Management and allocation of risk
- Schedule compliance and acceleration
- Procurement constraints

In terms of evaluating the most appropriate site(s) for the proposed project and charging facilities, we have reviewed the two potential projects sites identified in the RTP, the A. Phillip Randolph Facility and the New Orleans East facility. While both alternatives appear to be viable, the site evaluation and planning effort will determine whether the sites are of an adequate size and shape to accommodate the new charging infrastructure. It will also address the critical issues surrounding resiliency and reliability of electrical power infrastructure at each location, determining whether there is adequate power from the utility to support RTA's needs. Resiliency is a particularly important consideration due the challenges posed to the region from strong storms impacting power availability and RTA's critical role in natural disaster response.

In the end, RTA will have a clear direction on how to deliver the project and a comprehensive evaluation of the optimal location for the project.

3 – Experience

Our team is bringing RTA our world-class expertise in transit decarbonization and project implementation. We will leverage this expertise to help RTA consider the pros and cons of various project delivery methods, to evaluate the candidate sites, and to develop a preliminary project site plan. Factors such as delivery schedule, cost control, the ability of RTA to provide input, and ownership of risk become critical when selecting a project delivery method. This is particularly true in light of evolving technology risk, cost escalation, and recent supplier consolidations and bankruptcies. We will layer our deep knowledge of transit electrification and our proven track record of project implementation to set RTA up for long-term success on this critical project.



Our team's relevant experience will inform every aspect of our approach to RTA's zero-emission, resilient fleet planning project. We have provided selected examples of the team's experience managing similar projects relevant to RTA's scope of services. At the end of this section, we have provided a table (Exhibit 3-1) of our most recent EV facility and infrastructure projects with transit agencies across the U.S. While not a comprehensive list of our past performance, these projects demonstrate our successful track record of coordinating with transit agencies, their various departments, stakeholders, and outside agencies to achieve our clients' objectives. In addition to this experience, the RapidRide I Line 1 project from our submitted qualifications is relevant, as it demonstrates expertise with bus operations bus project concept development and design.

BEB Charging Infrastructure and Facility Upgrades, Boise, ID

Jacobs is providing turnkey design-build services to the Valley Regional Transit (VRT) for the design and installation of battery-electric bus (BEB) charging infrastructure at the Orchard Facility Bus Depot (overnight charging) and the Main Street Station (enroute charging). The design also includes the provision of 2.5MW of new electrical service to Main Street Station.

Jacobs assisted in the grant application development of the Federal Transit Administration (FTA) Low or No Emission Vehicle Competitive Grant Program. VRT was ultimately awarded an FTA Low-No grant of $17.4M and will use this award as well as $2.6M in local matching funds to purchase up to eight electric buses and the associated charging infrastructure and system improvements. Approximately half of the grant funds are anticipated to be used for bus procurement and the other half for design, procurement, and construction of the infrastructure improvements.

Project Relevance

- Preliminary design, cost estimating, programming, and site selection analysis for proposed BEB facility
- Assisted Owner in development of FTA Lo/No Grant application and continued coordination with FTA
- Project delivery evaluation and analysis with Owner to arrive at a progressive design-build delivery model
- Grant award includes workforce training funding that will go towards workforce development/training to maintain and operate BEBs and charging infrastructure.

Reference: Joe Guenther, Capital Project Manager, jguenther@valleyregionaltransit.org, 208.258.2705

Zero-Emission Bus Transition Blueprint, Santa Clara County, CA

The Jacobs team is developing a comprehensive ZEB Transition Blueprint plan for the Santa Clara Valley Transportation Authority (VTA). The plan will provide technical expertise in the areas of ZEB technology and charging, facility planning, transit operations, energy management, and ZEB funding. The process will result in a high-level plan for VTA's zero-emission bus transition that identifies an implementation plan and near-term next steps for the zero-emission transition process.

The ZEB Blueprint requires balanced approaches for sequencing capital investment, community benefit, resiliency needs, and evolving technology in a way that is inclusive of multiple needs and viewpoints. The implementation planning must be staged to align with cash flow, operational capability and facility condition, resiliency needs, power infrastructure, capital requirements, and technology evolution.

Project Relevance

- Equity and Resiliency Analysis and recommendations included in the Strategy to ensure long term fairness and sustainability of the program and bus service
- Comprehensive review of facility programming, site and location analysis and electrical grid capabilities for proposed Bus fleet charging stations, maintenance facilities, etc.
- Provides step by step strategy and implementation plan for transitioning rubber tire fleet to zero emission vehicles for the Authority

Reference: Adam Burger, Innovation Mobility and ZEB Program Manager, Adam.Burger@vta.org, 408.546.7923

Zero-Emission Fleet Transformation Study, New York, NY

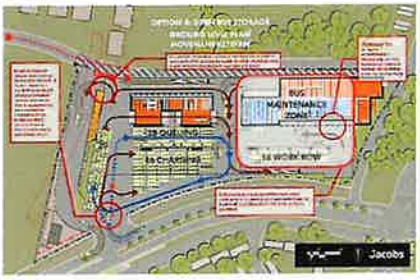
The Metropolitan Transportation Authority (MTA), which operates the nation's largest bus fleet, is committed to transitioning its 5,800 buses to a zero-emissions fleet by 2040. Jacobs is helping MTA achieve this goal by evaluating existing conditions at MTA's 28 bus depots along with the modifications and technologies needed to implement the Zero Emission Fleet Transition. We developed a defensible decision-making methodology based on factors such as equity, operational feasibility, cost, and schedule. We then facilitated a series of workshops with MTA staff as they considered several proposed alternative approaches to transition their bus network.

Project Relevance

- Comprehensive evaluation and analysis of transitioning bus fleet to electric vehicles
- Site and facility programming and preliminary design concepts of EV charging sites, facilities and networks
- Implementation planning and decision-making to identify potential project delivery methods

Reference: Sunil G. Nair, Chief Officer, Zero-Emission Fleet Transformation, sunil.nair@nyct.com, M: 646.574.2413, O: 646.252.1043

Facility Modernization Program, Boston, MA



We are the program manager for the Massachusetts Bay Transportation Authority's (MBTA's) Bus Facility Modernization Program, a once-in-a-generation, multi-stage effort to deliver a modernized network of bus maintenance facilities, right sized to support current and future operations, and support the transition of MBTA's 1,100 bus fleet to all-electric battery-electric buses (BEB) through facility upgrades.

Project Relevance

- Engagement and coordination with FTA's Zero Emissions Fleet grant program and funding
- Comprehensive evaluation and analysis of transitioning bus fleet to electric vehicles
- Assessment of the system-wide electrical grid and charging infrastructure to ensure adequate, sustainable and resilient power grid to support long term goals

Reference: Scott Hamwey, Director of Bus Modernization, shamwey@mbta.com, 617.686.6711

Exhibit 3-1. Related and Relevant Project Experience. *The table below indicates the breadth and depth of our most recent work with public transportation agencies to transition their fleet to zero emissions and provide for a resilient and sustainable future.*

Project, Location, Firm	Contract Duration	Project Management	Bus Operations, Maintenance, Service Planning, & Scheduling	Zero Emissions Facility Design	Zero-Emissions Vehicles & Propulsion Systems	BEB Charging Infrastructure	Alternative Fuels	Power Supply, Energy Modeling & Cost Analysis	Capital Project Planning, Estimating, and Scheduling	Environmental Impact & Environmental Justice	Grants & Funding
SFMTA Vehicle Engineering and BEB Procurement | San Francisco, CA. *Jacobs**	2009 – 2020 (Vehicle Eng.) 2020 – Ongoing (BEB Procurement)	●		●	●				●		
MTA Zero Emissions Fleet Transformation Study | New York, NY. *Jacobs**	2022 - Ongoing	●	●	●	●	●	●	●	●	●	●
MBTA Bus Facilities Modernization Program | Boston, MA. *Jacobs**	2020 - Ongoing	●	●	●	●	●	●	●	●	●	●
NJ TRANSITGRID Microgrid Power System | Jersey City, NJ. *Jacobs*	2016 - Ongoing	●						●	●	●	●
WMATA Vehicle Engineering Consulting Services | District of Columbia. *Jacobs*	2000 - Ongoing	●		●	●				●	●	
King County Metro, South Annex Bus Base and Facilities Maintenance Plan | Seattle, WA. *Jacobs*	2017 - Ongoing	●	●	●	●	●			●	●	●
DC Circulator Facility Design | District of Columbia. *Jacobs*	2021 - Ongoing	●		●	●	●	●	●	●		
Toronto Transit Commission (TTC) Technical Requirements for Depot Charging Infrastructure | Toronto, ON. *Jacobs*	2019	●		●	●	●	●	●	●		
TTC Bus Specification Review | Toronto, ON. *Jacobs*	2020	●	●	●	●		●		●		
Valley Regional Transit Low-No Grant | Boise, ID. *Jacobs and CTE*	2022 - Ongoing	●	●	●	●	●		●	●		●
NJ Transit Zero Emissions Systems Planning & Engineering Research Partnership Program | Newark, NJ. *Jacobs and CTE*	2022 - Ongoing			●	●	●	●	●	●		
RTC Program Management for Overall Regional Transit Plan | Las Vegas, NV. *Jacobs and CTE*	2016 - Ongoing	●	●	●	●	●	●	●			
VTA On-Call Planning Bench. *Jacobs*	2022 - Ongoing									●	
SFMTA Geary Bus Rapid Transit | San Francisco, CA. *Jacobs*	2013 - 2014	●							●		
BART Station Replacement, Fremont and Coliseum | San Francisco, CA. *Jacobs*	2017	●							●		
BART Transbay Corridor Core Capacity Program | San Francisco, CA. *Jacobs*	2017 - Ongoing	●							●		●

4 – Project Team

Our project team is lean and efficient, bringing expertise from similar projects completed around the country. The project organization structure ties directly into the project scope and deliverables.

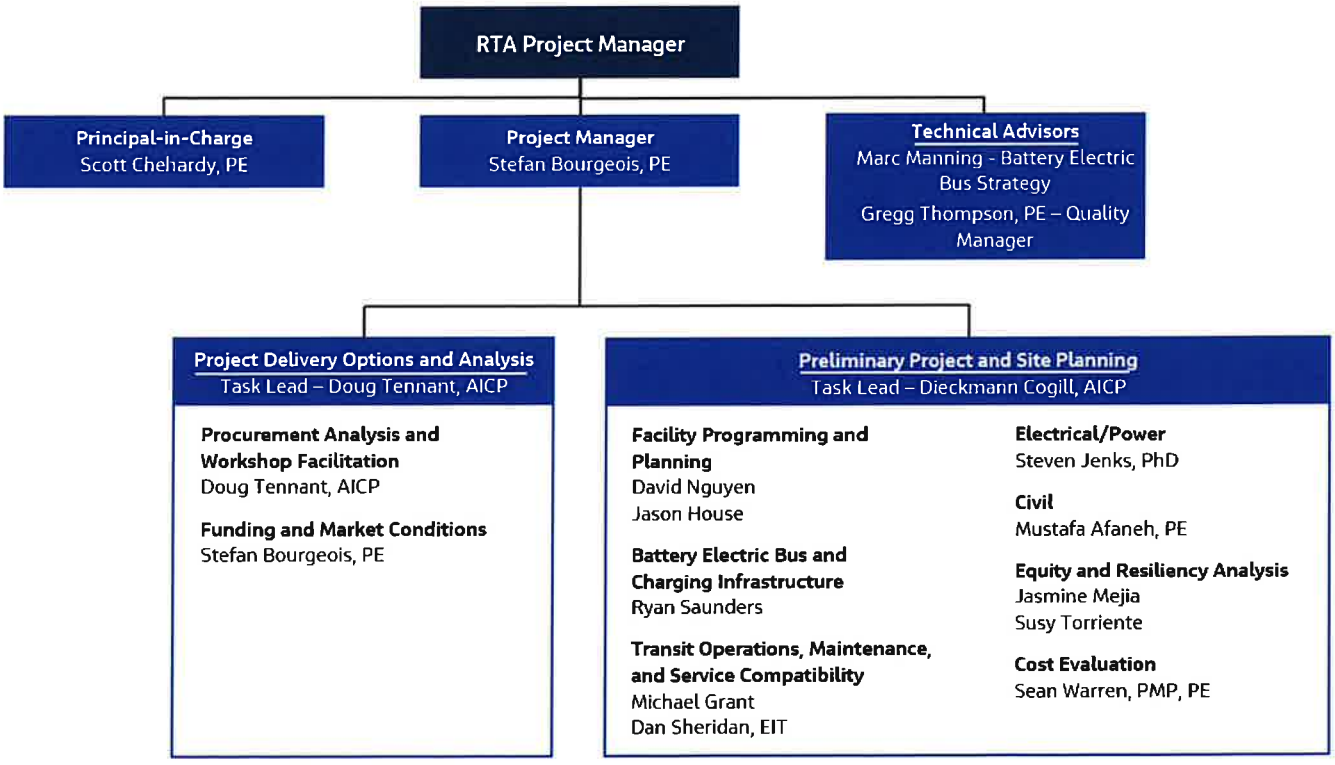
Local Presence, Global Reach

The team for RTA's Zero-Emission, Resilient Fleet Planning project has been carefully chosen based on their technical and industry leadership, extensive experience in their specialties (notably, managing the planning and implementation of zero-emissions bus fleets for some of the largest transit agencies in North America), and success in leading teams to deliver projects on time and on budget.

