

Mining Beyond Coal in Appalachia

Lessons in Economic Reimagination and Redevelopment

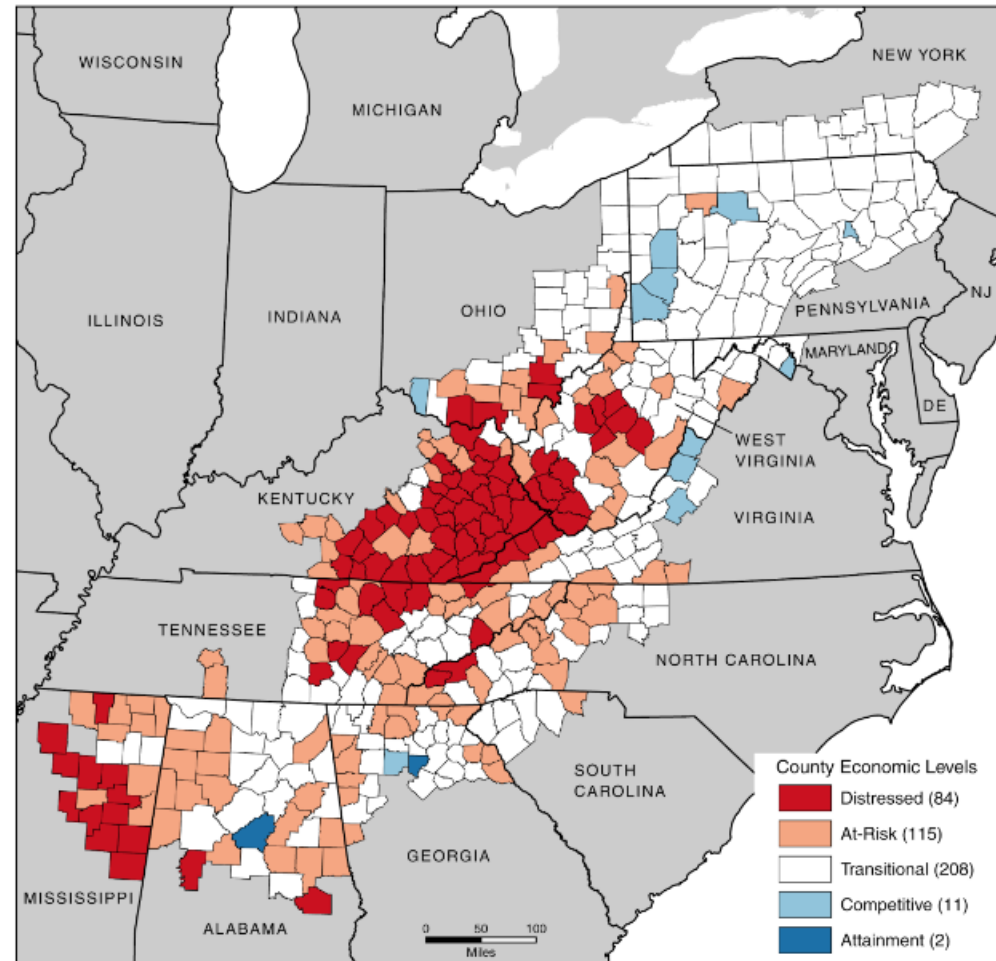
WORKING DOCUMENT

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EEGLP Lafayette College

Why CCED is important

- War on Poverty has failed. Central Appalachia continues to be distressed and systematically impoverished.
- Culture is layered, rich, diverse and attractive
- Region must search for and pursue its own economic development.



Created by the Appalachian Regional Commission, August 2017

Data Sources:

Unemployment data: U.S. Bureau of Labor Statistics, LAUS, 2013–2015

Income data: U.S. Bureau of Economic Analysis, REIS, 2015

Poverty data: U.S. Census Bureau, American Community Survey, 2011–2015

Effective October 1, 2017
through September 30, 2018

What's the Matter With Eastern Kentucky?

NYT Magazine June 26, 2014



NY Times Article

- Took six measures available for every US county (education, income, joblessness, disability, life expectancy, and obesity).
- Eastern Kentucky scored worst nationally.
- Discussed failure of government policies.
- Concluded that de-populating the region may be best policy response.

