

SERA Solid Waste Resumes

LISA A. SKUMATZ, Ph.D., Principal, SERA, Inc.

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SUMMARY

Dr. Skumatz brings more than 30 years of experience in solid waste policy and program design, evaluation, and modeling. For 23 years, Dr. Skumatz has been Principal of SERA, a research and consulting firm that specializes in solid waste and resource conservation work. SERA's business focus includes "best practices" and quantitative policy and program work to identify effective and cost-effective sustainability initiatives at the local, regional, national, and international level. Her extensive expertise in policy and program analysis in recycling / solid waste has been recognized in the US and internationally – reflected in her project assignments but also in three "Lifetime Achievement..." awards and appointments/elections to numerous boards and panels. She has published 150 papers and articles. Lisa brings a mix of practical and forward-thinking solutions, backed by proven quantitative skills, creativity, and problem identifying-and-solving capabilities. She brings real-world data to all her work, and has the robustness of background to understand and frame the issues from the range of relevant perspectives.



EDUCATION

Ph.D., M.A. **Economics**, The Johns Hopkins University, Baltimore, Maryland, 1978, 1987.
B.A. Economics, The University of Wisconsin, Madison, Wisconsin, 1975.
Certification Sustainability Leadership and Implementation Certification, University of Denver and Natural Capitalism, 2011

EXPERIENCE

1994- Principal, Skumatz Economic Research Associates (SERA, Inc.)
1998- President, The Econservation Institute (non-profit)
2014 Faculty, Graduate Department, University of Colorado, Denver
1990-94 Vice President, Pacific Northwest Division, Synergic Resources Corporation.
1987-90 Rates Economist, City of Seattle.
1985-87 Energy Research Analyst, Pacific Gas and Electric Company.
1980-85 Research Economist, Battelle Pacific Northwest Laboratories.
1978-80 Research Economist, U.S. Bureau of Labor Statistics.
1977-78 Economist, U.S. Department of Health, Education, and Welfare.
Previous - Teaching Assistant and Research Assistant, The Johns Hopkins University, Baltimore
Paid Intern - Ralph Nader's Public Interest Research Group, Washington DC
Other - Town Trustee, Town of Superior, CO 2004-2014
2014-5 – Graduate school faculty, University of Colorado-Denver, Public Affairs

EXPERIENCE HIGHLIGHTS

SWM & ZW Plans / Modeling – and “Comp Plan in a Box”: She has developed “zero waste” and “solid waste management” plans for communities and counties in the US. She uses information on community waste composition, tonnage levels, sectors, and other data to identify the most cost-effective portfolio of programs, incentives, and policies toward waste diversion and effective waste management – and estimates the cost to the city/county/state client and (cost and often rates) to the residential and commercial generators affected by the programs. SERA incorporates estimates of the avoided GHG and jobs / economic development for many of these clients. Dr. Skumatz developed SERA’s “comp Plan in a Box” model, which asks communities “20 questions” and uses the data to score and prioritize more than 200 solid waste programs for their suitability for the specific community. She has conducted state-level plan and goal development work for Massachusetts, Colorado, Oregon, Connecticut, Washington, and Iowa, and dozens of similar projects for Counties and municipalities across the US and Canada. She has developed a comprehensive solid waste forecasting and program analysis model that is “tailorable” for communities, which streamlines data collection and analysis of successful program / policy alternatives.

- **Selected Clients include:** Colorado CDPHE, State of Connecticut, Oregon WPLG, Massachusetts OEOA, Iowa DNR, EPA Headquarters and Regions 5 / 9 / 10; Nashville TN; Alameda StopWaste, CA; Boulder County, City of Boulder, Eagle County, CO; UK-WRAP; Metro Vancouver, BC; Seattle Public Utilities, WA; Consortium of 15 Cities / Counties in CA; Anchorage AK; Pitkin County, CO; Mesa County, CO; Westminster, CO; Fort Collins, CO; Snohomish County, WA; and many other cities / counties.

PAYT: Dr. Skumatz is the international authority on Pay As You Throw (PAYT), an incentive-based strategy for increasing recycling. Her solid waste clients include a wide range of communities and counties across North America, as well as the major US, Canadian, and UK solid waste authorities. She works with clients to develop practical, tailored PAYT options suited to their situation. These assignments include feasibility, design, implementation, and rates work for communities. For state and national agencies, she has conducted workshops, developed toolkits, websites, white papers, sample ordinances and legislation, frequently-asked-questions, rate models, and other research to assist communities in implementing PAYT. She has also provided testimony for state legislatures and others on PAYT. Her work demonstrating that PAYT and curbside recycling are more cost-effective and quicker than leading energy efficiency strategies to deliver GHG reductions (with similar job-creation effects) has changed the role of solid waste strategies in sustainability plans for communities across the US.

- **Projects include work for:** EPA (headquarters and Regions 8, 9, and 10); States of PA, IL, IA, WY, OH, CA, GA; UK’s WRAP; University in Santiago, Chile; Local Government Commission; ICMA; Large NE City; Maui County (HI); GVRD / Metro Vancouver, BC; Snohomish County, WA; Knox County, TN; Anchorage, AK; Sacramento County, CA; Cincinnati, OH; Gilroy, CA; Morgan Hill, CA, Orange County, CA; Berkeley, CA; San Francisco, CA; Ventura, CA; Oak Park, IL; Sunrise, FL; Largo, FL; Ft. Wayne, IN; Victoria, CRD, BC; and many others.

