Broadband & Digital Equity Strategic Plan

Workforce, Education, and Equity Committee

June 7, 2021

Liz Cedillo-Pereira
Chief of Equity and Inclusion

City of Dallas

Overview

- Recap of efforts to bridge the digital divide

- Summary of Broadband and Digital Equity Strategic Plan provided by CTC Technology & Energy
  - Findings
  - Recommendations: Subsidy, Infrastructure, Programming

- Next Steps

Efforts to Bridge the Digital Divide

Short Term

- Wi-Fi Hotspots/Hardware Purchase
- Cisco Demonstration Projects
- Digital Navigators*
- TEA Matching Fund Support for ISDs in Dallas*

Medium Term

- Strategic Engineering Plan*
- Private Wireless Networks*
- Request for Developer Interest
- Street Light Pilot Project

Long Term

- Implement Plan Recommendations
- Smart City Integration
- Dark Fiber
- Leverage Additional Funding *
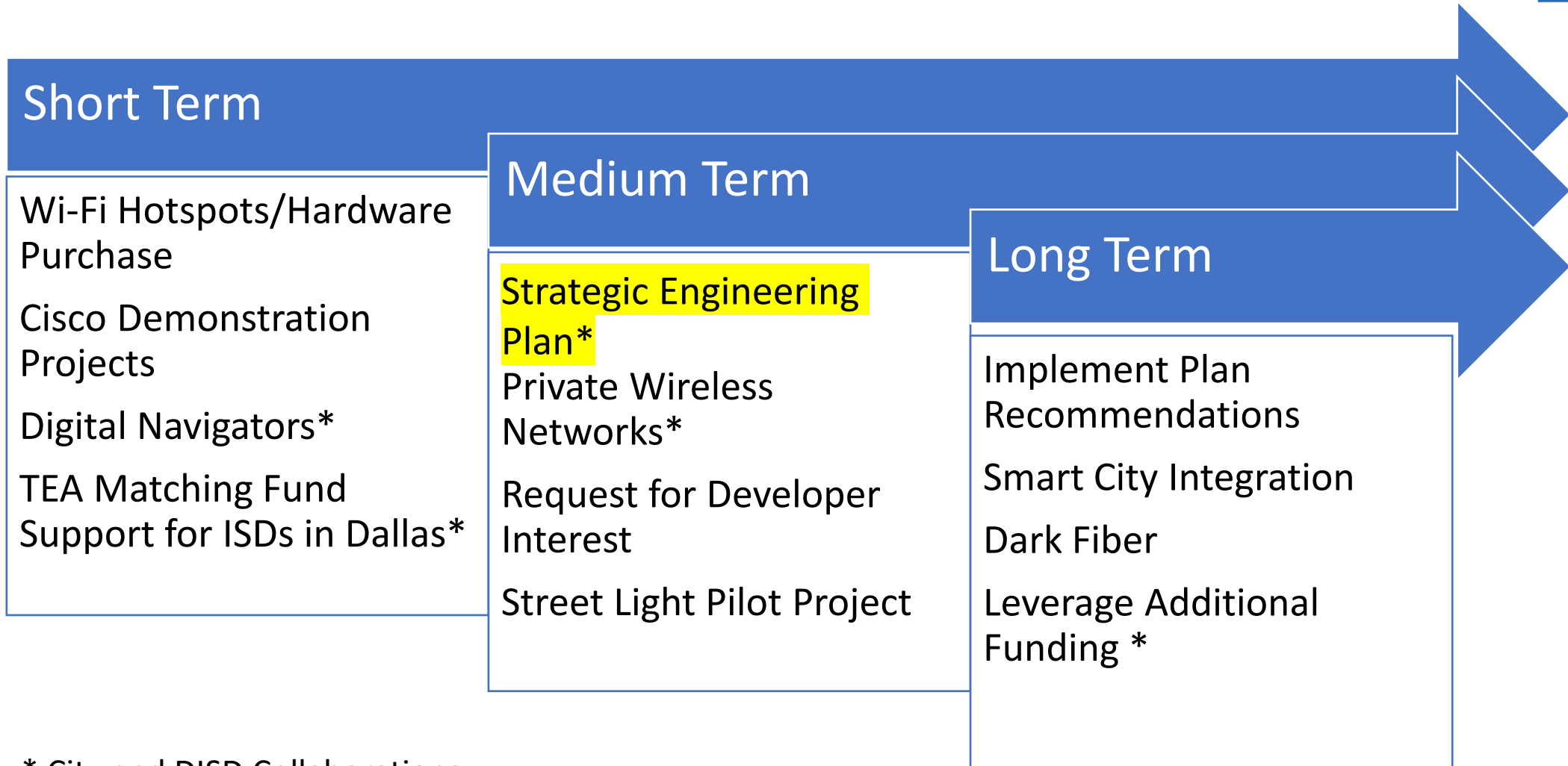
* City and DISD Collaborations

Broadband & Digital Equity Strategic Plan

Prepared for the City of Dallas & Dallas Independent School District

CTC Technology & Energy

Joanne Hovis, President

Andrew Afflerbach, Ph.D., P.E, Chief Executive Officer and Chief Technology Officer

Project objective: Develop strategic approach to addressing digital equity issues in Dallas

DISD & the City have taken significant steps to address the digital divide, but barriers to equitable internet access & use remain in Dallas—just as they do across the country

This project aimed to identify digital equity issues & broadband gaps, & to develop solutions to ensure all Dallas residents & DISD students have access to high-speed home broadband service

