Community-Engaged, Digital Equity

1. Vision – challenge idea

Covid-19 exposed the true depth of the digital divide and the gap between people who have access to broadband internet, computers, and knowledge of how to use both and those who do not [1]. In urban low-income communities, digital divides tend to reinforce social and economic divides and exacerbate existing inequalities, including access to employment, health care, public services, and education [2,10,12]. The 2021 Digital Equity Act aligns digital equity with social and economic justice, best achieved by prioritizing investment in local solutions [3 (a), (b)].

The contours of the digital divide became clear to me while supporting a 2017 project, entitled *How Can Investments in Smart Cities Technologies Improve the Lives of Low-Income, Inner-City Residents, NSF Award-1737495*. The team of technical and social scientists from the University of Maryland, College Park (UMD), University of Baltimore, Morgan State University, and Johns Hopkins University, sought to understand how investments in 5G and smart cities technology could improve the lives of West Baltimore residents. They created an asset-and-community-based approach that surfaced needs including: (1) stable, good-paying jobs; (2) safety without surveillance; and (3) ubiquitous residential broadband access [10].

The urban digital divide has proved pernicious, long-standing, deeply entrenched, and pre-covid, easy for businesses and government to ignore. The PowerMap, an analytical equity tool created by Morgan State's Lawrence Brown, demonstrates how the effects of redlining - discriminatory mortgage practices dating from the 1930's - can still be seen today as a "Black Butterfly" across Baltimore - in equity indicators like affordable housing, educational readiness, and access to capital [4]. Areas of high inequality are in historically Black neighborhoods to the east, west, and south of the city spine (Figure 1, red areas).

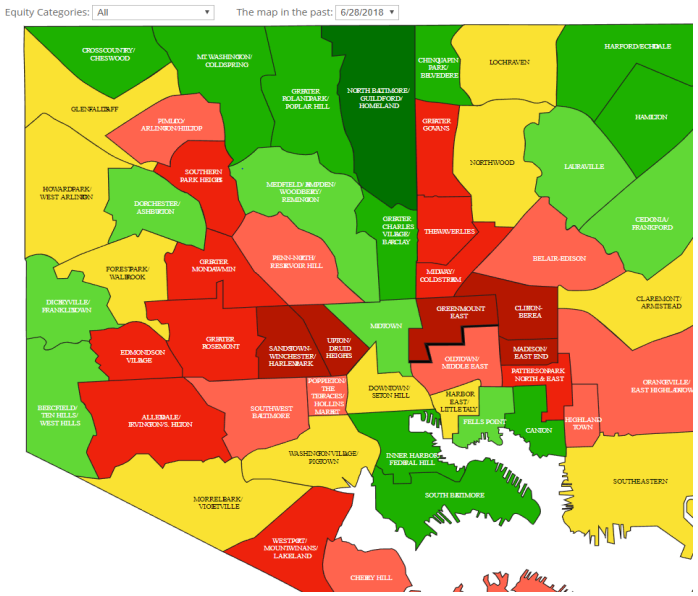

Figure 1, Brown's PowerMap – Baltimore City Equity Tool; Red areas = high inequality including access to affordable housing, education readiness, and capital.

Today's digital divide is concentrated in these same neighborhoods. Using the Census Bureau's American Community Survey, Baltimore Neighborhood Indicators Alliance Digital Equity Map [5] shows that some 40-54% of Baltimore households in Black Butterfly neighborhoods are without residential broadband. Similar deficits are replicated in neighborhoods in Prince George's (e.g., Greater Riverdale) and Montgomery (e.g., Long Branch) Counties [22-24] and across the country. The urban digital divide is primarily an economic issue, not a technical one.