Funding, Incentives, and Rates: Dr. Skumatz has conducted funding options analysis and recommendations work for zero waste, sustainability, solid waste, hazardous waste, energy, and other integrated planning work at the Federal and State level (Colorado, Washington, Iowa, Massachusetts, and Oregon) and for many counties and cities. She has assessed / developed options for funding programs and facilities, capital and operations / maintenance costs from more than 50 different types of sources including legislative initiatives, surcharges and deposits (toxics, landfills, and product stewardship), incentives, fines, rates, bonding, and others. The options include self-funding options that provide incentives (e.g. PAYT, commercial rates, program rates, etc.), and supporting this work, she is a

skilled rates economist with expertise in examining cost of service / revenue requirement and incorporating rate designs that meet incentive, sufficiency, and other goals. She has conducted extensive work on Advanced Disposal Fees (ADFs) and extended producer responsibility (EPR) and their suitability at the local, county, state, and other levels – and has examined options for more than two dozen “problem” or opportunity materials. She has conducted rate studies for solid waste agencies across the US, including detailed work examining reactions to changes in rate structures and incentives associated with residential, commercial, and disposal facility fees and policies. She has evaluated rates, real time pricing, and incentive scenarios (including three sets of state-level regulator-imposed incentive approaches for investor-owned utilities). She has conducted innovative work on this topic across the US and Canada.

- **Selected Clients include:** Colorado CDPHE; Boulder County, CO; Alameda StopWaste, CA; Nashville TN; King County, WA; Seattle, WA; US EPA; State of Massachusetts OEOA; Iowa DNR; Oregon WPLG; Clean Washington Center, WA; Metro Vancouver, BC; Mesa County, CO; Anchorage, AK; Pitkin County, CO; City/County of Denver, CO; San Jose, CA; San Francisco, CA; Santa Barbara, CA; Chandler, AZ, and many other cities / counties / authorities.

Models of Recycling & Composting Collection and Processing Options: Dr. Skumatz has constructed detailed cost models for residential collection, recycling processing (from “dump and pick” to mega automated plants), and composting facilities. The models allow SERA to develop reliable costs for collection and processing of materials, and to run scenarios to assess the relative impacts of integrated options. The models are “real world”, with extensive input and vetting from hauler and the private and public processing industry.

- **Selected Clients include:** Private client, New York City MRF, Colorado CDPHE, Asheville NC, Lethbridge Canada, State of CT, and others.

Social Marketing / Behavioral / Outreach Programs and Evaluation: Dr. Skumatz has written manuals and toolkits on behavioral programs and best practices. She has designed, conducted, and/or evaluated behavioral programs in the solid waste and energy fields. This includes residential programs all across the nation, and additional evaluations of military programs, schools programs, and commercial programs. The work includes multiple social marketing projects, including detailed evaluations with quasi experimental design and detailed tracking of impacts, costs and persistence of effects. In one project, we used our retention work to demonstrate the cost-effectiveness of “cycling” a well-known behavioral program. For a large client in California, we prepared a wide-ranging best practices manual on behavioral programs, addressing methods and results related to measurement and attribution of impacts, and retention of behavior change, state-of-the-art, and gaps. Lisa has conducted detailed work measuring the impact of outreach and education programs, and have examined the impacts attributable to attitudinal and socio-demographic effects, including self-efficacy and other factors.

- **Selected clients include:** Insinkerator, CIEE, Colorado CDPHE, Iowa DNR, Military client, CET, Tompkins County NY, Alliance to Save Energy, and others.

Food and Organics: Dr. Skumatz has conducted assignments in organics including best practices manual and state-of-the-art in food collection programs for EPA, analysis of food recover initiatives in Illinois, feasibility / design / costing studies for yard and food waste collection programs in many communities (Longmont, Arlington County, Anchorage, etc.), and detailed work on best practices for food waste programs in the commercial sector. She has designed and evaluated food waste collection pilot programs. Lisa’s work also includes markets work analyzing the potential for local and regional markets for compost, and the likely end-users and prices. She also conducted work in modeling and costing drop-off and collection programs, and compost processing sites for communities and state plans.

- **Selected clients include:** EPA Region 5, Illinois, State of Colorado, State of Connecticut, Longmont CO, Boulder CO, Arlington County VA, Santa Barbara CA, Chittenden SWMD, King County WA, Boulder County CO, Portland Metro, Anchorage, Mesa County CO, others.

Sustainability, Economic Development, “Green” Jobs, GHG Impacts: Dr. Skumatz has worked to examine the relationship between environmental sustainability, program impacts, costs, and performance. She has conducted work examining the cost-effectiveness of dozens of solid waste and energy initiatives to compare cost per Metric Ton of Carbon Equivalent (MTCE) diverted by various programs, and assessed relative performance on timing, retention, risk, job creation/ economic development, “authority”, funding, and other criteria to assist communities and authorities in crafting strong, well-integrated, implementable sustainability plans. She has brought the case for balanced portfolios to energy and solid waste policy-makers across the US. Some of her work was used by the Obama Transition team. She has helped develop models to measure and compare performance metrics for sustainability initiatives undertaken by communities and programs in California and across the US. Using input-output modeling, Dr. Skumatz and SERA staff have measured the net job creation impact of “green” initiatives including: energy efficiency programs, recycling and organics programs, food waste programs, recycling incentive programs, and other “green jobs” assignments.

- **Selected Clients include:** Colorado CDPHE, EPA, PG&E, Xcel Energy, SDG&E, Boulder County, ACEEE, among others.