Project approach: Collect new data, identify & analyze immediate opportunities to develop a robust, targeted strategic plan for the medium to long term

Assessment of the broadband marketplace

Digital equity data collection & analysis

Planning & engineering for pilot broadband solutions for student connectivity

Long-term planning for an infrastructure-based approach for underserved communities in Dallas
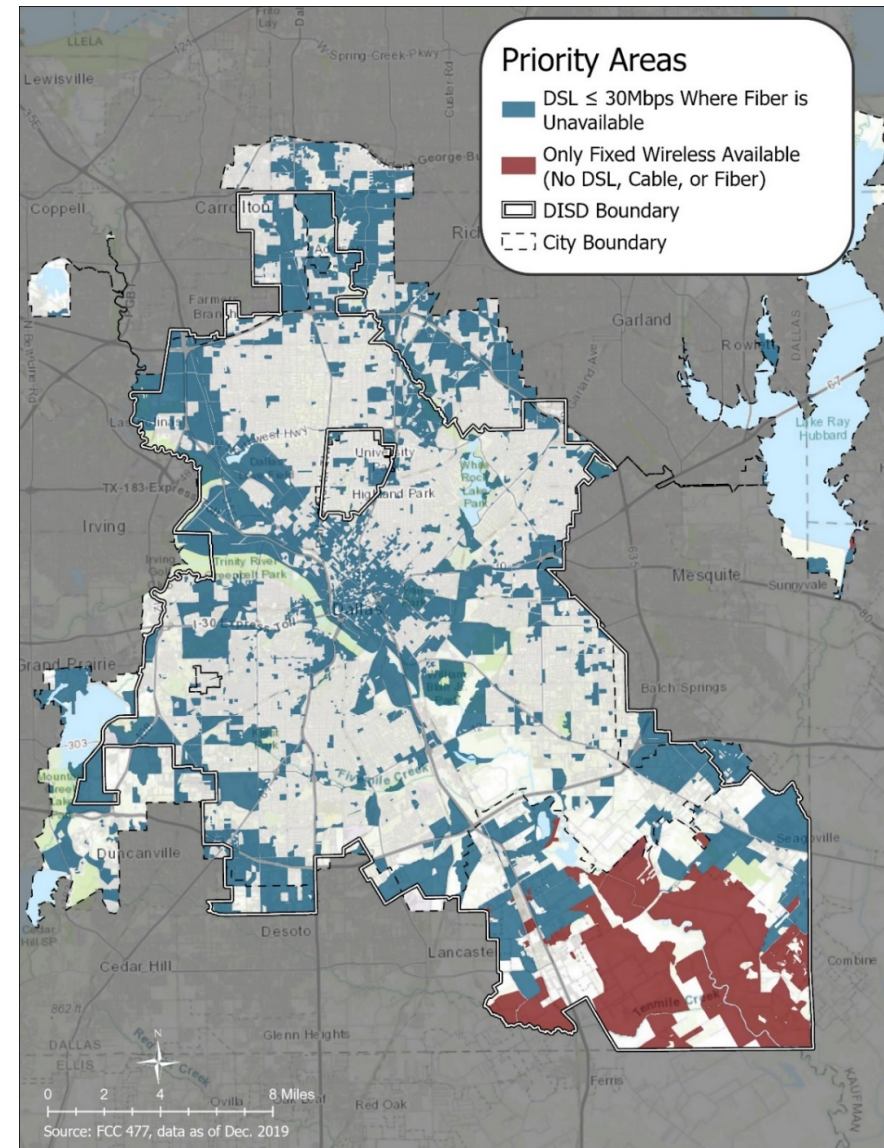
Findings

Network investment has not occurred consistently across all neighborhoods

Charter & AT&T—supplemented by other providers in small areas—serve the entire market area

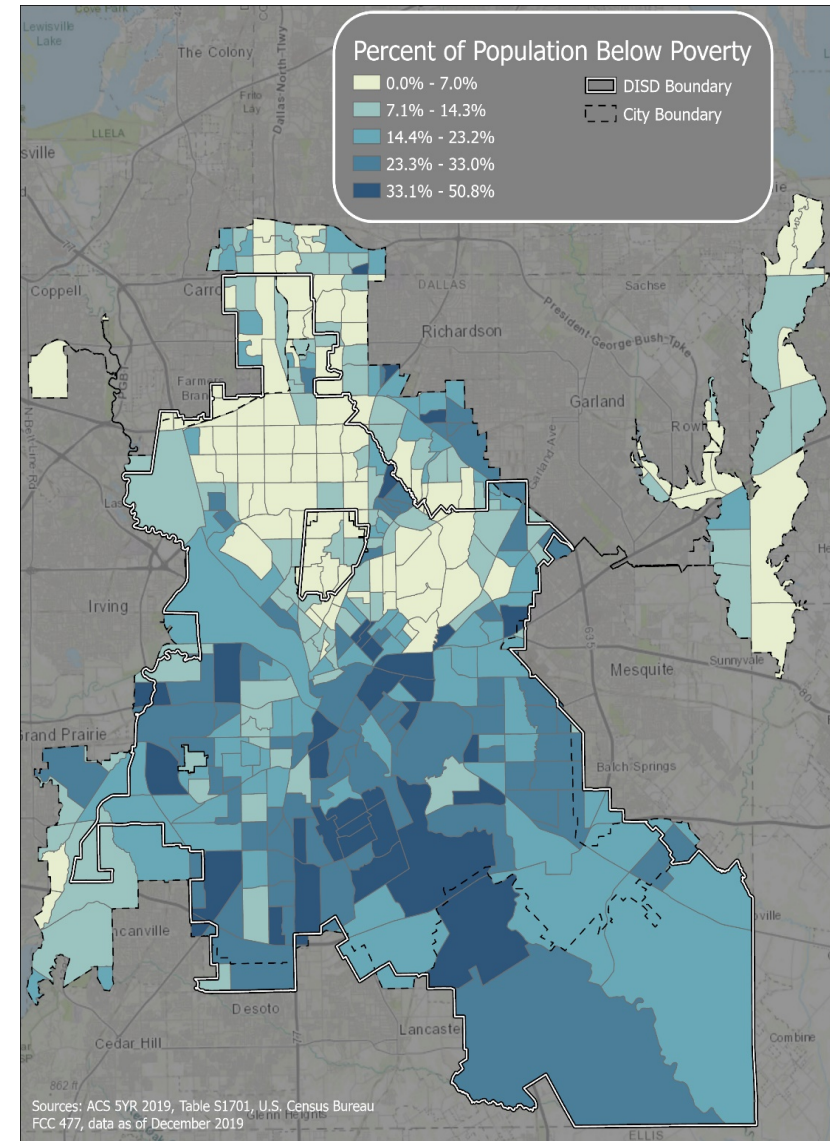Gaps in provision of true broadband speed & broadband adoption persist

