March 6, 2015

George Hohmann
Contracts and Purchasing Manager
Metropolitan Washington Council of Governments
777 North Capitol Street, NE, Suite 300
Washington, DC 20002

Subject: Solicitation No. 15-010, "Multi-Sector Approach to Reducing Greenhouse Gas Emissions in the Metropolitan Washington Region"

Dear Mr. Hohmann:

SC&A, Inc., in association with Louis Berger Group and Sharp & Company (a Maryland DBE firm), is pleased to respond to the subject solicitation to provide support to the Multi-Sector Workgroup convened by MWCOG. The SC&A Team is staffed by professionals with extensive experience and success in facilitating and supporting greenhouse gas (GHG) stakeholder planning processes. This expertise covers the transportation, land use, energy, and built environment sectors and includes experience in conducting analyses of GHG mitigation strategies applicable to these sectors. The team already has an in-depth understanding of the MWCOG region, planning processes, and transportation model.

Our proposal details the qualifications of the firms included on our team, as well as the experience of the staff who are included in this bid. Our approach to the Statement of Work includes a strong emphasis on facilitation and communication, utilizing the expertise of Sharp & Company along with our in-house facilitation abilities in tandem with analysis and evaluation expertise in each of the GHG sectors, with Louis Berger providing support for the land use sector. In addition, all three firms are located within the Metropolitan Washington area and bring experience in working with public agencies from this region, as well as the past experience of SC&A staff in working directly with MWCOG.

SC&A accepts all terms and conditions contained in the Request for Proposals.

Please direct any questions about our proposal to Maureen Mullen, Senior Chemical Engineer, at 703-893-6600, ext. 240, or mmullen@scainc.com.

Sincerely,

Gregory P. Beronja, P.E.
President and CEO

RFP No. 15-010

Multi-Sector Approach to Reducing Greenhouse Gas Emissions in the Metropolitan Washington Region

Proposal

submitted to the

Metropolitan Washington Council of Governments

Submitted by:

SC&A, Inc.
1608 Spring Hill Rd., Suite 400
Vienna, VA 22182
(703) 893-6600
(703) 821-8236 (fax)
www.scainc.com

Principal Contact:

Ms. Maureen Mullen
(703) 893-6600
mmullen@scainc.com

March 6, 2015

TABLE OF CONTENTS

1.0 Qualifications of the Offeror and Personnel 1

1.1 Qualifications of the SC&A Team 1

1.1.1 SC&A 1

1.1.2 Louis Berger Group 2

1.1.3 Sharp & Company 3

1.2 Key Personnel 4

1.3 Relevant Project Experience 11

2.0 Scope of Work 15

2.1 Task 1. Finalize Contractor Work Plan and Schedule 15

2.2 Task 2. Meet with Sector Subgroups and Review Proposed Strategies 17

2.3 Task 3. Presentation of GHG Reduction Strategies for Analysis to MSWG 20

2.4 Task 4. Analyze Selected Strategies 22

2.5 Task 5. Prepare and Present Interim Technical Report 27

2.6 Task 6. Explore GHG Goals and Targets in Each Sector 28

2.7 Task 7. Prepare and Present Final Technical Report 29

3.0 Services, Pricing, and Schedule 31

4.0 References 35

4.1 SC&A References 35

4.2 Louis Berger References 35

4.3 Sharp & Co. References 36

APPENDICES

Appendix A: Resumes of Key Staff and Relevant Project Summaries
Appendix B: DBE Participation
Appendix C: Standard Terms and Conditions

LIST OF TABLES

Table 1. Background of Key Personnel 5
Table 2. Crosswalk of Project Experience and Qualifications 12
Table 3. Summary of Proposed Personnel 17
Table 4. SC&A Cost Proposal: Multi-Sector Approach to Reducing Greenhouse Gas Emissions in the Metropolitan Washington Region 32

LIST OF FIGURES

Figure 1. Project Organization 5
Figure 2. MSWG Planning Process Diagram 16
Figure 3. Project Schedule 33

SC&A TEAM TECHNICAL PROPOSAL

1.0 QUALIFICATIONS OF THE OFFEROR AND PERSONNEL

SC&A, Inc. (SC&A) is pleased to submit this proposal to the Metropolitan Washington Council of Governments (MWCOG) to provide technical assistance to the Multi-Sector Working Group (MSWG) convened by MWCOG. The MSWG is expected to identify implementable strategies for reducing greenhouse gas (GHG) emissions from the transportation, land use, energy, and built environment sectors; quantify the benefits of these GHG reduction strategies; explore GHG reduction goals, and develop an action plan for the Washington region. The experience, personnel, and proposed methods that our team brings to this project will provide MWCOG with the necessary support for the MSWG to be successful in achieving its mission. SC&A is proposing a team of consultants with extensive experience facilitating and supporting stakeholder planning processes with a focus on transportation, land use, energy, and built environment sectors, as well as conducting analyses of GHG mitigation strategies applicable to these sectors. The team already has an in-depth understanding of the MWCOG region, planning processes, and transportation model and is familiar with many of the stakeholders involved with this effort. The team members are SC&A, the Louis Berger Group, and Sharp & Company, Inc. [a Maryland Disadvantaged Business Enterprises (DBE) firm]. SC&A brings expertise in the GHG mitigation stakeholder process and evaluation of GHG strategies for the transportation and energy/built environment sector at the state and regional level. The Louis Berger Group brings extensive experience in land use planning and evaluation of potential land use strategies. Sharp & Company provides excellence in communication, meeting facilitation, and outreach processes to obtain meaningful results and overall communications coordination for the products of this project.

Section 1.1 below describes the qualifications of each of the firms on the SC&A Team and Section 1.2 provides information on the key personnel proposed for this project. Relevant past performance by team members is discussed in Section 1.3.

1.1 Qualifications of the SC&A Team

1.1.1 SC&A

SC&A was founded in 1981 to provide environmental consulting services, primarily to the federal government and other public sector agencies. The company provides expertise in environmental management, risk assessment and management, public outreach, training, and information management. SC&A numbers over 150 staff members (42 employees and 115 Associates with whom we have agreements) located across the United States who offer capabilities across a spectrum of disciplines and subject areas. SC&A has held over 500 contracts, including 250 with the federal government. In June 2013, SC&A acquired the contracts and hired the staff of the Springfield, Virginia, office of TranSystems Corporation (formerly E.H. Pechan & Associates, Inc., or "Pechan"). This proposal includes key SC&A staff who are former Pechan employees and are recognized for their in-depth knowledge of energy, air pollution, and GHG technical and policy issues. These staff have been active in providing facilitation and technical assistance to states in climate action plan development. These efforts

included base-year GHG emission inventory development, emission forecasts for mid- and long-range forecast years, and mitigation strategy evaluation in 20 U.S. states, Canada, Mexico, and China.

SC&A staff are also familiar with the MWCOG transportation sector emission analysis techniques. Our proposed Project Manager, Maureen Mullen, provided ongoing support to MWCOG's air quality and transportation divisions for more than 15 years. During this time, she participated in MWCOG's MOBILE6 Task Force, as MWCOG transitioned its onroad vehicle emission calculations from EPA's MOBILE5 model to the MOBILE6 model. Once the MOBILE6 Task Force's mission was completed, Ms. Mullen also worked with MWCOG's transportation and air quality staff to develop a MOBILE6 Interface system for MWCOG to use in developing MOBILE6-based emission inventories. SC&A staff have also provided SIP and transportation conformity assistance to MWCOG. Through these activities, SC&A staff are familiar with MWCOG's transportation modeling process and the key stakeholders to MWCOG's environmental and transportation programs.

In partnership with the Center for Climate Strategies (CCS), SC&A staff have supported numerous sub-federal level climate action processes, by developing comprehensive GHG emission inventories and forecasts for all GHG inventory sectors and by providing stakeholder facilitation and policy analysis support for the transportation and land use sectors. Most notably, SC&A staff facilitated and analyzed GHG mitigation strategies for the transportation and land use sectors in Minnesota, Maryland, Michigan, and Pennsylvania. SC&A performed similar state-level climate action planning work for three states in northern Mexico. Related climate action past performance includes the development of GHG emissions inventories and projections for over 20 U.S. and six Mexican states. These GHG inventories were comprehensive and covered all economic sectors.

In addition to climate action planning, SC&A staff have provided facilitation and technical support to ozone stakeholder groups in Pennsylvania ozone nonattainment areas and Kansas City, for example, assisting these groups in selecting emission control measures to adopt and providing technical analyses of a selected set of measures, including criteria pollutant emission reductions, costs, and co-benefits. Staff members have also performed control measure emission reduction and cost analyses for EPA, including the Section 812 prospective analysis of the emission reductions and costs of the 1990 Clean Air Act Amendments, state Departments of Transportation, and regional and metropolitan planning organizations.

The key staff members who are proposed for this MWCOG contract are located in our Vienna, VA, office, within easy access via Metro of MWCOG's offices.

1.1.2 The Louis Berger Group

Founded in 1953, The Louis Berger Group, Inc. (Louis Berger) maintains a nationally-recognized practice in transportation, land use and environmental planning. The firm is comprised of urban planners, transportation planners, economists, environmental scientists, and engineers. The firm understands the intricacies of working in the National Capital Region and specializes in balancing the diverse requirements of multiple local government and federal

entities, regional agencies, and civic organizations, along with public participation. Louis Berger has been located in Washington, DC, for more than 30 years. Throughout this time, the firm has worked on more than 400 projects in the area. We have worked for DC Office of Planning, District Department of Transportation, Water and Sewer Authority, Department of Public Works, the Metropolitan Washington Airports Authority, the General Services Administration, National Park Service and Naval Facilities Engineering Command, among numerous other local, regional and federal clients.

Louis Berger will be leading the development and analysis of land use sector greenhouse gas reduction strategies for this MWCOG project. The key qualifications of the firm for this role include the following:

- National research expertise in the interaction of transportation, land use and air quality– As part of an on-call contract with FHWA, Louis Berger has prepared a comprehensive literature review on the *Emissions Benefits of Land Use Planning Strategies*. Louis Berger remains at the forefront in research on indirect land use effects, most recently authoring a guidebook on the subject for the Montana Department of Transportation.

- Transportation planning and modeling capabilities, including extensive experience in travel demand management strategies for military installations coping with the traffic and parking constraints of the National Capital Region.

- Track record in supporting MPO socioeconomic and land use forecasting. Louis Berger is providing socioeconomic forecast services to MPOs such as the New York Metropolitan Transportation Council (NYMTC) and North Jersey Transportation Planning Authority (NJTPA). Our staff includes economists specialized in forecasting and real estate, both of which are critical to understanding future land use patterns and their associated GHG emissions profile. Our economic staff recently completed an analysis of potential for development along the DC Streetcar project alignment as part of a real estate economic and financial analysis.

- On-call planning contractor for DC Office of Planning and New York City Department of Planning—Our work for DC OP has included extensive public outreach and development and prioritization of economic development strategies, skills directly relevant to prioritizing land use strategies for GHG reduction.

- Tremendous experience in Transit Oriented Development. For example, Louis Berger has been an on-call contractor under New Jersey Transit's Transit Friendly Planning Program, developing an innovative TOD geodatabase to enable tracking of development projects and development potential in the vicinity of rail stations.

1.1.3 Sharp & Company

Sharp & Company has significant experience providing project communications and public relations services for urban projects with multiple stakeholders from diverse socioeconomic backgrounds. From its roots in advertising and graphic design, the 32-year-old DBE-

certified firm has built a significant practice in transportation communications. The firm's "high touch to high tech" tool set addresses communication needs and maintains positive community and public relations throughout the project life cycle.

The firm has provided outreach and public engagement services for MWCOG's Old Lee Highway Great Street Multimodal Improvement Plan Project, Montgomery County/MWCOG Friendship Heights and Silver Spring Transit Management District Employer Outreach project, VDOT I-66 Inside the Beltway Multimodal Study, South Capitol Street SFEIS project, and MDOT 2035 Transportation Plan. Sharp & Company's work for Virginia Department of Rail and Public Transportation resulted in unprecedented acceptance of their Statewide Rail Plan, a document cited by AASHTO as a best practice in communicating about rail plans. Through its work supporting the National Surface Transportation Policy and Revenue Commission's public hearings, public outreach, and media relations, the firm has demonstrated its relationships with elected and appointed officials and managing projects with multiple stakeholders with diverse interests.

1.2 Key Personnel

Figure 1 illustrates the roles and relationships of the personnel proposed in this project. Maureen Mullen of SC&A will be the overall Project Manager. In this role, she will be the primary point of contact with the MWCOG Project Director, and provide the necessary coordination among the project team. She will review all work products before delivery to MWCOG. We have broken the general work scope into facilitation/outreach and technical areas. The facilitation/outreach area will be coordinated by Juan Maldonado and will include coordination of the plans for the Sector Workgroup meetings, presentation preparations for the other meetings, and preparation of reports. He will be supported by staff from Sharp and Company. He will also be the lead in developing GHG goals and targets in Task 6. On the technical side, Maureen Mullen will serve as the Technical Lead for the Transportation Sector, assisted by Jackson Schreiber and other SC&A staff; Jennifer Gonzalez will serve as the Technical Lead for the Land Use Sector, with support from Louis Berger staff; and David von Hippel will serve as the Technical Lead for the Energy/Built Environment Sector, with support from SC&A staff. James Wilson will serve as a Policy Advisor across all sectors. Further information regarding the relevant experience of each of the key personnel is provided below. Short resumes for all key personnel are provided in Appendix A. A summary of the background and experience of all key personnel is included in Table 1.

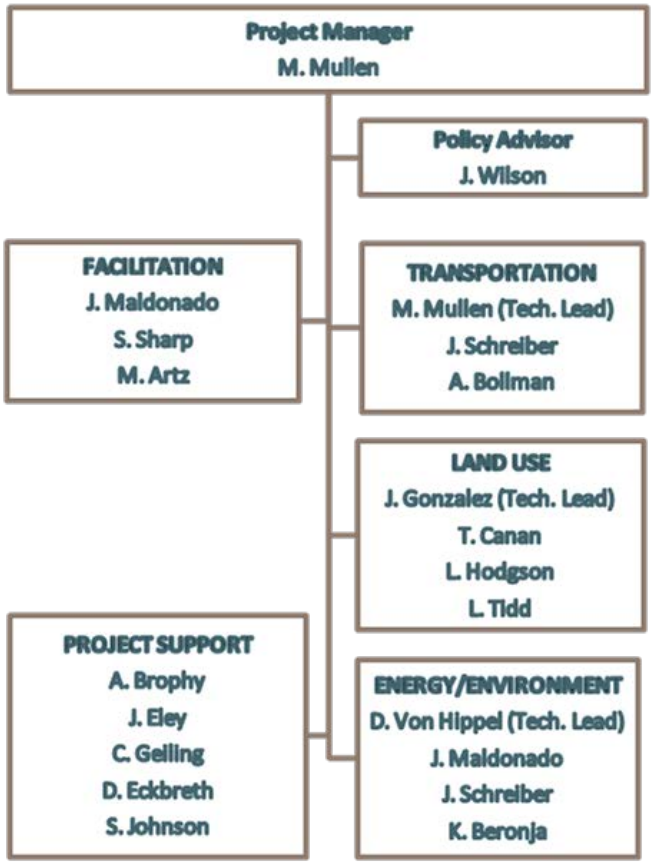


Figure 1. Project Organization

Table 1. Background of Key Personnel

Name	Role in Study	Highest Degree	Years Experience
SC&A			
Maureen Mullen	Project Manager, Transportation Lead	B.S., Chemical Engineering	27
Jim Wilson	Policy Advisor	M.S., Public Policy and Management	39
Juan Maldonado	Facilitation Coordinator	M.S., Environmental Planning and Management	14
Andy Bollman	Economics Advisor	M.R.P., Environmental Planning	25
Jackson Schreiber	Key Technical Analysis	M.E.E.P., Energy and Environmental Policy	9
David von Hippel	Energy/Built Environment Lead	Ph.D., Energy and Resources	33

Table 1. Background of Key Personnel

Name	Role in Study	Highest Degree	Years Experience
Louis Berger Group			
Tim Canan	Land Use Senior Advisor	MURP, Urban and Regional Planning	26
Jennifer Gonzalez	Land Use Lead	M.A., Environmental Policy	5
Laura Hodgson	Land Use Demand Management	MURP, Urban and Regional Planning	8
Leo Tidd	Senior Land Use Planner	MPA, Environmental Science and Policy	9
Sharp & Company			
Susan Sharp	Outreach/Communications Lead	B.A., Graphic Design	42
Mary Arzt	Communications Specialist	BFA, Graphic Design	36
Charise Geiling	Communications Specialist	B.S., Journalism	21

Maureen Mullen is the SC&A Team's proposed Project Manager and the Transportation Lead. She has 27 years of experience related to the development of emissions inventories and assessing emission control strategies, with a focus on the transportation sector. Her experience includes numerous inventories covering criteria pollutants, toxic air pollutants, and GHGs. She has worked with EPA, regional planning organizations, stakeholder groups, and state and local air and transportation agencies in emission inventory projects, transportation-related studies, stakeholder support, policy and regulatory analyses, and trends analyses. She has also worked with transportation agencies, by providing assistance in determining the emission impacts of proposed transportation projects. At the local level, Ms. Mullen has assisted local Metropolitan Planning Organizations by performing analyses related to transportation conformity and ozone and particulate matter (PM) attainment, and the development of GHG on-road inventories. Ms. Mullen is an experienced user of EPA's Motor Vehicle Emission Simulator (MOVES) model and also has significant experience in using the predecessor MOBILE models.

Ms. Mullen has managed the development of GHG emission inventories and forecasts covering all emission sectors for about 20 states and has prepared the GHG emission inventories for the transportation, waste, residential/commercial/industrial fuel consumption, and non-fossil fuel industrial processes sectors in many of these states. In addition, she managed a team of analysts in the development of inventory methodologies and implementation of these methodologies for all emission sectors in preparing the four-county GHG emission inventory for Southern California. She has also co-facilitated the Transportation and Land Use Working Groups in Arizona and New Mexico, assisting the stakeholders in selecting and analyzing a set of GHG mitigation measures to assist these states in reducing GHG emissions.

Ms. Mullen participated in MWCOG's MOBILE6 Task Force, as MWCOG transitioned its onroad vehicle emission calculations from EPA's MOBILE5 model to the MOBILE6 model. At these Task Force meetings, she provided information to the stakeholders on the changes in the

models, worked with MWCOG staff to develop consensus on the inputs to use with the MOBILE6 model and the modeling methodologies to use, and presented information on the sensitivity of the model to key inputs. Once the MOBILE6 Task Force's mission was completed, Ms. Mullen worked with MWCOG transportation and air quality staff to develop a MOBILE6 Interface system for MWCOG to use in developing MOBILE6-based emission inventories.

Ms. Mullen is also skilled in developing tools that state or local agency staff can use to assist in the evaluation of transportation-related emission control measures. For example, she has developed tools for transportation agencies in Montana and Tennessee to use in evaluating the emissions impact of various types of CMAQ projects.

Juan Maldonado, the proposed Facilitation Coordinator for this project, has 14 years of experience conducting regional and corporate GHG assessments, as well as environmental policy analysis. Starting in 2010, he led the development of state-level GHG emissions inventories for six Mexican states and then helped launch climate action planning initiatives in three of these states in support of Mexico's national climate action plan and engagement with the United Nations Framework Convention on Climate Change (UNFCCC). In this multi-phased project, he served as the assistant project manager implementing a stakeholder planning process in the Mexican states of Baja California, Sonora, and Coahuila and facilitated the Agriculture, Forestry and Waste technical working group. Critical to the planning process was the introduction of a comprehensive mitigation policy catalog numbering close to 400 actions across major economic sectors including energy supply, transportation, fossil fuel production, residential/commercial/ industrial energy demand, industrial processes and industrial product use, waste management, agriculture, forestry, and land use. Jointly with the Border Environmental Cooperation Commission, he helped developed and delivered a series of workshops for regional audiences across northern Mexico to build regional capacity for the development of state climate action plans in support of Mexico's national climate action plan.

Mr. Maldonado is SC&A's project manager for the development of the GHG and criteria air pollutant emission inventories for the Port Authority of New York and New Jersey (PANYNJ). The inventory is designed to meet multiple objectives, including registration of operational control GHG emissions with The Climate Registry, informing State Implementation Plan (SIP) development in the states of New York and New Jersey, and evaluating the performance of internal GHG reduction goals and targets. He has also supported other costing studies such as the reasonably available control measure (RACM) analysis of fine particulate matter ($PM_{2.5}$) reduction measures associated with residential wood fuel burning for the Allegheny County Health Department in Pennsylvania. Mr. Maldonado is accredited with the California Air Resources Board as a GHG Lead Verifier.

James Wilson will serve as Policy Advisor on this project, providing senior oversight in the analysis of control strategies. He has 39 years of experience in performing and managing technical studies of air pollution policy issues, including managing complex emission inventory projects, for GHGs and a wide range of other air pollutants. Mr. Wilson is nationally recognized for his work in emission inventory development, emission projections, and control strategy cost analyses.

His recent experience includes providing support in the development of statewide Climate Change Mitigation Plans in Maryland, Michigan, and Pennsylvania. This work included building stakeholder support through facilitation of numerous transportation and land use technical work groups, as well as quantifying the benefits of a wide variety of GHG mitigation strategies such as VMT reductions, fuel efficiency improvements, and use of low-carbon fuels. Mr. Wilson also has climate adaptation project experience. He was a key staff person in a project that TranSystems Corporation performed for Chicago Transit Authority that examined the effect of severe weather events on the CTA system, and where investments might be made to reduce system problems during expected future severe weather.

Mr. Wilson also directed Pechan's efforts for both the first and second EPA Section 812 studies of the costs and benefits of the Clean Air Act Amendments of 1990 (CAAA). For the Section 812 prospective, Pechan estimated 1990, 2000, 2010, and 2020 criteria pollutant emission reductions, as well as the direct compliance costs associated with CAAA-mandated control programs. Mr. Wilson also works with state and local agencies, including MWCOG, to develop transportation plans that conform with highway vehicle emission control plans in State Implementation Plans (SIPs).

Jackson Schreiber will be a key technical and policy analyst on this project and has nine years of experience in performing GHG inventory and forecast work. He has experience in working with GHG Transportation and Land Use Stakeholder Groups in Minnesota, Maryland, Pennsylvania, and Michigan, providing detailed analyses of the GHG emission benefits, costs, and co-benefits of selected policy measures. Mr. Schreiber has performed policy support work on both criteria air pollutants and GHGs. He has experience with preparing GHG inventories for over a dozen states, typically focusing on the transportation, land use and residential/commercial/industrial energy consumption sectors of the forecast. He has performed GHG inventory and forecast work at the national, sub-state, and county levels, the Port Authority of New York and New Jersey, as well as on international projects in Canada, Mexico, and China.

Andy Bollman is a Senior Economist with 25 years of environmental consulting experience, including 20 years of experience providing technical support related to air quality planning issues. Mr. Bollman's experience has focused on developing base and forecast year emission inventories, and analyzing the impact of emission control strategies. This expertise, gained from over fifty emission inventory/projection projects for Federal, State, and local government and regional planning organizations (RPOs), extends across all pollutants (greenhouse gases and criteria and hazardous air pollutants) and source categories (onroad/nonroad mobile sources and large/small stationary sources). He is a recognized authority in the preparation of emission activity forecasts to support air quality modeling and policy analysis. Among the recent projects that he managed was a California Air Resources Board project to develop 1970–2050 criteria pollutant and greenhouse gas (GHG) stationary source emissions activity data; a Western Climate Initiative (WCI) project to develop base and forecast year GHG emission estimates from emission sources subject to the WCI's cap-and-trade program, covering both stationary and mobile GHG-emitting sources in seven States and four Canadian provinces; and an Environmental Protection Agency (EPA) project to develop approaches and gather information and data on the best available growth and control information for select non-stationary point and nonpoint industrial sources for future years.

Dr. David von Hippel is the Energy/Built Environment Lead. He is an independent consultant (included here as an SC&A Associate) offering over 30 years of experience in the energy and environmental fields, including work on development of Climate Action Plans for numerous states and regions, including development and quantitative analysis of GHG emissions mitigation policies in the Residential, Commercial/Institutional, and Industrial (RCII) sectors, and in the Energy Supply sector. He facilitated and/or provided analytical support to Technical Working Groups for RCI, Energy Supply, Energy Supply and Demand, on many projects, including in Montana, Washington (state), North Carolina, Arizona, New Mexico, Minnesota, and the Midwest (for the Midwestern Governors' Association). He worked extensively on development of cost-effectiveness analysis and related cost-curve preparation for energy- and GHG-saving measures in the RCII sectors in numerous jurisdictions and venues, including for Vermont, Utah, Hawaii, the Western Region Air Partnership, the Northwest Energy Coalition, the State of Oregon, and the Energy Trust of Oregon. In addition, has worked internationally for over 25 years, including energy analysis and planning at the national level (including energy efficiency and microeconomic analysis), utility integrated resource planning, demand-side management planning and related analysis, air pollution inventory development, and work on a host of other issues.

Jennifer Gonzalez is the Land Use Lead. She is a senior planner with experience in city and regional land use planning focusing on environmental sustainability, climate adaptation and resiliency projects. She also has experience in coordinating community outreach, stakeholder engagement, and visioning sessions. Her environmental policy background includes the preparation of environmental review documents pursuant to the National Environmental Policy Act (NEPA), New York State Environmental Quality Review Act (SEQR), and New York City Environmental Quality Review (CEQR). She has authored various research reports and studies, most recently as the corresponding author for Sustainability Tools in Action: Reducing Vehicle Miles Traveled Through Coordinated Transportation and Land Use Planning Across Levels of Government, published in the Transportation Research Record: Journal of the Transportation Research Board, No. 2453, and has presented on the topics of greenhouse gas adaptation and mitigation at the Transportation Research Board (TRB) 93rd Annual Meeting and New Jersey TransAction Conference. Projects have earned recognition, including a 2014 Outstanding Plan Award from APA-NJ; 2014 'Rising to the Top' award from New York State; 2012 Smart Growth Award from New Jersey Future; an Engineering Excellence Distinguished Award from ACEC-NJ; and a 2011 Plan Implementation Award from APA-NJ. Ms. Gonzalez holds a certificate from the American Institute of Certified Planners (AICP), is a LEED Green Associate and Senior Fellow with the Environmental Leadership Program.

Timothy Canan will serve as a Land Use Senior Advisor in this project. He has 26 years of experience in land use, transportation, and environmental planning, including more than 10 years in the private sector conducting environmental compliance under the National Environmental Policy Act (NEPA). In addition to private sector experience, he previously worked for the MWCOG and Loudoun and Arlington Counties in Virginia conducting local and regional land use and transportation planning, regional air systems planning, and demographic and socioeconomic analysis and forecasting.

Leo Tidd is a Senior Land Use Planner. He brings experience with land use forecasting, air quality research, and GHG-reduction planning to the team. He is a co-author of two NCHRP 25-25 studies related to air quality (Task 71: Templates for Project-Level Analysis with MOVES and AERMOD, and Task 89: Establishing Representative Background Concentrations for PM hot-spot analysis). He contributes regularly to Louis Berger's national practice in addressing the indirect land use impacts of transportation, most recently through the development of a guidance manual on induced growth for the Montana Department of Transportation. He has led the preparation of studies addressing the potential induced growth and related environmental impacts of major transportation projects, such as the 20-mile I-93 widening in New Hampshire and the proposed Gaston East-West Connector in North Carolina.

Laura Hodgson will provide Land Use Demand Management experience to this project. She is an urban planner who specializes in transportation and multi-modal planning, urban design, master planning, community planning, and mapping and research. Through eight years of professional experience and professional development activities she has developed a sound understanding of the factors that create efficient, well operating transportation systems, with a focus on the connection and relationship between land use, urban design, economics, and transportation. She has worked on a variety of planning projects at various scales and capacities, including successfully completing several multi-modal transportation planning projects with

Transportation Management Programs. She supported technical work and served in assistant project management roles on a number of projects. Her skills also include analyzing traffic distribution and generation; parking analysis studies; site and land use planning; research; understanding of the built environment, planning regulations, and real estate development principles; various analytical and graphic tools; report layout and design; land suitability analysis; graphic and urban design; GIS analysis; and comprehensive planning.