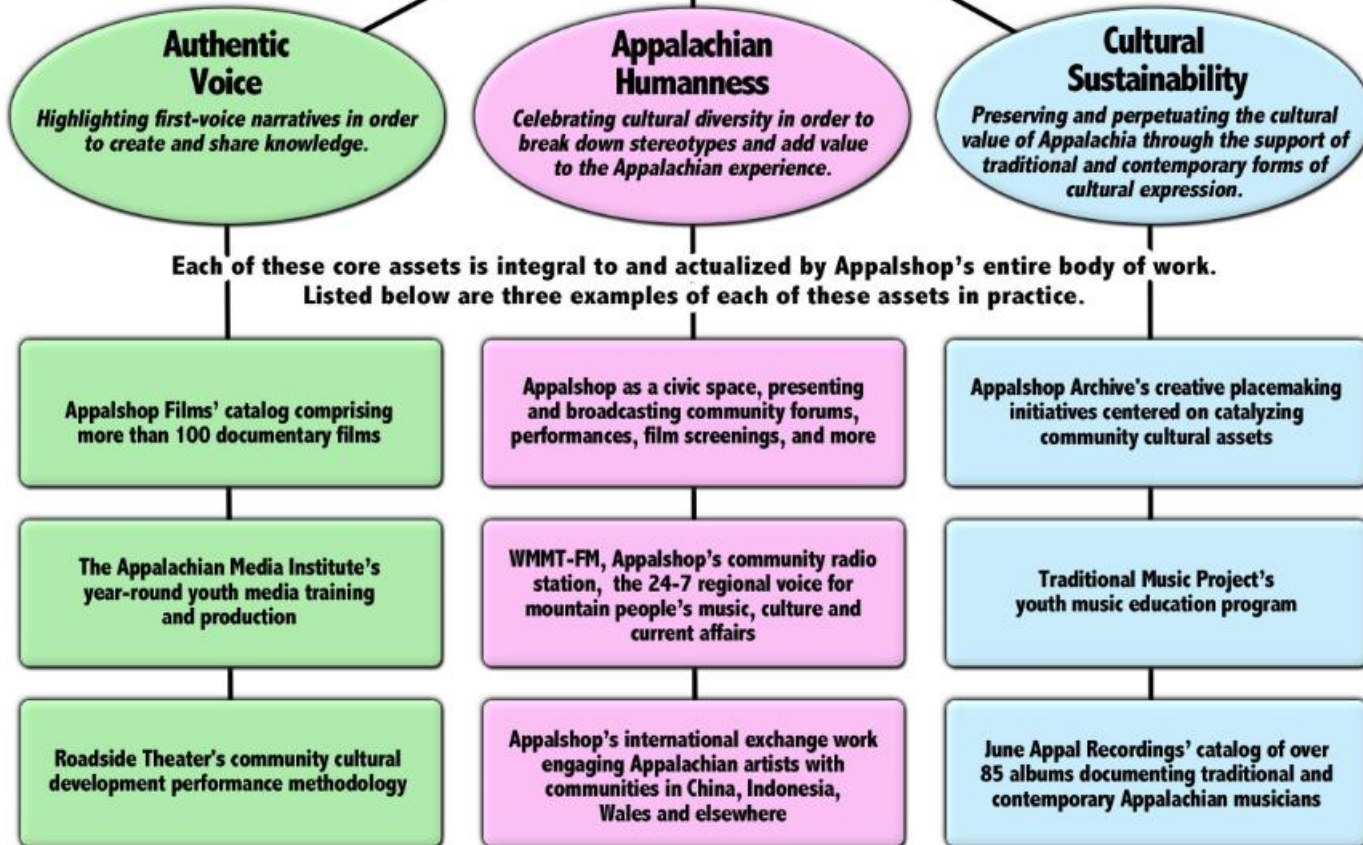
NY Times Article

- Extraordinary example of how liability mapping can lead the “expert problem solvers” to “interesting solutions.”
- Essence, when government policies fail, it is “self-evident” that there is little value in the community or region.
- That is, outside of a reliance on government’s expertise, projects and financing, communities in distress have little capacity and *will* for self-development through exercising voice and agency.

Asset Mapping

- Asset mapping focuses on identifying latent and under-utilized assets that are not attaining their full value in the market place.
- After these assets are mapped, a strategic plan is developed so as to realize the value of these assets.
- The collaborative process focus buttresses the asset-mapping objective.

Appalshop Core Assets



Technology Based Asset Mapping

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Background

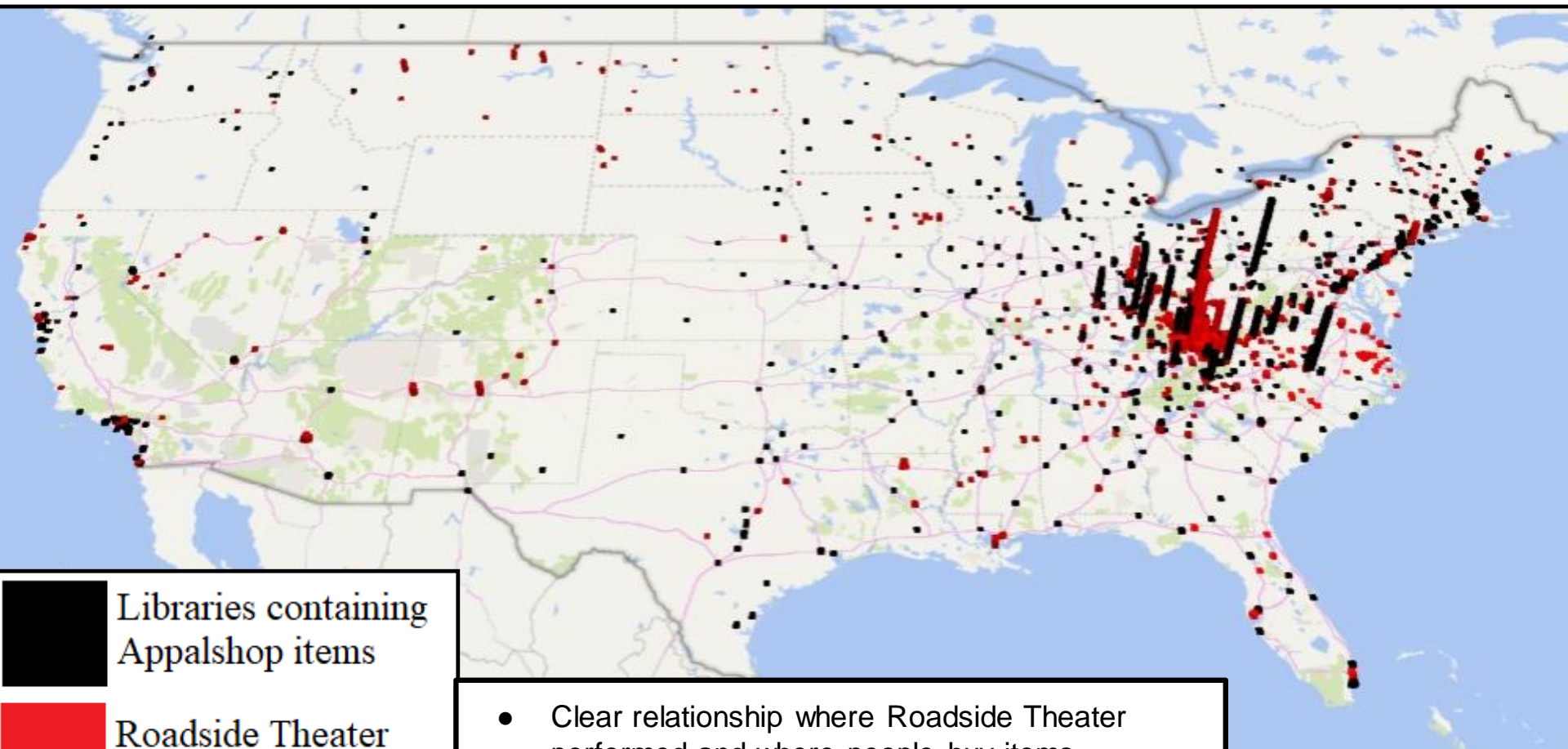
- Culture-based economies have key draw - tourism - which relies on accessibility
 - Obvious geographical impediment for Central Appalachia
 - Due to economic decline, we can determine that Appalachia's inaccessibility outweighs the consumers' desire to travel into the region to experience the rich culture
 - How can we change this? (i.e. how an area's inaccessibility can be an asset instead of an impediment)
- Our paradigm: a process of commoditizing culture through a technological highway as development and community wealth

Location-based Data

- Currently, geotargeting employs individuals' past locations and preferences to deliver the “right message at the right time.”
 - Used to increase local business traffic, app downloads, ticket sales
- How we used it
 - Compiled various data to pinpoint locations
 - Roadside Theater performances (1974-2017)
 - Appalshop products held in libraries
 - Bluegrass festivals
 - Migration patterns from census data
 - Ebay sales - “Bluegrass,” “Banjos,” June Appal recordings
 - Businesses - "Bluegrass," "Appalachia," "Appalshop," "Woodworking."
 - Gives representation of shared cultural appreciation
 - Let's us determine where current demand for cultural-specific products exist