Stefan Bourgeois will serve as the project manager and the main point of contact for RTA. Task 1 will be focused on the evaluation of delivery method options for implementing the Lo-No Grant project. This task will be led by Doug Tennant, and he will be supported by expertise in the field of construction management, project delivery, and emerging solutions such as charging-as-a-service. Task 2 will focus on preliminary site planning and options evaluation. Dieckmann Cogill will lead this task and she brings deep experience delivering similar zero-emission fleet transition planning projects for a number of agencies to RTA. She will be supported by discipline experts in the fields of ZE vehicles, charging infrastructure, energy and power, transit operation and maintenance, and service planning. Evaluation of facility options that will be developed by Dieckmann's team will include criteria such as equity and resiliency, service compatibility, power availability and cost. It is the understanding of the team that service compatibility and power demand modeling will be provided by RTA.

The table in this section provides the proposed project roles and responsibilities and qualifications of project principals and key staff members. For staff not included in the prequalification application, a 2-page resume is included in this submission. All staff identified will perform the work and will not be substituted with other personnel or reassigned to another project without RTA's prior approval.

Organization Chart. *Our team is committed to advising and supporting RTA's preliminary evaluation and planning activities required for the acquisition and integration of Lo/No emissions vehicles and related infrastructure in the RTA network and facilities.*



Team's Project Roles and Responsibilities and Qualifications. *Our team brings demonstrated experience in transit fleet electrification to help RTA select the best delivery method and develop a preliminary project and site plan.*

Name, Role/Responsibility	Brief Qualifications
Stefan Bourgeois, PE, Project Manager and Funding and Market Conditions	▪ More than 13 years of project management, project planning, transportation, and utility design experience for clients across South Louisiana
Scott Chehardy, PE, Principal-in-Charge	▪ More than two decades of civil design and project management experience in the greater New Orleans metropolitan area
Marc Manning, Battery Electric Bus Strategy Senior Advisor	▪ Has been involved with transit bus engineering and acquisition leadership at Chicago Transit Authority and Los Angeles Metro and is currently involved in planning efforts for similar zero emissions fleet transition projects for MBTA, MTA, New Jersey Transit, and more
Gregg Thompson, Quality Manager	▪ Served as a project manager and/or quality manager on multiple infrastructure designs, including his most recent role as project manager for the Lo/No zero emissions vehicle grant application, project design, and construction in Boise, ID
Doug Tennant, AICP, Project Delivery Options and Analysis Task Lead, Procurement Analysis and Workshop Facilitation	▪ With more than 30 years of transportation management experience and a history of successful project delivery across the Southeast, has extensive experience with all project delivery methods, including traditional design-bid-build, design-build, and other alternative delivery approaches for transit agencies and state DOTs
Dieckmann Cogill, AICP, Preliminary Project and Site Planning Task Lead	▪ Served in significant leadership roles on two of the largest zero-emission transition projects in the country and brings experience visioning complex planning and implementation/deployment with some of the nation's largest transit agencies
David Nguyen, Facility Programming and Planning	▪ With 9 years of experience with vehicle electrification and over 6 years developing facility and charging infrastructure designs and strategies, specializes in in spatial design and facility layout development for retrofitting existing bus facilities for electrified bus fleets
Jason House, Facility Programming and Planning	▪ Over 14 years of experience with vehicle electrification, over 7 years of charging infrastructure design, and over 18 years of combined electrical engineering experience in the vehicle and facility engineering spaces
Ryan Saunders, Battery Electric Bus and Charging Infrastructure	▪ Brings extensive knowledge of the technological trends in the commercial EV space and understands the current challenges facing commercial EV deployments; his prior experience includes working at Proterra where managed a team responsible for supporting over 250 electric bus demonstrations at transit agencies
Michael Grant, Transit Operations, Maintenance, and Service Compatibility	▪ Strong strategic transit/transportation planning experience, as well as spatial analysis, and performance indicators/metrics; currently lead modeler for fleet electrification of 28 transit depots with supporting transition plans
Dan Sheridan, EIT, Transit Operations, Maintenance, and Service Compatibility	▪ Vehicle engineer experienced with maintenance, operations, vehicle procurement, vehicle mid-life overhaul, future vehicle development, lean initiatives, and design review
Steven Jenks, PhD, Electrical/Power	▪ Expertise in least-cost optimization techniques provides insight into key technical and cost performance metrics necessary to understand and compare decarbonization strategies and microgrid resource selection
Mustafa Afaneh, PE, Civil	▪ Civil engineer with experience on infrastructure projects in Louisiana
Jasmine Mejia, Equity and Resiliency Analysis	▪ Expertise in equity analysis, guiding the development of transportation equity analysis and performance measures for long-range plans and leads racial equity analysis efforts for transportation clients
Susy Torriente, Equity and Resiliency Analysis	▪ Instrumental in the development of numerous sustainability and resilience plans for municipalities
Sean Warren, PMP, PE, Cost Evaluation	▪ Specialized as a project controls, cost engineering, value engineering/ constructability professional on several of the largest design-build and CMAR contracts in Southeast Louisiana

Education
- BS, Civil Engineering, University of Louisiana at Lafayette

Registrations/Certifications
- Professional Engineer: LA, NC, MS, AL, FL

Years of Experience
- 13 years

Stefan Bourgeois, PE

Project Manager; Funding and Market Conditions

Stefan Bourgeois, PE, is a client service leader/senior project manager with over 13 years of professional experience in engineering project management, design, planning, construction administration, grant writing, municipal code review, and enforcement for a variety of Louisiana clients including the City of New Orleans, St. Tammany Parish, St. Charles Parish, St. John the Baptist Parish, Lafayette Consolidated Government, Lafayette Utilities System, City of Carencro, City of Scott, City of Youngsville, and Lafayette Parish Sheriff's Office. Stefan has managed over a dozen staff members including engineers, technicians, construction inspectors, survey crews, and administrative positions. The team focused on infrastructure projects including roadway design, drainage, wastewater collection and treatment, water distribution, and surveying.

Relevant Experience

Esperance and Ezekiel Jackson Lift Station Upgrades | St. John the Baptist Parish, Reserve, LA | Project Manager/Engineer of Record. The provided services include topographic and right-of-way surveys, geotechnical investigation, lift station design, utility design, construction documents, bid and award services, construction administration, construction close out, and inspection. Stefan provided professional engineering design and construction administration services for the upgrade of two wastewater lift stations. Both lift stations were outdated, suction lift style pumping stations that required full modernization. Both lift stations are heavily depended on by the surrounding residential neighborhoods and were in dire need of modern, submersible pumps, a full SCADA operating system to provide automation in both remote monitoring and operations. The design also included new valves and hardware, a modern above ground valve pad, improved sites, access, and over 1,000 feet in new, fusible PVC force mains.

Wastewater Treatment Plant | City of Scott, Lafayette Parish, LA | Project Manager. Stefan worked closely with the owner in the initial preliminary planning and testing phase of the wastewater treatment plant project that focused on replacing the existing 0.5-mgd plant with a new, 2-mgd wastewater treatment plant. This project consisted of preliminary planning of a proposed activated sludge wastewater treatment plant for the City of Scott. The City is a fast-growing community, and the population growth is out pacing the capacity of the existing wastewater treatment plant. The existing wastewater treatment plant has exceeded its design life and is experiencing many operational deficiencies such as violating its discharge limitations and raw wastewater overflows. The proposed treatment plant will be designed to accommodate future population growth within the city for a 30-year design period. The initial preliminary planning phase consisted of extensive influent analytical testing procedures and a preliminary engineering report (PER). The PER assessed conditional rating of the existing facility, evaluated population projections, and explored various alternatives for a plant replacement.

Primrose Canal Stabilization Project | St. Charles Parish, Boutte, LA | Engineer of Record and Project Manager. The provided services include geotechnical investigation, sheet pile design, sheet pile alignment layout, construction documents, bid and award services, construction administration, construction close out, and inspection. Stefan was tasked to provide professional engineering design and construction administration services for the channel embankment stabilization project for Primrose Canal in St. Charles Parish. The

channel side slopes were collapsing into the channel because of existing wood bulkheads that were failing. The project focused on replacing the existing wood bulkheads with 30-foot steel sheet piles that stabilized the channel side slopes. The project included over 1,500 linear feet of steel sheet piles and connecting various concrete con-span bridges to the steel sheet piles. Additionally, over 5,000 feet of channel grading was designed for the project while accounting for all drainage outfall laterals through the vertical sheet pile.

East Pont Des Mouton, Phase II: Roadway Widening | Lafayette Parish, LA | Project Engineer.
Stefan led the design efforts of the roadway and storm drainage system, and construction administration for this project. Role included geometric design of the roadway and intersections, the hydraulic design of the subsurface drainage system, sequence of construction design, quality control as well as design of the striping layout for traffic flow. Responsible for managing the finances of the project such as resource allocation on work tasks and monthly billing. Worked with landowners and the Lafayette Consolidated Government to secure right-of-way and servitudes for the roadway and utility improvements.

New Public Safety Complex for Lafayette Sheriff's Office | Lafayette Parish, LA | Project Engineer.
Stefan was involved in the structural design of concrete tilt-up wall panels, steel connections of tilt-up panels, structural concrete masonry walls, concrete, and steel lintel beams as well as steel bar joists. Also worked concurrently with his structural design team and the architectural design team to ensure all conflicts between theoretical applications of architecture and structural engineering were solved. Plan review of other consultants on the design team such as mechanical and electrical was paramount to ensure conflicts with the main structure were mitigated.

Marc Manning

Battery Electric Bus Strategy Technical Advisor

Marc is a senior project manager and vehicles discipline lead in Jacobs' Green Fleets practice. For the past 7 years, Marc has worked in transit bus engineering and acquisition leadership at Chicago Transit Authority (CTA) and Los Angeles Metro (LA Metro), where he supported the procurement of over $1 billion in transit buses with electric, CNG, and diesel powertrains. His teams were responsible for engineering and warranty support for the life of the vehicles. Marc was responsible for developing the short- and long-term strategies to deploy zero-emissions buses, and he participates in various committees to study, advance, and accelerate the adoption of zero-emissions buses nationwide. He contributed to developing the APTA Bus Procurement Guidelines, supported various TRCP projects, and SAE Charging standard (SAE3105). Prior to working for public transit agencies, Marc worked in product development for the market leader in transit bus engines, Cummins Inc. In this capacity, he worked across a wide array of engineering functions (including manufacturing, product development, and service support) with a specialty in combustion, performance, and emissions development.

