

Creating Community Resilience to Foster Business Resilience in the Tennessee Automotive Supply Chain Cluster

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Introduction

According to a study conducted by the ARC Advisory Group¹, “approximately 40% of business² without a robust, practiced business continuity plan fail immediately because they have no plans for a rapid recovery and insufficient funds to cover the costs of extended downtime. An additional 25% fail within two years from lost business revenues and cash flow problems.” The ARC Advisory Group study also found that the average production downtime loss for a small to medium company is approximately \$35,000/hour. Additionally, a recent survey of over one hundred companies conducted by insurancenewsnet.com found that 85% of the companies had suffered significant losses due to supply chain disruptions, with the average productivity loss being approximately \$3.4 million.

These studies indicate that modern business supply chains are extremely vulnerable and that communities and businesses are not prepared to respond. For example, consider the recent production idle at the General Motors plant in Spring Hill, TN. The location experienced a parts shortage due to earthquakes in Japan. This situation not only impacted the actual production and potential earnings for GM, it impacted the workers and local economy. The end result for the Spring Hill community was a layoff of over 2,000 workers at GM and its other local suppliers. During the production idle, employees received approximately three quarters of their normal wages. While a short term disruption with potentially small consequences, the consideration of the very real threat of a large scale disaster and the ripple effect that could cripple a local economy cannot be ignored.

¹ Founded in 1986, ARC Advisory Group is a leading technology research and advisory firm for industry. Further information may be found at <http://www.arcweb.com/>.

² Small to medium sized businesses in retail and industry. Includes automotive tier two and three suppliers.

