Libraries in Community Systems.

From Research Findings to Decision Tools: Supporting Local Choices

Libraries in Community Systems is a national research project into public library value in terms of community level outcomes like community resilience, educational effectiveness, and economic wellbeing.
Research findings formed the basis of the decision tools.

Key Finding — Librarians co-produce capability and wellbeing WITH their diverse publics

Key Finding — Public libraries are one node in a community, not THE hub contributing to wellbeing

"The library is committed to ensuring that every community member, regardless of their socioeconomic status, has the same access"
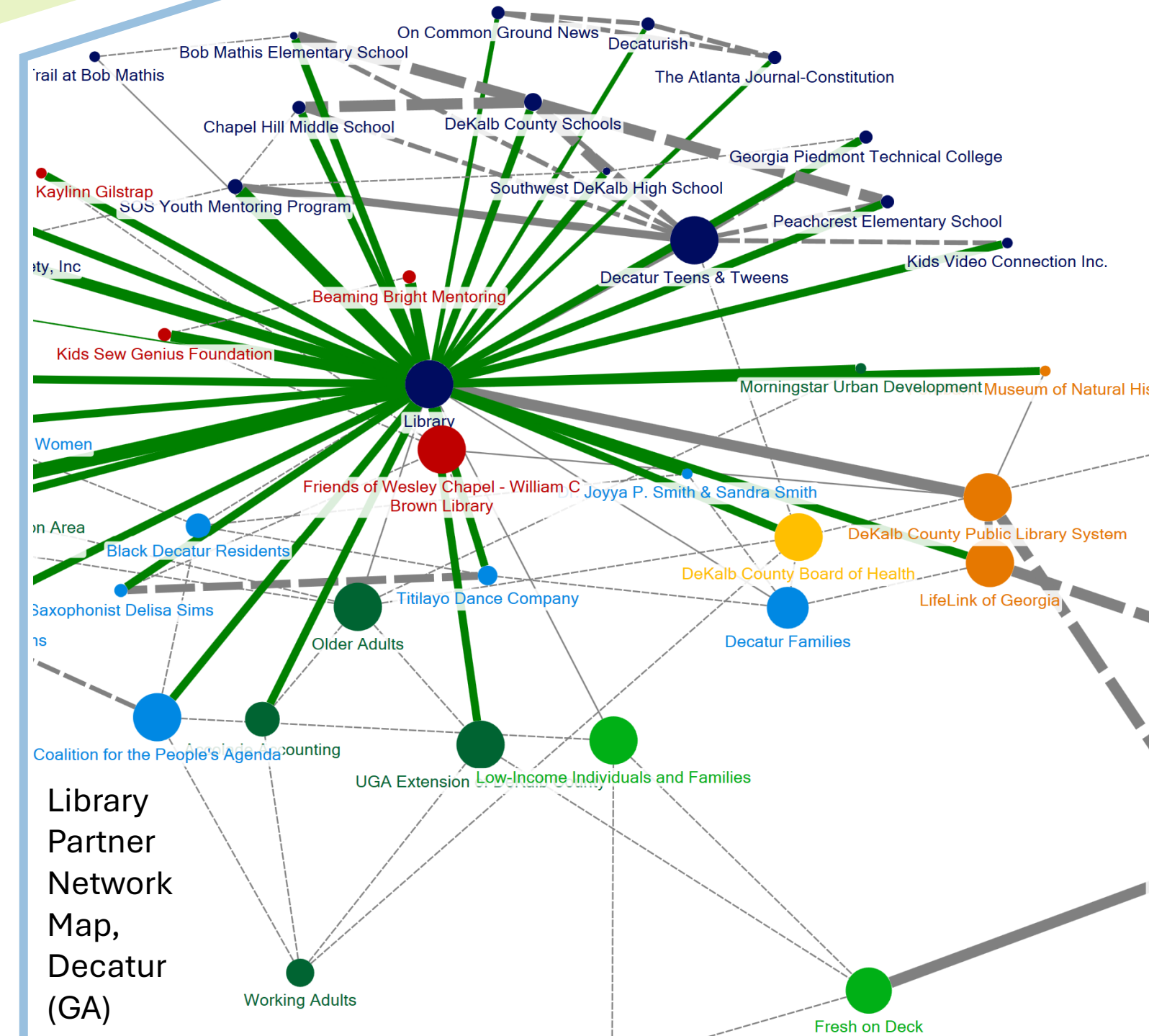
"People need a free place to go…"

"It makes us a tighter community, and everybody's invested in each other."

