



ADVANCED
MANUFACTURING
INSTITUTE

Engineering Success

Working Together to Energize and Build
Regional Innovation Capacity

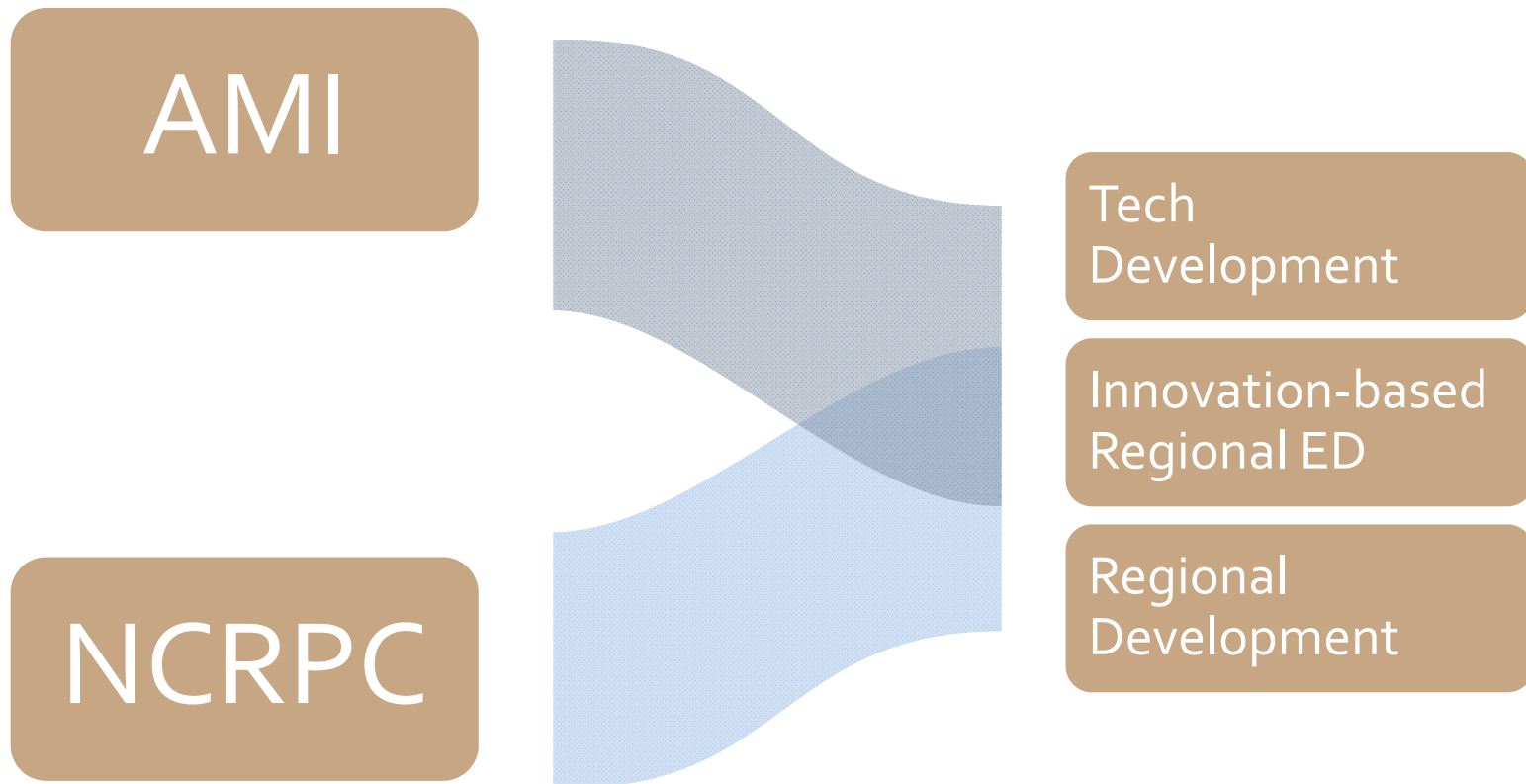
An EDD/UC Collaboration

Discussion Outline

- **A Merging of Competencies and Perspectives**
- **A Pilot Endeavor**
- **KOIN: Adding to the Rural Development ED Portfolio**
- **Networking the Rural and Urban**



A migration to a complementary relationship



Who We Are...



- **Mission:** to advance technologies, people, and companies through collaborative engineering and business partnerships.
- **Clients:** Startups, small companies, large corporations, and community partners



AMI's Professional Consulting Staff

- **15 full-time experienced technical/business professionals**
 - 7 Mechanical engineering positions
 - 2 Chemical engineering positions
 - 1 Industrial engineering position
 - 1 Electrical engineering position
 - 1 Product designer position
 - 1 full-time technician
 - 1 Commercialization/business planning professional
 - 1 Economic analyst



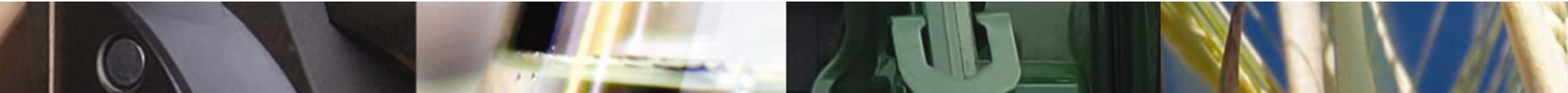
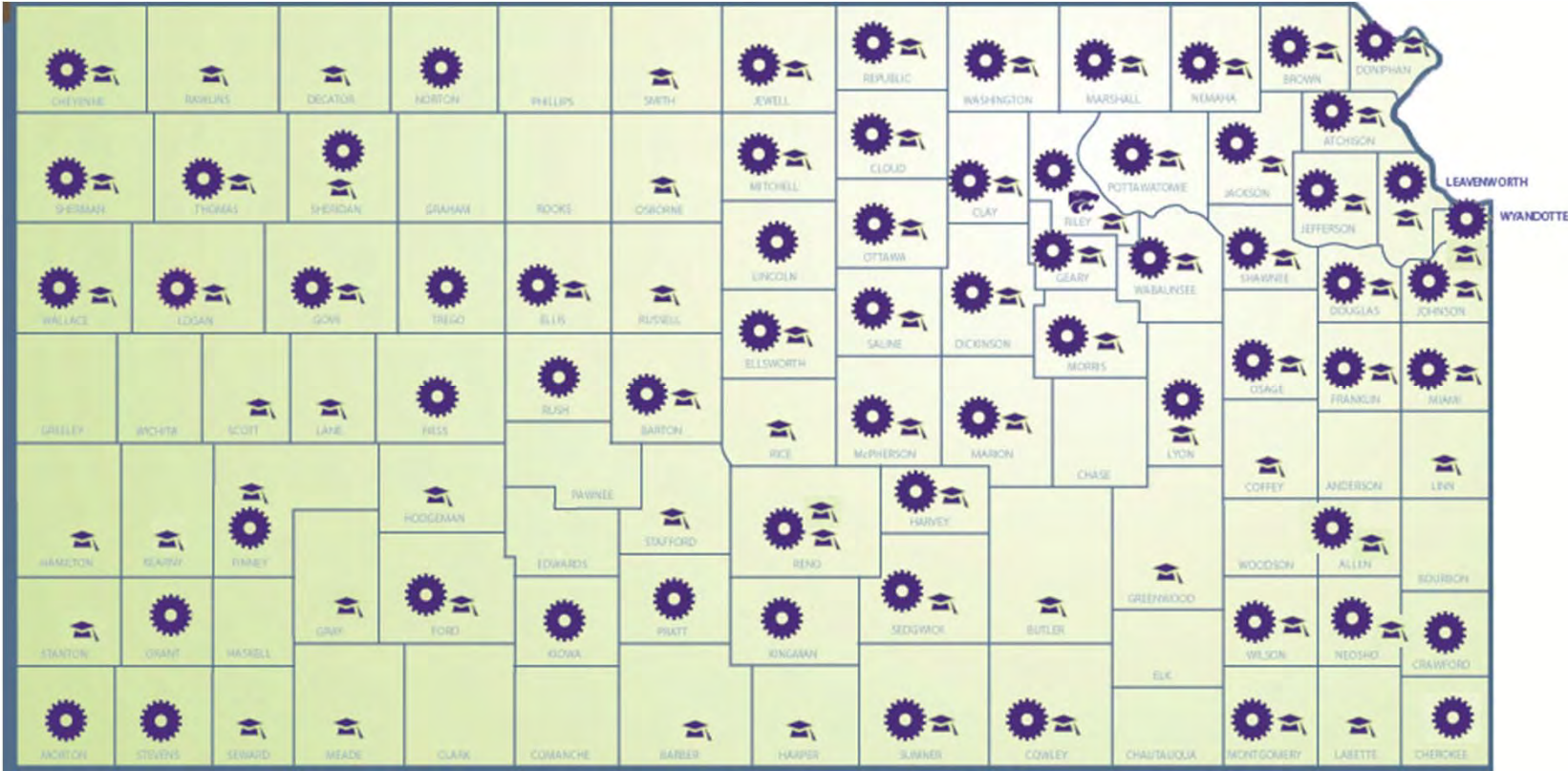
The AMI Internship Experience – A Hands-on Program

- Since 1995 over 450 students have interned at AMI
- Modeled after the proven “teaching hospital” mentoring approach
- Students have been from all the manufacturing-related engineering disciplines and school of business
- Experience focus is on developing:
 - Technical skills
 - Business perspective
 - Communications skills
 - Professionalism

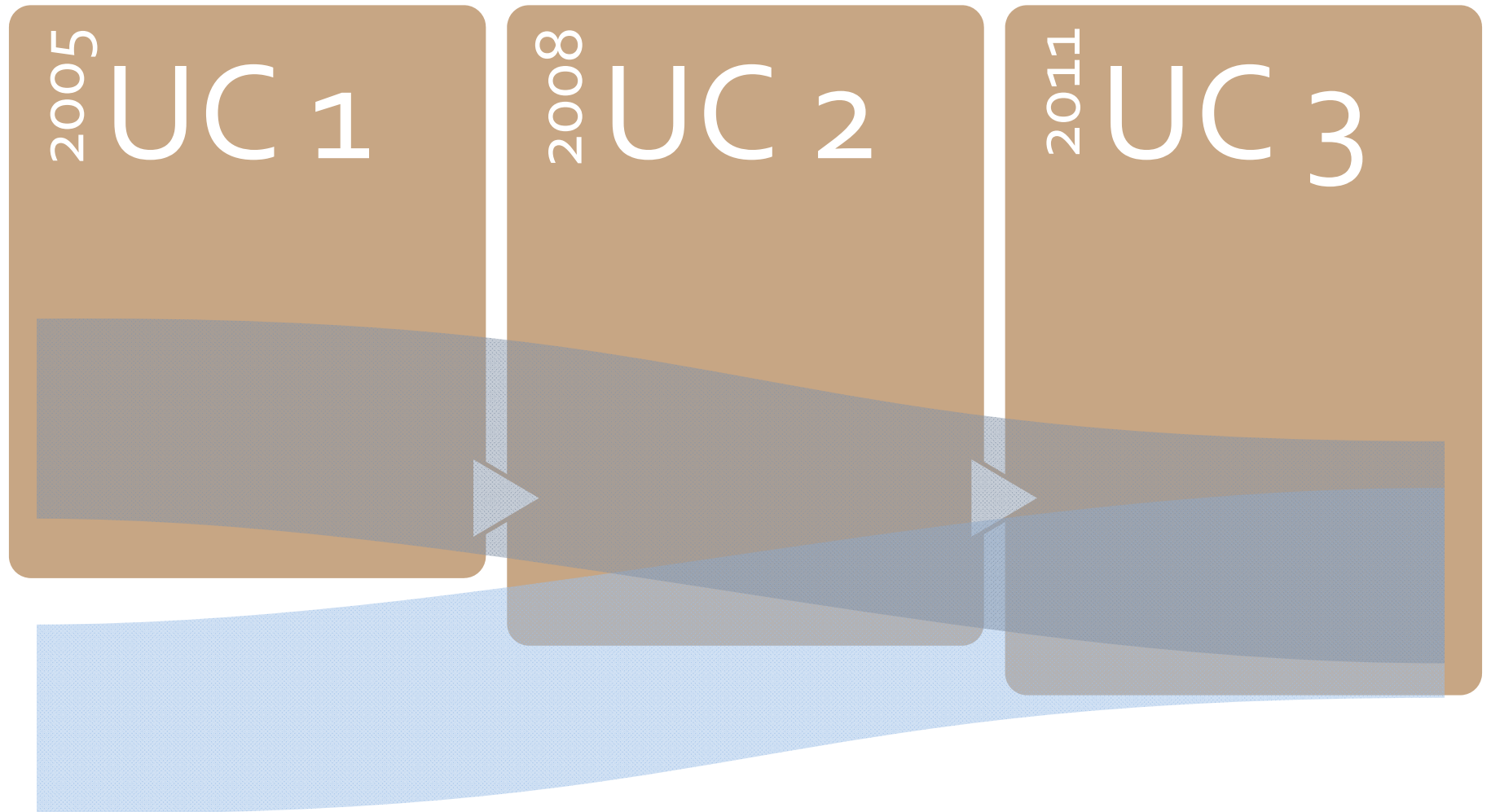


Who Uses AMI Services?

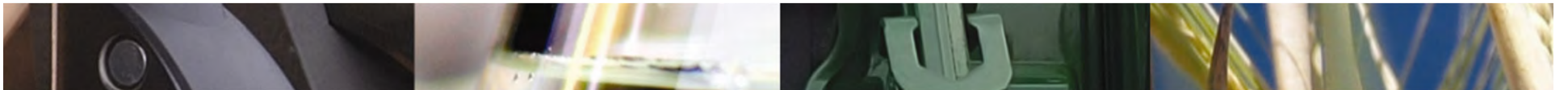
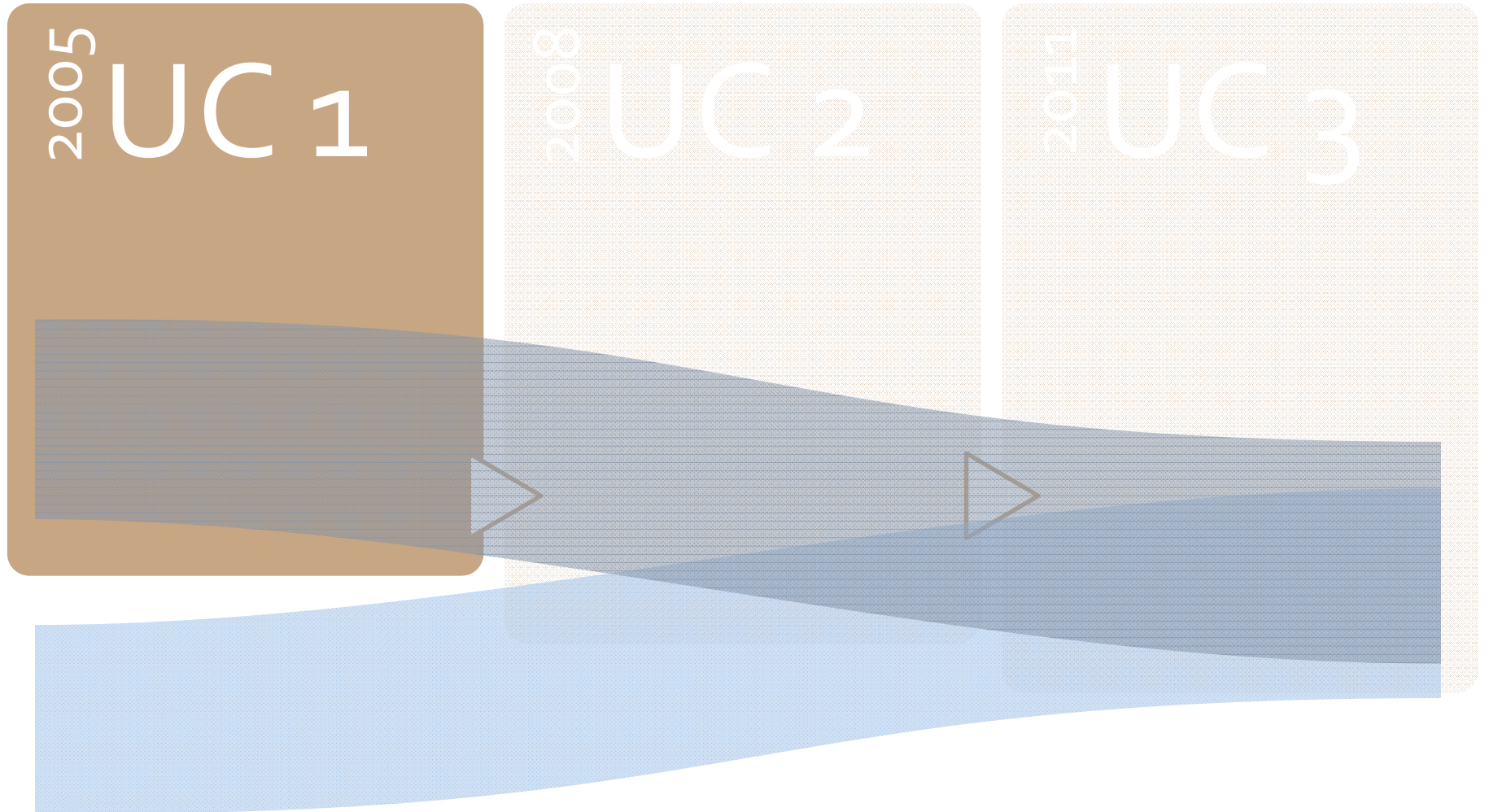
AMI has done projects in 66 Kansas Counties....