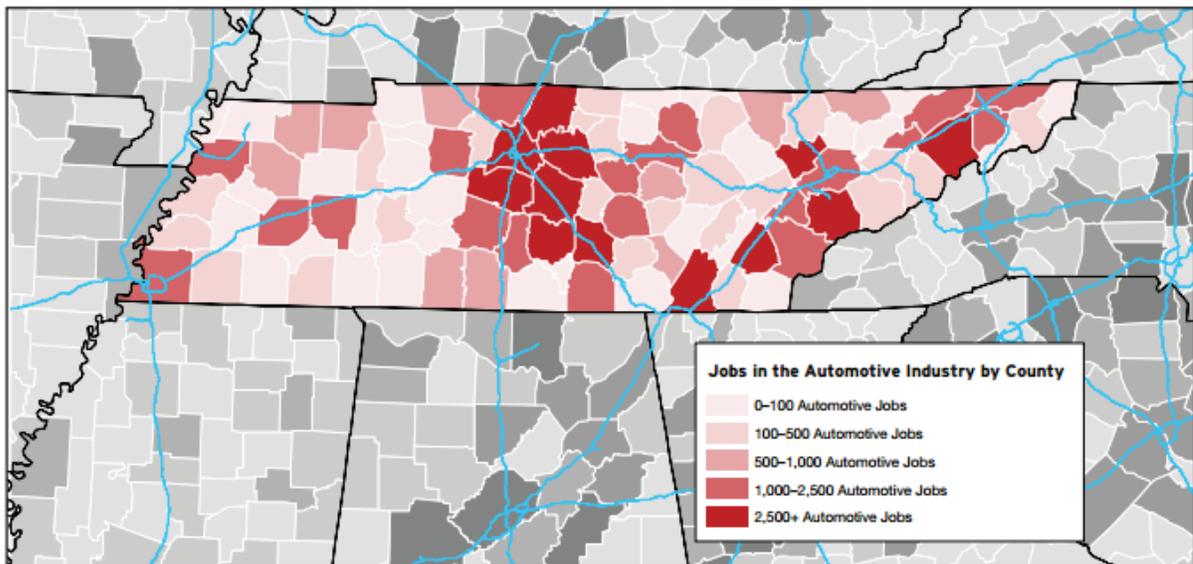
Project Background

This community resilience project is grounded in initial work surrounding the Tennessee Valley Automotive Industry Cluster. Primarily from the recognition that a major automotive supply chain disruption would have a devastating economic effect. The region is home to over six hundred automotive suppliers. These Tier 1, Tier 2, and Tier 3 automotive companies are part of a vast supply chain that supports the main automotive manufacturing plants of Nissan, General Motors, and Volkswagen in the Tennessee Valley Region and several automotive manufacturing plants located outside of the region. Today's standard automotive supply logistics network is based almost entirely upon just-in-time production and any disruption in the network can result in the shutdown of higher tier automotive supply companies as well as the major automotive manufacturing plants.

The business resilience strategy draws upon extensive research and analysis of the automotive industry inside, as well as outside, of the Tennessee Valley region. A recent Brookings Institution study, Drive! Moving Tennessee's Automotive Sector up the Value Chain, and research conducted by the Center for Automotive Research examined the critical factors necessary for the continued growth of automotive investment in Tennessee and identified opportunities to accelerate that industry's growth. Additionally, extensive research by the University of Tennessee Center for Business and Economic Research provides an inside perspective on the development of the Tennessee Valley region's automotive sector including transitions, challenges, and opportunities that will impact the region's future automotive industry.

The Brookings study revealed the following facts concerning Tennessee's role in the automotive industry:

1. Tennessee's automotive sector managed to increase its share of North America's auto production market and lead the state's economic recovery;
2. Tennessee's large automotive sector encompasses an extended production network and supply chain;
3. Tennessee's share of North American vehicle related manufacturing employment has held firm throughout a disruptive era;
4. Tennessee's automotive chain suppliers account for more than three-quarters of industrial jobs in the state and incorporates all systems of the automobile; and
5. As shown in the graphic below, Tennessee's automotive industry actually involves every region of the state.



Source: Brookings analysis of data from Dun & Bradstreet, ELM Analytics, and MarkLines

In summary, the Brookings report concluded the following³:

- Tennessee is home to the largest auto industry in the South in terms of employment and supply chain employment;
- Tennessee has an industry profile with 650 automotive businesses (direct employment) including three OMEs: Volkswagen, Nissan, and General Motors;
- More than 94,000 Tennesseans work in automotive manufacturing which includes 1,200 OME employees and 82,000 Tier 1, Tier 2, and Tier 3 employees;
- The Tennessee automotive industry includes a network expanding across 75 of the state's 95 counties; and
- The automotive cluster has been the driving force of Tennessee's recession recovery, responsible for 12 % of all job creation since 2008. (From 2010 – 2012 automotive employment increased by an average 16.1 % compared to 1.8 % for the overall economy.)

Figure 1, on page 7, summarizes the concentrations of automotive industry and related manufacturers by Tennessee development districts that overlap the Tennessee Drive! for the Future Consortium region. The potential \$9,037,008,243 revenue loss from a major supply chain disruption is a total of all companies that provide support to the Tennessee automotive industry. Additionally, this table reflects the “spillover” effects from the main supply chain into secondary markets and economies. It is important to note that this summary information is based on extrapolation of provided data and that this information only applies to the automotive industry. Tennessee is also home to several other industries and business clusters: a \$38 billion healthcare

³ Brookings data was reported in 2013. Recent numbers from Tennessee ECD as of August, 2016 report 930 auto suppliers in 88 of 95 counties with over 100,000 automotive workers.

and medical device industry, a \$5 billion chemical industry, and a \$1.5 billion food and beverage industry, to name a few.

A comprehensive community and business continuity and resilience management plan will assist companies and communities to more rapidly regain growth and profits by minimizing losses of production, deliveries, sales, workforce, and wages while also mitigating risks, capturing opportunities, creating competitive position, and improving stakeholder value. The primary objective of a continuity and resilience plan should consider the impact of business interruptions on profitability and sustainability – not only for the company but the employees and community.

