[May 26, 2021]

Executive Summary

Survey Description/Objective

On March 26th, 2021, a survey on internet service was mailed to all residences (1,471) in Columbus. Residents were given the option of replying via paper copy (US mail or drop off at City Hall) or by accessing an on-line survey (Survey Monkey). A copy of the mailed survey is included in this summary.

The purpose of the survey was to delineate areas of the city that are adequately served with broadband infrastructure vs. those areas that are not, and to assess satisfaction with current broadband service. It was also intended to be used as supporting documentation when internet service providers or the City apply for grants to fund internet infrastructure expansion. The mapping information allows us to better partner with providers with existing infrastructure or planned construction in the underserved areas and to answer questions from our residents about availability of service.

Respondent were asked to provide address, phone number and email address to allow the City to map out the responses. This contact information may also be used to follow-upon questions. A second question was included on the survey to assist in optimizing communication to our residents. This question asked what types of information residents would like to receive from the city and the method of communication the respondent preferred (mail or email).

Target Audience

Surveys were mailed to all residential addresses in the City limits. Typical response rates for a survey of this type vary depending on multiple factors, but 5% to 30% is usual, with surveyors that have little person-to-person contact with their survey audience trending on the lower end of the range. As of April 30, 2021, 322 responses were received, 131 (41%) online and 191 (59%) on paper, for an overall response rate of 22%. It is interesting that in our community, more people responded on paper, requiring either a stamp and a trip to the mailbox or a trip to City Hall to drop off the survey, than responded electronically. This may be because of the underlying problem with internet access in our community or it may reflect an older demographic that prefers paper to electronic communication. Regardless, it is something to keep in mind as we work towards developing optimal means of communication with Columbus residents.

Background

Access to adequate broadband service has been a known problem in Columbus for decades. The rural nature of the city with its many wetlands and large lot sizes presents a challenge to cost-effective installation of structural broadband infrastructure in our community. In addition, there are

several areas of the city that are known "dead zones" or low signal zones for cellular providers, further complicating the access problem, since cellular solutions to internet access depend on strong reception. Lastly large areas of wooded terrain and weather patterns further limit the effectiveness of satellite solutions and fixed antennae wireless.

As a result of the COVID-19 pandemic, a large percentage of our residents were forced to work from home using the internet for virtual meetings and accessing work files remotely, in addition to engaging in on-line learning. Social distancing requirements meant that many previous means of in-person socializing and entertainment moved to a virtual format. All of these changes further stressed the already inadequate broadband infrastructure in Columbus. and many other communities.

The pandemic also alerted State and Federal decision makers to the inadequacy of broadband infrastructure in many communities, and they have responded by directing significant financial resources to expand broadband infrastructure. The Columbus City Council recognized the opportunity to leverage the newly available funding to try to solve the broadband access problem in Columbus and in March 2021, authorized a survey to gather information that would support a strategic planning approach to maximize our broadband coverage while minimizing the financial impact to our residents. The survey is also a requested, if not a required piece of documentation in many broadband infrastructure grant applications.

Definitions

For the purposes of this summary, the following definitions are used.

Speed: Internet speed is how fast the data can be uploaded (how fast you send data) or downloaded (how fast you receive data) on your computer or device. *www.verizon.com/info/definitions*

Bandwidth: The maximum amount of data transmitted over an internet connection in a given amount of time (typically measured in megabits per second-or Mbps). Bandwidth is what allows you to have more devices working at the same time. Per Verizon: "Let's compare bandwidth to filling a bathtub. If the bathtub faucet has a wide opening, more water can flow at a faster rate than if the pipe was narrower. Think of the water as the bandwidth and the rate at which the water flows as the speed". (*www.verizon.com/info/definitions*)

High Speed: The Federal Communications Commission (FCC) definition of high-speed internet is anything above 25 Mbps download and anything above 3 Mbps upload speed, but the FCC came out with that definition back in 2015. Current MN state statute sets a deadline of 2022 to achieve universal access to 25Mbps download by 3 Mbps upload, and another deadline of 2026 to achieve universal access to 100Mbps download by 20Mbps upload.

Broadband: Refers to Internet connections that can transfer data and information (like web pages) at high speeds. Broadband service in Minnesota may be delivered through the fiber and coaxial networks of cable providers; DSL service over the telephone network; optical fiber to the home or business; mobile and fixed wireless systems; and satellite connections. *(from: MN Dept. of Employment & Economic Development Office of Broadband Development)*

Latency: Latency is sometimes referred to as delay or ping rate. It's the lag you experience while waiting for something to load. If bandwidth is the amount of information sent per second, latency is the amount of time it takes that information to get from its source to you. (*www.verizon.com/info/definitions*)

Throughput: Throughput is how much information actually gets delivered in a certain amount of time. If bandwidth is the max amount of data, throughput is how much of that data makes it to its destination – taking latency, network speed, packet loss and other factors into account. (*www.verizon.com/info/definitions*)

What you need for online activities*

Bandwidth	Action
50–100 Mbps	Streaming HD and 4K video, streaming music, gaming, working from home, using home security devices
100–200 Mbps	Streaming 4K video, gaming, running a home office, using home security and smart home devices
200 Mbps and above	Running a home office or creative profession, streaming in 4K, gaming, using home security and smart home devices

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Results

Mapping out the survey responses by address shows several areas of Columbus that are underserved (see attached map). Many of these are areas currently served by CenturyLink, whose DSL service is delivered in some areas over older copper wire lines that also transmit landline telephone signals. Overlaying this map with maps of provider service areas and areas of planned construction can demonstrate clearly where service exists or will exist and where further construction is warranted. It will also help to direct questions to the service provider most likely to assist residents.