The Relationship Enabler: The EDA U/C Program



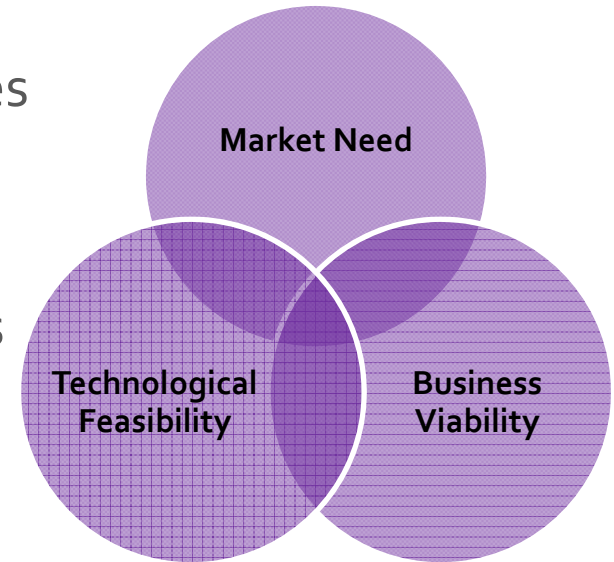
Early Stage Technology Development



UC1: Early Stage Technology Development

ESTD Agent

- Develop new products
- Develop new processes and technologies
- Develop the means to bring products to market more rapidly
- Develop the means to produce products more efficiently.



Research

Technology Development

Product & Process Development

Commercialization

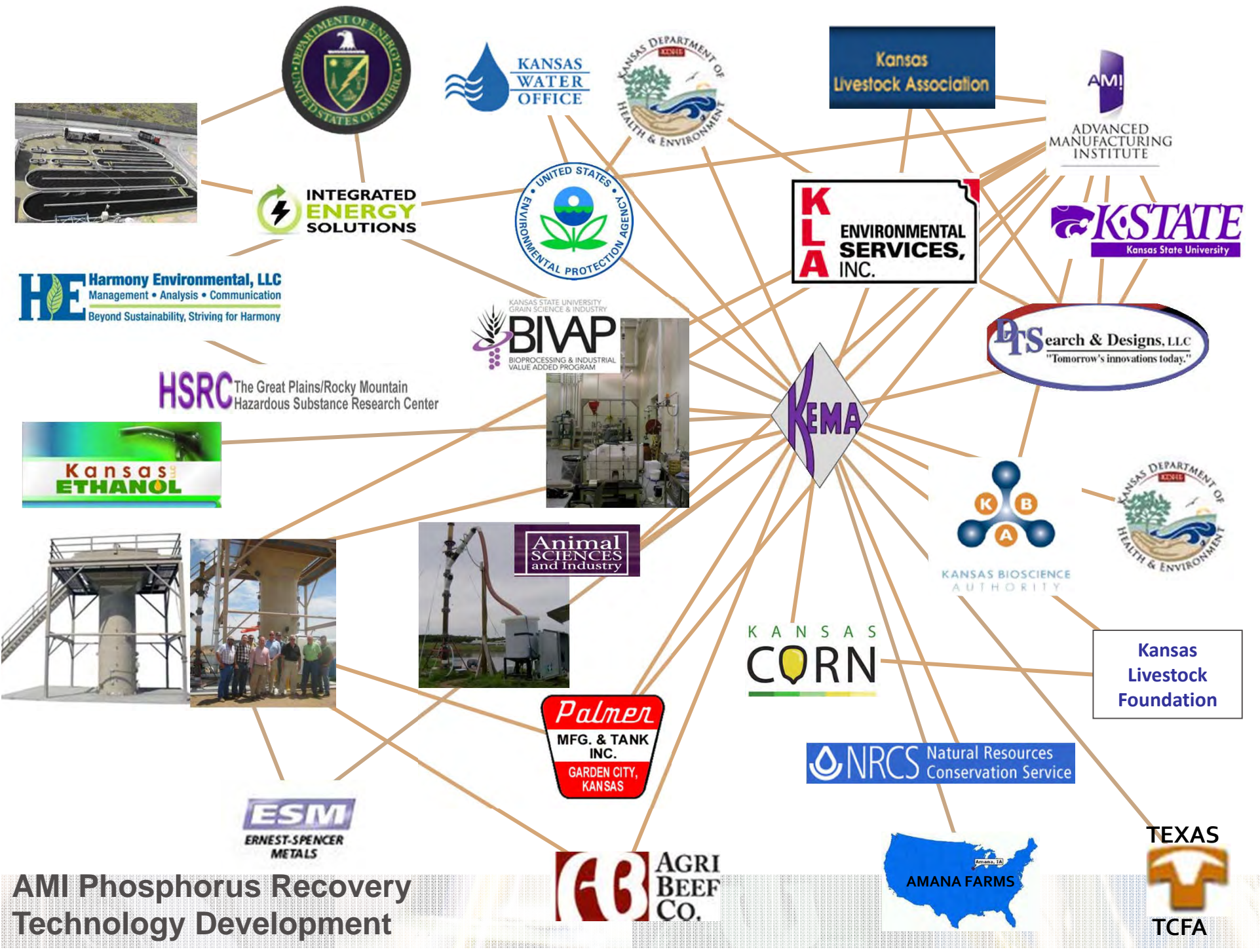


Integrated Business and Technology Development Services

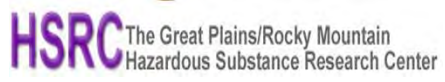
	Preliminary Phase	Development Phase			Commercialization Phase	
	Investigation	Feasibility	Development	Introduction	Full Scale Production	Maturity
Technical	Technology Concept Analysis	Technology Feasibility	Engineering Prototype	Pre-Production Prototype/ Pilot Plant	Production	Production Support
Market	Market Needs Assessment	Market Study (Desirability)	Strategic Marketing Plan	Market Validation	Sales and Distribution	Market Diversification
Business	Venture Assessment	Economic Viability	Strategic Business Plan	Business Start-Up	Business Growth	Business Maturity

Source: Goldsmith Technology Commercialization Model





**AMI Phosphorus Recovery
Technology Development**



Questions AMI Asked at the end of UC₁:

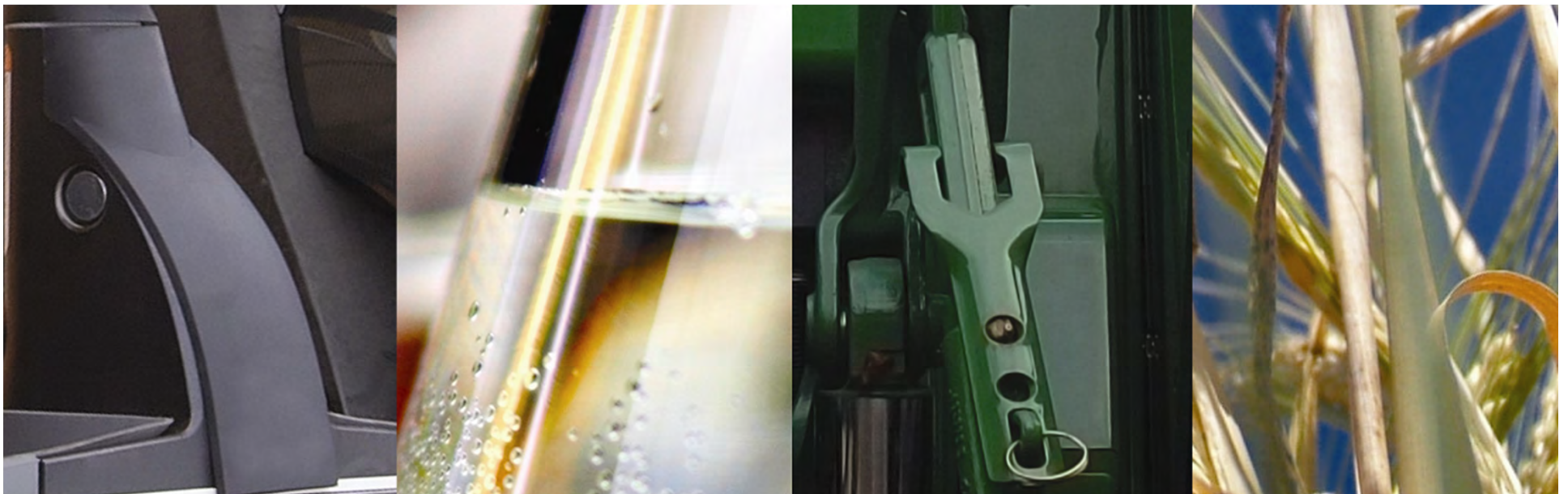
- **How can AMI:**
 - help more Kansas companies systematically connect to and accelerate top-line growth opportunities?
 - help companies connect to required elements for growth regardless of location?
 - **Source of Ideas/Technologies**
 - **Capital**
 - **Infrastructure**
 - **Expertise**
 - **Workforce**
 - facilitate greater connectedness of Kansas companies to identify and pursue new growth opportunities?
 - impact more than one company at a time?



On a similar but parallel path in North Central Kansas...

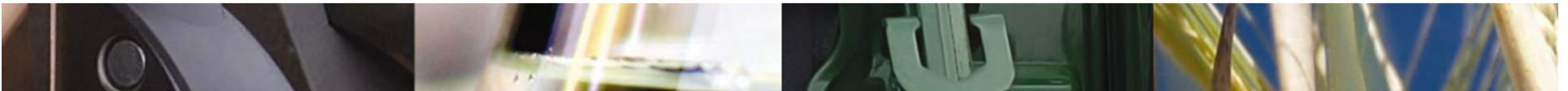


Initial Stage Motivation

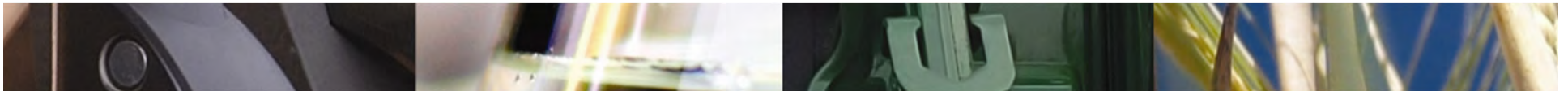


Epiphanies- 1995 to 2007

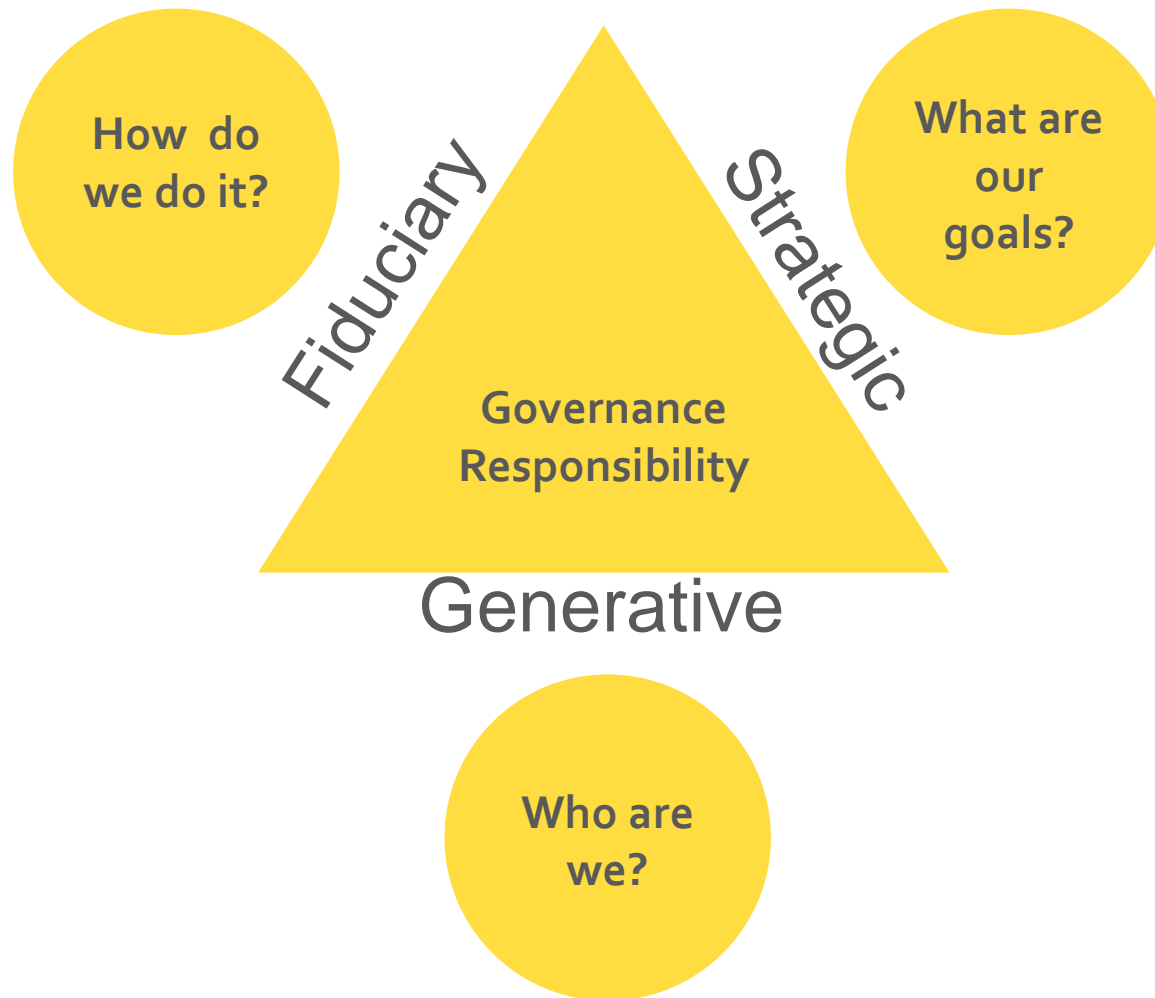
- The NCRPC, as an organization, can and should be a partner in all aspects of project planning, development and implementation to the extent it actively assumes a portion of the risk.
- The urban – rural dichotomy exists only in policy, not in reality.
- “Administrative regions” restrict thought.
- The link between “community” and “corporate place” needs to be removed.



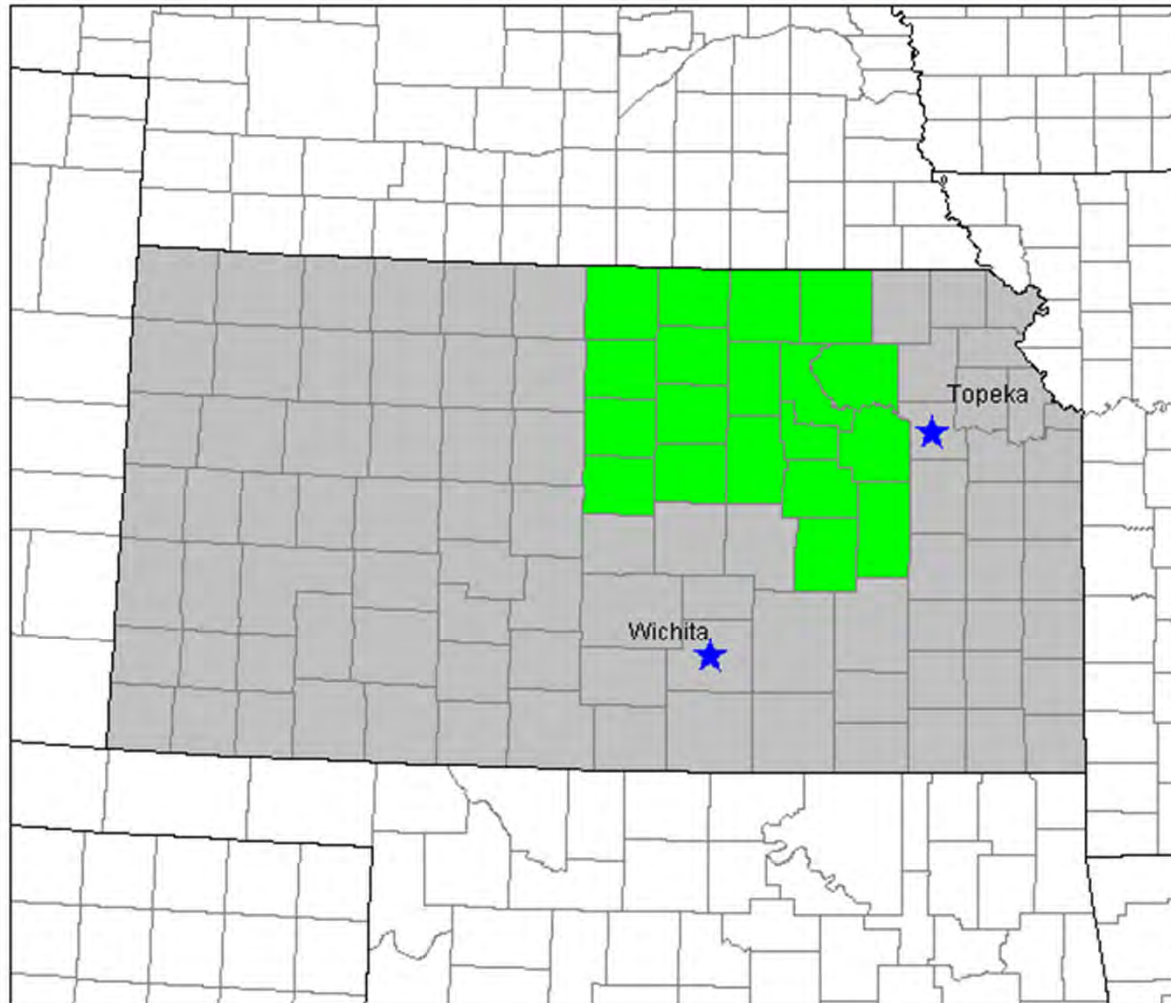
Issues Facing Rural Locations




Strategic Thinking




Nineteen (19) Counties Served by NCK Rural Business Development Tax Credit Program