Policy Analysis: Dr. Skumatz’s policy work includes development of solid waste strategy at the national level (EPA / PAYT; UK’s WRAP); state level (IA, WA, CO, MA, OR, CA, and others), and sustainability work (for cities and counties in CA, CO, and elsewhere). Dr. Skumatz conducted statistical work to analyze the performance and cost impacts of single stream recycling for clients including AF&PA, Waste Management and private clients, a non-profit, Boulder County CO, Fort Collins CO, and others. She collected data from communities, MRFs and mills, and conducted detailed analyses to identify the tradeoffs, strengths, and weaknesses compared to dual stream programs, Dr. Skumatz helped establish recycling goals and supporting portfolios, policies, and associated funding; worked with stakeholders / task forces / legislators to achieve adoption and buy-in; and provided numerous briefings in association with these assignments. She estimated cost per MTCE for various energy and recycling strategies to guide national and local policy on climate change (used in CO, OR, many cities, and requested by Obama’s Transition Team). She has been a leader in national PAYT policy, and advised the UK (and specifically London) on PAYT. She assessed the performance of California’s AB939 legislation (costs and intended / unintended impacts) and recommended measurement, policy, and other changes. For the State of Colorado (and other states) she developed solid waste policy, measurement, and legislative recommendations, worked on the State’s Task Force to develop legislative policy for electronics waste, and developed a statewide “vision” for solid waste and recycling going into the future. For California, she developed key input for legislation on product stewardship at the State level. For a county in Colorado, she developed revised “green” commercial (and residential) building codes. She has also drafted ordinances and legislation on solid waste initiatives. She has developed sustainability, energy, solid waste, water, and air quality initiatives, policy and funding work at the local level for numerous clients.

- **Selected Clients include:** EPA, UK-WRAP, Colorado CDPHE, Boulder County, consortium of 15 California cities and counties, AF&PA, City of Seattle, Seattle/King County, Steel Recycling Institute, National Soft Drink Association, American Beverage Association, Fort Collins CO, Boulder County CO, SCE, CPUC, CIEE, and many others.

Program Evaluation / Analyses, Impacts, and Data: Lisa's work has focused on evaluation of policy and strategy alternatives in solid waste management. She specializes in bringing specialized evaluation methods, including control groups / experimental design, multivariate statistical approaches, and other methods to provide defensible results and program attribution to her work. Most of her evaluation work is designed to support decision-making (at the community, state, or national level) about the development, design, refinement, and funding of policy and program / strategy options. She has specialized in gathering and analyzing data from "in the field" programs, assessing data from more than 1,000 communities to identify (using statistical models) what works best and in what types of situations. Her publications on quantitative program and policy performance are the most requested articles by the field's trade journals, and her workshops and presentations are highly attended. She has conducted policy work analyzing PAYT, food scraps and organics, zero waste, education and social marketing, electronics waste, recycling legislation, single stream, economic alternatives to flow control, product stewardship and ADFs, funding alternatives, mandates and bans, rate and incentives design (residential, commercial, trash, programs), measurement / tracking alternatives, construction and demolition and wood waste, and many other topics. She has analyzed the incremental diversion and cost associated with more than three dozen recycling, and composting strategies, and used the work to craft best practices and identify "outlier" communities. In both the solid waste and energy fields, Dr. Skumatz has pioneered methods that are now "protocol" in multiple states.

- **Projects include work for:** States of RI, MA, NC, MN, CO; KAB; EPA (federal and Regions 5 and 9); 15 cities / counties in California, Metro Vancouver, BC; Fort Collins CO; Westminster, CO, Boulder, CO; MN SWMCB, Seattle, WA; Porterville, CA; Gainesville, FL; Largo, FL; West Jordan, UT; Portland Metro, OR; Santa Clarita, CA; King County, WA; Akron, OH; Berkeley, CA; Santa Barbara, CA; Austin, TX; associations (NEMA, PSI, APC, NSDA, SRI), CA DTSC, non-profits (Reason Foundation), private clients, and others.

Tonnage Forecasts, Set Outs, and Waste Characterization Analyses: Forecasting: Dr. Skumatz, an economist / econometrician, has been conducting work forecasting solid waste tonnage for rate studies and comprehensive / zero waste plans since 1987. She brought enhanced forecasting techniques from the energy field, demonstrating the improvements that could be provided by using time series other regression approaches with economic drivers. This method supports "what if" scenario analyses based on changes in underlying economic conditions, demographic changes, etc. She has conducted very detailed work of this nature for state and local clients as well as EPA. For several clients, she developed waste-shed forecasts using census block group information and a travel time model to identify tonnage flows to existing and new / potential facilities. For communities without waste information for the C&I side, she also developed a user-friendly model designed to allow the community to "tailor" a commercial / industrial waste composition and tonnage forecast based on their local economic conditions, business employment, and other factors. For simpler projects, she had used traditional methods that engineering firms often rely on, based on per-capita generation or disposal / diversion figures, with growth factors related to population or business or sectoral projections. Waste Compositions and Set Out Surveys: Lisa has also conducted scores of statistical waste characterization studies to gather data on recycling and trash streams constituents, and designed and conducted scores of set out surveys for communities considering solid waste changes. She has conducted residential, commercial, multi-family, and C&D waste sorts, and used the data for program targeting; modeling for new PAYT, organics, or recycling programs; or as part of comprehensive plan assignments. She has used surveys to collect data for hard-to-measure impacts, including behaviors, decision-making, and attribution of changes to programs and educational efforts, and measured the impact of education on behavior changes and program impacts.