In addition to conducting survey, we have met twice with representatives from the MN Dept. of Employment & Economic Development Office of Broadband Development (OBD) and attended a recent OBD webinar "Orientation to OBD Mapping and Data Resources", met several times with Midco to identify potential build areas over the next 2.5 years and have secured a commitment from Anoka County to match the City's contribution to Broadband expansion in Columbus from Federal American Recovery Act Funds. Efforts to connect with CenturyLink continue.

While this survey was not statistically designed and one can assume the response rate was heavily biased towards those respondents who are not satisfied with their broadband service and/or options, it is the best picture we have of what services actually are available to areas of Columbus (maps from DEED and service providers show the "best" service the provider is capable of offering, rather than what is available for purchase). It also helps us understand what aspects of service are

most highly valued (speed and reliability) and how residents use the internet. This latter information helps in planning for the future. The following summarizes the results of the survey.

- 56% of respondents who purchase internet service use CenturyLink, while 27% use Midco.
- 36 (11%) of the respondents do not subscribe to internet service; 55% indicated this is because they have no access to a provider, 14% because of limitation of service, 17% cited price and 5% indicated it was because they either don't want it or had other reasons. A deeper dive could be made by looking at the addresses of the responses that indicated no access to confirm this or to direct the residents to a broadband provider that can offer service.
- DSL is the predominant (58%) technology that serves Columbus residents replying to the survey and CenturyLink is the largest provider.
- Midco provides service to just over a quarter of the respondents of our survey through fiber optic or coaxial/fiber hybrid technology.
- Cellular, satellite, fixed antennae wireless or a combination of technologies fill in the gaps left by DSL and fiber. We heard that many households do combine technologies to allow multiple users to access the internet simultaneously or to perform the tasks they require. This strategy, while necessary in our current environment, is inefficient and costly to our residents.
- 52% of respondents who have internet service have a download speed of less than 25 Mbps, the current definition of high-speed internet. 76% of the respondents have speeds of less than 100 Mbps, the soon to be adopted definition of high-speed. In Columbus, "high-speed" internet is more of a marketing term than the reality for many.
- 66% of respondents indicated their provider does not provide the internet speed they desire, of which 29% wished to purchase service with a minimum speed of 101 Mbps, 6 % wanted the fastest they could get and 18% responded with comments indicating that they wanted something faster than they currently could purchase.
- 61% of respondents indicated they were highly likely (47%) or very likely (14%) to consider switching internet service if given a chance. Of those respondents likely to switch service, the majority cited faster speed (26%), better reliability (12%), lower cost (10%) or some combination of these or other factors (36%) as the reason for wanting to switch. Similarly of the 22% that were unlikely (6%) or very unlikely (16%) to switch providers, almost all indicated it was because they were satisfied with the current provider, with a few respondents indicating that they would be reluctant to lose the bundled services or would not want to change their email address.
- The survey attempted to assess the level of satisfaction with current service providers, 45% of respondents indicated they were unsatisfied (17%) or very unsatisfied (28%) with their internet service provider, while 30% indicated they were satisfied (15%) or very satisfied (15%) with their provider. The remaining 25% indicated a score of "3" on a five-point scale, indicating more ambivalence.
- Of the 102 respondents who **affirmatively** answered Question 6 "Does your provider meet the internet speed you desire?" 47% indicated their service is delivered via high-speed cable but 60% indicated that the provider was Midco; and 38% indicated DSL but 29% indicated their service provider was CenturyLink. This discrepancy may indicate that there is confusion about the respondent's understanding of the different internet delivery services,

and this seems to be more common in respondents who are satisfied with their service than those who are not (i.e., they recognize the name of the provider that bills them for service but have not had a reason to research the technology that is provided). Close to 80% of this group reported speeds exceeding the current definition of high speed (25 Mbps) with 22% reporting speeds between 76-100 Mbps and 27% exceeding 100 Mbps.

- Of the 200 respondents who **negatively** answered Question 6 "Does your provider meet the internet speed you desire?" 67% indicated DSL as the form of internet service with 70% indicating CenturyLink as the Service Provider; 10% indicated high speed cable with the same percentage naming Midco as the service provider, 9% indicated cellular and 7% satellite with HughesNet providing most of the service. As noted in the above bullet, respondents who are NOT satisfied with their service have likely researched other options and are more familiar with the technology used to deliver their service. 68% of these 200 respondents indicated they were provided speeds under the current definition of high-speed (25 Mbps) with 49% reporting speeds of under 10 Mbps.
- The three highest uses of the internet were: browsing internet/shopping (14%), checking email (13%) and a three-way tie (each at 11%) between streaming shows/movies, teleconferencing and watching online videos. Respondents could choose as many uses as applied (there were 2118 uses indicated from the 302 answers received) so we can't assume any priority to those uses that were chosen most frequently. A deeper dive into the data could further elucidate how the uses were "bundled" by the respondent.
- The results clearly show the residents want the city to fix this problem, with 91% of respondents supportive of the City actively pursuing additional broadband options. A few qualified that they supported the City's efforts IF it did not raise their taxes.