David Vaughn

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CAREER STATEMENT

David is a Professor of Practice within Clemson University's Glenn Department of Civil Engineering, the Founder and Owner of Integrated Resilience, LLC, he is a former Fluor Fellow, Director of Resilience Solutions, and Secretariat of the World Economic Forum – Disaster Resource Partnership (WEF DRP). He founded and spearheaded development of Fluor's Business Continuity and Disaster Management Services which helped Clients build resilience by mitigating risk to natural disasters.

He has more than 25 years of project management experience in diverse industries, including pharmaceuticals, chemicals, oil and gas, steel mills, microelectronics, water treatment, and contingency operations. His experience in rapid deployment, planning, disaster management, and reconstruction is a culmination of his work in support of the U.S. Army Sustainment Command, FEMA, and various private sector companies.

David's passion for his profession is demonstrated by his personal commitment to a number of humanitarian projects, including:

- Serving as a vice co-chair for The Infrastructure Security Partnership to implement strategies that help economically challenged build resilience.
- Volunteering as the Project Manager as part of the Haiti Relief effort for the Episcopal Diocese of Upper South Carolina (EDUSC).
- Mentoring Clemson Engineers for Developing Countries students who are assisting the economically challenged people of Haiti. Under his guidance, this team received awards in 2014 from the Institute of International Education and in 2010 from the university and the State of South Carolina for their work.
- In honor of his support for engineering students who are changing the world, David was awarded the 2012 Martin Luther King Jr. Excellence in Service Award and the 2014 Distinguished Service Award from Clemson University.

EXTRACURRICULAR ACTIVITIES

Panelist – Community Resilience Panel
National Institute of Science and Technology (NIST) – Community Resilience Program
September 2015 to Present
As a Community Resilience Panelist he will be working to improve the disaster resilience and economic stability of communities and the supply chains they depend upon. This will be accomplished through the identification of current best practice methodologies, using all-hazards and economic development approaches to inventory, assess, manage, and reduce long-term risk; all in support of the objectives of the NIST Community Resilience Program which is working to connect and engage community and infrastructure-sector stakeholders at all levels to identify policy and standards-related gaps and barriers and to propose innovative solutions to improve community resilience, and develop and maintain a central repository for guidance documents, tools and reference materials to support community resilience planning and implementation.

Project Manager
Episcopal Diocese of Upper South Carolina (EDUSC) – World Mission Committee
December 2009 to Present
David currently serves on the Executive Committee of the EDUSC World Mission Committee, in this role his mission is to promote sustainable projects in the Central Plateau of Haiti and to execute these project in an ethical and transparent manner. He also serves as the Project Manager / Engineer over all projects funded by EDUSC's World Mission Committee, this included a $1.2MM water project and various other projects in Cange, Haiti where he was responsible for overall project success.

In December of 2009, he became involved with the project and by August of 2010 was named as the Project Manager / Engineer. Concurrently, he formalized a relationship with CEDC. His duties included coordination with several NGOs such as PIH / Zanmi Lasante and other universities. He also perform oversight of engineering, procurement and construction activities in support of the water system, which included a dam, penstock, pump house, pump systems, transmission lines, filtration, treatment, cisterns, a distribution system, and fountains. On an ongoing basis he oversaw the CEDC Interns via email, weekly conference calls and through his travels to Cange (~4 times/year). The CEDC Interns oversaw the installation by locals, ensure engineering and construction standards meet International Building Code (IBC) and managed projects to ensure cost and schedule certainty. The system is currently delivering ~100 gpm of water that is filtered, sterilized with UV and chlorinated. Locals have been trained to perform O&M and testing on the system which is monitored by the Interns. Beyond the work in Cange, the infrastructure projects are expanding into remote villages through the installation of wells, latrines, bio-digesters and work with village leaders to develop a means of cooperative governance.

Vice Co-Chair of the Operationalizing and Functional Resilience Subcommittee
The Infrastructure Security Partnership (TISP)
June 2014 to Present
As the vice co-chair, David is working to create an executable plan that will operationalize resilience in a community / region by engaging all sectors leveraging a standardized framework. This approach will leverage a common language, a baseline through vulnerability assessments that will create a prioritized action plan with metrics that allows measurement of progress over time and will reduce lifecycle risk / cost over time.