"Well, if the library is doing it, we trust you. We trust the library. So, it must be okay."

"My children were raised in a library"

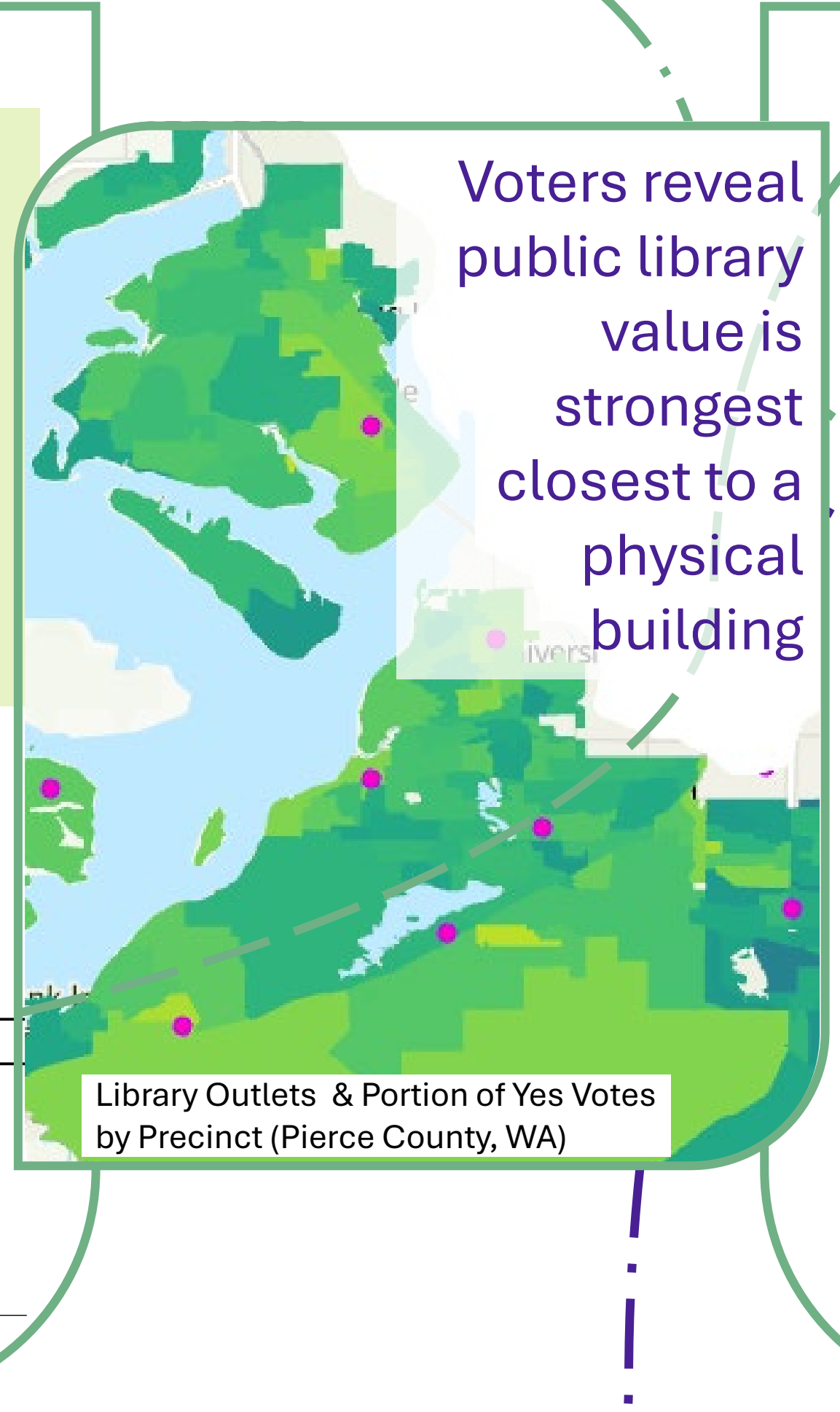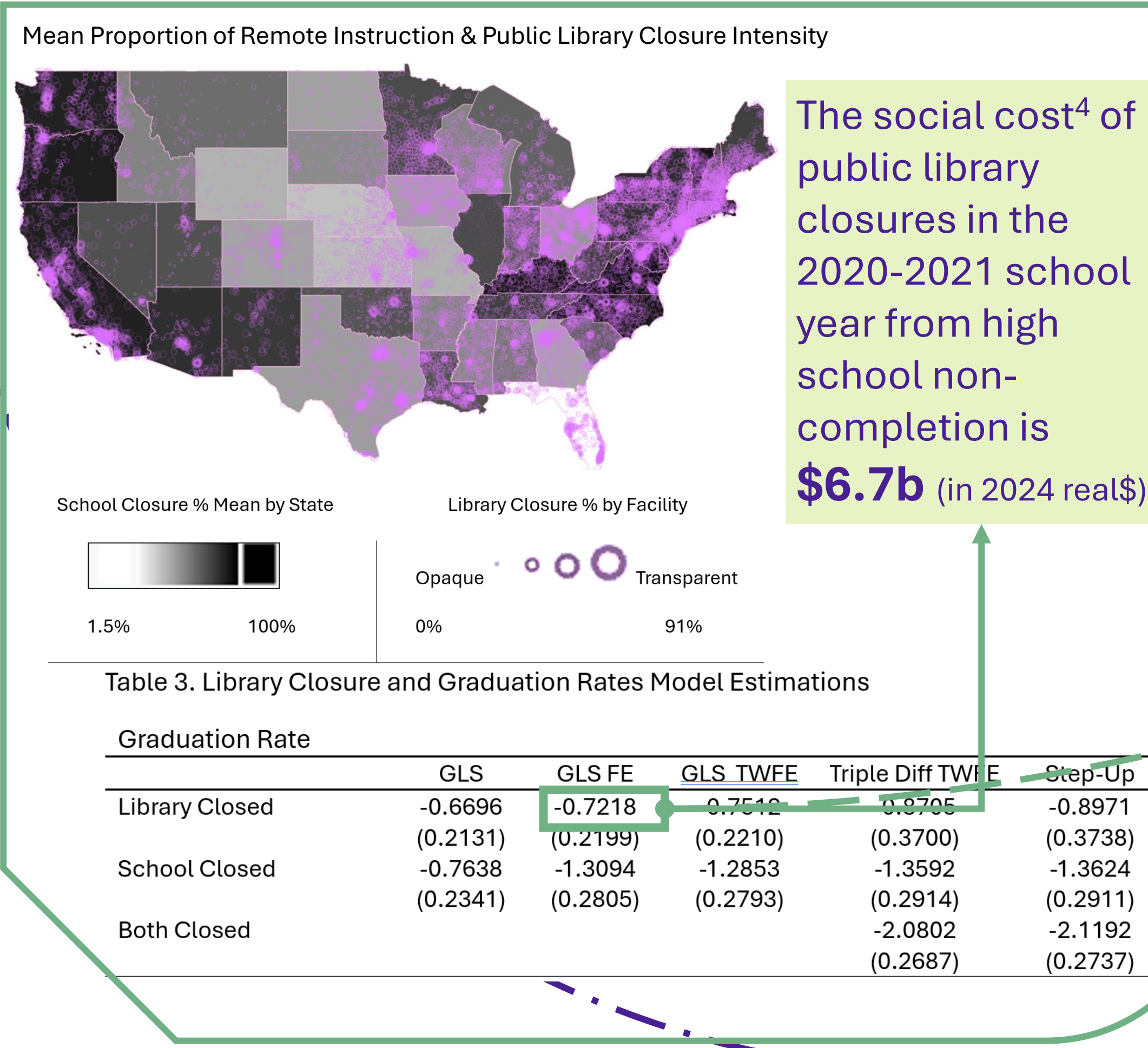Quotes from interviews, December 2021 – March 2022

Social Network Analysis has a nascent relationship with library literature with strong recent arguments for growing this research area[1,2]. In conversation with our partners we explored processes of mapping partner, resource, and user groups, and conducting cluster analysis.