Gaps include areas with only low-speed DSL & areas with only fixed wireless

Priority Areas
- DSL ≤ 30Mbps Where Fiber is Unavailable
- Only Fixed Wireless Available (No DSL, Cable, or Fiber)
- DISD Boundary
- City Boundary

Source: FCC 477, data as of Dec. 2019

Low-investment areas correlate in part with poverty levels

Network investment (fiber deployment, upgrade of DSL networks) has been inconsistent

Areas with higher poverty often have lower network investment by internet service providers

Percent of Population Below Poverty
- 0.0% - 7.0%
- 7.1% - 14.3%
- 14.4% - 23.2%
- 23.3% - 33.0%
- 33.1% - 50.8%

DISD Boundary
City Boundary

Sources: ACS 5YR 2019, Table S1701, U.S. Census Bureau
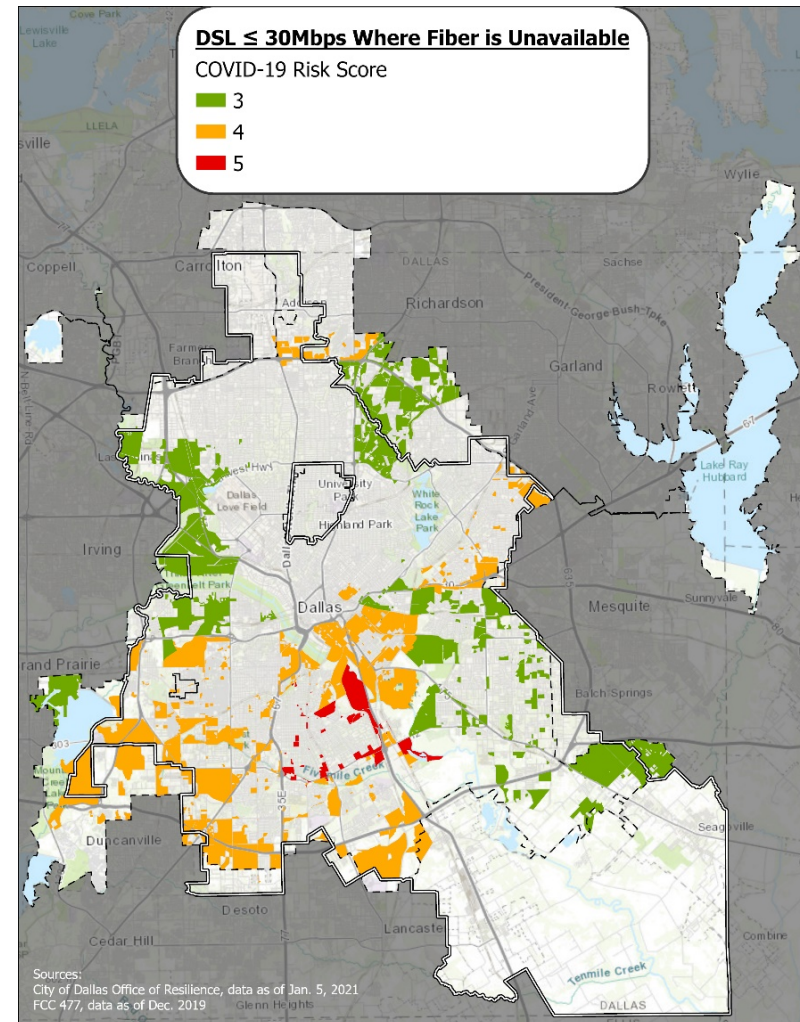FCC 477, data as of December 2019

Low-investment areas also overlap with the Dallas Equity Impact Assessment Tool COVID-19 risk scores

