

1. Introduction/Abstract

In a digitized world, the reliance on digital infrastructure and systems to execute day to day functions has skyrocketed. In Baltimore, the digital divide, the gap between those with the internet and those without, runs deep. According to a study conducted by the Abell Foundation, in 2018, around 40.7% of households in Baltimore did not have wireline internet service, such as cable, fiber, or digital subscriber line service. We conducted our research on the socio-economic effects of the digital divide in Baltimore, under the supervision of Professor Monica Sanders and her Undivide project team. In addition to conducting qualitative research for Prof. Sanders, we were also tasked with creating an asset map and an Internet Bill of Rights for Jonathan Moore, founder of Rowdy Orb.it, an enterprise that aims to leverage community broadband infrastructure, in order to visualize the effects of the digital divide and empower and protect Internet users in Baltimore.

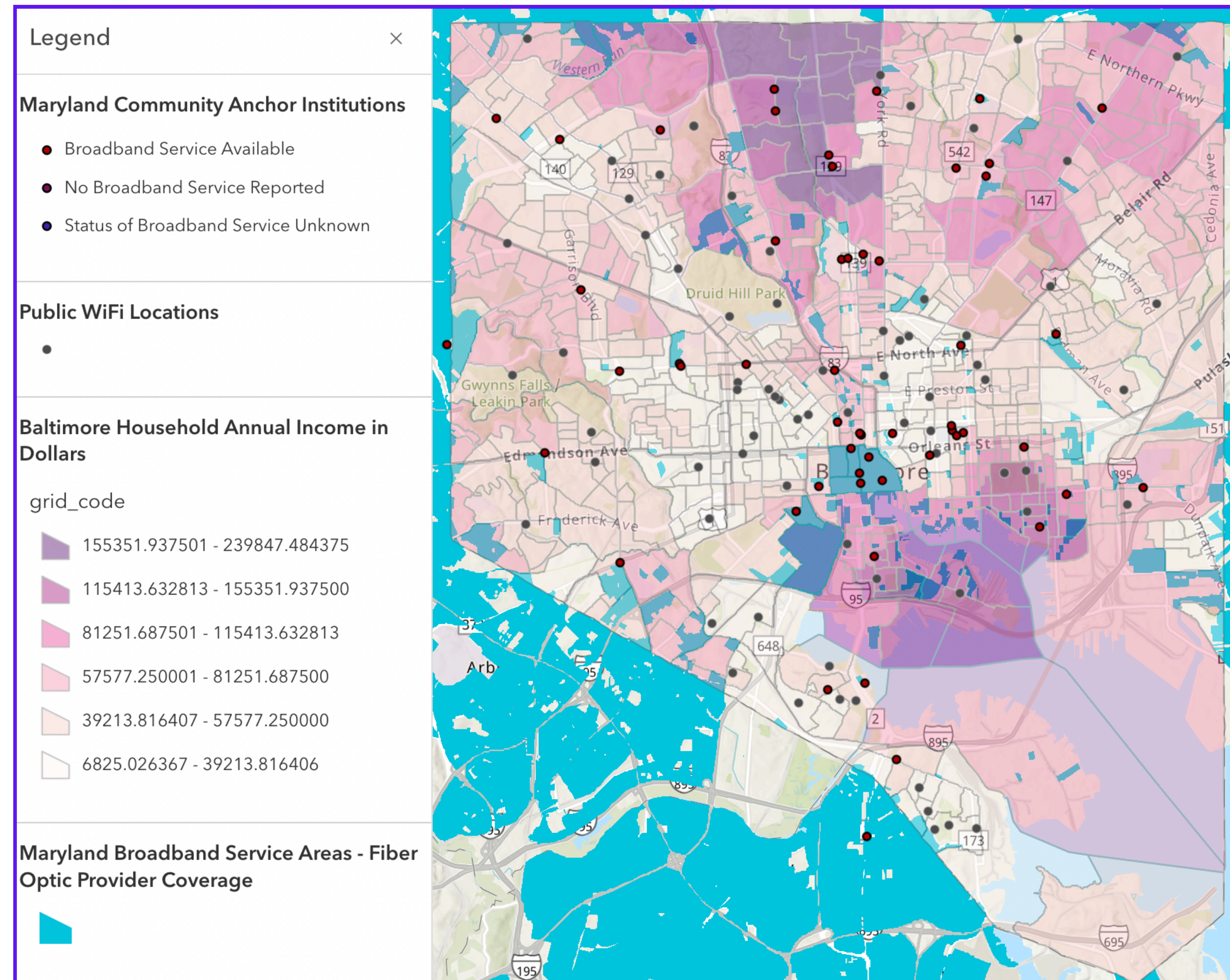
2. Methodology

Our research primarily used qualitative analysis by the means of interviews, to gain a comprehensive understanding of the effects of the digital divide within Baltimore, Maryland, in addition to an analysis of legal research and other reports conducted by experts on the matter of digital equity. By utilizing these means of research, we aimed to gain an understanding of the public sentiment by those who were being affected by local and federal policy, while cross referencing the sentiment with reports analyzing the legislature and socio-economic situation from a broader perspective. We conducted seven hour long interviews throughout the research period, with each interview containing individually tailored questions designed to adapt to the interviewee's profession and area of expertise.