Importance of Location-based Data

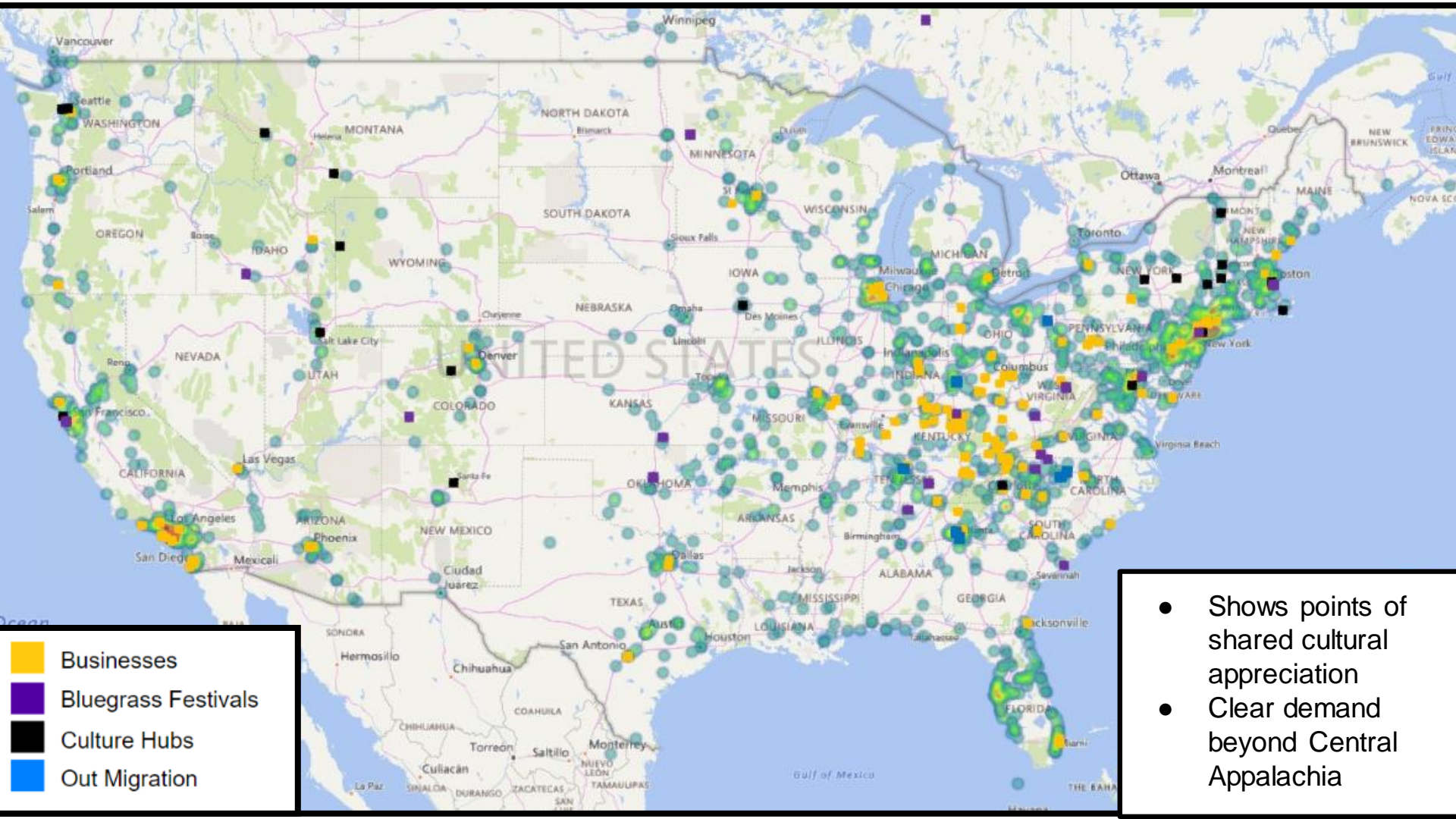
- Need to implement strategies that can perform up to speed with the fast-paced, technologically-driven culture of today
- Cost effective, eliminates geographical barriers, and has the potential to drastically expand sales
- Maximize efficiency within an organization
- Integration into competitive market exchange as social and economic value creation



Libraries containing Appalshop items

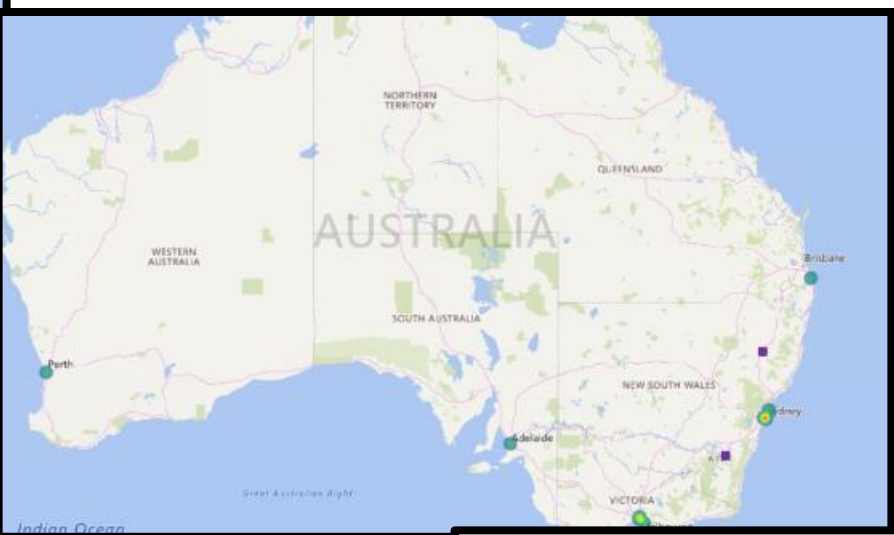
Roadside Theater Performances

- Clear relationship where Roadside Theater performed and where people buy items
- Sales & outreach centralized in Appalachia