Education
- MS, Mechanical Engineering (Thermal/Fluid Sciences), North Carolina State University
- BS, Mechanical Engineering (with Honors), Georgia Institute of Technology

Registrations/Certifications
- Six Sigma

Years of Experience
- 18 years

Relevant Experience

Valley Regional Transit (VRT) | Lo-No Grant Project, Boise, ID. | Electric Vehicle and Charging Infrastructure Subject Matter Expert. Marc led the team to scope the grant, coordinated with various teams to write the grant, and worked with VRT to select the project partners. As a result of this win, Jacobs will be delivering charging infrastructure turnkey services for VRT. The value of this contract will be ~$10 million of the total. VRT won $17.3 million in federal support for a $20 million project that will provide eight on-route electric chargers in Main Street Station, eight additional battery electric vehicles and four electric depot chargers at the Orchard maintenance yard and all the necessary workforce training and development.

Massachusetts Bay Transportation Authority (MBTA) | Bus Facility Modernization Program and New Bus Procurement, Boston, MA | Electric Vehicle and Charging Infrastructure Subject Matter Expert. Marc serves as a charging infrastructure and electric vehicle expert on the ongoing projects. In this role, Marc provides design guidance and charging equipment recommendations based and design review oversight of 3rd Party design milestones. Marc also evaluates electric vehicles for the client operation profiles and provides recommendations tailored to the MBTA's operations. MBTA is aggressively moving towards a zero-emissions bus fleet and Jacobs is leading a coordinated strategy of the agency's maintenance facility modernization electrification investments and annual electric bus procurements.

New Jersey Transit (NJT) | Zero Emission Systems Planning and Engineering Research Partnership Program, Newark, NJ | Electric Vehicle and Charging Infrastructure Subject Matter Expert. Marc is providing guidance on best practices on launching initial electric buses. Additionally, Marc is provided guidance on best practices on how to support the program as it expands. (e.g. workforce planning). New Jersey Transit is launching their first electric buses in late 2022. Additionally, they are developing a roadmap for future Zero Emission Bus Deployments.

Port of Long Beach (POLB) | Harbor Department Zero Emissions Fleet Infrastructure Master Plan, Long Beach, CA | Electric Vehicle and Charging Infrastructure Subject Matter Expert. Marc provides design guidance and

charging equipment recommendations. The recommendation is based on the modeling of the fleet and understanding what limitations (e.g. power and space) for future charging infrastructure installations. Furthermore, Marc is helping lead coordination with the utility company, South California Edison (SCE). Jacobs is created that details the infrastructure necessary to convert over 200 harbor fleet vehicles (light duty and medium duty) and 16 harbor vessels to zero emissions fuels. The study includes an energy demand analysis of the Port Fleet's existing operations, assessment of zero emission.

Los Angeles County Metropolitan Transportation Authority (LA Metro) | Various Projects, Los Angeles, CA | Senior Director – Vehicle Engineering & Acquisition. Marc's team managed $790 million in transit bus acquisitions, encompassing 145 electric buses from New Flyer and BYD, and their associated charging infrastructure, and 689 CNG buses from New Flyer and ElDorado, which were the first to utilize BAE's REAL (Reduce Engine Accessory Loads) system. Marc's team was responsible for formulating the plan to convert the fleet to 100% zero-emissions buses by 2030. Through this, his team pushed for BYD to deploy heat pumps that resulted in significant energy-efficiency savings. In addition to vehicle acquisitions, Marc's team managed the bus warranty and provided the engineering support for Metro's 2,400+ buses. As part of this support, his team was responsible for implementing improvements to improve reliability and reduce cost. In response to the COVID-19 pandemic, his team became responsible for analyzing and deploying technical solutions on the bus fleet. The projects required developing an implementation plan for over 130 MW of on-route and depot charging infrastructure, and coordinating with multiple utilities (e.g., SCE, LADWP, Pasadena Water & Power) and modeling the impacts of various charging strategies. It also required reviewing various technologies to improve energy efficiency (e.g., heat pumps) and reduce vehicle weight.

Gregg Thompson, PE

Quality Manager

Gregg Thompson is a project manager and an environmental engineer with 27 years of experience in public infrastructure design, project planning, and development and execution of construction contracts. Gregg specializes in managing engineering teams in the collaborative delivery of large-scale facility construction and renovations, and his most recent work with Valley Regional Transit's Battery Electric Bus Facility Upgrade and Charging Infrastructure is setting the standard for expedited delivery of FTA's Lo/No Vehicle Emissions grant program.

Education

- MS, Environmental Process Engineering, University of Illinois at Urbana Champaign
- BS, Civil Engineering, Oregon State University

Registrations/Certifications

- Professional Engineer: OR, ID

Years of Experience

- 27 years

Relevant Experience

Battery Electric Bus (BEB) Charging Infrastructure and Facility Upgrade – Preliminary Planning/Design and Project Delivery Analysis | Valley Regional Transit (VRT), Boise, Idaho | Project Manager. In addition to Gregg's assistance in developing VRT's Lo/No Vehicle Emissions grant application, he is leading the Jacobs team in the programming and design of VRT's installation of battery-electric bus (BEB) charging infrastructure at the Orchard Facility Bus Depot (overnight charging) and the Main Street Station (enroute charging). Thompson also has assisted VRT leadership in the review and evaluation of suitable project delivery methods and models for the project, emphasizing the need for accelerated delivery and cost certainty.

Battery Electric Bus (BEB) Charging Infrastructure and Facility Upgrade – Turnkey Design-Build Services | Valley Regional Transit (VRT), Boise, Idaho | Project Manager. As a result of Gregg and his team's expedited work and analysis in the preliminary phases of VRT's BEB project, Thompson and Jacobs were awarded a Progressive Design Build contract by VRT to complete the design and construct the proposed BEB facilities per the $20M Lo/No grant award. The project includes turnkey design-build services to install battery-electric bus (BEB) charging infrastructure at the Orchard Facility Bus Depot (overnight charging) and the Main Street Station (enroute charging) and the provision of 2.5MW of new electrical service to Main Street Station. VRT selected the Progressive Design Build project delivery model in order to continue the positive schedule momentum that had been created in the early stages of the project, as well as the advantages of a uniquely collaborative approach to design and cost control issues that had been created by Thompson and the Jacobs team early in the process

Nampa Wastewater Treatment Plant Group F Progressive Design-Build | City of Nampa, Idaho | Engineering Manager. Gregg managed this $170 million improvements project. Jacobs is the design-build contractor and design engineer on this project. Deep bed, mono-media sand filters are designed to help meet the City's phosphorus limit target of 350 micrograms/liter (µg/L) on a monthly average basis. Jacobs created a collaborative design-build process that has created a cost-effective filtration facility, addressing constructability concerns, and planning for commissioning and startup.

Lander Street Water Renewal Facility Phase I Improvements I City of Boise; Boise, Idaho I Project Manager. Initial project manager for this improvement project that provides tertiary treatment to meet strict phosphorus and ammonia discharge requirements. Phase I focused on condition replacements, including preliminary treatment and disinfection. This phase will prepare the plant for Phase II improvements related to permit compliance.

Doug Tennant, AICP

Project Delivery Options and Analysis Task Lead; Procurement Analysis and Workshop Facilitation

Doug Tennant has more than 35 years of multimodal transportation planning, design, and management experience across the Southeast and a history of successful management of large-scale infrastructure projects and programs for various transit agencies, DOTs, and public entities. Trained as an urban and community planner, Doug's early career focused on developing community and state transportation plans, and his most recent experience has centered on assisting transit agencies and transportation departments transition their strategies and plans to accommodate a decarbonized, multimodal future.

Education
- Masters, Vanderbilt Univ. Policy Development & Evaluation

Registrations/Certifications
- AICP #213283 – National Certification - Transport Planning

Years of Experience
- 35 years

Relevant Experience

Nashville Metro Transit Authority (MTA) | East West Connector BRT – NEPA and Preliminary Engineering, Nashville TN | Project Manager. Doug assisted MTA and the Metro Nashville plan, evaluate and apply for and receive FTA Small Starts Capital Grant funding for the 12-mile Bus Rapid Transit project through downtown Nashville. Services provided included preliminary planning and engineering design to support the development of the project's Environmental Assessment, public engagement and facilitation, and multiple Project Delivery workshops with MTA, the City, and the State (TDOT) to evaluate the best procurement and delivery method for the project.

GoTriangle Transit | Durham Orange Light Rail Transit – NEPA and Preliminary Engineering, Raleigh, NC | Principal and Senior Advisor. As principal-in-charge and senior planning advisor, Doug assisted in developing and facilitating a 2-day workshop for GoTriangle leadership and staff to evaluate alternative project delivery options for their proposed $1.1 billion light rail service in Durham and Orange counties in the Research Triangle area of North Carolina. The pros and cons of multiple project delivery methods (design-bid-build, construction manager, design-build, P3 concession, etc.) were reviewed, evaluated, and discussed with GoTriangle leadership as they advanced their NEPA and preliminary engineering efforts.

Central Oklahoma Public Transportation Authority (COPTA) | OKC Streetcar Planning and Regional Transit Hub Site Selection, Oklahoma City, OK | Principal and Senior Planner. As principal-in-charge and senior planning advisor, Doug assisted COPTA and City of Oklahoma City MAPS leadership in developing, planning, and gaining federal, state, and local approval for the construction of a $135 million, 4-mile streetcar circulator connecting downtown Oklahoma City to Midtown health district and the Bricktown entertainment district. As a part of the overall streetcar program, managed the work of programming, evaluation, and selection of a preferred site and project delivery model for the regional transit hub that would serve as the centerpiece of the transit network in downtown Oklahoma City. Multiple sites were evaluated, and alternative delivery models were reviewed (CMAR, DB, CMGC) for the transit hub.

GoChapel Hill Transit | North South Bus Rapid Transit (NSBRT)– NEPA, Preliminary and Final Engineering, Chapel Hill, NC | Principal and Senior Advisor. Doug assisted in the planning and evaluation of alternate routes and service plans for the proposed 8.2-mile NSBRT line through Chapel Hill. Assisted in the identification and locating of transit stations and the central hub, as well as leading the team's efforts to inform and educate the NSBRT's project leadership in reviewing alternative delivery and procurement models in anticipation of a FTA Small Starts construction grant.

Diekmann Cogill, AICP

Preliminary Project and Site Planning Task Lead

Dieckmann is a program manager and transportation planner with over 23 years' experience planning, managing, and delivering transportation projects. She currently focuses on zero-emissions fleet transition planning and has experience managing facility improvements, fleet transition, service planning and enterprise-wide operational transition planning. She brings expertise from diverse jurisdictions within the U.S. Dieckmann has a proven ability to successfully manage complex transportation planning projects to ensure quality. She applies strong project management best practices and principles, while focusing on providing clear and frequent lines of communication; and building strong productive relationships with clients and stakeholders. Dieckmann applies her depth of planning knowledge to effectively collect and analyze data to inform decision making. Her specialty is developing context sensitive solutions to complex project challenges.

Education

- MA, Urban and Environmental Planning, University of Virginia
- BA, Metropolitan Studies, Urban Design and Architecture, New York University

Registrations/Certifications

- American Institute of Certified Planners (AICP)

Years of Experience

- 23 years

Relevant Experience

Santa Clara Valley Transportation Authority (VTA) | Zero Emissions Bus Transition Blueprint, San Jose, CA | Project Manager. Manage the planning and implementation for the deployment of zero-emission bus fleet for the VTA. VTA operates a fleet of approximately 400 buses out of three depots. The plan will help the agency meet the regulatory requirement of the 2018 California Air Resources Board, Innovative Clean Transit Regulation that sets a 2040 goal for California transit operators to operate fully zero-emission fleets. The blueprint will focus on a funding strategy and implementation planning and prioritization for near term and long-term projects required for an equitable transition. This will include costs for capital infrastructure required to support the transition, operating expenses and workforce training. It also includes an equity strategy, site planning and concept development, service modeling, energy strategy, and fleet strategy. Dieckmann is responsible for management the integration and delivery of the numerous technical disciplines required to develop an integrated zero-emissions bus blueprint.

