

**Illinois Innovation Network
Sustaining Illinois Supplemental Funding Proposal**

Sustainable Inclusive Supply Chain for The Electric Vehicle Industry in Illinois

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Abstract

The Supply Chain Innovation Center and Business Incubator (SCICBI) at Governors State University and the Urban Transportation Center at University of Illinois Chicago are jointly proposing the project *Sustainable Inclusive Supply Chain for The Electric Vehicle Industry in Illinois* under the scope of the Illinois Innovation Network Supplemental Funding Guidelines Sustaining Illinois, Fall 2021. The total project cost is \$45,086. The team is requesting \$30,000 from the Illinois Innovation Network and providing \$15,086 in-kind match. To ensure that Illinois can create a robust, sustainable, and inclusive supply chain for the electric vehicle industry, the team will conduct a literature review on the EV and related industry development, do a local market research by businesses interviews and infrastructure assessment, design a workforce development plan, build an ESG promoting program, create a matchmaking strategy for EV and related businesses, and estimate the potential economic impacts for a new EV business in the region. The proposed project will support two elements identified in the Sustaining Illinois: (a) Education and Workforce Development and (b) Economic Development. This program is a start to provide more jobs and economic growth to the disadvantaged communities. The proposed project will make concerted efforts to support workforce plan to train disadvantaged population groups in working with new technology so that they will be able to avail of jobs created in the emerging EV industry.

Project Description

There is a dramatic revolution underway in transportation. The United States and Illinois, in particular, have made substantial commitments to support the creation of an electric revolution in mobility. The State of Illinois has passed a new law creating incentives for investments in electric mobility, and they have created a plan that focuses on creating a robust world-class supply chain for the Electric Vehicle industry. CMAP is also looking at electrification in a variety of ways. It's one of several emissions' mitigation strategies that the transportation team is considering. In addition, they are looking more deeply into policies next year with a project to explore the region's needs to fully develop a network of charging infrastructure, considering gaps in long-distance charging along with the expressway network and the need for public infrastructure support charging in urban areas.

Recent innovations in the ways that goods are produced and distributed has increased reliance on sustainable and efficient transportation. The automation of production networks has resulted in decentralized manufacturing and production facilities that have increased the demand for efficient movements between previously disparate locations. This change in the way and how goods are transported to homes and businesses and how people are moving to different locations has further increased the demand for more sustainable and efficient transportation movements. The impact on the state of Illinois is clear: The region is uniquely positioned to benefit from this confluence of increased transportation demand due to its locational advantages. The region is not capitalizing on its locational and market-based advantages. Grand Rapids, Michigan, and Fort Wayne, Indiana, have experienced substantial economic turnarounds. In addition to increasing productivity, EVs are also reducing the environmental impact by applying clean energy such as fuel cells. In the last decade, significant advancements have come about in clean energy production, yet adoption of new hydrogen and fuel cell technologies still lag due to affordability and technical barriers. In June 2021, the U.S. Department of Energy launched the Hydrogen Energy Earthshot with the goal of reducing the cost of clean hydrogen by 80% per \$1 kilogram in one decade. As new applications for hydrogen are developed, it is projected that hydrogen could reach a \$130-\$170 billion a year industry in the U.S. by 2050. The inclusion of clean energy technology will also help reduce emissions in the Illinois and stimulate the economy through green electricity and fuel cell technology.

In addition, the communities are hit hard during the crisis. As of May 2020, the U.S. Bureau of Labor Statistics reports the area's average unemployment rate to be 19%. These rates are even higher for our target minority population living in low-income communities. For example, the population of Riverdale is 93% African American with a median income of \$14,000 (2013-2017 ACS 5-year estimates). The economic and demographic changes reshaping the region present both challenges and opportunities. Equitable regional prosperity requires increased opportunity and resources for all residents. This program is a start to provide more jobs and economic growth to the disadvantaged communities. The proposed project will also make concerted efforts to support workforce plan to train disadvantaged population groups in working with new technology so that they will be able to avail of jobs created in the industry.

To ensure that Illinois can create a robust, sustainable, and inclusive supply chain for the electric vehicle industry, the Supply Chain Innovation Center at GSU and the Center for Urban Transportation at UIC are collaborating and proposing to develop this proposal. The team will start with a research of EV in the State of Illinois to identify companies in the EV industry and suppliers to OEMs, including an assessment of their resource base and capabilities, and further deepen working relationships with those companies. Then via interviews and market research, the team will contact the user infrastructure assessment to assess the needs of current EV industry to further

prepare for the regional matchmaking events to support sustaining and developing the economy of the state, which is the element (b) Economic Development of the NOFO. The team will also assess the workforce needs from EV and related industry to support developing and sustaining the education of its citizens and developing a productive and inclusive workforce for the 21st century, which is the element (a) Education and Workforce Development. Besides, this program is a start to provide more jobs and economic growth to the disadvantaged communities. the proposed project will also make concerted efforts to support workforce plan to train disadvantaged population groups in working with new technology so that they will be able to avail of jobs created in the industry. The team aims to drive inclusive innovation, equitable workforce development and sustainable economic growth throughout the state.