Susan Sharp will serve as the Outreach/Communications Lead. She brings over 35 years of experience in electronic and print information communication and marketing, information architecture, creation and implementation of effective communication strategies, strategic planning, marketing communications, and graphic design. Ms. Sharp is a successful entrepreneur with experience delivering value and quality to an extensive loyal client base, including profit and non-profit organizations, government agencies, and institutions.

Mary Arzt will serve as a Communications Specialist on this project. As the winner of numerous national and international awards including ADDYs, Tellys, the International TV and Radio Gold Award, and the Best of Baltimore, she has demonstrated expertise in all areas of creative direction including communication strategy and project implementation. She brings more than 35 years of professional work experience, earning a reputation for exceptional creative work and management skill.

Cherise Geiling brings to this project more than 20 years of experience developing public outreach campaigns at the federal, state and local levels designed to improve public participation in transportation planning. She identifies special opportunities and designs events to inform, involve, and receive input from stakeholders, including advocating the use of social and interactive media and the use of non-traditional communication networks to reach underrepresented minorities. She has performed work for the U.S. Department of Transportation; Federal Highway Administration; Federal Transit Administration; states of Maryland and Virginia; Metropolitan Washington Council of Governments (MWCOG); Montgomery County, Maryland; and Fairfax and Chesterfield Counties, Virginia.

1.3 Relevant Project Experience

Table 2 summarizes projects in which the SC&A Team has demonstrated experience relevant to this MWCOG MSWG project. The areas of expertise relevant to each project are indicated in this table. Brief descriptions of each of these projects are included in the Appendix A.

Table 2. Crosswalk of Project Experience and Qualifications

Project Title	Area of Expertise						
	Mitigation/ Adaptation Planning	*Stakeholder Facilitation & Outreach*	*Strategy Analysis & Costing*	*Emissions Modeling*	*Transportation*	*Energy/Built Environment*	*Land Use*
SC&A							
State Climate Action Plans (MN, MD, MI, PA, WY, ID, AZ, NM)	√	√	√		√	√	√
Climate Action Planning and Capacity Building in Mexico's Northern Border	√	√	√	√	√	√	√
Pennsylvania Climate Change Advisory Commission Support	√	√	√	√	√		√
Development of Project Level Air Quality Studies and Related Services				√	√		
MOBILE6 Support to Metropolitan Washington Council of Governments		√		√	√		
Global Climate Change, Greenhouse Gas Emissions, and Transportation in Tennessee	√		√	√	√		
Port Authority of New York & New Jersey Greenhouse Gas Emission Inventory	√		√	√	√	√	
North Jersey Transportation Planning Authority Regional Greenhouse Gas Emissions Inventory and Forecast				√	√	√	√
Backsliding Research and Analysis		√	√				
Section 812 Prospective Study – EPA			√	√		√	
Kansas City Regional Clean Air Plan Updates – Mid-America Regional Council (MARC)	√	√	√		√	√	
PA Ozone Stakeholder Support		√	√		√		
Transit System Adaptation Pilot Study	√		√		√		
Development of GHG Emission Inventories and Reference Case Projections	√			√	√	√	√
Southern California Association of Governments Climate Action Planning	√			√	√	√	√

Table 2. Crosswalk of Project Experience and Qualifications

Project Title	Area of Expertise						
	Mitigation/ Adaptation Planning	*Stakeholder Facilitation & Outreach*	*Strategy Analysis & Costing*	*Emissions Modeling*	*Transportation*	*Energy/Built Environment*	*Land Use*
Support							
Louis Berger							
Naval District Washington Regional Transportation Vision	√		√		√		√
Transportation Management Plans, NAVFAC			√	√	√		√
New Jersey Transit Friendly Land Use Program					√		√
DC Streetcar Real Estate Economic and Financial Analysis			√		√		√
CHASE Planning and Economic Development Strategy			√		√		√
Ward 8 Community Summit		√			√		√
New York Rising Community Reconstruction Program	√		√				√
Sharp & Company							
I-66 Multimodal Study		√			√		√
South Capitol Street SFEIS		√			√		√
Statewide Rail Plan		√			√		
Oregon Avenue NW Improvements		√			√		√
2035 Maryland Transportation Plan		√			√		√

2.0 SCOPE OF WORK

The SC&A Team's proposed approach to the scope of work, and discussions of relevant experience, are included in the sections below.

2.1 Task 1. Finalize Contractor Work Plan and Schedule

The project schedule laid out by MWCOG for the MSWG process is very aggressive, particularly in the early stages of the project. However, the SC&A team is committed to meeting this schedule. Our proposed schedule, including meetings and deliverable due dates by task, is shown in Chapter 3 of this proposal. Figure 2 illustrates the relationships between the MWCOG groups, the SC&A Team, and the project deliverables. Our proposed schedule assumes the contract is fully executed by March 30, 2015. Delays to the contract execution date will result in comparable delays throughout the project. Upon contract execution and project initiation, SC&A will have a discussion with the MWCOG Project Director regarding the work plan and schedule contained in this proposal. Based upon feedback from the MWCOG Project Director, SC&A will make any necessary revisions to this work plan and schedule, and provide the final work plan and schedule to MWCOG. SC&A will update the schedule as needed throughout the project, as meeting dates are confirmed, revised, or established.

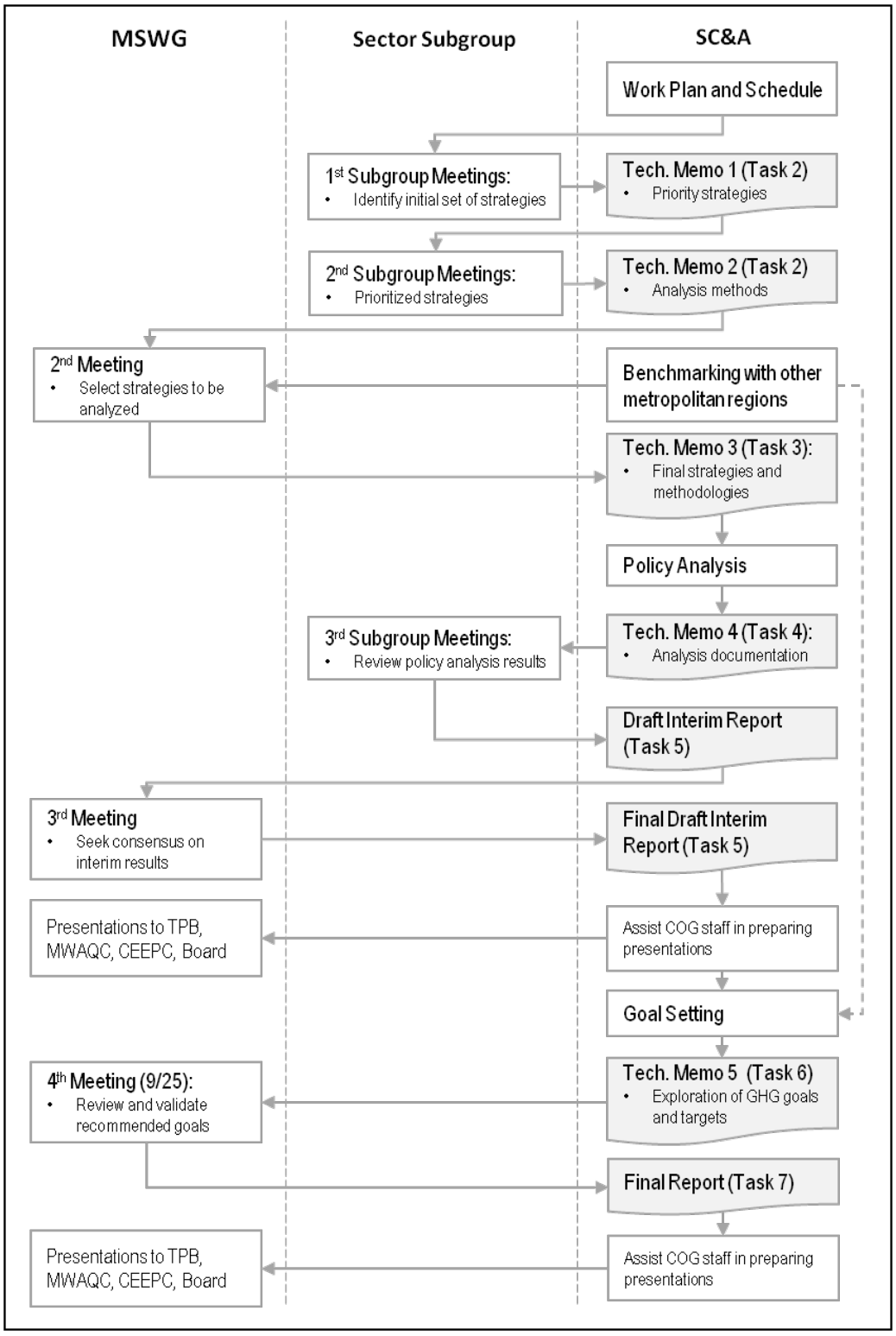


Figure 2. MSWG Planning Process Diagram

Project deliverables are shaded in light gray with reference to associated task number.

To accomplish this rigorous schedule, the work for this project has been divided among the participating team by sector for the technical work and by outreach/facilitation tasks. This division of labor helps to distribute the work among the team throughout the contract period so that no one is overloaded. Table 3 summarizes the proposed staff for this project, including their role in the project, availability, and expected utilization over the contract period.

Table 3. Summary of Proposed Personnel

Name	Key	Availability	Hours	Tasks						
SC&A				1	2	3	4	5	6	7
Mullen, M.	Yes	75%	200	*	*	√	*	*	√	*
Wilson, J.	Yes	10%	20			√	√		√	√
Maldonado, J.	Yes	25%	235		*	*	√	√	*	√
Bollman, A.	Yes	80%	30				√		√	
Schreiber, J.	Yes	50%	226		√	√	*	√	√	√
von Hippel, D.	Yes	30%	94		*	√	*		√	
Beronja, K.			80				√		√	
Brophy, A.			28					√		√
Eley, J.			24					√		√
Louis Berger Group										
Canan, T	Yes	10%	18			√	√	√	√	√
Gonzalez, J	Yes	50%	165		*	√	*	√	√	√
Hodgson , L	Yes	25%	55			√	√			
Tidd, L	Yes	40%	90		√		√		√	
Sharp & Company										
Sharp, S.	Yes	50%	24		*					
Arzt, M.	Yes	50%	62		√	√	√	*	√	*
Geiling, C.	Yes	75%	76		√	√	√			
Eckbreth, D.			50			√	√	√	√	√
Johnson, S.			80		√	√	√			

Legend for Tasks columns: * = significant role in task, √ = task participant.

2.2 Task 2. Meet with Sector Subgroups and Review Proposed Strategies

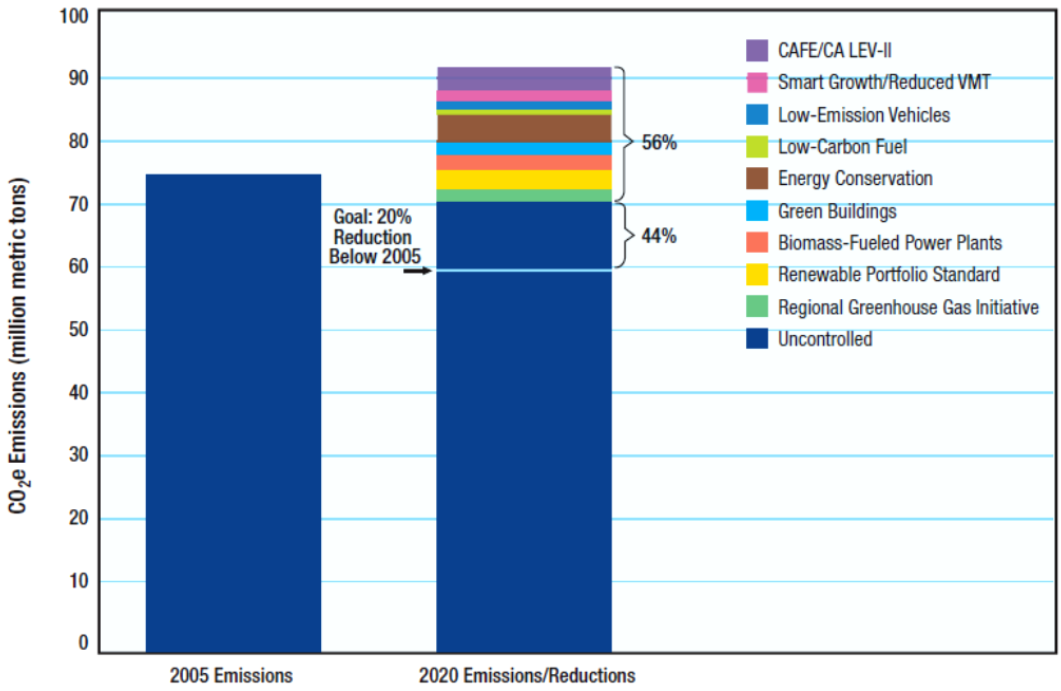
During the month of April, the SC&A facilitation team and the technical leads will program two meetings with each Sector Subgroup in coordination with each MWCOG Subgroup Leader to identify and subsequently prioritize GHG mitigation strategies for the region. SC&A technical leads will schedule these meetings in person in order to promote participation and the constructive exchange of ideas among subgroup participants.

SC&A anticipates that the identification of possible strategies by the subgroups will be informed primarily by the knowledge and professional experience of subgroup participants and past and ongoing COG climate action efforts (e.g., National Capital Region Climate Change Report), as

well as awareness of good or best practices stemming from similar climate action planning processes in other metropolitan regions. SC&A will sit down with the MSWG sector leads prior to the workgroup meetings to gather as much information as possible relating to what has occurred in the workgroup meetings that have already taken place, existing and planned mitigation actions underway within the MWCOG region, tools for designing straw policies, and the preferred framework for the qualitative evaluation of potential strategies. SC&A will compile and summarize this information and introduce it as an input to the first round of subgroup meetings. SC&A's technical leads may provide additional input in the process of identifying potential strategies in the event of perceived gaps in the initial menu of possible strategies. SC&A technical leads and facilitators will channel the subgroup efforts on refining preliminary measures capable of achieving the initial 2020 reduction target (as shown in the figure below) and also assist the subgroups in designing new "straw" proposals having the potential to reduce the remaining portion of uncontrolled emissions, looking towards reduction targets in 2050.

Figure 12. Regional Opportunities for Reducing Greenhouse Gas Emissions: 2005–2020

Current and potential future greenhouse gas reduction measures are projected to result in a 23 percent reduction from the projected 2020 business-as-usual greenhouse gas levels. That reduction is 56 percent of the reductions needed to reach the 2020 target.



Source: National Capital Region. Climate Change Report. November 2008.

During the second round of subgroup meetings, the SC&A team will moderate the process of prioritizing proposed strategies. Promising strategies will be qualitatively evaluated using a common framework across sectors. Selection of strategies will be conducted by consensus first, and if necessary, through balloting if consensus cannot be reached. SC&A will document the level of support for each selected strategy (i.e., consensus, super majority, simple majority) as well as the key points of disagreement for strategies selected by either super or simple majority.

With regard to subgroup work dynamics, the SC&A team will promote participation, collaboration, and innovation leading to the identification of bottom-up mitigation strategies that are likely to succeed in the local regulatory, administrative, and political context. Meeting facilitation will be led by Juan Maldonado with the support of Sharp & Company staff. Juan Maldonado has experience with facilitation in climate policy planning in the transportation sector from his work in Baja California. Sharp & Company is experienced in using several tools and techniques to encourage participation and cooperation among stakeholders. For example, Sharp & Company facilitated roundtable workshops in support of the 2035 Maryland Transportation Plan. Sharp & Company designed the sessions as interactive workshops that would engage stakeholders in discussion and provide the MDOT team with a set of preliminary goals and suggested strategies. To accomplish this, Sharp focused the areas of discussion on eight key strategies that the state had identified and participants were randomly assigned to one of eight groups. Participant evaluations consistently noted that randomly assigning participants to groups led to innovative solutions, and the state considered it one the most successful outreach efforts and has used it as a template for conducting other stakeholder outreach.

The SC&A technical leads for the Sector Subgroups are Maureen Mullen for the Transportation Subgroup, Jennifer Gonzalez for the Land Use Subgroup, and Dr. David von Hippel for the Energy and Built Environment Subgroup. Below are listed some considerations by subgroup that the SCA& team anticipates will be key during this stage of the planning process.

Transportation

SC&A will work with the MSWG Transportation Sector Subgroup to develop an extensive list of potential GHG reduction strategies for the region. The Transportation Sector Subgroup already has a preliminary list of options, which are informed by work such as the 2010 *Region Forward* report. SC&A has experience with assessing the potential GHG impacts and costs of transportation options, and which show the most promise for a given state or region. This involves relying on the local expertise of the group to know the transportation options which can be implemented given the resources available, along with SC&A's experience with which policies have been effective in other metropolitan areas in the past. SC&A has assisted stakeholders through this sort of selection process to determine the best transportation and land use options in state processes in Michigan, Pennsylvania, Wyoming and Idaho. Co-benefits of transportation measures can be significant, including reduced congestion, reduction in ozone and particulate matter concentrations, and fuel savings. Such co-benefits will be carefully considered in a qualitative manner at this stage of the process in helping to guide the decision towards which transportation measures to include in the quantitative Task 4 analysis.

Land Use

In coordination with the MSWG Land Use Sector Subgroup, the SC&A Team will prioritize potential land use strategies to focus on viable strategies for reducing greenhouse gas emissions. Radical changes in the *existing* pattern of land use in the region are not viable. However, policies that influence the location and form of *new* development and prioritize infill development in areas with transit access are viable. One important criterion for a strategy to be viable is that it has to have general support within the National Capital region, as evidenced by incorporation of the strategy in regional and local plans. Land use strategies will be most successful if they help encourage implementation of plans already in place, such as the emphasis

on accommodating new growth within Activity Centers as discussed in MWCOG's *Place + Opportunity: Strategies for Creating Great Communities and a Stronger Region,* and other products of MWCOG's Region Forward Vision. The National Capital Region's Land Use Goals are articulated in the Greater Washington 2050 Compact as follows:

- We seek the enhancement of established neighborhoods of differing densities with compact, walkable infill development, rehabilitation and retention of historic sites and districts, and preservation of open space, farmland and environmental resource land in rural areas.
- We seek transit-oriented and mixed-use communities emerging in regional activity centers that will capture new employment and household growth.

These serve as a valuable starting point for evaluating the best land use policies for the region

Other considerations for determining if a land use strategy is viable include the evaluation of co-benefits. Land use strategies offer many potential co-benefits that can be used to broaden strategy acceptance. These co-benefits include increased physical activity in dense walkable communities, decreased criteria pollutant emissions, and improved opportunities for community engagement and cohesion.

Energy/Built Environment
The Energy/ Built Environment Subgroup will be looking at mitigation measures that affect the energy supply and the energy demand sides of the equation. On the energy supply side, SC&A anticipates that implementation of the federal Clean Power Plan will have significant effects on the region. Nationwide, the Clean Power Plan is projected to achieve 30% GHG reductions by 2030 from 2005 levels. When these impacts are combined with energy consumption strategies, the compounded effect may be even greater. On energy demand, deployment of new technologies and adoption of performance standards through a combination of enabling, mandating, and fiscal policies will be key for finding incremental GHG reductions in this sector. A good number of strategies have already been identified by the Energy/Environment Subgroup. These strategies range from building standards for new construction and major renovations, next generation grid management for increased efficiency, to operational improvements in the electric power and gas supply, transmission and distribution systems. SC&A will build upon this work and provide our own expertise in combination with that of the Subgroup in order to arrive at the best possible list of measures to reduce the region's GHG emissions in this sector.

2.3 Task 3. Presentation of GHG Reduction Strategies for Analysis to MSWG

The set of strategies selected by the three Subgroups will be presented to the full MSWG under Task 3. At this meeting, the participants will have the opportunity to comment upon any of the recommended strategies, with an end goal of selecting the final list of strategies to be fully analyzed in Task 4. In addition, the MSWG, with the assistance of the SC&A Team, will need to consider whether combinations of strategies might produce synergies or overlaps in terms of GHG emission reductions. Synergies occur when two or more policies interact to increase the GHG impacts beyond what could be achieved individually, while overlapping policies may lead to double-counting of emission reductions if not handled properly in the quantitative analysis.

There are many examples of GHG mitigation policies that interact with each other. For example, changes in development density affect the efficiency of building energy demands and associated energy consumption through on-site boilers and/or off-site power plants, which will have potential overlaps and synergies with the Built Environment and Energy Sector. Changes in the density of development affect trip generation and mode choice, which will impact the transportation-sector emissions. In a dense walkable center it is possible to accomplish more daily tasks without auto trips, while increased transit options can make denser development more appealing. Two such policies were considered in Minnesota, and SC&A has experience evaluating such synergies to determine the GHG impacts and the costs of implementing two policies together as opposed to individually, in order to capture these synergistic effects.

When significant synergies and overlaps occur between and among strategies, these need to be addressed prior to the Task 4 quantification of the selected strategies. For example, many Land Use and Transportation policies both have an element of reducing vehicle miles traveled (VMT) to reduce overall emissions. All reduced VMT options need to be evaluated under one umbrella to ensure that double counting does not take place. In many cases, the VMT reductions (and ensuing GHG reductions) of one option need to be reduced in order to account for actions taken elsewhere. SC&A has performed these types of overlap analyses in multiple state processes, such as Baja California and Minnesota.

The SC&A Team will provide the MSWG with information related to which combinations of strategies may lead to synergies or overlaps. This information may be useful in the discussion at the MSWG meeting when the group is determining which strategies to consider for evaluation in Task 4.

It is important that the opinions of all participants are expressed at this meeting and that the positions of various stakeholders can be understood. The Team has found that the most successful techniques for soliciting comments on a set of options include providing a guided method for expressing opinions and working toward mutually respectful outcomes. Active listening, respectful airing of differences, and a commitment to work toward a mutually agreeable outcome usually achieve the desired results. Sharp & Company has significant experience with effectively presenting transportation and land use policies in the region. For example, in the District of Columbia Sharp & Company began work on a roadway design project that had splintered the affected community and left almost all residents very hostile to the District Department of Transportation. Sharp & Company was able to manage these meetings so that they remained productive even when emotions were running high, to ensure discussions did not break down and participants felt reassured that they are having influence over the process.

2.4 Task 4. Analyze Selected Strategies

Under Task 4, the SC&A Team will evaluate the GHG reduction strategies that were selected by the MSWG in Task 3. SC&A has extensive experience with developing an analysis of strategy implementation and related GHG impacts, co-benefits, and costs of GHG reduction. For all three sectors, the analysis and results will be performed in a transparent spreadsheet format that can be easily understood and reviewed by MWCOG staff and MSWG participants. These spreadsheets will include GHG reductions, policy costs across the public and private sector, and significant co-benefits (including air quality improvements, congestion relief, and job growth). SC&A will also utilize more advanced modeling tools as appropriate for each individual policy analysis such as EPA's MOVES and FHWA's SmartGap models.

The baseline GHG emissions inventory developed by COG's Climate Change Steering Committee in 2008 will be used as the starting point from which emission and fuel consumption reductions will be measured. However, in some cases this will need to be informed by important legislative changes that have been made since 2008—for example, the light duty vehicle efficiency standards put in effect in 2012, and the heavy duty vehicle standards from 2014. Where possible, SC&A will utilize COG's latest GHG inventory (which should be released shortly) to inform any updates to the 2008 inventory. All policy measures to be analyzed must go beyond the assumptions and conditions included in the baseline. For example, any measure aimed at improving vehicle efficiency would only be considered if it could provide GHG reductions beyond the fuel efficiency levels of the Federal CAFE or GHG standards included in the baseline.

Although precise analytical methodologies cannot be identified here since the specific strategies and measures have not yet been identified, the following discussion highlights concepts, tools, and general approaches key to the strategy categories identified in the RFP. Another issue that will need to be discussed with COG is the GHG accounting method to be used: direct (emissions based), consumption based, or consumption based with energy cycle (in order to capture some upstream emissions). The distinction between direct- and consumption-based emissions can be illustrated using the Energy Subsector. Emissions from a power plant while generating electricity would be considered direct emissions. When that electricity is used in a home or business, and the emissions from the generation of that electricity are accounted for based on the usage of the electricity, those emissions would be considered consumption-based emissions. In this example, a consumption-based accounting is most relevant when designing mitigation strategies for the built environment sector.

Transportation Sector

GHG emissions from on-road transportation are often described in terms of the "three legged stool" of vehicle technology, fuels, and vehicle miles traveled/travel efficiency. Improving vehicle technology is achieved by reducing the CO_2 emissions per mile driven, which can be achieved by making more efficient vehicles, or through alternative vehicle technologies like electric vehicles (EVs). Reducing the carbon content of fuel is the second leg of the stool, and the most difficult to implement at the local or state level. Improving travel efficiency can be achieved through technologies like signal synchronization, while reducing VMT focuses on reducing the demand for vehicle trips (for example, encouraging telecommuting or bike/ped

trips). Reducing VMT and improving travel efficiency are programs that can most easily be implemented at the local level, whereas fuel and technology initiatives often require the federal government.. Based on the materials posted by the MSWG's transportation subgroup, the "three legged stool" has been shifted to account for this more local/regional approach, with fuel/vehicle technologies in a single heading, while VMT reduction and improved transportation efficiency get additional attention. The following are examples of potential transportation options for which SC&A has performed quantitative GHG reduction, cost, and co-benefit analyses, and which may be considered by the MSWG in this process:

- Pay-as-you-drive (PAYD) automobile insurance ties a substantial portion of consumer insurance costs to the number of miles driven during the course of a year (or other time period). This type of insurance policy would provide an incentive to Metropolitan Washington-area residents to drive less in order to save money on insurance premiums. Because insurance is regulated at the state level, any PAYD insurance plan would need to be implemented in DC, Maryland and Virginia, and such a policy would have additional benefits beyond the borders of the MWCOG planning region. A key variable in estimating the benefits of PAYD is the elasticity of annual vehicle miles traveled (VMT) compared with the per mile price of automobile insurance. This is something that would need to be discussed with the transportation working group, and SC&A will provide information on the growing literature available on VMT elasticity in response to PAYD initiatives.

  For any quantitative assessment of PAYD insurance, we will begin by determining the appropriate program participation goals in future years, because quantitative GHG emission reductions are proportional to these expected participation rates. Significant participation along with a strong price signal that produces a market response can lead to expected significant program benefits.

  SC&A has prepared PAYD evaluations for state climate plans in Maryland, Minnesota, and Pennsylvania, and we have relied on studies by the Arizona Public Interest Research Group, a Dallas-Ft. Worth area pilot study to estimate expected VMT reductions for each motorist that purchases PAYD insurance, and a Massachusetts Risk Assessment of PAYD Implementation and Results. We will review any new research studies for evidence of the expected driver response and incorporate that information in the analysis.

- Improved Transit. MWCOG shares the goal of providing reliable public transit options throughout the region with WMATA and other transit providers in the region. An analysis of improved transit would begin with an assessment of existing plans to maintain and expand service in the region (which would serve as the baseline), and incorporate any potential service expansions which are currently under consideration but have not been finalized.

  When SC&A performed a similar analysis for the Minneapolis-St. Paul metropolitan area, it utilized the local Metropolitan Council's plan for aggressive transit expansion through 2040, and adjusted the timetable to show an additional commitment to transit funding (thus pushing the timetable forward to 2030). SC&A then fed this information

into the FHWA's SmartGAP model (2014), which is a sketch planning tool which synthesizes households and firms in a region and determines their travel demand characteristics based on their built environment and transportation policies. SC&A used the model to estimate the impacts of doubling transit usage on the 7-county Minneapolis-St. Paul Metro area.