Layers

 COUNTY:Counties

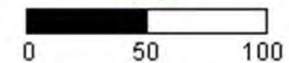
 COUNTY:States

 North Central
Kansas

Counties included:

Chase, Clay, Cloud,
Dickinson, Ellsworth,
Geary, Jewell,
Lincoln, Lyon,
Marshall, Mitchell,
Morris, Ottawa,
Pottawatomie,
Republic, Riley,
Saline, Wabaunsee
and Washington

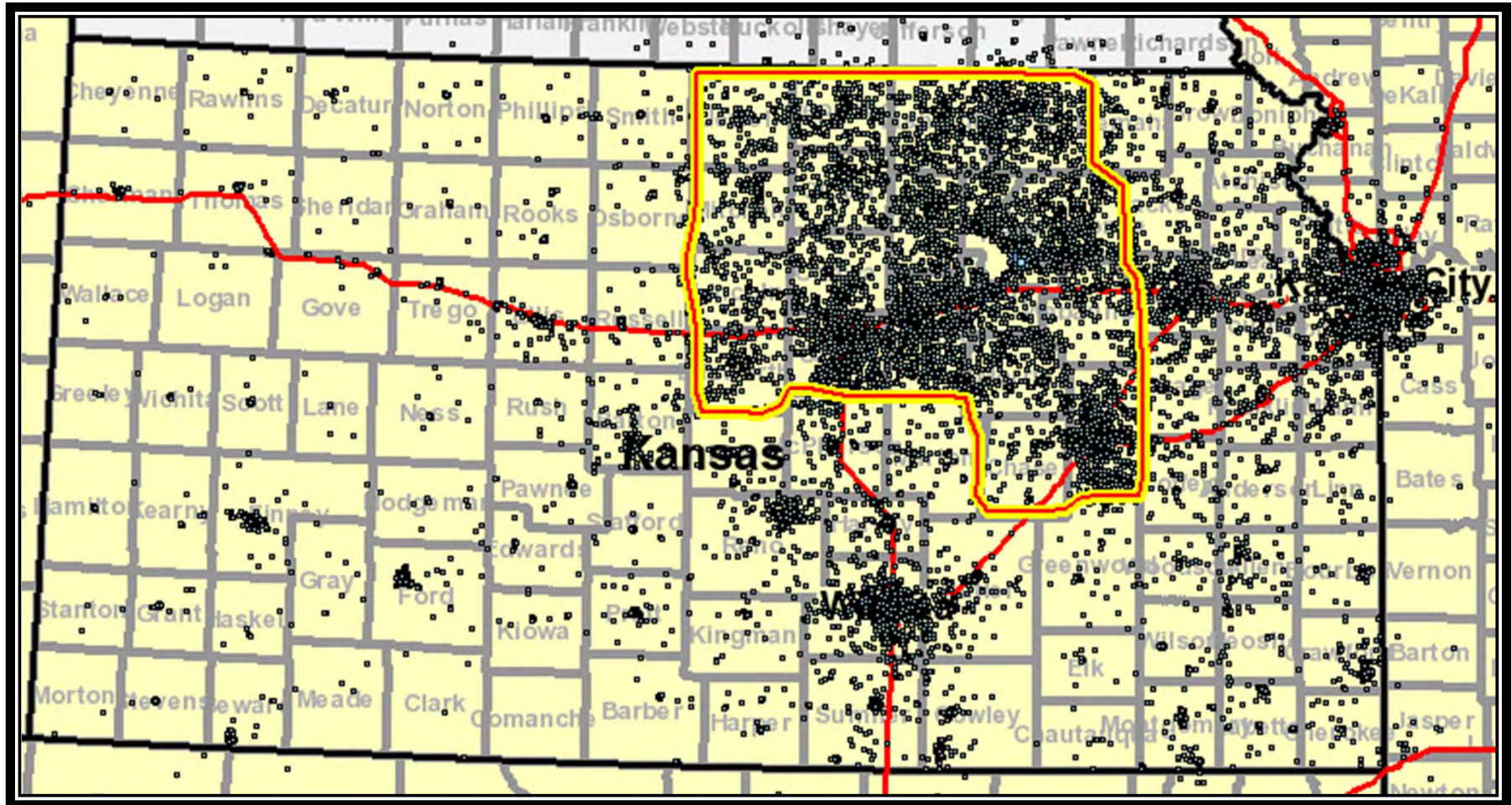
Miles



NCK RBDTC Region

Home Location of Individuals

Employed by Businesses in NCK Region



NCRPC 2005 CEDS UC Integration

Strategy 10: Further engage the Advanced Manufacturing Institute (AMI), which is associated with the School of Engineering at Kansas State University.

- Objective 10.1: Ensure area business has access to engineering, production and marketing knowledge otherwise absent in the region as a means of meeting special business needs.
- Objective 10.2: Create a mechanism whereby AMI can refer product ideas to those North Central Kansas businesses which have both the capacity and capability of producing the product.
- Objective 10.3: Work with AMI to devise a technology based economic development program that provides detailed knowledge on the business networks serving businesses within the region.
- Objective 10.4: Create a “pipeline” that enables qualified ideas and technologies, products, outside expertise, and capital to flow into North Central Kansas.



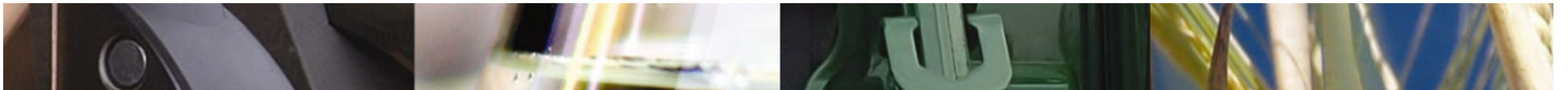
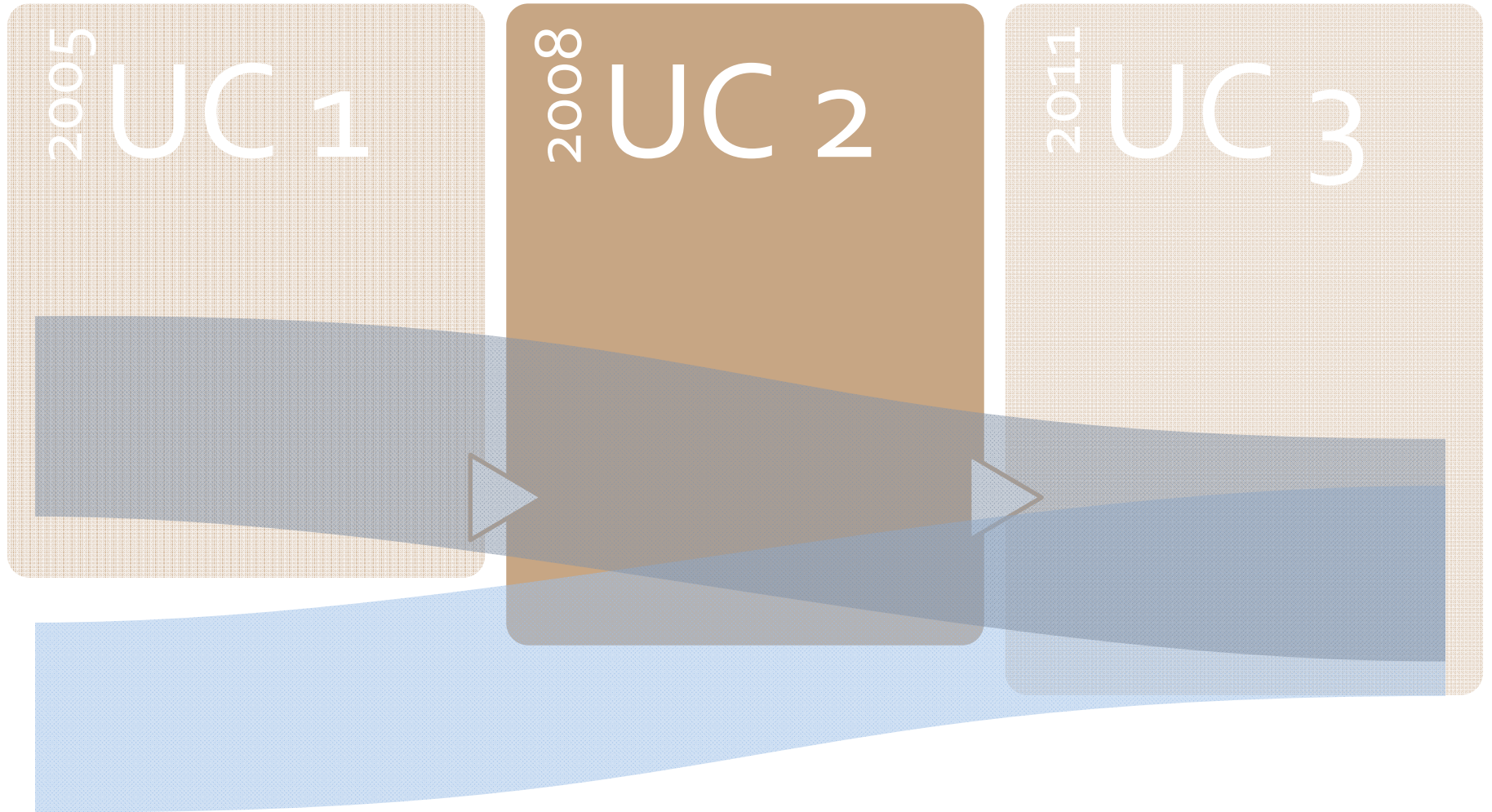
Initial Regional Pilot Project Origins

Questions / Requests posed of AMI

- What business clusters are operating in NCK?
- Which business sectors are growing and which business sectors are fading?
- What linkages exist between the various business sectors present?
- Is there a way to illustrate the data in map form that makes it easier for local leadership to better understand the regional economy?



UC2: Developing a Shared Perspective



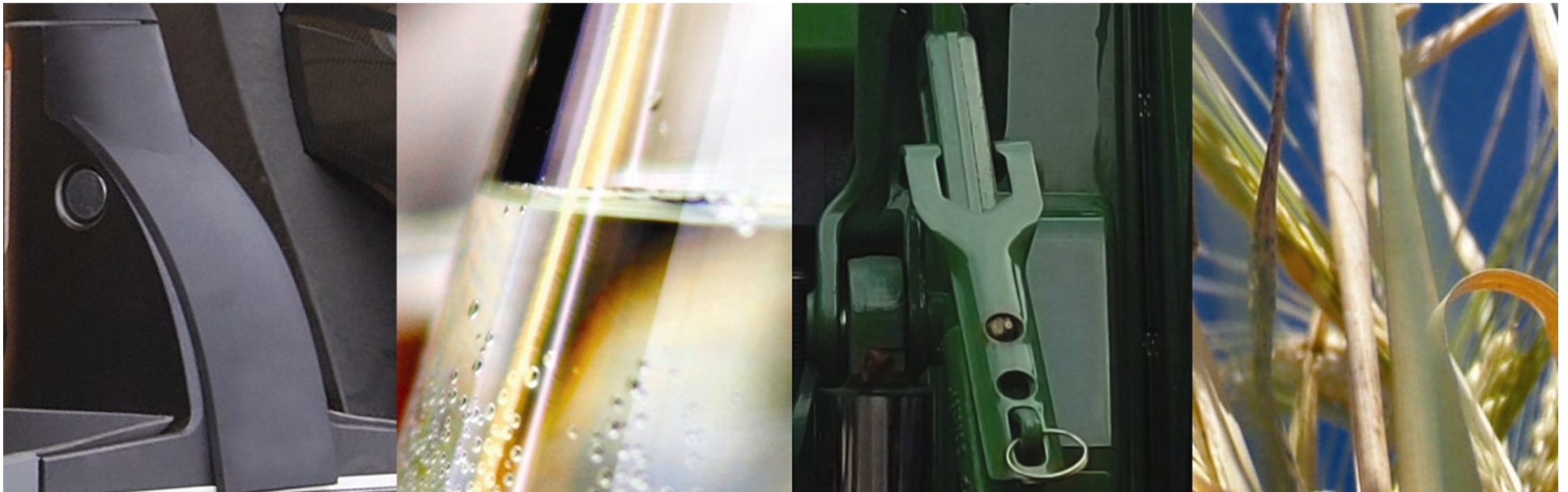
North Central Kansas Regional Industry Cluster Analysis and Innovation Networking Project

(A Core Component of AMI's UC2 Grant)



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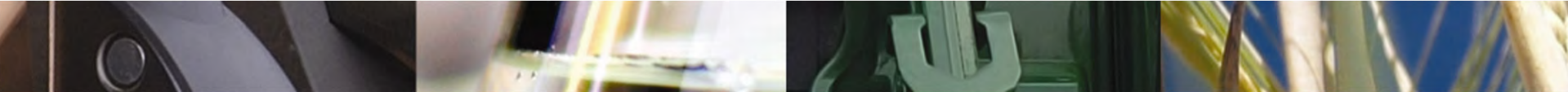
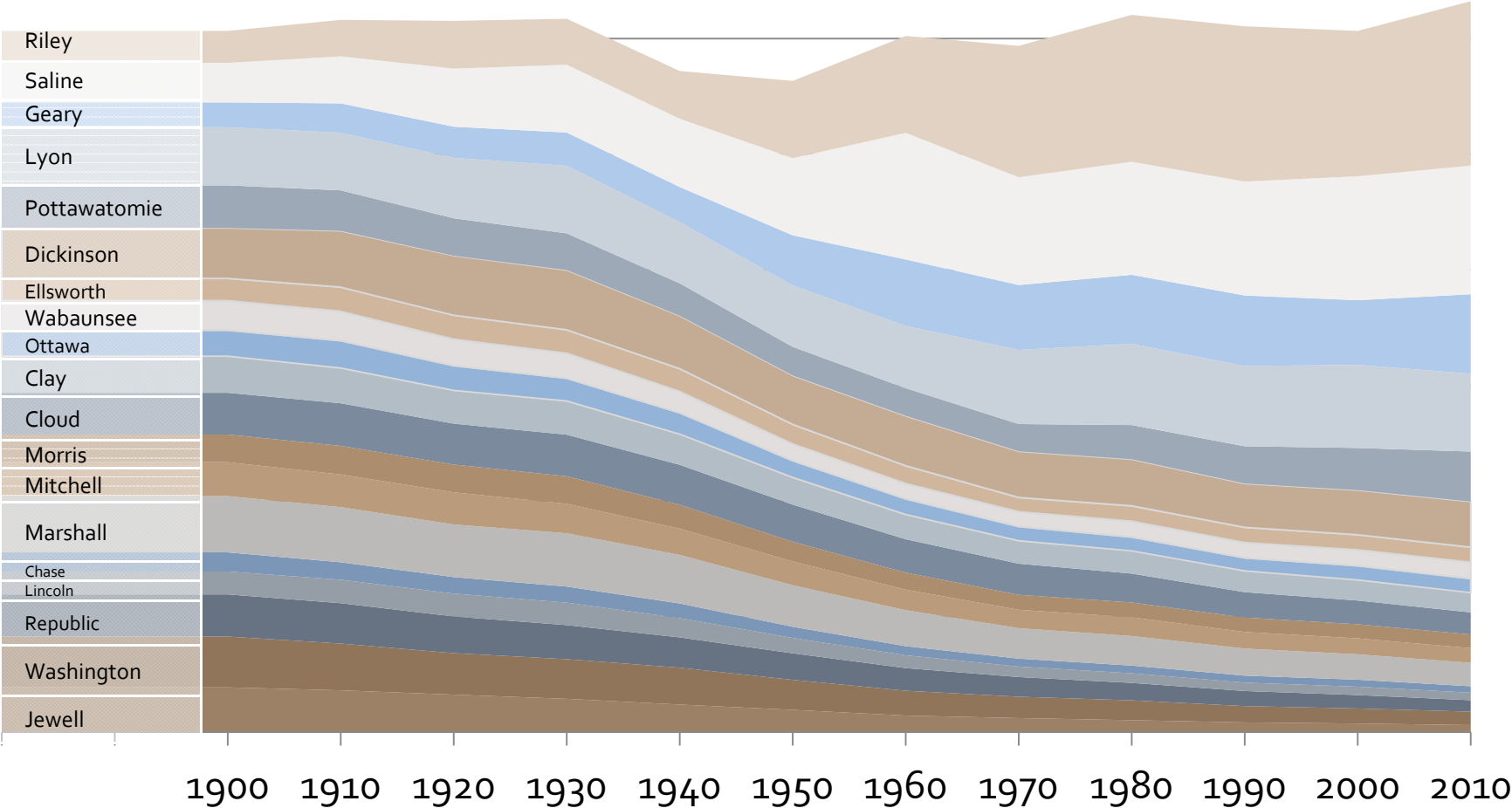


Learning's From and During Pilot Project

- Population Dynamics
- Perspectives
- Clusters
- Social Networks
- Wicked Problems

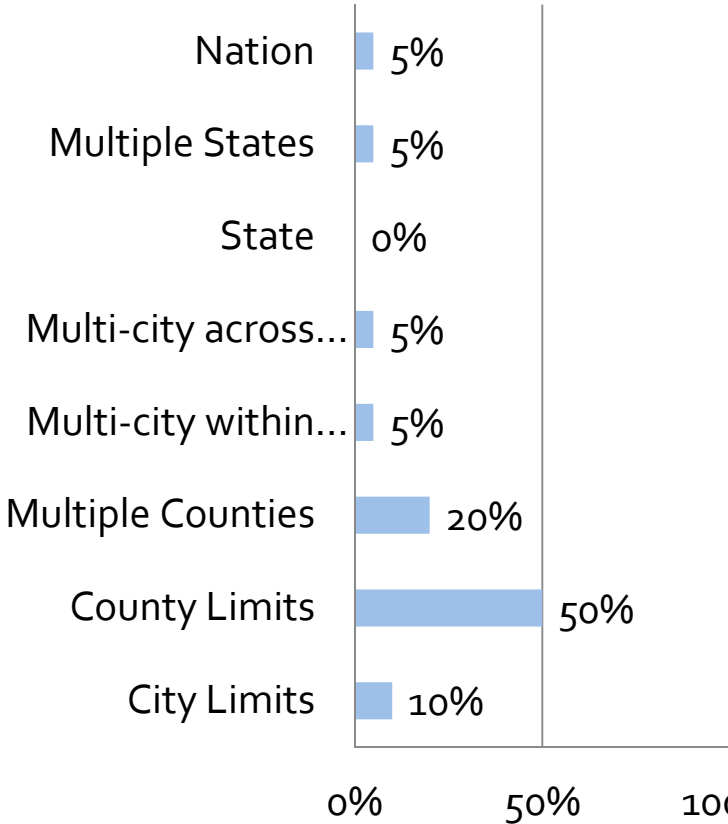


Total Population in Region

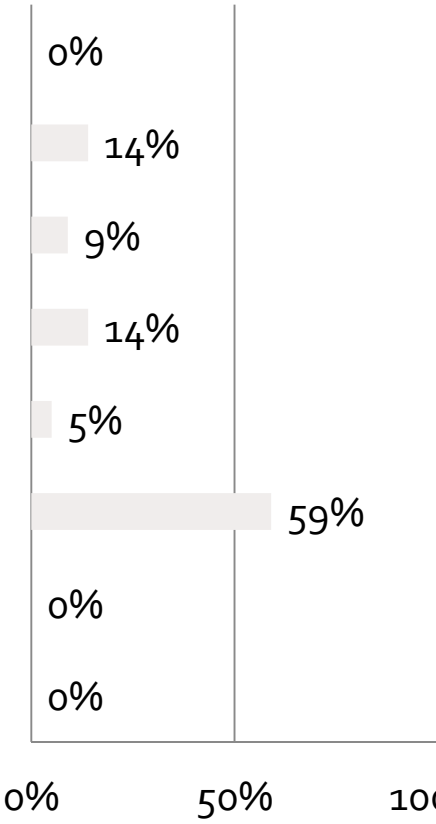


What is a Region?