Risk criteria match some patterns of broadband adoption nationwide

Risk scores were used as local data proxy for social & economic challenges facing segments of the Dallas community
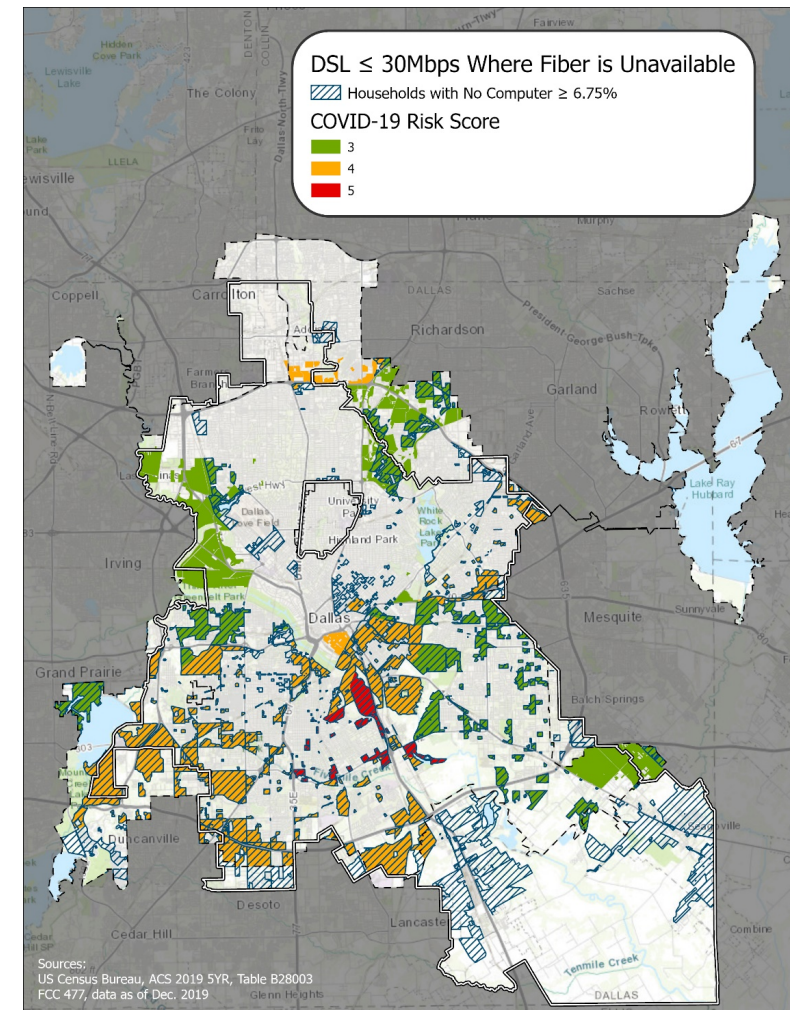
Several areas of the City with high Covid risk scores (3, 4, 5) overlap with areas that do not have access to fiber

DSL ≤ 30Mbps Where Fiber is Unavailable

COVID-19 Risk Score

■ 3
■ 4
■ 5

Sources:
City of Dallas Office of Resilience, data as of Jan. 5, 2021
FCC 477, data as of Dec. 2019

Low-investment areas also overlap neighborhoods with low computer ownership

Analysis of Census Bureau's American Community Survey shows significant additional overlap

Areas throughout the City & DISD with higher-than-average lack of computers

DSL ≤ 30Mbps Where Fiber is Unavailable
Households with No Computer ≥ 6.75%
COVID-19 Risk Score
3
4
5

Sources:
US Census Bureau, ACS 2019 5YR, Table B28003
FCC 477, data as of Dec. 2019

Survey indicates students & residents have broadband access & device utilization gaps

Almost all respondents have internet access, but service is inadequate to meet students needs during the COVID-19 pandemic

Lower-income households lack service at a much higher rate than the overall population

Students & residents have challenges with usage of computing devices (access, affordability)
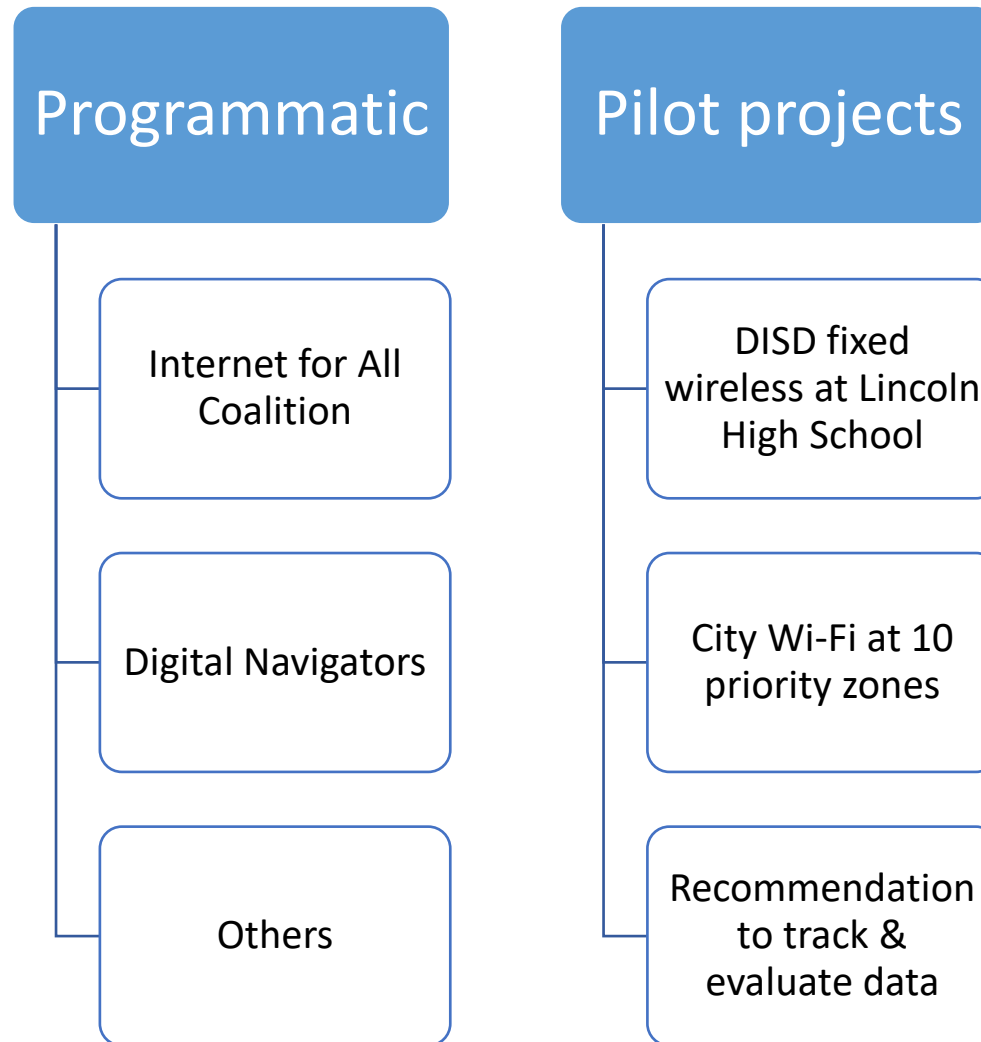
City of Dallas
and
Dallas Independent School District