Figure 1: Summary Analysis of Automotive Industry across Development Districts, October, 2015

	# DRIVE Counties in Region	OEMs	Tier 1	Tier 2	Tier 3	Total Automotive Jobs	Total Estimated Potential Revenue Loss From a Major TN Supply Chain Disruption*
South Central Tennessee Development District	13	General Motors	32	50	30	7918	\$ 1,447,827,182
Greater Nashville Development District	13	Nissan and Nissan Headquarters	88	108	60	34010	\$ 4,554,696,484
Upper Cumberland Development District	15		31	44	26	10305	\$ 610,348,235
East Tennessee Development District	9		39	56	34	20211	\$ 1,147,505,449
Southeast Tennessee Development District	10	Volkswagen	28	31	27	10950	\$ 1,276,630,893
Totals	60		218	289	177	83394	\$ 9,037,008,243

* Data was provided by NIST and generated from the following agencies: Tennessee Department of Labor and Workforce Development, Census Bureau's Most Current Population Survey for TN, American Community Survey, Bureau of Economic Analysis' National Income and Products Accounts, and Oak Ridge National Labs

Applicability to TCED Coursework

This project is directly applicable to several TCED certification coursework modules.

- 1. Tennessee Business Retention and Expansion and Tennessee Marketing and Attraction course** – In today’s global environment a standard and comprehensive community continuity and resilience plan that includes the voice of business and industry could be a major deciding factor in attracting and retaining businesses. Having a plan and the infrastructure and resources to implement the plan shows potential investors and local businesses and workforce that the Tennessee EDO’s are committed to growth and sustainability.
- 2. Tennessee Economic Development Finance** – Understanding how EDO’s can take advantage of local, state, and federal financing and incentives to develop, execute, and sustain a continuity and resilience plan removes the obstacle that continuity and resilience planning is too costly. Additionally, state level economic development recruiters could consider providing more incentives and support to companies that can demonstrate a strong business continuity program that also maintains the standard of living for the community.
- 3. Tennessee Managing Economic Development Organizations** – Successfully managing an EDO includes improving communities, diversifying economies, and building collaborative relationships with various stakeholders. Leading a continuity and resilience planning process is one way to maximize those goals and drive toward integrated and shared community excellence.
- 4. Tennessee Strategic Planning for Economic Development** – Economic development uses a top down approach to improving standard of living, increasing business activity, and improving the business climate, workforce, etc. While EDO’s cannot control business development decision, they *can* influence them. Taking the strategic plan to a higher step and understanding the risks that can prevent achieving the EDO’s mission, vision, and goals is imperative. For example, an EDO may have the goal to build a fully developed industrial park. Missing from that goal is an understanding of the risks to the goal and a continuity plan to ensure the goal is accomplishable given reasonable risks.

Local, State, and National Trends that Support this Project

Locally, the voice of the customer is a major factor in pursuing community led continuity and resilience – major OEM’s often require suppliers to have some level of plan in place to minimize production disruptions. A recent survey of manufacturing companies in the South Central Tennessee region revealed that although most larger companies have an established disaster preparedness/business resilience plan, medium and smaller companies do not. Medium and small business leaders indicated that they recognized the importance of an established disaster preparedness/business plan and its significance in maintaining a successful operation after a disaster event. However, they do not have the resources (people, money, time) to properly develop, implement, and sustain a program. For the automotive industry cluster, this project also supports the IMCP Drive! for the Future Consortium’s initiative. Specifically in the goal of “ensuring that the region remains globally competitive and continues to emerge as a leading center for advanced automotive technologies”.