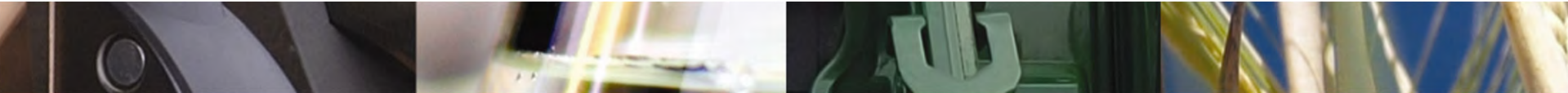
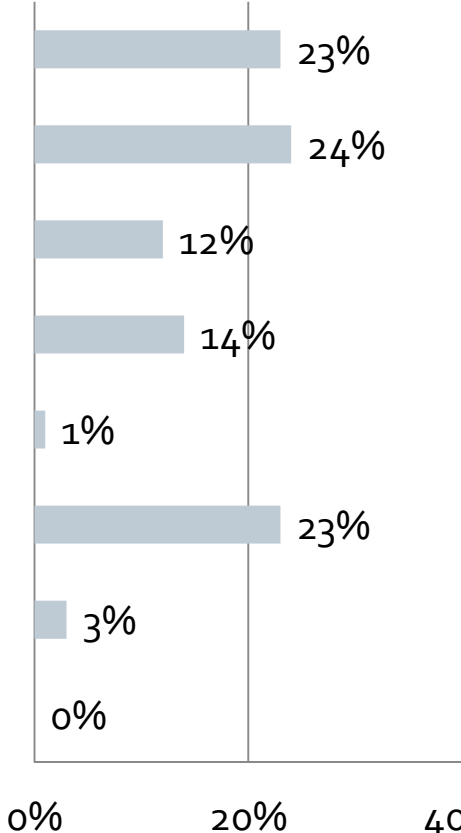
Eco Dev Community



Banks

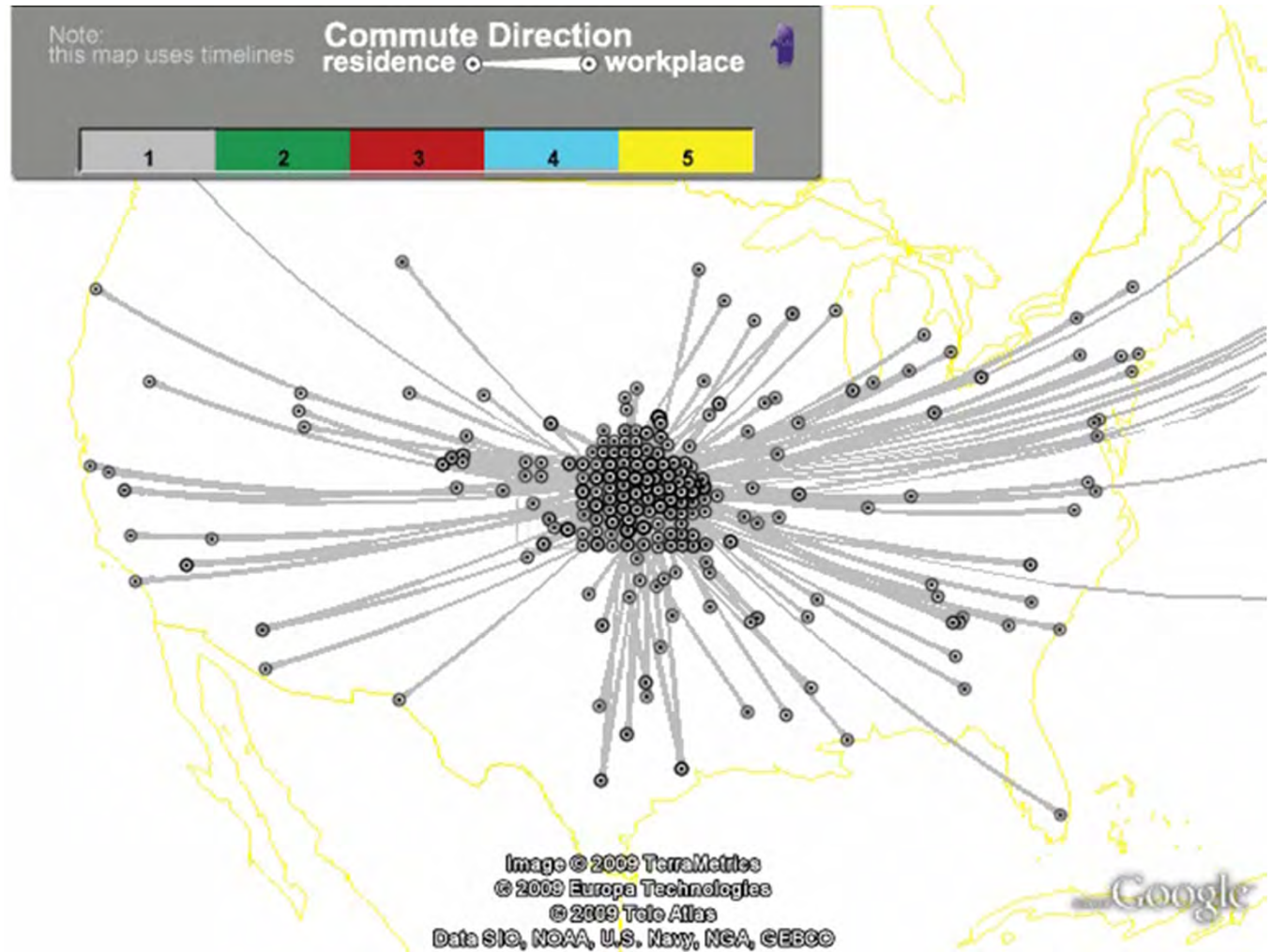


Business Community



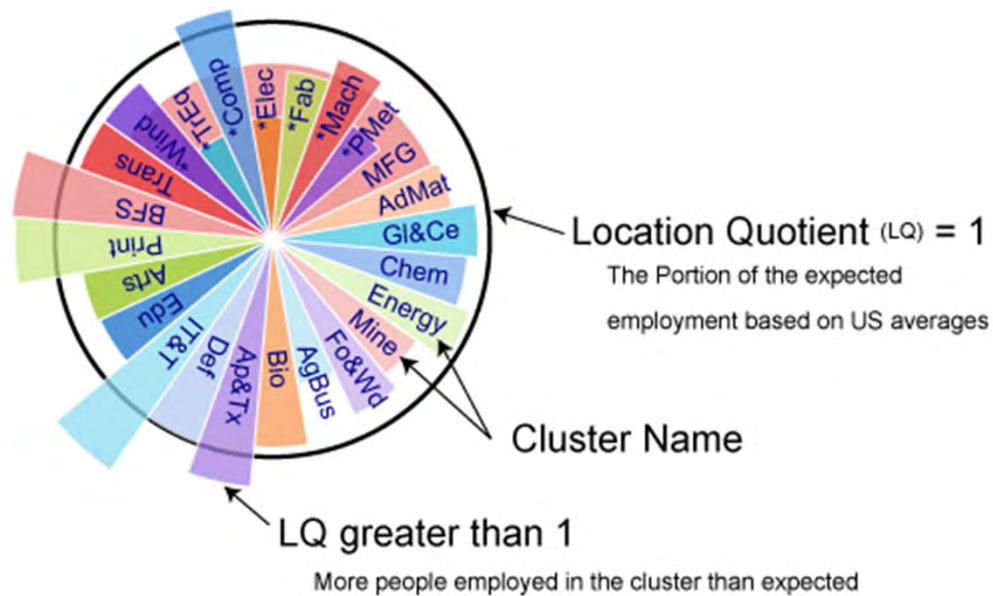
Regional Analysis - Interdependencies

- **Workflow**
 - Shows where people in the region work through the world



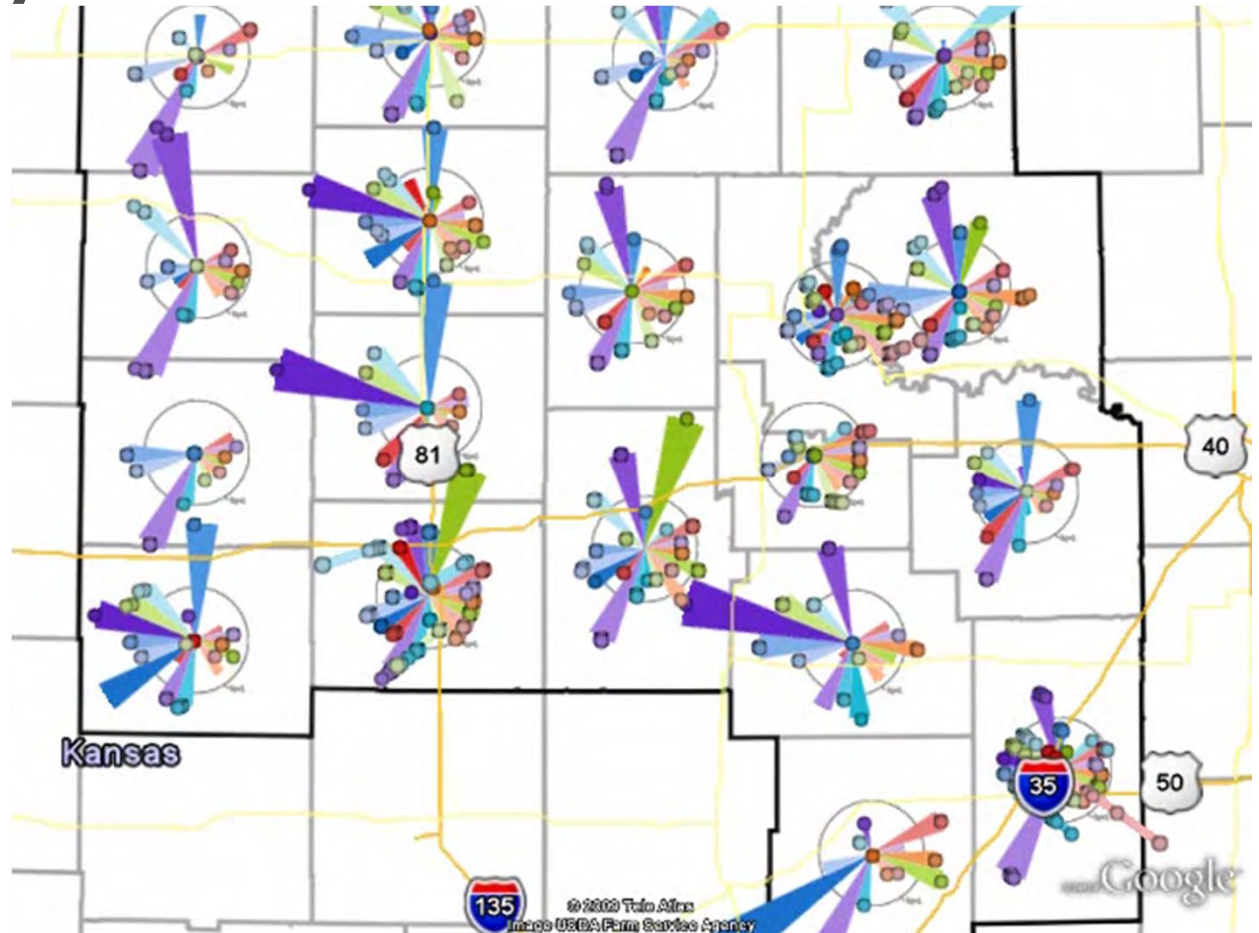
LQ Bursts as a Measure of Region Clusters

$$LQ = \frac{\left(\frac{\text{Employment in Industry } \langle j \rangle \text{ in Region}}{\text{Total employment in region}} \right)}{\left(\frac{\text{Employment in industry } \langle j \rangle \text{ in US}}{\text{Total employment in US}} \right)}$$



Regional Analysis – Where to Start?

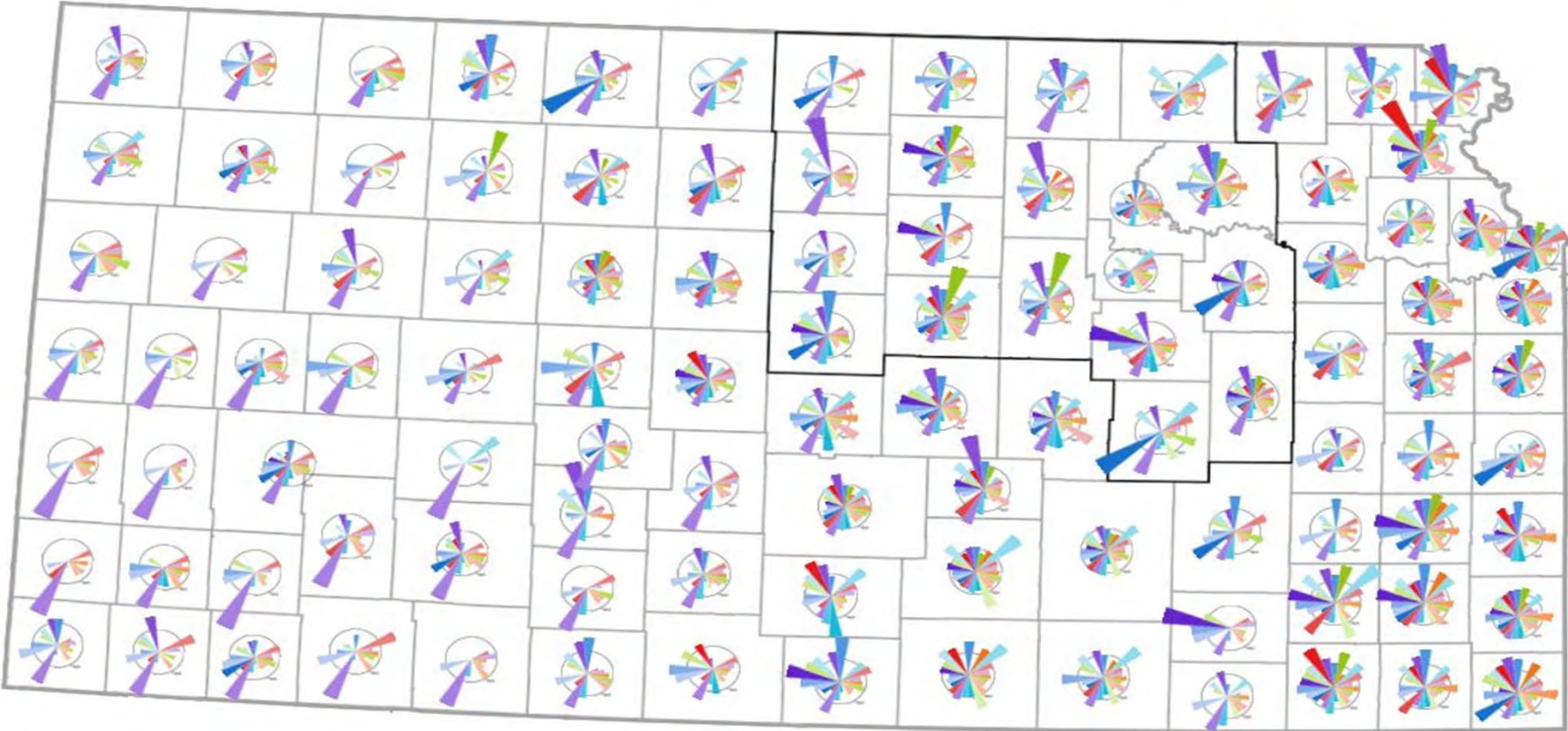
- Focus on traded industries
- What do we:
 - Preserve ?
 - Extend ?
 - Combine ?
- Assess innovation readiness
- Need to redefine clusters in rural regions
- Visualization can reshape the discussion