Industry Advisor/ Professor of Practice
Clemson University – Clemson Engineers for Developing Countries (CEDC)
August 2010 to September 2015
As a volunteer, his primarily role is to mentor a class of students with Clemson Engineers for Developing Countries (CEDC) who dedicate their efforts to assisting the people of Haiti, he has been engaging the students since December 2009. In 2010, CEDC received the "Commission of Higher Education Service Learning Award" presented by Clemson University, later that year they became the recipient of the "Service Learning Award" presented by the State of South Carolina and in January 2014 they won the 2014 Andrew Heiskell Award for Innovation in International Education under the category of Study Abroad.

Since its inception, the class has grown from 7 to nearly 100 students and expanded to over 30 departments with 4 full-time interns in Cange, Haiti. The standard classroom environment was redesigned to operate like a corporation with functions including program management, marketing, accounting, current operations and IT.

CEDC engages local communities in the Cange area with three mission pillars, including Education, Civil Infrastructure and Economic Development. They designed and installed a chlorinated municipal water system in Cange which happens to be first in the country of Haiti. Other projects include: sanitation solution via bio-digester technology, working with local CMU factories to create ASTM quality block, working with local villages to establish governance, and various other projects.

The program has been acknowledged as a pace setter in the April 2012 edition of Leadership and Management in Engineering – "Fulfilling Engineering Program Objectives through Service Learning Campaigns in Developing Countries" (http://ascelibrary.org/doi/abs/10.1061/(ASCE)LM.1943-5630.0000164) by achieving the outcome areas as define in the ASCE (2008) "Civil Engineering Body of Knowledge for the 21st Century". Furthermore, the CEDC program has created a methodology that supports vertical integration, translational education and translational research which offers value to the students, the populations served, the funding partners, the University and the prospective employers – a true win/win/win/win/win scenario.

Panelist - Private Sector Representative
UN OCHA – ECOSOC – Humanitarian Affairs Segment – Interoperability
June 2014
Interoperability has its roots in information technology, with the original aim to make computer systems compatible through standardized protocols and common interfaces. Concepts of interoperability have also been applied in other areas, such as the military, to allow joint operations of troops from different countries and cultural backgrounds (e.g. NATO). In disaster response and humanitarian relief, interoperability is increasingly recognized as a way to ensure efficient coordination and cooperation among various actors from affected countries, regional and international organizations and a vast variety of bilateral responders. Interoperability requires participating actors to have at least a minimal level of harmonization of strategies, policies, doctrines and structures, and a willingness to work together to achieve and maintain shared interests against common objectives.

HONORS AND AWARDS

Distinguished Service Award
Clemson University - Glenn Department of Civil Engineering
April 2014
The Glenn Department of Civil Engineering at Clemson University presented the Distinguished Service Award to David Vaughn for his vision, dedication, leadership, passion, and service to the Department, University, and Profession through his contributions to Clemson Engineers for Developing Countries that continues to create global impact in the lives of others.

Andrew Heiskell Award for Innovation in International Education: Study Abroad
Institute of International Education
February 2014
The Clemson Engineers for Developing Countries (CEDC) Haiti Initiative is an innovative student-directed program that began as an applied engineering program, but now also integrates civic engagement and extends across disciplines to improve the quality of life and work towards a sustainable future for the village of Cange in Haiti's Central Plateau.

Secretariat
World Economic Forum – Disaster Resource Partnership
March 2014
The World Economic Forum - Disaster Resource Partnership (WEF - DRP) is an international alliance of Engineering & Construction (E&C) Community companies. Its objective is to develop a cross-sector, professional, and accountable humanitarian response to disasters that has the ability to scale up to meet growing demands. The Secretariat provides overall coordination and global support to the National and International Services networks.

Fluor Fellow
Fluor Enterprises
July 2013
The Fluor Fellows Program has a robust nomination and certification process to ensure individuals are experts in their field of work and are recognized across the company. Fluor's Project Execution Services Technical Review Board admired the business value David brought to Fluor and was please to approve his nomination.

