

STEVE NOONAN, P.E.
Mechanical Engineer and Rail Systems Expert

More than 40 years of experience in the engineering field, encompassing engineering, design maintenance, maintenance supervision, project management, training, technical consulting and operations management. Managed U.S.-based engineering services and provided project management to numerous transportation systems and clients. Responsible for the application of technical resources to projects and engineering tasks, including coordinating resources among international operations and U.S.-based teams, ensuring the quality of technical deliverables, adherence to appropriate standards and compliance with clients' technical and operating requirements.

Vehicle Systems: Systems design, engineering, inspection, maintenance, and production/manufacturing resident engineering for rail rolling stock equipment. Specification of rolling stock from concept through subsystems, components and parts for new train production and complete rail car overhauls. Systems, subsystems and components include propulsion, pantograph traction power gear, third rail power equipment, train control, braking, couplers, structural car body/car shells, trucks, side doors, end doors, lighting, controls, HVAC/air conditioning, event recorders, diagnostics & health monitoring, communications, interiors, seating, operating cabs, safety/security. Experienced in troubleshooting and failure analysis of equipment problems/defects including train derailments and fires on rolling stock, as well as application and maintenance of diesel engines for propulsion and power generation.

Operating Systems: Systems experience includes interfaces between rail vehicles and the operating environment including track, traction power, signals, third rail, catenary, tunnels, stations, platforms, elevators/escalators, shops, yards, bridges, and road crossings in normal operating environments as well as construction settings.

Rotating, Hydraulic and Power Conditioning Equipment from Rail, Marine, Facilities and Maintenance Industries: Systems and components including generators, transformers, rectifiers, switching equipment, circuit breakers, wiring, electric motors, hydraulic motors, hydraulic pumps, cylinders, rams, valves, lathes, drill presses, boring machines, wheel and bearing presses, planers, milling machines, grinders, saws, cutters, welding equipment, ventilation fans, forklifts, cranes. Experiences include evaluation and development of functional criteria, design/specification, use and repair of tools/equipment, development of installation plans and supervision of installations and repairs, management of warranty programs., evaluation of defects, condition assessments and financial and personnel resource planning focused on state-of-good-repair.

Barn Reclamation: Development of safe demolition plans, selection, rental and supervision of equipment utilization including telescopic forklift/lull, chain hoists, cable winch pullers, pre-tensioning straps, tractors, bulldozer. Cutting and supervision of loading for reclaimed wood using chainsaws, reciprocating saws, circular saws and skid steers into multiple (type) trailers for transport.

Regulatory Standards & Requirements: Experienced in application of regulatory requirements including Code of Federal Regulations (CFR), Federal Railroad Administration (FRA), Environmental Protection Agency (EPA), National Fire Protection Agency (NFPA), National Electric Code (NEC), National Electric Manufacturers Association (NEMA), International Electrotechnical Commission (IEC), Military Standards (MIL-STD), American Welding Society (AWS), American Bureau of Shipping (ABS), United States Coast Guard (USCG), Occupational Safety and Health Administration (OSHA), American Society of Mechanical Engineers (ASME), American National Standards Institute (ANSI), Americans with Disabilities Act (ADA).

PROFESSIONAL EXPERIENCE

2019 to present **Robson Forensic, Inc.**
Associate

Provide technical investigations, analysis, reports, and testimony toward the resolution of commercial and personal injury litigation involving electrical and mechanical equipment/machinery, in production and maintenance facilities, as well as transportation system operating environments. These include rail passenger coaches, trainsets, locomotives, maintenance of way (MOW) equipment, maintenance facilities, railroad systems, rail operations, production/overhaul/manufacturing plants, and vehicular bridges, tunnels and terminals.

2010 to 2020 **WSP**
Vice President and Manager, Rail Vehicle Group - Northeast

Responsible for Rail Vehicle Engineering and Planning, managing staff and contract resources supporting all aspects of rail vehicles including planning, technology assessment, design/procurement support, production QC and commissioning activities. Assignments included Maryland MTA Rolling Stock GEC, Illinois DOT HSR, Atlanta-Chattanooga/SEHSR candidate trainset evaluations, WMATA Rail Vehicle CIP Evaluation, Caltrans Coach Overhaul and FTA Asset Management projects.