We found only weak links between library structure and map structure. What did emerge was poly-centrality. While libraries hold a key place in the lives of many community residents, other organizations and institutions hold similar or greater roles in residents' lives. This confirms other recent civic infrastructure findings[3].
Libraries are important but are not alone.

Library Partner Network Map, Decatur (GA)

Mean Proportion of Remote Instruction & Public Library Closure Intensity

School Closure % Mean by State
1.5% — 100%

Library Closure % by Facility
Opaque ○ ○ ○ Transparent
0% — 91%

The social cost[4] of public library closures in the 2020-2021 school year from high school non-completion is **$6.7b** (in 2024 real$)

Table 3. Library Closure and Graduation Rates Model Estimations

Graduation Rate

	GLS	GLS FE	GLS TWFE	Triple Diff TWFE	Step-Up
Library Closed	-0.6696	-0.7218	-0.7512	-0.8705	-0.8971
	(0.2131)	(0.2199)	(0.2210)	(0.3700)	(0.3738)
School Closed	-0.7638	-1.3094	-1.2853	-1.3592	-1.3624
	(0.2341)	(0.2805)	(0.2793)	(0.2914)	(0.2911)
Both Closed				-2.0802	-2.1192
				(0.2687)	(0.2737)

Voters reveal public library value is strongest closest to a physical building

Library Outlets & Portion of Yes Votes by Precinct (Pierce County, WA)

Optimization with Non-negativity Assumption

$$\underset{(X_i)}{\text{Max}}\, \pi = A \prod_{i=1}^{4} X_i^{\alpha}$$

$$\text{s.t.} \quad W = \sum_{i=1}^{4} W_i X_i$$

$$X_{i,t} \geq L X_{i,0} \;\forall\; i = 1,2,3,4$$

Measure Library – Outcome Relationship WITH user inputs

Using a multi-mediator structural equation model with fixed effect panel regression to estimate the elasticity (ie. input-output relationship) between library service & community outcome, at each permutation of geographic region, population density, and single or multiple outlet category combination as well as overall national models.
At the national level, causal mediation analysis suggests that across social wellbeing indexes measured, public libraries have a positive effect, though sometimes small contribution to a specific outcome. For instance, public libraries have a positive effect on community level economic outcomes, but service and use explain 15% of the overall variation in economic outcomes.

service to use — use to outcome — service to outcome

Library Contribution to Social Wellbeing Calculator

What level of annual service would you like to provide?

Total library programs offered* — 100

Total physical items in collection* — 1000

Total Open Hours* — 1100

Total public access computer terminals* — 8

Economic Diversity Change — 5%

Each community outcome index we measure is linked to a context page. Here readers will learn how the index was developed, how the quantitative and qualitative data relate to one another, and how to read the data dashboard for useful information.
In interviews and surveys of our library partners, we heard wellbeing defined in terms of **every** person. The Dashboard is designed to support understanding of how inequality in wellbeing outcomes is shifting (or not) over time and geographies.

The economic diversity index gives the diversity of income levels, occupations, and employment for a US county relative to other counties in the region, with the same level of rural/urban mix and outlet structure. Collections and programs are services which influence this measure the most. For more: Economic Diversity Dashboard

Data Dashboard & Empirical Context

Economic Diversity & Inequality in Opportunity by County

Measure Names
Avg. Black Unemployment Diff

Measure Values
-15.0 — 91.3

References
1. Hicks, Deborah, Mary F. Cavanagh, and Amy VanScoy. "Social network analysis: A methodological approach for understanding public libraries and their communities." *Library & Information Science Research* 42, no. 3 (2020): 101029.
2. Norton, Michael H. 2021. Understanding the Social Wellbeing Impacts of the Nation's Libraries and Museums. IMLS Community Catalyst Report
3. University of Wisconsin Population Health Institute, County Health Rankings & Roadmaps. 2023. 2023 County Health Rankings National Findings Report: cultivating civic infrastructure and participation for healthier communities.
4. Calculation based on social cost of non-completion, converted into 2024 dollars, multiplied by .75% of 2021's graduating class. Vining, Aidan R., and David L. Weimer. 2019. "The Value of High School Graduation in the United States: Per-Person Shadow Price Estimates for Use in Cost–Benefit Analysis" *Administrative Sciences* 9, no. 4: 81.