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MUSA Capstone

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Proposal 1

Motivation:

This project will identify parts of Appalachia that have the greatest need for broadband grants from the Infrastructure Bill. As America moves away from coal fired power plants in favor greener energy sources, mines are shutting down, eliminating the main industry for countless Appalachian towns. Politicians, tech leaders, and former miners alike have suggested an industry shift into computer science and technology, creating a “Silicon Holler.” While tech could lead to a regional renaissance and the work force seems open to the change, much of the area lacks the necessary resources – jobs, education, and broadband. Non-profits such as Mind Miners have attempted to educate and support with career resources but struggled with the lack of reliable and high-speed internet. Additionally, tech companies were hesitant to relocate to Appalachia, or at the very least hire remote workers; however, with the shift to remote work amidst the pandemic, this no-longer appears to be a major barrier. The terrain that makes Appalachia ideal for mining, in turn make it difficult for broadband, but with financial support from the recent Infrastructure Bill, broadband can reach remote areas. So how where should infrastructure dollars be spent in Appalachia to encourage “Silicon Holler”?

Existing Research:

There is ample research on the economic (and educational) impact of internet and broadband access. Furthermore, the concept of the “Silicon Holler” is not new, but since the passing of the infrastructure bill this resource allocation study provides a relevant approach.

Datasets:

* Census and ACS – This will demonstrate economic trends of the area and show spatial and temporal relationships with mine locations. Perhaps most importantly, the census has internet and broadband information on a census tract level.
* Open Data West Virginia, Pennsylvania, Kentucky – Location of mines and dates of opening and closing
* Open Street Maps – This can measure driving distances, which may be more relevant in Appalachia given the mountainous terrain, which makes straight line distances less relevant
* Business Census, Info USA, or other economic measures – identify the larger economic trends of mine areas.

Methods:

* Use OpenStreet maps and the mine locations to determine the drive sheds of each mine location. Compare this with the census industry and employment data. Map!
* Identify the economic trends using the census and other economic resources within the drive sheds of closed mines – examine this over time – how did the opening of a mine impact the population, income, etc of the town? How did the closing of a mine impact these variables in 1 month, 6 months, 1 year, etc. – Map! And possibly a gif of the changes over time
* Identify internet and broadband access in these areas – has broadband been introduced in areas and economic trends improved? – Map!
* Engineer features and identify target variable to run ML to identify top priority regions. – Map!

Deliverables:

A report displayed on a website with interactive maps and graphics.

Use:

The infrastructure bill is largely distributing the broadband funds through grants. This report could help certain areas plead their case or help with the resource allocation itself.