SLR International Corporation
2 Commerce Drive, Suite 110, Bedford, New Hampshire, 03110

January 18, 2024

Mr. Tobey Reynolds, PE
Assistant Director of Project Development; Chairperson, Consultant Selection Committee
New Hampshire Department of Transportation

RE: Statewide On-Call Preliminary Engineering Prequalified List of Consultants for LPA QBS Contracts

SLR International Corporation (SLR) is pleased to submit this Letter of Interest for the statewide on-call preliminary engineering prequalified list of consultants Local Public Agency (LPA) QBS contracts. SLR is a multidisciplinary engineering, environmental science, and planning firm with offices located throughout New England, including Bedford, NH. We currently have 5 staff that are NHDOT LPA Certified. All work under this contract will be completed internally by SLR staff, with the exception of topographic survey and ROW plan development (to be completed by Doucet Survey).

SLR has successfully completed roadway design, bridge design, transportation planning and engineering, environmental, and related services throughout New Hampshire and New England, for over 100 New England municipalities and dozens of New Hampshire municipalities. Our staff have municipal experience in all of the planning, engineering, and environmental service areas presented in the Request for Letters of Interest.

We are pleased to designate **Michael Zarba, PE** to serve as our primary Project Manager for assignments under this contract. Mike is a former Municipal Engineer, Highway Superintendent, and Public Works Director. He understands the need to balance state and municipal requirements. With over 30 years of experience working on highway and bridge design as well as related municipal infrastructure improvement projects, Mike has exceptional communication skills and substantial experience in engaging the public. **Mike is a licensed PE in New Hampshire and is NHDOT Local Public Agency (LPA) certified. He is currently serving as Project Manager for the Town of Hampton, NH on-call roadway engineering and coastal engineering contract and is the Project Manager for the NHDOT Charlestown 40667 project.** Recently, Mike's team was selected for traffic, parking, circulation, stormwater, and accessibility at Rye Harbor State Park in Rye, NH.

We have several other senior roadway and structural engineers qualified to serve as Project Manager for assignments that may be more appropriate to their background. We currently have on-call municipal engineering and planning service contracts with Hampton, NH; Salem, NH; Manchester, NH; Rochester, NH; Dover, NH; and more than 50 active on-call contracts for municipalities in other New England states. We have recently completed the Patricia Russell Park and Stormwater Improvement Project for Keene, NH, and have an ongoing contract for the Mountain Grove Erosion Control – Shore Road Design for Manchester Water Works. Via a previous merger, SLR has been serving New Hampshire municipalities for three decades.

Doucet Survey will provide topographic survey, ROW layout, and plan development, as required. Doucet currently has an on-call survey services contract with the Department. Their Bedford, NH office is located in the same building as SLR, which will provide for efficient coordination.

We look forward to the opportunity to receive prequalification for these municipal services. Feel free to contact me at (207) 541-9544 or mzarba@slrconsulting.com with any questions.

Regards,

SLR International Corporation

Michael Zarba, PE
Principal Transportation Engineer
Maine Office Manager

Project Understanding & Approach

SLR staff are familiar with the NHDOT Local Public Agency Manual for the Development of Projects; and understand the roles and responsibilities for consultants, municipalities, NHDOT and FHWA. We are also familiar with the NHDOT wetlands, cultural resources, contamination, water quality, and air and noise programs and requirements. SLR staff are qualified to complete work in all of these areas, providing efficiencies and project cost effectiveness. Before submitting on any municipal engineering project, we review potential real or perceived conflicts of interest with other current or recent past projects.

SLR has successfully completed roadway design, bridge design, and related services for over 100 New England municipalities. We have staff with substantial experience working on Federally funded TAP, CMAQ, MOBRR, and SBA programs. We also have experience working with municipalities throughout New England assisting with Federal and state funded infrastructure grant programs.

SLR staff have substantial experience in the following municipal engineering services:

Highway Design: SLR has developed an extensive portfolio of highway and infrastructure improvement projects for municipalities, state agencies, and private developers. With a "Complete Streets" approach, our in-house staff can handle all aspects of a transportation improvements system, including planning, permitting, conceptual design, environmental assessment, pavement and drainage evaluation, safety concerns, and construction management services. Our in-house technical staff can handle all aspects of transportation improvement systems, including planning, permitting, conceptual design, environmental assessment, pavement and drainage evaluation, safety concerns, value engineering, cost estimating, final design, and construction management services.

Bridge and Culvert Design: SLR has expertise in preliminary design, final design, and development of contract documents for bridge maintenance, rehabilitation, and replacement design for various bridge structures; inspection and load rating of various bridge types, including gusset plates, and completions of Bridge Rating Form 4 for as-built and as-inspected conditions; hydraulic calculation and analyses associated with bridges, waterways, and drainage structures; design of scour countermeasures and substructure protection; overhead sign structure design; retaining wall design; and bridge construction support services. SLR is a leader in New England in the incorporation of fluvial geomorphology in the assessment of culvert sizing and design to improve resiliency and sustainability. We were recently awarded an ACEC Engineering Excellence Award in Massachusetts for such a culvert design project.

Environmental Services: SLR's experience includes environmental and cultural resource identification and impact evaluation and minimization; preparation of appropriate state and NEPA environmental documentation, as well as natural and cultural resource investigations and permitting requirements.

Geotechnical Evaluations, Analyses, and Design: SLR geotechnical engineers are involved with subsurface exploration programs; field testing; underpinning; temporary earth retaining systems; soil and rock slope stability; bedrock contouring; seismic analysis; and pavement evaluations and design.