- Eco-Driving. Direct eco-driver training encourages driving habits such as shifting to a higher gear earlier, using cruise control, coasting to stoplights, and accelerating more gradually. Encouraging these driving habits can have benefits ranging from fuel and GHG savings, as well as reduced traffic accidents.

  SC&A evaluated the costs and GHG impacts of an eco-driver training program in Michigan. This analysis estimated the impact of a training program for both driving instructors (who would pass this information on to those they are teaching), as well as a public service push to encourage eco-driving for the population at large. This analysis found that both programs could potentially reduce VMT by more than 3%, and that fuel savings for drivers would more than cover the costs of training and public service messages. This analysis relied on studies from the Federal Highway Administration, as well as an eco-driving initiative implemented in the Netherlands. For an MWCOG analysis, SC&A will review the literature for additional examples of eco-driving initiatives in the U.S., as well as any updated evidence of the expected driver response to eco-driving training.

Land Use Sector

In coordination with the MSWG Land Use Sector Subgroup, the SC&A Team will quantify the GHG impacts and costs of the land use strategies selected in Task 2. This quantification of land use policies will incorporate any plans already in place, such as the emphasis on accommodating new growth within Activity Centers as discussed in MWCOG's *Place + Opportunity: Strategies for Creating Great Communities and a Stronger Region,* and other products of MWCOG's Region Forward Vision.

SC&A and Louis Berger both have extensive experience in the Land Use Sector. Louis Berger has used integrated transportation-land use models in the context of major transportation environmental impact statements, such as the Circ-Williston Transportation Project in Vermont, which included a quantification of the change in regional greenhouse gas emissions in the six-county Northwest Vermont region. This work accounted for the changes in household location and transit use as a result of a new alignment for a highway project outside of Burlington. Louis Berger wrote the book on addressing indirect land use effects of transportation through NCHRP 466, which included an extensive review of the tools available for land use forecasting. Louis Berger is also familiar with travel demand forecasting within the context of Washington, DC, through transportation planning work for federal clients such as NAVFAC and GSA.

SC&A likewise has experience with land use planning. SC&A used the FHWA's SmartGAP model (2014), to estimate the impacts of denser development patterns in the 7-county Minneapolis-St. Paul Metro area (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington counties). This ongoing work estimates the costs, VMT impacts, and resulting changes in building energy demand as a result of moving towards denser residential housing in

the 7-county area. This obviously includes significant overlaps with the Energy and Built Environment Sector, as the building impacts were actually greater than the fuel savings from reduced VMT.

In addition to GHG benefits and costs, SC&A and Louis Berger will also examine co-benefits and implementation challenges for the MWCOG. Land use strategies offer many potential co-benefits that can be used to broaden strategy acceptance. These co-benefits include increased physical activity in dense walkable communities, decreased criteria pollutant emissions, and improved opportunities for community engagement and cohesion. Some co-benefits can be difficult to quantify, particularly those related to social cohesion. However, others such as the change in pollutant emissions associated with a given change in land use can be relatively straightforward to determine—first estimating the change in vehicle travel (using literature on trip generation and travel patterns of different land use types), and then estimating how the change in VMT affects emissions (using the EPA mobile source emissions model MOVES2014 or pivoting of modeling already completed for other MWCOG planning initiatives, including regional emissions analysis for transportation conformity).

Some land use measures imposing significant costs or with a long term payback time carry the potential for unintentional negative consequences that must be considered in an honest and transparent way. An example of a potential negative consequence of a land use strategy could be increased development in the vicinity of transit stations leading to displacement of disadvantaged socioeconomic groups. Thus, incorporating principles of environmental justice in the planning process will be critical to achieving widespread acceptance. Potential "mitigation" measures for gentrification impacts of Transit Oriented Development include set-asides for affordable housing in new developments, such as may be negotiated through Community Benefits Agreements between the local government and the developer. Inclusionary zoning or housing policies are another option in use in Montgomery County, Maryland, since the 1970s and more recently implemented in the District of Columbia.

Energy and Built Environment Sector

SC&A has significant experience with stakeholder-based climate action planning projects for the energy and built environment sector. SC&A has worked with stakeholders and working group members to gather and structure the data required to analyze the greenhouse gas emissions reduction and costs of a variety of emissions reduction options. This includes designing and building custom Excel tools to evaluate emissions reduction options including (but not limited to) increased industrial energy efficiency, enhanced demand-side management programs, reduction of high global-warming-potential greenhouse gas emissions, "zero-net-energy" buildings, expanded use of renewable energy in the building sector, applications of combined heat and power systems in all sectors, and enhanced building energy codes.

Some specific options that might be selected for quantification in the Energy and Built Environment Sector include:

- Improved Building Codes and Standards. Building energy codes and standards specify minimum energy efficiency requirements for new buildings or for buildings being renovated. Improved building efficiency standards offer the opportunity to provide long-term GHG savings due to the long lifetime of buildings. Potential elements of a policy to improve building codes include: requiring high-efficiency appliances when possible;

training of building code officials in energy code enforcement; education for builders and contractors to meet building codes and take advantage of efficiency improvements; and financial incentives towards the incorporation of LEED standards.

Potential measures supporting this option can include consumer education, improved enforcement of building codes, and improved access to information on and software tools to calculate the impact of energy efficiency technologies on building energy performance. SC&A has quantified the GHG benefits of many options to improve building codes and standards, including for the Midwestern Governor's Association, as well as state analyses for North Carolina and Florida.

- Green Power Purchasing. Green power purchasing comprises a variety of consumer-driven strategies to increase the production and delivery of low-GHG power sources. Possible elements of green power programs include:
    - Regulatory encouragement for utilities to develop green power tariff structures, and to make information on green power options available to consumers.
    - Requirements that power sources and emissions data be reported in consumer utility bills.
    - Goals or mandates for green power purchases in the MWCOG region.
    - Provide information and promotional materials to encourage voluntary purchasing of green power.

  SC&A has evaluated many options to improve building codes and standards, including for the Midwestern Governor's Association, as well as state analyses for Minnesota and North Carolina.

- Urban Forestry. Expanded urban forestry can have threefold benefits for the MWCOG region:
    - Trees provide shade, which can cool buildings in the immediate vicinity, and reduce building energy demand.
    - Trees provide a natural temperature regulation to reduce the urban heat island effect, which will also reduce building energy demand.
    - Trees provide carbon storage and sequestration.

  Increased tree canopy coverage can be accomplished by a combination of tree planting projects, delineating natural areas in new developments, preservation of existing trees on parcels during development, and adequate care and maintenance of existing trees in developed areas. SC&A has performed urban forestry analyses at the state level for Florida and Iowa.

Overlap Analysis

It is important that any analysis include an evaluation of any synergies and overlaps that are occurring between different options. This process will be laid out in Task 3 to identify areas where overlap or synergies may occur and create a plan for capturing these interactions. This process uses a sector-based approach, and therefore it will be important to clearly delineate the boundaries of and interactions between each sector to avoid double counting or missing

emissions reduction benefits that cross multiple sectors. Task 4 would also require a final step of evaluating all three sectors, to determine any change in the total GHG impacts of all policies if they were implemented by MWCOG.

2.5 Task 5. Prepare and Present Interim Technical Report

The Interim Technical Report will document the work performed under Tasks 2 through 4. Although a number of potential strategies will not be selected for analysis under Task 4, it is still important that the record of this project identify measures that were explored, and, if possible, to identify reasons why these measures were not selected for further analysis. This can be useful in providing background for future workgroups. This can also provide context for how the analyzed strategies were selected. Comments that were received from the Sector Workgroups in the Task 4 presentations will be addressed in the Interim Technical Report. In some cases, this may lead to revisions in the analyses.

For each sector, the Draft Interim Report will present:

- The initial set of potential GHG reduction strategies, along with qualitative rankings of these measures;
- A summary of the key discussion points related to each strategy;
- A discussion of how the strategies for further analysis were selected by the Sector Workgroup;
- The full technical analysis of each selected strategy; and
- A summary of the GHG emission reductions and the expected co-benefits of the selected strategies.

Key elements of the Draft Interim Report will be presented to the full MSWG. The SC&A team will work with the MSWG to facilitate consensus on any concerns or disagreements brought up at the MSWG meeting. Where consensus is reached, SC&A will revise the Draft Interim Report to reflect the consensus agreement. If there are areas where consensus is not reached, SC&A will document the areas of disagreement. In either case, these revisions will be included in a Final Interim Report. The SC&A Team will revise the MSWG presentation materials to reflect the material in the Final Interim Report, and will assist COG, as needed, in presenting this material to the TPB, MWAQC, CEEPC, and the COG Board.

The Draft and Final Interim Reports will be edited by a technical editor, and will utilize the experience of Sharp & Company to make the report visually appealing, and providing a consistent theme across the reports and presentation materials. Sharp & Company is known for being able to distill complex information into materials that are readily grasped by non-technical audiences. For this project, Sharp & Company recommends consideration of techniques such as infographics that can quickly tell a story.

When Virginia proposed a number of new rail projects in its Statewide Rail Plan, Sharp & Company worked with the Commonwealth to develop a set of icons that quickly identified project benefits. These visuals tied together all of the projects and enabled report readers, such as

elected officials, to immediately see why these were important projects to support. AASHTO cited the document as a best practice in communicating about rail plans.

For a Transportation Research Board highway research project, Sharp & Company has distilled a number of processes into an easy-to-follow infographic. Replacing numerous paragraphs with these visuals guides the viewer to exactly their area of concern. In these distracted and distracting times, assisting audiences to quickly find their way through material maintains interest and increases participation.

2.6 Task 6. Explore GHG Goals and Targets in Each Sector

To assist MSWG in the task of establishing short-term (i.e., 2020) and long-term (e.g., 2050) goals and targets, SC&A will first research and review goals and targets established in other metropolitan areas (as well as those previously established in the MWCOG region) as a means of benchmarking the emission reduction potential of the suite of strategies analyzed under previous tasks. To that end, SC&A has identified a preliminary list of other regions where relevant initiatives have taken place and regional goals and targets established, including but not limited to:

- Southern California Association of Governments (SCAG) – California's Sustainable Communities and Climate Protection Act, or Senate Bill (SB) 375, requires SCAG to develop a Sustainable Communities Strategy (SCS) to reduce greenhouse gas (GHG) emissions from cars and light trucks through integrated transportation, land use, housing and environmental planning. The SCS is a plan for meeting greenhouse gas emission reduction targets set by the California Air Resources Board (ARB) for the SCAG region. The 2012–2035 RTP/SCS achieves a 9 percent per capita GHG reduction for 2020 and a 16 percent per capita reduction for 2035.
- New York City – Mayor de Blasio announced last September that New York City is committing to reducing its greenhouse gas emissions by 80 percent over 2005 levels by 2050, starting with *One City, Built to Last: Transforming New York City's Buildings for a Low-Carbon Future* – a sweeping plan to retrofit public and private buildings to dramatically reduce the city's contributions to climate change, while spurring major cost savings and creating thousands of new jobs for New Yorkers who most need them.
- City of Boston – On November 12, 2014, Mayor Martin J. Walsh announced the release of the draft 2014 Climate Action Plan for public comment. The draft plan lays out concrete goals and targets across three sectors: Large Buildings and Institutions, Transportation, and Neighborhoods (built environment).

Second, SC&A will prepare a range of sector-specific goals and targets from the strategies analyzed in previous tasks. Boundary and accounting considerations will be made transparent, and SC&A will document the pros and cons associated with each plausible goal and target scenario. It is particularly important to clearly define the boundary and associated GHG accounting methods when strategies affect out-of-jurisdiction emissions that occur as a consequence of activities within the jurisdiction boundary, most notably electricity generation and the management of municipal solid waste. Other key considerations under this task include

the need to minimize leakage and properly address the mechanisms for transferable emission units, if applicable.

When bundling individual strategies into sector bundles, it is important to recognize and assess possible interaction between various measures. It is often the case that mitigation actions are not independent. For instance, in the Energy/Built Environment sector, two or multiple strategies may overlap (e.g., a net-zero building and an HVAC energy efficiency standard), and their combined effect be somewhat reduced. In other cases, combined strategies results in a greater combined effect than the sum of its parts, thus reinforcing each other.

As specified in the RFP, proposed sector goals and targets will be classified according to their implementation potential either as achievable, stretch, or contingent on other government-level action. For the latter class, SC&A will prepare a high-level estimate of their effects, including at minimum the effects of the current CAFÉ standards and the Clean Power Plan.

2.7 Task 7. Prepare and Present Final Technical Report

The Final Technical Report will expand upon the information contained in the Final Interim Report, adding information from the Task 6 exploration of goals and targets. In addition, comments received from the MSWG on the Task 6 presentation will be addressed in the Final Interim Report. This report will add the following to the Final Interim Report:

- An Executive Summary;
- A summary of the GHG goals and targets that have been set in other metropolitan areas;
- By sector, the range of potential GHG goals and targets identified for the COG region;
- Comparisons of the expected emission reductions from the selected GHG reduction strategies to the range of GHG goals and targets.

The SC&A team will develop presentation material based upon the material included in the Final Technical Report and will assist COG, as needed, in presenting this material to the TPB, MWAQC, CEEPC, and the COG Board.

As with the Interim Report, the Final Technical Report will be edited by a technical editor, and will utilize the experience of Sharp & Company to make the report visually appealing, and provide a consistent theme across the reports and presentation materials.

3.0 SERVICES, PRICING, AND SCHEDULE

The cost proposal for the SC&A Team is presented in Table 4. This is a fixed price cost estimate. The table contains detail on the loaded hourly rates of each staff person, hours by task, and the total cost by task. The total estimated cost for this project is $199,253, with 1,557 labor hours.

Figure 3 illustrates the timeline for completing this project and associated deliverable dates.

Table 4. SC&A Cost Proposal: Multi-Sector Approach to Reducing Greenhouse Gas Emissions in the Metropolitan Washington Region

Name	Role in Study	Hourly Rate	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7	Total
SC&A										
Mullen, M.	Project Manager, Transportation Lead	$147	12	60	8	40	32	8	40	200
Wilson, J.	Policy Advisor	$229	0	0	4	8	0	4	4	20
Maldonado, J.	Facilitation Coordinator	$110	0	45	20	50	20	80	20	235
Bollman, A.	Economics Advisor	$114	0	0	0	20	0	10	0	30
Schreiber, J.	Technical Liaison	$90	0	50	16	120	16	16	8	226
von Hippel, D.	Energy/Built Environment Lead	$166	0	20	8	60	0	6	0	94
Beronja, K.	Research Assistant	$59	0	0	0	40	0	40	0	80
Brophy, A.	Technical Editor	$90	0	0	0	0	8	0	20	28
Eley, J.	Clerical	$62	0	0	0	0	8	0	16	24
Total SC&A Labor			**12**	**175**	**56**	**338**	**84**	**164**	**108**	**937**
Louis Berger Group										
Canan, T	Land Use Senior Advisor	$172	0	0	4	4	4	4	2	18
Gonzalez, J	Land Use Lead	$97	0	25	15	60	20	25	20	165
Hodgson , L	Land Use Demand Management	$79	0	0	15	40	0	0	0	55
Tidd, L	Senior Land Use Planner	$141	0	25	0	40	0	25	0	90
Total Louis Berger Group Labor			**0**	**50**	**34**	**144**	**24**	**54**	**22**	**328**
Sharp & Company										
Sharp, S.	Outreach/Communications Lead	$212	0	24	0	0	0	0	0	24
Arzt, M.	Communications Specialist	$212	0	12	10	10	10	10	10	62
Geiling, C.	Communication Specialist	$134	0	60	8	8	0	0	0	76
Eckbreth, D.	Graphic Designer	$105	0	0	10	10	10	10	10	50
Johnson, S.	Production	$79	0	60	10	10	0	0	0	80
Total Sharp and Company Labor			**0**	**156**	**38**	**38**	**20**	**20**	**20**	**292**
Contract Total Hours			**12**	**381**	**128**	**520**	**128**	**238**	**150**	**1,557**
Contract Total Cost			**$1,769**	**$53,995**	**$16,744**	**$62,822**	**$16,820**	**$28,249**	**$18,854**	**$199,253**

Task	Deliverables/Milestones	Key Dates
	Contract Execution	3/30/2015
1	**Finalize Contractor Work Plan and Schedule**	
	Final Work Plan and Schedule	4/2/2015
2	**Meet with Sector Subgroups and Review Proposed Strategies**	
	Meet with COG leads for each Sector Subgroup	4/7/2015
	First set of Sector Subgroup meetings	4/14/2015
	Technical Memorandum #1 - Priority strategies	4/21/2015
	Second set of Sector Subgroup meetings	4/28/2015
	Technical Memorandum #2 - Analysis methodologies	5/4/2015
3	**Presentation of GHG Reduction Strategies for Analysis to MSWG**	
	MSGW Meeting #2	5/8/2015
	Technical Memorandum #3 - Recommended strategies & methods	5/22/2015
4	**Analyze Selected Strategies**	
	Analysis of selected strategies	
	Technical Memorandum #4 - Strategies analysis documentation	7/10/2015
	Third set of Sector Subgroup meetings	7/17/2015
5	**Prepare and Present Interim Technical Report**	
	Draft Interim Technical Report	7/24/2015
	MSWG Meeting #3 - Presentation of Interim Technical Report	7/31/2015
	Final Interim Technical Report	8/19/2015
	Preparing materials for COG meetings	8/31/2015
	Participation in COG meetings	9/15/2015
6	**Explore GHG Goals and Targets in Each Sector**	
	Preliminary memorandum on GHG goals and targets	5/8/2015
	Technical Memorandum #5 - GHG goals and targets	9/18/2015
	MSWG Meeting #4 - Presentation of technical memorandum	9/25/2015
	Response to comments from MSWG on Task 6 memorandum	10/9/2015
7	**Prepare and Present Final Technical Report**	
	Final Technical Report	11/13/2015
	Preparing materials for COG meetings based on Draft Final Report	11/23/2015
	Participation in COG meetings	12/15/2015
	Participation in COG Board meeting	1/16/2015

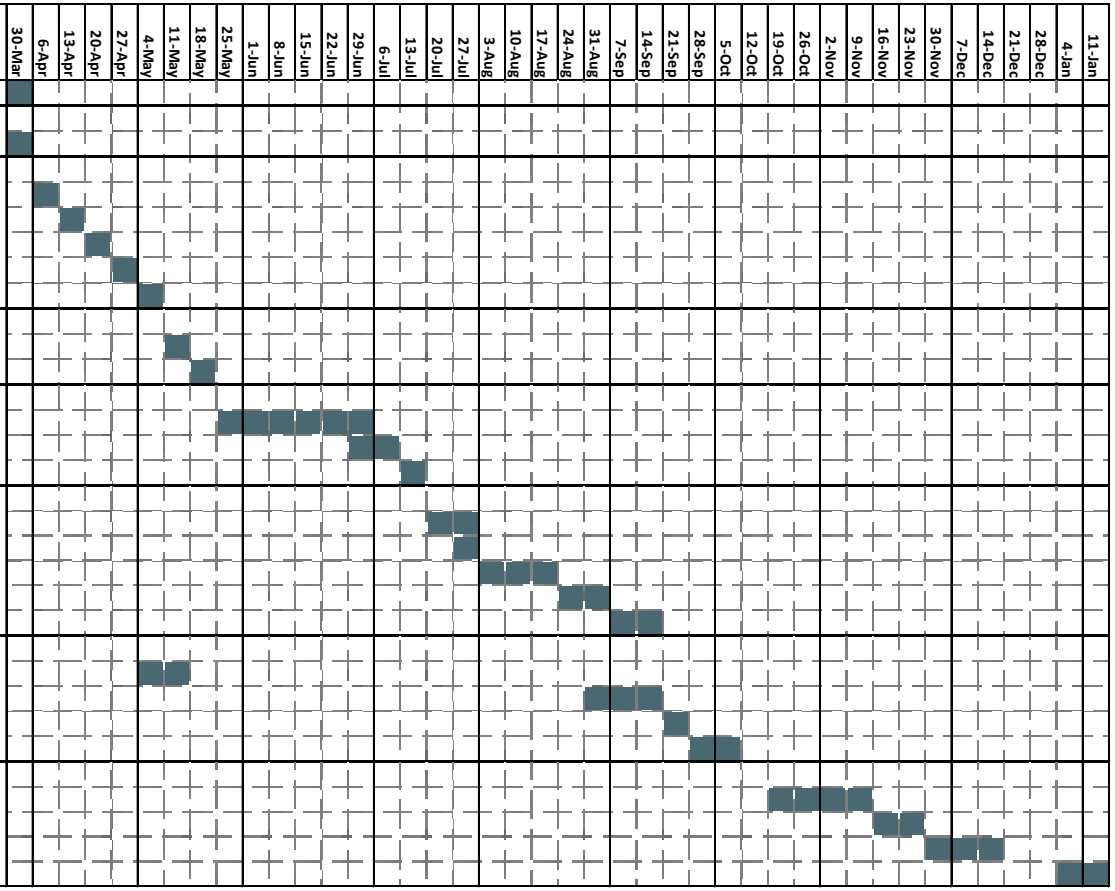


Figure 3. Project Schedule

4.0 REFERENCES

Three references are supplied in the sections below for each of the three firms included on the SC&A Team, along with the requested contact information. In addition, following the reference contact information is a list of the key personnel from this proposal who have performed work for that reference.

4.1 SC&A References

Dr. Tomás Balarezo Vásquez
Regional Planning Manager
Border Environment Cooperation Commission
(877) 277-1703
(915) 257-8910, direct
tbalarezo@cocef.org

Key Personnel: Juan Maldonado, Jackson Schreiber

Eulalie Gower-Lucas
Senior Transportation Engineer
Department of Transportation Planning
Metropolitan Washington Council of Governments
777 North Capitol Street, NE
Suite 200
Washington, DC 20002
202- 962-3335
egower-lucas@mwcog.org

Key Personnel: Maureen Mullen, Jim Wilson

Dean Van Orden
Assistant Director
Bureau of Air Quality
Pennsylvania Department of Environmental Protection
400 Market Street
Harrisburg, PA 17101
717-783-9264
dvanorden@pa.gov

Key Personnel: Jim Wilson, Maureen Mullen, Jackson Schreiber

4.2 Louis Berger References

Vivian E. Baker
Assistant Director, Transit Friendly Land Use & Development
NJ TRANSIT

1 Penn Plaza East, 8th Floor, Newark, NJ 07105
973-491-7822
vebaker@njtransit.com

Key Personnel: Jennifer Gonzalez,

William Sadlon
NEPA Program Manager
Naval Facilities Engineering Command, Washington
1322 Patterson Ave. SE, Suite 100, Washington Navy Yard, DC 20374-5065
202-685-0164
william.sadlon@navy.mil

Key Personnel: Laura Hodgson

Hilda Lafebre, DBIA
Manager, Capital Project & Environmental Planning Caltrain │SamTrans │Transportation Authority
P.O. Box 3006, San Carlos, CA 94070-1306
650-622-7842
lafebreh@samtrans.com

Key Personnel: Leo Tidd

4.3 Sharp & Co. References

Brian McMahon
Senior Supervising Planner
Parsons Brinckerhoff (prime for contract with District of Columbia Department of Transportation)
1401 K Street, NW, Suite 701, Washington, DC 20005
202-661-5332
mcmahonb@pbworld.com

Key Personnel: Susan Sharp, Mary Arzt, Charise Geiling

Oliver Boehm
Manager of Landscape Architecture and Urban Design
Volkert, Inc. (prime for contract with District of Columbia Department of Transportation)
5400 Shawnee Road, Suite 301, Alexandria, VA 22312
703-642-8104
oliver.boehm@volkert.com

Key Personnel: Susan Sharp, Mary Arzt, Charise Geiling

Michael Flood
Senior Planner

Parsons Brinckerhoff (prime for contract with Maryland Department of Transportation)
100 Charles St, Tower 1, 17th Floor, Baltimore, MD 21201
410-246-0528
flood@pbworld.com

Key Personnel: Susan Sharp, Charise Geiling

APPENDIX A:
RESUMES OF KEY STAFF AND RELEVANT PROJECT SUMMARIES

Table A-1. Summary of Team Experience in Related Work

Company Name	Client	Period of Performance
SC&A	**Center for Climate Strategies**	**2006-Present**
State Climate Action Plans (MN, MD, MI, PA, WY, ID, AZ, NM) Under contract to the Center for Climate Strategies, provided technical and facilitation support for the Transportation and Land Use technical work groups for the states of Minnesota, Maryland, Michigan, Idaho, Wyoming, and Pennsylvania. Work included facilitating meetings for the development of goals, policy options, and comprehensive GHG mitigation strategies. The transportation sector considers issues such as smart growth, eco-driving, fleet efficiency, feebates, tire improvements, and anti-idling. Under contract to the Center for Climate Strategies, provided technical and facilitation support for the transportation and land use technical work groups for the states of Maryland, Michigan, and Wyoming. Work included development of goals, policy options, and a comprehensive greenhouse gas mitigation and carbon footprint reduction strategy for consideration by the respective states. Worked for the states of Pennsylvania and Idaho and their respective Departments of Transportation on the development of goals and cost curves for a variety of transportation issues. The transportation sector considers issues such as smart growth, eco-driving, fleet efficiency, feebates, tire improvements, and anti-idling.		
SC&A	**Border Environment and Cooperation Commission, as subcontractor to Center for Climate Strategies**	**2010-2014**
Climate Action Planning and Capacity Building in Mexico's Northern Border TranSystems|Pechan, in conjunction with CCS and the Border Environment and Cooperation Commission, provided capacity-building efforts in the border states of Mexico by providing training modules in the CCS model of climate action planning. One module, for example, was Policy Option Quantification and Analysis and covered how to describe selected policy options in terms that allow for quantification, and how to conduct those quantifications and associated economic analyses. The purpose of these training modules was to build capacity within each state to implement the climate action planning process and to enable the participants to play a vital role in future climate planning, analysis and implementation. In addition, TranSystems|Pechan provided project technical and management support for the implementation of a comprehensive, multi-stakeholder process for the development of climate action plans for the border states of Sonora, Baja California, and Coahuila, Mexico. Activities included preparing and facilitating advisory group meetings resulting in the development of a list of priority policy options to reduce greenhouse gases (GHGs) and the quantification of their impacts. SC&A later provided further support on this project to assist the state of Baja California in developing state GHG mitigation action policy plans and in formulating stakeholder recommendations and reports for the Transportation and Urban Development Technical Work Group (TWG).		
SC&A	**Pennsylvania Department of Environmental Protection, as subcontractor to Center for Climate Strategies**	**3/2009-7/2009**

Pennsylvania Climate Change Advisory Commission Support
Pechan provided technical support to the Pennsylvania Climate Change Advisory Committee through assistance in developing work plans on climate mitigation actions, quantitative analysis of GHG reductions and costs, and the development of baseline data, including GHG inventory and forecast data. Pechan staff provided facilitation and technical support to the following subcommittees: transportation and land use, agriculture and forestry, and waste and industry. We quantified the GHG emission reductions and associated costs of 10 transportation and land use sector policy options being considered for inclusion in the state climate action plan. Analyses focused on estimating GHG reductions and cost effectiveness from 2009 to 2020. Mitigation options evaluated included biofuels/renewable fuels, low rolling resistance tires, pay-as-you-drive insurance, feebates, eco-driving, low GHG freight movement options, and increasing support for efficient transit and freight transport.

SC&A	**Virginia Department of Transportation, as subcontractor to Michael Baker**	**11/2014-Present**

Development of Project Level Air Quality Studies and Related Services
SC&A is currently involved in preparing hot spot analyses of two major corridors in the Washington metropolitan area. One project involves the addition of a new travel lane on I-395 and the other involves a study of adding managed lanes to I-66 west of the Capital Beltway. SC&A is performing CO hot spot analyses of both projects, and a mobile source air toxics (MSAT) hot spot analysis for the I-395 project. These projects will involve interaction with Interagency Consultation Groups, using the MOVES model to develop emission rates following EPA and FHWA guidance, and dispersion modeling to determine the projected changes in CO concentrations with the proposed projects.