3. Thematic Analysis

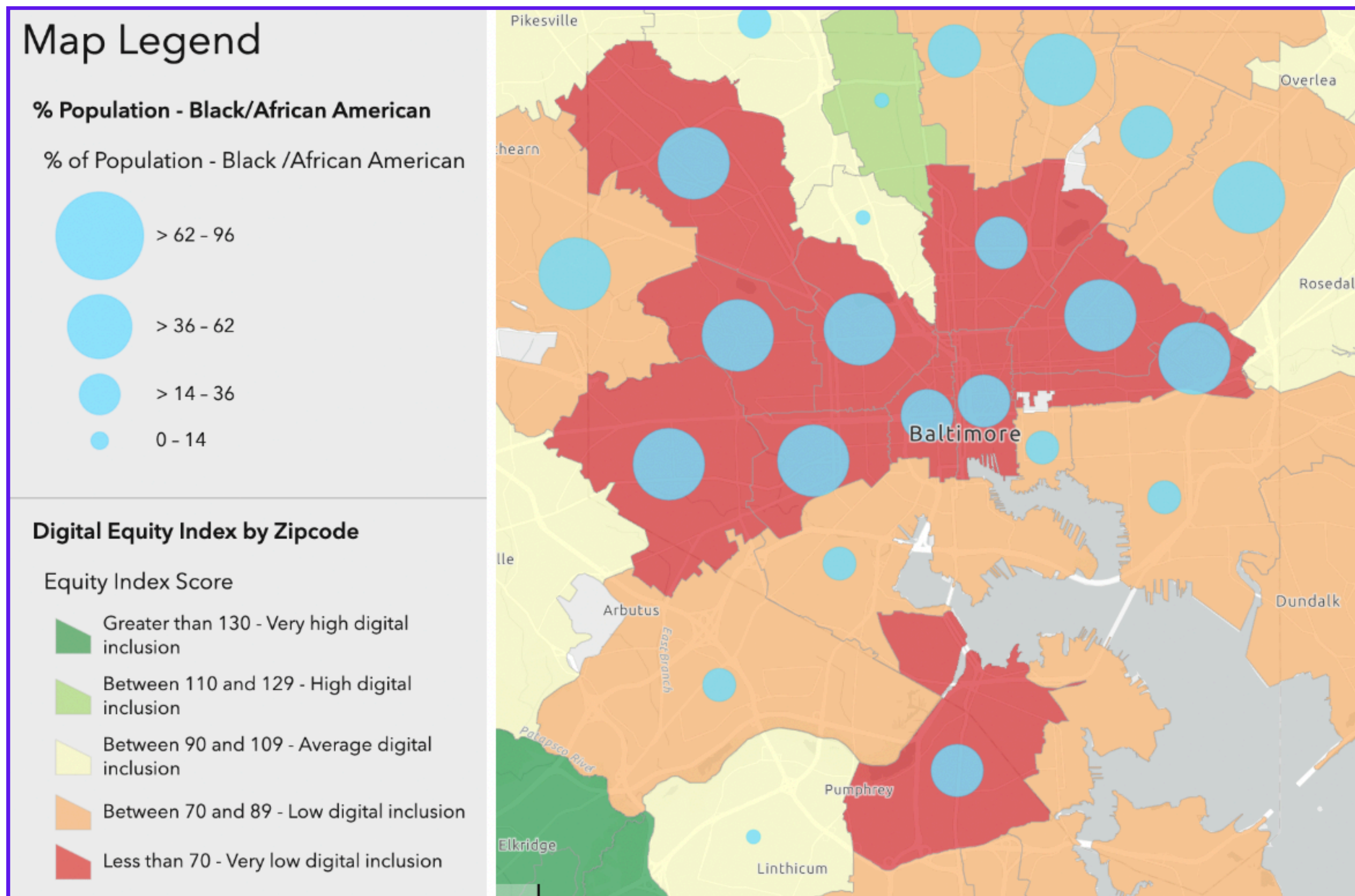
Our interviews gave us a first hand account of the effects of the digital divide in Baltimore. We utilized thematic analysis for our interviews, which is done in most social science research reports. We split themes into two categories, (1) broadband infrastructure ownership and (2) the role of the internet for well being.