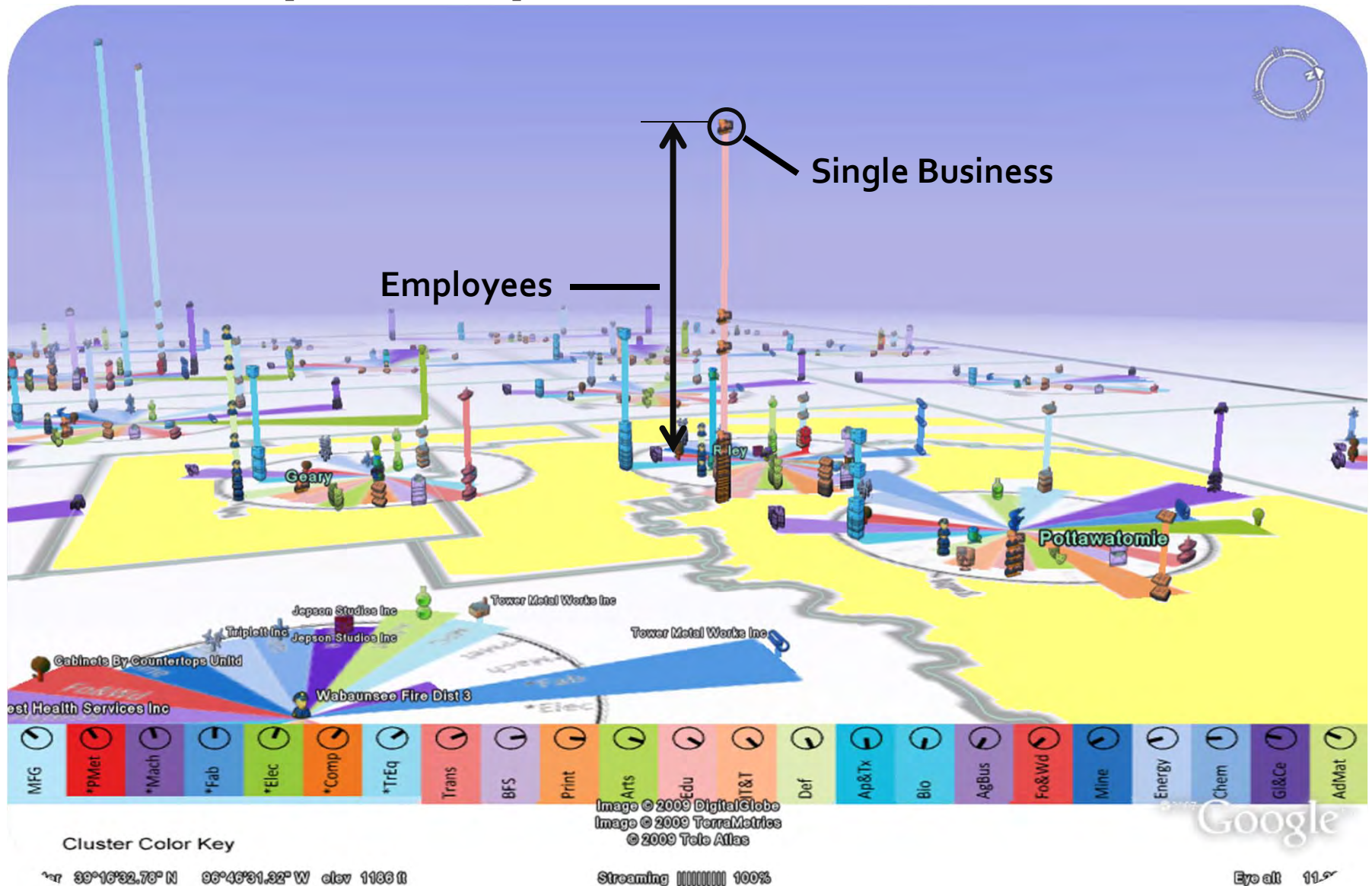
AMI.NCRPC.ORG



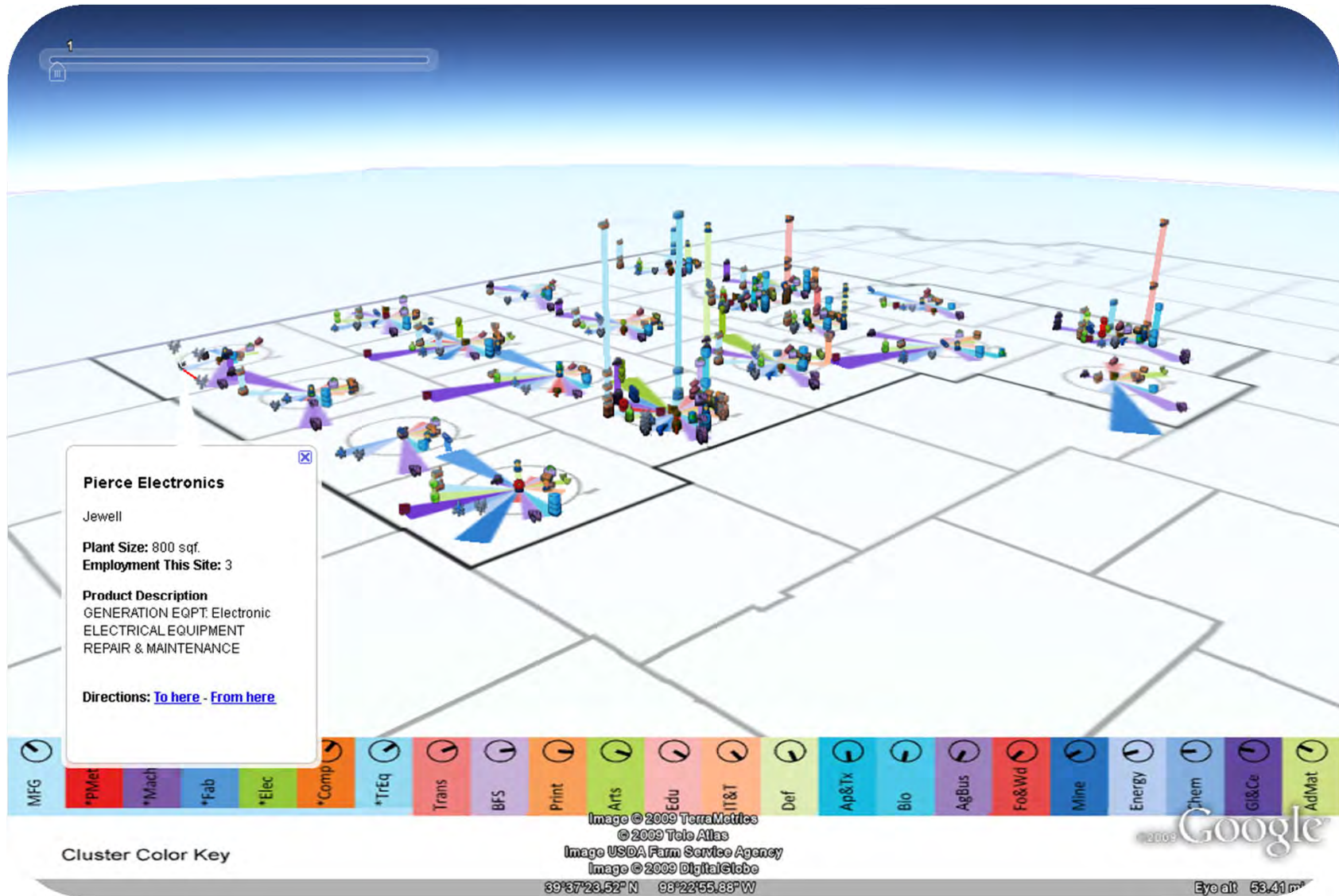
What does Kansas look like?



Landscape Perspective

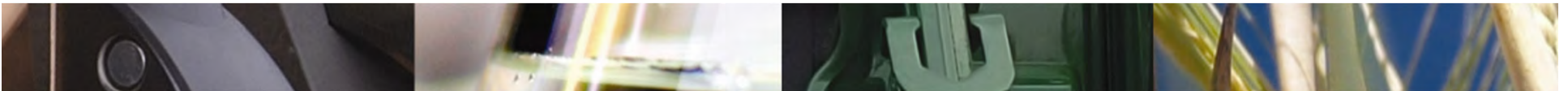
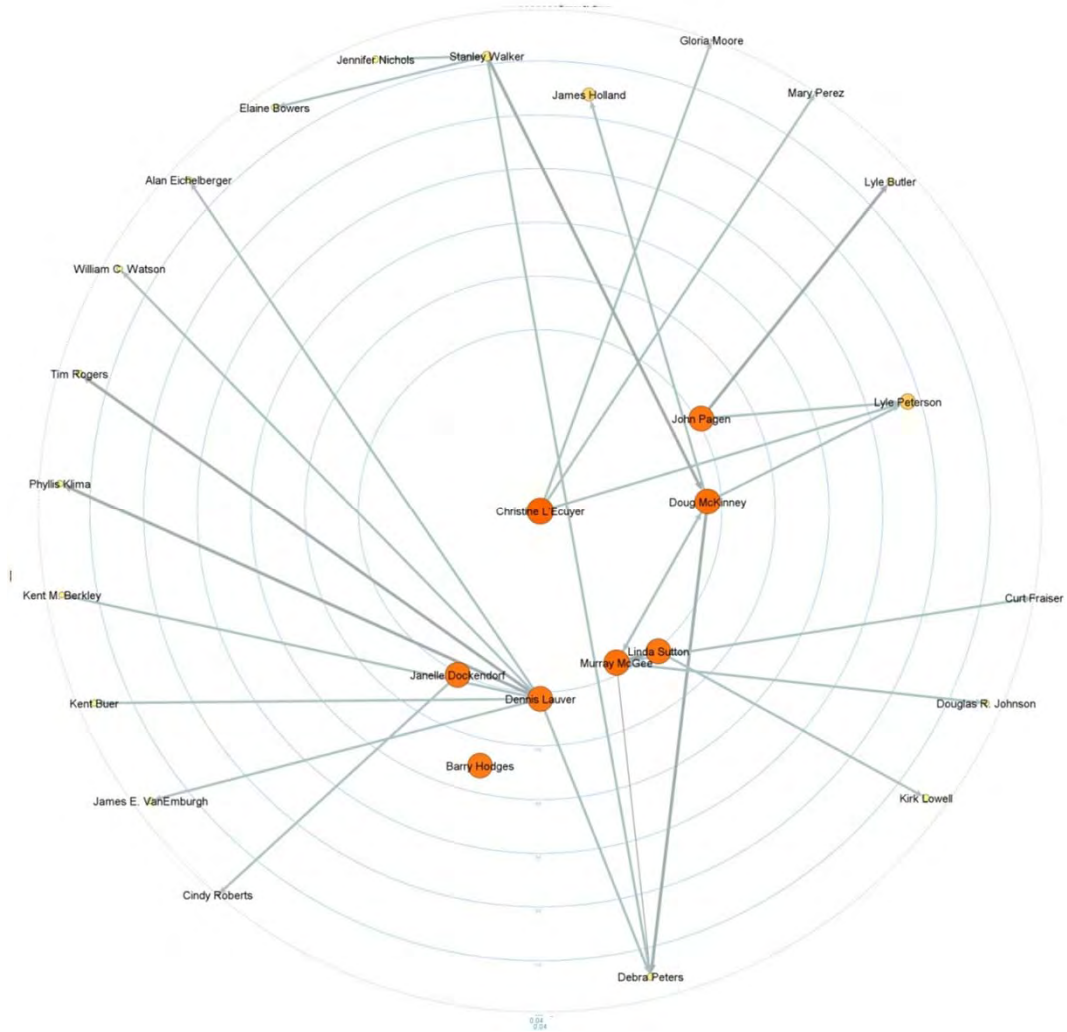


Access to Business Detail



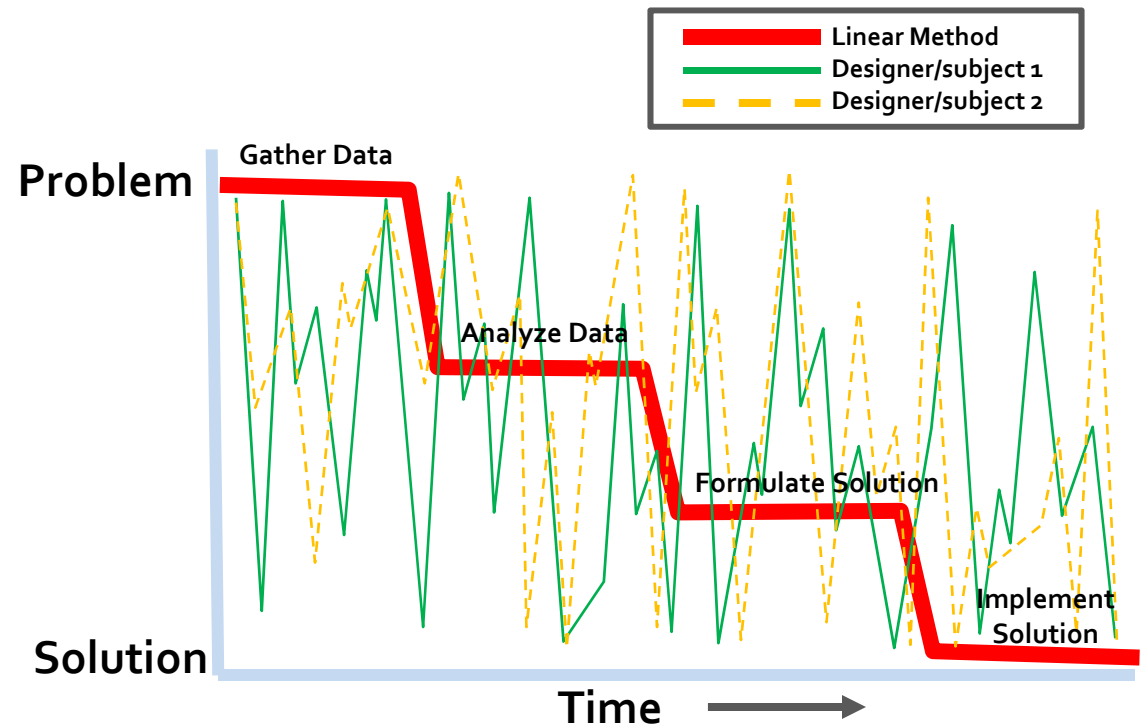
Connectedness - Social Network Analysis Maps

- Identify network stars
- Find the missing links
- Find best paths to connect the unconnected
- Develop supply chain linkages
- Metrics show connectivity and importance of each node



Rural Development is a Wicked Problem

- Don't understand the problem until have developed a solution
- Have no stopping rule
- Solutions not right-or-wrong, but better-or-worse
- Can't learn about the problem without trying solutions –likely to spawn new problems
- Unique and novel
- Symptom not the problem
- Social complexity – people!



Thus, How Can Rural Regions Compete?



The Rural Economic Development Portfolio

Recruitment

Grow Your Own

Incentive Focus

Clustering

Entrepreneurship

Using local tax dollar to recruit new business from other areas in to your region

Acknowledge a concentration of existing businesses and develop policy to support companies

Develop policy and/or services to support individual startup and existing businesses



How can Rural Regions Compete!