This project also supports several federal level initiatives and strategies. First, the 2012 White House National Strategy for Global Supply Chain Security which seeks to “strengthen global supply chains in order to protect the welfare and interests of the American people and secure our Nation’s economic prosperity” by “fostering a resilient supply chain”. Second, the White House “Public & Private Sector Efforts to Increase Community Resilience through Building Codes and Standards” and the National Institute of Standards and Technology: Codes and Standards for Resilience. Third, the initiative supports expectations for improved preparedness as defined by several agencies: U.S Food and Drug Administration, The Dodd-Frank Wall Street Reform and Consumer Protection Act, the Commodity Futures Trading Commission, the Federal Emergency Management Agency, and the Homeland Security Act to name a few. Finally, and more importantly at the local and state levels, the project supports the

growing increase in community “stressors” beyond natural disasters or weather events. These stressors include economic downturns, the lack of skilled and dedicated workforce to maintain economic growth, community violence, environmental issues, and cyber security.

Project Description

The opportunity this project seeks to achieve is “Creating *Community* Resilience to Foster *Business* Resilience in the Tennessee Automotive Supply Chain Cluster”. The reasons for focusing on the automotive cluster are obvious; however, to reiterate recent statistical updates, Tennessee has the largest automotive industry in the Southeast with over 100,000 automotive workers in 88 of 95 counties. The visual representation, Figure 2, page 10, shows how much of the state could be impacted by a major disruption.

Figure 1: Distribution of Automotive Suppliers by County, Courtesy of the Tennessee Department of Economic and Community Development



Over the course of the last two years, the University of Tennessee Center for Industrial Services has worked with the South Central Tennessee Development District to implement continuity and resilience planning at the business and community level. SCTDD’s and UT CIS’s endeavor is to address the Brookings recommendation that Tennessee’s industry leaders must “*assertively and strategically focus on targeted interventions aimed at addressing specific industry weaknesses.*” The mission of the long term project is to facilitate and implement strategies that will drive continuous industry development by fostering the ***broad health*** of the

communities that serve the automotive supply chain. The initiative seeks to achieve the following results:

- Create awareness for the need to have a proactive community continuity and resilience program
- Develop and implement program for the South Central Tennessee Development District that can be standardized across other Development Districts
- Develop community level program for Bedford County to include all stakeholders
- Drive from the community level into the business level to include a robust system focused on the automotive cluster
- Determine, document, and share best practices by which local and state EDO's can drive and support community and business continuity and resilience

Note that this project is focused on being proactive not reactive. There are hundreds of examples and case studies on what to do after an event and financial resources are often available to help with “recovery”. There is great value in understanding the difference between continuity, resilience, and recovery. Continuity planning focuses on the restoration of business functions. It involves a more comprehensive approach to ensuring resilience. Resilience demonstrates the ability of an organization to rapidly adjust and transform the business or business function in response to any anticipated and unanticipated change. Recovery planning focuses on the restoration of infrastructure that supports the business functions.

This project began in 2014 at the request of the South Central Tennessee Development District. They contacted UT CIS to inquire about services dedicated to helping small to medium size companies prepare and respond to disasters. As a result, SCTDD and UTCIS partnered to conduct two regional workshops for area industries in business resilience planning. These two half day workshops were conducted in Shelbyville and Mt. Pleasant with the participation of local Emergency Management Agencies, EDO partners, and manufacturing representatives. UT CIS served as the program facilitator sharing case studies and best practices. As a follow up to the workshops, UT CIS was invited to be a speaker for the NADO conference in Nashville. As a

direct result of this work, SCTDD in partnership with UT CIS was awarded a 2015 NADO Innovator of the Year Award. In an effort to gain funding for the larger result of achieving a standard program that would reach across all Tennessee Development Districts and the whole automotive cluster, an unsolicited grant proposal was developed seeking funding to support further development and outreach.