- **Maryland Transit Administration (MTA)** – Provided engineering services on the Baltimore-Washington D.C. Maglev Project, including assessment of technology transfer plans designed to satisfy the Federal Railroad Administration’s (FRA) deployment program goals, as well as independent peer review of cost estimates for operating systems and annual operations and maintenance (O&M).
- **Maryland MTA Rolling Stock GEC – Project Manager** leading multi-disciplined team with sub consultants to deliver technical and project management services to MTA’s commuter, subway and light rail transit modes. Managing a local team of vehicle engineers supported by DBE subcontractors and a full range of rail vehicle technical and maintenance experts. Served as Resident Engineer for MTA’s LRT Overhaul Project. Provided engineering recommendations to address equipment defects uncovered during the overhaul process to return vehicles and components to safe and consistent configurations.
Provided engineering services in the overhaul of passenger rail locomotives aimed at returning equipment to acceptable reliability levels to achieve required service needs.
- **TransLink Mark III Transit Vehicle Procurements – Project Manager** for WSP Inspection Services performed at contractors’ US and International sites for vehicle equipment fabrication, assembly and testing.

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- **Memphis Area Transit Authority – Technical Project Manager** leading a team of vehicle consultants and partner firms to develop and implement a rehab program for vintage trolleys to enable safety certification and re-initiation of revenue service. The vintage trolley fleet had been removed from service following two major fires in service. Assessed the equipment conditions, the root causes of the conditions leading to the fires, and the maintenance organizations ability to collaborate with outside contractors in a selective overhaul program that could lead to safety certification of the equipment and the traction power catenary system that feeds the entire system.
- **NYCT Grant Application** – Developed technical/operational analysis of NYCT's mobile pumping equipment and deployment in support of their grant application seeking post-Sandy Storm funding to increase system resilience.
- **Caltrans GEC/Comet 1B Coach Overhaul – Project Manager** leading a multi-disciplined team to develop specifications/work-scopes to overhaul used equipment for use in intercity service in California. The document preparations were non-traditional in that we worked collaboratively with the selected contractor to develop scopes that take advantage of existing supply chains and practices within the realm of the customer's requirements and regulatory compliance. Maintenance practices from existing equipment were reviewed, revised and tailored to a mixture of old and new equipment with a wide range of ages and technologies. Maintenance requirements for this refurbished fleet were prepared for incorporation into an existing 3rd party maintenance contract. Negotiated the purchase of spare components including trucks, doors, air conditioning and compressed air/braking equipment. Worked first hand in the field with a salvage contractor to remove all components, package and ship to the rehabilitation site. Audited a full set of OEM drawings to select and transfer documentation to support the contractor's installation and testing, as well as Caltrans future maintenance activities.
- **WMATA CIP Evaluation – Lead Evaluator** of WMATA rail vehicle fleets and related maintenance organizations, revenue and non-revenue, to audit/assess the state of vehicle programs, facilities and services in support of the capital program.
- **Structural Metals Services** – Managed a team of certified weld inspectors providing services to transportation sector projects across the US. The team included AWS certified inspectors for structural welding, NDT and coatings; assignment of resources is managed from a pool of qualified employees, bolstered by contracted services, to meet the demands of fluctuating workloads and the requirements for specific skills and certifications to address different customers' needs.
- **Buy America Auditing** – Provided federally mandated auditing for operating agencies purchasing rolling stock (coaches and locomotives) and fare control systems. Pre-award audits are required to assess the contractors' ability to design and build to the purchasers' technical specifications using materials, components and labor meeting minimum U.S. content limits Post-award audits were required to assess/determine whether the contractor actually met the requirements.