Internet Usage Survey

December 2020

Even if you do not have home internet service, please complete this survey form and return to us. Your opinions, experiences, and information are important to us. If you need help completing this survey in your language, please email officeofresilience@dallascityhall.com or rebsanchez@dallaisd.org or call 972-925-5671.

Extensive efforts by the City & DISD have made Dallas a national leader in advancing digital equity

Programmatic

- Internet for All Coalition
- Digital Navigators
- Others

Pilot projects

- DISD fixed wireless at Lincoln High School
- City Wi-Fi at 10 priority zones
- Recommendation to track & evaluate data

Recommendations

Recommendation: Pursue federal funding opportunities

Unprecedented federal broadband funding provides opportunities for Dallas

Treasury allocated $350M to Dallas under the Local Fiscal Recovery Funds program

Dallas' most viable source of broadband funding

City will control the funds – could devote some portion to broadband efforts

A half-dozen entities in Dallas are eligible for funding under $285M Connecting Minority Communities Pilot program

Dallas Nursing Institute

El Centro College

Mountain View College

Paul Quinn College

Richland College

University of North Texas at Dallas

Recommendation: Pursue federal funding opportunities (continued)

Some federal funding programs represent better opportunities for Dallas than others

Texas will receive funding from Treasury under the $10B Coronavirus Capital Projects Fund; the State will allocate some portion of its funding to Dallas	States will receive a fixed allocation from this fund – awaiting more guidance from Treasury
	The City could propose to inject some or all of its funding from the Capital Projects Fund into its current broadband programs
National Telecommunications and Information Administration's (NTIA) Broadband Infrastructure Program is likely to favor rural unserved areas	Dallas has little chance of an award
	Urban areas are not ruled out, but the City's application would have to score higher than applications from unserved rural communities—which is unlikely

Recommendation: Consider developing new wireless infrastructure as a partial solution to broadband gaps in Dallas– can be pursued by DISD, the City, or jointly

Fixed Wireless Model Overview				Capital Costs			Operating Costs	
Model	# of DISD Rooftops	Locations Served	Percent of Locations Served	Capital Cost	Average Distribution Network Cost Per Served	Installation and CPE Cost Per Location Served	Annual Cost	Annual Cost Per Location Served
DISD – All	210	74,500	77%	$38.2 million - $57.3 million	$510 - $775	$350	$4.9 million - $7.3 million	$65 - $100
DISD – CRI < 40	107	44,800	46%	$21.0 million - $31.5 million	$475 - $700	$350	$2.8 million - $4.2 million	$65 - $95
All City Residents Covid Risk 5	5	720	69%	$900,000 - $1.4 million	$1,225 - $1,875	$350	$280,000 - $425,000	$390 - $580
All City Residents Covid Risk 5 & Risk 4	5	775	NA	$900,000 - $1.4 million	$1,150 - $1,750	$350	$280,000 - $425,000	$360 - $540

Prioritization established by the DISD Community Resource Index (CRI), a tool created by the Child Poverty Action Lab "to inform investment decisions and resource allocations"