Traffic Engineering: SLR offers a broad range of services in the area of traffic engineering and design. Work includes traffic impact and parking studies, access management, congestion mitigation, bicycle-pedestrian studies, traffic calming, transit studies, highway interchange planning, safety studies, traffic signal/communication systems design, intersection designs, signage, and pavement marking designs.

Stormwater Engineering: SLR has been at the forefront of stormwater engineering and management, ranging from development of regional and statewide regulations and guidelines to site-specific design of stormwater detention basins and treatment systems. Our staff are well versed in TR-20, HEC-1, and HEC-HMS hydrologic models.

Construction Phase Services: SLR administers construction support services that are an invaluable asset to our major design disciplines, providing the expertise of qualified professionals and field technicians in construction administration, engineering, and inspection. Members of the team are certified by National Institute for Certification in Engineering Technologies (NICET), the American Traffic Safety Services Association (ATSSA), and the NorthEast Transportation Technician Certification Program (NETTCP). The firm's construction-phase services include bidding assistance, periodic site observations, resident engineering, review of contract submittals and payment requisitions, and project closeout.

Supplemental Added Services: SLR has offered a wide array of additional services to municipalities throughout New England, including:

Landscape Architecture for Context-Sensitive Design Solutions

SLR has nearly 20 landscape architects in New England. Our environmental and highway design teams integrate Landscape Architecture into almost every project for creative solutions aimed at streetscape, mitigating visual impacts, and restoring affected properties.

Resiliency, Climate Change Adaptation, and Rivers and Roads / Fluvial Geomorphology Assessments and Design

For projects in coastal areas, understanding the effects of Sea Level Rise may be key to developing solutions that will "adapt" to provide for maximum longevity. For roads adjacent to rivers prone to flooding, understanding changing rainfall patterns, including greater storm frequency and intensities, may be key to developing solutions that will be more "resilient" as we strive to combat climate change. SLR is a recognized leader in New England in the application of Rivers and Roads principles and practices to improve resiliency in the design of roadways, culverts and bridges.

Water and Wastewater Design

SLR offers system evaluations, engineering and design, and construction oversight services.