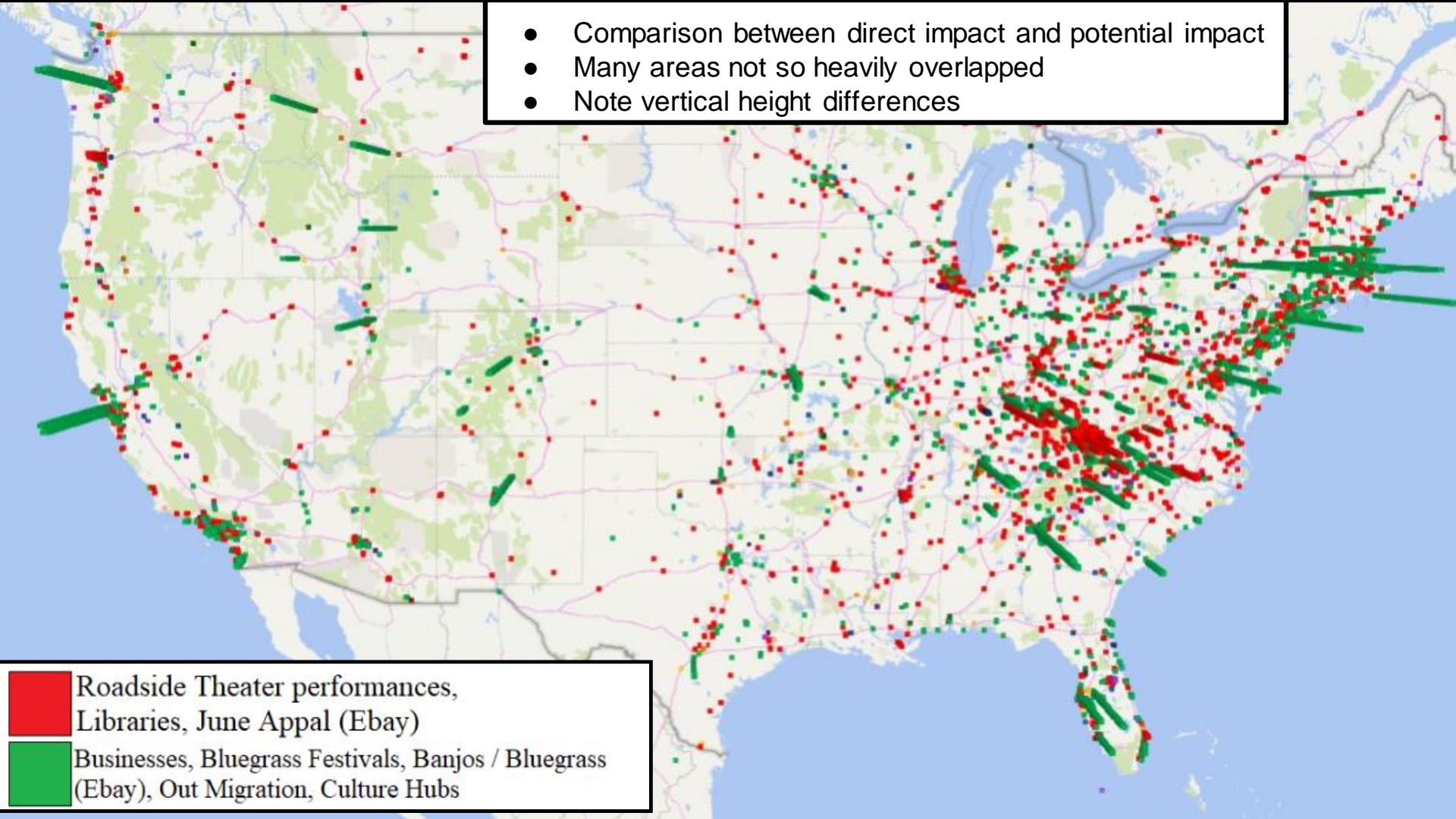
-  Businesses
-  Bluegrass Festivals
-  Culture Hubs
-  Out Migration

- Shows points of shared cultural appreciation
- Clear demand beyond Central Appalachia



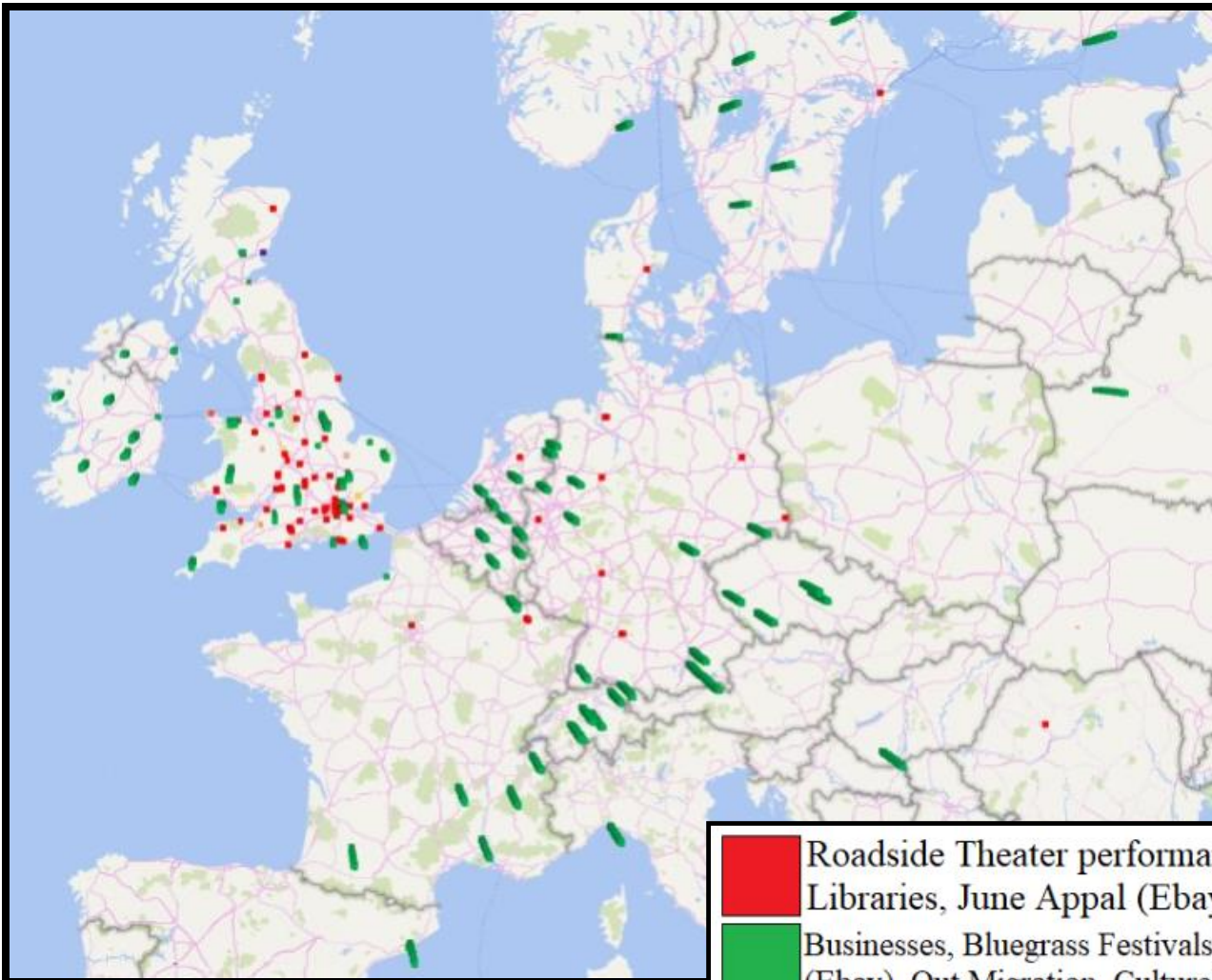
- Shows points of shared cultural appreciation
- Clear demand beyond Central Appalachia