COVID risk areas designated by City of Dallas' Office of Equity and Inclusion

Numbers have been rounded

CBRS fixed wireless from antennas on DISD rooftops or towers could serve 80% of DISD student addresses
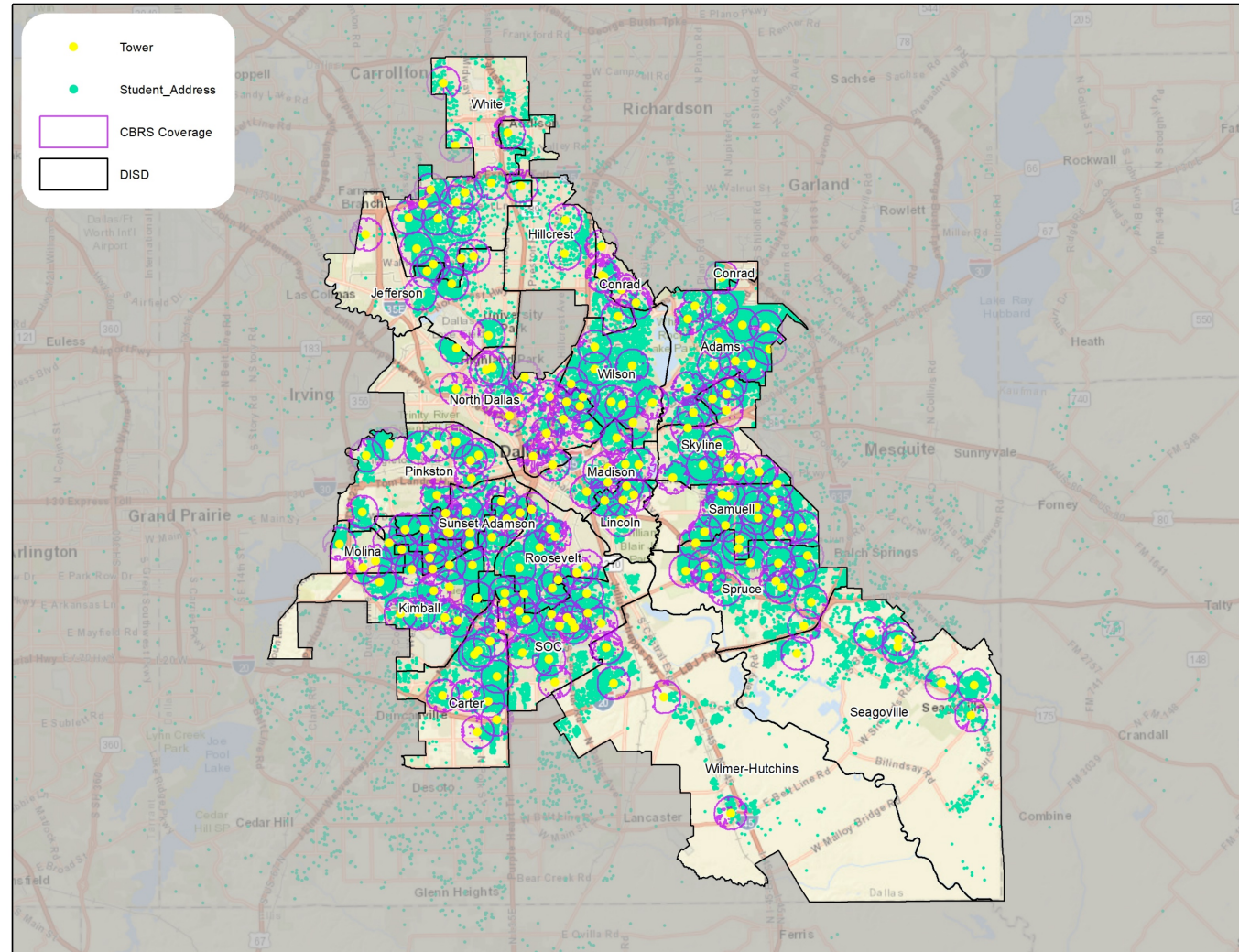
Recommendation: If the City deploys wireless service for low-income residents, do so at minimal or no fees to users

Offering free service entails less operating cost & complexity than a paid service with respect to sales, marketing, billing, collections

Given the significant cost barriers associated with low adoption of broadband, a free service has potential for far greater impact than a paid service

Capital & operational costs on Slide 16

Recommendation: Evaluate the ongoing outcomes of the City & DISD's wireless pilots

Collect data & evaluate technical performance & business processes

Evaluate user experience with service in real environment (indoor, outdoor)

Estimate actual costs for service, maintenance, help desk

Recommendation: Continue the City's wireless pilot in 10 priority zones

Wi-Fi mesh network with 5 – 10 access points in each area

Solar-powered antennas installed on City-owned poles installed for the pilot

In proof-of-concept phase, residents connect using their own Wi-Fi-enabled devices

Recommendation: Continue DISD's wireless pilot at Lincoln High School

Educational network to serve students near the school

Radios located on school building; users given devices for home

Backhaul through DISD fiber network

Recommendation: Collect data to evaluate the wireless pilots' business processes

Standardized procedure to install or activate a user

Customer support help desk

Maintenance processes & equipment refresh cycles

Agreements with pole or facility owners, as well as backhaul network operators

Analysis of labor & material costs

Recommendation: Collect data to identify the wireless pilots' technical strengths & weaknesses

Numerical performance parameters measured with user equipment (speeds, latency, jitter)

Range of end-user equipment & environments

Qualitative assessment using actual applications

Stress testing to determine scalability

Backhaul configurations, network management, security

Recommendation: Continue analyzing & developing a fiber optic backbone to support digital equity efforts

A City-owned fiber optic backbone that enables City operations & supports digital equity efforts can deliver considerable value to Dallas

- Potential cost savings & scalability
- Control over facilities & management
- High availability & reliability
- Independence from public network
- Control over network security