The proposed project is aligned with all five performance goals defined in IDOT's Long-Range Transportation Plan and coupled with the proposed Connect2Work Partnership Program. It supports the efficient, safe, and equitable movement of people and goods

The proposed project is also aligned with the five policy priorities identified in Connecting Cook County 2040 Long Range Transportation Plan. It is studying and implementing the priority of supporting the region's role as North America's transportation capital via the research work to document, assess, and prepare optimum growth strategies for EV industry in relation to current trends, available property, existing infrastructure, and condition/capacity of respective transportation systems. It incorporates existing market sustainability and new market identifications (including modern transportation, logistic, and communication technologies and clean energy applications) in a series of site-specific interim reports to support the priority of maintaining and modernizing what already exists while ensuring that today's investments do not preclude future innovation and growth. Besides, culminating in a project identifying optimum matchmaking strategies and public/private investment will support the performance-based program development and near-term investment management plan. Finally, given the region's unique manufacturing and logistics clusters and demographic features, the results from the proposed study will help best connect the transportation assets to the significant developments in the study area that would encourage active development through connecting workforce via modern technologies, thereby further promoting equal access to opportunities for all regional residents.

Scope of Work

The Supply Chain Innovation Center at GSU and the Center for Urban Transportation at UIC are proposing to develop a program that will complete reports in:

1. EV in the State of Illinois

- Identify companies in the EV industry in the state of Illinois, including an assessment of their resource base and capabilities
- Deepen working relationship with companies that do or could be a supplier to OEMs manufacturing electric vehicles and a listing of products and services that could be supplied
- Deepen working relationship with companies that do or could be a supplier to OEMs manufacturing buses and locomotives and a listing of products and services that could be supplied

This section will draw a picture of EV industry in the state of Illinois

2. User infrastructure assessment

- Assessment of the near-term supply of infrastructure such as charging stations
- Discussion of issues around technology standardization and recommendations
- Assessment of demand conditions and prioritization of infrastructure build-out

This section will result in an infrastructure assessment study to identify development prioritizations. It might also generate insights on the standard agreements between public agencies, end users, and technology providers that streamline coordination and outline the bill of rights for each user.

3. Develop a workforce assessment and economic impact analysis of a new EV business in the industry

- Literature review on EV industry and trends on the state of development within several facets of EV industry, including market size, job creations and job loss due to automation, impacts on environment, clean energy development, fuel cells potentials, etc.
- Detailed economic impact assessment, including:
 - i. identification of occupations and jobs that will be created
 - ii. 5-year forecast of demand for jobs
 - iii. 5-year assessment of supply (skills) conditions
 - iv. strategies for bridging demand-supply gaps
 - v. impact on underserved communities
 - vi. impact on tax generation
 - vii. impact on resilience and competitiveness of the state's economy

The results from this task will provide transferable and scalable solutions to workforce challenges associated with EV industry supply chains, as well as help catalyze the development of a taxonomy of EV workforce challenges and develop a toolkit of solutions (i.e., targeted strategies and actions), which municipalities, counties, businesses, and other stakeholders can implement.

The final deliverable will be a comprehensive report that addresses each of the subprojects described above as well as a future plan for the next steps.

Describe potential for future work and sources of follow-up funding

As much as the intent of the proposal is going to be developing and testing new technologies, the project team is also mindful of standing up the project after the life of the grant. The team has

extensive experience and strong relationships with the different public and private stakeholders in the industry and strong support of the industry. We will also establish a sustainability committee to make sure the project can move forward. The potential sources will be based on a combination of regional and state grants as well as significant contributions from the private sector that are interested in technologies in the area. The surrounding communities in the region will benefit from the research results as well as from workforce development initiatives that will be jointly developed by the project principals to help the disadvantaged population to improve their skills and be contributing members of the emerging and changing EV industry.

Each of the partners have extensive experience to engage new and diverse stakeholders. For example, the SCICBI provides various certification training programs in supply chain, six sigma, global business and E-commerce to employees and businesses in the region, as well as consulting and incubating services to start-ups and entrepreneurs. The Transportation Center at UIC has a proven record of supporting local diverse businesses in its economic and community development. Working with local community organizations, the team has a robust supplier diversity program and network, with partnerships through the Chicago Minority Supplier Development Council, Women Business Development Center, and other organizations focused on engaging diverse businesses and advancing equity. Outreach for this effort will be conducted through a committee focused on identifying and implementing diversity, equity and inclusion opportunities.

Team bios (no more than one-half page per team member)

Dr. John Simon

John T. Simon is an associate professor of management in the College of Business, Governors State University. He also serves as the program coordinator for BA in Business and Applied Science and BA in Manufacturing Management. His research interests are in the areas of operations and supply chain management. He is a member of ASCM (Association for Supply Chain Management) and holds CSCP (Certified Supply Chain Professional) certification.

He has a Ph.D. in Industrial Engineering and Management Sciences from Northwestern University and has published journal articles in *Institute of Industrial Engineers Transactions*, *International Journal of Production Research*, *Advances in Competitiveness Research*, *INFORMS Transactions on Education*, *Management Research Review*, and *Journal of the Operational Research Society*.