2012 Martin Luther King, Jr. Excellence in Service Award
Clemson University
January 2012
David was recognized as the community member recipient of this award. He is the director of contingency operation for Fluor Corp. He has given his time to the Clemson Engineers for Developing Countries as an

adviser and mentor to the members, who are working to improve the infrastructure and living conditions in Haiti. David spent 30 hours a week assisting students who are working on the project. He has also taken numerous trips to Haiti to help with the students' projects to design and build water-delivery systems to rural residents.

SIGNIFICANT PROFESSIONAL EXPERIENCE:

Clemson University, Glenn Department of Civil Engineering [September 2015 to Present]

Professor of Practice; Clemson, SC [September 2015 to Present]

Bridging from his role as a volunteer, Clemson has engaged David to institutionalize his role as a mentor to the students of Clemson Engineers for Developing Countries (CEDC) with the intent of expanding their impact within the university and the world.

Integrated Resilience, LLC; Central, South Carolina [December 2014 to Present]

After being afforded the ability to broaden his horizons, he took the opportunity to expand his influence in the realm of resilience by officially establishing Integrated Resilience, LLC. The service offering is a full spectrum pre and post-event risk management solution. These services include site-specific multi-hazard modeling and assessments, multidimensional vulnerability assessments, preventative action plans, recovery plans, tabletop exercises, public/private integration, insurance coordination and comprehensive recovery services. These services help build resilience against business interruption, internal process disruptions, single points of failure and to reduce global supply chain concerns.

Beyond the business focused offering; strategies and tools have been developed to build Community Resilience. These tools include multi-sector alignment, resilience building tools, knowledge of infrastructure development and post-event recovery plans. These tools and plans leverage a development strategy based upon a resilient engineering framework that focuses on process and outcome driven accountability.

Fluor Corporation; Greenville, South Carolina [June 1999 to December 2014]

Fluor Fellow and Director of Resilience Solutions; Greenville, SC (July 2011 to December 2014)

As the Director of Resilience Solutions he developed services that address the needs of the private and public sectors in both developed and developing countries. These services are comprised of two main components:

- Business Continuity and Disaster Management Solutions (BCDMS) was developed as a full spectrum of pre- and post-event risk management solutions that increases resilience against business / service interruption. To address clients' needs, he developed cost-effective approaches to prepare for and mitigate disasters, and, when catastrophe does strike, he developed a methodology to respond rapidly to help clients recover operations quickly.

- Efficient National Development Using Resilient Engineering (ENDURE) was developed at the behest of the USACE to reduce risk while building capability and capacity in developing regions of the world. This program was built on the foundation of BCDMS, expedited infrastructure projects and expedited post-event recovery services. This "systems" based approach to national development strategy through resilient engineering includes a framework for process focused, outcome driven accountability.

He is experienced with the nuances of working in developing countries and understands the importance of developing a strong infrastructure to support a growing economy, ultimately building a sustainable and resilient nation.

Functional Director of Quality for Contingency Operations; Greenville, SC (July 2009 to July 2011)

Responsible for Quality Assurance and Quality Control aspects on all Contingency Operations and Support projects (i.e. Logistics Civil Augmentation Program (LOGCAP), Global Contingency Construction (GCC), Federal Emergency Management Agency (FEMA), CETAC, World Wide Power (WWP), etc.). Establishment of a Quality Management System that includes: development of Quality Control Plans, Site Quality Manual and Standard Operating Procedures; preparation of reports on non-conformances and corrective actions; development of orientation programs for personnel; development of training and certification program for QA personnel; preparation of charts and metrics showing the status and progress of non-conformances and corrective actions; preparing presentations for various Clients; and establishment of the QA records management program.

Lead several initiatives which included the development of SOPs, DTGs, and process flow maps with instructions to enable consistent delivery of a function or service. He oversaw the development of Quality Control Plans (QCPs) for multiple programs that met the contractual requirements and were "fit for purpose". He pioneered the Joint Assessment Project which was a new initiative that engaged the Functions and Quality in assessing the processes and procedures; identify gaps and risks; and develop Corrective Action Plans to address the gaps and mitigate risk.