SC&A	**Metropolitan Washington Council of Governments**	**2001-2008**

MOBILE6 Support to Metropolitan Washington Council of Governments
Pechan provided support to MWCOG in the transition from the use of EPA's MOBILE5 onroad emission factor model to the MOBILE6 model for use in updating the SIP and transportation conformity plans for the metropolitan Washington area. In early 2002, a MOBILE6 Task Force was convened, comprised of local and state transportation and air quality staff, to review the inputs needed for MOBILE6. Pechan prepared preliminary data and presented results and recommendations at monthly meetings of this task force. Pechan prepared county-level MOBILE6 input files for each of the MWCOG counties representing ozone season conditions and winter conditions for key evaluation years. Pechan also performed post-processing of emission factors. These emission factor files were then used by the MWCOG transportation staff to calculate trip-based onroad emissions. Beginning in 2005, Pechan developed an interface model for MWCOG staff to use to create the MOBILE6 input files in-house needed for ozone and CO analyses, consistent with the methodology used by Pechan. Pechan provided training to MWCOG staff to enable MWCOG to eventually prepare all of the necessary MOBILE6 inputs in-house. This interface system allows MWCOG staff to enter the data to be used for each of the key MOBILE6 parameters, by county. Pechan also adapted this process to include annual or seasonal $PM_{2.5}$ input files, along with ozone season input files. Pechan later modified the interface model to include GHG emission calculations. Pechan prepared a user's guide covering all applications of the interface model. This model has since been used numerous times by MWCOG staff in the preparation of onroad emission inventories for various purposes.

SC&A	**Tennessee Department of Transportation**	**3/2008-6/2008**

Global Climate Change, Greenhouse Gas Emissions, and Transportation in Tennessee
TDOT requested assistance to assess the relationships among transportation, global climate change, and GHGs; the policy implications of those relationships; potential impacts of climate change on transportation infrastructure in Tennessee; and the options available to Tennessee for reducing or managing the impacts of transportation on global climate change and GHG emissions. Pechan developed statewide base- and forecast-year GHG emission estimates by sector so that Tennessee could identify the sectors of most importance in the state. Pechan also performed a comprehensive analysis of policy options

that might be appropriate for reducing transportation sector energy use and associated GHG emissions in Tennessee. One of the deliverables for this project was a set of PowerPoint briefing slides that TDOT used to brief its Metropolitan Planning Organizations on GHG issues.

SC&A	**Port Authority of New York and New Jersey, as subcontractor to Southern Research Institute**	**8/2007-Present**

Port Authority of New York & New Jersey Greenhouse Gas Emission Inventory

Port Authority of New York and New Jersey is implementing a program to reduce its greenhouse gas (GHG) emissions by 80 percent by the year 2050. For this project, SC&A developed a 2006 calendar year GHG emission inventory of Port Authority facilities and operations, including the emissions of its tenants (e.g., airlines and shippers) and patrons (e.g., airport passengers, PATH riders). In addition, the consulting team developed and implemented systems that allow for annual tracking and reporting of GHG emissions. Since the 2006 calendar year GHG/CAP emission inventory was completed, SC&A has completed similar organizational emission inventories through the current 2013 inventory period. SC&A trained PANYNJ staff members in using the GHG emission estimation methods and briefed the New York City Mayor's Office about the methods used to estimate GHG emissions for this project. A paper describing the 2006–2008 emission inventory efforts was published in the *Transportation Research Record—Environment 2011*.

SC&A	**North Jersey Transportation Planning Authority**	**11/2009-1/2011**

North Jersey Transportation Planning Authority Regional Greenhouse Gas Emissions Inventory and Forecast

Pechan prepared a GHG inventory and forecast for the entire NJTPA region (13 northern counties of New Jersey). The inventory and forecast provides emissions data for all GHG sources/sinks at both the county and municipal levels and for all six Kyoto gases. The base year is 2006 and forecasts were developed out to 2050. Novel approaches were used to construct this inventory and forecast, including (1) the development of both direct and consumption-based GHG estimates and (2) the development of GHG estimates capturing the full energy cycle (e.g., upstream GHG emissions associated with fuel consumption and waste generation). Inventory spreadsheets were developed for each sector showing the relevant activity, emission factors, emissions calculations, growth factors, and forecasted emissions at the county and municipal levels. Training and a Web-based look-up tool for emissions data were also developed for use by project stakeholders. This project represented Phase 1 of a multi-phase effort by NJTPA to develop a Climate Action Plan for the region.

SC&A	**Pennsylvania Department of Transportation, as subcontractor to Michael Baker**	**2013**

Backsliding Research and Analysis

PennDOT and Pennsylvania DEP requested assistance to support the state's efforts to resolve emissions backsliding issues that will likely result from three potential actions: (1) discontinuance of low volatility gasoline in the Pittsburgh area, (2) phase out of service station Stage II vapor controls in the Pittsburgh and Philadelphia areas, and (3) modernization of the vehicle inspection and maintenance program. PennDOT and DEP formed a working group that will research and discuss the needs and potential approaches to meet these needs. We supported this group and provided analyses and research. Our staff developed control measure evaluations for a range of stationary and area source VOC and NO_X emission reduction options in Pennsylvania. This information was presented to the working group in May 2013, and then the working group decided which measures to include in its anti-backsliding analysis to submit to EPA. Control measure analysis years were 2013 and 2016.

SC&A	**U.S. Environmental Protection Agency, as subcontractor to Industrial Economics**	**2005-2008**

Section 812 Prospective Study – EPA

Section 812 of the Clean Air Act Amendments of 1990 (CAAA) requires EPA to perform periodic,

comprehensive analyses of the total costs and total benefits of programs implemented pursuant to the Act. The first prospective analysis was completed in 1999. The second prospective analysis was initiated during 2005. The first step in the second prospective analysis was the development of base- and projection-year emission estimates, which will be used to generate benefit estimates of CAAA programs. We developed emission projections for the 2010 and 2020 analysis years. There are several unique features of this analysis. One is the use of consistent economic assumptions from the DOE Annual Energy Outlook 2005 projections as the basis for estimating 2010 and 2020 emissions for all sectors. Another is the analysis of the different emissions paths for both with and without CAAA scenarios. Other features of this analysis include being the first EPA analysis that uses the 2002 NEI files as the basis for making 48 state emission projections, incorporating control factor files from the regional planning organizations that had completed emission projections at the time the analysis was performed, and modeling the emission benefits of the expected adoption of measures to meet the 8-hour ozone NAAQS, the Clean Air Visibility Rule, and the $PM_{2.5}$ NAAQS. Cost estimates were calculated under post-CAAA control scenarios in projection years 2000 and 2010 using control assumptions consistent with those in the benefits analysis. Costs associated with PM, VOC, and NOx CAAA provisions were estimated using Pechan's ERCAM. Costs were computed for individual source categories for each affected pollutant and tracked by CAAA. The results of this study have been reviewed by EPA's Science Advisory Board.

SC&A	Mid-America Regional Council	2010-2011

Kansas City Regional Clean Air Plan Updates – Mid-America Regional Council (MARC)

We performed technical analysis and process planning tasks to assist MARC in updating its regional clean air action plan. This plan focuses on voluntary measures that the Kansas City Metro area can pursue to reduce ozone precursor emissions as part of the area's attainment plan for expected EPA ozone NAAQS revisions. A technical report analyzing all of the emission reduction strategies identified by the working group and community engagement process was submitted to the working group. The analysis of voluntary controls used many criteria, including cost effectiveness, ease of implementation, and technical feasibility. The report also identified both short- and long-term voluntary control strategies and emission reduction measures that could be used to improve air quality in the Kansas City region. Our role included reviewing emission-reduction strategies identified by the community working group and identifying any additional strategies used elsewhere; determining any legal or regulatory actions at the state or local level required to implement identified strategies; preparing cost estimates for implementing strategies; developing a technical report listing all of the emission-reduction strategies and the level of reductions that would be realized if implemented; developing scoring criteria for emission-reduction strategies; and scoring proposed emission-reduction strategies and recommending the most effective strategies. This included a cost-benefit analysis.

SC&A	Pennsylvania Department of Environmental Protection	

PA Ozone Stakeholder Support

During the 1990s, Pechan provided technical support to ozone stakeholder programs in Pittsburgh and Philadelphia and assisted these areas in developing a set of control strategies that provided the most cost effective solution to attaining the ozone standard. Pechan later supported similar ozone stakeholder programs in South-Central Pennsylvania and the Reading-Lehigh Valley.

SC&A	Chicago Transit Authority	2012-2013

Transit System Adaptation Pilot Study

The CTA project began with assessing the impacts of various weather events on CTA ridership. TranSystems analyzed the impact of high heat, extreme cold, rain and snow on ridership and overall CTA revenues and presented this information at several meetings with CTA staffers to foster discussion of the greatest threats to the CTA system from extreme weather. TranSystems used information from these analyses and discussions to create a threat matrix of which weather related events posed the greatest threat to the CTA system and then used the threat matrix to create several detailed analyses of potential CTA adaptation strategies to reduce system vulnerability.

SC&A	Center for Climate Strategies	2007-2011
Development of GHG Emission Inventories and Reference Case Projections Pechan developed GHG base case emissions and reference case projections for about 20 states, in cooperation with the Center for Climate Strategies. These projections generally extended through the 2030 or 2040 timeframe, and included all six Kyoto GHGs. In all of these projects, Pechan developed the transportation inventories and forecasts, and for about half of the projects, Pechan was responsible for the development of all sectors of the emission inventories.		
SC&A	**Southern California Association of Governments, as subcontractor to Center for Climate Strategies**	**5/2010-12/2011**
Southern California Association of Governments Climate Action Planning Support TranSystems provided support to the Southern California Association of Governments (SCAG) socioeconomic impact and regional competitive analysis of AB32/SB375 for the SCAG regional economy (four counties in southern California). TranSystems's primary role in this project was the development of a GHG inventory and forecast for years from 1990 through 2035. TranSystems worked with a number of stakeholders in the Southern California area to obtain the most appropriate activity data and emission factors for use in this study. TranSystems prepared this GHG inventory and forecast for all GHG emission sectors and all six Kyoto gases. As the inventory covered four counties, bottom-up inventories were developed where possible, but in cases where substate data were not available, allocation techniques were used to allocate state emissions or activity to the four counties.		
Louis Berger	**Naval Facilities Engineering Command (NAVFAC) Washington**	**2010-2011**
Naval District Washington Regional Transportation Vision Louis Berger, in a joint-venture with another firm, developed a Regional Transportation Vision for the NDW (including naval installations in the National Capital Region) to proactively address transportation at a regional level. NDW includes seven commands comprising 23 sites within the DC area. The NDW Regional Transportation Vision provides overarching goals and objectives, formulates policies and strategies that influence regional travel patterns, and establishes a framework for TMPs that will be implemented at each Navy installation. The Regional Transportation Vision supports sustainable principles of development that optimize the use of existing and future transportation facilities, reducing single occupant vehicle travel. Elements of the vision include a comprehensive long-range transportation program, representing an integrated policy for transportation, circulation, and parking. It includes cost-effective measures to reduce greenhouse gas (GHG) emissions, reduce long-distance commuting to work, reduce SOV travel, establish and maintain a "clean, green" government vehicle fleet, and preserve the environment at, and around, all NDW installations.		
Louis Berger	**Naval Facilities Engineering Command (NAVFAC) Washington**	**2011-2014/2015**
Transportation Management Plans, NAVFAC Louis Berger prepared Transportation Management Programs for six Washington, DC, area Naval installations as part of an IDIQ contract with Naval Facilities Engineering Command (NAVFAC) that also includes Master Plans and Environmental Assessments at installations varying in size and location. The goals of the TMPs align with the MWCOG and federal sustainability goals and include maintaining acceptable air quality levels, improving transportation options, reducing trips generated and vehicle miles traveled, ensuring no degradation in vehicular levels, and providing a reduction in energy consumed. The TMPs evaluate existing transportation and parking conditions, evaluate planned growth over the next five years, and develop a program of measurable strategies to achieve the goals. The strategies are carefully developed based on the conditions of each installation and when applied together have the potential to achieve a shift in travel mode and a reduction in installation produced greenhouse gases. For two of the installations, Louis Berger completed an analysis of the CO_2 emissions that would result from varying		

levels of implementation of the TMP policies. Three scenarios—high, medium, and low degree mode shifts—were analyzed for their greenhouse gas impact on the region.

Louis Berger	New Jersey Transit	2009- Present

New Jersey Transit Friendly Land Use Program

The objective of this task order contract has been to identify and then prioritize rail station locations for incentivizing transit-oriented development. An example task order under this contract was the development of a Transit Planning Database containing relevant information about rail stations and properties in the vicinities of stations. The geodatabase used a SharePoint platform, enabling NJ TRANSIT to maintain a searchable database of ridership and economic and demographic data in combination with land use data that could be kept up to date in a user friendly way. The database also enabled NJ TRANSIT to capture all of its projects and enable it to quickly make specific queries into the database that resulted in tailored reports with maps and images in support of developer and community interests as well as executive management and external briefings

Louis Berger	DC Office of Planning	2013

DC Streetcar Real Estate Economic and Financial Analysis

This study provided a quantitative assessment of the economic and fiscal benefits of the proposed DC Streetcar system and an evaluation of how value capture and other funding techniques can be combined to provide the necessary capital funds. The effort included a parcel-level assessment of the land use impacts of the streetcar in the context of changes in the city's zoning regulations. These changes in use, density, and in select locations, height, allowed the District to accommodate recent trends in demographic and economic change and make the most of the streetcar's potential. The study also examined threats to affordable housing and community economic conditions as well as opportunities for enhancing affordability and taking full advantage of publicly owned properties and underutilized parcels.

Louis Berger	DC Office of Planning	2012 to 2013

CHASE Planning and Economic Development Strategy

The Congress Heights, Anacostia, and Saint Elizabeths area – called collectively "CHASE" – has been extensively planned over the past decade, but is also expected to see many more new housing developments, major redevelopment projects, jobs, and transportation infrastructure investments in the next five to ten years. The Louis Berger team developed the CHASE Action Agenda, an implementable land use/ transportation and economic plan that outlined action steps to be completed over 12 months to ensure that upcoming changes and efforts in the community bring meaningful economic opportunity to Ward 8. These action plans were developed in close consultation with District agencies, community stakeholders, and community organizations to achieve a realistic set of next steps to advance economic opportunities in the CHASE area. Community Outreach was a key component to this project and included an Open House and Community Resource Fair held at a local elementary school in Ward 8.

Louis Berger	DC Office of Planning	2011

Ward 8 Community Summit

On Saturday, July 9, 2011, nearly 600 Ward 8 residents, community leaders, District officials, and guests joined Mayor Vincent C. Gray, Council member Marion Barry, other Council members, and agency directors at the Ward 8 Community Summit to work together to help shape the future of Ward 8. Louis Berger worked with DCOP to confirm the date and location, organize the program, and develop the materials for the program. The Louis Berger team led the outreach effort to encourage attendance. The Louis Berger team also developed the agenda and detailed scripts for the presentations and interactive exercises for the entire day. An innovative feature of the event was electronic "clicker" with six button choices to express opinions on ideas presented. Each table had a trained facilitator to record ideas and suggestions for each assigned topic. Facilitators electronically submitted the ideas generated to a group of "consolidators" who identified common themes and variations in ideas among the topics generated. Once a set of options was identified for each topic area, all participants could vote on their preferences and

immediately view the results in bar graphs on the large screens. The innovative technology and interactive format kept each table engaged in lively conversation, able to see how their ideas compared with their neighbors. The technology also captured all information for posterity, including the self-identified demographics for each "clicker" for individual participants.

Louis Berger	New York State, Department of State	2013 to Present

New York Rising Community Reconstruction Program

To facilitate community redevelopment planning and the resilience of communities affected by Superstorm Sandy, the State has established the New York Rising Community Reconstruction Program and has allocated $25 million for planning in the most affected communities. For communities in Staten Island and Nassau County, New York, the Louis Berger Team used the Coastal Hazard Asset Inventory and Risk Assessment Tool developed by New York State to assess the key vulnerabilities and needs of each community, evaluate risk, and develop short term stabilization actions as well as more holistic, long range, and forward-looking approaches to resiliency. The team also identified cost-effective implementation strategies with identified funding sources that creatively integrate rebuilding strategies with actions to increase economic opportunity. Development of a successful plan will qualify a community to receive Community Development Block Grant – Disaster Recovery (CDBG-DR) funds to implement the identified projects.

Client quote:

"Your team has done a wonderful job ushering the Staten Island committee through this planning process and the projects will have a huge impact on the lives of Staten Islanders. In particular, the housing program will offer so much hope to people who - right now - are running out of hope. So many other projects will allow this community to be more resilient in the future. You should be very proud."

- Alex Zablocki, NYC Regional Lead,
Governor's Office of Storm Recovery

Sharp & Company, Inc.	Virginia Department of Transportation, as a subcontractor to Cambridge Systematics	7/2011-4 /2012

I-66 Multimodal Study

Sharp & Company supported this study that identified highway, transit, bicycle, and pedestrian alternatives along this critical Northern Virginia commuter corridor from the beltway to the District line. Sharp & Company developed and implemented a public process that reached out to and gathered input from stakeholders affected by the study. These stakeholders included state and local jurisdiction technical staff, local transportation agencies, elected officials, residents, commuters, businesses, and the general public. Sharp & Company conducted over 25 individual stakeholder interviews to inform and learn about project concerns.

A key element of the public involvement effort was keeping the focus on the multimodal nature of the study. To avoid confusion among stakeholders with materials that were being distributed for the many other studies and programs being conducted along the I-66 corridor, Sharp & Company created a simple, unique identifier for all study materials, even signage for public meetings. Sharp & Company developed templates for the design of presentation materials to retain the consistency of the identifier and color selections.

An important part of the public outreach process was reaching out to Spanish speaking populations surrounding the Study area. To accomplish this, public meeting advertisements were crafted in Spanish and placed in local newspapers such as El Tiempo Latino and Washington Hispanic. Sharp & Company also ensured all public meetings materials were translated into Spanish and a Spanish language interpreter was available at public meetings. In addition, Walter Tejada, a prominent Hispanic Arlington County

Board member, was interviewed by Susan Sharp to receive his input on the study.

Sharp & Company also provided regular study factsheets to inform the public of study progress and key findings and solicited input through a dedicated web page on the VDOT website (http://www.virginiadot.org/projects/northernvirginia/i-66_multimodal_study.asp). Press was favorable and focused on this aspect of the study, supporting an environment where groups formerly polarized on the issue of additional lane capacity are now working together to forge solutions.

Sharp & Company, Inc.	**District Department of Transportation, as a subcontractor to Parsons Brinckerhoff**	**8/2013 - Present**

South Capitol Street SFEIS

The South Capitol Street Corridor Project calls for replacing the Frederick Douglass Memorial Bridge and transforming related sections of urban freeway into a beautiful scenic boulevard that increases pedestrian and vehicular safety, improves multi-modal transportation options, increases community accessibility, and supports economic development on both sides of the Anacostia River.

Critical to the successful completion of this phase of the project is re-introducing the plan to the community and generating public awareness about the new Proposed Alternative. Sharp & Company has recommended and is implementing a variety of public information activities to bring this project back into the minds of key stakeholders and affected communities. Four public meetings are planned in Wards 6 and 8 to discuss the project and disseminate information on the new Proposed Alternative. To promote the meetings, Sharp & Company is placing meeting notices in local newspapers. To further increase visibility, Sharp & Company is re-designing the project website with a fresh new look and updated content. In addition, Sharp & Company will develop three newsletters about the project to inform the community of project progress since the project left off in 2011, share project updates, and announce opportunities for participation. All communication materials include new, concise, and clear graphics and maps of the project study area.

Sharp & Company, Inc.	**Virginia Department of Rail and Public Transportation, as a subcontractor to AECOM**	**11/2009 – 10/2012**

Statewide Rail Plan

Sharp & Company was responsible for rewriting and designing this strategic document, transforming it from a technical manuscript into one suitable for public distribution. This involved taking different authors' manuscripts and editing them into a consistent "voice" and viewpoint. Design entailed the re-creation of numerous maps, charts and graphs as well as the research and editing of photo images. In addition, Sharp & Company re-purposed the material, developing a PowerPoint presentation and a set of posters illustrating specific projects of public interest.

The report was cited by AASHTO in its best practices for communicating about rail plans. By adding iconography that clearly and quickly delineated the benefits of proposed projects, AASHTO credited the report with easily building public understanding and support. Feedback DRPT has received has been consistently positive, noting that the reorganization of the material and its presentation greatly facilitates understanding of the agency's goals — internally and externally — and has helped engender support. The success of that project led DRPT to engage Sharp & Company to develop the Statewide Public Transportation Plan.

Sharp & Company, Inc.	**District Department of Transportation, as a subcontractor to Volkert, Inc.**	**8/2014 – Present**

Oregon Avenue NW Improvements

Sharp & Company is providing public outreach support for the District of Columbia Department of Transportation (DDOT) and the Federal Highway Administration (FHWA) controversial rehabilitation of the 1.7-mile segment of Oregon Avenue, NW, between Military Road and Western Avenue. In 2011, residents along Oregon Avenue had expressed major concerns about the reconstruction and its impact on

their neighbors. Many residents were not pleased with the environmental assessment preferred alternative recommendation that included sidewalks and no designated bike lanes.

In 2014 Sharp & Company was asked to work with the design consultant team to help constructively engage the community using context sensitive principles. Crucial to the success of the outreach effort has been the interactive website (www.oregonaveddot.com) developed for the project. Like most project sites, it provides general project information, project resources, project schedule, public participation opportunities, comment section, meeting materials, and email notification sign-up page. But this website goes further. Residents have been invited to participate in polls to determine their preferences for everything from construction materials to landscaping elements. Materials being considered – such as street lighting options – are shared on the website and comments and conversation are encouraged.

This has completely changed the tone of public interactions with the community. During the environmental assessment many residents were frustrated by the lack of public meetings. Initial meetings for the design phase unleashed the community's festering frustration. By patiently and persistently sharing information about every aspect of the design – explaining the engineering necessities, clarifying the District's design requirements, demonstrating (literally) how pedestrians, bicycles, strollers, and wheelchairs would interact on differing sidewalk widths, residents began constructively engaging with the design process.

Public meetings are conducted at every design milestone. The website is updated after each meeting and the issues and elements to be determined for the next design phase are laid out so the community knows what its attention needs to turn to next. What began as an antagonistic process has, through the use of context sensitive methods, turned into a productive collaboration that provides a model for other contentious transportation projects.

Sharp & Company, Inc.	**Maryland Department of Transportation, as a subcontractor to Parsons Brinckerhoff/RKK**	**9/2012 – 1/2014**

2035 Maryland Transportation Plan

Sharp & Company facilitated four roundtable workshops in support of the 2035 Maryland Transportation Plan, a 20-year vision for transportation in Maryland that will ultimately guide statewide investment decisions across all modes of transportation. Each roundtable was attended by up to 100 stakeholders from various specialties, including local and elected officials, transportation agency officials, business owners, and Maryland residents. Sharp & Company has designed the sessions as interactive workshops that will engage stakeholders in discussion and provide the MDOT team with a set of preliminary goals and suggested strategies.

In addition to the roundtable sessions, a survey was used to gather information about the transportation issues that are important to Maryland residents. With the assistance of Sharp & Company, MDOT entered into a partnership with 24 library systems in Maryland. Each library system agreed to assist the MTP public outreach efforts by displaying a small icon on the home pages that links to a survey. Library patrons were able to click on the link to participate in the survey and provide input. Sharp & Company enlisted the help of MetroQuest to build and monitor the survey results.

ANDY BOLLMAN			
PROPOSED ROLE	Economics Advisor	**AVAILABILITY**	80%
EDUCATION	• M.R.P., Environmental Planning, University of North Carolina, 1994 • B.A., Economics, University of Maryland, 1985		
PROFESSIONAL EXPERIENCE	• 2014–Present: SC&A, INC.: Senior Economist • 2012-2014: ALPINE GEOPHYSICS, LLC.: Senior Economist • 2010-2012: TRANSYSTEMS CORPORATION: Senior Economist • 1992-2002: E.H. PECHAN & ASSOCIATES, INC.: Senior Economist • 1991-1992: RESEARCH TRIANGLE INSTITUTE: Economist • 1987-1991: JACK FAUCETT ASSOCIATES, INC.: Analyst • 1986-1987: COR, INC.: Database Specialist		

SUMMARY OF PROFESSIONAL ACCOMPLISHMENTS

Mr. Bollman is a Senior Economist with 25 years of environmental consulting experience, including 20 years of experience providing technical support related to air quality planning issues. Mr. Bollman's experience has focused on developing base and forecast year emission inventories, and analyzing the impact of emission control strategies. This expertise, gained from over fifty emission inventory/projection projects for Federal, State, and local government and regional planning organizations (RPOs), extends across all pollutants (greenhouse gases and criteria and hazardous air pollutants) and source categories (onroad/nonroad mobile sources and large/small stationary sources). He is a recognized authority in the preparation of emission activity forecasts to support air quality modeling and policy analysis. Among the recent projects that he managed was a California Air Resources Board project to develop 1970-2050 criteria pollutant and greenhouse gas (GHG) stationary source emissions activity data; a Western Climate Initiative (WCI) project to develop base and forecast year GHG emission estimates from emission sources subject to the WCI's cap-and-trade program, covering both stationary and mobile GHG-emitting sources in seven States and four Canadian provinces; and an Environmental Protection Agency (EPA) project to develop approaches and gather information and data on the best available growth and control information for select non-stationary point and nonpoint industrial sources for future years.

SELECTED PROJECTS

- Currently managing a project to provide the Small Business Administration (SBA)'s Office of Advocacy (Advocacy) with technical analysis in support for EPA's Significant New Alternatives Policy (SNAP) proposed rule to delist certain ozone-depleting substance (ODS) substitutes due to their climate change impact. Performing a technical review of regulatory support documents, industry data, and public comments to develop/analyze regulatory alternatives to EPA's proposal to address concerns of the small business community.
- Managed a project for the WCI to develop base and forecast year GHG emission estimates from emission sources subject to the WCI's cap-and-trade program, covering both stationary and mobile GHG-emitting sources in seven states and four Canadian provinces. The harmonized set of historic and forecasted emissions data resulting from this project is useful for other purposes, including comparative analyses of emission reductions from the cap to business-as-usual emissions and of WCI emissions to other regional and national estimates, as well for support to allowance market assessments.
- Provided support for an EPA pilot project to develop a multi-pollutant inventory of GHG emissions, and criteria and toxic air pollutants for the State of Iowa. Developed emission estimates for the RCI combustion and fossil fuel production sectors.
- Performed technical review and validation of the energy forecast modeling used to support Ontario Cabinet Office-Climate Change Secretariat's estimates of projected greenhouse gas (GHG) emission reductions associated with fourteen initiatives of the Climate Change Action Plan. Also, analyzed the estimated electricity generation sector GHG reductions associated with Ontario's Coal Phase-out program, and the impacts of multiple energy efficiency initiatives in the residential, commercial and industrial sectors.

- Developed historical and forecast GHG emission estimates for 10 state GHG emission inventory projects supporting analysis of climate change mitigation policies. This work, which was conducted in collaboration with the Center for Climate Strategies, focused on the industrial process and fossil fuel production, transmission, and distribution sectors.
- Managed EPA projects over multiple years to develop comprehensive county-level nationwide onroad and nonroad mobile source emission estimates for historical and forecast years using the National Mobile Inventory Model (NMIM). Efforts included updating model inputs, preparing estimates of base year vehicle VMT, and developing VMT forecasting methods and estimates for future years.
- Provided technical support to the WCI by developing Manufacturing and Commercial/Institutional energy consumption and carbon dioxide emission estimates by state/province, industry sector, fuel type, and employment size. The purpose of this effort was to identify the number and type of sources that would have potential regulatory obligations under a cap and trade program for western region states and most Canadian provinces. Also assisted in the analysis of the potential effect of alternative projection assumptions on future year GHG emission estimates for the Electricity, Residential, Commercial, and Industrial fuel consumption and Transportation sectors.
- Managed a project for EPA to assist the Emission Inventory Improvement Program (EIIP) Projections Committee in developing emission projection guidance, methods, tools, and analyses. This effort assisted state and local air quality agencies in developing projected emission inventories for SIPs.
- Managed an EPA project to develop future year county-level emission reduction and cost impacts of mobile source control options. These control options included, but were not limited to: plug-in hybrids; low-Reid vapor pressure (RVP) gasoline; elimination of long-duration idling; aftermarket catalysts; and continuous inspection and maintenance programs.
- Managed a project for EPA to provide technical support for the development of Version 5.0 of the Economic Growth Analysis System (EGAS), EPA's emission activity growth software model. Technical support included regression analyses to determine which socioeconomic variables correlate with historical changes in national emission activity levels; and developing and implementing methods for projecting vehicle miles traveled (VMT).
- Analyzed the economic impacts on firms, government entities, and EPA of a proposed Employee Commute Options program in the Sacramento Metropolitan Air Quality Management District.