Dr. P.S. Sriraj

In September of 2016, Dr. P.S. Sriraj was appointed Director of the Urban Transportation Center at UIC. He also is Director of the [Metropolitan Transportation Support Initiative \(METSI\)](#) and Research Associate Professor. His areas of expertise include public transportation systems, equity and transportation improvement, program evaluation and applying systems thinking/complex problems approaches to transportation.

Since 2000 he has served as principal investigator or a co-investigator on more than 42 funded research projects, generating more than \$14 million in research funding. His research has addressed the integration of transit modes, mobility and equity issues for transportation disadvantaged population groups, alternative funding sources for intercity passenger rail, the benefits of freight infrastructure improvement, transit adaptation to climate change, mobility management networks, pedestrian safety, and performance measures for transportation systems.

He serves as an Associate Editor in the [Journal of Public Transportation](#), the [Journal of Geographic Information Systems](#), as well as serving as a Director in the Executive Committee of the [Council of University Transportation Centers](#). In August of 2020, Illinois Governor J.B. Pritzker appointed Dr. Sriraj to the Illinois International Port District board.

Dr. Sriraj earned a Doctor of Philosophy degree in civil engineering and a Master's of science degree in civil engineering from the Illinois Institute of Technology. And, he holds a Master's of Science in physics and a Bachelor's of Engineering in Civil Engineering from Birla Institute of Technology & Science, Pilani, India.

Mr. Reggie Greenwood, Director, Supply Chain Innovation Center and Business Incubator, GSU Reggie Greenwood's career emphasizes building partnerships with education and public and private organizations that deliver sustainable economic & community development. He is a serial entrepreneur starting public and private organizations that engage the synergies of healthy manufacturing/logistics companies and commercial development and educational institutions.

He is the Director of the Supply Innovation Center and Business Incubator where he is: creating business connections with manufacturing and TDL companies in order to provide training

and other services to improve their effectiveness in supply chain operations; creating a variety of services to support the development of new products and services that apply technology to improve the operations of supply chains; and creating innovative development projects with companies in blockchain, air cargo, 3D printing, E-Commerce, global business, and autonomous tractor terminals around intermodal operations.

He has achieved certifications in SCPro, Certified in Logistics, Transportation, and Distribution, Green Six Sigma, and Certified Global Business Management Profession.

Reggie has worked with multiple partners to develop an Integrated Education, Workforce and Economic Development Strategy for the Chicago Southland. This work has been part of the resurgence of the Chicago Southland as a Manufacturing and Logistics Supercluster with over a billion dollars of recent investment. Reggie has provided services in industrial land redevelopment, planning for logistics infrastructure, education and workforce, financial incentives, marketing, supply chain training, and export/import support.

Previously, Mr. Greenwood was a partner in a small manufacturing company and subsequently a manager for a division in a larger firm. He was educated at the University of North Carolina at Chapel Hill from which he holds a M.S. Degree in City and Regional Planning-Concentration in Economic Development and a B.S. Degree in Business Administration.

<http://www.linkedin.com/in/reggiegreenwood>

Budget: \$30,000 requested; \$15,086 matched

Of the \$30,000 requested, Governors State University will subcontract funding in the amount of \$10,000 to the University of Illinois Chicago. Also, only 20.5% of requested funds will pay for full-time researchers'/professors' salaries.

Category	Funding Request *	Match Provided
A. Personnel	\$17,558	\$6,608
B. Fringe Benefits	\$1,533	\$2,353
C. Travel		
D. Equipment		
E. Supplies		
F. Other* (Specify)	\$10,909	\$6,125
G. Total	\$30,000	\$15,086

Personnel

Dr. John Simon, PI (GSU), will devote 0.3 month of summer effort and is charged to the grant for a total of \$3,418.

Dr. P.S. Sriraj, Co-PI (UIC), will devote 0.12 month of calendar effort and is charged to the grant for a total of \$1,580.

Salary for one graduate assistant (GSU) is included for \$7,200 at 25% for 12 months.

Salary for one graduate student research assistant (UIC) is included for \$5,360 at 25% for 4.5 months during the academic year.

Fringe Benefits

GSU: Fringe benefits are assessed on Dr. Simon's salary at rate of 17% and 2% for the graduate student. A total of \$725 is charged to the grant.

UIC: Fringe benefits are assessed on Dr. Sriraj's salary at rate of 36.09% and 4.41% for the graduate student. A total of \$808 is charged to the grant.

Other

GSU: An consultant will be hired for \$1,350 to conduct on economic impact analysis. Also tuition of 18 credit hours is included for the graduate assistant in the amount of \$7,308.

UIC: Tuition remission in the amount of \$2,251 is included at a rate of 42% of salary.

Matching

GSU: Match in the amount of \$10,086 includes unrecovered indirect costs (\$6,125) and 4% salary plus fringe benefits for Reggie Greenwood (\$3,961).

UIC: Match in the amount of \$5,000 includes 2.283% of Dr. Sriraj's salary and fringe benefits.