New York Metropolitan Transit Authority (MTA) | Zero Emissions Fleet Transition Plan, New York City, NY | Project Delivery Manager. Development and evaluation of alternatives for zero-emissions fleet deployment/implementation through 2040, a comprehensive rollout plan for zero-emissions bus rollout through 2029, and a high-level road map for deployments through 2040. Dieckmann is responsible for management the integration and delivery of the numerous technical disciplines required to develop an integrated zero-emissions fleet transition plan. This includes vehicle and charger technology, facility assessments, power and electrical infrastructure, and service planning and modeling. Dieckmann's previous experience delivering ZE Fleet transition plans and ZE facility plans led to early deployment of and coordination between technical disciplines, being able to quickly discern the key elements for decision making led to savings in schedule and budget.

Massachusetts Bay Transportation Authority (MBTA) | Bus Facility Modernization Program, Boston, MA | Program Manager. Jacobs is providing program management services to the MBTA in support of the transformative Bus Facility Modernization Program. As Program Manager, Dieckmann manages a multi-disciplinary team including Jacobs and various teaming partners to deliver a modern bus facility network to support the future bus fleet. In addition to overall program management, Dieckmann is the lead for transportation planning, transit

service planning and environmental assessment activities, and development of phasing and concepts for the modernization of nine bus maintenance facilities.

Massachusetts Bay Transportation Authority (MBTA) | Zero Emissions Fleet Deployment Strategy; Boston, MA | Program Manager and Transit Planning Lead. Dieckmann led a team that evaluated the operational feasibility of battery electric buses at two maintenance facilities in Quincy and North Cambridge, analyzing multiple vehicle technologies, seasonal conditions, and charging infrastructure. The evaluation enabled the MBTA to determine a technology solution and identify needed bus schedule changes. The team was also able to determine peak energy demands at maintenance facilities as well as intermediate charging locations along key bus routes. As part of this evaluation, a bus facility network wide baselining effort was conducted at all MBTA bus maintenance facilities. The development of this document contributed to the award of approximately $116 million in federal funding for zero-emissions fleet procurement.

Massachusetts Bay Transportation Authority (MBTA) | Bus Facility Modernization Program; Boston, MA | Deputy Program Manager. As deputy program manager, Dieckmann managed a multi-disciplinary team including Jacobs and various teaming partners to deliver a modern bus facility network to support the future bus fleet. Dieckmann is the lead for transportation planning, transit service planning and environmental assessment activities, and development of phasing and concepts for the modernization of nine bus maintenance facilities.

King County Metro, Rapid Ride I Line Engineering, Seattle, WA | Deputy Program Manager. Jacobs developed, designed, and procured bidding documents for roadway and signal improvements, transit passenger facilities, and Metro communications infrastructure for a bus rapid transit line connecting Auburn, Kent, and Renton in Washington. Dieckmann was deputy to the project manager in delivering tasks related to service speed and reliability improvements, passenger facility upgrades, and access to transit stations.

Education
- BS, Construction Management, California Polytechnic State University, San Luis Obispo

Registrations/Certifications
- California General Engineering (Class A) Contractors License, Qualifier/RME

Years of Experience
- 10 years

David Nguyen

BEB Charging Infrastructure

David has 10 years' experience with vehicle electrification, over six years developing charging infrastructure designs and strategies, and over 10 years in the heavy civil and transportation industry. He has led project delivery for numerous advanced charging projects for public transit, including installation and commissioning of in-depot pantographs and chargers for City of Edmonton; facility upgrades and installation of DC plug in chargers for Reno RTC; and installation of on-route 450kW chargers and overhead charging reels for City of Spokane. Over his career in transit bus electrification, he has led project delivery (design, construction, and commissioning) as the prime project manager for over 35 clients, while also providing construction oversight and drawing review services to over 100 public transit agency clients. David is especially experienced in spatial design and facility layout development for retrofitting of existing bus facilities for electrified bus fleets. He has developed commissioning and vehicle/ charger testing plans for new fleet deployments with overhead on-route chargers and is particularly skilled in charger interoperability testing and validation.

Relevant Experience

ZEB Blueprint Plan | Santa Clara VTA | Facilities Planning Lead. Led facilities planning activities in the development of VTA's Zero-Emissions Bus (ZEB) Blueprint Plan.

Zero Emissions Transition Plan | New York MTA, New York City, NY | Electric Vehicle and Charging Infrastructure Subject Matter Expert. In this role, David serves as an SME for the charging infrastructure and power integration site planning production design team. MTA selected Jacobs to lead their zero-emission fleet transition and implementation. Phase 1 of the project involves site assessment/feasibility for power distribution for electric bus conversion.

Electric Bus Infrastructure Project | Spokane Transportation Authority (STA), Spokane, WA | Senior Project Manager/Lead. Project roles included management of design development, subcontractor procurement and management, construction coordination, commissioning, and testing, as well as onboarding training for client. Acting as the project lead, David directly managed the process to obtain contractors licenses in Washington state for Proterra, as well as mange the design and permitting processes for four separate sites in Spokane, under an accelerated timeline to construct all infrastructure in less than 10 months. David designed the controls wiring for the overhead charge reels, as well as overseeing onsite the integration, testing, and commissioning of the units. Acting as the project lead, David directly managed the process to obtain contractors licenses in Washington state for Proterra, as well as mange the design and permitting processes for four separate sites in Spokane, under an accelerated timeline to construct all infrastructure in less than 10months. David designed the controls wiring for the overhead charge reels, as well as overseeing onsite the integration, testing, and commissioning of the units. Design and installation of six 450kW fast charging pantographs structures across three separate transit center sites in Spokane, inclusive of civil and electrical utility upgrades. Also included in the project were ten 150kW ABB DC charging systems with first-of its kind motorized overhead charging reels. Total design/build contract value was $2.5 million. Project was completed ahead of schedule and on budget.

Kathleen Andrews Bus Garage – Electric Bus Charging Project | City of Edmonton, AB (Canada) | Senior Project Manager/Lead. Project roles included management of design development, subcontractor procurement and management, construction coordination, commissioning, and testing, as well as onboarding training for client. Program managed the innovative first of its kind installation outside of Germany, where the pantographs were installed in a tight depot-style configuration, thus requiring innovation of both WIFI and RFID sensors to authenticate and initiate charge session with the Proterra buses. Managed the implementation and commissioning of the sensor systems, as well as developing customer fabricated mounting hardware for the ABB dispenser boxes. Design and installation of 40 overhead pantograph structures with 150kWABB DC charging systems, with unique RFID authentication, inside an existing bus garage facility. Project was completed and handed off to client in early 2021 with completion on time and on budget. Overall project value was over $60M USD, with the constructed value managed by David was $3M USD. Program managed the innovative first of its kind installation outside of Germany, where the pantographs were installed in a tight depot-style configuration, thus requiring innovation of both WIFI and RFID sensors to authenticate and initiate charge session with the Proterra buses. Managed the implementation and commissioning of the sensor systems, as well as developing customer fabricated mounting hardware for the ABB dispenser boxes.

Electric Bus Infrastructure Projects | San Mateo County Transit District (SAMTRANS), South San Francisco, CA | Senior Project Manager/Lead. Project manager for the setup and commissioning of Proterra charging systems at Samtrans North Base bus depot. Delivery, installation, and commissioning of Proterra 60kW DC charger equipment for use with mobile generators to support the initial testing of Proterra battery electric buses. Also, performed detailed design review and project oversight for the installation of 125kW Proterra charger equipment at the Samtrans North Base bus depot.

Electric Bus Charging Infrastructure at Moffet Field | CBRE/Google, Sunnyvale, CA | Senior Project Manager/Lead. Project manager for the setup, commissioning, and training of Proterra charging systems at Moffett Field in support of Van Hool battery electric coach charging for CBRE/ Google shuttle operations. Delivery, installation, commissioning, and user training of Proterra 125kW DC charger equipment for use by Google to support battery electric Van Hool coach buses. Also, performed detailed design review and project oversight for the installation of 125kW Proterra charger equipment by CBRE.

Electric Bus Shuttle Charging Infrastructure Projects | San Jose Airport, San Jose, CA | Senior Project Manager/Lead. Project manager for the setup, commissioning, and training of Proterra charging systems at San Jose Airport. Delivery, installation, commissioning, and user training of Proterra 60kW DC charger equipment for use by San Jose Airport to support battery electric Proterra 40' buses. Also, performed detailed design review, permit and drawing package QC, as well as onsite project oversight for the installation of charger equipment.

Electric Bus Shuttle Charging Infrastructure Projects | Santa Cruz Metro, Santa Cruz, CA | Senior Project Manager/Lead. Project manager for the setup, commissioning, and training of Proterra 125kW charging systems for Santa Cruz Metro. Delivery, installation, commissioning, and user training of Proterra 125kW DC charger equipment for use by Santa Cruz Metro to support both battery electric 40' buses and coach buses. Also, performed detailed design review, permit and drawing package QC, as well as onsite project oversight for the installation of charger equipment.

Electric Bus Infrastructure Project | Regional Transportation Commission of Washoe County, Reno, NV | Senior Project Manager/Lead. Project roles included management of design development, subcontractor procurement and management, construction management, commissioning, and testing, as well as onboarding training for client. Design and installation of two overhead 500kW Proterra Blade Charger systems at the 4th street transit station. Also involved the installation of 25 60kW DC fast chargers at the main Reno bus garage inclusive of civil and electrical site upgrades. Developed site assessments for future RTC electrical charger expansion.

Education
- MS, Electrical Engineering (Control Theory and Microelectromechanical Systems), University of Michigan
- BS, Computer Science Engineering and Electrical Engineering (double major), University of Toledo

Registrations/Certifications
- NA

Years of Experience
- 18 years

Jason House

Facility Programming and Planning

Jason House has over 14 years of experience with vehicle electrification, more than 7 years of charging infrastructure design, and over 18 years of combined electrical engineering experience in the vehicle and facility engineering spaces. He has developed charging models, evaluated charging simulation / modeling products, led technical electrification master planning efforts, created charging infrastructure bid packages with drawing sets, and completed scaled facility level charging infrastructure designs. Additionally, his experience in en-route charging project planning and deployment led him to develop comprehensive commissioning, preliminary hazards analysis checklists, and functional tests that far exceed current OEM industry practices.

Relevant Experience

ZEB Blueprint Plan | Santa Clara VTA | BEB Charge Infrastructure Lead. Led activities related to the technology assessment and planning for BEB charging infrastructure in the development of VTA's ZEB Blueprint Plan.

Stride BRT Inductive Charging | Sound Transit, Seattle, WA | Charging Infrastructure Subject Matter Expert. Jason advises Sound Transit on enroute electric bus charging infrastructure and design application. He leads a charging infrastructure design team as part of a national center of excellence focused on cutting edge charging design and application engineering with a team of civil, structural, and electrical engineers. This project includes five installation sites with inductive on route chargers and additional inductive charger at a bus depot. Sound Transit is implementing extensive enroute charging at multiple bus rapid transit sites. The project includes design work ranging from pre- design site assessment to 100% construction documents for two sites five inductive charging sites.

MTA Zero Emissions Transition Plan | MTA, New York City, NY | Electric Vehicle and Charging Infrastructure Subject Matter Expert. Jason serves as the task lead for the charging infrastructure and technology and BEB battery electric bus technology during the technology review and condition assessment phase of the project. Jason also leads the charging infrastructure and power integration site planning production design team. MTA selected Jacobs to lead their zero-emission fleet transition and implementation. Phase 1 of the project involves site assessment/feasibility for power distribution for electric bus conversion and construction of site layouts/preliminary design concepts.

Bus Facility Modernization Program and MBTA New Bus Procurement | MBTA, Boston, MA | Electric Vehicle and Charging Infrastructure Subject Matter Expert. Jason provides design guidance and charging equipment recommendations based and design review oversight of 3rd Party design milestones. Jason also evaluates electric vehicles for the client operation profiles and provides recommendations tailored to the MBTA's operations. MBTA is aggressively moving towards a zero emissions bus fleet and Jacobs is leading a coordinated strategy of the agency's maintenance facility modernization electrification investments and annual electric bus procurements. Jason serves as a charging infrastructure and electric vehicle expert on the ongoing projects.