- Clients include Seattle WA, Snohomish County WA, Metro Vancouver BC, State of OR, State of MA, and State of CO, Anchorage AK, Pitkin County CO, Boulder CO, Boulder County CO, Tukwila WA, USEPA, and many others.

Surveys, Market Research, and Data Collection: Dr. Skumatz has extensive experience in all phases of detailed survey design, statistics, and analysis for research and program evaluation purposes. She has conducted statistical surveys using random or stratified random approaches to collect data from households, businesses, program agencies, and communities. These surveys have been used to gather data from communities on solid waste programs and facilities, costs, and local information to analyze program options. She has conducted thousands of residential and commercial surveys to gather data on attitudes (including self-efficacy), behaviors, awareness, demographics, willingness-to-pay, program preferences, and other data for solid waste plans. She has conducted in-depth interview work with stakeholders and market actors on market issues, costs, capacity, program and policy strengths and weaknesses, and many other topics. She has conducted and analyzed validation surveys, determining the accuracy and consistency of phone, on-site, and mail surveys for particular types of questions; developed complex sampling designs; and is highly skilled in identification and treatment of survey bias and weighting and imputation methods (including refereed journal paper on the topic). She has conducted statistical and modeling work for solid waste projects, using standard questions and data, as well as more complex analyses like regression analysis, principal components, logit, hazard analyses / measure lifetime analyses, logit modeling from card rankings, and other methods. Recent large-scale statistical surveys include work on the number, types, and lifetimes of mercury-containing thermostats in States around the US in support of goal-setting for industry.

- Clients include Seattle WA, Mecklenburg County NC, Metro Vancouver BC, States of NY / ME / IL / CA / RI, Oregon DEQ, Boulder CO, Boulder County CO, Edgewater CO, Oak Park IL, Anchorage AK, Pitkin County CO, Tukwila WA, and many others.

Market Analyses: Dr. Skumatz has conducted detailed studies of market potential and existing markets for many solid waste streams. This work includes analyses of compost markets and processing capacity (existing, near, and longer-term), food waste processing capacity, markets for C&D materials, and analyses of the markets – traded off with transportation costs – for all common recycled materials. Market impacts from single stream were also assessed. The work involved surveys / interviews with existing market actors, capacity modeling, modeling of market prices and cost / benefit assessment for new or expanding programs.

- Clients include Colorado CDPHE, King County WA, AF&PA, Portland Metro OR, Boulder County CO, Honolulu HI, Chittenden County VT, and others.

HONORS, MEMBERSHIPS, PRESENTATIONS, AND PUBLICATIONS

Dr. Skumatz has received three Lifetime Achievement Awards for her work in solid waste measurement and policy analysis, at the international level (International Solid Waste Association of North America); national level (National Recycling Coalition) and state level (Colorado). She currently or previously has served on the Boards of the National Recycling Coalition (NRC, 12+ years on board), Solid Waste Association of North America (SWANA, Board of Colorado Chapter 2 years); Colorado’s Task Force on Electronics Waste, two state recycling association boards (CO, WA), the Executive Board of the Colorado Municipal League (government), and several county and regional recycling commissions. She was appointed to the “Harvard 2000” panel to identify market-based initiatives for environmental issues. She is a member of several professional energy, economics, and resource economist associations.

Her work has included assignments in most of the 50 states, across Canada, the UK, Japan, Chile, and New Zealand. She has presented papers (including keynotes) on solid waste, sustainability, or energy issues at more than 70 national conferences, 7 international conferences, more than 150 state and regional venues, and numerous academic conferences, and has prepared more than 100 conference papers or white-papers.

Dr. Skumatz has given well over 100 US workshops / webinars for states and agencies. She has more than 125 publications in solid waste (100+ more in energy), including work in peer-reviewed journals (*Waste Management; Solid Waste and Technology*), trade journals (*Resource Recycling, Biocycle*, others) and conference proceedings. She has appeared in the national “popular” press (*Wall Street Journal, New York Times, Consumer Reports, Kiplinger Financial, “Parade Magazine” Sunday newspaper insert*) and TV (*Fox Business News, Good Morning America*), and many local / regional radio stations and newspapers across the US. Dr. Skumatz has been an invited guest lecturer at Yale University, Brown University, Keio University (Tokyo), University of Wisconsin, University of Washington, Denver University, and elsewhere

GARY HORTON

Senior Associated Consultant SERA

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SUMMARY

Gary Horton is a seasoned waste industry executive recently retired from Western Disposal Services, Inc. in Boulder, Colorado. In his various roles with the Company, including Vice President of Finance and President, Mr. Horton managed a private collection firm as it evolved from trash collection only to trash, recyclables and compostable organics collections – and to fully automated trucks and the introduction of a CNG transition. At various times, he has overseen the operation of landfills, the processing of commercial recyclables and the production of compost and other organic materials from organics collected from both residential and commercial sources.



A big believer in cooperation between private business, local government and non-profits in developing comprehensive waste diversion programs, Mr. Horton played a key role in the development of the waste management activities in Boulder County and the cities located within the County.

EDUCATION

B.A., University of Denver, Business Administration

WORK EXPERIENCE

2015- Associated Senior Consultant, SERA, Superior, CO
1980-2015 Western Waste Systems, Boulder, Colorado, various positions including President
1975-1980 La Primo Foods, Denver, CO, Accounting

PROJECT EXPERIENCE HIGHLIGHTS

Mr. Horton began his career in public accountancy where he earned his Certified Public Accountants credentials, although he no longer practices as a CPA, that training laid the groundwork for a keen insight into cost analysis, rate design and operational analysis.