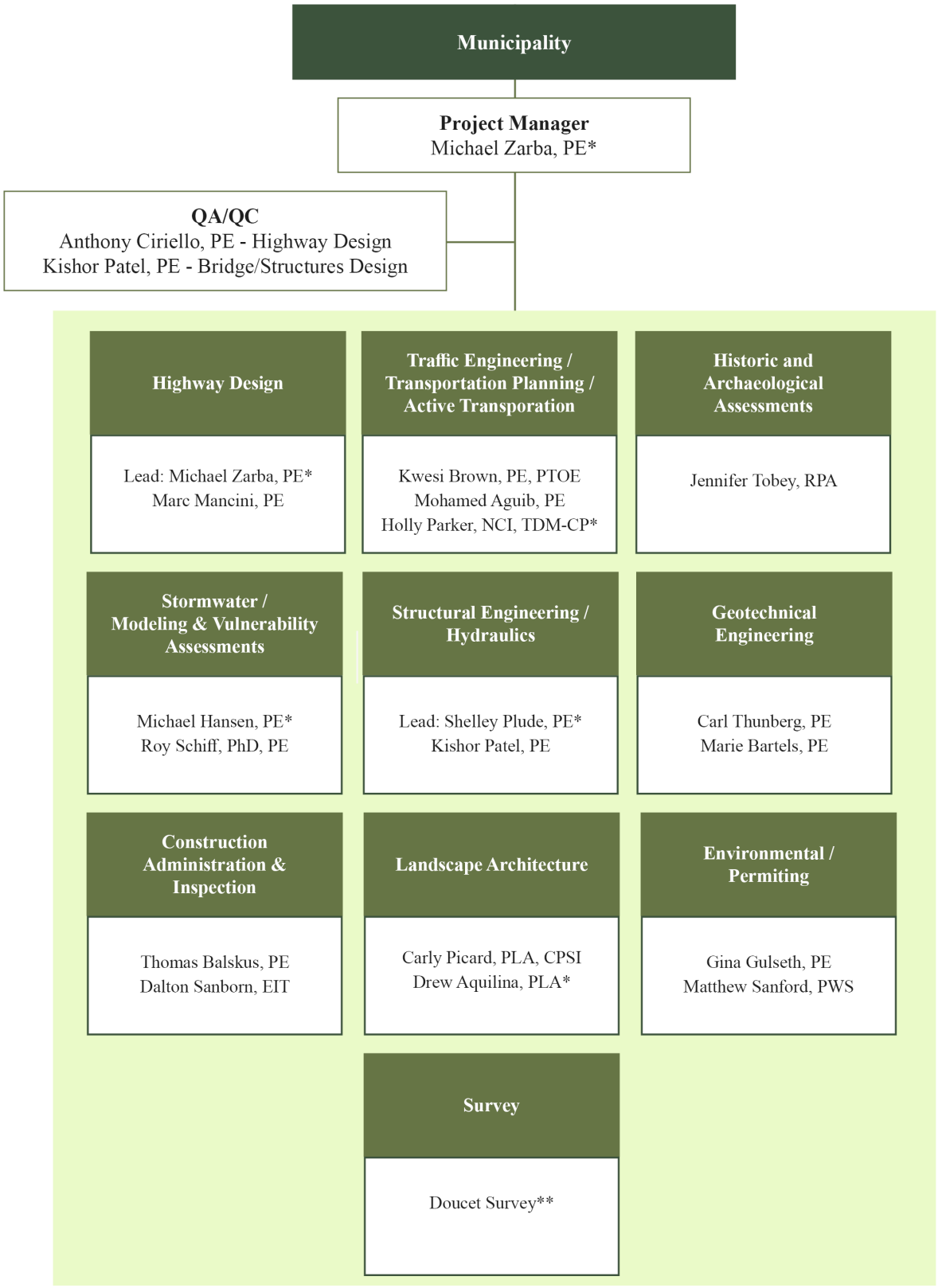
Bikeways and Greenways

SLR is a leading consultant for the planning, design, and construction administration and inspection of bikeways and greenway projects. The firm has been involved in more than 100-miles of bikeway and multi-use trail projects throughout the East Coast. The nationally acclaimed Farmington Canal Greenway in Cheshire, Connecticut, designed by SLR, is the first Federally funded greenway and is recognized as one of the best trails in the country and has received several awards for its "Design Excellence."

Our approach to managing and completing municipal projects will be guided by the following:

- **Adherence to the NHDOT Local Public Agency Manual for the Development of Projects; and all applicable NHDOT Policies, Principles, and Practices**
- **Commitment to Quality Management (QM), incorporating Quality Assurance and Quality Control**
- **Proper Resource Allocation & Staffing**
- **Adherence to Project Schedule & Budget**
- **Early Identification of Sensitive Environmental, Natural and Community Resources & Proactive Development of Impact Mitigation Strategies**
- **Value Engineering and Constructability**

Organizational Chart



***NHDOT LPA Certification**

****Subconsultant**

Project Team

		PROJECT EXPERIENCE																
		YEARS OF EXPERIENCE	YEARS WITH FIRM	PROJECT MANAGEMENT	HIGHWAY DESIGN	BRIDGE DESIGN	STRUCTURAL ENGINEERING	ALTERNATIVE PROCUREMENT METHODS	CORRIDOR STUDY PLANNING	BRIDGE INSPECTION	BRIDGE LOAD RATING	HYDROLOGY / STORMWATER	ENVIRONMENTAL	TRAFFIC ANALYSIS	GEOTECHNICAL ENGINEERING	SURVEY	ACTIVE TRANSPORTATION	PUBLIC INVOLVEMENT
KEY PERSONNEL	PROJECT ROLE																	
Michael Zarba, PE*	Project Manager	34	4	X	X	X		X	X			X		X			X	X
Tony Ciriello, PE	Higway Design QA/QC	31	30	X	X	X	X	X				X	X				X	X
Kwesi Brown, PE, PTOE	Traffic Engineering/Signals	22	13	X	X				X					X			X	X
Marc Mancini, PE	Highway Design	7	4	X	X				X								X	X
Mohamed Aguib, PE	Traffic Engineering/Signals	14	3		X				X					X			X	
Michael Hansen, PE*	Stormwater Design & Hydraulic Modeling	25	1		X							X	X					
Kishor Patel, PE	Structures Design and QC, Overhead Sign Structure Design	23	23	X		X	X			X	X						X	
Shelley Plude, PE*	Structures Design	12	12	X		X	X			X	X						X	X
Holly Parker, NCI, TDM-CP*	Active Transportation, Public Involvement	27	2						X								X	X
Carl Thunberg, PE	Geotechnical Engineering	36	3		X	X									X			
Roy Schiff, PE, PhD	Hydrology and Hydraulics, Flood Mitigation, Bank Stabilization	19	17	X	X	X						X	X					X
Gina Gulseth, PE	Haz. Materials Assessments, Remediation	29	4	X									X		X			
Carly Picard, PLA	Landscape Architecture, Context Sensitive Design, Visualization	16	6										X					
Drew Aquilina, PLA*	Landscape Architecture, Context Sensitive Design, Visualization	30	2							X			X					
Jennifer Tobey, RPA	Historic and Archaeological Assessments	23	N/A										X					X
Mathew Sanford, PWS	Natural Resources Management, Wetland Studies, Permitting	23	22									X	X					
Doucet Survey	Survey	29	N/A													X		

*NHDOT Local Public Agency (LPA) Certification

References

Contact Information	Project(s)	Relevant Services Provided
Jennifer Hale, PE Town of Hampton, NH P: (603) 929-3202 E: jhale@hamptonnh.gov	Hampton NH On-Call Roadway Engineering and Coastal Engineering Services	On-Call Contract – Services Included, as Required: • Roadway Design • "Complete Streets" Design • Traffic Signal Operations and • Design • Drainage Evaluation and • Design • Hydraulic Modeling • Sea Level Rise and Adaptation • Studies • Sustainable Shoreline Design • Structures Inspection and • Design • Public Participation
Timothy Dexter MassDOT P: (857) 368-8794 E: timothy.dexter@state.ma.us	Route 7 Culvert Replacement – Williamstown, MA	• Hydraulics • Culvert Replacement • MassDOT Rivers and Roads Methodology • Fluvial Geomorphology
Andrew Bohannon City of Keene, NH P: (603) 757-1835 E: abohannon@keenenh.gov	Patricia T. Russell Park and Stormwater Improvements – Keene, NH	• Stormwater Improvements along Carpenter Street • Water Quality Improvements • Park Improvements • Parking and Circulation Improvements

Appendix

Michael F. Zarba, PE

Principal Transportation Engineer | Portland, ME

Michael Zarba is a Professional Engineer with over 30 years of municipal and consultant engineering experience. He has extensive design, management, and administrative work experience in municipal public works and consultant engineering firms. Mike has a broad knowledge of design, construction, and maintenance of public infrastructure. He also has experience in roadway design, municipal site plan revisions, drainage, and building maintenance. Mike brings extensive knowledge of, and experience in, designing, building, and maintaining public works facilities and public infrastructures. He is part of our Transportation Engineering Department and maintains a close connection to our Construction Engineering and Inspection teams to effectively complete roadway, bridge, utility, and facility type projects.