Various Projects | Chicago Transit Authority (CTA), Chicago, IL | Zero Emissions Group Lead. Jason, as CTA's Zero Emissions Group Lead, managed electric vehicle contracts, design reviews, zero emissions grants project scoping/design, and project delivery while overseeing a team of engineers and

technicians. Jason began his CTA career working on electrical facilities projects including, boiler power/control systems, building automation systems, facility power upgrade projects, and traction power. Working on en-route charging and depot charging electric bus specifications for over 6 years, he successfully deployed 5 overhead Heliox chargers 450kW to serve en-route charged buses, with infrastructure (conduit, equipment pads, and foundations) to support an 8 Heliox 450kW chargers, as well as designing and deploying a 300kW Siemens en-route charger at Midway Station Bus Turnaround into an existing canopy structure with no mast. He was also integral in the technical development of the CTA Electrification Master Plan.

Ryan Saunders

Facility Programming and Planning

Ryan is a project delivery manager for zero emission vehicles. He is a mechanical engineer with 5 years' experience in commercial vehicle electrification, implementation, and design. Before joining Jacobs, Ryan worked at Proterra as a sales engineer, business development program manager, and product lead. As business development program manager with Proterra, Ryan developed and managed a $2 million budget, $15 million in vehicle assets and a five-person team that was responsible for supporting over 250 electric bus demonstrations at transit agencies across North America. In the role of product lead, Ryan gained extensive knowledge on the technological trends in the commercial EV space. Ryan developed strong relationships with suppliers and customers to better understand the current challenges facing commercial EV deployments and the many solutions being developed to solve them.

Education

- BS, Mechanical Engineering (Concentration in Energy Systems), Iowa State University of Science and Technology

Registrations/Certifications

- Class B CDL with Passenger Endorsement

Years of Experience

- 5 years

Relevant Experience

ABQ RIDE 1 Year Electric Bus Lease | ABQ RIDE, Albuquerque, NM | Project Lead. Ryan supported the initial RFP bid for the BEB lease by generating pricing quotes for training costs, vehicle lease cost, and charger equipment lease and installation costs. Once RFP was won, he managed refurbishment of the used bus asset and delivery of said asset to the client. Ryan coordinated charger delivery and installation timing with bus delivery to minimize travel needs of training and commissioning teams. This was critical for meeting the project launch deadline due to COVID travel limitations. Additionally, Ryan continually worked with the customer through the entire lease to resolve issues with the charger and vehicle and aided the client in developing operational plans to help fully utilize the vehicle. Lease led to 5 vehicle procurement. Ryan used this new opportunity to develop a tool to quickly develop pricing quotes based on proposed equipment, lease duration, and training requirements. One year lease of one 40' Catalyst E2 (440 kWhr) transit bus, temporary installation of one 125 kW Proterra PCS charger, maintenance and operator training, and continual operational support. Customer budget ~$250k with opportunity for lease to be extended.

Zero Emission Shuttle Service | Global Climate Action Summit, San Francisco, CA | Project Lead. Ryan was responsible for creating the routes for the event. This event was uniquely challenging given the size of the vehicles and challenging topography and narrow roads found in downtown San Francisco. Ryan created a detailed operational plan that was shared with the event organizers and shuttle drivers. Ryan worked with Proterra simulation engineers to determine the energy demands of the shuttle service. This data was used to create a charging plan that could support the event with only two 60 kW Proterra PCS chargers in Burlingame, CA. The 4 vehicles operated successfully for the entire event. Provide shuttle service for attendees of the 2018 Global Climate Action Summit in San Francisco from accommodations to the conference center. Once daily events are complete, provide shuttle service for attendees to dinner events. 4 40' Proterra E2 (440 kWhr) used to provide service. 2 of the vehicles were borrowed from VTA. Proterra and VTA were excited to support Zero Emission transportation for the Summit.

30 Day Electric Bus Demonstration | Broward County Transit, South FL | Project Lead. Ryan coordinated the preparation of the bus asset and charging equipment for the test and the delivery logistics. He worked with the customer on the legal agreement to transfer liability. Additionally, Ryan provided onsite support throughout the testing period to train drivers and to troubleshoot and resolve vehicle and charger issues. He created a report from the data collected from testing and presented it to Broward County Transit Staff. Success in the test led to a 42-vehicle procurement. Torrential rains throughout testing caused many issues with the mobile charging equipment. Ryan worked with Broward County Staff to utilize onsite power generators to replace the damaged Proterra unit. Additionally, Ryan worked closely with the charger mfg. to quickly resolve multiple charger failures. As a result, no downtime was experienced due to mobile charger issues. 30-day in-service test of 40' Catalyst E2 (440 kWhr). Mobile charging to be provided by OEM. 24 operators to drive the vehicle during test period. Training to be provided to operators daily. Report on operational performance to be provided after test.

Michael Grant

Transit Operations, Maintenance, and Service Compatibility

Michael has 18 years of experience with transportation planning and business intelligence. Michael is a strong addition for data analytics, process efficiencies, quality assurance, and innovation. His focus from the planning side has been with strategic transit/transportation planning. From the technical side, it has been with programming, spatial analysis, and performance indicators/metrics.

Education

- Advanced Diploma, Geographical Information Systems, British Columbia Institute of Technology
- HBSc (Honors), Environmental Science, University of British Columbia

Registrations/Certifications

- NA

Years of Experience

- 18 years

Relevant Experience

Valley Regional Transit | Battery Electric Bus Modeling, Boise, ID | Transportation Planner/Modeler. Michael modeled the VRT service for fleet electrification to identify schedule constraints, on-route charging opportunities, and general fleet composition. Identified cost savings relative to charger/dispenser count and configuration. The model identified the ideal configuration for one-to-one transition of vehicle numbers and supporting metrics for energy and power requirements.

Metropolitan Transportation Authority | Battery Electric Bus Modeling, New York, NY | Transportation Planner/Modeler. Michael is the lead modeler for fleet electrification of 28 transit depots with supporting transition plans. Implemented functionality to batch model multiple depots with adaptable variables. The main outcome is to identify vehicle performance throughout the region and prioritize routes and services that most benefit environmental justice communities.

Massachusetts Bay Transportation Authority | Transit Facility Strategy, Boston, MA | Transportation Planner. Michael had a lead role developing the battery electric bus model used to forecast transit schedule energy requirements, charging locations, and vehicle requirements. The modeling helped minimize depot location costs on scheduling and vehicle routing. It implemented a bus management strategy for allocating buses to routes based on energy efficiency and consumption at the bus stop to stop level.

Sound Transit | Battery Electric Bus Modeling, Seattle, WA | Transportation Planner/Modeler. Michael designed a schedule builder program to create a future BRT transit schedule (GTFS) using headway inputs and outputting block and trip information. Implemented a schedule builder tool to iterate through various schedules and recovery times. The resulting schedule was modeled for fleet electrification for overall performance and fleet and infrastructure needs including energy and power demands.

City and County of Honolulu, Department of Transportation Services | Paratransit Fleet Electrification, Honolulu, HI | Transportation Planner/Modeler. Michael assessed the baseline performance of the paratransit system based on annual trips and ridership. He established a method for incorporating real world travel profiles and trip origin/destinations with fleet electrification modeling to identify fleet and battery requirements for future service. The intent was to evaluate the number of paratransit vehicles required to operate the service based on current conditions, future ridership, and fleet electrification. Additional modeling was developed with a vehicle routing algorithm for schedule efficiency, total vehicle count, and supporting metrics.

Maryland Transit Administration | Bus Stop Balancing, Baltimore, MD | Transportation Planner. Michael led the spatial analysis on the transit network and bus stop configuration, spacing, and amenities by conflating the transit schedule with the road network. The automated review of each route and stop

sequence relative to its surrounding environment to provide faster and more reliable trips, safer and smoother rides, and improve the physical environment at and around bus stops of the MTA. Innovative solutions aligned the schedule with the road network to produce turn-by-turn directions, lane change conflicts, and a new bus stop naming convention.

Toronto Transit Commission | Scarborough Rapid Transit System (SRT) to eBRT, Toronto, ON | Transportation Planner/Modeler. Michael designed a future transit schedule for a bus rapid transit (BRT) service following the existing SRT alignment. Established a baseline for layover opportunity charging while optimizing the schedule. The schedule was modeled for fleet electrification to identify service constraints, on-route and garage charging needs, and overall vehicle numbers. The analysis helped the TTC plan alternative service to bridge the gap between the decommissioning of SRT and the completion of the Scarborough Subway Extension (SSE).

City of North Vancouver | Bus Speed and Reliability Program, North Vancouver, BC | Transportation Planner. Michael had a lead role in analyzing bus speed and reliability. Using bus travel times, ridership, and schedule data, the analysis prioritized locations of poor speed and reliability. Subsequent transit improvement measures, cost, and benefits were identified for funding opportunities with TransLink. The work created a project implementation plan for covering 3 fiscal years. The methodology allowed for analysis at the block level along bus route segments.

Education
- MS, Engineering Management, Northeastern University
- BS, Mechanical Engineering, Northeastern University

Registrations/Certifications
- Engineer-in-Training: MA

Years of Experience
- 8 years

Dan Sheridan, EIT

Transit Operations, Maintenance, and Service Compatibility

Daniel is an experienced project manager and vehicle engineer with a focus on quality, compliance, and technical competencies. His major responsibilities include providing support to various MBTA projects, including vehicle engineering, maintenance, operations, vehicle procurement, vehicle mid-life overhaul, future vehicle development, lean initiatives, and design review. Prior to joining Jacobs, Daniel served as a tire engineer specializing in supporting OE and aftermarket customers with technical product information, DOT testing, and off-highway compliance standards; and as a manufacturing engineer in the semiconductor industry focused on working with vendors, quality assurance, mechanical and electrical diagnostics, test compliance, and component design.

Relevant Experience

ZEB Blueprint Plan | Santa Clara VTA, Santa Clara County, CA | Thermal Event Modeling. Led activities related to fire risk assessment for facilities in the development of VTA's ZEB Blueprint Plan.

Battery Electric Bus Evaluation Program | MBTA, Boston, MA | Project Manager. Conducted industry review of BEB manufacturers in the North American market to help the client develop a strategic program for evaluation of BEB technology in the Boston transit service environment. Traveled to North American bus builders Proterra, New Flyer, and Nova to understand industry offerings and latest developments in electric vehicle technology/implementation. Worked with the client to develop specific program elements to maximize participation from bus builders and establish evaluation criteria for performance of BEBs. Future work includes technical specs and procurement support for future BEB fleets.

New Flyer Transit Vehicle Procurement | MBTA, Boston, MA | Project Manager. Provided support to MBTA Vehicle Engineering in the procurement of options for 194 additional New Flyer Diesel-Electric Hybrid 40-foot buses. Responsibilities include design review, direct management of sub-contractors for inspection services, vehicle commissioning support, contract spending forecasting, contract invoicing, monthly progress reporting, and formal project correspondence writing activities.

New Flyer Transit Vehicle Procurement | MBTA, Boston, MA | Project Manager. Provided support to MBTA Vehicle Engineering in the procurement of 175 CNG-powered 40-foot buses, 156 Diesel-Electric Hybrid 40-foot buses, and 44 Diesel-Electric Hybrid 60-foot buses from New Flyer Industries. Responsibilities included contract spending forecasting, contract invoicing, monthly progress reporting, and project correspondence writing activities. Vehicles are in revenue service and Jacobs current activities include various fleet support activities.

Battery Bus Maintenance Facility Feasibility Study, A Better City | MBTA, Boston, MA | Deputy Project Manager. Provided support to feasibility study for a battery electric bus facility integrated with a mixed-use development at the MBTA's existing Albany Street bus maintenance facility. Responsibilities included research of battery electric bus operations and impacts on maintenances and current agency operations to determine feasibility of battery electric bus maintenance facility integrated into a residential/commercial building in a dense urban environment. Study includes identification of facility requirements, battery bus industry review, evaluation of existing battery electric bus facilities, and feasibility assessment for a public private partnership at the Albany Street location. Final deliverables included conceptual facility and development designs as well as a feasibility report.