SELECTED PUBLICATIONS AND PRESENTATIONS

Bollman, A.D., V. Glenn, R. Mason, and L. Chappell, "Analysis of a New Stationary Non-EGU Projection Methodology," presented at the 19th International Emission Inventory Conference, "Emission Inventories – Informing Emerging Issues," September 28-30, 2010.

Wilson, J.H., Jr., A.D. Bollman, *et al*., "Emission Projections for the U.S. Environmental Protection Agency Section 812 Second Prospective Clean Air Act Cost/Benefit Analysis," *Journal of the Air and Waste Management Association*, Volume 58, 657-672, May 2008.

Bollman, A.D. and G. Stella, "Economic Growth Analysis System (EGAS) Version 4.0," paper presented to the 10th Annual International Emission Inventory Conference, "One Atmosphere, One Inventory, Many Challenges," April 30, 2001.

Bollman, A.D., S. Nizich, and L. Chappell, "Economic, Demographic, and Regulatory Influences on Historical Emissions Trends," paper presented to the Emission Inventory Specialty Conference, Air & Waste Management Association, October 13, 1995.

JUAN A. MALDONADO			
PROPOSED ROLE	Facilitation Coordinator	**AVAILABILITY**	25%
EDUCATION	• M.S., Environmental Planning and Management, Johns Hopkins University, 2012 • B.S., Chemistry, North Park University, 1998	**YEARS EXP.**	14
PROFESSIONAL EXPERIENCE	• 2013–present: SC&A, INC.: Environmental Scientist/Greenhouse Gas (GHG) Verification & Sustainability Manager • 2008–2013: TRANSYSTEMS CORPORATION/E.H. PECHAN & ASSOCIATES: Environmental Scientist/Project Manager • 2006–2007: BRENTAG PACIFIC, INC.: Regional Safety Regulatory and Quality Manager. • 2005–2006: CENTRO HISPANO DE ESTUDIOS TEOLOGICOS: Executive Assistant to the President and Adjunct Professor • 2001–2005: ASSOCIATED ENVIRONMENTAL MANAGEMENT: Environmental Specialist/Senior Project Manager		

SUMMARY OF RELEVANT EXPERIENCE

14 years of experience conducting air quality assessments domestically and abroad. Primary skill areas include greenhouse gas (GHG), hazardous air pollutant (HAP), and criteria pollutant emission inventory development, emission forecasting, and costing of emission abatement actions.

SELECTED PROJECTS

SC&A project manager for a capacity-building project in Baja California, Mexico. The objective of the project is to assist stakeholders and local experts design a suite of GHG mitigation policies, assess their GHG reduction potential and social costs, and prepare the GHG marginal abatement cost curve of proposed actions. The outcome of this project will be integrated into Baja California's state climate action plan. Responsible for building capacity in the area of transportation and land use; also provides technical expertise in matters relating to the GHG emission baseline. This project is conducted in partnership with the Center for Climate Strategies, with the collaboration of the Secretariat of Environmental Protection of Baja California (Secretaría de Protección al Ambiente) and support from World Wildlife Fund and the Border Environmental Cooperation Commission. *Dates: 2013–2014.*

Acted as assistant project manager implementing a multi-stakeholder planning process and facilitated the Agriculture, Forestry and Waste technical working group under contract with the Center for Climate Strategies. Supported state climate action planning in the Mexican states of Baja California, Sonora, and Coahuila. Critical to the planning process was the introduction of a comprehensive mitigation policy catalog numbering close to 400 actions across major economic sectors including energy supply, transportation, fossil fuel production, residential/commercial/industrial energy demand, industrial processes and industrial product use, waste management, agriculture, forestry, and land use. The objective of the project was to identify priority GHG mitigation actions for micro- and macroeconomic analysis. *Dates: 2010.*

For the Allegheny County Health Department in Pennsylvania, conducted reasonably available control measure analysis of fine particulate matter (PM2.5) reduction measures associated with residential wood fuel burning. The project's objective was to evaluate and modify the 2007 SIP emission inventory and perform a reasonably available control measure analysis for area and mobile sources. *Dates: 2011.*

Jointly with the Border Environmental Cooperation Commission, developed and delivered a series of workshops for regional audiences across northern Mexico to build regional capacity for the development of state climate action plans in support of Mexico's national climate action plan and engagement with the United Nations Framework Convention on Climate Change. *Dates: 2010–2011.*

SC&A's project manager for the development of the GHG inventory and forecast for the Commonwealth of Puerto Rico for three sectors including transportation, residential/commercial/industrial energy consumption, as well as industrial processes and product use. The GHG inventory and forecast will serve as an input to Puerto Rico's 3E Action Plan stemming from Executive Order 2013-18. This project is performed in collaboration with the Center for Climate Strategies (CCS). (2014)

Project manager for the development of the CY 2010, 2011, 2012, and 2013 GHGs and criteria air pollutant emission inventory for the Port Authority of New York and New Jersey (PANYNJ) covering scope 1, 2, and 3 emissions. The inventory is designed to meet multiple objectives, including registration of operational control GHG emissions with The Climate Registry, informing State Implementation Plan (SIP) development in the states of New York and New Jersey, and evaluating the performance of internal GHG reduction goals and targets. Emitting activities covered by these inventories

include electric generating units, on-road and non-road sources, and aircraft. *Dates: 2008–present.*

Project manager for a renewable energy study with the New York Power Authority. The objective of the project was to optimize the environmental attributes of a biomass gasification facility, i.e., to maximize the output of emission voluntary carbon units and renewable emission credits for the purpose of reducing the carbon footprint of the Port Authority of New York and New Jersey. The eligibility of the project was assessed using the United Nations Framework Convention on Climate Change Clean Development Mechanism methodology AM0025 and the Verified Carbon Standard protocol version 3.2. *Dates: 2012.*

Managed the development of state-level GHG emission inventories for six Border States in northern Mexico for the purpose of establishing a baseline to compare the effects of mitigation actions. The project required active cross-border coordination to ensure accounting methods for historical and projected emissions were acceptable and consistent across multiple jurisdictions. The GHG accounting methodology conformed to the 2006 Intergovernmental Panel on Climate Change Guidelines. This project was performed in collaboration with the Center for Climate Change, Border Environmental Cooperation Commission, Mexico's National Institute of Ecology, and the state environmental secretariats in Baja California, Sonora, Chihuahua, Coahuila, Nuevo León, and Tamaulipas. *Dates: 2008–2010.*

Provided technical support to climate action initiatives in Florida, Kansas, Kentucky, Maryland, Pennsylvania, and Wyoming. Responsibilities included updating components of state GHG inventory and forecast reports. Typical updates included the extension of the inventory temporal series, revision of emissions growth emission factors, and the processing of bottom-up data sources. Sectors for which analysis was conducted included waste, forestry, and fossil fuel combustion by residential, commercial, and industrial sources. (2008-2009)

Managed air quality study for the Central States Air Resources Agencies with the objective of enhancing pesticide application emissions estimates for Arkansas, Iowa, Kansas, Louisiana, Minnesota, Missouri, Nebraska, Oklahoma, and Texas. The improved emission inventory was used to inform SIP development and to assist states in preparing their 2011 National Emission Inventory submissions. The objectives of the project included the development of volatile organic compound and HAP emission factors, and the monthly allocation of annual emissions. Project results were presented at the Air & Waste Management Association 106th Conference. *Dates: 2012.*

At Brenntag Pacific, chaired the corporate safety task force and spearheaded the development and implementation of a corporate safety/environmental training program and developed the platform for monitoring progress and evaluating program effectiveness. The program was implemented at 20 facilities in the western US. (2006-2007)

SELECTED PRESENTATIONS & WORKSHOPS

T.D. Peterson, S.M. Roe, J.A. Maldonado, H. Nelson, and C. de la Parra, "Climate Mitigation Policy Micro-Economic Analysis Workshop", presented to the local technical team of the Baja California Climate Change Action Plan Project. Workshop sponsored by the Mexico Low Emissions Development Strategies Program, the World Wildlife Fund, and Border Environment Cooperation Commission, January 14-15, 2014.

T.D. Peterson, S.M. Roe, J.A. Maldonado, and C. de la Parra, "GHG Mitigation Policy Design Workshop", presented to the local technical team of the Baja California Climate Change Action Plan Project. Workshop sponsored by the Mexico Low Emissions Development Strategies Program, the World Wildlife Fund, and Border Environment Cooperation Commission, September 29, 2013.

T.D. Peterson, M.E. Giner, J.A. Maldonado, et al. "Module 3: Policy Option Quantification and Analysis", presented to regional audiences across northern Mexico to build local capacity for the development of state climate action plans. Workshop sponsored by the Border Environmental Cooperation Commission. Broadcasted from Saltillo, Coahuila on June 8-9, 2011.

T.D. Peterson, M.E. Giner, J.A. Maldonado, et al. "Module 2: Priority Policy Option Selection for Climate Action Planning", presented to regional audiences across northern Mexico to build local capacity for the development of state climate action plans. Workshop sponsored by the Border Environmental Cooperation Commission. Broadcasted from Hermosillo, Sonora on January 26-27, 2011.

T.D. Peterson, M.E. Giner, J.A. Maldonado, et al. "Module 1: Implementing and Effective Multi-Stakeholder Process for Climate Action Plans", presented to regional audiences across northern Mexico to build local capacity for the development of state climate action plans. Workshop sponsored by the Border Environmental Cooperation Commission. Broadcasted from Ciudad Juarez, Chihuahua on August 25-26, 2010.

MAUREEN MULLEN			
PROPOSED ROLE	Project Manager	**AVAILABILITY**	75%
EDUCATION	• B.S., Chemical Engineering, Carnegie Mellon University, 1986	**YEARS EXP.**	27
PROFESSIONAL EXPERIENCE	• 2013–Present: SC&A, INC.: Senior Chemical Engineer, Project Manager • 2011–2013: TRANSYSTEMS CORPORATION: Senior Chemical Engineer, Project Manager • 1998–2010: E.H. PECHAN & ASSOCIATES, INC.: Senior Chemical Engineer, Project Manager • 1988–1998: E.H. PECHAN & ASSOCIATES, INC.: Chemical Engineer		

SUMMARY OF RELEVANT EXPERIENCE

Ms. Mullen has over 27 years of experience with expertise in the development of emissions inventories and tools to assist others in preparing inventories and assessing the impacts of control strategies, with a focus on the transportation sector. Her experience includes numerous inventories covering criteria pollutants, toxic air pollutants, and greenhouse gases (GHGs). She has worked with the U.S. Environmental Protection Agency (EPA), Regional Planning Organizations, stakeholder groups, and state and local air and transportation agencies (including the Metropolitan Washington Council of Governments) in emission inventory projects, transportation-related studies, stakeholder support, policy and regulatory analyses, and trends analyses. She has also worked with transportation agencies, by providing assistance in determining the emission impacts of proposed transportation projects. At the local level, Ms. Mullen has assisted local Metropolitan Planning Organizations by performing analyses related to transportation conformity and ozone and particulate matter (PM) attainment, and to the development of GHG on-road inventories. Ms. Mullen is an experienced user of EPA's Motor Vehicle Emission Simulator (MOVES) model and also has significant experience in using the predecessor MOBILE models.

SELECTED PROJECTS

Sector Lead in developing the on-road attracted travel portion of a GHG and criteria pollutant emission inventory for the Port Authority of New York and New Jersey for multiple calendar years, and currently for 2013. This included attracted travel to the Port Authority's airports, port commerce facilities, bridges/tunnels/terminals, PATH train, and fleet vehicles. Evaluated activity data related to attracted travel available for each facility and developed emission calculation methodologies using the available data. *Dates: 2007-Present.*

Performing CO and MSAT hot spot analyses for two major road projects in the northern Virginia area for the Virginia Department of Transportation. *Dates: 2015-Present.*

Lead analyst in project to assist Montana in evaluating and administering its Congestion Mitigation and Air Quality Improvement (CMAQ) program. Developed a spreadsheet tool for the Montana DOT to use in evaluating the emission reduction benefits associated with a variety of CMAQ projects that lead to reduced vehicle miles traveled or trips. *Dates: 2012-2013.*

Performed emission and cost analyses for the Pennsylvania Backsliding Resolution Working Group convened by the Pennsylvania Departments of Transportation and Environmental Protection of the most promising VOC and NOx control measures that could be used to offset the expected backsliding from revising the Pennsylvania I/M program. *Date: 2014.*

Sector Lead in managing the annual preparation of national highway vehicle criteria pollutant emission inventories for historical years for EPA's NEI and Trends analysis, incorporating local VMT and emissions data, where available. For the 2011 NEI, prepared default VMT estimates at the county, roadway type, and vehicle level of detail used by EPA for estimating on-road emissions in counties for which no state or local VMT data were submitted. *Dates: 1992-2013.*

Managed project to prepare computer application tool for the Metropolitan Washington Council of Governments (MWCOG) to automate and track development of MOBILE6 input files and related post-processing tasks. The MOBILE6 data are used by MWCOG in the development of ozone and PM State Implementation Plans and for transportation conformity analyses. The tool includes criteria pollutants and also GHG pollutants. *Dates: 2005-2008.*

Provided technical support to the Metropolitan Washington Council of Governments (MWCOG) in issues related to transportation conformity and ozone attainment. Provided technical support to MWCOG's MOBILE6 Task Force on issues related to moving from the use of EPA's MOBILE5b model to estimate highway vehicle emissions to the successor MOBILE6 model and presented information on this topic to stakeholders at the Task Force meetings. Also prepared MOBILE5b and MOBILE6 emission factor files for counties in modeling domain, presenting results and highway vehicle-related modeling issues to MWCOG's technical committees. Provided training on the use of MOBILE6 to MWCOG staff. *Dates: 2001-2003.*

Provided technical and facilitative support to the Transportation and Land Use Technical Work Groups in Arizona and New

Mexico to assist these states in developing and analyzing policy recommendations that could reduce GHG emissions from the transportation sector. *Dates: 2005-2006.*

Project manager in the development of GHG emission inventories and reference case projections for about 20 states. Emission inventory and forecast development included the transportation, waste, agriculture, forestry, residential/commercial/industrial fuel consumption, and non-fossil fuel industrial processes sectors. Managed the preparation of inventory documentation covering all sectors. In some states, the work also included an evaluation of emission reductions associated with recent or planned actions. *Dates: 2007-2011.*

Managed the development of a GHG emission inventory and forecast covering a six-county area for the Southern California Association of Governments for all emission sectors. Developed appropriate methods to estimate emissions using available data. This included a combination of bottom-up methods using available plant or utility data, collecting county-specific data for some sectors, and scaling state-level data to the six-county region where other data were not available as well as developing appropriate methods for forecasting emissions based on available data. *Dates: 2010-2011.*

Provided technical assistance to the Baltimore Metropolitan Council in evaluating a set of 50 potential onroad emission control strategies. These control strategies are intended to assist the area in attaining the 8-hour ozone National Ambient Air Quality Standards (NAAQS) and the particulate matter with an aerodynamic diameter of 2.5 microns or less (PM2.5) NAAQS. *Date: 2006.*

Managed project aimed at reviewing existing climate, energy, and air quality planning programs from around the country, available tools for performing these analyses, and specific reduction measures. Provided recommendations to Chittenden County, Vermont related to tools and strategies that they could implement to consolidate future climate change, energy, and air quality planning in the region. *Dates: 2011-2012.*

Provided technical support to an FHWA project to develop a set of driving cycles under different congestion conditions that can be used by other agencies with EPA's MOVES models for screening of new highway projects. Also included performing a control strategy analysis of various strategies to reduce drayage emissions at ports using driving cycles developed under this project specific to port traffic. *Dates: 2009-2010.*

Analyzed the potential changes in criteria pollutant emissions that would result from the use of alternative fuels by fleet vehicles in the Texas nonattainment areas for the Texas Commission on Environmental Quality. *Date: 2010.*

Managed a project for the Pennsylvania Department of Environmental Protection to evaluate the potential ambient air quality impacts of varying volumes of biofuel consumption by the transportation sector within the state. *Dates: 2009-2010.*

Provided technical support to Tennessee DOT in a project to quantify the air pollution emission benefits of various Congestion Mitigation and Air Quality Improvement Program projects, such as diesel retrofits. Developed methodologies and spreadsheets for easy evaluation of the emission benefits of a number of potential project types. *Dates: 2006-2007.*

Provided technical support and analysis on a project that addressed global climate change, GHG emissions, and transportation in Tennessee. This Tennessee DOT-sponsored project included a national overview of transportation-climate change issues, development of a state-level GHG emission inventory and projections, and analysis of policy options for Tennessee. *Date: 2008.*

Performed a quantitative PM hot spot analysis to evaluate near-roadway concentrations of PM2.5 that would result from the building of the Inter-County Connector in Maryland, using MOBILE6 and CAL3QHC, prior to the release of MOVES or of EPA's guidelines for performing quantitative PM hot spot analyses. Also prepared a research paper that examined evidence of elevated PM2.5 concentrations in near-roadway environments due to emissions from highway vehicles. This evaluation considered ambient monitoring data, source apportionment studies, and dispersion modeling. *Dates: 2007-2009.*

Managed a contract with the Southern Appalachian Mountains Initiative to develop emission inventory projections through 2040 for all anthropogenic emission sources within the eastern United States, evaluate emission control strategies, prepare direct cost analyses of emission control strategies, and analyze emission uncertainties. Assembled and facilitated workgroups of experts in the highway vehicle and electric utility sectors to solicit and incorporate their expectations of technology development and activity through 2040. *Dates: 1997-2002.*

Provided technical and facilitative support to the Pittsburgh Ozone Stakeholders Working Group, a group charged with developing a control plan to bring the area into attainment of the ambient ozone standard. Support activities included delivering monthly presentations at stakeholder meetings, providing data on air quality monitor data, emissions data, control options and emission reduction potentials and costs, and supplying emission input files for air quality modeling. *Date: 1996.*

JACKSON SCHREIBER			
PROPOSED ROLE	Technical Coordinator	**AVAILABILITY**	50%
EDUCATION	• M.E.E.P., Energy and Environmental Policy, University of Delaware, 2007 • B.A., Political Science, focus on Environmental Studies, St. Mary's College of Maryland, 2005	**YEARS EXP.**	9
PROFESSIONAL EXPERIENCE	• 2013–present: SC&A, INC.: Environmental Analyst • 2007–2013: TRANSYSTEMS CORPORATION/E.H. PECHAN & ASSOCIATES: Environmental Analyst • 2006–2007: UNIVERSITY OF DELAWARE: Policy Research Assistant		

SUMMARY OF RELEVANT EXPERIENCE

Mr. Jackson Schreiber has nine years of experience with GHG policy support work. Mr. Schreiber has contributed inventory and forecasting support work for over 20 states across the country, often focusing on the transportation, land use, and residential/commercial/industrial sectors of the forecast. He also has worked extensively on policy work at other levels of government, including the federal government, North Jersey Transportation Planning Authority, and the Mid-American Regional Council in Kansas City.

SELECTED PROJECTS

Under contract to the Center for Climate Strategies, provided technical and facilitation support for the Transportation and Land Use Technical work groups for the states of Minnesota, Maryland, Michigan, and Wyoming. Work included development of goals, policy options, and a comprehensive GHG mitigation and carbon footprint reduction strategy for consideration by the respective states. Worked for the states of Pennsylvania and Idaho, and their respective Department of Transportation on the development of goals and cost curves for a variety of transportation issues. The transportation and land use sectors considers issues such as smart growth, transit infrastructure improvements, eco-driving, fleet efficiency, feebates, tire improvements, and anti-idling (2007-present).

As part of the Comprehensive Leadership Strategies for Emerging Energy Economy (CLSEEE) project, analyzed various Transportation and Land Use (TLU) policies to determine the most efficient and cost effective methods to reduce national TLU emissions. This information will then be input into EPA's MARKAL model. This project includes economy-wide cost effectiveness calculations including fuel savings, macroeconomic job impacts, energy security benefits, and changes in infrastructure spending (2011-2012).

Developed the GHG inventory and forecast template for the residential, commercial, and institutional sectors in China for the Center for Climate Strategies. Involved creating a template to estimate GHG emissions in a Chinese providence for the 1990-2035 period. This information could be organized at the consumption based or energy cycle level, and also included an estimate of Particulate Matter and Black Carbon emissions (2012).

Under subcontract to the Center for Climate Strategies, provided technical support of the Agriculture, Forestry and Waste Technical Work Groups for the states of Michigan, Florida, Iowa, Alaska, Pennsylvania and Arkansas. This included the development of goals and policy options for a variety of AFW policies, including biofuels, soil carbon management, nutrient efficiency, and energy efficiency (2007-2011).

For the Mid-American Regional Council, analyzing the voluntary actions available to reduce VOC and NOx emissions in the Kansas City nonattainment area. These focused primarily on transportation options, including increased nonmotorized transport, changing refueling habits and utilizing biofuels (2010-2011).

Conducted a GHG and criteria pollutant inventory for the Port Authority of New York and New Jersey. This work centered around the attracted travel emissions to the airports, emissions from fleet vehicles and aviation ground support equipment at Port Authority facilities. Used the EDMS model to estimate CAP/GHG emissions for the Port Authority Airports. This work for Port Authority has continued for six consecutive inventory years (2008-present).

Reevaluated Montana's air quality program by examining the past and current expenditures of federal CMAQ money in Montana, and how that spending is likely to change under MAP-21. Evaluated the most vulnerable communities to air quality problems in Montana. Presented a summary of these findings at the Transportation Research Board's Conference in Charlotte, NC (2013-2014).

For the North Jersey Transportation Planning Authority, prepared a GHG Inventory and Forecast. Developed the 2006 base year through 2050 forecast year GHG estimates for both the onroad and nonroad (aircraft, commercial marine) sectors. This allowed users to view GHG emissions on a direct, energy consumption, or life cycle basis. Allocated emissions to the county and municipal levels of detail (2010-2011).

Under subcontract to the Center for Climate Strategies, Mr. Schreiber assessed the emissions reduction options available for the state of Denver to achieve an 8- hour ozone attainment and reduce GHGs. This included an assessment of the actions being taken in the SIPs for six cities, (Chicago, Phoenix, Los Angeles, Sacramento, Houston and Dallas) to achieve their ozone attainment goals (2010).

Provided technical support for GHG Adaptation Planning for the Chicago Transit Authority (CTA). This included creating a risk matrix of the likelihood and impact of various weather events on the CTA system. Estimated the impacts of past weather events on CTA and in order to reduce system vulnerabilities in the future (2012-2013).

Developed an SIP for Allegheny County Health Department. Analyzed the potential CAP reductions for various RACM measures. These were primarily home areas sources, including improved lawn and garden practices and fuel switching for lawnmowers, leafblowers and snowblowers (2013).

DAVID F. VON HIPPEL			
PROPOSED ROLE	Energy/Built Environment Lead	**AVAILABILITY**	30%
EDUCATION	• Ph.D.: Energy and Resources, University of California at Berkeley. 1987 • M.S.: Energy and Resources, University of California at Berkeley. 1983 • M.A: Biology, University of Oregon. 1981. • B.A.: Mathematics and General Science, University of Oregon, 1980	**YEARS EXP.**	33
PROFESSIONAL EXPERIENCE	• 1991–present: DAVID VON HIPPEL ANALYSIS AND PLANNING: President, Independent Energy/Environmental Consultant and Analyst • 1987–1991: TELLUS INSTITUTE (formerly ESRG): Research Associate • 1984–1986: THE WESTERN CONSORTIUM FOR THE HEALTH PROFESSIONS: Research Assistant on U.S. Environmental Protection Agency contract • 1984–1985: FUTURE RESOURCES ASSOCIATES, INC.: Research Associate • 1984–1987: SANITARY ENGINEERING AND ENVIRONMENTAL HEALTH RESEARCH LABORATORY (SEEHRL), UNIVERSITY OF CALIFORNIA/BERKELEY: Researcher • 1983: UNIVERSITY OF CALIFORNIA/BERKELEY, ENERGY AND RESOURCES GROUP: Senior Teaching Assistant • 1982–1983: U.S. FOREST SERVICE contract: Research Assistant • 1982: WORLD BANK: Summer Intern with the New and Renewable Energy Division		

SUMMARY OF RELEVANT EXPERIENCE

Over 30 years of experience in the energy and environmental fields, including work on development of Climate Action Plans for numerous states and regions, including development and quantitative analysis of GHG emissions mitigation policies in the Residential, Commercial/Institutional, and Industrial (RCII) sectors, and in the Energy Supply sector. Facilitated and/or provided analytical support to Technical Working Groups for RCI, Energy Supply, Energy Supply and Demand, on many projects, including in Montana, Washington (state), North Carolina, Arizona, New Mexico, Minnesota, and the Midwest (for the Midwestern Governors' Association). Worked extensively on development of cost-effectiveness analysis and related cost-curve preparation for energy- and GHG-saving measures in the RCII sectors in numerous jurisdictions and venues, including for Vermont, Utah, Hawaii, the Western Region Air Partnership, the Northwest Energy Coalition, the State of Oregon, and the Energy Trust of Oregon. In addition, has worked internationally for over 25 years, including energy analysis and planning at the national level (including energy efficiency and microeconomic analysis), utility integrated resource planning, demand-side management planning and related analysis, air pollution inventory development, and work on a host of other issues.

SELECTED PROJECTS

Supported state and regional stakeholder climate planning processes, working with a consultant team (Center for Climate Strategies) and stakeholder groups (e.g., Midwestern Governors' Association) on energy efficiency and energy supply topics to develop climate plans for numerous states and regions in the United States. Activities have included facilitation of Technical Working Groups at multiple locations throughout the United States, including extensive analysis, analytical model development, and report writing for state and regional action plans, with a focus on analysis of greenhouse gas emissions reduction/energy efficiency options for the industrial and for the residential/commercial/institutional sectors. *Dates: 2005–present.*

Analyzed energy efficiency and greenhouse gas emissions reduction in multiple US and Canadian jurisdictions. Activities performed included analysis, model development, preparation and delivery of many reports and presentations, including analysis of the potential for future energy efficiency investments and programs to reduce

emissions and costs in the residential, commercial, industrial and other sectors of the economies of Oregon, Utah, the Pacific Northwest, the Carolinas, and other regions. *Dates: 1990–2013.*

Supported international integrated resource planning (IRP) and demand-side management (DSM)-related planning and training projects for the United Nations Development Programme and United Nations Department of Economic and Social Affairs. Conducted training in IRP and DSM in Syria, Egypt, and Saudi Arabia, as well as at a regional workshop in Jordan, and preparation of a framework for IRP and DSM implementation in Egypt, evaluation of IRP and DSM opportunities in Syria, and development of an integrated resource plan for Saudi Arabia. *Dates: 1998–2005*.