Years of Experience	Education	Technical Registrations
6 years with the firm 30 years with other firms	BS, Civil Engineering	Professional Engineer – ME, NH, CT Local Project Administration (LPA) Certification - Maine DOT, New Hampshire DOT

On-Call Engineering Services for Site Assessments and Preliminary Designs to Mitigate Flooding in Hampton, NH Neighborhoods by Restoring Hampton-Seabrook Estuary Salt Marsh, Hampton, NH
Project Manager for a project entitled Alternative 6: Improve Drainage on Greene Street, Gentian Road, and Kings Highway. Mr. Zarba was responsible for providing the schematic layout and concept plan necessary to update the existing deteriorated stormwater infrastructure that was designed and installed with a different drainage area.

NHDOT Route 12, Charlestown, NH
Project Manager for preliminary and final design to select an appropriate action that is supported by the community; technically feasible; environmentally permittable; and economical. This challenging project which will include traffic engineering and transportation planning; assessment of riverbank stabilization; an adjacent railroad operation; and environmental assessments.

Anthony A. Ciriello, Jr., PE

Sector Lead, Infrastructure | Cheshire, CT

Tony Ciriello is our Infrastructure Sector Lead driving growth within the business while staying connected to clients and projects. He offers a strong background in infrastructure-related projects including highway and bridge construction and rehabilitation, interstate resurfacing and widening projects, traffic engineering, and utility construction projects including coordination, design, and approvals for rail crossings. He oversees the firms' state, municipal, and federally funded transportation design and planning projects in accordance with Federal Highway Administration, State Departments of Transportation, and AASHTO standards.

Years of Experience	Education	Technical Registrations
30 years with the firm 1 year with other firms	BS, Civil Engineering	Professional Engineer – CT

Spring Street Reconstruction & Streetscape, Portland, ME
Provided design oversight at the Principal level and QA/QC for the Spring Street reconstruction and streetscape project. The project transformed a high-speed vehicle centric arterial roadway into a lower speed complete street. The redesign revised the road alignment to eliminate large raised medians and incorporated new sidewalks, shorter crosswalks, landscaped esplanades, dedicated bike lanes, and streetscape amenities on approximately 2,200 linear feet of Spring Street between High Street and Union Street. Utilities including storm, sanitary, water line, gas, and electrical will be redesigned and relocated as necessary. The project was constructed in 2016 with funding by MaineDOT.

Michael R. Gagnon, PE

Principal Civil Engineer | Agawam, MA

Mike Gagnon brings over 30 years of diverse project experience with the preparation of feasibility studies, engineering reports, construction drawings, regulatory permits, technical specifications, and cost estimates. Mike has been responsible for engineering services associated with many transportation, land development, and water resource projects throughout southern New England from inception through construction. He has expertise in stormwater management design and hydraulic modeling. He has vast knowledge of local, state, and federal land use and environmental regulations, with several years of project development experience and coordination with local and state agencies including MassDOT, MassDEP, CTDEEP, local planning boards, and conservation commissions. Mike has managed many small- to medium-sized projects that include technical and fiscal responsibilities, client communications, supervision of support staff, and coordination with outside consultants.

Years of Experience
12 years with the firm
27 years with other firms

Education
BS, Civil Engineering

Technical Registrations
Professional Engineer – MA, CT, NH

MassDOT Task-Based Services On-Call: Hydrologic, Hydraulic & Scour Analysis for Accelerated Bridge Program
Project Manager for rapid responds analysis and design for bridges located in Taunton, West Stockbridge, West Bridgewater, & Westfield, MA. Responsible for hydrologic and hydraulic analysis and report preparation. Data collection and site investigation consisted of site visits to document existing conditions, sediment samples for sieve analysis and subsequent scour analysis, obtaining previous hydraulic models and reports as prepared for the National Flood Insurance Program (NFIP), bridge drawings, FEMA mapping, and GIS information.

Thomas P. Balskus, PE

US Manager of Construction Engineering | Cheshire, CT

Tom Balskus offers a broad range of experience in the areas of civil and construction engineering. Project experience includes design of stormwater management, highway design, sanitary sewer, and dam/spillway design. Construction experience includes inspection and administration, feasibility, and project coordination on state and federally funded transportation and other infrastructure projects.

Years of Experience
25 years with the firm
4 years with other firms

Education
BS, Civil Engineering
BSCCE Courses

Technical Registrations
Professional Engineer – CT
ACI - Concrete Field Testing Level I
NETTCP - Concrete Inspector, Hot Mix Asphalt Paving Inspector, Soils & Aggregate Inspector
American Traffic Safety Services Association (ATSSA)

Safety and Traffic Improvements to Route 4 from the Farmington River to Mountain Spring Road (CTDOT Project No. 51-260), Farmington, CT
Provided construction engineering and inspection services for CTDOT for the reconstruction of Route 4 and a new local road including installation of watermain, sanitary sewer, storm sewer, gas and communication utility relocations, controlled material handling, retaining walls, box culvert, roadway reconstruction with staged construction, signalized intersections, and significant prosecution and progress/ maintenance and protection of traffic requirements.