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2008 to
2010

Interfleet Technology

Principal-in-Charge/Project Manager/Test Manager/Expert Witness Consulting

- **Metropolitan Atlanta Rapid Transit Authority (MARTA) (client)** – Began as Principal-in-Charge and later assumed the roles of project manager and test manager for a detailed analysis of vehicles and systems, to determine root causes for MARTA's plaguing problem of premature current collector shoe failures. MARTA had experienced a fracturing of shoes/paddles in service at an exorbitant level, far exceeding the consumption normally attributed to wear in service. Components in the truck system, as well as third rail and running rail infrastructure elements, were subjected to thorough analyses to determine their potential contribution to the accelerated failure rates. In addition to an assessment of maintenance practices and prior engineering analyses, laboratory and in-service instrumented tests were devised and implemented to acquire detailed data, leading to definitive conclusions and recommendations to sustain normal consumption rates due to wear in the MARTA system while also improving the economics of material supply. In addition to enabling lower costs for materials and labor, the recommendations addressed key issues of safety and reliability.
- **Bombardier (client)**
Provided engineering services to a car builder to determine causes of, and potential solutions for, a fleetwide problem with delaminating train side doors. Engineering drawing reviews, vendor design process analysis, site reviews of factory fabrication methods for door panels, interviews with the door system supplier, inspection of materials handling and car door installation, and vehicle field investigations were performed. Review of this data was performed to ascertain the root cause of the failures and conceptual designs for corrective modifications were provided to the customer and documented in a full written report.
- **Confidential client (Major US Bank)**
Provided litigation support/expert witness services and served as team leader providing strategic and technical inputs and management to expert witness support services to financial partners in transit equipment leasing transactions. Services included analysis of transaction documents, site visits and document review to assess maintenance activities relative to lease term commitments, detailed vehicle and system data collection and organization, and industry data collection and review. This data was reviewed personally and with managed support of additional technical experts on staff to arrive at an organized, logical, sourced report with cost estimating, to permit a thorough and structured presentation of the information in support of our lead expert witness.
- **Confidential client (Major Freight Railroad)**
Provided litigation support/expert witness services to a confidential client. Served as lead vehicle expert witness supporting a railroad operator and commuter rail agency in defending a suit related to a door incident where a woman suffered injuries in exiting a moving train. Extensive review of depositions and first hand examination of operations and maintenance activities provided vital information to attorneys leading to the development of a settlement with the plaintiff.

THE EXPERTS
Robson Forensic

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- 2005 to **Michael Baker Co.**
2008 *Rail Practice Leader*
Managed rail and transit services including planning, engineering and project management. Clients/tasks included: NJ Transit prototype GPS locator system for locomotive and trains, Norfolk Southern Railroad Intermodal Facility design services and the Commonwealth of Pennsylvania Transportation Funding and Reform Commission Technical Equipment and Operating Systems Assessment.
- 1997 to **Lea & Elliott / Amtrak (Primary Client)**
2005 *Project Manager/Senior Engineer – Northeast Corridor (NEC)* *1997-2001*
Reported to the Amtrak vice president - high-speed rail (HSR). Responsible for reporting project status and issues from an integrated project perspective for both Amtrak's \$2.5 billion purchase of high-speed electric train sets and HHP locomotives, and the system's electrification and civil improvements within the NEC. A special assignment included evaluating the status of key technical open issues and revised schedules for production/commissioning/retrofit with confidential reporting to Amtrak management and the U.S. Department of Transportation's (USDOT) Inspector General.
- Amtrak & Midwest States Coalition (clients)
Project Manager – Midwest Corridor HSR *2001-2003*
Project manager for planning and procurement activities during the Midwest HSR Corridor Project (MWRRI). Led the development of a performance-based specification for the procurement of train sets, facilities and maintenance to maximize competition and lower capital costs for Amtrak and the nine-state consortium. Provided engineering services to Amtrak in the evaluation of proposals and negotiation of D/B/M contracts. The solicitation documents were designed to solicit maintenance regimes which take advantage of best practices for reliability and maintainability from 3rd party maintainers within the boundaries of federally regulated maintenance operations.
- Automated People Mover Systems & Transit Systems (various clients)
Provided services for different projects and tasks including: Mid-Life Equipment and Systems overhaul design for Newark Airport Airtrain Monorail System, Crush load systems operation analysis for planned new Seattle Monorail system, NYMTA Independent Engineering Consultant for new train procurements (NYCT, LIRR, MNR).
- 1984 to **Port Authority of New York & New Jersey/ Port Authority Engineering**
1997 **Department/ (PATH) Rapid Transit Fleet – Car Equipment Division (Maintenance/Repairs/Overhaul)**
Assistant Superintendent *1994-1997*
Managed inspection, maintenance and repairs for a fleet of 400 revenue and work cars with 300 employees. Also managed manpower and materials budgeting for division personnel for day-to-day operations as well as projects and contracted services. Additionally, as Supervisor of Technical Services, performed engineering and supervised the technical staff, including engineers, MIS specialists, training supervisor and a quality control specialist, while managing the efforts of staff and technical consultants engaged in the analysis of fleet performance and scope development for the mid-life overhaul project.

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Delivered engineering and supervision of staff in the evaluation of individual and fleet defects to all rolling stock in PATH's revenue and work train fleets. Mechanical and electrical equipment defects arising from equipment failures including derailments and fires were evaluated, root causes determined and corrective action plans developed. Managed test/measurement equipment calibration program supporting vehicle maintenance activities.

Developed and implemented maintenance and equipment modifications to achieve safe and reliable service in accordance with industry standards and federal regulations.