- Comparison between direct impact and potential impact
- Many areas not so heavily overlapped
- Note vertical height differences

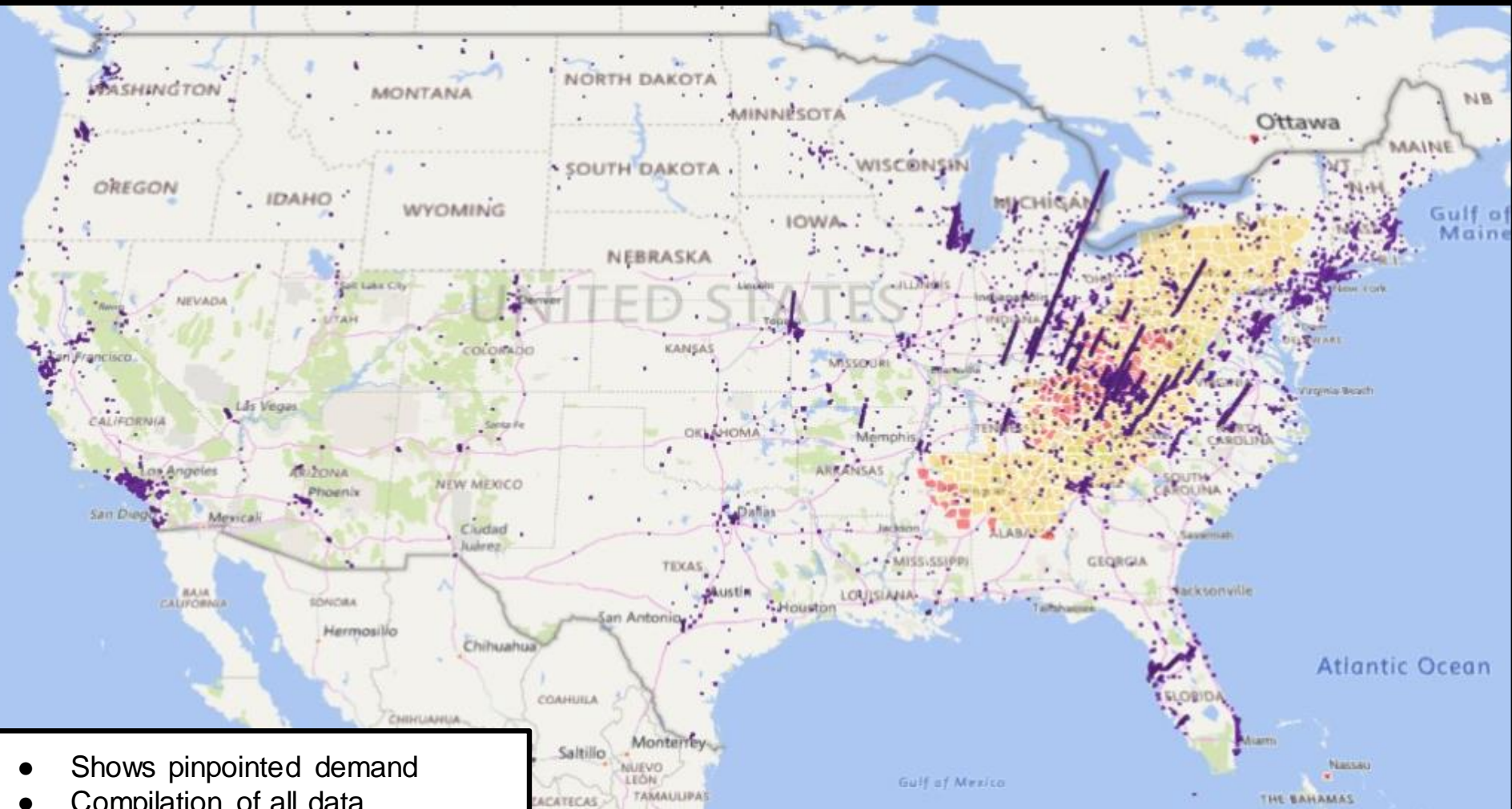


● Roadside Theater performances, Libraries, June Appal (Ebay)

● Businesses, Bluegrass Festivals, Banjos / Bluegrass (Ebay), Out Migration, Culture Hubs



- Roadside Theater performances, Libraries, June Appal (Ebay)
- Businesses, Bluegrass Festivals, Banjos / Bluegrass (Ebay), Out Migration, Culture Hubs



- Shows pinpointed demand
- Compilation of all data

Letcher County Culture Hub (LCCH)

LCCH will focus on activities related to the:

- Creation
- Development
- Production
- Protection
- Coordination, and
- Distribution

of Appalachian cultural and creative goods and services for local, regional, national and international consumption on a commercial basis.

Social Capital: The Case for the Letcher County Culture Hub

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Motivation

- What is Social Capital?
- Social Capital and Development: A new Paradigm?
 - Previous Literature.
- Social Capital Allows for:
 - Lower transaction costs, bureaucracy
- So, how do you measure it?
 - Social Network Analysis



Social Network Analysis (SNA)

- Provides a Framework for investigating social structures through the use of networks and graph theory.
- Key Metrics:
 - **Centrality** - *Ratio of number of links*
 - **Betweenness** - *the extent to which a node lies between other nodes in the network*
 - **Closeness** - *degree with which an individual is nearer to all others in a network*
- Previous use of SNA:
 - MASS MoCA: Massachusetts Museum of Contemporary Art

Calculations: Centrality

Centralization is calculated as the ratio between the numbers of links for each node divided by the maximum possible sum of differences. Centralization provides a measure of the extent to which a whole network has a centralized structure. It is measured as follows:

$$R = \frac{\sum_{j=1}^g \{\max(D_i) - D_j\}}{(g - 1)^2} \quad (1)$$

where D_j represents the number of actors in the network that are directly linked to the actor j and

Calculations: Betweenness

Betweenness is defined as the extent to which a node lies between other nodes in the network.