Marc S. Mancini, PE

Associate Transportation Engineer | Cheshire, CT

Marc Mancini is an Associate Transportation Engineer with experience preparing technical reports, developing roadway construction plan sets, bid documents, traffic signal design and conducting traffic analysis. Marc's work involves planning for corridor studies, multi-modal transportation circulation, and context-sensitive transportation operation analysis. He is proficient in the use of software programs including ArcGIS, AutoCAD, Civil 3D, MicroStation, Open Roads, HCS and Trafficware Synchro.

Years of Experience	Education	Technical Registrations
4 years with the firm 3 years with other firms	BS, Civil Engineering	Professional Engineer – CT

Route 12 Improvement Project (NHDOT), Charlestown, NH
Will be serving as a Senior Transportation Engineer responsible for traffic analyses, highway design, and preliminary/final/construction plan development for a recently awarded NHDOT contract involving widening and drainage/stormwater improvements to a section of Route 12 in Charlestown, NH.

High Street Complete Streets Improvements, Bridgewater, MA
Transportation Engineer responsible for the planning and design of complete streets components along a 0.3-mile section of High Street between Route 28 (Main Street) and the High Street Bridge. The planning and design process included a review of the Town's Complete Streets Prioritization Plan, identification of safe pedestrian and bicycle mobility, a review of utility impacts and the redesign of High Street to include sidewalks and bike lanes.

Mohamed Aguib, PE

Senior Transportation Engineer | Boston, MA

Mohamed Aguib is a Senior Transportation Engineer at SLR with over 11 years of comprehensive transportation engineering experience. He has been involved in a variety of projects and disciplines including transportation planning, traffic operations, roadway design, pedestrian/bike safety, transportation research, and grant applications. His experiences involved private sector, local municipalities, and state departments. Mohamed's interests include serving the community through transportation and civil engineering projects.

Years of Experience	Education	Technical Registrations
2 years with the firm 11 years with other firms	BS, Civil Engineering	Professional Engineer – CT, MA, MI

High and Maple Streets Corridor Improvements, MassDOT, Holyoke, MA
Transportation Engineer for High and Maple Streets Signal Upgrades and Corridor Improvements project. The project aims to improve the overall efficiency along High and Maple Streets and improve safety for all modes of transportation including motorists, transit, pedestrians, and bicyclists.

Michael Hansen, PE, CFM

Principal Hydrology & Hydraulics Engineer | Bedford, NH

Michael Hansen is a Principal Hydrology & Hydraulics Engineer with over 20 years of experience with a focus on water resource projects. His work includes site design, stormwater assessment and design, Low Impact Development design to manage stormwater, permitting, peer reviews, QA/QC, and construction bid and inspection services. He previously worked for NHDES.

Years of Experience	Education	Technical Registrations
1 year with the firm 24 years with other firms	BS, Civil Engineering BA, Philosophy	Professional Engineer - NH Certified Floodplain Manager; NHDOT Local Public Agency Certification Training

Route 12 Improvements (NHDOT), Charlestown, NH
Senior Hydrology/Hydraulics Engineer responsible for stormwater management and permitting tasks for a recently awarded NHDOT contract involving widening and drainage/stormwater improvements.

Shelley Plude, MS, PE

Senior Structural Engineer, Bridge Design Lead | Cheshire, CT

As a Senior Structural Engineer, Ms. Plude is responsible for structural calculations and analysis, preparation of construction documents, existing conditions inspections/reports, structural type studies, and day-to-day project management on a variety of bridge projects including municipal, state, and federally funded rehabilitation, superstructure, and full bridge replacements. Other projects include retaining walls and bulkheads, pedestrian facilities, and dams and fishways. While completing her master's at the University of Connecticut, she served as a graduate research assistant responsible for conducting research in the field of damage detection as a part of the bridge health monitoring program.

Years of Experience	Education	Technical Registrations
12 years with the firm	MS, Structural Engineering BS, Civil Engineering	Professional Engineer – CT, CT, ID, MA, ME, NH, NY, OR, VT, WA New Hampshire DOT LPA Certified

Replacement of Nonnewaug Road Bridge (State Project No. 10-88), Bethlehem, CT
Served as the Project Manager and Structural Design Engineer for the replacement of the Nonnewaug Road bridge. The existing bridge will be replaced on a new roadway alignment allowing the new bridge to be built off-line while maintaining the existing roadway throughout the majority of construction. Tasks included inspection of the existing structure, structural design, development of plans, specifications, and cost estimate, and shop drawing review.

Rehabilitation of Smokey Hollow Road Bridge over Bantam River (State Project No. 86-90 FLBP), Morris, CT
Provided design services for the rehabilitation of Bridge No. 05173 under the Federal Local Bridge Program. Performed a detailed type study, and value engineering assessment to reduce construction costs, structural calculations, developed construction documents, special provisions, and cost estimate for the new 95-foot 3-span, continuous steel girder superstructure, and concrete abutment. Coordinated with hydrologic engineer for scour analysis to justify removal of center pier.

Roy Schiff, PHD, PE

Principal Water Resources Engineer & Scientist | Waterbury, VT

Roy Schiff specializes in river and floodplain restoration, geomorphic and habitat assessment, flood mitigation, hydrology and hydraulics, transportation resilience, and sediment transport analysis. In addition to applied restoration work such as channel creation, bank stabilization, and dam/levee removal, he has been involved in several research projects across Vermont and the region evaluating the economic impacts of living in floodplains, drafting best engineering practices to reduce future flood risks, improving protocols for habitat assessment, and creating guidelines for channel restoration.