FGG Contingency Operations – Planning & Readiness; Greenville, SC (June 2005 to Dec. 2009)

Contingency Operations – Project Manager / Planning Lead

- Planning – Ensures success on current and potential operations. Planning templates were created to ensure consistency across all mobilizations which reduced risk and expedited operations. These planning models were developed as a hybrid between "War College" methodology and Fluor Corporate systems; this approach coupled two successful platforms that were then "fit for purpose".
- GIS (Geographical Informational Systems) – Initiated the use of GIS within FGG in support of planning and operational efforts. Successfully demonstrated how datasets such as damage assessments, demographics, logistical information and disaster / operation specific information could be overlaid on maps thus improving operational planning. For larger mobilizations, GIS was integrated into the operations thereby gaining efficiency.
- Disaster Planning – Pre / post disaster planning approaches were developed that utilized datasets ranging from vulnerability assessments, calculated damage assessments via HAZUS, Remote Sensing (pre vs post event aerial photography), housing stock assessments, PDAs (Preliminary Damage Assessments), DDAs (Detailed Damage Assessments), demographics and codes / permits for the affected areas. All elements are applied to a planning model which will define scope, quantity and geographic locations; once the "Need" has been determined then "Resources" can be located and applied. The strategies can be implemented based upon the best fit for the area which is determined by available funding, materials / equipment that is locally available, skill sets of the local population and whether the strategy will support a transitional community concept.

Contingency Operations – Rapid Deployment Lead

- Developed programs that would expedite start-up of projects around the world. The rapid deployment plans included execution plans, Fly-Away Kits, communication systems, and strategies to successfully mobilize projects anywhere on the globe. Additional duties included planning operations of several worldwide projects including Afghanistan, Kuwait, Iraq and Romania.
- Facilitated tabletop and scenario based exercises between contingency operation PMOs and functional leads to address current project resource constraints and to identify actions required to support rapid mobilization efforts.

Manufacturing and Life Sciences; Greenville, SC [June1999 to May 2005]

- Project Manager for both Micro-Electronics and Pharmaceutical projects from inception through turn-over. Duties included the oversight of establishing and managing a robust Safety Program; design / constructability reviews; project estimating, scheduling; scope development, drafting of the Project Execution Plan and the Project Procedures Manual; data and document management; establishing and managing to the project baseline, procurement and subcontract acquisitions; factory acceptance testing; subcontract management; overall field execution; developed and executed an earned value system; managed cash flow; project controls and reporting; established and managed Quality Assurance Programs; and commissioning / turn-over of the projects to the Client.

PROJECT EXPERIENCE:

ASC (US Army Sustainment Command) – LOGCAP IV (Logistics Civil Augmentation Program); Southern Afghanistan Expansion – Kandahar (KAF), Afghanistan. Chief Engineer / Field Operational Support Manager acting as the single point of contact for the FET (Facility Engineering Teams) in support of the simultaneous engineering and construction of eight FOBs located in Southern Afghanistan. Assisted in the development of a standardized change management, SOW development and competitive bidding processes. Lead weekly LOGCAP coordination meetings with Fluor, DCMA and USFORA. Facilitated all land acquisitions for KAF through the coordination, development and delivery of presentation to COMKAF (NATO) to gain approval for the installation of all Fluor facilities. Supported the engineering, construction, quality and O&M efforts that included site work; food service; billeting; potable water; waste water; fuel; power production and distribution; laundry service; environmental; and pest control. [2008 to 2009]

ASC (US Army Sustainment Command) – LOGCAP IV (Logistics Civil Augmentation Program); Afghan Expansion Project – Various locations in Afghanistan. Project Manager / Operational Support Manager (Home Office) supporting the LOGCAP team in the development of the PEP (Project Execution Plan), PPM (Project Procedure Manual), and SOPs (Standard Operating Procedures) for each PWS element in support of four RDTs (Rapid Deployment Teams) who were constructing twelve FOBs (Forward Operating Bases) across Afghanistan in support of the troop surge. [2008]