Hauler Ordinances and PAYT: During Mr. Horton’s tenure with Western Disposal, the company helped the City of Boulder and Boulder County design their waste hauler ordinances which required the use of Pay-As-You-Throw rates, the inclusion of free recyclables collection with trash collection and both free and minimal cost pricing models for organics collected from residents. For two SERA project in Fort Collins, CO Mr. Horton contributed and authored white papers on;

- Tonnage and cost estimates for both residential and commercial programs including a recycling ordinance
- PAYT rate incentives

Contracting and Public Engagement: Western Disposal was the successful bidder for the initial implementation of “single-hauler” residential programs in both Louisville and Lafayette, CO. Mr. Horton was one of the presenters in those communities for question and answer meetings with local residents.

Those were contentious meetings but they all resulted in residents feeling that they had been heard and listened to concerning the issue of losing the ability to choose their individual refuse hauler. He has been a valuable contributor to SERA's Westminster project, providing the necessary link between the City Council and multiple haulers in public meetings addressing the potential change to PAYT and a single contracted hauler.

Collection and Facilities Expertise & Modeling: Mr. Horton has an understanding of facilities of collections not only from a hauling and operational standpoint, but as a CPA that understands the cost intricacies needing for effective modeling work. With SERA, this work has included collection cost modeling for both residential and commercial sectors and for multiple streams- trash, recycling, and organics. Gary has developed detailed models of MRF processing, residential and commercial collection services, and organics processing. He recently completed work developing cost models for collection and processing for the Colorado State Integrated Materials Management Plan.

Sustainability Innovations: During his tenure at Western Disposal he oversaw the progression from manual trash collection to fully automated trucks and the introduction of a CNG transition as well as use of technology to reduce the number of route vehicle miles traveled by the truck. He can be credited with creating the first Class II composting facility in Boulder County and to reduce the company's power consumption for the operations building, the largest solar awning in the state.

Public Policy: In addition to his activities in Boulder County, Mr. Horton served on the Board of Directors of the Colorado Association for Recycling for six years and served for five years on the Assistance Committee to the Pollution Prevention Advisory Board to the Colorado Department of Health and the Environment. That committee is charged with distributing money collected by the State of Colorado through Landfill rate surcharges to worthwhile recycling, composting and other waste diversion projects throughout the State of Colorado. The City of Boulder "trash" tax was developed and implemented with active participation from Mr. Horton. Mr. Horton also served on the board of the Boulder County Recycling and Composting Authority for many years.

He has worked on a number of projects with SERA, including:

- Westminster municipal collection costs and efficiencies / options model
- Lethbridge recycling collection and service procurement optimization
- Connecticut Solid Waste Management Plan
- Colorado CDPHE Integrated Materials Management Plan
- PAYT options in Asheville NC
- MRF cost and operations options for private client
- And other assignments.

PUBLICATIONS- AWARDS

Mr. Horton has written publications on PAYT, composting collection and processing (in Resource Recycling) and others. In 2014, he received a Lifetime Achievement Award from Colorado Association for Recycling for his work in waste reduction.

DANA D'SOUZA

Senior Analyst and Project Manager, SERA

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SUMMARY

Ms. D'Souza is our senior research analyst with SERA, Inc. and has conducted research on nearly every aspect of solid waste and recycling systems. Most recently she has worked on projects that include statewide integrated solid waste and diversion planning, commercial material recycling data collection and analysis, organics program research including hands on measurement, and a multistate project to help states estimate the outflow of hard to recycle materials. On dozens of projects, she has conducted detailed surveys or interviews with participants, non-participants, stakeholders, program staff and others to identify program impacts, successful designs, costs, and "best practices".



She has conducted both quantitative surveys and detailed case study research for state, city / county, and national business clients. She is a skilled interviewer, with excellent capabilities obtaining cooperation with participants and non-participants alike for a wide range of program evaluation projects. She has successfully interviewed an array of stakeholders – households, commercial businesses, cities and state contacts, and others -- for residential and commercial programs in California, Minnesota, Colorado, and across the nation. Her strengths include an understanding of how the information will be used, which helps make sure she conducts appropriate follow-up on complex analytical issues.

EDUCATION

1991 **B.A. International Business**, San Diego State University
Emphasis: Business- (Accounting, Finance, Marketing, Management); European Studies; French

WORK EXPERIENCE

2008-present **SERA**, Senior Energy Consultant and Project Manager
2010-2014 **Econservation Institute**, Superior, CO- Grant Compliance- Financial & Contractual Compliance
2004-2010 **Board of Trustees**, Town of Superior, CO – Approval / Oversight of Municipal and Utility Funds, Budgets & Departmental Planning, Land Purchases, Contracts, Community Programs, Capital Investment Projects, and Housing and Facility Development Planning.
1998-1999 **Roche Pharmaceuticals**, Boulder, CO- Accounting assistant- Capital Projects
1991 **National Pen Corporation**, San Diego, CA- Accounts Receivable for national sales
1990 **International Trade Administration**, San Diego, CA- Financial Trade Internship- International Letters of Credit

PROJECT EXPERIENCE HIGHLIGHTS

Projects: 2017- Westminster PAYT & Contracting, Island County SW Rates, KAB Public Space Recycling, CDPHE Materials Market, NYC Variable Rates; 2016- Illinois Compost Market Analysis with Economic and Job Impacts, Colorado Integrated Solid Waste Management Plan, Dakota County, MN Commercial Diversion Programs; 2015/2016; Longmont, CO PAYT and Organics; Lethbridge, CAN; USDN Commercial Toolkit;

Ms. D'Souza gathered and analyzed information about community solid waste practices, including their solid waste management plans and goals, business programs, cost of services, and contracts. Both businesses and haulers were interviewed to understand the cost implications of current systems and potential opportunities. In addition, she crafted case studies with the same information of comparable communities and best practices for commercial diversion programs. SERA developed various options for communities to increase diversion through changing collection frequencies, adding recycling, and composting programs, or introducing best practices and options for businesses and municipalities. We modeled the financial impacts, funding mechanisms, and viability of the different scenarios. This included proposing rates, working with local recycling committees and creating presentations for stakeholders and city councils.