Years of Experience	Education	Technical Registrations
18 years with the firm 2 years with other firms	PhD, Stream Restoration & Aquatic Ecosystems MS, Environmental Science & Engineering BS, Civil Engineering	Professional Engineer – VT Certified Soil Evaluator, University of Massachusetts

On-Call Engineering Services, Hampton, NH
Project Manager for assignments under this 5-year on-call roadway engineering and coastal engineering services contract. Responsible for performing technical oversight for all of the tasks associated with the firm's first assignment which required a Flood Control Study for the Route 1A corridor. Developed model boundary conditions, evaluated model results, predicted inundation levels for various storm events and with consideration of the projected effects of climate change, and identified flood mitigation strategies.

Holly Parker, NCI, TDM-CP

Principal Transportation Planner | New Haven, CT

Holly Parker is a Principal Transportation Planner with over 25 years of experience in active transportation planning. She has a deep understanding of the planning and public engagement required to support walking, cycling, and transit, and to encourage shared vehicle use. She has formalized this experience with a National Charrette Institute (NCI) training and certification. She recently received the Transportation Equity Fundamentals Certification.

Years of Experience	Education	Technical Registrations
2 years with the firm	MS, Environmental Studies	National Charrette Institute Transportation Demand Management Certified Professional
25 years with other firms	BA, Political Science	NHDOT Local Project Administration (LPA) Certification

Parking Supply/Demand Analysis for Downtown Portsmouth, Portsmouth, NH
As a subconsultant to Desman Design Management, served as a Principal Transportation Planner with responsbilities of multi-modal design, Transportation Demand management, and public engagement.

Town-Wide Walk/Bike Master Plan, Brattleboro, VT
Serving as Project Manager for the development of a Town-wide walk/bike master plan that will provide a roadmap to a safer, more convenient, and more connected network for those that walk and bike in Brattleboro.

Carl W. Thunberg, PE

Principal Geotechnical Engineer | Bedford, NH

Carl Thunberg is a Principal Geotechnical Engineer with over 30 years of experience in geotechnical analysis, design, and construction. His areas of expertise include deep and shallow foundation analysis/design for bridges, roadways, buildings, dams, slopes, retaining walls, dewatering, landfills, and planning the execution of large-scale subsurface exploration programs on land and over water. Carl has a strong reputation for professionalism, quality, practicality, teamwork, and an ability to manage projects to successful technical and financial outcomes.

Years of Experience	Education	Technical Registrations
3 years with the firm	BS, Civil Engineering	Professional Engineer - NH, CT, ME, MA, NY, RI, VT, WA, OR
34 years with other firms	BS, Hydrology	

Route 12 Improvements (NHDOT Project), Charlestown, NH
Lead Geotechnical Engineer for improvements to a section of Route 12 in Charlestown, New Hampshire for the NHDOT. The project will include roadway design, traffic engineering, environmental assessment, structural engineering, and geotechnical engineering services.

Nashua Department of Public Works Office Building, West Hollis Street, Nashua, NH
Project Manager for the geotechnical engineering study for a proposed DPW Administrative Office building adjacent to the Four Hills Landfill. A report including subsurface conditions and the geotechnical implications of these conditions with respect to design and construction for the proposed building was prepared.

Applicable Work Experience

ROADWAY PROJECTS

Route 12 Charlestown 40667: The NHDOT has contracted with SLR on the Charlestown 40667 project, which involves the reconstruction and rehabilitation of NH Route 12 in Charlestown, NH. The project area is approximately 2.4 linear miles of NH Route 12 from the Route 12A intersection in the south to Almar Street in the north. The section of Route 12 north of Almar Street has been previously improved, and construction of improvements along Route 12 south of Route 12A was recently completed. The project will widen the shoulders in each direction, for a net addition of approximately 6 feet along the travel way.

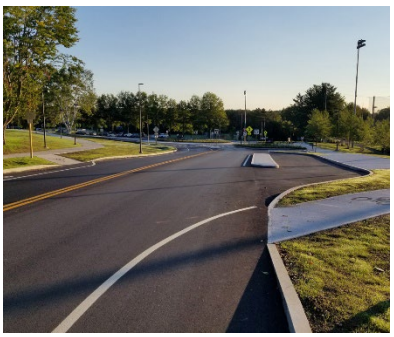
Hampton, NH On-Call Roadway Engineering and Coastal Engineering Services: On-Call Contract – services to include, as required: roadway design; traffic signal operations and design; coastal engineering services; drainage evaluation and design; hydraulic modeling; sustainable shoreline design; structures inspection and design; and public participation. SLR is currently working on its first assignment, which involves a combination of highway, stormwater, and coastal planning and design to complete the Meadow Pond / King's Highway Flood Mitigation Study. This study will analyze the existing impacts from sea-level rise, increase in frequency and intensity of storms, tidal influences, existing floodplain conditions and storage, as well as existing restriction from bridge outlet structures and stormwater management systems, and will propose phased improvements to reduce the frequency and intensity of flooding currently experienced by residents in this coastal neighborhood of Hampton.

Magalloway River Bank Stabilization - Errol, NH: SLR worked with NHDOT on concept design and JP Sicard on final design to stabilize a section of river bank along the Magalloway River in Errol near New Hampshire Route 16. We designed the engineered log jam / bank revetment using trees, rock ballast, and plantings. The project is located in a National Wildlife Refuge and thus aquatic and riparian habitat restoration were important factors of the bank stabilization project. The road was moved as part of the design to help establish a stable slope. The project included survey, site assessment, alternatives analysis, and design. We will also be assisting with construction oversight to implement the design. Computations were performed using USDA methods to confirm that footer, key, stacked and racked logs would be stable based on geotechnical, buoyancy, and hydraulic forces.