Steven Jenks, PhD

Electrical/Power

Steven Jenks has 18 years of experience with renewable and clean energy technologies, and he is focused on the rapidly changing energy sector, including the transition to zero-carbon resources, distributed energy resources, electricity market reform, and the role of electricity in decarbonization. His expertise in least-cost optimization techniques provides insight into key technical and cost performance metrics necessary to understand and compare decarbonization strategies and microgrid resource selection. Steven's extensive knowledge in alternative energy systems ranges from the physics of photovoltaic solar cells to low-carbon energy system modeling, and he has prepared a wide range of energy and emissions reductions analyses, including microgrid energy optimization, greenhouse gas and emissions reductions strategies, wholesale market participation, and revenue projection. +Green Fleets: Steven has led several strategic initiatives, including NJ TRANSIT's bus electrification roadmap and NJ TRANSIT's first-ever corporate sustainability plan. He was a primary architect in crafting the strategy NJ TRANSIT has adopted in moving forward to achieve its ambitious goal to transition to zero-emissions buses by 2040.

Education
- PhD, Physics, Drexel University
- MS, Physics, Drexel University
- BS, Mechanical Engineering, The College of New Jersey

Registrations/Certifications
- NA

Years of Experience
- 18 years

Relevant Experience

NJ TRANSIT | NJ TRANSIT Zero Emissions Systems Planning, and Engineering Research Partnership Program, Newark | Co-Principal Investigator. As co-principal investigator, Steven manages, conducts research, and ultimately is responsible for the execution of this program. Leads the Jacobs technical team and interfaces with the client regularly to discuss research outcomes as it relates to zero-emission buses and infrastructure. NJ TRANSIT plays a key role in supporting New Jersey's Energy Master Plan (EMP), including "Reducing Energy Consumption and Emissions from the Transportation Sector" and "Supporting Community Energy Planning and Action in Underserved Communities". To create a sustainable and resilient transit system throughout the state, one big step is to purchase 10% of zero-emission buses by 2024 and raise the percentage to 50% by 2026. In 2032, all bus purchases are expected to be zero-emission. To provide power for zero-emission buses, existing bus garages need be modernized, and new garages need be constructed to store, maintain, and refuel (charge) buses. Partnering with Rutgers University, this Program aims to research and undertake studies that will uncover the needs for a NJ TRANSIT zero emission bus transition and obtain support from FTA for zero-emission bus implementation.

NJ TRANSIT | NJ TRANSITGRID, Newark, NJ | Energy SME. Steven is the energy SME for Jacobs providing technical input and expertise to this highly visible advanced microgrid resiliency project. Responsible for coordinating the PJM interconnection and market participation, providing technical input, specifically around clean energy and necessary resiliency requirements satisfying, drafting sections of the RFP, and assisting in providing technical feedback on the viability of proposed solutions. Electrification is the future of transit, and microgrids represent the future of resilience solutions in transit electrification. NJ TRANSIT's TRANSITGRID project, a first-of-its-kind application of a microgrid for transit, demonstrates technical innovation, resilient solutions, and alternative delivery methods. Following the crippling impacts of Superstorm Sandy (and after drawing important lessons learned from multi-region blackouts, grid failures, and cyberattacks), NJ TRANSIT identified an opportunity to safeguard its transit and ridership from grid emergencies, imagining the first

transit microgrid in the U.S. The core function of the TRANSITGRID is to improve the resilience of electric supply between the major transportation hubs of Hoboken Station, Secaucus Junction, Newark Penn Station, Penn Station New York, and other stations in New Jersey. The TRANSITGRID is designed to be able to disconnect from the commercial power grid and operate autonomously when needed, transporting up to 40% of the peak ridership of three major rail lines - without support from the existing electrical grid - by powering traction power systems and critical power signal systems to allow for safe train operations.

Confidential Client | Advanced Manufacturing Facility, Confidential Location | Battery Energy Storage System Design Lead. Steven is providing design support to develop a solar plus battery energy storage system (BESS) that will be integrated into the campus. This includes conceptual design, modeling, feasibility analysis, and schematic design support. In this capacity, steven developed a sophisticated dispatch strategy for the BESS to provide solar stability on an hourly basis and sized the BESS accordingly. Jacobs is providing architecture and engineering services to develop an advanced manufacturing facility that aligns with the client's conceptual design to build the most advanced, energy-efficient, resilient 24/7 campus. In addition to aiming for a highly sustainable campus, the client has set a goal of producing 25% of its annual energy with on-site renewables. Jacobs is leading the design and coordination for all phases including detailed masterplan, schematic design, construction documents, permitting, and construction administration. Included in the design is an on-site solar plus battery energy storage system where solar capacity must be maximized using rooftops and parking lots to meet the project's energy goals.

Confidential Client | GPS Concept Design, Various Locations within U.S. | Interconnection and Clean Energy SME. Steven provided research and technical input to the power interconnect report that presented conceptual solutions and recommendations for implementing renewable energy interconnection between public utility infrastructure and data centers. Specifically, he provided recommendations on the types of renewable energy plus storage systems could support primary and back-up power to data centers. Reliability and resilient design was a necessary focus, and Steven developed solutions using advanced modeling techniques factoring in non-dispatchable renewable resources and flexible demand response. Jacobs provided architectural and engineering design services to the client to support the development of a program-level, site-agnostic concept design for a Green Power Shell Product (GPS) offering a green, sustainable data center solution.

NJ TRANSIT | Zero-Emission Bus Roadmap, Newark, NJ | Energy and Sustainability Engineer. Legislation established requirements for NJ TRANSIT to move toward 100% zero-emission bus purchases by 2032, specifically, all NJ TRANSIT bus purchases made on or after December 2024 must include at least 10% zero-emissions buses, escalating to 50% by December 2026, and 100% by December 2032. To comply with this aggressive mandate, NJ TRANSIT is taking a series of deliberate steps that include phased zero-emissions bus deployment at targeted bus garages, undertaking a bus garage modernization program, and conducting a comprehensive zero-emissions bus system design and investment planning study. Steven led the development of this approach and advised exactly what steps are necessary to achieve the zero-emissions bus requirement.

Mustafa Afaneh, PE

Civil

Mustafa has more than 4 years of professional experience in engineering project management, design, planning, and construction administration for Louisiana clients including the City of New Orleans, St. Tammany Parish, St. Charles Parish, St. John the Baptist Parish, and City of Scott. Mustafa has also worked with local commercial and residential developers.

Education
- BS, Civil Engineering, University of New Orleans

Registrations/Certifications
- Professional Engineer: LA

Years of Experience
- 4 years

Relevant Experience

FEMA RR045 – Filmore South Group D (FRC) | City of New Orleans Department of Public Works, New Orleans, LA | Assistant Project Manager/ Project Engineer. Mustafa aided in the roadway and drainage design, utility design, final design (construction documents), bid and award services, construction administration, construction close out, inspection, and reporting.

FEMA RR021 – Central City Group A | New Orleans, LA | Assistant Project Manager/Project Engineer. Mustafa assisted with the baseline and topographic survey, roadway and utility design, as well as construction administration for a full street reconstruction. Scope included design and coordination of all subsurface utilities, comprising water, drainage, and sewer systems. Mustafa assisted with multi-agency coordination, including the New Orleans Department of Public Works, Sewerage and Water Board of New Orleans, and various utility agencies.

Esperance and Ezekiel Jackson Lift Station Upgrades | St. John the Baptist Parish, Reserve, LA | Assistant Project Manager/Project Engineer. Mustafa performed engineering design, client coordination, construction administration services for the upgrade of two outdated suction lift style pumping wastewater that required a full modernization. Both lift stations depended on the surrounding residential neighborhoods and were in dire need of modern, submersible pumps, a full SCADA operating system to provide automation in both remote monitoring and operations. Also included new valves and hardware, a modern above ground valve pad, improved sites, access, and over 1,000-foot in new, fusible PVC force mains.

Wastewater Treatment Plant | City of Scott, Lafayette Parish, LA | Assistant Project Manager/Project Engineer. Mustafa worked on initial preliminary planning and testing phase of the wastewater treatment plant project that focused on replacing the existing 0.5-mgd plant with a new, 2-mgd wastewater treatment plant. Also provided engineering support for the development of the Preliminary Engineering Report.

Canal Stabilization Project, Primrose Canal | St. Charles Parish, Boutte, LA | Assistant Project Manager/Project Engineer. Mustafa provided engineering design and construction administration services. The channel side slopes were collapsing into the channel because of existing wood bulkheads that were failing. The project focused on replacing the existing wood bulkheads with 30-foot steel sheet piles that stabilized the channel side slopes. The project included over 1,500 linear feet of steel sheet piles and connecting various concrete con-span bridges to the steel sheet piles. Additionally, over 5,000 feet of channel grading was designed for the project while accounting for all drainage outfall laterals through the vertical sheet pile.

Education
- MA, Natural Resources and Sustainable Development, United Nations Affiliated University for Peace
- MA, International Affairs, American University
- BS, Environmental Management and Protection, California Polytechnic State University

Registrations/Certifications
- NA

Years of Experience
- 14 years

Jasmin Mejia

Equity and Resiliency Analysis

Jasmin brings 14 years of experience in equity analysis, guiding the development of transportation equity analysis and performance measures for long-range plans and leads racial equity analysis efforts for transportation clients. Recently, she led, managed, and served as a subject matter expert for the development of a transportation equity guidance document for the City and County of San Francisco Planning Department. Jasmin is a generalist with experience developing community impact assessments, and CEQA/NEPA sections such as environmental justice, land use, housing, water quality, hydrology, and transportation. Jasmin's natural and human environment technical experience and sustainable development academic background allows her to bring a deep understanding of the complex relationship between social, environment, and economics.

Relevant Experience

Santa Clara Valley Transportation Authority | El Camino Real BRT Project EIR, Santa Clara County, CA | Environmental Planner. Conducted senior review of sections of the EIR/EA, completed quality control of the technical studies and prepared the construction chapter. The project proposes to replace the Shoemaker Bridge (West Shoreline Drive), improve the I-780 corridor, and accommodate planned City improvements on local streets.

City and County of San Francisco | Equity Guidance for the Railyard Alignment Benefit Study, San Francisco, CA | Project Manager. Without a blueprint, Jasmin led the approach and development of the guidance document. The document outlined equitable community engagement strategies, transportation equity analysis methodology, and consideration of equity during the environmental review. The document provided guidance on transportation equity analysis and community engagement on future rail projects in the Railyard Alignments and Benefits Study project area, including the Pennsylvania Avenue Extension, 22nd Street Station, and other projects.

Los Angeles Metropolitan Transportation Authority | Los Angeles River Path EIR, Los Angeles, CA | Senior Technical Reviewer. Jasmin is providing senior technical review of the environmental justice and equity impact analysis report. The LA River Path Project proposes to construct an 8-mile bike path along the LA River through Downtown LA. The project runs between Elysian Valley in the City of Los Angeles, accesses downtown Los Angeles, and connects with the City of Vernon and City of Maywood. An Environmental Justice and Equity Impact Technical Report is being developed to determine the presence of disproportionate impacts and cost and benefits of the project.

SANDAG | SR-152 Coast, Canyons, and Trails Comprehensive Multimodal Corridor Plan, CA | Equity Subject Matter Expert. Jasmin advised on the development of the performance measures for equity and land use, including the data set for analysis, for the development and prioritization of future transportation projects. The Plan will evaluate travel modes and transportation facilities, develop transportation solutions, and improve multimodal connections, and decrease environmental threats.

Los Angeles Metropolitan Transportation Authority | North San Fernando Valley Bus Rapid Transit Project Racial Equity Analysis, Los Angeles, CA | Equity Task Lead. Jasmin led the development of the REA. The REA considered the community profile of the study area, equity analysis methodology and questions

to analyze the project's impacts, benefits, and consequences with relation to environmental, social, and transportation. She provided guidance on the approach to the analysis. The North San Fernando Valley Bus Rapid Transit Project is a proposed 13.8-mile BRT line that proposes to improve service and increase system connectivity between the seven communities.