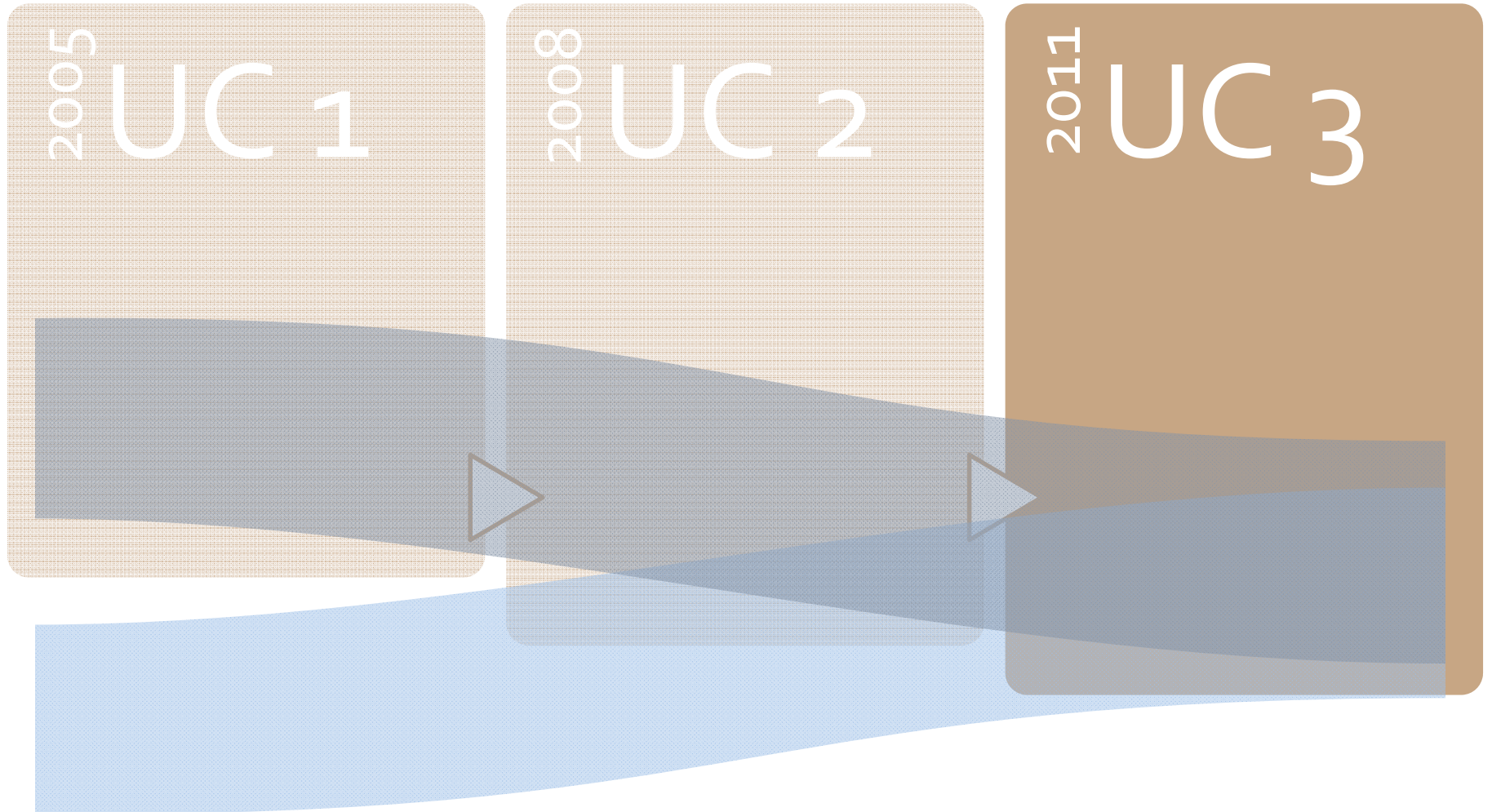
Building Connectedness to Business Opportunities

Based on input from our partners and clients, a viable “connectedness” solution must:

- Weave peer to peer business development opportunity networks
- Focus on clustering need and competencies, not just industries
- Connect to global market development opportunities/infrastructure
- Focus entrepreneurship on traded industries (wealth generators)
- Level competitive playing field (urban, global) with hub and node approach vs. traditional clusters
- Create “hard-to-copy” regional competitiveness
- Attract/retain skilled people
- Engage regional wealth and investment capital



UC₃: Rethinking What Critical Mass Means



The Rural Economic Development Portfolio

Recruitment

Grow Your Own

Ecosystem

Incentive Focus

Clustering

Entrepreneurship

Opportunity
Networks

Using local tax dollar to recruit new business from other areas in to your region

Acknowledge a concentration of existing businesses and develop policy to support companies

Develop policy and/or services to support individual startup and existing businesses

Increasing co-innovation by networking businesses around synergistic opportunities



The Networked Ecosystem Approach

Ecosystem

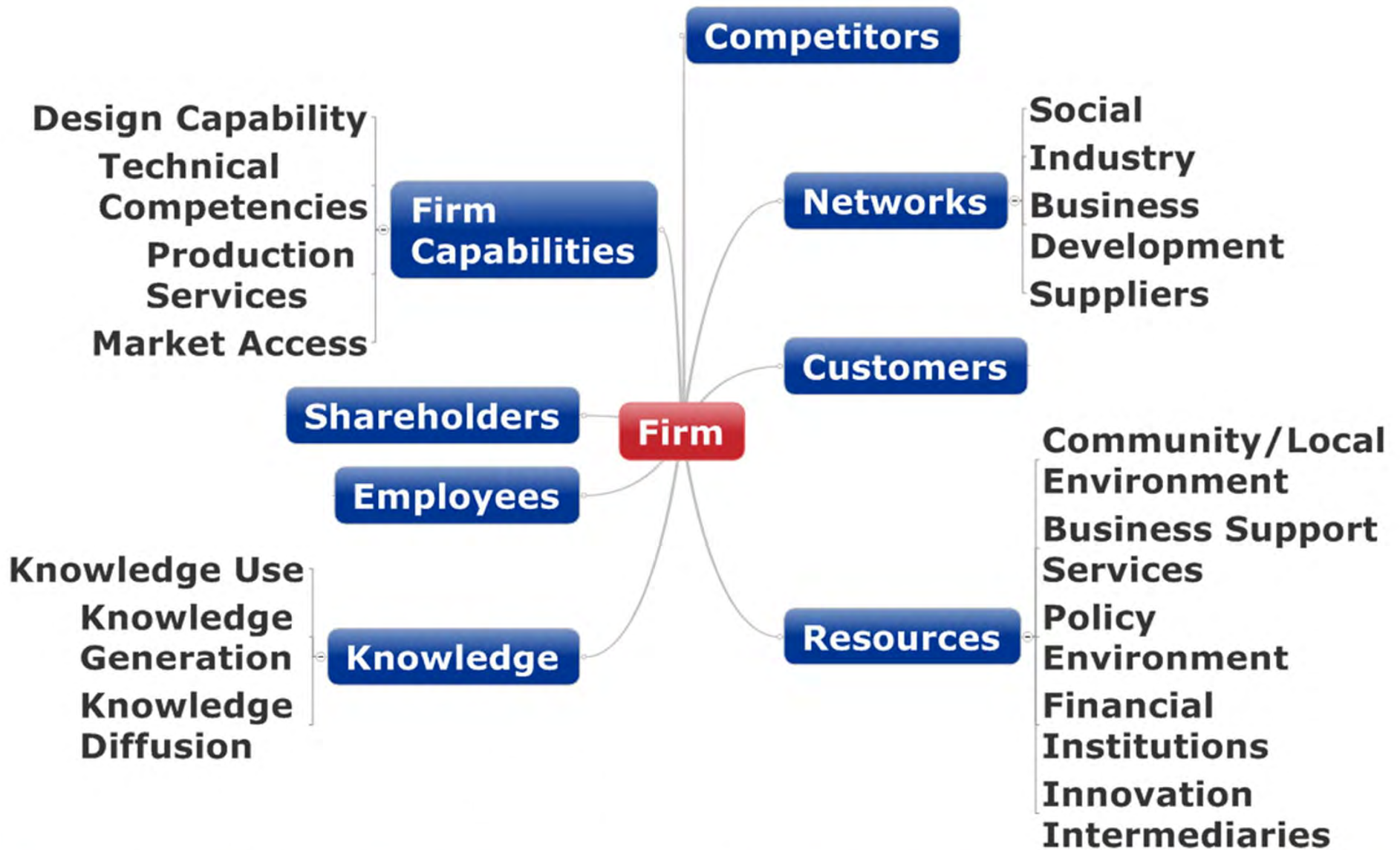
Opportunity
Networks

Increasing
co-innovation
by networking
businesses
around
synergistic
opportunities

- Relationship Focused
- Generates benefits of clusters w/o the critical mass of clusters
 - Volume of opportunities
 - Density of expertise
 - Diversity of interactions
 - Proximity to markets
- Challenges
 - Requires a strong and deep information network



Business Innovation Ecosystem



Kansas Opportunity Innovation Network



KOIN will create an environment that transcends geographic isolation, discovers new markets, innovates openly and fosters global competitiveness to be at the intersection of great ideas and new opportunities.

- Leverage AMI's integrated technology/business development competencies
- Profile innovation capabilities and needs of regions and local companies
- Scout new global opportunities
- Actively weave networks of technology providers, expertise and capital
- Span boundaries to build "hard-to-replicate" regional advantage

It is all about identifying and processing new business opportunities.





**Kansas Opportunity
Innovation Network**

**Regional Projects
Enable “Learning by
Doing” Approach**

*Business Profiling/Supply
Chain Network Development*

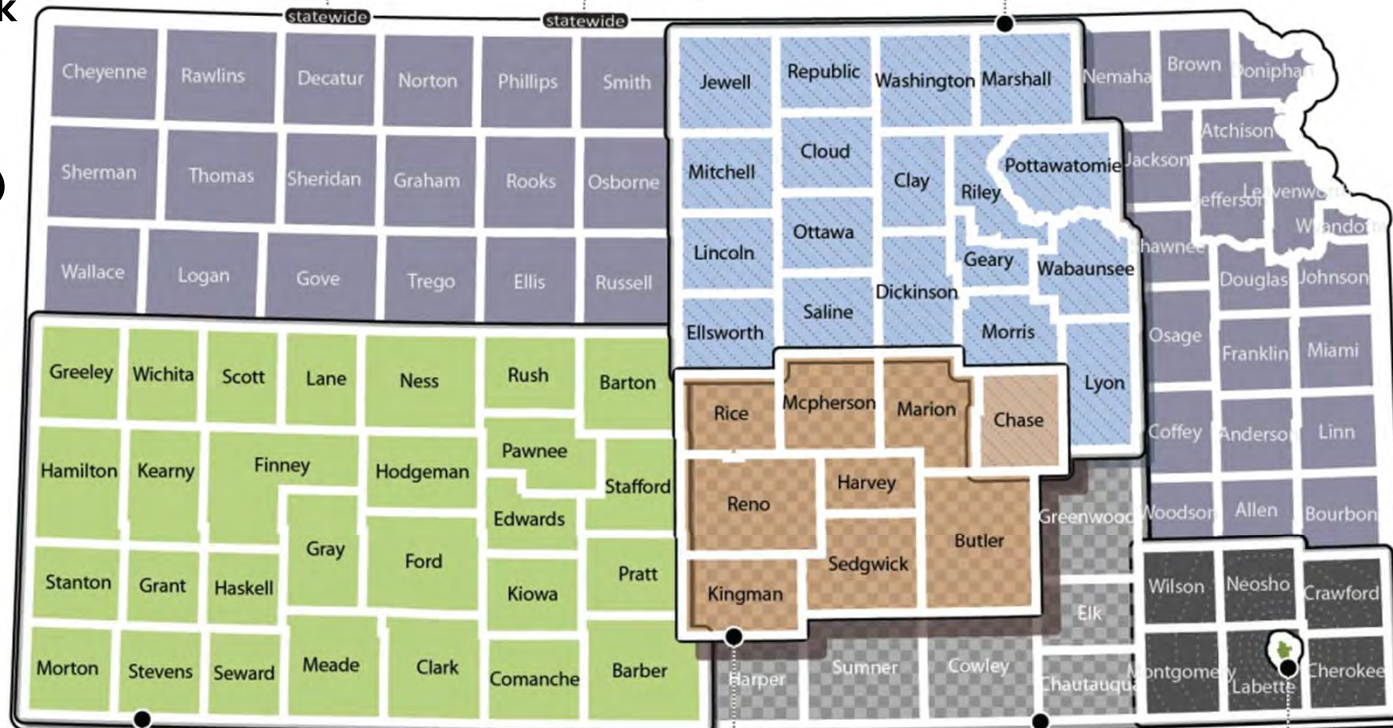
Partner: KDOC

*KTEC Technology
Cluster Strategy
Development*

Partner: KTEC

*Business Profiling and
Innovation Networking*

Partner: North Central
Regional Planning
Commission



Regional Asset Mapping

Partner: Great Plains
Development Inc.

*Regional Manufacturing
Park/Incubator IBED Strategy
and Business Development*

Partner: Harvey County
Economic Development
Council

*Wind Supply Chain ID and
Pre-profiling Assessment*

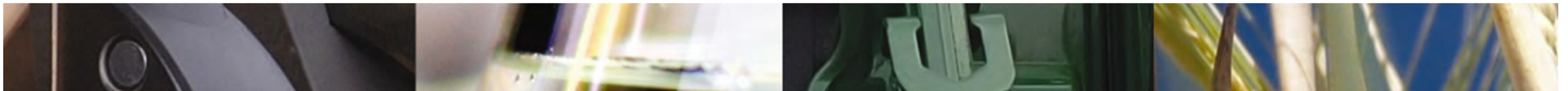
Partner: South Central
Kansas Economic
Development District

*Kansas Army Ammunition
Plant Business
Redevelopment*

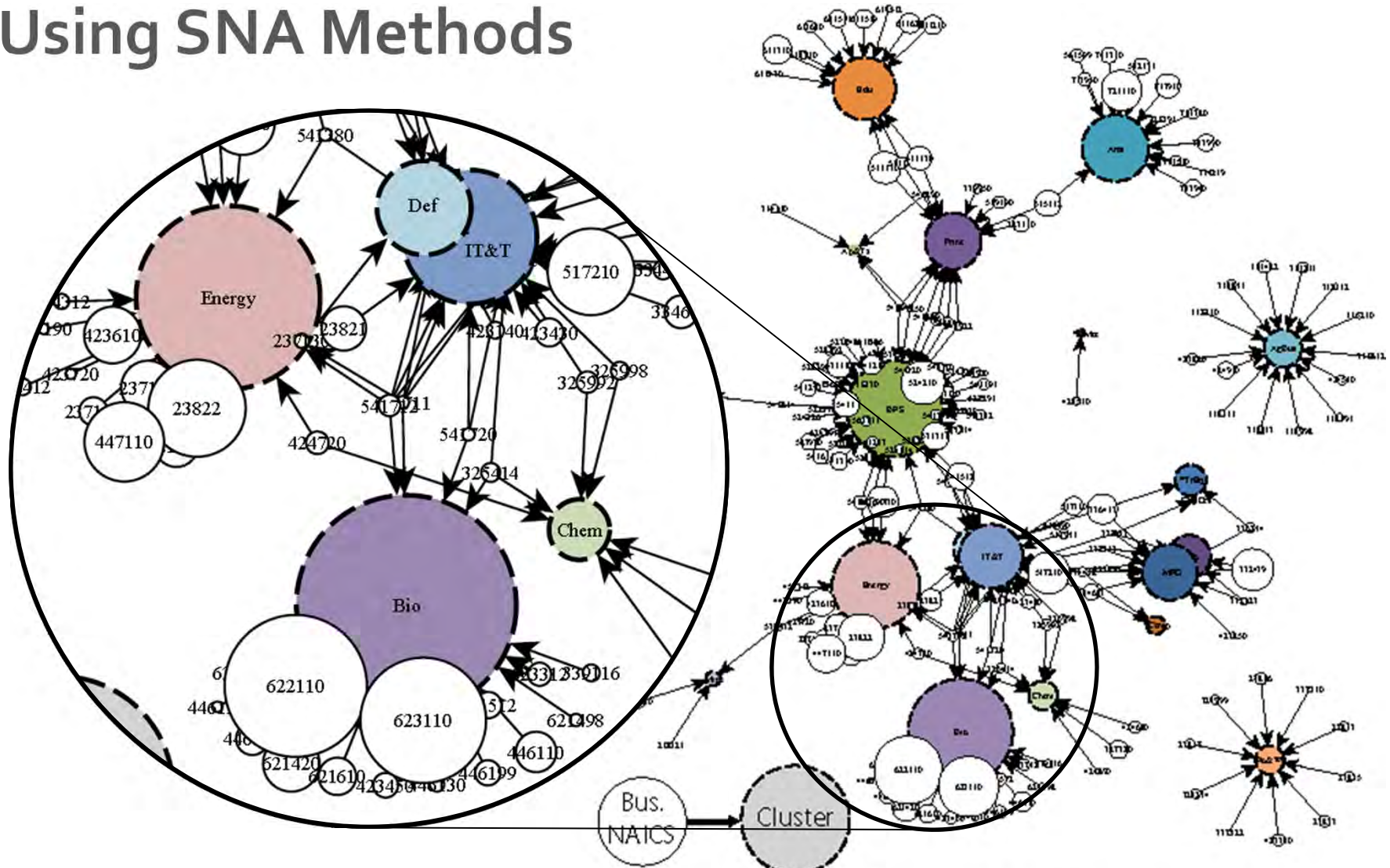
Partner: Great Plains
Development Authority

KOIN Services/Tools Under Development

- **Planning Assistance**
- **Mapping & Analysis Service and Tools**
- **Asset Mapping Tools**
- **Business and Innovation Profiling**
- **Opportunity Scouting**
- **Networking**
- **Business Development Assistance**