Supported the Vietnam National Target Program on Climate Change, with a focus on energy and transport, for the Asian Development Bank. The project aims included reducing the vulnerability of systems and infrastructure to the risks of climate change and identify the opportunities for greenhouse gas mitigation in municipal service delivery. The project supported the Ministry of Industry and Trade, the Ministry of Transport and three provincial governments in developing integrated mitigation and adaptation Action Plans under the Governments National Target Program to address climate change. As International Expert on Industry, led the national and provincial (three provinces) greenhouse gas emissions reduction planning effort, including preparation of forecasts and scenarios of future development in all energy-using sectors and energy supply sectors, identification and analysis of key greenhouse gas mitigation options for each sector, and lead the preparation of a working paper on energy and industry sector climate change assessments that documented the methodology employed, described the results of the greenhouse gas mitigation and baseline analyses, and suggested emissions reduction actions for implementation and inclusion in greenhouse gas emissions reduction action plans/roadmaps for Vietnam. *Dates: 2013-2014.*

Supported strategies for development of green energy systems in Mongolia, on behalf of the Global Green Growth Institute (through Stockholm Environment Institute—United States. Project Leader for preparation and evaluation of reference and greenhouse gas mitigation energy supply and demand (including industrial energy demand by subsectors as well as the transport and urban sectors) scenarios for Mongolia, including exploring and modeling the impacts of energy efficiency opportunities, and developing inputs to an emissions reduction roadmap. Responsible for all aspects of strategy formulation, in close cooperation with the Global Green Growth Institute, national counterparts, and other Team members. *Dates: 2013–2014.*

Supported East Asia Energy Futures/Asian Energy Security/East Asia Science and Security and related follow-on projects for the Nautilus Institute for Security and Sustainability. Acted as main facilitator and analyst on regional project bringing together working teams from each country/region of northeast Asia (Japan, North Korea, South Korea, China, Mongolia, and the Russian Far East), later including four additional Asia-Pacific nations (Taiwan, Australia, Indonesia, and Vietnam), to work together to assess different all-sector, including industrial energy use, transportation and urban development, energy-environment futures and scenarios using a common energy planning software tool (LEAP), including both national and regional cooperation energy scenarios. Activities performed included training of working team in software use and energy security analysis, document preparation in coordination with country teams, extensive energy security analysis, including review and collaboration in revising baseline and scenario (including energy efficiency scenario) modeling of the industrial and other sectors in each national model/analysis, workshop organization, energy-environmental-economic-energy security analysis of candidate regional energy cooperation scenarios, and collaborating on analysis of radiological risk associated with nuclear energy and spent fuel management facilities. *Dates: 2000–present.*

JAMES H. WILSON			
PROPOSED ROLE	Senior Advisor	**AVAILABILITY**	10%
EDUCATION	• M.S., Public Policy and Management, Heinz College, Carnegie-Mellon University, 1975 • B.S., Industrial Engineering, North Carolina State University, 1973		
PROFESSIONAL EXPERIENCE	• 2013–Present: SC&A, INC.: Senior Vice President, Air Quality and Climate Practice • 2011–2013: TRANSYSTEMS CORPORATION: Senior Associate and Vice President • 2002–2010: E.H. PECHAN & ASSOCIATES, INC.: President and CEO • 1983–2001: E.H. PECHAN & ASSOCIATES, INC: Managing Director and Project Manager • 1982–1983: TOSCO CORPORATION, AVON REFINERY: Environmental Consultant • 1978–1982: ENERGY & ENVIRONMENTAL ANALYSIS, INC.: Project Manager and Analyst • 1975–1978: U.S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF AIR QUALITY PLANNING AND STANDARDS: Environmental Engineer		

SUMMARY OF PROFESSIONAL ACCOMPLISHMENTS

Mr. Wilson has 39 years of experience in performing and managing technical studies of air pollution and climate policy issues. His key areas of expertise are criteria air pollutant and greenhouse gas (GHG) emission inventory development, emissions forecasts, and evaluating the cost and effectiveness of air pollution control and GHG mitigation strategies. He has frequently been involved in control strategy studies that involve both emission benefit and cost-effectiveness evaluations. Mr. Wilson has been recently active in facilitating transportation and land use technical workgroups in state-level climate change mitigation processes in Maryland, Michigan, Minnesota, and Pennsylvania. In this work, he leads the workgroup's review and revision of the transportation sector GHG inventory and forecast, develops recommendations for GHG Mitigation in the transportation and land use sector, and quantifies the GHG reductions and societal costs for a wide array of mitigation options. He has provided long-term technical support to federal and state environmental and transportation departments in Arizona, Illinois, Pennsylvania, Virginia, Texas, and Tennessee, and also to the Metropolitan Washington Council of Governments. This support has included emission inventories and forecasts, control measure evaluations, State Implementation Plan (SIP) support documents, and maintenance plans.

SELECTED PROJECTS

- Project Manager for a quantitative analysis of the benefits and costs of GHG policy options within the transportation and land use sector for the Pennsylvania Climate Change Advisory Committee. Ten transportation/land use policy options were evaluated using criteria such as life cycle GHG emission reductions, costs, policy mechanisms, co-benefits, key uncertainties, and feasibility issues.
- Provided support through the Center for Climate Strategies for the Maryland Climate Plan. Co-facilitated the Transportation and Land Use technical working group and evaluated the GHG emission reductions and costs of strategies. Made oral presentations at regular Maryland Climate Commission meetings at the Maryland Department of Environment. Also, arranged technical

working group meetings at the Maryland Department of Transportation as requested by agency staff. Later supported a follow-on project to address three major objectives in the plan updates.

- Through the Center for Climate Strategies, facilitated the Michigan Climate Commission transportation and land use work group that recommended mitigation options to be adopted in Michigan for this sector. Nine transportation/land use policy options were evaluated using criteria such as life cycle GHG emission reductions, costs, policy mechanisms, co-benefits, key uncertainties and feasibility issues. Developed oral presentation materials and made presentations to Commission members at meetings held in Lansing and Detroit, MI.
- Directed a contract to develop GHG and criteria pollutant emission inventories for the Port Authority of New York and New Jersey. This comprehensive inventory includes emissions from the Port Authority's aviation, port commerce, bridges/tunnels/terminals, real estate development properties, and office buildings. Provided a briefing on the GHG inventory methods to the New York City Mayor's Office. Assisted the Port Authority with submitting its organizational greenhouse gas emissions for 2010 to the Climate Registry and become climate registered.
- Managed a contract with the Allegheny County Health Department to quantify mobile and area source emissions for the Liberty-Clairton PM2.5 nonattainment area for the time periods that coincide with National Ambient Air Quality Standards (NAAQS) exceedances. A reasonably available control technology/control measure analysis was performed in order to identify whether there are control measures that could be implemented in the area to advance the attainment date by one year or more. Reasonably available control technology and reasonably available control measures analyses included estimates of the cost effectiveness of the PM-2.5 control alternatives. This analysis was included in the PM-2.5 State Improvement Plan (SIP) that was submitted to EPA Region 3.
- Task leader on a project team that provided technical support to the Pennsylvania Backsliding Resolution Working Group. Evaluated the most promising volatile organic compound and NOx control measures that could be used to offset the expected backsliding from revising the I/M program in four areas of Pennsylvania.
- Managed a study to perform technical analysis and process planning tasks to assist the Mid-America Regional Council in updating its regional Kansas City Clean Air Action Plan. This plan focuses on voluntary measures that the area can pursue to reduce ozone precursor emissions. Quantitative assessments of the emission control strategies were performed to compute multi-pollutant benefits and costs. This analysis focused on transportation measures and energy efficiency options.
- Evaluated transportation/growth management options for multi-pollutant planning for the Colorado Department of Public Health and Environment. Used a sample of ozone nonattainment areas to evaluate where transportation initiatives have been included in long-range transportation plans and/or specifically identified as creditable SIP measures, as well as the associated multi-pollutant emission reductions. Focused on the identification of initiatives with potential for reducing ozone and fine particulate precursors and GHG emissions.
- Managed a study to perform technical analysis and process planning tasks to assist the Mid-America Regional Council in updating its regional Kansas City Clean Air Action Plan. This plan focuses on voluntary measures that the area can pursue to reduce ozone precursor emissions. Quantitative assessments of the emission control strategies were performed to compute multi-pollutant benefits and costs. This analysis focused on transportation measures and energy efficiency options.

TIMOTHY CANAN, AICP			
PROPOSED ROLE	Land Use Senior Advisor	**AVAILABILITY**	10%
EDUCATION	• MURP, Urban and Regional Planning, Virginia Commonwealth University, 1989 • B.S., Public Administration, James Madison University, 1987	**YEARS EXP.**	26
PROFESSIONAL EXPERIENCE	• 2014–present: LOUIS BERGER GROUP, Associate Vice President, Planning, Facilities & Resource Management • 2010–2014: LOUIS BERGER GROUP, Senior Project Manager, Planning, Facilities & Resource Management • 2008–2010: METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS, Principal Planner • 2005–2008: LOUIS BERGER GROUP, Senior Planner • 200–2005: BOOZ ALLEN HAMILTON, INC., Associate • 1998–2000: LOUDOUN COUNTY, VIRGINIA, DEPARTMENT OF PLANNING, Senior Planner • 1996–1998: ARLINGTON COUNTY, VIRGINIA, PLANNING DIVISION, Planner • 1989–1996: METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS, Regional Planner		

SUMMARY OF RELEVANT EXPERIENCE

26 years of experience in land use, transportation, and environmental planning, including more than 10 years in the private sector conducting environmental compliance under the National Environmental Policy Act (NEPA). In addition to private sector experience, previously worked for the Metropolitan Washington Council of Governments (COG), and Loudoun and Arlington Counties in Virginia conducting local and regional land use and transportation planning, regional air systems planning, and demographic and socioeconomic analysis and forecasting.

SELECTED PROJECTS

GSA, FBI Headquarters Consolidation – Planning, NEPA and Section 106. Project manager for planning and compliance project entailing performing extensive environmental planning, project management, and technical services to support GSA in the proposed FBI Headquarters Consolidation. For this project, FBI proposes to consolidate the existing FBI Headquarters components into one location in the greater Washington, DC area to meet the Interagency Security Council (ISC) Level V security standards and effectively meet the needs of the FBI in fulfilling its mission. Leading interdisciplinary team conducting detailed site evaluations of numerous potential sites, supporting the GSA and FBI Site Evaluation Panel identify a narrowed list of sites for detailed analysis in the EIS, performing complex transportation and other site-specific analysis, managing public engagement activities, preparing the EIS, and conducting a Section 106 review. *Dates: 2013-present.*

GSA Potomac Hill Campus Master Plan, Washington, DC. Project manager. As part of a joint venture, Louis Berger is supporting GSA and its customer, the Department of State, prepare a campus master plan and accompanying Environmental Impact Statement for the redevelopment of the Potomac Hill site, an 11-acre parcel containing the Potomac Annex and Navy Hill. Potomac Hill is located in northwest Washington, DC, on the west side of 23rd Street, NW, across from the State Department's Harry S. Truman Headquarters Building. Louis Berger is providing extensive environmental planning, project management, public engagement and other technical services, which include transportation impact analysis, preparing a Transportation Management Plan, conducting detailed site and building analyses, and NEPA and Section 106 compliance reviews. The campus master plan is being prepared through GSA's Design Excellence Program. *Dates: 2014-present.*

GSA, Acquisition of Construction Services through Exchange of the Cotton Annex and GSA Regional Office Building Parcels in Southwest Washington, DC. Project manager. GSA proposes to acquire construction and related services to complete repair and alterations at GSA Headquarters building and for adaptive reuse of up to three historic buildings at the DHS Headquarters Campus at St. Elizabeths West Campus in Washington, DC. This action requires preparation of an Environmental Assessment and Section 106 review for the exchange of the two parcels. Responsibilities: leading interdisciplinary team conducting NEPA analysis, overseeing public engagement activities, performing detailed transportation analysis, and providing Section 106 services. *Dates: 2013-present.*

GSA, EA and Section 106 Compliance for the Disposal of the West Heat Plant Parcel, Washington, DC. Project manager for preparing compliance documentation for real property disposal of an urban parcel containing a heat plant located in the Georgetown historic area of Washington, DC, and adjacent to the Chesapeake and Ohio Canal and the Rock Creek National Park. Project entails extensive coordination with the District of Columbia Office of Planning (DCOP) and DC Department of Transportation (DDOT) to plan for the disposal and reuse of the property and evaluate future and current transportation patterns. Analysis also considered the effects of disposal and reuse of the parcel and associated assets and removal of above-ground storage tanks on natural, cultural and socioeconomic resources in historic Georgetown. *Dates: 2011-2013.*

Naval Facilities Engineering Command (NAVFAC) Washington, Medical Facilities Development and University Expansion EIS, Naval Support Activity (NSA) Bethesda, Maryland. Project manager for development of an EIS for implementing proposed actions at NSA Bethesda, Maryland, mandated by Congress in FY 2010 National Defense Authorization Act to achieve new statutory world-class standards for military medicine at Walter Reed National Military Medical Center. Responsibilities: led interdisciplinary team that prepared EIS and supporting studies deliverables and managed project schedule, traffic analysis subcontractor, adherence to all scope of work requirements. U.S. Navy signed ROD on August 29, 2013, signaling successful conclusion of NEPA process. *Dates: 2011-2013.*

NPS, EA and Section 106 for the Rehabilitation of Franklin Park Washington, DC. Project manager/planner. NPS, in partnership with DC Office of Planning and the DC Downtown Business Improvement District, proposes to revitalize Franklin Park in downtown Washington, DC to enhance the park's historic and urban qualities and transform it to a vibrant, active park, connected to its community. Preparation of compliance documentation, public and agency stakeholder coordination, and outreach including supporting and presenting at public meetings, coordination with project design firm, and alternatives development and analysis. *Dates: 2013-present.*

U.S. Army Environmental Command, EIS for Net Zero Waste, Water and Energy Implementation at Fort Bliss, Texas. Project manager for EIS that analyzed environmental and socio-economic impacts of installation policy, procedural changes, and infrastructure construction and operation needed to meet energy, water, and waste Net Zero goals for the installation as well as help achieve energy security by locating critical energy infrastructure on post. The Army's Net Zero vision calls for an installation, on an annual basis, to: (1) produce as much energy on site as it uses, (2) conserve and use freshwater resources in a manner that returns water back to the same watershed from which it was drawn and does not deplete the supply or quality of groundwater and surface water, and (3) reduce, reuse, and recover waste systems in a manner that results in zero landfill. *Dates: 2011-2014.*

MWCOG, Department of Transportation Planning, Washington, DC. Principal planner. Program manager for two metropolitan planning organization (MPO) responsibility areas: Continuous Airport System Planning program, and the Virginia Technical Assistance account of the regional Unified Planning Work Program. Responsibilities included developing annual work program elements; preparing and submitting grant applications for program funding; developing and tracking project schedules; conducting budget oversight of programmed work activities; organizing and conducting program management meetings; coordinating deliverable production, QA/QC review and transmittal in accordance with project scope requirements; and supervising three mid- and senior-level transportation engineers. Major accomplishments included managing the development of the Washington region's successful U.S. Department of Transportation (DOT) Transportation Investment Generating Economic Recovery (TIGER) grant application, which resulted in $59 million in transportation funding awarded for a multimodal, regional bus priority project; and administering the region's TIGER grant, including developing memoranda of understanding (MOUs) between MWCOG and five sub-grantee recipients, and serving as primary point of contact for the Federal Transit Administration and the 5 sub-grantee recipients. *Dates: 2008-2010.*

JENNIFER GONZALEZ, AICP, LEED GA			
PROPOSED ROLE	Land Use Lead	**AVAILABILITY**	50%
EDUCATION	• M.A., Environmental Policy, Lehigh University, 2009 • B.A., International Relations, Lehigh University, 2008	**YEARS EXP.**	5
PROFESSIONAL EXPERIENCE	• 2014–present: LOUIS BERGER, Senior Environmental Planner • 2013–2014: LOUIS BERGER, Environmental Planner • 2009–2013: COUNTY OF PASSAIC, New Jersey, Environmental Planner • 2009–2010: BENCHMARK ENVIRONMENTAL CONSULTING, INC., Policy Research Analyst (P/T)		

SUMMARY OF RELEVANT EXPERIENCE

Senior planner with experience in city and regional land use planning focusing on environmental sustainability, climate adaptation and resiliency projects. She also has experience in coordinating community outreach, stakeholder engagement, and visioning sessions. Her environmental policy background includes the preparation of environmental review documents pursuant to the National Environmental Policy Act (NEPA), New York State Environmental Quality Review Act (SEQR), and New York City Environmental Quality Review (CEQR). Authored various research reports and studies, most recently as the corresponding author for Sustainability Tools in Action: Reducing Vehicle Miles Traveled Through Coordinated Transportation and Land Use Planning Across Levels of Government, published in the Transportation Research Record: Journal of the Transportation Research Board, No. 2453. Presented on the topics of greenhouse gas adaptation and mitigation at the Transportation Research Board (TRB), 93rd Annual Meeting and New Jersey TransAction Conference. Projects have earned recognition, including a 2014 Outstanding Plan Award from APA-NJ, 2014 'Rising to the Top' award from New York State, 2012 Smart Growth Award from New Jersey Future, an Engineering Excellence Distinguished Award from ACEC-NJ, and a 2011 Plan Implementation Award from APA-NJ. Holds a certificate from the American Institute of Certified Planners (AICP), is a LEED Green Associate and Senior Fellow with the Environmental Leadership Program.

SELECTED PROJECTS

Louis Berger Environmental planner for U.S. General Services Administration, Potomac Hill Campus Master Plan EIS, Washington, D.C. Louis Berger is preparing the Environmental Impact Statement for the Potomac Hill Campus Master Plan. GSA, in cooperation with the U.S. Department of State (DOS) is preparing the Potomac Hill Campus Master Plan to guide the development of an 11.8-acre campus immediately west of the DOS headquarters in downtown Washington, DC. Key project challenges include rapidly evolving design alternatives through coordination with consulting parties and stakeholders to develop a unified, functional federal campus meeting the modern needs of the government; as well as the adaptive reuse of a prominent historic site to meet DOS's long-term space needs. Responsible for developing the project and alternatives descriptions, purpose and need while coordinating a team of scientists, planners and engineers to assess potential impacts and mitigation measures of the evolving campus master plan. *Dates: 2015–present.*

Louis Berger Environmental planner and Deputy Project Manager for NY Rising Community Reconstruction Plans, New York State Governor's Office of Storm Recovery / Housing Trust Fund Corporation, Staten Island, Nassau County, Brooklyn and Queens, New York. Deputy project manager and resiliency planner. Louis Berger provided technical planning services to the State of New York to develop critical resiliency plans for community reconstruction in Staten Island and Nassau County, New York. As a result of the Team's success with these four communities, the Team has been awarded a subsequent contract for similar planning efforts in Queens and Brooklyn, New York. For these communities, assessed the key vulnerabilities and needs of each community, evaluated risk, and developed both short term stabilization and repair actions as well as long range approaches to recovery and rebuilding. Through this process, coordinated communication with several local and state New York government entities, developed potential projects and guided community planning committees in prioritizing the most effective reconstruction strategies. She led the cost-benefit analysis efforts and participated in dozens of community planning and public engagement meetings. The result is a comprehensive plan with fact-based and cost-effective implementation strategies that creatively integrate rebuilding recommendations with actions to increase economic opportunity. *Dates: 2013-2014.*

Louis Berger Environmental Planner for the Hoboken Green Infrastructure Strategic Plan, NJ Transit, Hoboken, New Jersey. The Louis Berger Group provided technical environmental planning services to develop a Green Infrastructure Strategic Plan for the City of Hoboken, New Jersey. The strategic plan identified place-based sustainable stormwater management and flood control strategies for Hoboken on a sewershed basis, and reviewed applicable green infrastructure best management practices (BMPs) which also may be applied to other flood-prone areas throughout the region and state. Analyzed impervious coverage, land use and sub-surface conditions within the City to determine siting constraints and ideal locations for specific green infrastructure BMPs. This green infrastructure review was combined with an engineering review of the City's

combined sewer system and average rain events to determine the potential stormwater captured, stored or treated by various green infrastructure BMPs in each sewershed. She assembled a matrix of stormwater management strategies, which served as the basis for this green infrastructure framework; including cost-effective, long-term solutions to update the aging system and integrate source controls into the design and construction of capital improvement and private development projects. Her responsibilities also included identifying opportunities for strategic implementation of green infrastructure to achieve maximum benefit, with specific attention to how these measures can improve the resilience of Hoboken's transit infrastructure. *Dates: 2013.*

Louis Berger Environmental planner and Deputy Project Manager for Suffolk Sewers NEPA/SEQRA Environmental Assessments, New York State Governor's Office of Storm Recovery / Housing Trust Fund Corporation, Suffolk County, New York. Louis Berger is preparing NEPA environmental assessments and conducting SEQRA coordinated review for $383 million in resiliency and water quality projects to extend sewer infrastructure and establish new sewer districts in four areas of the county, including Forge River Watershed in the hamlet of Mastic; Carll's River Watershed in the Town of Babylon; Connetquot River Watershed in the Hamlet of Great River; and Patchogue River Watershed in the village of Patchogue. Project challenges include tailoring an expedited environmental review process for distinct projects with a similar purpose and need, induced growth, and interagency coordination across State, County, Village, and Town agencies. Responsible for project management and administration across technical areas and developing four preliminary/working scoping documents to facilitate agency coordination. *Dates: 2014–present.*

Louis Berger Environmental planner and Deputy Project Manager for Rebuild by Design Living with the Bay NEPA/SEQRA EIS Scoping Process, New York State Governor's Office of Storm Recovery / Housing Trust Fund Corporation, Nassau County, New York. Louis Berger is providing environmental review services for the public scoping process for a combined SEQRA/NEPA EIS for Phase I of the Living with the Bay project, developed through Rebuild By Design Competition funded by U.S. HUD Community Development Block Grant Disaster Recovery Program. Key project challenges include its conceptual nature, interagency coordination across levels of government, and the need to evaluate alternatives that consider different combinations of project components, as well as different designs of those project components, while meeting the purpose and need of flood risk mitigation, ecorestoration, and improved quality of life. Responsible for coordinating a team of several specialized subconsultants to develop a project description, technical approach, Positive Declaration, NOI EIS, Early Floodplain Notice, and Draft Scoping document, as well as host two public scoping meetings and coordinate with federal, state and local agencies to ensure a streamlined environmental review and permitting process. *Dates: 2014–present.*

County of Passaic Environmental Planner for Passaic County Future: A Sustainability Element of the Master Plan, Totowa, New Jersey. Developed a comprehensive sustainability plan and implementation strategy for the County of Passaic, New Jersey. She led a 12-month visioning and goal-setting process with a working group of government officials, local Environmental Commission and Green Team members, faculty from nearby Universities and sustainability experts. Passaic County Future addresses the interrelationships between environmental stewardship, economic responsibility and a thriving community and defines sustainability at a local level, providing actionable goals benchmarked from national standards, including the STAR (Sustainability Tools for Assessing and Rating Communities) Index and LEED-Neighborhood Development. The plan features a strategies matrix of specific actions, responsible agencies, and timeframes to achieve these goals, which serves as a roadmap for plan implementation. Passaic County Future is the first county-level comprehensive sustainability plan in the State of New Jersey; and was adopted both by the county government, as a guide for sustainability in government operations, and by the Planning Board, as a Sustainability Master Plan Element. *Dates: 2012–2013.*

County of Passaic Environmental Planner for Moving Passaic County: A Transportation Element of the Master Plan, Totowa, New Jersey. As a local environmental planner, integrated environmental sustainability into a multi-modal transportation plan for the County of Passaic, New Jersey. More than a traditional circulation element, Moving Passaic County uses surrounding land uses along transportation corridors in order to identify priorities for transportation investments and develop a blueprint for the county's future transportation system, including roads, transit, waterways, and bicycle and pedestrian facilities. The planning process included the development of Complete Streets Guidelines, context-sensitive technical design standards for transportation improvements that facilitate non-vehicular modes of transportation and reduce greenhouse gas emissions. The Guidelines will be used during development review and capital improvement projects. Responsible for envisioning Complete Streets as Green Streets, drafting a chapter with technical guidance on green infrastructure design elements recommended for use within the public right-of-way. This uniquely comprehensive approach to green infrastructure implementation will increase the air quality and public health benefits to the community, as well as provide sustainable stormwater management strategies to reduce flooding intensity. *Dates: 2011–2013.*

LAURA HODGSON, LEED AP

PROPOSED ROLE	Land Use Demand Management	**AVAILABILITY**	25%
EDUCATION	• Master of Urban and Regional Planning, Virginia Tech, 2012 • B.A., Architecture and Urban Studies, Virginia Tech, 2006	**YEARS EXP.**	8
PROFESSIONAL EXPERIENCE	• 2011–2015: LOUIS BERGER GROUP: Urban and Transportation Planner • 2007–2010: RTKL ASSOCIATES, INC.: Urban Designer and Planner		

SUMMARY OF RELEVANT EXPERIENCE

Urban planner who specializes in transportation and multi-modal planning, urban design, master planning, community planning, and mapping and research. Through eight years of professional experience and professional development activities she has developed a sound understanding of the factors that create efficient, well operating transportation systems, with a focus on the connection and relationship between land use, urban design, economics, and transportation. Worked on a variety of planning projects at various scales and capacities, including successfully completing several multi-modal transportation planning projects with Transportation Management Programs. Supported technical work and served in assistant project management roles on a number of projects. Skills also include analyzing traffic distribution and generation; parking analysis studies; site and land use planning; research; understanding of the built environment, planning regulations, and real estate development principles; various analytical and graphic tools; report layout and design; land suitability analysis; graphic and urban design; GIS analysis; and comprehensive planning.