For a national association, Ms. D'Souza gathered hard to find information on the recycling stream of the commercial sector. Ms. D'Souza interviewed public and privately owned MRFs collecting data on material flow and cost of material processing. She reached out to a wide number of communities in an effort to gather detailed recycled material data and program costs. In conjunction, she reviewed our community and solid waste program specific database, updating information for a large number of comparisons communities used for this project.

Solid Waste and Sustainability Initiatives

Ms. D'Souza has conducted program review, case study, and benchmarking interviews with solid waste program staff across the country, including data on program design, costs, infrastructure, and diversion. She has collected data on the wide variety of recycling and solid waste programs across the US – including recycling, yard waste, source reduction, electronics, single stream recycling, education / outreach programs, and others. These data have been used to identify cutting edge programs and provide key data on the factors affecting program performance

- *Illinois:* Ms. D'Souza was project lead for this study encompassing the organics and composting industry in the State of Illinois. Data was collected from existing reports and from interviews to facilities, policy experts, end-users, and material collectors and processors. Current and potential generation and capacity were calculated for program and policy recommendations. SERA also developed and input/output model scenario for job creation and impacts from increase organics diversion and estimated GHG reduction based on scenario recommendations, which required gathering costs on facilities, processing, and material sales. This study included a focus on the sustainable foods market, agricultural, and state highway projects for end use markets.
- *PAYT Community "Count":* For a project for EPA Region 9, Ms. D'Souza is heading the effort to conduct an update to the "count" of PAYT communities in North America including examining and qualifying the rate structure for the various programs. She has conducted interviews with environmental staff and recycling association staff from scores of states across the US, and has collected data (by interview or email) from hundreds of city and county solid waste officials across the US. Recently, she completed in-depth reviews of targeted states gathering specific price

differentials and cart sizes, and availability of additional diversion programs. We are expanding this to cover additional states.

- *Lethbridge*: This Canadian Community was interested in establishing a curbside recycling program and determining the feasibility of an in-house or contracted program. Ms. D'Souza interviewed numerous communities and haulers around North America to understand cost effectiveness of programming options, routing procedures and costs, equipment and staffing and rate setting requirements and diversion results. This was incorporated into a model for collection costs and integrated decision making for programming type and location- urban vs. rural.
- *Three Colorado CDPH&E Statewide Projects- Integrated SW Materials Management Plan; Colorado Roadmap; Colorado Visioning Project*: These were three separate projects over multiple years that identified waste, diversion, and recycling from a statewide and regional perspective. Ms. D'Souza gathered data at the community level including program collection and operating cost, rate structures and local tips fees to determine the variety of ways in which recycling had been implemented, and remaining gaps and opportunities for recycling in the State. She interviewed owners / operators of Hub & Spoke programs for understanding of the complexities and costs implications of this style operation in the state as well as material brokers to determine availability of end markets and material values. She also conducted detailed interviews with state solid waste officials in three other "leading" recycling states (Oregon, California, and Iowa) to identify lessons useful in moving recycling forward in Colorado. In addition, Ms. D'Souza was responsible for logistics and organization tasks for these statewide projects where SERA conducted, most recently, ten stakeholder meetings to craft the "future vision of recycling in Colorado". She identified and assessed possible locations and catering, and organized registration and other support assignments. The project outcomes will be used to help set goals for statewide recycling, identify infrastructure / program / legislative needs for use by state CDPHE staff, and to reformat / reprioritize targets for the statewide recycling grants program. The projects used "Appreciative Inquiry" methods at the stakeholder meetings to identify a shared "vision" for a sustainable future in recycling for Colorado.
- *SWMCB- For two projects* for this board regarding commercial solid waste practices, Ms. D'Souza gathered data through interviews, web research, and surveys for commercial invoicing practices, tonnage estimates, program and regulatory options, grant programs and costs for outreach, and best practices. This was used to develop recommendations for commercial recycling and organics diversion program strategies.
- *EPA Region 5 Best Practices in Food Waste Programs*: Ms. D'Souza was responsible for a literature review to identify food waste diversion programs around the country, and for conducting follow-up interviews with community food waste program staff to gather data on the design, cost, and impacts of residential and commercial food waste collection programs around the nation. The project, conducted for EPA, was designed to identify "best practices" in these programs, for small and large, urban and rural communities. The project ultimately developed a "toolkit", website, and report on successful food waste program design and implementation.
- *Commercial Recycling Toolkit USDN*: Ms. D'Souza gathered data through web surveys, literature review and detailed interviews with engineers, city supervisors, haulers, and program managers regarding commercial solid waste programs and systems in major cities around the nation. She gathered data on programs, policies, tonnage, facilities, costs, rate structures, tip fees, and other factors to provide a comprehensive picture of national commercial programs. She coordinated and wrote a "how to" guide / description of the multitudes of programs available and their applicability and impact for various sizes and types of communities and detailed case studies from a variety of communities and types of programs including budget/cost implications for communities of various sizes and situations. With this information, SERA also statistically analyzed the patterns of presence

and types of programs by community characteristics prepared a user-friendly scenario analysis model that allows cities to receive information suitable commercial programs for their community and case studies, tailored for their community.