Caltrans District 4 | State Route (SR) 37 Flood Reduction Project EIR/EA, CA **|** Project Manager. Jasmin is providing strategic guidance on project delivery during PA&ED and managing the environmental team through the preparation of the environmental document and provides strategic guidance on community engagement. Preparing sections of the environmental document and conducting senior review. The project proposes to elevate SR 37 from US 101 to the Atherton Avenue undercrossing to adapt to projected sea level rise and reduce recurring flooding. This project will build climate resiliency along economically important corridor in the Bay Area region.

San Francisco Planning Department | Potrero HOPE SF Master Plan EIR/EIS, CA **|** Deputy Project Manager. Jasmin developed the environmental justice analysis, responding to public and agency comments on the public document, and led the preparation of the Public Draft and Final EIR. The Project proposed to demolish 620 public housing units to develop housing for a range of income levels for up to 1,700 new units.

Education
- MPA, Public Administration, University of Miami
- BA, English, University of Miami

Registrations/Certifications
- NA

Years of Experience
- 32 years

Susy Torriente

Equity and Resiliency Analysis

Susy is an organizational strategist with over 30 years of local government experience. She has been instrumental in the development of numerous sustainability and resilience plans for the City of Fort Lauderdale, Miami Beach, and Miami-Dade County. Susy's portfolio includes planning, building code compliance, sustainability, and environmental management. She has presented at hundreds of climate, sustainability, and resilience conferences around the world over the last 10 years. Her groundbreaking work in the SE FL Compact and for each community, including her work on the Rockefeller 100 Resilient Cities, Resilient 305 has provided the framework and guidance to enhance community resilience across the region. Susy brings her expertise to leverage Jacobs' broad base resilience skills to deliver integrated solutions to public agencies.

Relevant Experience

South Florida Regional Planning Council | Military Installation Resilience Review, FL | Program Director. Susy leads a team, reviewing community resilience to ensure military readiness and mission assurance in four DoD installations in South Florida. Project includes data collection, stakeholder engagement, vulnerability assessment, strategy development, project prioritization and funding strategy development.

Miami-Dade County | Greynold's Park Sea Level Rise Mitigation Study, Miami, FL | Senior Resilience Advisor. Susy developed, evaluated, and ranked flood mitigation strategies by reviewing data and field conditions; flood scenarios, modeling data, and risk and vulnerability assessment. The Jacobs team also developed an accompanying implementation roadmap.

City of Key West | Post Disaster Recovery and Reconstruction Plan, Key West, FL | Resilience Advisor. Susy led the plan development through research and stakeholder engagement to prepare the City in advance of a catastrophic loss. Plan elements include authority, funding strategy, land use, mobility, housing, transportation, and natural environment. Susy helped develop a sea level rise policy to inform future design and construction. The policy establishes level of service standards for stormwater management and road elevation as a start.

U.S. Army Engineer Research and Development Center | Engineering with Nature Program at the DoD; Various Locations | Resilience and Operations Lead. A partnership between EWN and Jacobs to explore opportunities and develop guidance and pilot programs integrating nature-based designs into gray infrastructure. Susy supports the project as a subject matter expert in community resilience and climate adaptation.

City of Miami Beach | Resilient 305 Greater Miami and the Beaches (GM&B); Miami Beach, FL | Assistant City Manager and Chief Resilience Officer. GM&B is a collaboration of Miami-Dade County, City of Miami, and City of Miami Beach, created to respond to the region's major challenges such as climate change, globalization, and urbanization. In 2016, after a very competitive process, GM&B was selected from among 400 applicants to join the 100 Resilient Cities network as the only inter-governmental partnership working to develop a shared resilience strategy. Susy was one of three GM&B CROs leading the development of this plan through all stages from preliminary risk assessment; stakeholder and expert interviews; communications, work group convenings; prioritization; strategy development (structure and content); and ultimate approval by the three governing bodies. More than 50 actions were identified.

Education
- BSCE, Michigan State University

Registrations/Certifications
- Licensed Professional Engineer: LA, AL, AR, FL, MS, OH, TX
- PMI – Project Management Professional
- Licensed LA General Contractor

Years of Experience
- 25 years

Sean Warren, PE, PMP

Cost Evaluation

Sean's early progressive career experience was gained working civil transportation projects as an engineering field technician, project engineer, and assistant resident engineer. Since 2008, Sean has specialized as a project controls, cost engineering, value engineering/constructability professional on several of the largest design-build and CMAR contracts in Southeast Louisiana. Sean provides reliable, effective, and cost-efficient constructability solutions on his clients' most complex programs.

Relevant Experience

CPRA Mid-Basin Sediment Diversion Program | CPRA | Senior Project Management Professional. Providing owner representative project management support services on this historic $2.9 billion sediment diversion structure. The program includes the construction of new levee, flood control structures, highway realignments, new highway overpasses, realignment of rail roads, and rail bridge, site improvements, drainage, and erosion controls. Sean provides project management support services which includes cost engineering, schedule analysis, negotiation support, risk management, value engineering analysis, and general program management support.

Port New Orleans LIT | CMAR Construction New Orleans, LA | Principal Engineer. Responsible for the daily management of operations. Provided independent cost engineering support services on this $1.8 billion river port terminal program. The program includes the construction of new levee flood control structures, highway realignments, new highway overpasses, realignment of rail roads, pile support marine wharf structures, access bridges, and pile supported/elevated employee support buildings. The program includes marine dredging, new revetment, and construction over existing federal levees.

Port New Orleans Jourdan Road Wharf Rehab | CMAR | Principal Engineer. Responsible for the daily management of operations. Provided independent cost engineering support services on this $15M marine structure. The program includes the construction of new pile supported wharf structure, and rehabilitation of existing wharf structures using water based marine plant construction methods.

Mid Breton Sediment Diversion Structure | CPRA, New Orleans, LA | Principal Engineer. Responsible for the daily management of operations. Provided cost engineering support services on this $800 million river diversion structure. The program includes the construction of new levee, flood control structures, highway realignments, new highway overpasses, realignment of rail roads, and rail bridge, site improvements, drainage, and erosion controls.

Mid Barataria Sediment Diversion Structure | CPRA, New Orleans, LA | Cost Engineer (Subconsultant). Provided cost engineering support services on this $1.8 billion diversion structure. The program includes the construction of new levee, flood control structures, highway realignments, new highway overpasses, realignment of rail roads, and rail bridge, site improvements, drainage, and erosion controls.

GSA IDIQs | Design-Build Services Multiple IDIQ Contracts. Provided contractor estimates for design-build firm fixed price task orders. Work included dozens of interior renovations of government owned facilities.

USAF SABER IDIQ | Design-Build Services. Single award base engineering requirements contract. Provided contractor estimates for design-build firm fixed price task orders.

USACE | Design-Build Construction Services for the IHNC-02 Surge Barrier | Change Control Manager. Responsible for negotiating change orders on this historic program. The construction value for this program was $1.3 billion.

USACE | Design-Build Construction Services for PCCP Program. This program constructed the permanent canal closures and pumping stations at 17th Street Canal, Orleans Canal, and London Canal. The construction value of this program was $900 million.

5 – Proposed Project Plan

The team is pleased to provide this project plan and approach to provide planning and technical services to advise and support preliminary evaluation and planning activities required for acquisition and integration of zero emissions vehicles and related infrastructure in the RTA network and facilities. This scope of services and plan is based on our understanding of your needs and the requirements of the Low/No Grant award, and when complete, this plan and approach will move RTA toward execution of the $71.4 million FY2023 FTA Lo/No Vehicle Emission Grant award to assist RTA in transitioning to a zero-emission, resilient fleet with 20 battery electric buses (BEBs), 20 MW solar powered microgrid, charging infrastructure, and workforce development.

This project plan presents an efficient and thorough approach that will provide RTA with an evaluation of project delivery methods and preliminary site planning and design concepts. This evaluation will serve as a robust decision-making tool that will facilitate implementation of the full FTA Lo/No project.

Scope of Services

Our team's proposed scope of services includes Tasks 1 and 2. Task 1 is executed by four subtasks, and Task 2 is executed by seven subtasks. The primary tasks are listed below.

Task 1 – Review and Recommendation for Project Delivery Options

Subtask 1.1 - Inventory and Analysis – Understanding Project Context and Goals

Our team will conduct background research and review appropriate documents, site and market conditions and existing RTA plans to gain a full understanding of the proposed project, its goals, and the community context in which it will be delivered. We will review the following background materials and data:

a. Review RTA's Zero-Emission Fleet Transition Plan to understand RTA's goals and priorities related to this transition and any associated details that could influence or affect the type or nature of the proposed project delivery method

b. Review RTA's existing procurement policies and guidelines (and any other associated local or state procurement rules) to understand the limits of authority that currently can be exercised by RTA in the implementation of the grant

c. Review RTA's approved Section 5339 Grant Application to determine RTA's stated goals, priorities and commitments for the project and any FTA comments related to the grant application and approval, as these details could impact the preferred delivery method for the project

d. Review RTA's current and future capital and operations budgets and service plans for their system to understand how these investments and operational characteristics could impact delivery options and project parameters

Subtask 1.2 - Project Implementation and Delivery Workshop with RTA

We will prepare background materials for and conduct a Project Delivery Workshop with RTA leadership in order to inform RTA of past, current and future delivery options related to this project type, provide case studies of comparable projects to illustrate the advantages and disadvantages of various delivery methods, and solicit RTA input on key decision parameters and priorities for the project that could guide the ultimate delivery method selection.

The workshop is intended to be interactive and collaborative with RTA leadership and staff in order that a full examination of potential delivery options is provided to and understood by RTA. With this understanding and discussion, RTA can then provide guidance and direction as to their priorities for and importance of the various factors that impact their delivery option decision, and Jacobs can incorporate that guidance into the next phase of our work.

Considerations for Selecting A Delivery Model

While there is no best model for all projects, invariably the best choice for a project comes down to these critical factors:

- **Cost**
- **Schedule**
- **Risk allocation**
- **Complexity of project**
- **Owner's ability and desire to control the project**

Understanding and evaluating how RTA thinks on these items will form the basis of our work in Task 1 and decide which model works best for this project.

Subtask 1.3 - Evaluation and Ranking Matrix and Recommendations

Based on the results of the workshop and RTA's input, we will prepare the following items to present to RTA for their review and evaluation:

a. Project Delivery Method Evaluation and Ranking Matrix – We will prepare a matrix evaluation of the potential delivery options for the project and then rank these options as to their ability to meet the goals and priorities of RTA. Evaluation and ranking criteria could include schedule, cost, control/management of process, risk avoidance, ownership/operations scheme, DBE participation, community relations, etc.

b. We will present this Evaluation and Ranking Matrix to RTA leadership for your review and input, and based on this input, provide a final recommended delivery method to RTA for your consideration.

Jacobs will present this evaluation and ranking to RTA in a workshop setting (virtual or on-site as directed by RTA) and be prepared to review and discuss these findings. Jacobs will work with RTA to confirm their earlier guidance and direction on the critical decision factors (i.e. importance of cost, schedule, risk allocations, etc.), and apply RTA's most current thinking on the evaluation factors and rankings to determine the preferred and optimal delivery option.

Subtask 1.4 - Executive Summary and Recommendation

Based on the results of the workshop, RTA's review and input of the Ranking Matrix, and Jacobs' experience with this project type and its potential delivery options, we will prepare an Executive Summary deliverable for RTA that provides a high-level examination of our research, analysis, RTA's input and our final project delivery method recommendation for RTA's FTA FY 2023 Low or No Emission Vehicle Program (Lo/No) project. We will present this Executive Summary to RTA for your consideration and final approval/adoption as appropriate.

Task 1 Deliverable(s):

Executive Summary memo to include workshop, research and analysis synthesis, Ranking Matrix, and final recommendation for project delivery.

Task 1 Duration:

It is assumed that this task can be completed within 6-8 weeks of notice-to-proceed.

Multi-Factor Evaluation for ZE Fleet Transition Planning

We understand the complexities of site identification and project planning for a BEB fleet. We helped MBTA, King County Metro, Santa Clara VTA, and others to identify sites through evaluating criteria such as:

- **Service and deadhead analysis**
- **Utility availability**
- **Flood plain and other resiliency factors**
- **Environmental justice and equity**
- **Facility condition and size**
- **Real estate costs**

We will bring this knowledge and experience to RTA and specifically Task 2.