Connectedness - Mapping Industry Connections Using SNA Methods

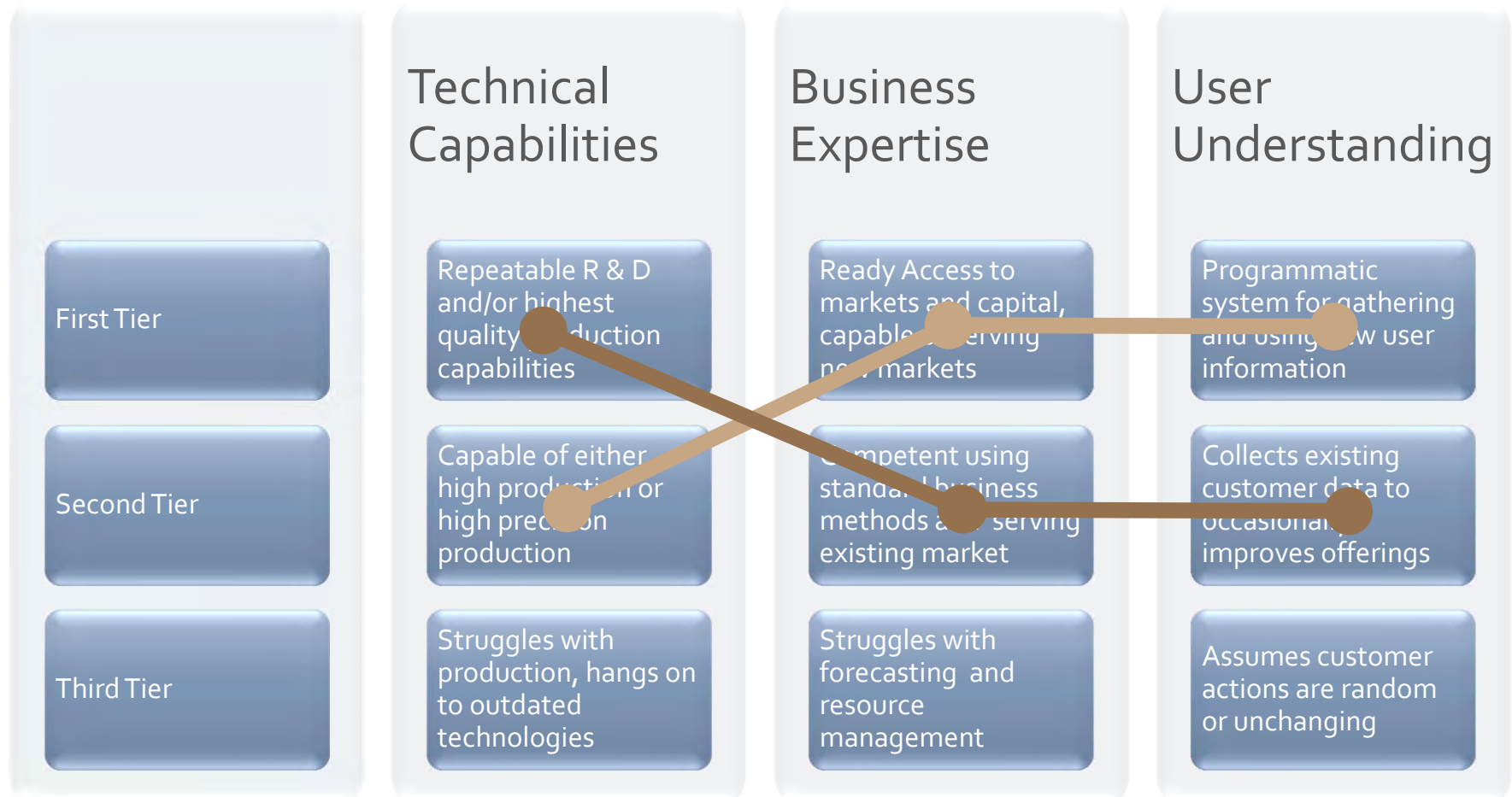


Businesses by NAICS in Clusters (size = employment)



Connecting Through Competencies

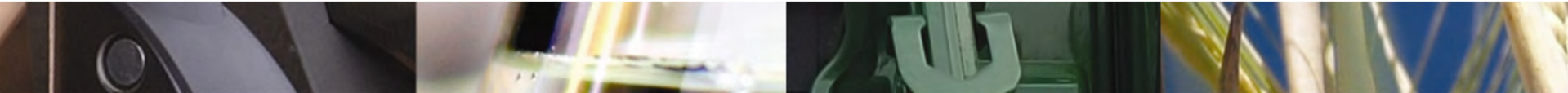
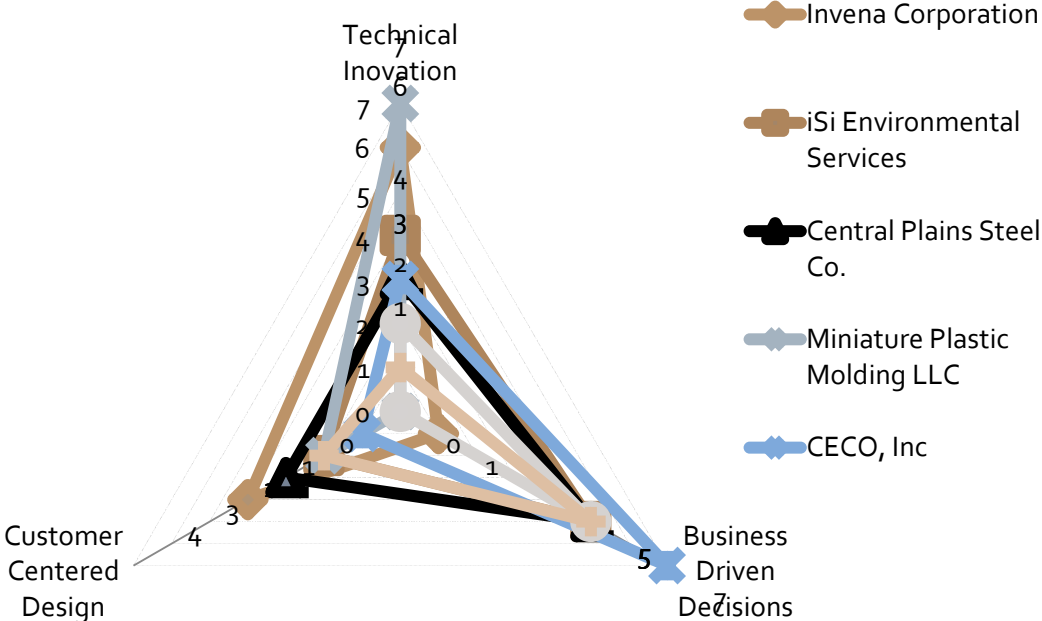
Business Profiles/Clusters not Based on Final Product/Service



Innovation Profiles

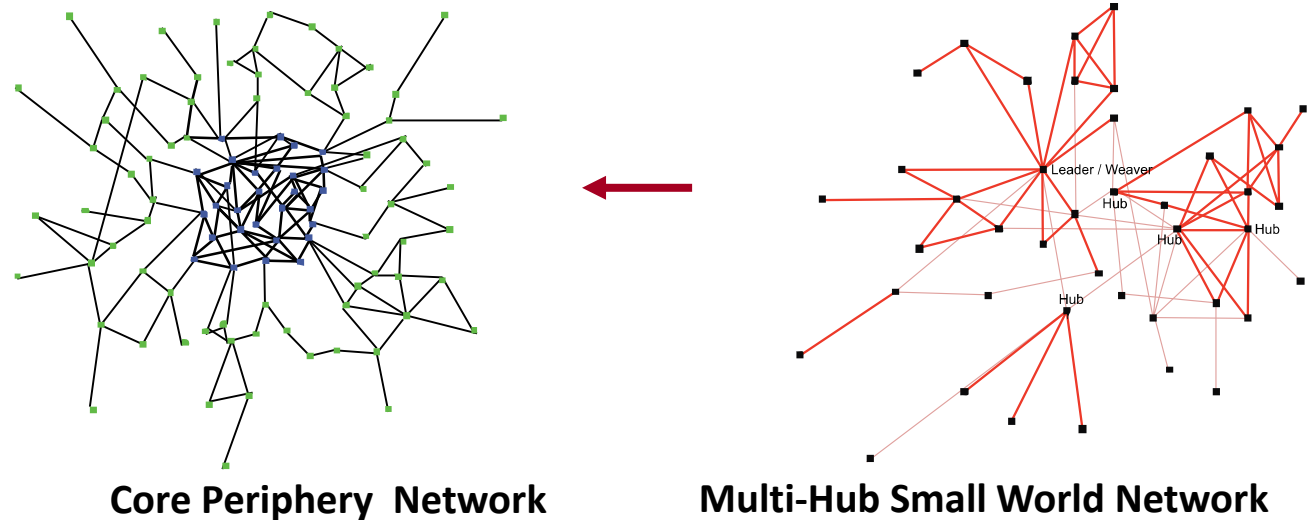
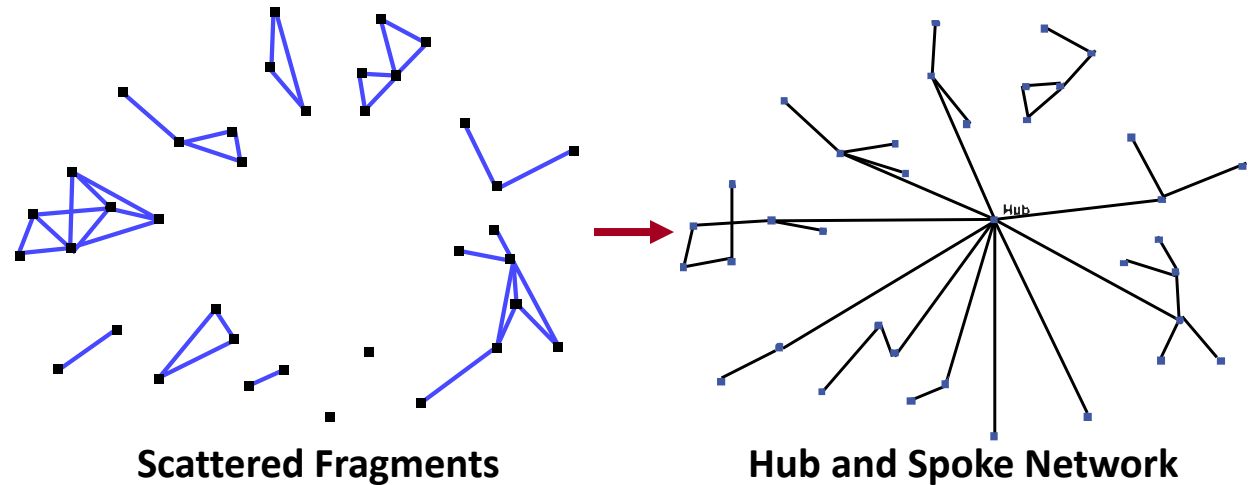
Aiming for a diverse ecosystem

- There is no one way to contribute to innovation

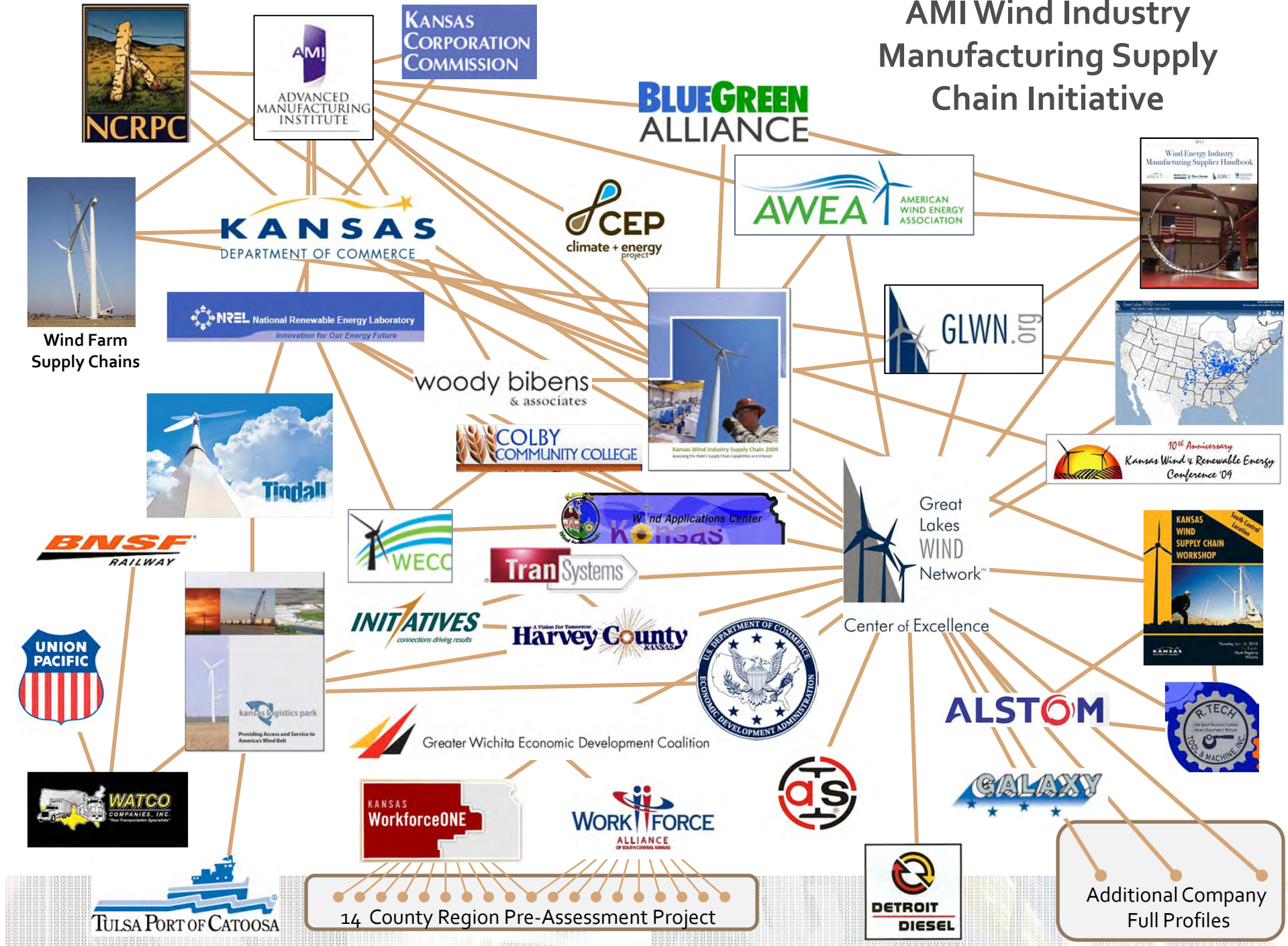


Network Weaving: Knitting Connectedness

- Most networks are fragmented unless deliberately developed
- Thicker networks help us learn faster, spot opportunities faster, align resources faster, and act faster. They accelerate innovation.
- Regional assets connected in new open innovation networks will expand opportunities



AMI Wind Industry Manufacturing Supply Chain Initiative



Wind Farm C&L Supply Chain Development

Goal: Increase local labor content of regional wind farm construction projects

- Provide wind farm developers and contractors with qualified “local” suppliers
- Proposed to adapt GLWN mfg. supply chain concepts to wind farm supply chain
 - Education
 - Capability profiling
 - Business development networking
- Partnered with KS Dept. of Commerce to provide initial education workshop – Green jobs funding
- Seeking funding to develop the balance of the wind farm supply chain services

Kansas Wind Farm Construction & Logistics Workshop ...
Get involved and learn about future opportunities

Tuesday, August 9, 2011 • 10 a.m. to 4:30 p.m.
Century II • Convention Hall • Wichita, Kansas

Early Bird Registration \$35 • Regular Registration \$50

Four new wind farms totaling over 800 MW will be constructed during 2011 and 2012 in Ford, Gray, Lincoln, Ellsworth and Elk counties. Millions of dollars of construction investment will be forthcoming. Kansas contractors can benefit! Join the Kansas Department of Commerce, **KANSASWORKS**, Associated General Contractors of Kansas, Advanced Manufacturing Institute and GLWN at this special workshop directed at helping Kansas contractors engage as subcontractors in wind farm construction.

Workshop topics include:

- How to become a part of the wind farm construction supply chain
- A review of upcoming Kansas projects and others in the Kansas pipeline
- An overview of available industry opportunities and qualification requirements
- The specific components to be constructed and other wind farm construction services requirements
- How projects are managed and wind farm developers and general contractors' expectations
- Potential next steps for interested companies

To Register, visit KansasCommerce.com/Wind.

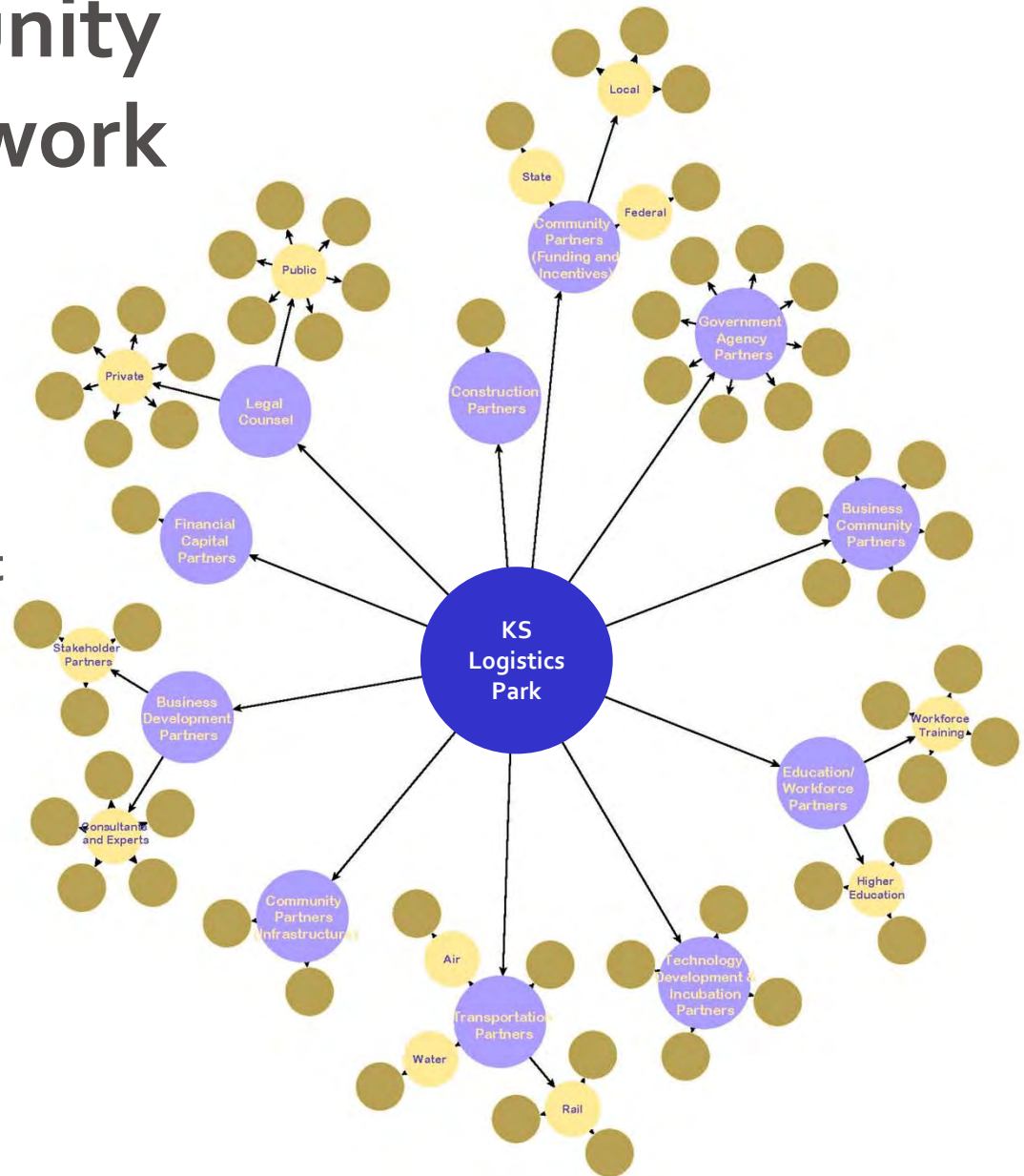
Interested in exhibiting?
Contact Joey Frederickson at frederickson@kansascommerce.com or (785) 296-2283 for details.