- *Community / Hauler / Business Benchmarking Interviews:* For projects in several communities, Ms. D'Souza conducted interviews with City staff, businesses, haulers, or others to identify current programs, rates / fees, costs, and diversion performance. These data were used for benchmarking / comparisons to client communities, and to identify feasible programs to address service "gaps" in options for client communities across Colorado.
 - *Similar work for Edgewater, Boulder County, Superior, Mesa County, Pitkin County, Loveland, Longmont*
- *Commercial Alleys Program:* In this project, Ms. D'Souza conducted more than 100 surveys with businesses and households in the client city to gather information on their perceptions of the "hard" and "soft" impacts of the City's innovative program to remove dumpsters from the alleys in the downtown core. These surveys covered issues including household/ business bill changes, changes in recycling, safety, alley access, cost of services, and other effects. She also conducted detailed interviews with a dozen "stakeholders" with a role in the program to gather information on their roles and responsibilities, program strengths and weaknesses, and impacts. The project showed that the program had an impact on bills that was offset by a 5-10 times increase in benefits to direct residents and businesses, and a similarly positive impact on tourists.
- *5 Projects: Business & Household Interviews:* Ms. D'Souza conducted interviews with businesses and households in the communities of Anchorage, Pitkin County, Mesa County, and City of Westminster to gather data on current recycling / waste behaviors, gaps and barriers, preferences among proposed program options, willingness-to-pay, and other topics. These data were used to craft a comprehensive plan for the community, developing a portfolio of practical programs and incentives to increase recycling in the community.
 - *Similar work for Anchorage, Pitkin County (CO), Mesa County (CO), Westminster (CO), Edgewater (CO), Dakota County, MN*
- *Advanced Deposit Fees (ADF) – Product Stewardship & Funding:* Ms. D'Souza gathered data on communities across the US and Canada that had ADF and extended product responsibility programs. As a second phase of the project, she contacted cities, associations, and reviewed the literature to gather data on the demand (dollar and units), and demand elasticities associated with 12 commodities targeted for possible ADFs, including toxics, packaging, single use bags, pesticides, cigarettes, fast food packaging, extended bottle bill items, and others.
- *Mandatory Recycling and Recycling Ban Options.* For clients in California and Canada, Ms. D'Souza interviewed program managers across the nation on mandatory commercial and residential recycling programs, and on a variety of material bans to identify effects, successful program design options, costs, and enforcement strategies for mandatory programs and bans.
- *Community Solid Waste Program Inventory / Analysis.* Ms. D'Souza conducted detailed interviews with engineers, city supervisors, and program managers regarding solid waste, recycling, yard waste, source reduction, and diversion program and systems in major cities around the nation. She gathered data on programs, policies, tonnage, facilities, costs, and other factors to provide a comprehensive picture of the solid waste system in the community. These data were used to help identify patterns in performance, produce benchmarking figures, and identify communities with "cutting edge" programs and policies.

- *Set Out Surveys and Waste Composition Analysis.* Ms. D'Souza conducted set out surveys / measurement of residential disposal, recycling, and yard waste, and sorted samples of waste and recycling to estimate refuse and recycling participation of households in several communities in Colorado. Tasks included collection and analysis of solid waste, recycling, and yard waste data from a sample of households in the area.
- *The Broadlands Project: Measuring the Diversion and Cost Impacts of Social Marketing.* The Broadlands Project, designed and implemented by SERA under a grant, used an experimental design to measure the impacts and cost effectiveness of community based social marketing on recycling and energy efficiency behaviors. The project included the use of social norms, new media, incentives, recognition, and multiple other outreach and education tools to increase the adoption of recycling and energy saving actions in a neighborhood of around 1,600 HHs in Colorado. Ms. D'Souza was responsible for literature review (identifying / helping adapt suitable intervention options), baseline measurement efforts (behavioral surveys and weights), delivery of social marketing efforts (posters as well as door-knocking and personal education / "commitment" efforts, and phone calls), and on-going performance measurement (weights and tracking). The project tracked retention of behaviors over an 18-month period, and developed a toolkit of outreach and education best management practices as well as a detailed evaluation of the participation and actions taken, impacts per dollar spent, the GHG avoidance, and job creation estimates.
- *Social Marketing: Impacts on Recycling.* For this analysis, Ms. D'Souza looked into various forms of social media in current use by communities for outreach and education and if they could see measurable impact on recycling or recycling behavior and whether this was a cost-effective tool. She interviewed major metropolitan communities in multiple states, companies that provide this service, and researched "aps" and mediums specifically used for recycling and the financial implications for community programs.
- *Social Marketing Evaluation of Military Conservation Behaviors:* This project involved behaviors in energy and water conservation, as well as recycling behavior. Ms. D'Souza conducted program evaluation interviews for a program implemented in military installations in a state. The interviews addressed program awareness and attitudes, behaviors and changes, and other topics used in the evaluation of the program. She also assessed the numbers of proposed behaviors and gave recommendations on project implementation.
- *Curb Your Carbon/Cool the Earth.* The Cool the Earth program is a ready-to-run program for K-8 students to educate students and their families about climate change and actions they can take to reduce their impacts. Ms. D'Souza was responsible for collecting information about environmental "equivalencies" to allow translation of survey results to GHG reductions and progress toward program goals. The report included details on program impacts and recommendations for program delivery and evaluation in subsequent years.
- *Social Marketing-The Broadlands Project:* For this grant project, SERA designed and implemented an experimental design to measure the impacts and cost effectiveness of community based social marketing on energy efficiency and recycling behaviors. Control routes were identified through coordination with the local hauler. The project included the use of social norms, new media, incentives, recognition, and multiple other outreach and education tools to increase the adoption of recycling and energy saving actions in a neighborhood of around 1,600 HHs in Colorado. Ms. D'Souza was responsible for literature review (identifying / helping adapt suitable intervention options), baseline measurement efforts (behavioral surveys and weights), delivery and design input of social marketing efforts (posters as well as door-knocking and personal education / "commitment" efforts,