FEMA – Formaldehyde Testing Program; Selma, Alabama; Cumberland, Maryland & Hope, Arkansas. Project Manager / Field Operations Manager. Performed initial planning efforts for the Formaldehyde Testing Program which was conducted at three different THU (Temporary Housing Unit) staging yards. Led the mobilization of management teams and contractors to each work location, all teams deployed within 24 hrs of NTP to start the initial work elements. As part of the SOW, procedures were drafted to address the roles and responsibilities of multiple agencies to ensure that safety requirements, key result areas, and reporting requirements were all met; in addition a detailed Quality Control and Quality Assurance plan was implemented to ensure all goals were achieved. [2008]

FEMA – Kansas Flooding (Housing Mission); Coffeyville, Kansas. Project Manager / Field Operations Manager. Performed initial planning for temporary housing mission located in Southeast Kansas. Was responsible for all field operations starting with rapid deployment to field, initial alignment with client with regard to expectations and procedures, established processes / procedures in field, initiated and support the QA effort, led group site assessment efforts which included environmental, coordinated efforts between Federal, State and local agencies to ensure alignment, facilitated local relationships and recommended changes to permitting / zoning regulations as required to complete the disaster recovery mission within the time frame allotted by FEMA. [2007]

FEMA – Wilma Disaster Recovery – JFO Planning – (Housing Mission & Planning); Orlando, Florida. Project Manager / Deputy Program Manager. Led a team in the development of the Strategic Housing Plan for Hurricane Wilma recovery effort. Assisted in the daily operation of the JFO and performed assessments on the operation to allow the Branch Director to determine required operation changes. The project team coordinated various types of assistance from NGOs for disaster applicants. Developed the FLTRO Human Service Operation Plan which included the overarching concept of operations, cross-functional process flow maps, procedures and training materials; many of which are now the national standard. Developed and facilitated a tabletop exercise between FEMA, the State of Florida and USACE to identify actions required to support the 2006 hurricane season. Coordinated between FEMA and the State of Florida to develop JHOC (Joint Housing Operation Command) that would expedite housing solutions in the future by leveraging the cooperation between Federal, State and local agencies. Upon completion, all deliverables were presented to FEMA in Washington, DC. [2005 to 2006]

FEMA – Katrina/Rita Disaster Recovery (Housing Mission); Gonzales, Louisiana and Greenville, South Carolina. Project Manager / Technical Planner. Developed disaster response mobilization plans which were subsequently used to respond to two different natural disasters funded by 23 task orders across the United States. Implemented a 24/7 Logistics Operations Center in the home office to support the needs of the rapid mobilization of personnel in response to Hurricane Katrina. A total of 480 Fluor personnel were deployed within the first month, and the project peaked at 4,400 personnel. Lead a team that drafted the PEP (Project Execution Plan) and PPM (Project Procedures Manual) for what developed into a $1.4 billion operation, which installed approximately 65,000 temporary housing units. Processes, procedures and automated systems were developed to maintain timely delivery, QA, accurate data collection, and reporting. [2005-2006]

Wyeth Vaccines – FSDF – Biological Vaccine Development Facility (Pharmaceutical) Sanford, North Carolina. Project manager for the construction and commissioning of a biological vaccine development facility with a total capital investment of approximately $254 million. Key result areas included: Safety, cash flow, schedule, earned value, change management, meeting regulatory requirements and smooth/consistent transitions between construction, QA/QC commissioning and validation. [2002 to 2005]

Lucent Technologies – Clean Humidification Steam Project (Clean room – Utility); Norcross, Georgia. Project manager for the installation of a clean humidification steam system which consisted of the installation of several miles of SS piping throughout the existing facilities and with no impact to production. Scope included engineering, acquisitions, construction, QA, and start-up / commissioning. Total capital investment was approx. $6.5 million. [2002]

Lucent Technologies – Ultra Tall Draw Facility III (Clean room – Fiber optic production); Norcross, Georgia. Assistant project manager for the construction of a fiber optic manufacturing facility with a total capital investment of $65 million. Responsibilities included management of bidding process which included the pre-qualification of bidders, compilation of construction bid documents, administration of the pre-bid meetings, evaluation of competitive bids, the offering of value engineering solutions to reduce costs, conducting pre-award meetings and issuance of contract documents to the successful subcontractors; key team member for the implementation of the Master Project Schedule; brought financial accountability to the project; change management; and drafted the monthly report. [1999 to 2001]