- Broadband Infrastructure Ownership**
 - Public- Many interviewees expressed frustration with the city government, as its "FreeBmoreWiFi" does not meet expectations and has provided slow and unreliable internet for Baltimoreans. Additionally, this frustration continued with the federal government, as Baltimore will not see a penny of the the \$42.45 billion that the federal Broadband Equity Access and Deployment Program (BEAD) is allocating for high-speed internet infrastructure grants. Therefore, this has led community anchor institutions to create their own public wifi networks, as Mr. Moore has done.
 - Private- Comcast controls the majority of the broadband infrastructure in Baltimore, which has created monopolistic pricing. City officials along with multiple other employees expressed the necessity of increasing competition within the market, by releasing RFPs for outside Internet Service Providers.
 - Communal- The prospect of locally owned mesh networks were met with mixed opinions. The lack of profit incentive for communal networks allows for lower operating costs and employs community members to do so. However, the difficulty of installation and funding present significant barriers to communal networks.
- Role of Internet for Well Being**
 - Social- Within our interviews with Dr. Felicia Henry, a professor of sociology, and Jill Donaldson, president of Medstar Harbor, we found that the lack of internet provides a large challenge for adaptation to digitalized services for those without internet and for previously incarcerated individuals. Additionally, the lack of digital literacy largely prohibits access to job searching websites and online patient portals for Medstar Hospital, among many other online services.
 - Economic- As stated previously, the lack of digital literacy heavily prohibits employment, and after COVID has created a "homework gap", or a large lack in education, for children without internet, both of which heavily prohibit the potential for economic growth. However, Mr. Moore's communal internet model provides an opportunity for economic revitalization in these underserved communities.



4. Fiber Coverage in Baltimore vs Median Household Income vs Public Wifi Areas

As Baltimore-specific digital equity studies and our interviewees identified income levels as primary determinants of internet access, we created a visualization that overlays median household income levels by neighborhood with existing Fiber Optic Provider infrastructure and free public Wi-Fi locations in Baltimore. We utilized data from the Maryland Department of Information Technology to map the fiber optic provider coverage areas and anchor institution locations. Our public Wi-Fi location data was sourced from the Baltimore Neighborhood Indicators Alliance and neighborhood median household income data from the Baltimore City Government.



5. Percent Black Population vs Digital Equity Index by Zip Code

Our research frequently made reference to the Baltimore Neighborhood Indicator Alliance and John Horrigan's digital equity index mapped above with percentages of Black population in each zip code. In conjunction with our asset map, this visualization importantly illustrates the inseparable relationship between systemic anti-Black racism and digital inequity.

6. Discussion

Broadband as a Public Utility:

The question of whether broadband should become a public utility akin to electricity, water, or gas received mixed responses in our interviews. Proponents of broadband as a utility like Jonathan Moore argue that such a shift in how broadband is provided, regulated, and maintained would be a massive step toward universal access, affordability, and reliability for all residents. Specifically, Mr. Moore highlighted how broadband service as a utility would be regulated to ensure affordability and would develop programs to subsidize internet costs for low-income households. In contrast, the two BCIT employees were hesitant as to whether a broadband utility would be able to deliver on universal reliable internet access. They discussed current pitfalls of the Baltimore Gas and Electric utility service such as its relatively high costs and difficulties with effective regulation.

Future Action and Policy Recommendations:

A primary issue with implementing affordable broadband access for all was the cost of installing fiber. A majority of this cost stems from the cost of digging up roads to build a fiber network. We propose that "Dig Once" policies be implemented, to successfully employ fiber infrastructure in developing communities at an affordable price. Solutions such as micro-trenching should be explored as well, where only a few inches are dug into the roads in order to implement fiber at a much lower cost.

Limitations and Need for Research:

A crucial component of closing the digital divide is research, including the work that informed this paper and the work that the Ten States Project continues to do. Regarding this paper's contributions to the subject, our study was severely limited due to its short 6-week timeframe and tight resources. We were not able to conduct a sufficiently large sample of interviews and analyze results across professions and demographics. Additionally, our analysis of differing infrastructure ownership methods was limited by our inability to survey users at scale. We found existing studies regarding the scope of the digital divide to be vital for identifying the need for action and hope that this paper and the ongoing work of the Ten States Project, in partnerships with groups across Baltimore, contributes to the implementation of data-driven public policy and community organizing.

7. Conclusion

Since the COVID pandemic, the digital divide has grown into a quintessential issue, as jobs, social services, education, and other important aspects of general welfare have been digitized. In Baltimore, Maryland, the calls for action continue to grow as the city maintains one of the highest rates of digital inequity, hindering its citizens from social and economic success. Changes must be made to the current state of broadband infrastructure in order to provide affordable broadband services for all citizens, and close the digital divide.

8. Acknowledgements

We would like to thank the incredible Professor Monica Sanders, for aiding us during the research process, and integrating us within her Ten States Project team throughout the research period, along with her continual guidance. This project would also not be possible without Georgetown's Center for Research and Fellowships, along with the Laidlaw Scholars program itself.

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