Disciplinary Officer

1995-1996

Served as Disciplinary Officer for the Car Equipment Division conducting hearings addressing unionized employees charged with violations of work rules. Hearings were conducted in accordance with local contracts (between PATH Corporation and multiple unions) and national union leadership/representation rules. Rendered local recommendations that fed into agency decision-making for type and duration of disciplinary actions that were subject to appeals at local and national levels.

Instructor

1994-1997

Delivered technical instruction to PATH's personnel in a three year apprentice program. Developed curriculum and instructed in live classrooms four courses; Mathematics, Blueprint Reading, Electrical Theory 1, and Electrical Theory 2. Semester long courses included instruction in theoretical concepts as well as hands on use of measuring instruments. Prepared and administered testing with pass/fail requirements for completion of the courses for certification of inspectors and repair technicians to staff PATH's rail vehicle maintenance organization.

Technical Services Consultant

1992-1994

Provided technical support to facility operations and capital improvement programs for rail, tunnel and bridge facilities (including Holland & Lincoln Tunnels, Bayonne/Outerbridge/Goethals/GWB Bridges and P.A. Bus Terminal). Tasks included assessment of electrical and mechanical conditions. Assessments were then used to provide details for scoping of repairs and re-construction, as well as data and guidance to asset management programs for agency facility systems.

Rail Vehicle Procurement Project Manager

1990-1992

Provided engineering and project management services for the purchase of 95 new cars and the complete overhaul of 250 rail transit cars. Served as Resident Engineer in two different plants performing overhaul. Assessed contractor designs/plans for implementation of repairs to vehicle structures and equipment mounting with respect to safety and functionality. Monitored testing of individual systems as well as completely overhauled vehicles.

Design Project Manager

1987 -1990

Managed agency and consultant teams designing the JFK International Airport Automated People Mover Systems.

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Senior Engineer

1984 – 1987

Provided engineering services including design and implementation of rail vehicles and rail maintenance facilities modifications. Supported machine shop operations including specification and procurement of machine tools followed by interface between manufacturers and machinists for training and warranty execution. Provided specification of facility modifications and directed both internal facility maintenance/construction forces and outside contractors.

1982 **American Bureau of Shipping**

1984 Surveyor – Electrical and Controls

Performed analysis and approval of shipboard electrical and control systems for US Flag vessels. Reviewed designs for compliance with ABS rules and identified specific deficiencies that would preclude certifications so that designers and shipbuilders could initiate clear corrective actions.

1979 to **Gulf Trading and Transportation / Texaco**

1982 *3rd Assistant / 2nd Assistant Engineer*

Provided engineering services on board Gulf Oil and Texaco ocean going tankers. Responsibilities included all aspects of operating and maintaining shipboard propulsion and power equipment associated with cargo handling and hotel loads. Performed machine repairs and maintenance addressing normal and emergency needs for all on-board systems. Used machine shop tools to fabricate and repair components and parts on board ship. Performed welding for repairs and fabrication of shipboard components and piping.

PROFESSIONAL CREDENTIALS

Professional Engineer: Delaware, District of Columbia, Florida, Illinois, Maryland, Mississippi, New Jersey, New York, Pennsylvania, South Carolina, Virginia
United States Coast Guard, 2nd Assistant Engineer
United States Naval Reserve, Lieutenant

EDUCATION

M.S., Management, Executive Program, New Jersey Institute of Technology, 1997
B.E., Marine Engineering, SUNY Maritime College, 1979

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Continuing education:

Municipal Wastewater Treatment Systems, McKissock, 2016

Precast Substructures – Comparison of Non-seismic and Seismic Connection Details, ABC-UTC, 2014

Fundamentals of Arc Welding, PDHengineer.com, 2013

Overview of Refrigeration Systems, PDHengineer.com, 2013

Engineering Ethics: Case Study of the TV Antenna Tower Collapse, PDHengineer.com, 2013

Principles of Steel Design, PDHengineer.com, 2012

Renewable Energy: The Practicality and Potential of its Leading Sources, PDHengineer.com, 2012

Electrical Engineering Fundamentals for Non-electrical Engineers, PDHengineer.com, 2012

PROFESSIONAL AFFILIATIONS

American Railway Engineering and Maintenance-Of-Way Association (AREMA)

American Public Transportation Association (APTA), Commuter/Intercity Rail Committee

American Council of Engineering Companies (ACEC), NJT Transportation Subcommittee

High Speed Ground Transportation Association: Board of Directors (2004)