2. Rationale (state of the art) and gap

Underpinning the 20+ year inability to close the digital divide is access to data and granularity in mapping that details exactly *what* and *where* the barriers are, and *why* they exist. Urban issues include [6-14]:

1. Lack of infrastructure: last mile fiber or fixed-antennae-wireless; lack of hardware (computers, post-3G phones).
2. Granularity: little publicly available information at the *exact* address level. Internet service providers (ISP) have this data but will not share it.
3. Affordability: infrastructure is present but low-income individuals cannot afford it.
4. Quality: individual has access, but quality (speed/bandwidth) is slow.
5. Friction: signing up for direct-to-consumer benefits or negotiating better rates/service is difficult.

The Federal Communications Commission (FCC) recognizes the broadband access knowledge deficits in federally mandated maps and has enacted a new Broadband Data Task Force (Feb 2021) to revise the criteria. While positive,

results are likely years off [19, 20]. Georgia, Pennsylvania, and New Mexico have commissioned data-maps that use private and public data to better prioritize covid-era and future investments [18-21]. Georgia's methodology is the most granular, achieved by passing a law that keeps ISP data confidential to access *exact address* service information [18].

During Covid-19, $-billions flowed to alleviate the symptoms of this crisis. Federal funding took four main tracks: (1) via the public school system and libraries to allow remote learning (via both hot-spot and hardware access); (2) as "direct-to-consumer" benefits (e.g., the Affordable Connectivity Program (ACP)) [15]; (3) to internet service providers (ISP's) to build new infrastructure; and (4) via distribution to states (via CARES and IIJA legislation) [16-17]. This unprecedented funding stream has not solved the problem but has highlighted its extensive impact. Research is needed to understand and apply "sticky" solutions and address root causes. Underpinning these solutions is the need to create granular, exact-address broadband deficit maps. Future research can then help scale solutions at county, state, and national levels.

3. Innovation and research approach

Objectives: We will execute a community-led, digital equity mapping research and advocacy training project in two high priority neighborhoods in Prince George's County, MD (PGC): Riverdale Park and College Park. The project will train community leaders and UMD students to co-develop and deploy a broadband access survey to gather mapping data on: (1) *residential service gaps;* (2) *reasons why service gaps exist; (3) adoption of direct-to-consumer benefit programs; and* (4) *if service is present, a measure of quality per upload/download speed test.* A digital access map will be developed from the collected data as the foundation for future targeted investments in local neighborhoods. The trainees will also curate materials on direct-to-consumer resources including the Affordable Connectivity Program, state, and county resources to convey this information to interested community members. The survey deployment, mapping and advocacy work will take place during each of 3 years. Further, new data avenues will be solicited/sourced to layer onto the map to elucidate further detail on the 5 friction points. This data will be solicited from: (a) State of Maryland speed test data; (b) public school and library systems who stepped in during Covid-19 with hot-spots and hardware; (c) ISP proprietary data for the study areas. In years 2-3, survey distribution methodologies will be varied/tested (including the use of broadcast social media).

Local need and covered populations: While the population has boomed in PGC with a 12% increase from 2010 to 2020, *poverty trends also increased by 20% from 7.9% to 9.5%* [23]. This is concerning as multiple studies indicate that poverty is a significant predictor of technology access [6, 7]. The American Community Survey, 5-year averaged data (2015-2019), allows identification of areas with digital access gaps by zip code and demographics [23,24, 27]. We are prioritizing mapping efforts in two neighborhoods with Internet Subscription (IS) deficits above 20% - Riverdale Park and College Park (Table 1) that will reach target populations including:

Table 1: ACS 2015-2019: Persons without Internet Subscription (IS); neighborhoods that scored significantly worse than overall; red highlight - covered populations with IS deficits above 20% [22]

ZCTA	Area	% without IS	% Black – without IS	% Latino/Hisp - without IS
n/a	Prince George's County	11.3	10.1	17.8
20737	**Riverdale Park**	**22.7**	16.9	**27.7**
20740	**College Park**	13.2	16.4	**21.4**

- individuals who live in a household with income less than or equal to 150 percent of federal poverty level;
- individuals with a language barrier, including individuals who are English learners; and have low levels of literacy;
- individuals who are members of a racial or ethnic minority group.

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