ADDITIONAL EXPERIENCE:

McIntosh Mechanical, Inc.; Sumter, South Carolina. Project manager for various commercial and industrial projects. [June 1998 to May 1999]

> **Bayou Steel (Electric Arc Furnace Upgrade and Ladle Metallurgical Furnace Installation); LaPlace, Louisiana.** Project manager for two steel furnace projects as a general contractor on an expedited time line which were completed within a two month period including quality control and start-up / commissioning, for a TIC of $10 million. [1998 to 1999]
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> **Gold Kist, Inc. (Warehouse/ Freezer); Sumter, South Carolina.** Project manager performing turnkey operations for the installation of a 65K ft^2 freezer with a TIC of $4.5 million. [1998]

RMT, Inc.; Greenville, South Carolina. Project Manager/Engineer for various projects which included design/build, constructability reviews, on-site construction management, quality assurance, start-up, commissioning, and training. [September 1994 to June 1998]

> **Van Waters & Rogers Chicago Facility; Bedford Park, Illinois.** Project manager for a $22.5 million (design / build) chemical distribution facility on a 41-acre site. Responsibilities included constructability reviews; writing of SOWs and management the bidding process; change management; and FDA approvals; QA; commissioning; and issued final construction report. [1996 to 1998]
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> **Schlumberger (Sangamo Weston Facility – Environmental/Demolition); Pickens, South Carolina.** Project manager performing on-site construction management using a multi-phased approach to demolish a 330,000 square foot PCB capacitor manufacturing facility that was constructed in the 1950's. V alue engineering efforts saved $2 million on a $4.5 million project. [1995 to 1996]
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> **Hoechst Celanese (Environmental – Groundwater Treatment); Charlotte, North Carolina.** Project manager providing onsite construction management and QA oversight services to retrofit an existing groundwater treatment system, finishing ahead of schedule and under budget. [1995]
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> **Belmont Dyers (Construction/Environmental – Wastewater Treatment); Belmont, North Carolina.** Project manager performing on-site construction management supervision of a packaged process water treatment system to establish compliance with local regulators. Work included construction, QA, start-up / commissioning, and training of plant staff. [1994 to 1995]

BASF Corporation; Central, South Carolina. Construction Project Manager / Project Engineer. Managed various projects that included process piping, civil construction, mechanical, electrical, and instrumentation. Responsibilities included design of various projects, safety of onsite contractors, coordination between plant and general contractor, and QA of subcontractors work to ensure compliance. [August 1992 – August 1994]

Garland Construction Company; Greenville, South Carolina. Project manager responsible for estimating, onsite supervision, purchasing, scheduling, writing subcontracts, and performing quality control. Specialized in design / build projects and was the primary coordinator between the owner and A/E. [June 1991 – August 1992]

Pioneer Enterprises, Inc.; Greenville, South Carolina. Project manager working with a military contractor and was responsible for generating submittals, schedules, subcontract agreements, purchase orders, and estimates. [August 1990 – May 1991]

BF Shaw; Laurens, South Carolina. Nuclear QC Specialist - RT, UT, PT, MT [May 1985 – Feb 1986]

EDUCATION

USACE / NAVFAC - Construction Quality Management for Contractors – October 2010
University of North Florida – Jacksonville, Florida

BSET, Civil Engineering Technology – Aug 1990
University of North Carolina at Charlotte; Charlotte, North Carolina

PROFESSIONAL LICENSES AND REGISTRATION

Unlimited General Contractors License; North Carolina – May 2003

Unlimited General Contractors License; South Carolina – May 1992

PUBLICATIONS

From Our Partners – Resilience: Managing the Risk of Natural Disaster
Center for Infrastructure Protection & Homeland Security, August 2015
http://cip.gmu.edu/2015/08/28/from-our-partners-resilience-managing-the-risk-of-natural-disaster/
Resilience is an area of growing concern due to climate change, population growth and migration, and a constantly growing dependency and interconnectivity of infrastructure. Over the years the need to comprehensively address all aspects along the resilience continuum has become ever more important.