Recommendation: Continue analyzing & developing a fiber optic backbone to support digital equity efforts
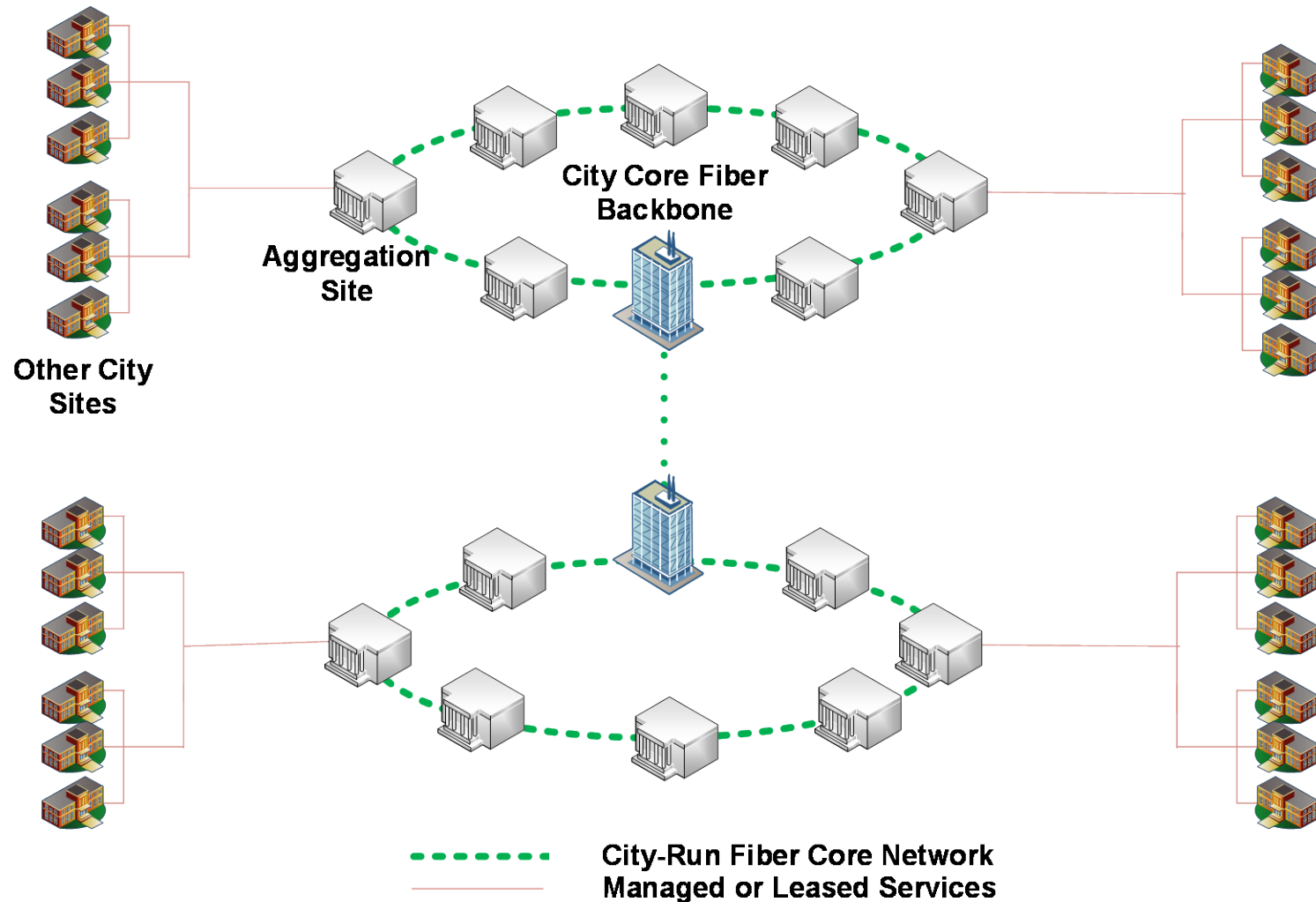
Develop a "hybrid" network approach

- City-driven dark fiber as a foundation at the "core"
- Managed fiber services at the "edge"
- Other owned & leased fiber for capacity; wireless as needed

Cost estimation requires further analysis

- Using suitable assumptions, a 100-mile fiber backbone costs approximately $22.5 million over 10 years
- That equates to the cost of about six years of leased backbone network services, assuming continued growth of video demand

Recommendation: Continue analyzing & developing a fiber optic backbone to support digital equity efforts