Western Avenue Complete Streets Improvement Project - Westfield, MA: SLR assisted the City of Westfield on improvements to this 2.7-mile arterial. **The key to our success was in assigning an internal team inclusive of engineers, planners, environmental scientists and regulatory specialists, landscape architects, and bike/pedestrian planning staff.**

Improvements included:

- Intersection and traffic signal reconstruction
- Construction of a new traffic signals
- Raised and flush median treatments
- Multi-use path along Western Avenue and Lloyds Hill Road
- Pavement reclamation with areas of full-depth pavement widening
- New pavement and granite curbing
- Pedestrian improvements including pedestrian signals, crosswalks, and handicap ramps
- Traffic signs and pavement markings
- Reconstruction of side street intersections and driveway aprons to meet new roadway grades
- Drainage improvements including infiltration measures
- Extension of sanitary sewer lines
- New water service connections and hydrants to the 12" water main
- Corridor landscape restoration



Colby College Athletics Center Intersection Review & Roundabout Design - Waterville, ME: SLR assisted Colby College in the development and design and engineering for roadway and streetscape improvements for a roundabout at the new Colby College Athletics Center in Waterville, ME. The complex, totaling 350,000-square-feet, includes an indoor 200-meter track, the state's only Olympic sized pool, a multi-level 13,500-square-foot fitness center, squash courts, and atrium. The center and roundabout opened in late 2020. The roundabout serves as a gateway to the campus from points to the south via Kennedy Memorial Drive. The roundabout further incorporates a walking trail alongside Johnson Pond.

West Street Roadway Rehabilitation - Goshen, MA: SLR assisted the Town of Goshen with the design, permitting, and preparation of construction plans for the reconstruction of West Street, a rural collector with one lane in each direction. The roadway is a vital link between Goshen and its community, as it serves as the primary bus route to the neighboring New Hingham Elementary School in Chesterfield. The two-mile-long reconstruction project involved minor widening to achieve a more bicycle and pedestrian friendly corridor, as well as pavement reclamation, landscaping, and rehabilitation of a 72-inch corrugated metal culvert. The project corridor features historic structures, dry laid stone walls, mature trees, and adjacent lands with state-regulated environmental restrictions.

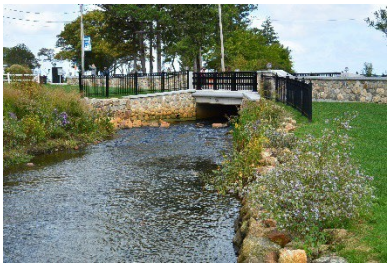
Reconstruction of Chase Avenue - Waterbury, CT: SLR was retained by the City of Waterbury to assist with the reconstruction of 5,700 linear feet of Chase Avenue, beginning at the intersection of Waterville Street and ending at North Main Street. The work involved roadway reconstruction and widening to accommodate two lanes in each direction, the construction of left-turn lanes at a number of side streets and major commercial drives, drainage improvements, and associated traffic signal modifications. Existing signals were upgraded and expanded as part of a closed-loop system that included emergency vehicle pre-emption. Analysis was performed using SYNCHRO, Version 7, a software package approved by the CTDOT. Extensive utility coordination and test pits were required for design of

drainage systems, construction of retaining walls, and widening. The project team worked closely with Yankee Gas and CT utilities to locate and administer test pits and revised drainage design to minimize extent of gas main relocations overall. The firm also provided construction administration services for the second phase of construction.

BRIDGE / CULVERT PROJECTS

Pleasant Pond Road Bridge over Collins Brook – Francestown, NH: SLR provided structural engineering and design services to Hanson Pipe & Precast. SLR designed a vehicular bridge and developed complete shop drawings for the precast concrete culvert, footing, and wingwalls for Pleasant Pond Road Bridge over Collins Brook. The bridge is 22-foot wide by 7- foot high by 30-foot long. SLR performed all necessary design and load rating calculations for the structure. The design was developed with consideration of foundation design parameters established by the project team's geotechnical engineers. The structure was built with little temporary and permanent impacts to the watercourse.

Vineyard Road over Burlington Brook – Burlington, CT: SLR was retained by the Town of Burlington for the design of a bridge replacement at Vineyard Road over Burlington Brook. The design conforms to CTDOT and federal standards. The existing bridge, constructed in 1954, is a single 52- foot span with a superstructure consisting of steel stringers with a cast-in-place concrete deck. The sufficiency rating for the bridge had fallen below 50% due to the poor condition of the steel stringers. The bridge width is 22 feet curb-to-curb with concrete curb and steel posts with cable guiderail along each fascia. The bridge superstructure is supported on concrete abutments. The firm provided survey; hydrologic, hydraulic, and scour analysis; wetland delineation; permitting; and roadway engineering and structural engineering services.



Replacement of Town Brook Bridges - Plymouth, MA: The Town of Plymouth retained SLR to design the removal of several dams and outlet structures and replacement with three bridges. This work, along with the design of channel modifications, allowed restoration of herring migration through this section of Town Brook. SLR was responsible for the design of the bridge replacements and dam removals, roadway modifications, hydraulic modeling, environmental permitting, stream channel modifications, landscape architecture, preparation of construction cost opinions, preparation of construction documents, shop drawing review, construction administration, and on-site project representation services.

Route 7 (Cold Spring Road) Culvert Replacement/Rivers and Roads Process – Williamstown, MA; MassDOT: The Rivers and Roads program was developed in consultation with SLR, who was selected by MassDOT to evaluate and design improvements to a culvert with chronic maintenance needs and high flood risk. This project is unique in that it is one of the first in Massachusetts to be guided by the principals of fluvial geomorphology – the science of river form and process. Experience shows that culverts and other transportation infrastructure are most resilient to flooding and erosion if they are designed to match the channel they are located in. For this project the existing culvert was too small, poorly aligned, and unable to properly transport sediment from the steep upstream watershed. The project was awarded an ACEC MA Engineering Excellence Award.