Resilience: Managing the Risk of Natural Disaster
The Infrastructure Security Partnership, August 2015
David Vaughn, Jeff Plumblee, Jonathan Vaughn and Bob Prieto
http://www.same.org/images/stories/Councils/TISP/Resilience_ManagingRisk.pdf
Over the last several decades, the world has experienced an increase in frequency and magnitude of natural and man-made hazards, and this trend is anticipated to continue for the foreseeable future. The population is shifting to more vulnerable locations, leaving all stakeholders more at risk than ever. Despite budgetary constraints, federal, state and local governments have made promising headway to develop emergency plans to respond to crises efficiently. Unfortunately, these government programs have primarily focused efforts on assistance for individual households and infrastructure, and these techniques have largely fallen short of helping private industry build resilience. Over the years the need to comprehensively address all aspects of the resilience timeline has become ever more important.

Resilience: Managing the Risk of Natural Disaster considers risk management strategies, risk identification methods, and pre- and post- event activities to minimize risk. Post-event recovery is a more widely understood field, as practitioners have a plethora of lessons learned from completed projects. Pre-event planning as a means of minimizing damage and downtime is a lesser developed field, and this book organizes both literature supported data and the authors' anecdotal experiences into a framework for disaster management, spanning pre- and post- event.

Resilience: An Engineering & Construction Perspective
The Infrastructure Security Partnership, August 2015
Bob Prieto, David Vaughn, Jeff Plumblee and Jonathan Vaughn
http://www.same.org/images/stories/Councils/TISP/Resilience_EngineeringPerspective.pdf
Resilience: An Engineering & Construction Perspective reflects our work and research in the disaster regime with a particular emphasis on the post disaster setting. Disasters, or as we prefer to call the "events of scale" are something that many of us will experience directly or indirectly over the course of our lifetimes. How we prepare, respond and recover from these events is critical to the human condition. This book is limited in scope but also in its perspective, namely being that of an engineer and constructor.

Resilience: An Engineering & Construction Perspective will expose the reader to many concepts but I will draw attention to three in particular. First the importance of identifying, assessing and tracking resiliency. Second, how post disaster construction occurs in a changed project deliver framework. Finally, the commonality of resilience and business continuity.

We hope you find these books of interest and value and recognize that these considerations apply to both public and private infrastructure and facilities and that resilience and business continuity considerations have common frameworks.

Building an Economy and Managing Risk Through Infrastructure Investment – The CIP Report
Center for Infrastructure Protection and Homeland Security, George Mason School of Law
December 2014
David Vaughn and Jeff Plumblee
http://cip.gmu.edu/wp-content/uploads/2013/06/December2014_CIPHS_TheCIPReport_InvestmantsandAssessments.pdf
Infrastructure as a Foundation for Basic Needs - Infrastructure is the foundation from which an economy should be built. The American Industrial Revolution and the expanse of the Roman Empire were made possible by solid infrastructure. As economies grow, they become more dependent upon transportation and communication networks, but before they can flourish, the groundwork must be laid to meet basic needs of the people.

Understanding Interdependence as a First Step to Community Resilience
The Infrastructure Security Partnership
April 8, 2014
David Vaughn, Jeff Plumblee and Bob Prieto
http://www.tisp.org/tisp/file/VAUGHN-PLUMBLEE_Understanding%20Interdependence%20.pdf
Local and state governments understand that they are vulnerable to natural hazards, but they often do not have the financial capacity to build resilience. Public-private partnerships can be a foundational tool that is mutually beneficial for government and the companies operating within their region. Large companies generally have a general idea of the risks that they face. In most cases though, these companies do not work to reduce their risk and the risk to the community around them. Instead, the companies will transfer the risk to an insurer. This presentation suggests mechanisms and methods to decrease community vulnerabilities, decrease business interruption, and decrease risks associated with both, working to complement insurance policies.