Here, the connectivity of the node's neighbors is taken into account and reflects the number of people who are connecting indirectly through direct links. It is calculated as follows:

$$c_b(n_j) = \frac{\sum_{k \neq j} \sum_{l \neq j} g_{kl}(n_j)}{(n-2)(n-1)} \quad (2)$$

where $c_b(n_j)$ denotes the standardized betweenness centrality of node j , $g_{kl}(n_j)$ represents the number of geodesics linking k and l that contain j in between.

Calculations: Closeness

Closeness refers to the degree with which an individual is nearer to all others in a network either directly or indirectly. Further, it reflects the ability to access information through the “grapevine” of network members. It is calculated as follows:

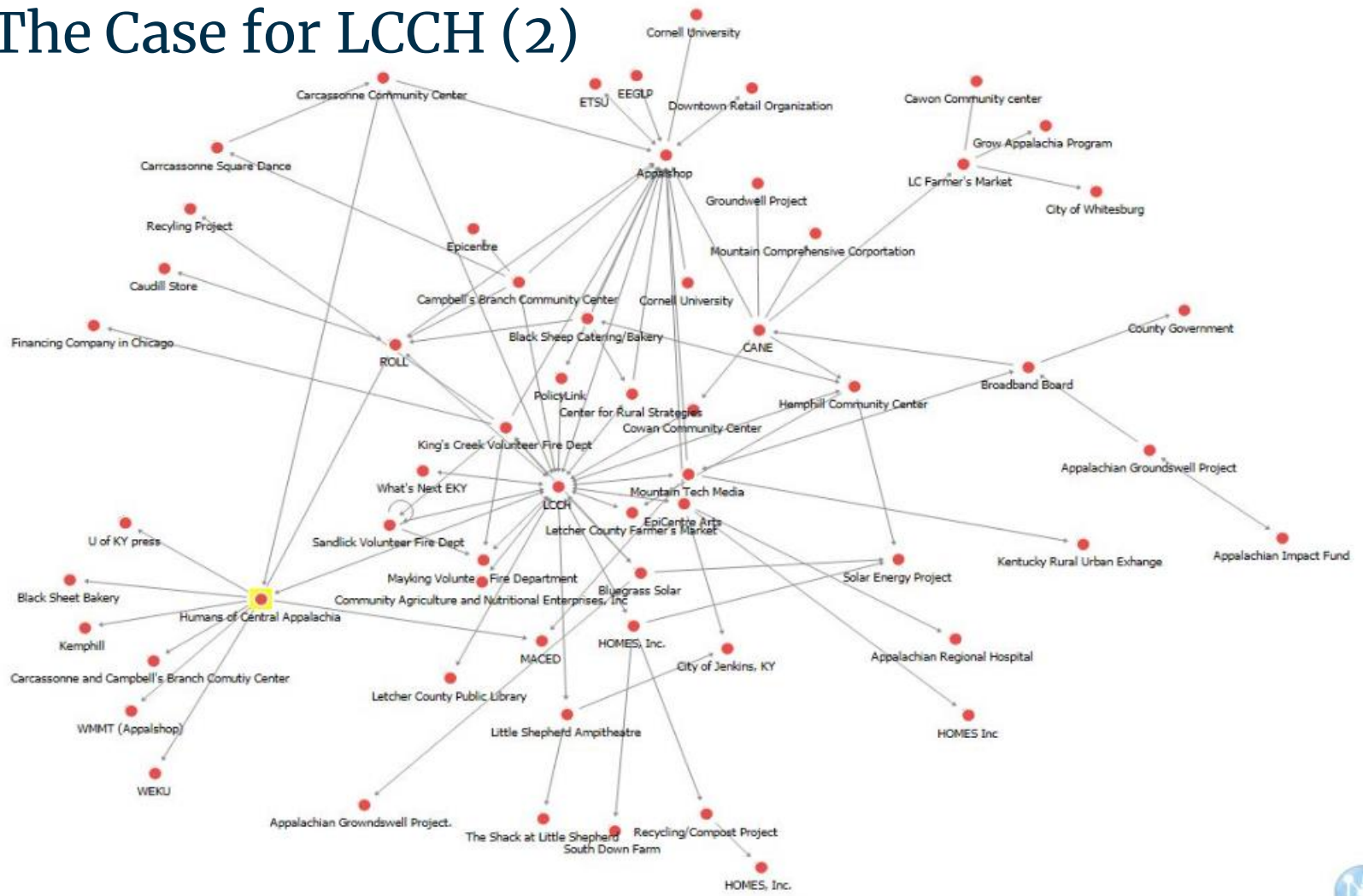
$$\frac{c_c(n_j) = n - 1}{\sum_{k=i, j=k}^n d(n_i, n_j)} \quad (3)$$

where $c_c(n_k)$ defines the standardized closeness centrality of node j and $d(n_i, n_j)$ denotes the geodesic distance between j and k .

The Case for LCCH (1)

	Centrality	Betweenness	Closeness
LCCH	0.35	0.537891	0.530973
Appalshop	0.266667	0.329925	0.483871
Humans of Central Appalachia	0.166667	0.201827	0.392157
King's Creek Volunteer Fire Dept	0.116667	0.078832	0.402685
CANE	0.116667	0.219444	0.384615
ROLL	0.1	0.057815	0.416667
Mountain Tech Media	0.083333	0.131113	0.410959
EpiCentre Arts	0.083333	0.087439	0.394737
Hemphill Community Center	0.083333	0.05258	0.402685
Campbell's Branch Community Center	0.083333	0.047834	0.394737

The Case for LCCH (2)



Summary Thoughts

When compared to similar studies, the social capital seems low for LCCH

- Results imply too many organizations disparate and disconnected
- Hence high transaction costs and critical impediment to success of LCCH

Pursuing Letcher County's Imagined Future via Input-Output Analysis

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Introduction to Input-Output Analysis

- Input-output analysis describes the economic linkages within a region
 - “Type I” (Indirect) multipliers measure trade between two firms
 - “Type II” (Induced) multipliers measure household expenditures
- High multipliers indicate that inputs and goods are sourced locally
- Low multipliers indicate that inputs and goods are primarily imported

Input-Output Matrices (2016, IMPLAN Data)

- Describes local trade between either sectors or households
- Rows are the spenders, columns are receivers