Culvert Prioritization Model: Aiding Communities in the Selection of Priority Restoration Projects - Southern New Hampshire: The Southern New Hampshire Planning Commission, in association with New Hampshire Department of Transportation, retained SLR to screen culverts in the Piscataquog River watershed for risk. The screen draws on existing data to evaluate geomorphic compatibility, structural condition, aquatic organism passage, structure criticality, and ultimately risk. Local data can also be entered into the model to screen structures.

Blacks Road Bridge over Honeypot Brook - Cheshire, CT: SLR has completed services for the reconstruction of the Blacks Road Bridge over Honeypot Brook in Cheshire, Connecticut. The existing structure was a single 15- foot span comprised of prestressed concrete double-tee beams supported by stone masonry abutments. The bridge has a curb- to-curb width of 26 feet and an out-to-out width of 28.5 feet. Considering the existing condition of the substructure, SLR recommended a full replacement of the bridge. Our type study evaluated three structure alternatives, taking into consideration the needs of the town, hydraulics, construction, maintenance, impact to the environment, existing utilities (including the nearby wellfield), and estimated construction costs.

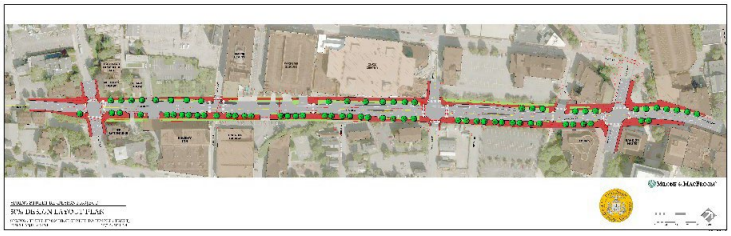
River Road Bridge over Pomperaug River (LOTCIP) - Southbury, CT: SLR provided design for rehabilitation of the River Road Bridge over Pomperaug River, a 100% CTDOT-funded local project. The existing bridge was constructed in 1962 and is a three-span structure (48'-88'-48') with a superstructure that consists of steel beams with a cast-in- place concrete deck. The curb-to-curb width of the bridge is 40' with a concrete safety curb and parapet with two-rail metal bridge railing. The three-span superstructure is supported by two concrete piers, and cast-in-place concrete abutments with wingwalls to retain the steep roadway slopes. As part of preliminary engineering, our design team developed three alternatives, including steel and concrete alternatives, and evaluated the potential for implementation of Accelerated Bridge Construction techniques. The project team conducted a full hydraulic analysis and scour assessment in order to confirm visual inspection reports and to aid in designing scour countermeasures. Scour countermeasures designed included sheeting the abutment footings below the mud line with large, rounded boulders to the surface in order to maintain stream conditions supportive of the local fish habitat.

Nonnewaug Road Bridge (State Project No. 10-88), Bethlehem, CT: SLR was retained by the Town of Bethlehem to perform design and construction inspection services for the replacement of Nonnewaug Road Bridge. SLR designed a 32-foot precast concrete arch on a new alignment which allowed Nonnewaug Road to remain open throughout most of the construction, a benefit to both the traveling public and the active farm operation adjacent to the bridge. With the bridge being highly visible to neighboring properties and the abutting farm being named after the existing bridge, special care was taken in selecting the aesthetic treatments including a stone form liner, painted bridge rail, and timber guiderail on the approaches.

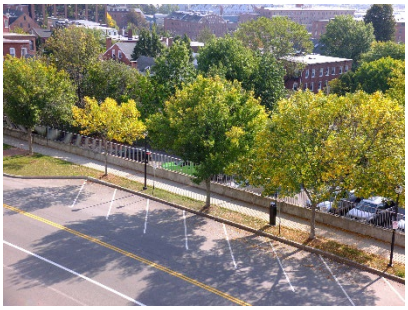
TRANSPORTATION CORRIDOR PROJECTS

College Street Corridor Study and Redesign - Brunswick, ME: SLR was retained by the Town of Brunswick to provide engineering design, master planning and construction administration services for the College Street Reconstruction project. The project consisted of full-depth reconstruction of approximately 1,800 linear feet of roadway, realignment and construction of new sidewalks on both sides of College Street and along Coffin Street, replacement and temporary bypass of an existing 6" water main with a new larger 12" main, removal and replacement of sewer manholes and pipe, evaluation (camera and inspection) of existing storm drainage system and design of improvements, and the redesign of three roadway intersections including College Street at Maine Street, College Street at Park Row, and College Street at Harpswell Road.

Spring Street Corridor, Streetscape and Redesign - Portland, ME: SLR was retained by the City of Portland to provide engineering design and landscape architecture services to redesign an approximately 2,400-foot section of downtown Spring Street. The project included:



- Larger pedestrian walkways, open spaces, and small pocket parks
- Reduced number of travel lanes and pavement widths
- Formal bike lanes
- Formal transit stops
- Curb line bump-outs to reduce
- pedestrian crossing distances and to better define parking areas
- Increased on-street parking
- Highlighting and branding of the area with art and historic elements
- Period street lighting
- Street trees and appropriate landscaping
- Decorative street bollards
- Destination signing and kiosks



In addition, within the available right-of-way, there were low-impact stormwater quality treatments incorporated, such as rain gardens, into the esplanade areas.