For example, South Carolina Emergency Management Division has acknowledged concerns regarding vulnerabilities in Charleston, SC. Charleston is at risk for both earthquake and hurricane, and transportation in the region is largely dependent upon a network of bridges. Charleston, boasting the nation's 4th largest container port, has a number of large companies in the area that stand to lose significant revenue if a disaster occurs. Even if companies are insured (most are), they are still concerned about customer satisfaction, lost sales, employee safety, brand erosion, and other impacts not covered by insurance. The local government has similar worries: safety of its citizens, business shutdowns, lost tourism, and loss of tax base.

Becoming more commonplace, municipalities are working with local companies to help prioritize mitigation and retrofit measures. One novel idea of particular relevance is to determine the center of mass for both commerce and government and to prioritize infrastructure mitigation based around these centers, identifying and bolstering critical network paths.

Critical factors for successful public-private collaboration: Oregon Bridge Delivery Program Case Study
The Infrastructure Security Partnership
April 8, 2014
David Vaughn, Jeff Plumblee and Bob Prieto
http://www.tisp.org/tisp/file/VAUGHN_PLUMBLEE_Critical%20Factors%20for%20Successful%20.pdf
Though most often public-private collaboration is sought out for financial reasons, some of the most successful projects are those in which the private industry partners are thoroughly integrated throughout the full life of the project. This presentation will focus around the partnership between the Oregon Bridge Delivery Partners and the Oregon Department of Transportation (ODOT) to complete the $1.3 billion OTIA State Bridge Delivery Program. The program includes the analysis and repair / replacement of hundreds of bridges throughout Oregon, paving roads, and improving and expanding interchanges. The project was publicly funded, but Fluor and HDR managed the program, providing the day-to-day support. To date, the project has won 36 awards across a broad range of categories.

The presentation details how collaboration between public and private sectors can offer a win-win scenario for all stakeholders. Financially, there are substantial benefits to be gained by investing in mitigation actions to avoid catastrophic loss. Additionally, based upon the organizational structure established by the public / private collaboration, each skill set was leveraged to optimize the team. Instead of the estimated 600 new employees ODOT would have had to hire for the project, ODOT was able to oversee the program with just 22 staff members. Private sector expertise was used to identify infrastructure elements that required upgrades or replacements and the public sector team functioned as a check and balance. Using this approach, only 271 of the 365 bridges reviewed needed repair or replacement, resulting in significant savings to the ODOT.

Key project team members and stakeholders involved with the OTIA State Bridge Delivery Program were surveyed, and they identified a number of common success factors that they deemed critical to project success, including using a unique Context Sensitive and Sustainable Solutions (CS3) approach to the five overarching program objectives.

Business Continuity and Disaster Management for Industrial Installations
PCIC, IEEE 2013
September 23, 2013
David Vaughn, Eddie Guidry and Richard Anderson
http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=6666009&url=http%3A%2F%2Fieeexplore.ieee.org%2Fiel7%2F6657459%2F6666008%2F06666009.pdf%3Farnumber%3D6666009
Over the last several decades the world has experienced an increase in natural disasters and it is anticipated that these challenges will continue for the remainder of the 21st century. The petrochemical industry has many refineries and plants in areas prone to natural disasters, such as the Gulf Coast which are subject to hurricanes and flooding. And reality, in every part of the U.S., there are risks to be contended with such as flooding, tornados, fires, earthquakes, or terrorism. No facility or community is immune.

The increased frequency of disasters has induced the creation of policies, standards, and methodologies that will help counter these affects, but fall short of addressing private industry's goal of resiliency. Federal, state and some local governments have attempted to develop emergency plans to respond to a crisis in the most efficient way possible despite budgetary constraints. However, these agencies are starting to realize the reestablishment of the local economies is essential to expedited financial recovery of any city, county, state or region. The level of coordination between the local agencies and the business communities varies greatly throughout the nation. This paper will explore some of the actions that are being taken by both public and private sectors; moreover, discuss further actions that are required by all parties to improve public and private integration thus creating a more resilient society. This paper will provide a step by step procedure that can be used to perform a risk assessment of a petrochemical industrial power system. It will also provide an example risk assessment scenario of a typical power system and discuss how to mitigate the risks that are identified.