SELECTED PROJECTS

GSA, Federal Bureau of Investigation DC Office Relocation, Washington, DC. Land use and zoning; Transportation deputy manager; transportation planner supporting analysis, writing, and research. Researched and prepared land use, zoning, and community character analyses for up to 15 sites in the GSA's efforts to relocate the DC Headquarters office, co-developed the methodology for analyzing the land use and zoning impacts of the proposed action, and oversaw the development of this section of the Draft Environmental Impact Statement (DEIS). Coordinated the writing, maps, graphics, and assembly of the transportation components of the EIS while also supporting the research, writing, and analysis of the transportation impacts of the proposed project for all alternative site locations and the indirect impacts of the transfer of the DC Headquarters property to a future developer. This transportation work included data collection in the field, graphic and technical report writing, and supporting the transportation analysis in various ways, including determining the background growth rates that would be used for future analyses by extracting MWCOG future transportation model growth values for the DC study area. *Dates: 2013-present.*

GSA, Potomac Hill Campus Master Plan, Environmental Impact Statement (EIS), and Transportation Management Program (TMP), Washington, DC. TMP Task Leader, Deputy Transportation Lead, and Transportation Planner. As part of a joint venture, Louis Berger is supporting GSA and its customer, the Department of State, prepare a campus master plan and accompanying EIS and TMP for the redevelopment of the Potomac Hill site, an 11-acre parcel containing the Potomac Annex and Navy Hill. Potomac Hill is located in northwest Washington, DC, on the west side of 23rd Street, NW, across from the State Department's Harry S. Truman Headquarters Building. Supports the project's Transportation Impact Analysis (transportation portion of the EIS), leading the development and outside agency approval of the TMP in coordination with the Master Plan, and has supported schedule planning and coordination. *Dates: 2014-ongoing.*

NAVFAC, Naval District Washington (NDW) Transportation Management Programs (TMPs), five DC area installations. Technical and project support, project management. Supports the development and refinement of TMPs for various NDW installations as they undergo the review and approval process of the regional federal planning authority (National Capital Planning Commission), regional Navy leadership, and installation level leadership. The objective of these TMPs is very similar to the objectives of the JBAB TMP noted below, to encourage more sustainable commuting patterns for installation employees. The five installations include: NSF Naval Observatory, NSF Carderock, NSF Arlington, Naval Research Laboratory, and the Washington Navy Yard. Several of the TMPs also included a GHG analysis study. *Dates: 2011-present.*

NAVFAC, Joint Base Anacostia-Bolling (JBAB) Transportation Management Program (TMP), Washington, DC. Technical and project support, report writing, project management. Co-managing and developing a Transportation Management Program at JBAB in coordination with NAVFAC Washington and JBAB stakeholders to reduce installation trip rates and vehicle miles traveled; encourage, support, and plan for multi-modal transportation options; and increase average vehicle occupancy rates. These objectives will help the installation meet national and local air quality, regulatory, and planning mandates. The TMP will be developed in coordination with the installation Master Plan being developed concurrently; both documents will guide future installation decisions. *Dates: 2012-2014.*

DC Office of Planning (DCOP), Congress Heights Anacostia Saint Elizabeth (CHASE) Land Use, Transportation, and Economic Development Study, Washington, DC. Lead Transportation Planner, Economic Development Support. Managed two of the six topic disciplines for the project: Transportation and Economic Development, and participated in every aspect of the dynamic project from beginning to completion. Working with Goody Clancy and Urban Mosaic Partners, the project team fulfilled the need to comprehensively evaluate and synthesize the results of the various plans, studies, and other initiatives to further previous planning efforts. This analysis and close consultation with District agencies and community organizations though an Advisory Committee led to the development of the CHASE Action Agenda. The Action Agenda is an implementable land use/ transportation and economic action plan that coordinated realistic next steps with all stakeholders creating a clear path to bring meaningful economic opportunity to Ward 8. Additionally, the project team developed supporting resource guides (jobs, retail, housing) and sponsored a Community Resource Fair to help residents, business owners, and community NGOs "connect-the-dots" with resources and information that are often hard to find to equip the community to take advantage of the opportunities available to them right now. *Dates: 2013-2014.*

NAVFAC, Naval Air Station (NAS) Patuxent River Transportation Improvement Plan and Red-Line Study, Patuxent River, Maryland. Technical and project support. Supported the project team efforts to study the existing traffic patterns and circulation (vehicular, bike, pedestrian) in conjunction with planned growth and develop a Transportation Improvement Plan with recommendations to reduce traffic congestion, recommend improvements to meet current and projected multi-modal transportation needs, and improve level of service at the installation. Was involved throughout the project including the kick-off meetings and interviews, online transportation survey and analysis, recommendation development, writing, and report production and layout. Also contributed extensively to the development of an additional phase of the project which included conducting a charrette with stakeholders to refine a future security-related plan and develop stakeholder "buy-in." *Dates: 2011-2012.*

NAVFAC, Naval Support Facility (NSF) Dahlgren Transportation Improvement Plan, Dahlgren, Virginia. Technical and project support, project management. Supported the project team efforts in the same capacity that she supported the NAS Patuxent River TIP, with the exception of the charrette. *Dates: 2011-2012.*

NAVFAC, Naval Support Activity Bethesda (NSA Bethesda) Environmental Impact Statement (EIS), Bethesda, Maryland. Editing and mapping support. Provided editing and mapping support in several stages of this effort to analyze the existing conditions and future impact of installation growth on the exterior and interior installation transportation network. The report included recommendations on how to address the transportation impacts of construction growth. *Dates: 2011-2013.*

NAVFAC Washington, Transportation Visioning Process, Washington, DC. Technical support. Provided technical support for this effort to develop an overarching vision to reduce the transportation footprint of Naval facilities while improving Navy personnel morale and work force satisfaction. The project included a series of strategies, grouped into major categories and evaluated for their potential impacts across a range of measures. Contributed to the analysis of the transportation survey results for the six primary installations, each of which manages and oversees individual installations. The survey received over 10,000 responses and required particular attention to detail given the volume of answers, number of individual installations (15+), and aggregation groupings used for analysis. *Dates: 2011-2012.*

For RTKL Associates, Inc., created graphics and digital models, and helped develop master plan designs of projects for various clients ranging in size from buildings on small infill sites to large greyfield/greenfield developments of several hundred acres. Researched zoning and comprehensive plans for projects seeking entitlements. Conducted site analysis studies for public and private sector clients. Participated in projects with a community planning process. Collected and analyzed large amounts of data in support of a federal sector technical report. Balanced and completed calculations of project programming and parking supply/demand for large mixed use projects. Supported schematic design and construction documents for landscape architecture and architecture studios. *Dates: March 2007-July 2010.*

Urban Land Institute, Technical Assistance Panel Member, "Harvesting the Value of Metrorail in Loudoun County, Virginia." Participated as a panel member to provide expert multidisciplinary advise on land use and real estate issues facing Loudoun County, Virginia. The panel examined the timely topic of land use and development around an upcoming Metro line extension and advised on the desired and beneficial balance of land uses in the County's Revised General Plan as well as provided advice on additional topics and questions. *Dates: May 7-8, 2014.*

LEO TIDD, AICP			
PROPOSED ROLE	Senior Land Use Planner	**AVAILABILITY**	40%
EDUCATION	• MPA., Environmental Science and Policy, Columbia University School of International and Public Affairs, 2006 • B.S., Environmental Studies, SUNY College of Environmental Science and Forestry, 2004	**YEARS EXP.**	9
PROFESSIONAL EXPERIENCE	• 2006–present: LOUIS BERGER: Planner/Senior Planner/Principal Planner		

SUMMARY OF RELEVANT EXPERIENCE

Brings experience with land use forecasting, air quality research, and GHG reduction planning to the team. He is a co-author of two NCHRP 25-25 studies related to air quality (Task 71: Templates for Project-Level Analysis with MOVES and AERMOD, and Task 89: Establishing Representative Background Concentrations for PM hot-spot analysis). Contributes regularly to Louis Berger's national practice in addressing the indirect land use impacts of transportation, most recently through the development of a guidance manual on induced growth for the Montana Department of Transportation. He has led the preparation of studies addressing the potential induced growth and related environmental impacts of major transportation projects, such as the 20-mile I-93 widening in New Hampshire and the proposed Gaston East-West Connector in North Carolina.

SELECTED PROJECTS

Air quality and greenhouse gas emissions task manager, U.S. General Services Administration, Potomac Hill Campus Master Plan EIS, Washington, D.C. Leading air quality technical studies for the development of 11.8-acre Potomac Hill campus, including intersection hot-spot analysis, stationary source screening and a greenhouse gas emissions analysis. *Dates: 2015-Ongoing*

Air quality and greenhouse gas emissions task manager, U.S. General Services Administration, FBI Headquarters Consolidation EIS, Washington, D.C. Leading air quality technical studies for various alternative locations for a new FBI headquarters building, as well as the reuse of the J Edgar Hoover Building, including intersection hot-spot analysis, stationary source screening and a greenhouse gas emissions analysis. *Dates: 2015- Ongoing*

Monmouth County, Transportation Audit and Sustainable Transportation Plan. Monmouth County, New Jersey. Planner. Used ICLEI's Clean Air and Climate Protection Software (CACP 2009) as part of an inventory of Monmouth County's transportation-related greenhouse gas emissions. The inventory of county government was conducted in accordance with the recently released Local Government Operations Protocol version 1.1. As part of this study, Berger developed recommendations for reducing greenhouse gas emissions from county vehicles and services. *Dates: 2010-2011*

Circ-Williston Transportation Project Environmental Impact Statement, Chittenden County, VT. Task Manager. For the Circ-Williston Final Environmental Impact Statement (FEIS), estimated year 2030 CO2 equivalent greenhouse gas emissions from hourly traffic volumes and speed data using emission factors from the mesoscale analysis mode of the Draft MOVES model. The primary output of the analysis was the relative change in future CO2 equivalent emissions from the No Build condition under various transportation alternatives. Since the Chittenden County Transportation model used to develop traffic inputs to the greenhouse gas analysis is an integrated transportation-land use model, the analysis captured not only greenhouse gas emission changes related to the direct effects of the alternatives on traffic patterns and speeds, but also the indirect land use effects of the alternatives (e.g. changes in the location of households and employment caused by project-related changes in accessibility). *Date: 2009*

New Jersey Turnpike Authority, New Jersey Turnpike Interchange 6 to 9 Widening Indirect and Cumulative Impact Analysis, New Jersey. Task Manager. Lead author of a technical report assessing the potential for a major widening project to influence growth patterns, both at a regional scale and at a local scale around interchanges. The study made extensive use of GIS analysis tools to measure past land use change on a watershed basis, identify potentially developable land, and to assess potential future land development impacts. *Date: 2008*

Alabama Department of Transportation (as a subconsultant to PBS&J), Birmingham Northern Beltline Indirect Effects and Cumulative Impacts Technical Report, Alabama. Editor. Contributing author and editor of a technical report evaluating the potential indirect and cumulative environmental impacts of a four-lane, 52-mile, limited-access expressway facility proposed by the Alabama DOT to complete a circumferential route around the City of Birmingham. Authored key sections of the document and revised the document in response to comments to the satisfaction of ALDOT and FHWA. *Date: 2009*

Montana Department of Transportation, Assessing the Extent and Determinates of Induced Growth. Project manager. Led a research study to develop screening criteria and a detailed analysis methodology for assessing indirect land use effects of transportation projects in Montana. The indirect effects guidance will reduce the time spent attempting to determine the appropriate level of analysis and methodology appropriate to the project context. It will also assist practitioners with locating the relevant data, saving time and money during the environmental review process. *Dates: 2012-2013*

National Cooperative Highway Research Program, Project 25-25 Task 43: Legal Sufficiency Criteria for Adequate Indirect Effects and Cumulative Impacts Analysis as Related to NEPA Documents. Research Analyst. Contributing author of a report providing a guidebook for practitioners for conducting legally sufficient indirect and cumulative impact analyses under NEPA. Specific tasks included writing case studies on projects demonstrating effective practices and writing guidance on legal sufficiency criteria. *Date: 2008*

NCHRP, Project 25-25 Task 89: Establishing Background Concentrations for Particulate Matter Hot-Spot Analysis. Task manager. Responsible for research on the availability of future particulate matter background concentrations from U.S. Environmental Protection Agency (EPA) rulemakings and SIP submissions, as well as template documentation for determining background concentrations, including procedures for addressing exceptional events in project-level analysis (such as wildfires and dust storms among others.). *Date: 2014*

National Cooperative Highway Research Program (NCHRP), Project 25-25 Task 71: Templates for Project-Level Analysis with MOVES, AERMOD and CAL3QHC/R. Task manager. Responsible for preparing the regulatory framework and dispersion modeling portions of this project-level air quality research project. The research objective was to develop user-friendly template air quality technical report that meet all applicable regulatory requirements for particulate matter (PM2.5 and PM10) and carbon monoxide hot spot analyses. As part of this effort, used CAL3QHC and AERMOD for modeling three example projects and contributed to the preparation of example reports demonstrating the application of the template. *Dates: 2011-2012*

New Hampshire Department of Transportation, I-93 Improvements (Salem to Manchester) SEIS, New Hampshire. Deputy project manager. Lead author of the I-93 SEIS, which was prepared in response to a court order requiring analysis of the effects of induced population and employment growth on secondary road traffic and air quality. In addition to editing all components of the SEIS, was also responsible for several technical analysis tasks, including a regional emissions sensitivity analysis for ozone precursors, and a cumulative impact analysis assessing the aggregate consequences of the project combined with other reasonably foreseeable projects and forecasted levels of population and employment growth in Southern New Hampshire. The project involves widening I-93 from two lanes to four lanes in each direction for a distance of 20 miles between the Massachusetts state line and Manchester, New Hampshire. The previous plaintiffs decided not to challenge the SEIS during the 180-day limitation on claims period that followed the issuance of FHWA's Supplemental Record of Decision on the project. *Dates: 2009-2010*

TRAINING

EPA/FHWA Quantitative Particulate Matter Hot Spot Analysis Training, 2011
AERMOD Dispersion Modeling Training, Lakes Environmental, 2011
EPA and FHWA MOVES2010 Training, 2010
EPA and FHWA Draft MOVES2009 Training, 2009
Introduction to Transportation Conformity, National Transit Institute, 2008

MARY ARZT			
PROPOSED ROLE	Communications Specialist	**AVAILABILITY**	50%
EDUCATION	• BFA, Graphic Design, University of Florida, 1979 • Post-Graduate, School of Visual Arts, NYU Film School, 1981	**YEARS EXP.**	36
PROFESSIONAL EXPERIENCE	• 2005–present: SHARP & COMPANY, INC.: CEO and Creative Director • 1993–2005: MARY ARZT DESIGN AND ADVERTISING: President and Creative Director • 1984–1993: WEITZMAN/LIVINGSTON ADVERTISING: Associate Creative Director • 1982–1984: MARY PITTINOS ART DIRECTION: Art Director • 1981–1982: SIDDALL, MATUS & COUGHTER: Assistant Art Director		

SUMMARY OF RELEVANT EXPERIENCE

As winner of numerous national and international awards including ADDYs, Tellys, the International TV and Radio Gold Award, and the Best of Baltimore, has demonstrated expertise in all areas of creative direction including communication strategy and project implementation. Partner at Sharp & Company with more than 35 years of professional work experience, earning a reputation for exceptional creative work and management skill.

SELECTED PROJECTS

To increase pedestrian safety awareness for the Montgomery County/Metropolitan Washington Council of Governments Street Smart Pedestrian Safety Marketing Campaign, is leading a highly successful pedestrian safety public outreach campaign that has included the creation and development of special curb markings along the segment of Piney Branch Road, an area with the highest number of pedestrian collisions in the County. The markers indicate where it is safe and not safe for pedestrians to cross the street. County Executive Ike Legget joined State, local, and regional leaders in commemorating the installation of the curb markers. After their installation, pedestrian collisions decreased by 50%. *Dates: 2011–Present.*

Sharp & Company provided public outreach and communication services for the Baltimore Washington International (BWI) airport's long range planning, environmental planning, and terminal and intermodal planning process. This engagement, which lays the groundwork for future airport growth, comprised of the development of public information dissemination strategies, creative direction and production of public outreach and stakeholder materials and activities. Working with hundreds of planning and research documents, devised a set of public materials that examine critical planning areas. This hybrid document – more comprehensive than a standard executive summary – provided solid information without overwhelming the audience with a lot of background materials. Each planning area has a separate document that stands alone but can also be read as part of the complete set. BWI considers this one of its best public documents and a model to be used for future public outreach. *Dates: 2006–2010.*

As creative director, oversaw all aspects of design and production for numerous presentation materials produced, including the redesign of technical documents for general and public elected officials. To ensure continuous public awareness and involvement in the study, created a web presence for the plan. Among the creative outreach approaches utilized was the development of a dynamic video to encourage public participation. *Dates: 2010–2011.*

Provided all creative direction for the Virginia Department of Rail and Public Transportation (DRPT) Statewide Rail Plan, including managing art direction, supervising illustrators, and managing workflow to ensure timely delivery and consistent messaging. Determined the visual design for the Plan based on the copy developed, assuring that it reflected DRPT's image. Numerous graphics were re-conceived to eliminate extraneous information and focus on clearly making the point. This was especially true in the section devoted to outlining specific projects. Devised a graphic iconography that was used to quickly encapsulate the specific benefits of a project, enabling easier comparison of them. The American Association of State Highway and Transportation Officials cited this work as a best practice for communicating to stakeholders in statewide rail plans. *Dates: 2009–2010.*

For the second statewide plan developed by DRPT, directed design, layout, and production, making sure that the graphic integrity was maintained. The end product was visually and creatively interesting as well as being user friendly. *Dates: 2010–2011.*

Seven years ago, DRPT determined that it needed to draw more attention to its efforts to reduce single occupancy vehicle (SOV) use. Try Transit Week was launched as a week-long event that encouraged the public to try alternatives to their SOV. As creative director, developed the brand identity so that is stood on its own but could also be co-branded with regional transportation providers who participate in the program. For 5 years, managed the development of all creative materials including website design and development, print and internet advertising, all writing and visitor tracking. *Dates: 2008–2012.*

As creative director of the Virginia Department of Transportation (VDOT) I-66 Multimodal Study, led the design and creation of a consensus building study identifier and website, creating a resource for citizens to find important study information and provide their feedback. The website has given the community a place where their ideas and opinions have been documented by VDOT. All of the suggestions will be considered and many will be incorporated into the final recommendations. Has also been vital in the creation the factsheets, designing the layout, and developing all the graphics such as tables, charts, and photographic images. *Dates: 2011–2012.*

As creative director of the Chesterfield County's Comprehensive Plan, designed the project logo and tagline. The logo was consistent with Chesterfield County's current branding yet was unique to the Plan. Its simple design allowed for the versatile usage of the logo to be placed on printed materials, emails, presentations, and electronic media. The memorable tagline, "Today, Tomorrow, Together," communicated Chesterfield County's desire to develop a community-driven vision for the future. The tagline became the theme of the project and was used on a variety of communication materials and in County presentations. In addition, oversaw the creation of all communication materials including the development of public meeting advertisements and website design. *Dates: 2009–2010.*

As creative director of the Fairfax County's Transit Development Plan community meetings, designed and developed all advertisements, which included flyers, posters, and banners. These ads boosted public meeting attendance, generating interest in the plan and encouraged the public to participate in the important process of optimizing public transit services in Fairfax County. In addition, was responsible for creating the presentations, maps, and charts used at the public meetings and on the Fairfax County website. Citizens appreciated her unique use of iconography and color that allowed them to easily understand the County's recommendations for the 10-year Transit Development Plan. *Dates: 2009–2010.*

As creative director of the North County Transit District Ridership Campaign, developed the creative advertisements that increased ridership across the transit system's bus and rail systems. The campaign strategy relied on simple, easy to understand benefits presented in an offbeat way designed to appeal to the specific audience segments using each form of transportation. The combined print and social media campaign in English and Spanish produced significant ridership increases, exceeding program benchmarks. Coaster rail ridership alone rose over 21%. *Dates: 2011–2012.*

CHARISE GEILING

PROPOSED ROLE	Communications Specialist	**AVAILABILITY**	75%
EDUCATION	• B.S., Journalism, University of Maryland College Park, 1990	**YEARS EXP.**	21
PROFESSIONAL EXPERIENCE	• 1994–present: SHARP & COMPANY, INC.: Communication Specialist • 1990–1994: ADAM SANDLER, INC.: Account Executive/Media Buyer		

SUMMARY OF RELEVANT EXPERIENCE

More than 20 years of experience developing public outreach campaigns at the federal, state and local levels designed to improve public participation in transportation planning. Identifies special opportunities and designs events to inform, involve, and receive input from stakeholders, including advocating the use of social and interactive media and the use of non-traditional communication networks to reach underrepresented minorities. Fluent Spanish-speaker providing Spanish translation of materials as well as on-the-spot interpreting services at public outreach events. Work has been performed for the U.S. Department of Transportation; Federal Highway Administration; Federal Transit Administration; states of Maryland and Virginia; Metropolitan Washington Council of Governments (MWCOG); Montgomery County, Maryland; and Fairfax and Chesterfield Counties, Virginia.

SELECTED PROJECTS

Working with Montgomery County's Commuter Services, project manager of a team of Outreach Coordinators to encourage employers to promote travel alternatives and reduce trips by single occupancy vehicles. In addition to planning, organizing, and coordinating Customer Information Days and special events such as Car Free Day, Walk & Ride, and Bike to Work Day, the team works with employers to identify if they are required to submit a Traffic Mitigation Plan and assists them with the process. These outreach efforts have helped Montgomery County meet or exceed the employer participation levels set forth by the Metropolitan Washington Council of Governments. *Dates: 2014–Present.*

As communication specialist, assisting the MWCOG Transportation/Land-Use Connections Program to develop a conceptual plan for a redesigned multimodal Old Lee Highway in Fairfax, VA. At the public meeting, collects public input for improving pedestrian and bicycle access on this thoroughfare. Streetmix, an online interactive street section builder, will support these efforts and will be used to encourage the public to develop their vision of the road. *Dates: 2015.*

As communication specialist, assisted Maryland in the development of its 2035 transportation plan. Implemented four half-day roundtable meetings that included state and local elected officials, business leaders, and the community. Activities included site arrangements, developing a meeting agenda that included one break out session, facilitating discussions, and preparing PowerPoint presentations. Attended all four roundtable meetings to provide on-site meeting support, including Spanish interpreting. To encourage statewide input, helped develop an online survey and coordinated with library systems statewide to support this effort. *Dates: 2012–2014.*

In an effort to create opportunities for receiving input, promoted and coordinated public and stakeholder meetings in the Long Bridge Study area (southwest Washington, DC). Activities for the public meetings included coordinating site arrangements, identifying the audio visual needs, preparing PowerPoint presentations, developing advertisements and press releases in English and Spanish, and on-site meeting support, including Spanish interpretation. Also coordinated a workshop for 75 state and local officials and transportation leaders. *Dates: 2012–2014.*

As communication specialist, coordinated Community Advisory Panel and public meeting locations and materials for the DC Circulator Transit Development Plan. Helped develop an innovative, interactive workshop where participants planned new Circulator service. Feedback from participants praised the activity as extremely productive and worthwhile. Also oversaw all public outreach coordination activities, including identifying and booking event space, ordering supplies, ensuring appropriate décor, managing on-site production, working with vendors to create presentation materials in English and Spanish, and preparing budgets with periodic progress reports to senior staff. Was available for on-site Spanish interpreting services. *Dates: 2010–2011.*

As communication specialist, works with the design consultant team to present the proposed design plans for the rehabilitation of the 1.7-mile segment of Oregon Avenue, NW, between Military Road and Western Avenue, to impacted residents for their consideration. Helping to promote and facilitate four open house public meetings, which have been designed as forums for residents to speak to the design team one on one as well as in small working groups. *Dates: 2014–Present.*

As communication specialist, developed a public engagement plan to collect input from the public for creating the framework for the ADA Transition Plan and prioritizing the areas to be addressed. In addition to using the traditional methods of reaching stakeholders, used the innovative approach of designing pop-up meetings where stakeholders would already be gathered, including the Columbia Lighthouse for the Blind 5K, the Mayor's Disability Awareness Expo, and Gallaudet University Homecoming. Also ensured that printed and electronic materials were available in alternative formats and languages. *Dates: 2014.*

As communication specialist, developed the public outreach plan and oversaw its implementation, from initial project identifier development through final project report for the Virginia Department of Transportation (VDOT) I-66 Multimodal Study. To encourage participation and cooperation between Arlington and Fairfax counties, managed four public meetings for this study and oversaw the coordinating of all logistics such as securing the venues, seating and table arrangements, securing any audio/visual needs, developing signage for the interior and exterior of the facility, and providing name tags, flip charts, and easels. Attended all of the public meetings, working at the front table making sure everyone was greeted with a smile and received the proper study materials. Clients have hailed her ability to calmly and diplomatically speak with the aggrieved citizens, allowing everyone to feel heard no matter what their position. In addition, developed advertisements for the public meetings in accordance with VDOT guidelines. Advertising placed in newspapers such as the Washington Post, El Tiempo Latino, and the Arlington Sun dramatically increased awareness of the study. *Dates: 2011–2012.*

To facilitate the evaluation of transportation alternatives and recommendations for the Virginia Office of Intermodal Planning and Investment North-South Corridor Master Plan Study, coordinated and implemented two public meetings. Activities included managing site arrangements in Loudoun and Prince William counties, developing materials such as nametags, sign in sheets, signage, and comment sheets. Was also responsible for coordinating advertisements in El Tiempo Latino, Loudoun County Local Living, Prince William County Local Living, Ashburn Today, and Gainesville Today. Attended both public meetings and provided on-site meeting support, including Spanish translation and interpretation. *Dates: 2012–2013.*

Serves as the communication specialist for the James City County VA Mooretown Road Extension Study. Supports the public outreach efforts of a study that will weigh potential benefits and impacts to property and business owners located in the study area for extending Mooretown Road. Organizing three public meetings, preparing meeting materials, and developing activities to engage and encourage public input, including polling exercises. *Dates: 2014–Present.*

In an effort to generate input and interest from the community for the Fairfax County Transit Development Plan, Sharp & Company organized and promoted eight public meetings. Coordinated all public meeting logistics and production. Activities included site arrangements, coordination with Board of Supervisors staff, preparation of agendas, preparation of all handout materials in English and Spanish, preparation of advertising and press releases in English and Spanish, and on-site meeting support, including Spanish translation and interpreting. *Dates: 2009–2010.*

SUSAN SHARP			
PROPOSED ROLE	Outreach/Communications Lead	**AVAILABILITY**	50%
EDUCATION	• B.A., Graphic Design, The American University, 1973	**YEARS EXP.**	42
PROFESSIONAL EXPERIENCE	• 1982–present: SHARP & COMPANY, INC.: President and Senior Communication Specialist • 2003–2005: WMATA: Business Technology Strategist • 1977–1982: SHARP/ROKUS DESIGN: Creative Director • 1975–1977: EARNEST, LURIE & MITCHELL ADVERTISING: Art Director • 1975–1976: ABRAMSON ADVERTISING: Associate Art Director • 1974–1975: WEITMAN ADVERTISING: Assistant Art Director • 1973–1974: COMPRINT: Production Artist		

SUMMARY OF RELEVANT EXPERIENCE

Over 35 years of experience in electronic and print information communication and marketing, information architecture, creation and implementation of effective communication strategies, strategic planning, marketing communications, and graphic design. Successful entrepreneur with experience delivering value and quality to an extensive loyal client base, including profit and non-profit organizations, government agencies, and institutions.

SELECTED PROJECTS

Senior communications specialist for the Maryland Department of Transportation (DOT) 2035 Long-Range Transportation Plan. Developed the communications plan, which included the creation of four interactive workshops, presented throughout the state. These involved various stakeholders – including elected officials, advocacy groups, civic association members, community planners, and the general public – mixed into random groupings to address the proposed goals and objectives for the Plan. The state's reservations about randomly assigning group participants were allayed when significant numbers of participants commented that the interaction within the groups fostered a greater level of understanding and positive proposals. In addition, proposed and developed an innovative online survey to satisfy statutory requirements while actively engaging the public through traditional and new media. *Dates: 2012-2014.*

Responsible for all stakeholder interviews and outreach for the Maryland DOT Carbon Neutral Corridor project. Stakeholder outreach included local government staff, local developers or builders and their organizations, major businesses in the area, non-profit groups, farmers, local civic leaders, federal site staff, and local planning organizations of two counties and several jurisdictions in Maryland. In addition to identifying and coordinating stakeholder participation, prepared monthly updates for distribution and updated the Maryland DOT website. *Dates: 2011–2012.*

For the District of Columbia DOT South Capitol Street Supplemental Environmental Impact Statement/Record of Decision, provides communication strategy and oversight of the public involvement program where communication is vital to maintaining current public support and addresses project detractors. Implemented several public information techniques to achieve this goal such as providing information updates to the website, developing newsletters, and scheduling public meetings in Ward 6 and Ward 8. In addition, working along with Parsons Brinckerhoff and the National Park Service and the DC Historic Preservation Office on Section 106 compliance efforts. *Dates: 2013–present.*

For the District of Columbia DOT Oregon Avenue NW Improvements project, working with the design consultant team to present the proposed design plans for the rehabilitation of the 1.7-mile segment of Oregon Avenue, NW, between Military Road and Western Avenue, to impacted residents for their consideration. Helping to promote and facilitate four open house public meetings, which have been designed as forums for residents to speak to the design team one on one as well as in small working groups. *Dates: 2014–present.*

The District of Columbia DOT is required to provide an opportunity for people outside of the agency, people with disabilities, and other interested individuals and organizations to review and comment on the Transition Plan.