Other City Sites

Aggregation Site

City Core Fiber Backbone

City-Run Fiber Core Network
Managed or Leased Services

Recommendation: Evaluate Charter & AT&T's low-cost programs as alternative means of filling gaps
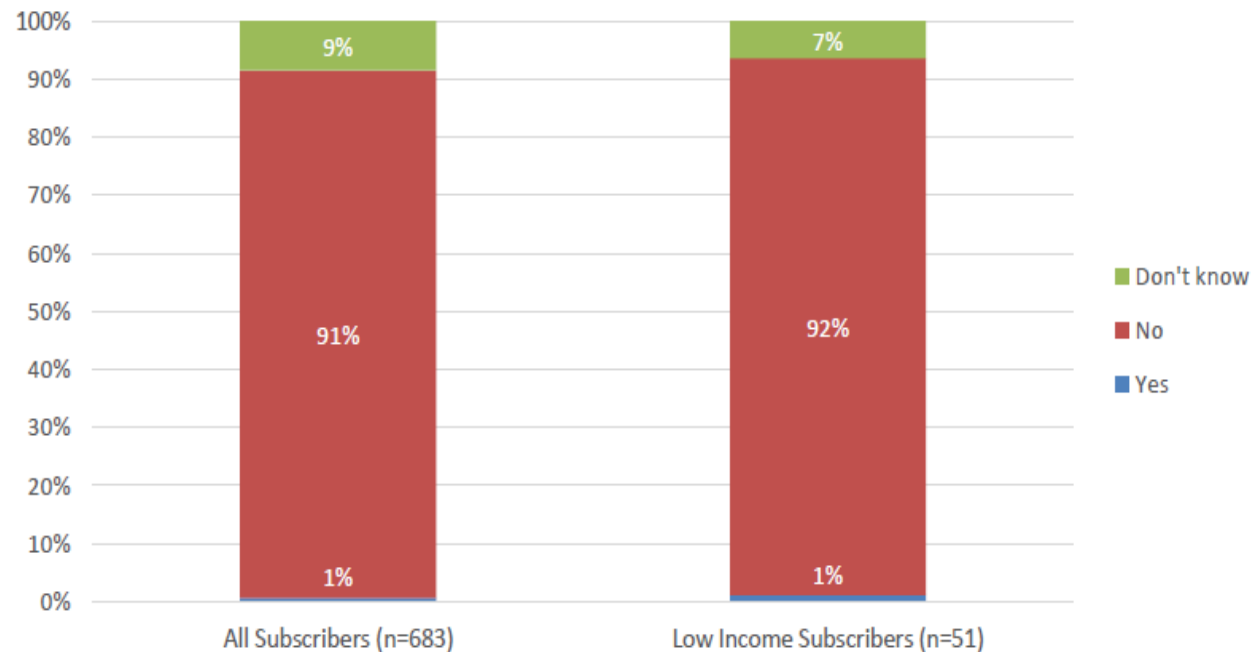
Survey found only 3% of low-income residents are enrolled in Spectrum Internet Assist program—58% have not heard of the program
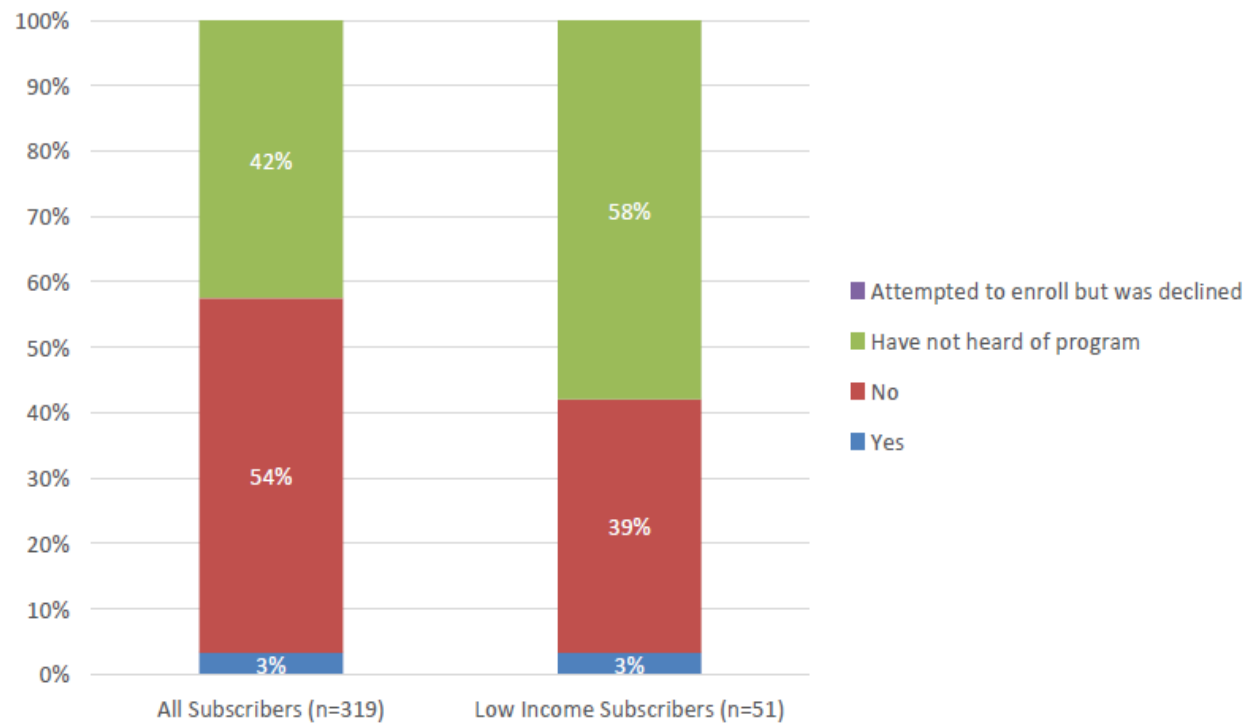
Charter's Spectrum Internet Assist program & AT&T's Access program offer qualifying residents low-cost broadband services – but the programs are extremely underutilized

Recommendation: Evaluate federal subsidy programs as alternative means of filling gaps

Survey found only 1% of low-income residents are receiving the FCC Lifeline program's $9.25 monthly subsidy

All Subscribers (n=683): Don't know 9%, No 91%, Yes 1%
Low Income Subscribers (n=51): Don't know 7%, No 92%, Yes 1%

Legend: Don't know, No, Yes

The FCC's Lifeline & Emergency Broadband Benefit programs offer opportunities for qualifying residents to receive broadband subsidies

Recommendation: Evaluate bulk-purchase as alternative means of filling connectivity gaps

The City or DISD could facilitate bulk purchase of AT&T or Charter broadband services for residents, potentially with financial support from the new federal Emergency Connectivity Fund

DISD has received a bulk purchase proposal from Charter to connect unserved students; such a contract could be eligible for Emergency Connectivity Fund reimbursement

Recommendation: Expand digital equity initiatives in Dallas

Expand the Digital Navigators program to maximize participation in ISPs' low-cost programs & federal subsidy programs

Fund the expansion of digital skills training offered through the Digital Navigators program

Create a device recycling & skills training program

Prepare for procurement of home-based services under the Emergency Connectivity Fund (DISD)

Next Steps

- Brief Dallas Independent School District (DISD) Board of Trustees on June 11, 2021

- Post draft Broadband and Digital Equity Strategic Plan on City of Dallas and DISD websites on June 15, 2021

- Brief City Council on August 4, 2021