As a parallel path, UT CIS facilitated the participation of Mr. Stephen Cauffman from the National Institute of Standards and Technology. Mr. Cauffman is the lead for the Disaster Resilience Materials and Structural Systems division of the NIST Engineering Laboratory and responsible for “convening the diverse body of stakeholders to develop a community-centric Disaster Resilience Framework” focused on buildings and infrastructure. He has also lead the development of the NIST *Community Resilience Planning Guide for Buildings and Infrastructure Systems*. Our partnership with Mr. Cauffman began with his facilitation of a one hour webinar with UT CIS, SCTDD, and appropriate Bedford County, TN stakeholders (mayors, local business, and industry, emergency response providers). The purpose of the webinar was to create awareness and offer insight into the larger area of Business Continuity and Resilience. Mr. Cauffman followed up the webinar with a one day, on-site workshop conducted at the Bedford County EMA office. The workshop was attended by the same stakeholders that participated in the webinar. Through the course of the day, attendees were presented with four main questions:

1. What is important to the community?
2. What is the communities’ vision/long term plan?
3. What are the threats to the vision/long term plan?
4. Who should be part of a collaborative planning team?

This structure was intentionally utilized as there is a great need to educate the community and businesses to the bigger picture viewpoint of continuity and resilience – it is not just about

weather events or natural disasters. Communities and businesses must adopt that big picture viewpoint in order to be truly sustainable and promote growth. The Bedford County meeting was very informative and provided a strong list of actionable follow up activities that will improve the communities' continuity and resilience.

In an effort to assist SCTDD in becoming the leading voice in establishing sustainable continuity and resilience programs for other Tennessee Development Districts and the automotive industry, UT CIS recently began facilitating the development of a South Central Tennessee Development District Continuity and Resilience program. The initial workshop focused on identifying key stakeholders, processes, risks, and action plans to mitigate risk and ensure continuity and resilience.

Lessons Learned and Next Steps

As evidenced by the project timeline to date, incorporating continuity and resilience planning throughout a community is a long term endeavor. One of the biggest potential roadblocks is a lack of awareness and sense of urgency. It is not a question of "if an event will happen" but "when will an event happen". Organizations are busy keeping up with the day to day demands of running a business and may have the perception that the likelihood of an adverse event is low, that investing in advance preparation is not worth the potential reward, or that they can cope with the consequences. Creating awareness and a sense of urgency are key to protecting the community as a whole. Once the sense of urgency is developed, required leadership commitment and community collaboration will create the momentum to follow through.

In reference to this project, UT CIS will continue to facilitate the development and implementation of the continuity and resilience program at SCTDD. Part of this plan will be reaching out to other development districts to share best practices. UT CIS will continue to create

collaborations with EDO partners in order to spread awareness. For example, UT CIS is currently partnered with the Tennessee Automotive Manufacturing Association to provide lunch and learn engagements and half day workshops for the automotive industry. UT CIS will work toward integrating services among all of our public service agencies (County Technical Assistance, Law Enforcement Innovation Center, and the Municipal Technical Advisory Service) to develop a holistic continuity and resilience approach that works for Tennessee.

Conclusion and Recommendations for EDO's

Progress to date on this project has shown that a large portion of small to medium sized companies in Tennessee do not have a continuity and resilience plan. In addition to a great deal of useful continuity and resilience information geared toward EDO's, the Restore Your Economy website at <http://restoreyoureconomy.org/> provides a chart illustrating the responsibilities of economic development professionals in pre disaster planning (and post disaster recovery). Below is a summary of some of those responsibilities and appropriate recommendations that can be adopted:

1. Understand how an event can impact the community and industries - utilize an economic or business impact analysis to develop an inventory of stakeholders, key industry clusters, processes, and labor and workforce characteristics. The impact analysis can then be transferred to a risk assessment template to determine threats and mitigation responses.
2. Lead a planning process that includes stakeholders from both public and private sectors – develop a diverse group that includes elected officials, local business and industry leaders, public utility representatives, local emergency management personnel, health and human services representatives, and local financial institutions.

3. Educate the community – sponsor workshops and informational activities to share the information with the community to increase awareness and create a sense of urgency
4. Identify sources of funding – work with local financial institutions to coordinate ways in which the institution can make funding available for both pre and post events. Federal funds are only available after an event and these funds can take time to acquire and have limitations. Possible solutions include revolving loan funds, bridge loan programs, and business grant programs.

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