Managed the public outreach and involvement throughout the project period via an ADA-compliant website. Specific outreach tactics included creating an ADA advisory group, developing a ADA-compliant website and telephone hotline, and conducting public meetings. *Dates: 2014.*

As senior communications specialist, developed the public engagement plan for the District of Columbia DOT DC Circulator Transit Development Plan. An integral part of the transportation planning process, the engagement plan successfully built stakeholder support among varied constituents for new route considerations. To facilitate research and develop strategic goals, hosted Community Advisory Panels and public meetings in Ward 2 and 7 to brainstorm high-level themes regarding what the Circulator should aim to achieve. Because constituent groups had been provided an opportunity to share their concerns and be listened to, the new routes selected were embraced by the public with no backlash. *Dates: 2010–2011.*

Engaged by the Virginia Department of Rail and Public Transportation (DRPT) to craft a new document to help build support for its ambitious statewide rail program. Working from a technical document created to meet Federal Railroad Administration requirements, worked closely with DRPT to devise a strong message, a purpose to the communications. Based on that, determined and produced the narrative value and story, developing text that engaged stakeholders by communicating a clear vision and strategy to address the Commonwealth's rail needs. Repurposed material for public meetings, creating PowerPoint presentations and writing text for other meeting materials. *Dates: 2009–2010.*

Senior communications specialist for the Virginia DOT I-66 Multimodal Study Inside the Beltway Study that identified highway, transit, bicycle, and pedestrian alternatives along this critical Northern Virginia commuter corridor crossing two counties from the beltway to the District line. Developed and implemented a public process that reached out to, gathered input from, and built consensus among stakeholders affected by the study. These stakeholders included state and local jurisdiction technical staff, local transportation agencies, elected officials, interest groups, residents, commuters, businesses, and the general public. In addition to public meetings, conducted over 25 individual stakeholder interviews to inform and learn about project concerns. *Dates: 2011–2012.*

As senior communications specialist of the Chesterfield County VA Comprehensive Plan, developed a public outreach strategy and plan that tied public outreach activities to the project milestones. As overall project manager, coordinated with Chesterfield's Public Affairs office, as well as the County's Planning and Technology Departments, to ensure that the public had access to materials and processes over an 18-month planning process period. Strong branding and messaging provided unified communications. Special attention was given to devising the site architecture, writing content and providing graphics, and assuring accessibility and easy navigation of the project website. Offered improvements such as shortening lengthy copy, adding bullet points and links where possible, adding video, and devising interactive features to increase citizen participation, and providing Facebook and Twitter access. Worked with Chesterfield on a regular basis to update the site to keep information fresh and accurate and the process transparent. In addition, wrote a regular newsletter, "Today, Tomorrow, Together," that engaged a wide range of community groups, businesses, homeowner associations, church groups, and the public. Aimed at fostering public participation "Today, Tomorrow, Together" maximized Chesterfield's outreach and reached traditionally under represented and non-participating populations. *Dates: 2009–2010.*

Collaborated with Fairfax County's Department of Transportation staff and the planning team to devise a public communications strategy and plan designed to obtain maximum attendance at Transit Development Plan community meetings and build supervisor support. This entailed performing a thorough assessment of existing communications, developing a plan and process for utilizing current and new outreach efforts, and crafting a message to generate public awareness. Recommended several innovations that Fairfax had not previously considered. These included building a comment form into the website to encourage citizen comments and promoting public meetings through Twitter and Facebook. The value of these communication channels was confirmed when attendees mentioned that they had heard of the meeting through social networking sites. *Dates: 2009–2010.*

Senior communication specialist for the Transportation Research Board's Effects of Changing Transportation Energy Supplies and Alternative Fuel Sources on Transportation Project. To encourage and guide officials to institute appropriate policies and management strategies, developed the framework for and wrote an interactive tool inviting stakeholder participation that. Additionally, wrote and developed a presentation to promote the availability of the interactive tool. *Dates: 2010.*

APPENDIX B:
DBE PARTICIPATION

DBE Participation Plan

DBE Subcontractor		Percentage of Contract
Subcontractor: Sharp & Company		20.4%
Address: 794 Nelson Street, Rockville, MD 20850		
Certifying State: MD	DBE Certification #: 08-142	

Maryland Department of Transportation
The Secretary's Office

Martin O'Malley
Governor

Anthony G. Brown
Lt. Governor

James T. Smith, Jr.
Secretary

December 29, 2014

MARY ARZT
SHARP & COMPANY, INC.
794 NELSON STREET
ROCKVILLE, MD 20850

Dear MARY ARZT (cert # 08-142):

We are pleased to inform you that your company has been found eligible to continue its certification as a Minority Business Enterprise (MBE), Disadvantaged Business Enterprise (DBE), Small Business Enterprise (SBE), and/or Airport Concessions Disadvantaged Business Enterprise (ACDBE) effective December 29, 2014.

Your firm remains certified for the services for which you have been approved and officially notified in writing. Your current certification status can be found in the Maryland Department of Transportation's (MDOT) Directory of Certified MBE/DBE/SBE/ACDBE Firms available online at http://mbe.mdot.state.md.us/directory. MDOT's online directory is the official record of your firm's certification status. It is important that you carefully review the accuracy of your listing in the Directory. If you have any questions about your firm's certification status, contact MDOT's Office of Minority Business Enterprise (OMBE) immediately at 410-865-1269 or 1-800-544-6056.

If you wish to expand the area(s) of work for which your firm is currently certified, you may request an Expansion of Services. The application for expansion of services can be found at http://www.mdot.maryland.gov/Office of Minority Business Enterprise/ExpansionCover.html Please submit your application request to:

Maryland Department of Transportation
Office of Minority Business Enterprise
7201 Corporate Center Drive
Hanover, MD 21076
410-865-1309 (fax) or mbe@mdot.state.md.us

Your firm must be recertified annually in order to maintain its certification. We will contact you when it is time to begin the next recertification process.

Sincerely,

Randy Reynolds
Director, Minority Business Enterprise

APPENDIX C:
STANDARD TERMS AND CONDITIONS

ATTACHMENT A
STANDARD TERMS AND CONDITIONS

I. Energy Conservation – 42 U.S.C. 6321 et seq.

The Contractor agrees to comply with mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act.

II. Clean Water Requirements – 33 U.S.C. 1251 et seq.

1. The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended. The Contractor agrees to report each violation to COG and understands and agrees that COG will, in turn; report each violation as required to assure notification to appropriate federal agencies including the appropriate EPA Regional Office.
2. The Contractor also agrees to include these requirements in each subcontract exceeding $100,000 financed in whole or in part with Federal assistance.

III. Lobbying – 31 U.S.C. 1352 et seq.

(*To be submitted with each bid or offer exceeding $100,000)*

The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal Loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of and Federal contract, grant, loan, or cooperative agreement.
2. If any funds or than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form—LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions [as amended by "Government wide Guidance for New Restrictions on Lobbying," 61 Fed. Reg. 1413 (1/19/96). Note: Language in paragraph (2) herein as been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (P.L. 104-65, to be codified at 2 U.S.C. 1601, *et.seq.*)]
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

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

[Note: Pursuant to 31 U.S.C. § 1352(c)(1)-(2)(A), any person who makes a prohibited expenditure or fails to file or amend a required certification or disclosure form shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such expenditure or failure.]

The Contractor, SC&A, Inc., certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. A 3801, *et seq*., apply to this certification and disclosure, if any.

Gregory P. Beronja
Signature of Contractor's Authorized Official

Gregory P. Beronja
President & CEO
Name and Title of Contractor's Authorized Official

3/6/15
Date

IV. Access to Records and Reports – 49 U.S.C. 5325

1. The Contractor agrees to provide COG, and if applicable the state or federal funding agency, the Comptroller General of the United States or any of their authorized representatives access to any books, documents, papers and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts and transactions.
2. The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.
3. The Contractor agrees to maintain all books, records, accounts and reports required under this contract for a period of not less than three years after the date of termination or expiration of this contract, except in the event of litigation or settlement of claims arising from the performance of this contract, in which case Contractor agrees to maintain same until COG, the applicable state or federal funding agency, the Comptroller General, or any of the their duly authorized representatives, have disposed of all such litigation, appeals, claims or exceptions related thereto.

V. Funding Agency Changes

Contractor shall at all times comply with all applicable state and federal agency regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the funding agreement between such agency and COG, as they may be amended or promulgated from time to time during the term of this contract. Contractor's failure to comply shall constitute a material breach of this contract.

VI. Clean Air – 42 U.S.C. 7401 et seq

The Clean Air requirements apply to all contracts exceeding $100,000, including indefinite quantities where the amount is expected to exceed $100,000 in any year.

1. The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. §§ 7401 et seq. The Contractor agrees to report each violation to COG and understands and agrees that COG will, in turn; report each violation as required to assure notification to the funding federal agency, if any, and the appropriate EPA regional office.
2. The Contractor also agrees to include these requirements in each subcontract exceeding $100,000 financed in whole or in part with Federal assistance.

VII. Recycled Products – 42 U.S.C. 6962

The Recycled Products requirements apply to all contracts for items designated by the EPA, when COG or the contractor procures $10,000 or more of one of these items during the fiscal year, or has procured $10,000 or more of such items in the previous fiscal year, using federal funds.

The Contractor agrees to comply with all requirements of Section 6002 of the Resource Conservation and Recovery Act (RCRA), as amended (42 U.S.C. 6962), including but not limited to regulatory provisions of 40 CFR Part 247, and Executive Order 12873, as they apply to the procurement of the items designated in Subpart B of 40 CFR Part 247.

VIII. No Government Obligation to Third Parties

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

IX. Program Fraud and False or Fraudulent Statements and Related Acts – 31 U.S.C. 3801 et seq.

1. The Contractor acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 U.S.C. § 3801 et. seq. and all appropriate federal agency regulations apply to its actions pertaining to this Project. Upon execution of the underlying contract, the Contractor certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, it may make, or causes to be made, pertaining to the underlying contract of the Federally assisted project for which this contract work is being performed. In addition to other penalties that may be applicable, the Contractor further acknowledges that if it makes, or caused to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification, the Federal Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986 on the Contractor or to the extent the Federal Government deems appropriate.
2. The Contractor also acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification to the Federal Government under a contract connected with a project that is financed in whole or in part with Federal assistance, the Federal Government reserves the right to impose the penalties of 18 U.S.C. § 1001 and 49 U.S.C. § 5307(n) (1) on the Contractor, to the extent the Federal Government deems appropriate.
3. The Contractor agrees to include the above two clauses in each subcontract financed in whole or in part with Federal assistance. It is further agreed that the clause shall not be modified, except to identify the subcontractor who will be subject to the provisions.

X. Termination – 49 U.S.C. Part 18

Applicable to all contracts in excess of $10,000

a. **Termination for Convenience** – COG, by written notice, may terminate this contract, in whole or in part, at any time by written notice to the Contractor when it is in COG's best interest. If this contract is terminated, COG shall be liable only for payment under the payment provisions of this contract for services rendered before the effective date of termination.
b. **Termination for Default [Breach or Cause]** – If the Contractor fails to perform in the manner called for in this contract, or if the Contractor fails to comply with any

other provisions of the contract, COG may terminate this contract for default. Termination shall be effected by serving a notice of termination on the Contractor setting forth the manner in which the Contract is in default. The Contractor will only be paid the contract price for services performed in accordance with the manner of performance set forth in the contract. If it is later determined by COG that the Contractor had an excusable reason for not performing, such as strike, fire, or flood, events which are beyond the control of the Contractor, COG, after setting up a new delivery of performance schedule, may allow the Contractor to continue work, or treat the termination as a termination for convenience.

c. COG in its sole discretion may, in the case of termination for breach or default, allow the Contractor ten (10) working days in which to cure the defect. In such case, the notice of termination will state the time period in which cure is permitted and other appropriate conditions.
If the Contractor fails to remedy to COG's satisfaction the breach or default of any of the terms, covenants, or conditions of this Contract within the 10 working days after receipt by Contractor of written notice from COG setting forth the nature of said breach or default, COG shall have the right to terminate the Contract without further obligation to Contractor. Any such termination for default shall not in any way operate to preclude COG from also pursuing all available remedies against Contractor and its sureties for said breach or default.

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

XI. Civil Rights Requirements – 29 U.S.C. § 62, 42 U.S.C. § 2000, 42 U.S.C. § 602, 42 U.S.C. § 12112, 42 U.S.C. § 12132, 49 U.S.C. § 5332

1. **Nondiscrimination** – In accordance with Title VI of the Civil Rights Act, as amended, 42 U.S.C. § 2000d, section 303 of the Age Discrimination Act of 1975, as amended, 42 U.S.C. § 6102, section 202 of the Americans with Disabilities Act of 1990, 42 U.S.C. § 12132, and all other provisions of Federal law, the Contractor agrees that it will not discriminate against any employee or applicant for employment because of race, color, creed, national origin, sex, age, or disability. In addition, the Contractor agrees to comply with applicable Federal implementing regulations.
2. **Equal Employment Opportunity** – The following equal employment opportunity requirements apply to the underlying contract:
    a. **Race, Color, Creed, National Origin, Sex** – In accordance with Title VII of the Civil Rights Act, as amended, 42 U.S.C. § 2000e, the Contractor agrees to comply with all applicable equal employment opportunity requirements of U.S. Department of Labor (U.S. DOL) regulations, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," 41 CFR Parts 60 et seq., (which implement Executive Order No. 11246, "Equal Employment Opportunity," as amended by Executive Order No. 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," 42 U.S.C. § 2000e note), and with any applicable Federal Statutes, executive orders, regulations, and Federal policies that may in the future affect activities undertaken in the course of this Project. The Contractor agrees to take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, creed, national origin, sex, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination;

rates of pay or other forms of compensation; and selection for training, including apprenticeship. In addition, the Contractor agrees to comply with any implementing requirements the funding federal agency may issue.

b. **Age** – In accordance with section 4 of the Age Discrimination in Employment Act of 1967, as amended, 29 U.S.C. § § 623 and other applicable law, the Contractor agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, the Contractor agrees to comply with any implementing requirements the funding federal agency may issue.

c. **Disabilities** – In accordance with section 102 of the Americans with Disabilities Act, as amended, 42 U.S.C. § 12112, the Contractor agrees that it will comply with the requirements of U.S. Equal Employment Opportunity Commission, "Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act," 29 CFR Part 1630, pertaining to employment of persons with disabilities. In addition, the Contractor agrees to comply with any implementing requirements the funding federal agency my issue.

3. The Contractor also agrees to include these requirements in each subcontract financed in whole or in part with Federal Assistance, modified only if necessary to identify the affected parties.

XII. Breaches and Dispute Resolution

Disputes – Disputes arising in the performance of this Contract which are not resolved by agreement of the parties shall be decided in writing by the COG Executive Director or his/her designee. This decision shall be final and conclusive unless within ten (10) working days from the date of receipt of its copy, the Contractor mails or otherwise furnishes a written appeal to the Executive Director or his/her designee. In connection with any such appeal, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of its position. The decision of the Executive Director or his/her designee shall be binding upon the Contractor and the Contractor shall abide the decision.

Performance During Dispute – Unless otherwise directed by COG, Contractor shall continue performance under this Contract while matters in dispute are being resolved.

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

Remedies – Unless this contract provides otherwise, all claims, counterclaims, disputes and other matters in question between COG and the Contractor arising out of or relating to this agreement or its breach will be decided by arbitration if the parties mutually agree, or in a court of competent jurisdiction within the District of Columbia.

Rights and Remedies – The duties and obligations imposed by the Contract and the rights and remedies available there under shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law. No action or failure to act by COG or the Contractor shall constitute a waiver or any right or duty afforded to them under the Contract, not shall any such action or failure to act constitute an approval of or acquiescence in any breach there under, except as may be specifically agreed in writing.

XIII. Patent and Rights in Data

A. **Rights in Data** - The following requirements apply to each contract involving experimental, developmental or research work:

(1) The term "subject data" used in this clause means recorded information, whether or not copyrighted, that is delivered or specified to be delivered under the contract. The term includes graphic or pictorial delineation in media such as drawings or photographs; text in specifications or related performance or design-type documents; machine forms such as punched cards, magnetic tape, or computer memory printouts; and information retained in computer memory. Examples include, but are not limited to: computer software, engineering drawings and associated lists, specifications, standards, process sheets, manuals, technical reports, catalog item identifications, and related information. The term "subject data" does not include financial reports, cost analyses, and similar information incidental to contract administration.

(2) The following restrictions apply to all subject data first produced in the performance of the contract to which this Attachment has been added:

(a) Except for its own internal use, the Purchaser or Contractor may not publish or reproduce subject data in whole or in part, or in any manner or form, nor may the Purchaser or Contractor authorize others to do so, without the written consent of the Federal Government, until such time as the Federal Government may have either released or approved the release of such data to the public; this restriction on publication, however, does not apply to any contract with an academic institution.

(b) In accordance with 49 C.F.R. § 18.34 and 49 C.F.R. § 19.36, the Federal Government reserves a royalty-free, non-exclusive and irrevocable license to reproduce, publish, or otherwise use, and to authorize others to use, for "Federal Government purposes," any subject data or copyright described in subsections (2)(b)1 and (2)(b)2 of this clause below. As used in the previous sentence, "for Federal Government purposes," means use only for the direct purposes of the Federal Government. Without the copyright owner's consent, the Federal Government may not extend its Federal license to any other party.

1. Any subject data developed under that contract, whether or not a copyright has been obtained; and

2. Any rights of copyright purchased by the Purchaser or Contractor using Federal assistance.

(c) For FTA Assisted Contracts - When FTA awards Federal assistance for experimental, developmental, or research work, it is FTA's general intention to increase transportation knowledge available to the public, rather than to restrict the benefits resulting from the work to participants in that work. Therefore, unless FTA determines otherwise, the Purchaser and the Contractor performing experimental, developmental, or research work required by the underlying contract to which this Attachment is added agrees to permit FTA to make available to the public, either FTA's license in the copyright to any subject data developed in the course of that contract, or a copy of the subject data first produced under the contract for which a copyright has not been obtained. If the experimental, developmental, or research work, which is the subject of the underlying contract, is not completed for any reason whatsoever, all data developed under that contract shall become subject data as defined in subsection (a) of this clause and shall be delivered as the Federal Government may direct. This subsection (c), however, does not apply to adaptations of automatic data processing equipment or programs for the Purchaser or Contractor's use whose costs are financed in whole or in part with Federal assistance provided by FTA for transportation capital projects.

(d) Unless prohibited by state law, upon request by the Federal Government, the Purchaser and the Contractor agree to indemnify, save, and hold harmless the Federal Government, its officers, agents, and employees acting within the scope of their official duties against any liability, including costs and expenses, resulting from any willful or intentional violation by the Purchaser or Contractor of proprietary rights, copyrights, or right of privacy, arising out of the publication, translation, reproduction, delivery, use, or disposition of any data furnished under that contract. Neither the Purchaser nor the Contractor shall be required to indemnify the Federal Government for any such liability arising out of the wrongful act of any employee, official, or agents of the Federal Government.
(e) Nothing contained in this clause on rights in data shall imply a license to the Federal Government under any patent or be construed as affecting the scope of any license or other right otherwise granted to the Federal Government under any patent.

(f) Data developed by the Purchaser or Contractor and financed entirely without using Federal assistance provided by the Federal Government that has been incorporated into work required by the underlying contract to which this Attachment has been added is exempt from the requirements of subsections (b), (c), and (d) of this clause, provided that the Purchaser or Contractor identifies that data in writing at the time of delivery of the contract work.

(g) Unless the federal funding agency determines otherwise, the Contractor agrees to include these requirements in each subcontract for experimental, developmental, or research work financed in whole or in part with Federal assistance.

(3) Unless the Federal Government later makes a contrary determination in writing, irrespective of the Contractor's status (i.e., a large business, small business, state government or state instrumentality, local government, nonprofit organization, institution of higher education, individual, etc.), the Purchaser and the Contractor agree to take the necessary actions to provide, through the federal funding agency, those rights in that invention due the Federal Government as described in

U.S. Department of Commerce regulations, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms under Government Grants, Contracts and Cooperative Agreements," 37 C.F.R. Part 401.

(4) The Contractor also agrees to include these requirements in each subcontract for experimental, developmental, or research work financed in whole or in part with Federal assistance provided by FTA.

B. **Patent Rights** - The following requirements apply to each contract involving experimental, developmental, or research work:

(1) General - If any invention, improvement, or discovery is conceived or first actually reduced to practice in the course of or under the contract to which this Attachment has been added, and that invention, improvement, or discovery is patentable under the laws of the United States of America or any foreign country, the Purchaser and Contractor agree to take actions necessary to provide immediate notice and a detailed report to the party at a higher tier until the Federal funding agency is ultimately notified.

(2) Unless the Federal Government later makes a contrary determination in writing, irrespective of the Contractor's status (a large business, small business, state government or state instrumentality, local government, nonprofit organization, institution of higher education, individual), the Purchaser and the Contractor agree to take the necessary actions to provide, through the Federal funding agency, those rights in that invention due the Federal Government as described in U.S. Department of Commerce regulations, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," 37 C.F.R. Part 401.

(3) The Contractor also agrees to include the requirements of this clause in each subcontract for experimental, developmental, or research work financed in whole or in part with Federal assistance.

XIV. Interest of Members of Congress

No member of or delegates to the Congress of the United States shall be admitted to a share or part of this Contract or to any benefit arising there from.

XV. Interest of Employees of COG

No employee of COG who exercises any functions or responsibilities in review or approval of the undertaking or carrying out the Project during his or her tenure or one year thereafter shall have any personal interest, direct or indirect, apart from his or her official duties, in this Contract or the proceeds thereof.

XVI. Interest of the Contractor

The Contractor covenants that it has presently no financial interest, shall not acquire any financial interest, direct or indirect, which would conflict in any manner or degree with the performance of services required to be performed under this Contract. The Contractor further covenants that, in the performance of this Contract, no person having any such interest shall be employed.

XVII. Allowable Costs

Only those costs which are consistent with Title 48 Part 31 of the Code of Federal Regulations shall be reimbursed under this Contract.

XVIII. Covenant Against Contingent Fees

The Contractor warrants that it has not employed any person to solicit or secure this Contract upon any agreement for a commission, percentage, brokerage or contingent fee. Breach of warranty shall give the Contracts Officer the right to terminate this Contract or, in his discretion, to deduct from the Contract price or consideration the amount of such commission, percentage, brokerage or contingent fees. This warranty shall not apply to commissions' payable by the Contractor upon contracts or sales secured or made through a bona fide established commercial or selling agency maintained by the Contractor for the purpose of securing business.

XIX. Indemnification

The Contractor, acting as an independent contractor, shall hold COG harmless from and shall be solely responsible, where found liable, for the payment of any and all claims for loss, personal injury, death, property damage, or otherwise, arising out of any act of omission or negligence of its employees or agents in connection with the performance of this work.

XX. Severability

It is understood and agreed by the parties that if any of these provisions shall contravene, or be invalid under, the laws of the particular state, county or jurisdiction where used, such contravention or invalidity shall not invalidate the whole agreement, but the Contract shall be construed as if not containing the particular provision or provisions held to be invalid in the said particular state, county or jurisdiction and the rights and obligations of the parties shall be construed and enforced accordingly.

XXI. Assignments

This Contract shall not be assigned, sublet or transferred in whole or in part by the Contractor, except with the previous written consent of the COG Contracting Officer or his designee.

XXII. Entire Agreement

This Contract sets forth the entire understanding of the parties and supersedes all previous agreements, whether oral or in writing, relating to the subject matter hereof. This Contract may only be altered, amended or modified in accordance with Changes Clause of this Contract.

XXIII Confidential or Personal Data

a. COG respects the privacy or business interests involved in confidential or personal data. It is COG's policy to obtain confidential or personal data or store or allow storage of such data only 1) when necessary to fulfill COG's information-gathering and data collection responsibilities, or 2) in conjunction with COG projects. COG intends to minimize risk of disclosure of such confidential or personal data.

b. Whenever feasible and the requirements of a project allow, the names of survey participants or users of a website or other data collection method shall not be accepted, recorded, stored or retained.

c. When COG engages in a project, which involves the collection or storage of confidential or personal information by or through use of surveys, websites or by other data collection, the following conditions shall be met:

1) The survey, website or other collection method shall contain a set of conditions for use and a disclaimer of any COG liability for use, in language approved by COG in writing.

2) The party(ies) working with COG shall demonstrate adherence to a federal or applicable state standard for protecting confidential or personal information.

3) The confidential or personal information collected or stored by or through the survey, website or other data collection shall be kept confidential. All necessary steps shall be taken to protect the privacy of the users of the website or other data collection. Any confidential or personal information provided by users of the website or other data collection, including but not limited to their names and addresses, shall be protected.

4) COG shall retain control over and ownership of all surveys, WebPages, control files and scripts, database schema, and database contents, in addition to all content which is published on or stored by the website or other data collection, unless COG specifically agrees in writing otherwise.

5) No release of any announcements intended for public dissemination concerning the collection or storage of such information by or through the survey, website or other data collection shall occur until COG has given prior written authorization, unless COG specifically agrees in writing otherwise.

6) In the event that information collected or stored by or through the survey, website or other data collection shall be stolen or handled incorrectly, the party(ies) working with COG on the project shall be responsible for any required notification to persons who have entered personal information in that system and all costs related thereto.

7) The project documents shall provide that other parties working with COG on the survey, website or other data collection or storage shall indemnify COG with at least the following commitment:

   The [CONTRACTOR or other party] shall indemnify and hold COG harmless from and shall be solely responsible, for the payment of any and all claims for loss, personal injury, death, property damage, infringement or misappropriation of any third party's intellectual property rights, violation of privacy, confidentiality or otherwise, arising out of any act of omission or negligence of its employees or agents in connection with the performance of the work under this [agreement or memorandum of understanding].

8) At the end of the project or contract, any personal or confidential information shall be given to COG or destroyed and a certification of destruction provided to COG by the contractor or other party.

XXIV. COG's Policies and Procedures

When federal law, or any grant conditions, certifications or assurances require COG to utilize competitive procurement procedures for selection of a contractor, COG's policies and procedures shall govern every aspect of the contractor selection process, e.g., the solicitation, evaluation, award, and post-award process (including, without limitation, any protest of an award, and the terms and conditions under which a contract may be approved, executed and administered). Any contractor and potential contractor will be provided with a copy of such policies and procedures, on request.

XXV. Additional Requirements

In addition to the terms and conditions expressly referenced in this CONTRACT, the SUBGRANTEE acknowledges and agrees that the terms and conditions of any federal or state grant that provides funding for this CONTRACT, in whole or in part, shall apply to and shall govern the parties' rights and obligations under this CONTRACT and shall be deemed additional terms, conditions and requirements of this CONTRACT.

XXVI. Priority of Requirements

In the event of a conflict between or among any of the terms, conditions and requirements applicable to this CONTRACT, the conflict shall be resolved by assigning the following priorities, in the order as stated below:

1) Terms and conditions of any grant that provides funding for this CONTRACT, in whole or in part;
2) Terms and conditions set forth or referenced within Attachment A to this CONTRACT;
3) Terms and conditions set forth or referenced within Parts I and II of this CONTRACT;
4) Terms, conditions, specifications, and requirements set forth within any solicitation (e.g., RFP or IFB) pursuant to which this CONTRACT was awarded.

ATTACHMENT B
CERTIFICATION REGARDING
DEBARMENT, SUSPENSION, AND OTHER
RESPONSIBILITY MATTERS

The prospective vendor certifies to the best of its knowledge and belief that it and its principals:

- Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any department or agency of the District of Columbia, State of Maryland or the Commonwealth of Virginia or any of the 22 jurisdictions comprising the membership of the Metropolitan Washington Council of Governments (COG);
- Have not within a three year period preceding this date been convicted of or had a civil judgment rendered against them for commission of fraud or criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State or local) with commission of any of the offenses enumerated above of this certification; and
- Have not within a three-year period preceding this date had one or more public transactions (Federal, State or local) terminated for cause or default.

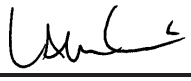
Vendor understands that a false statement on this certification may be grounds for rejection of any submitted proposal or quotation or termination of any award. In addition, under 18 USC Sec. 1001, a false statement may result in a fine of up to $10,000 or imprisonment for up to 5 years, or both if federal funds are being used to support the procurement.

SC&A, Inc.

Typed Name of Vendor

Laurie Loomis, VP

Typed Name & Title of Authorized Representative



3/6/15

Signature of Authorized Representative Date

ATTACHMENT C
CONTACT INFORMATION SHEET

(THIS PAGE MUST BE COMPLETED AND SUBMITTED WITH THE PROPOSAL)

RFP/RFQ No.: 15-010 Federal Tax ID No.: 54-1183001

Name of Offeror: SC&A, Inc.

Address of Offeror: 1608 Spring Hill Road, Suite 400, Vienna, VA 22182

Telephone No: 703-893-6600 Fax No.: 703-821-8236 Website: www.scainc.com

Name of Authorized Representative: Gregory P. Beronja

Mailing Address (If different from Above): same as above

Telephone No.: 703-893-6600 x206 Mobile No.: _____ Other: _____

Email Address: gberonja@scainc.com

Name of Contact Person for this RFP/RFQ: Maureen Mullen

Title of Contact Person: Project Manager

Telephone No.: 703-893-6600 x240 Mobile No.: _____ Other: _____

Email Address: mmullen@scainc.com