Institutions Receiving	Description	11 Ag, Forestry, Fish & Hunting	21 Mining	22 Utilities	23 Construction	31-33 Manufacturing	42 Wholesale Trade	48-49 Transportation & Warehousing	44-45 Retail trade	51-56 Professional Services	61-72 Educational, Health, Recreation Service
1	11 Ag, Forestry, Fish & Hunt...	\$112,163	\$12,542	\$0	\$36,367	\$482,033	\$4	\$27	\$66	\$11,099	\$2,317
2	21 Mining	\$85	\$300,183	\$41	\$2,569	\$1,194	\$652	\$21,571	\$1,114	\$1,665	\$3,878
3	22 Utilities	\$3,251	\$425,745	\$5,004	\$84,756	\$318,171	\$188,688	\$97,213	\$679,856	\$635,011	\$900,982
4	23 Construction	\$3,075	\$806,579	\$18,892	\$8,486	\$106,939	\$53,776	\$72,880	\$137,027	\$1,741,860	\$229,220
5	31-33 Manufacturing	\$3,702	\$31,258	\$93	\$970,364	\$1,176,282	\$33,920	\$3,184	\$57,118	\$305,324	\$55,175
6	42 Wholesale Trade	\$56,203	\$1,586,849	\$3,391	\$1,430,266	\$2,059,840	\$722,696	\$733,160	\$517,654	\$999,691	\$2,344,651
7	48-49 Transportation & War...	\$28,237	\$1,023,526	\$7,933	\$687,829	\$973,245	\$842,050	\$2,030,514	\$2,257,425	\$682,287	\$769,271
8	44-45 Retail trade	\$319	\$97,197	\$263	\$1,918,166	\$36,947	\$9,304	\$191,128	\$90,338	\$394,386	\$272,068
9	51-56 Professional Services	\$21,892	\$2,711,299	\$28,041	\$1,255,053	\$2,264,045	\$4,202,468	\$1,905,523	\$5,643,874	\$28,962,836	\$12,524,406
10	61-72 Educational, Health, ...	\$4,426	\$57,725	\$2,621	\$143,899	\$277,974	\$434,141	\$134,913	\$426,017	\$1,899,644	\$2,023,670

Output
(Mining):
\$332,952

Input (Mining):
\$7,052,903

Total professional services: \$119,038,874
Total Educational/Health/Recreation Services: \$24,530,668

Input-Output Data as a Forecasting Tool

- **Problem:** Input-output data describes the past rather than the future
- **Our approach:** Re-calibrating estimates through examining the input-output data of established cultural economies
- Input-output data from national cultural economies

Process of determining culture hubs

- Three selected: One small, one medium, and one large
- Selected on criteria that reflects the depth of the culture hub's linkages
 - Co-producing, co-purchasing, co-advertising, co-learning, and co-informing

Small		Medium		Large	
Asheville, NC	Hudson, NY	Pittsfield, MA	Bremerton, WA	Washington D.C.	Los Angeles, CA
Breckenridge, CO	Oneonta, NY	Asheville, NC	Ithaca, NY	New York City, NY	Silver Spring, MD
Summit Park, UT	Juneau, AK	San Rafael, CA	Santa Fe, NM	San Francisco, CA	Newark, NJ
Bennington, VT	Jackson, WY	Missoula, MT	Barnstable Town, MA	Nashville, TN	Minneapolis, MN
Bozeman, MT	Vineyard Haven, MA	Burlington, VT	Des Moines, IA	Boston, MA	Seattle, WA

Breckenridge, CO

- Conservative path
- Population: 30,257
- Cultural economy based on mountain identity and folk art
- While isolated, pairs cultural economy with skiing industry



Santa Fe, NM

- Median path
- Population: 148,686
- Mixes Spanish colonial

influences with Native American
and Hispanic culture

- Performance and new wave
art is prevalent in Santa Fe



Nashville, TN

- Aspirational path
 - Represents the upper limit that cultural economies may reach
- Population: 1,830,345
- “Music capital of the world”
- Aspirational in nature, must constantly be striven for



Impact Analysis: Appalshop

- What would Appalshop's impact look like if put into these economies?
 - Data from Appalshop's publicly available tax information
 - Expenditures divided into four categories according to IMPLAN classifications:
 - Grantmaking, giving, and social advocacy organizations (Roadside Theater)
 - Motion picture and video industries (Archives, media production)
 - Radio and television broadcasting services (WMMT)
 - Other educational services (AMI)

Results: Grantmaking, giving, and social advocacy

	Grantmaking, giving, and social advocacy organizations (514)					
	Direct Effects	Indirect Effects	Induced Effects	Total Effects	Type 1 Multiplier	Type SAM Multiplier
Letcher County	1	0.18313	0.09036	1.27349	1.18314	1.27349
Nashville	1	0.32680	0.22993	1.55673	1.32680	1.55673
Santa Fe	1	0.22913	0.23714	1.46627	1.22913	1.46627
Breckenridge	1	0.22166	0.19224	1.41390	1.22166	1.41390
Letcher County	1	0.18313	0.09036	1.27349	1.18314	1.27349
Avg. of National	1	0.25920	0.21977	1.47897	1.25920	1.47897
Difference	0	-0.07606	-0.12941	-0.20547	-0.07606	-0.20547
		-29.35%	-58.88%	-13.89%		

- Breckenridge: 21% from industry, **112%** from households
- Santa Fe: 25% from industry, **162%** from households
- Nashville: 78% from industry, **154%** from households

Results: Motion picture and video industries

	Motion Picture and Video Industries (423)					
	Direct Effects	Indirect Effects	Induced Effects	Total Effects	Type 1 Multiplier	Type SAM Multip
Letcher County	1	0.22222	0.11299	1.33521	1.22222	1.33521
Nashville	1	0.53955	0.33055	1.87009	1.53955	1.87009
Santa Fe	1	0.27623	0.12078	1.39701	1.27623	1.39701
Breckenridge	1	0.40068	0.13854	1.53922	1.40068	1.53928
Letcher County	1	0.22222	0.11299	1.33521	1.22222	1.33521
Avg. of National	1	0.40549	0.19662	1.60211	1.40549	1.60213
Difference	0	-0.18326	-0.08364	-0.26690	-0.18326	-0.26692
		-45.20%	-42.54%	-16.66%		

- Breckenridge: **80%** from industry, 22% from households
- Santa Fe: **24%** from industry, 6.8% from households
- Nashville: 142% from industry, **192%** from households