Kansas Department of Commerce | GLWN.org | KANSASWORKS | AGC of KANSAS | ADVANCED MANUFACTURING INSTITUTE
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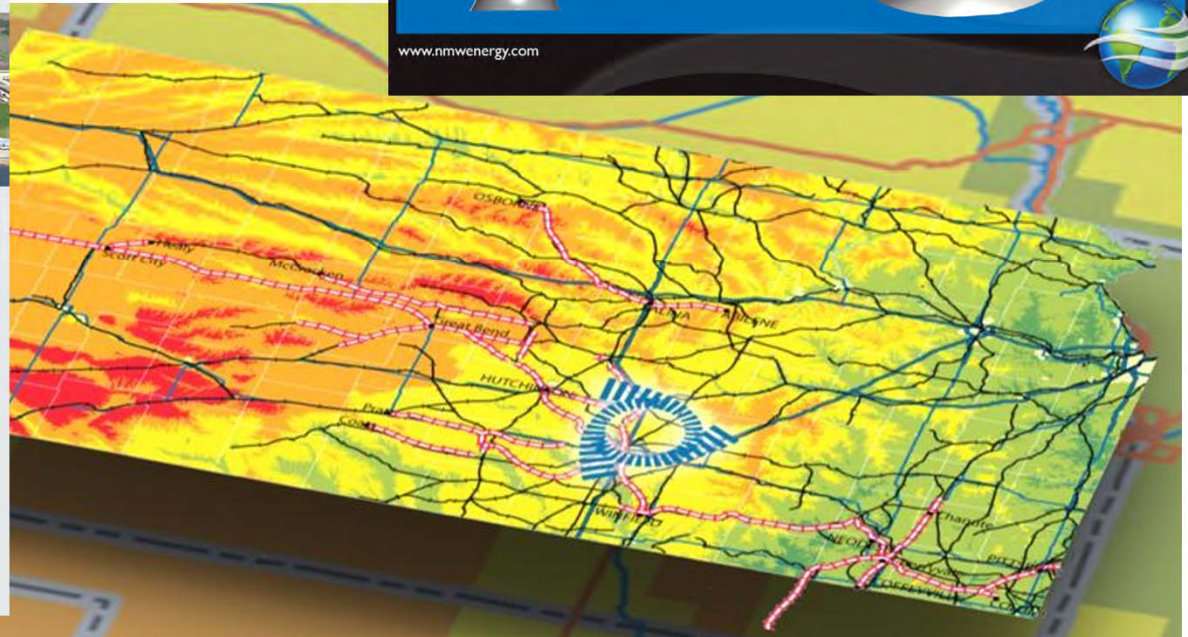
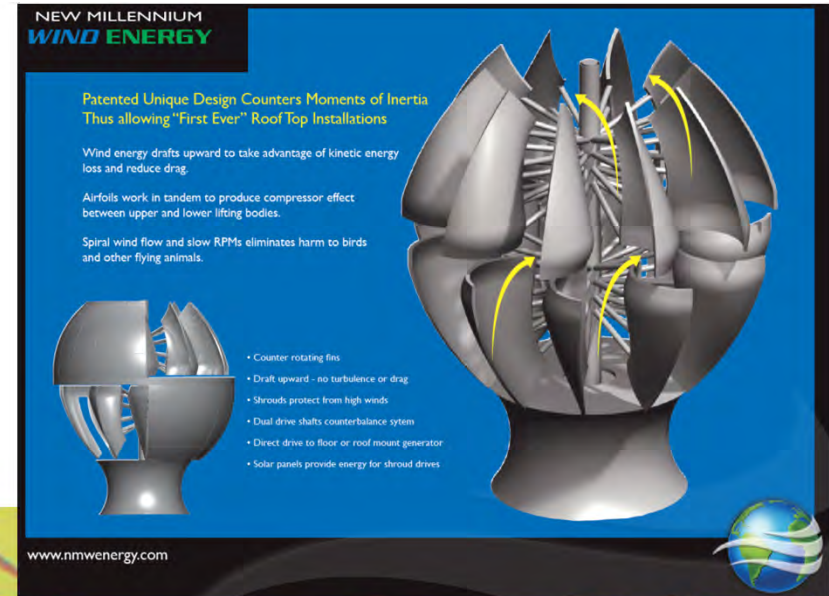
The KLP's Opportunity Development Network

- Leverages regional assets
 - Natural/man-made
 - Public/private
- Targeted business development
- Building global connections
- Wrapped innovation/growth services
- Team- based approach
- Strategic partnering inside and outside region
- Partners not geography limited



The KLP Team Secures Second Wind Company

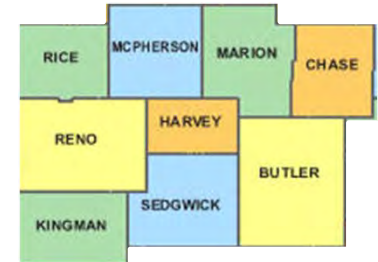
- A proven rural development regional approach
- County population: 33,700 (Harvey)
- Largest community: Newton – 17,000
- Invested over \$15M to develop park to date
- Received EDA infrastructure investment
- New Millennium: 350 jobs, \$40M investment



South Central Kansas Rural Innovation Accelerator



Rural Business Enterprise Grant



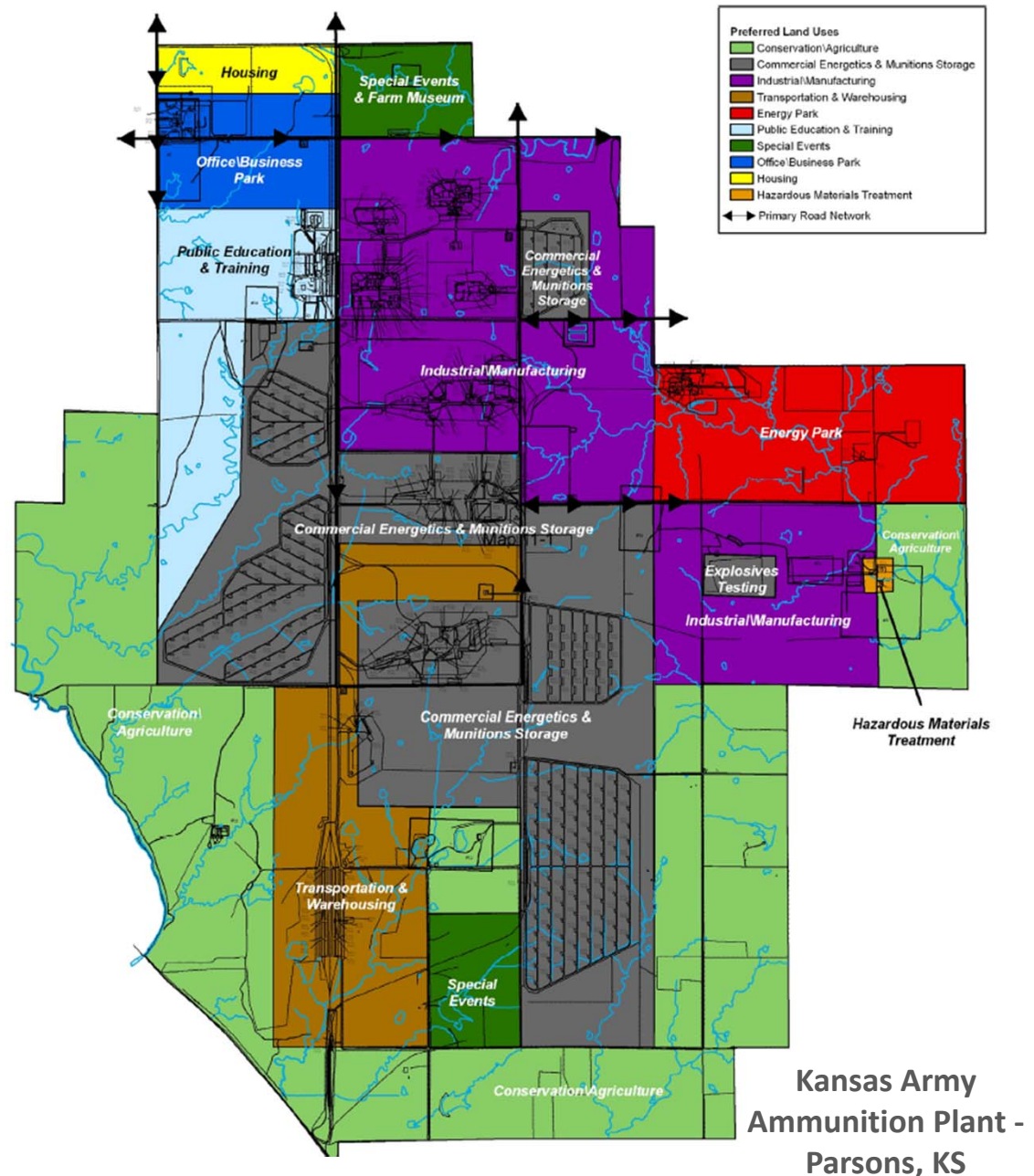
Goal: Grow a renewing stream of next generation regional goods producers

- Evaluates feasibility of manufacturing incubator serving nine rural counties
- Identifies business and technology needs of small emerging mfgers
- Support established manufacturers' "skunk work" development projects
- Develops plans to deliver sustainable incubation services
- Assesses the region's innovation readiness (ecosystem assessment)
- Compliment's region attraction/expansion efforts with top-line growth
- Synergizes organization missions, regional assets, and investments



Great Plains Industrial Park Development

- Collaboratively develop a three year strategic marketing plan
- Virtually extend market research and business development functions of staff
- Build networks to accelerate the search for opportunities
- Build recruiting team to respond to prospect opportunities
- Explore feasibility of non-traditional strategies to address park's previous mission
- Facilitate creative reuse thinking through visualizations



Networking the Rural and Urban

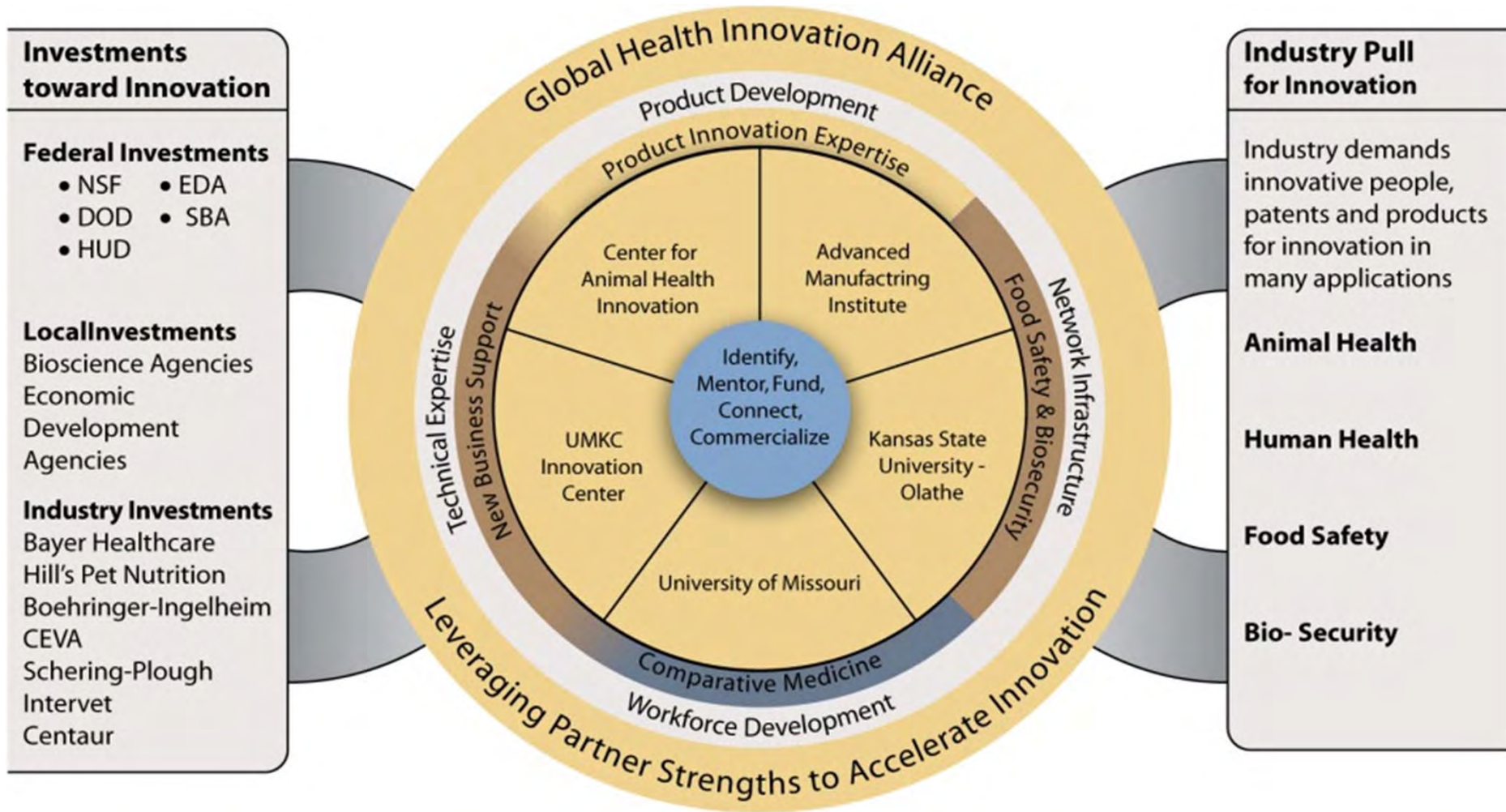


The Global Health Innovation Alliance

A Kansas City Animal Health Corridor Initiative

A Proposal Submitted to the Jobs and Innovation Accelerator Challenge





Center for Animal Health Innovation

Industry led Proof of Concept Center designed and funded to accelerate innovation.

Kansas State University - Olathe

Advanced Manufacturing Institute

Early Stage Technology Development, Infrastructure Development, and Process Improvement

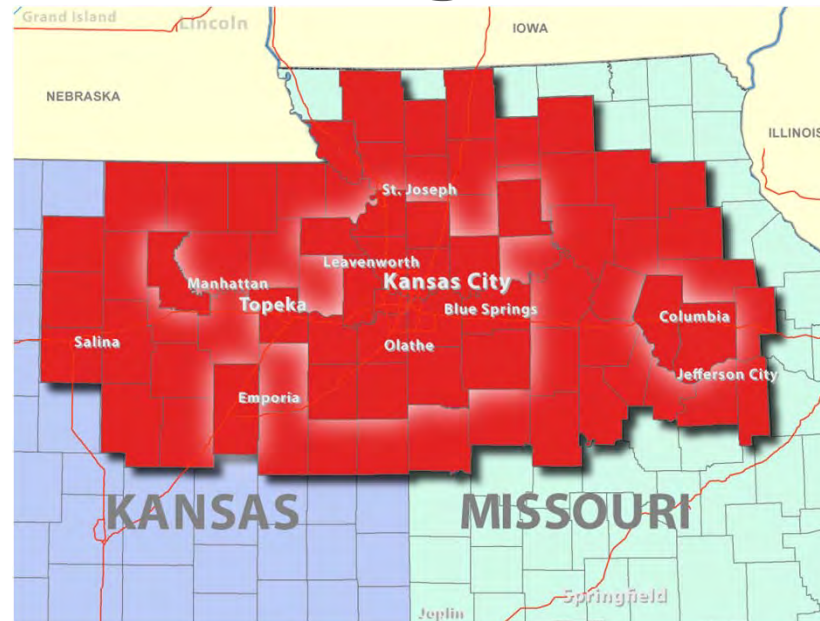
University of Missouri

Workforce Development, Comparative Medicine, Biodesign Innovation Program

UMKC Innovation Center

Technical expertise and infrastructure capabilities to support new business creation.

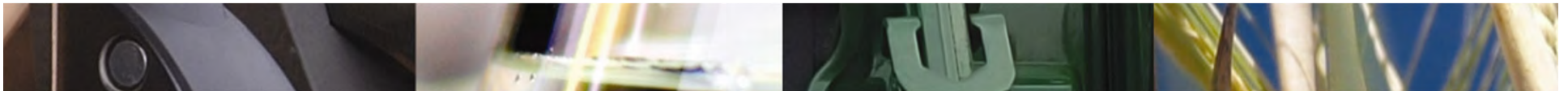
Virtually Networking the Rural and Urban



- Broadens business participation in the animal health industry cluster
- Creates a bridge to link rural communities into regional growth driver
- Urban cluster serves as a global portal for region's rural businesses
- Leverages regional private/public assets and investments
- Leverages/expands opportunity innovation networking concepts



KOIN's Objective:
*Overcome Critical Mass Challenges
with Critical Connection Strategies*





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