and phone calls), and on-going performance measurement (weights and tracking). The project found significant impacts in energy efficiency and recycling, measured retention of behaviors, and tracked a variety of cost-effectiveness metrics. The project also developed a toolkit of outreach and education best management practices. Ms D'Souza led or assisted on most of these activities on the project including focus groups and project coordination.

PUBLICATIONS, PRESENTATIONS, AND VOLUNTEER

Ms. D'Souza has given presentations and poster sessions on her energy, recycling, social media / marketing, and sustainability work at conferences including the SWANA B.C, and US National & Regional SWANA conference, Behavioral Energy (BECC) conference, Colorado Association for Recycling, and National AESP, and ACEEE conferences. Publications include articles in trade journals such as Resource Recycling.

VOLUNTEER

2008-2010 Representative to Denver Regional Council of Governments- Oversight/ Approval federal funding dispersal to regional programs including water utility, ageing programs, and highway/ transportation projects.

2006–2013 Open Space Advisory Committee Town of Superior; Vice Chair 2012; Chair 2013
Worked on developing Town of Superior's Open Space Advisory Document and Best Practices
Coordinated with other local and county Boards; Served as advisory role to Town Board with purchases and uses of non-developed land for Open Space

MICHAEL SANTULLI

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SUMMARY

Mr. Santulli is a quantitative analyst with SERA. While with SERA he has developed Excel models to analyze stakeholder information from Colorado sub-regions to support work on the State's Comprehensive Materials Management Plan. He leads SERA's work on job creation computations, providing input-output model expertise for assessing the job and economic development effects of recycling, organics / food, and energy projects at the county, state, and national level. He conducted this work for a food waste program in Illinois, and other projects. He conducted PAYT surveys around the country, including work with the largest communities in the US. He conducted case study work on PAYT, opt-in and opt-out yard waste and food scraps programs, and urban vs. rural / private vs. public collection efficiencies and performance statistics. Mr. Santulli programs and analyzes SERA's "clicker" presentations used for our Appreciative Inquiry stakeholder meetings.



EDUCATION

- 2015 B.A. Environmental Studies, Sustainable Development Specialization
University of Colorado, Boulder
- 2016 Certification LEED Green Associate, US Green Building Council

WORK EXPERIENCE

- 2015-Present **Research Consultant**, SERA, Superior, CO
- 2015-2015 **Research Assistant**, CU Environmental Center, Boulder, CO
- 2014-2015 **Marketing and Sustainability Intern**, iLaunch, Spark, Boulder, CO
- Other: 2016, Volunteer, Business Sustainability Intern, Boulder county Public Health

PROJECT EXPERIENCE HIGHLIGHTS

- *Dakota County, MN Analysis of Commercial Recycling and Organics Diversion:* In this project, Mr. Santulli performed data analysis to provide the client with useful metrics for assessing the state of their waste management programming. Calculations included average generation for different business types and sizes (by both employee count and square footage). He used GIS software to map various material flows out of the metropolitan area. He also performed primary research to assess the strength of the financial/technical assistance available to business in the five-county area for pursuing improved diversion programs.
- *CDPHE Statewide Comprehensive Solid Waste Plan, CO:* For this project, Mr. Santulli gathered data on current needs, gaps, support/cooperation and funding opportunities for each region in Colorado. After gaining insights on each region he worked with Lisa Skumatz to draft initial state recommendations. He helped to facilitate stakeholder meetings by programming the "clicker" stakeholder response presentation and analyzed both the qualitative and quantitative data gathered at these meetings.

- *Illinois:* Mr. Santulli was the lead input-output modeler for this study encompassing the organics and composting industry as it relates to the sustainable food industry in the State of Illinois. Data was gathered from existing reports and interviews to facilities, policy experts, end-users, and material collectors and processors. The input-output model was designed to project job creation and other economic impacts from increased organics diversion and also estimate GHG reduction based on scenario recommendations. This study included a focus on the sustainable foods market, agricultural, and state highway projects for end use markets.
- *Rate Analysis-Island County, WA:* Mr. Santulli gathered data on MSW, recycling, yard waste, special wastes, and wood wastes tonnages, costs, revenues, and fees from different solid waste facilities and municipalities in the County. He also performed calculations for primary analysis.
- *American Forest and Paper, Assoc. Identification and Characterization of High / Low Performing Residential and Commercial Recycling Programs:* In this project, Mr. Santulli surveyed and interviewed communities with high / low recycling access and performance across the US. He performed the primary data analysis, identifying national and regional trends in both recycling and organics diversion programs.
- *Asheville, NC PAYT and Recycling Assistance:* As a new-comer to SERA, Mr. Santulli helped to analyze the data, and finalize the report.

PRESENTATIONS AND PUBLICATIONS

Mr. Santulli has presented locally at Colorado's Recycling Association and nationally at AESP and EEDAL. He has assisted authorship on numerous papers including those on market saturation.