Task 2 – Preliminary Project and Site Planning

The objective of Task 2 will be to provide RTA the evaluation and tools to select a preferred concept for implementation of the zero-emission resilient fleet project - transition to a zero-emission, resilient fleet with 20 BEBs, a 20 MW solar power based microgrid, charging infrastructure, and workforce development. **Our previous review of the site, as well as our technology expertise allows us to complete this task efficiently and quickly.**

Subtask 2.1 - Define Evaluation Criteria for the Site and Project Identification

The team will work with RTA staff and stakeholders to define clear evaluation criteria, including service compatibility, power availability, facility compatibility, cost, equity, and resiliency, which will serve as the guideline for decision-making throughout the task.

Subtask 2.2 - Equity Analysis

The team will work with RTA to review existing work that has been completed by RTA. The Strategic Mobility Plan includes metrics for mitigating climate change and improving public health. The evaluation criteria will include prioritization for BEB deployment in areas that will improve health and reliability to those who have historically been vulnerable to the impacts of environmental burdens. Approximately 8.9% of adults over the age of 18 in the state of Louisiana have asthma, and by comparison in New Orleans the rate is 9.7% or 37,928 residents. Riders rely on public transit as a means to get to school, work, and medical care. Reducing emissions of

vehicles reduces the risk of exposure to pollutants that could trigger an event that requires emergent medical attention. Working closely with RTA, we will calculate equity statistics by route and facility.

Subtask 2.3 - Resiliency Analysis

Planning for resiliency is vital for RTA given recent history of powerful storms, hurricanes, flooding, and accompanying power failures. RTA service plays a vital role in disaster response. New Orleans relies on RTA service for evacuation, to serve as cooling centers, and to support people and responders who remain in the city during disasters. Transition to BEBs and reliance on the utility electric grid will potentially present resiliency issues in the event of a power outage. The team will compare the resiliency of each facility location to ensure a comprehensive understanding of the project's impact on these critical aspects. Resilience statistics such as flood plain mapping and, if available, data regarding outage frequency and duration will be reviewed to compare each site.

Subtask 2.4 - Facility Condition Assessment

We will provide an assessment of the existing conditions at both potential project sites: A. Philip Randolph Facility and New Orleans East Facility. This assessment will aim to ensure that the project is aligned with the current site conditions.

We will conduct a desktop and in-person site assessment of the A. Philip Randolph Facility and New Orleans East Facility. The assessment will identify potential site constraints and opportunities with the goal of evaluating the condition and adequacy of the facility to meet RTA's present and future needs, as identified in subtask 2.5, and inform recommendations for design concept development and evaluation. The desktop assessment will be performed using geographic information systems (GIS) and publicly available data to map and document natural, community and built environment characteristics that could influence the conceptual layout of a facility. Mapping shall include, but is not limited to, property boundaries, easements/setbacks, topography, zoning requirements, utilities, environmental constraints, and transportation facilities. The desktop assessment will also consider other land use and transportation planning activities influencing the site and socioeconomic characteristics of the site area.

The team will work with RTA to coordinate an on-site evaluation of both facilities. The goal of the site visit is to meet with a small group of staff to gain a better understanding of the elements of the existing site and facility that are currently working well and/or presenting challenges to the operations of the facility, to document the useful life of the facility and to note site-specific characteristics that will inform the conceptual layout such as site size, geometry, access, circulation and any demolition required for new construction or renovation. The site visit will be used to ground truth the site and make note of advantageous characteristics and/or potential constraints that cannot be ascertained via publicly available desktop data such as traffic conditions, new development, topography, site encumbrances, etc.

The below listed conditions will be evaluated.

i. Utility existing conditions
ii. EDR/substation
iii. Power availability
iv. Existing site layout and constraints

Subtask 2.5 - Define Facility Program

In coordination with RTA, the team shall define the program requirements for the current and anticipated BEB service, as well as stakeholders and user groups that could contribute to the development of the program definition process. The team will hold one workshop focused on defining a facility program and establishing the project definition brief (PDB). The workshop will focus on identifying the baseline operational, maintenance, and administrative needs for RTA's zero-emission and resilient fleet project (including charging infrastructure and microgrid infrastructure), and focus on characteristics specific to facility layout and zero emission vehicles. The Facility Program and PDB will document the following:

Fleet Assumptions: Document the existing and planned routes that are to be served by the BEB vehicles along with the number, size(s), and type(s) of revenue and nonrevenue vehicles operating out of the facility.

Staffing Assumptions: The team shall document that total and peak staff that will report to the facilities, including operators, maintenance, and administrative staff.

BEB Infrastructure: Subject matter expert shall facilitate a discussion with RTA on the operational and financial trade-offs of in-depot charging infrastructure approaches, with the goal of identifying and documenting RTA's preferred approach for bus maintenance facilities.

Building Program: Identify any BEB specific maintenance building requirements, as well as standard maintenance and operational requirements and lists all potential vehicle spaces, equipment spaces, and administrative spaces.

Site Spatial Program: Develop a site space program to document all maintenance facility site areas, including building footprint, employee parking, bus parking, fueling, yard storage, and utilities such as sub stations and stormwater retention. The site program shall also account for required circulation and easements.

We will define the requirements for the facility program, covering the below listed critical aspects.

i. Electrical infrastructure
ii. Chargers
iii. Pantograph connections
iv. Gantries for pantographs
v. Microgrid infrastructure
vi. Fire suppression
vii. Spatial requirements for all infrastructure and equipment
viii. Transportation Operations requirements
ix. Maintenance Operational requirements
x. Other operations on sites such as paratransit/non rev/OCC

Subtask 2.6 - Prepare Design Concepts and Evaluate Against Evaluation Criteria
We will prepare design concepts for three options:

1. Option 1 - New Orleans East Facility only
2. Option 2 - A. Philip Randolph Facility only
3. Option 3 - both locations

Our team of BEB experts and design disciplines will use their deep knowledge of the industry to identify key issues and factors for consideration between the options. We will develop a conceptual layout for the options listed above to demonstrate the site's ability to accommodate the proposed building program and Project needs. The conceptual layouts will include a diagrammatic study of major site and building components; ingress/egress location(s); general site circulation; and parking requirements for the purposes of testing the layouts for their ability to accommodate the bus maintenance facility program identified in subtask 2.5. We will conduct an in-person workshop to review the concept plan options with RTA during the concept development process to: 1) Review draft conceptual layouts and 2) Review refined conceptual layouts and discuss trade-offs.

We will then evaluate these design concepts against the previously defined evaluation criteria, ensuring alignment with the project goals. Evaluation criteria will include service compatibility, power availability, facility compatibility, cost, equity, and resiliency. It is assumed that the service compatibility and power needs are being conducted by CTE and will be provided to the team. Representative cost opinions for each option/design concept will be estimated using recent representative projects. It is assumed that RTA will provide relevant information from recent projects as appropriate. The purpose/intent of the cost comparison will be for order of magnitude comparison between options, and not for budgeting purposes.

Subtask 2.7 – Present Selected Option
We will present the three design concepts along with the evaluation to RTA. The aim of the presentation will be to provide guidance and assistance in selecting a preferred alternative to move forward in the design process. The decision will be supported by documentation and data contained within the evaluation. The selection of the delivery method, as well as the preferred alternative will define the project's next steps.

Task 2 Deliverable(s):
Our team will provide a technical memo detailing the results, analyses, program, options, and recommendation of tasks 2.1-2.7.

Task 2 Duration:
It is assumed that this task can be completed within 14 weeks of notice-to-proceed. Task 2 and Task 1 can be initiated concurrently.

Subtask	Deliverable	Project Timeline											
Task 1 - Review/Recommend Project Delivery Options		March 2024				April 2024				May 2024			
Subtask 1.1	Inventory and Analysis												
Subtask 1.2	Project Implementation & Delivery Workshop												
Subtask 1.3	Evaluation and Ranking Matrix												
Subtask 1.4	Executive Summary and Recommendation												
Task 2 - Preliminary Project and Site Planning													
Subtask 2.1	Define Evaluation Criteria for Facility Plan												
Subtask 2.2	Equity Analysis												
Subtask 2.3	Resiliency Analysis												
Subtask 2.4	Facility Condition Assessment												
Subtask 2.5	Define Facility Program												
Subtask 2.6	Prepare Design Concepts & Evaluation Criteria												
Subtask 2.7	Present Selected Option												

Assumptions and Exclusions Regarding the Project Plan and Scope of Work

The scope of services and major tasks identified in this section of our proposal have been tailored to provide the necessary data, information, and evaluation criteria required for RTA's decision-making in terms of project delivery methods and site selection. This work has been created understanding and assuming the project budget is as stated in the RFP, and accordingly, the work is limited in its detail as follows:

1. All data used for our work will be provided from existing data sources (i.e., RTA data and files, GIS files at the City, etc.). Primary data collection efforts (i.e., site survey, traffic counts, abstract research, environmental studies, etc.) are excluded from our project plan.
2. Site and facility concept plans are general in nature and are not envisioned as detailed or scaled engineering and architectural design drawings. The facility programming and concept plans will be based on comparable, similar projects developed or completed with other agencies or communities. The more-detailed designs and engineering drawings for the facility will be provided in subsequent phases of the project.
3. Estimates of probable construction costs and overall project costs will be based on the best available market conditions in the local area and our experience with similar projects with similar owners across the United States. These estimates are for information purposes only and should not be viewed or interpreted as Guaranteed Maximum Prices for any of the project elements.
4. Workforce planning and evaluation services included in the Lo/No grant award are not included in this scope of work or project plan.
5. Detailed service planning or route analysis and recommendations are not included in our scope of work.
6. Detailed evaluation of the power grid and capabilities at each site is to be provided by others. We will use this power/electrical evaluation in our site assessment evaluation, but the information and analysis is to be provided by others.
7. It is assumed that the existing transportation use on both existing sites are permitted uses per the city's zoning ordinance, and further, the proposed facility additions/renovations funded by the Low/No grant will also be "permitted" on each property.

6 – Cost Proposal

Total cost for the project plan is on a lump sum basis for an estimated total of $150,000. A summary of this lump sum amount by task deliverable is provided below. The project team has prepared this estimate based on our understanding of the project goals, specific activities, and assumptions as outlined in this proposal. As of this proposal submission, our team has not yet received draft contract terms and conditions. The project team reserves the right to issue exceptions to the contract terms and conditions and update our proposal upon review. Our team will notify RTA in advance should the actual scope and the associated costs differ from that assumed. Any adjustments to scope or costs as may be required shall be made in coordination with RTA.

Subtask	Deliverable	Estimated No. of Hours	Estimated Cost ($)
Task 1 - Review and Recommendation for Project Delivery Options		194	$45,000.00
Task 2 - Preliminary Project and Site Planning		490	$94,000.00
Estimated Total Amount for other Costs (Travel, etc.)			$11,000.00
	Total Number of Hours		684
	Total Estimated Lump Sum Cost ($)		**$150,000.00**

The following assumptions have been taken into consideration in the preparation of this proposal and our accompanying lump sum fee. We believe these assumptions to be reasonable for the proposed work program and reasonable based on our previous discussions with RTA. If these assumptions can't be fulfilled by either RTA or our team, our proposal may need to be modified or updated accordingly.

- Two in-person, 1-day workshops are included in this project plan, one for Task 1 and one for Task 2. All other workshops referenced in the project plan will be virtual. Upon award, we will work with RTA to determine the best time and date for each workshop.
- RTA will provide upon request the necessary documentation for the team to complete Subtask 1.1 - Inventory and Analysis – Understanding Project Context and Goals.
- The scope presented herewith is based on RTA's needs at this time. If RTA desires additional consultation about other project elements (i.e., detailed schedule, refined capital cost, potential charging infrastructure contractors, etc.), the project team will provide these services as additional scope of work.
- All deliverables for Task 2 will be preliminary planning in nature and not intended as design nor for construction.