Results: Radio and television broadcasting

	Radio and television broadcasting (425)					
	Direct Effects	Indirect Effects	Induced Effects	Total Effects	Type 1 Multiplier	Type SAM Multip
Letcher County	1	0.63114	0.11255	1.74370	1.63114	1.74370
Nashville	1	1.02546	0.44557	2.47103	2.02546	2.47103
Santa Fe	1	0.58558	0.21785	1.80343	1.58558	1.80343
Breckenridge	1	0.83445	0.18073	2.01518	1.83445	2.01518
Letcher County	1	0.63114	0.11255	1.74370	1.63114	1.74370
Avg. of National	1	0.81516	0.28138	2.09655	1.81516	2.09655
Difference	0	-0.18402	-0.16883	-0.35285	-0.18402	-0.35285
		-22.57%	-60.00%	-16.83%		

- Breckenridge: 62% from industry, **295%** from households
- Santa Fe: -7% from industry, **93%** from households
- Nashville: 32% from industry, **60%** from households

Results: Other educational services

	Other educational services (474)					
	Direct Effects	Indirect Effects	Induced Effects	Total Effects	Type 1 Multiplier	Type SAM Multiplier
Letcher County	1	0.16207	0.22077	1.38284	1.16207	1.38284
Nashville	1	0.37027	0.42452	1.79479	1.37027	1.79479
Santa Fe	1	0.24453	0.47556	1.72008	1.24453	1.72008
Breckenridge	1	0.23928	0.41121	1.65049	1.23928	1.65049
Letcher County	1	0.16207	0.22077	1.38284	1.16207	1.38284
Avg. of National	1	0.28469	0.43710	1.72179	1.28469	1.72179
Difference	0	-0.12262	-0.21633	-0.33894	-0.12262	-0.33894
		-43.07%	-49.49%	-19.69%		

- Breckenridge: 47% from industry, **86%** from households
- Santa Fe: 50% from industry, **115%** from households
- Nashville: 92% from industry, **128%** from households

Conclusion of Input-Output Analysis

- Letcher County: Great potential, but must be strategically developed
 - Capture demand from across country
 - Strengthen social linkages
- Social multipliers have most room to grow
 - Support local businesses

Final Thoughts

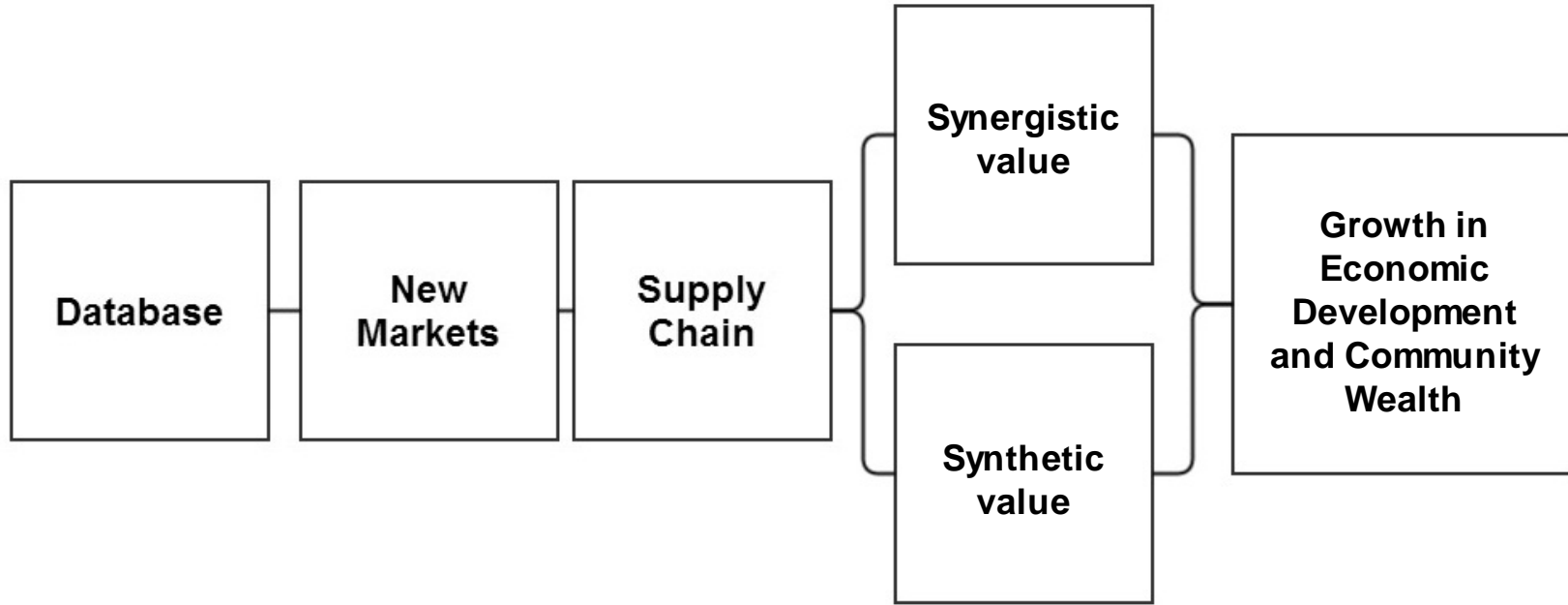
Fluney Hutchinson PhD

*Economics and Policy Studies
Director of EEGLP and Whitman '49 Fellows Program*

Letcher County/Appalshop's Path to Sustained Prosperity

Initial Conditions and Assets	Modes	Synthetic Opportunity	Synergistic Opportunity	Capacity for Outcome	Imagined Future	Sustainable Economic Development
Core Assets i.e. culture	IMPLAN	Mountain Tech and Media	Communication	Entrepreneurship	Appalachian Identity and Humanness	Broad-based
Derived Assets	Cluster Mapping	Educational Partners	Networking and Technology	Community	Malleability	Inclusive
Instrumental Value	Internal Interrogation	Regional Training Facility	Data Collection	Intrinsic Culture	Agency and Empowerment	Shared
Capital, both Latent and Exposed	Conscious Capitalism	Grant Development	Data Forecasting	First Voice	First Voice	Localized

Economic Impact and Cultural Linkages



Concluding Thoughts

- Strengthening the capacity of residents to exercise voice, agency and ownership over their community affairs is essential to their ability to create communities that they value.
- Such strengthening allows communities to better pursue their aspirational goals of building inclusive, resilient, developmental, and wealth creating communities.
- The project builds the capacity of Letcher County to exercise informed agency in pursuit of community development, and how this process can be enhanced through collaboration in interdisciplinary public scholarship (IPS) with higher education institutions.

Appendix I

Asset Mapping for
Community Development
March 2014

Appendix II

Appalshop Letter of
Invitation to EEGLP

May 2014

Appendix III

Memorandum of
Understanding Appalshop-
EEGLP
April 2014

Appendix IV

Cambridge U Essay on
Community Development
February 2017