

# COMMUNITY OWNED FIBER OPTIC RING

## GUIDING PRINCIPLES

The community owned fiber optic project will meet many specific economic and connectivity objectives of its community partners. More importantly its design is guided by certain principles and community values and brings direct substantial benefits to Davis residents. These benefits are referenced from and included in the Feasibility Study Report (FSR), the phone survey, and the DavisGIG online poll. Some of the current needs that the network is designed to address are:

1. **Digital Inclusion** - Currently in the marketplace there are areas where residents have no choice, or poor connectivity. There are three specific areas in Davis<sup>1</sup> where only one wireline provider offers any service considered by the FCC to have “Broadband.”<sup>2</sup> A community owned network that covers all parcels, and methodically expands to future parcels ensures that all residents, regardless of income level will be connected to the network.<sup>3</sup>
2. **Digital Divide** - The network, which will connect to every parcel in the community, can ensure that all residents regardless of income level have at least minimal level of wireline broadband service without data caps or restrictive transfer allowances that come with cell phone plans. Municipal ownership will ensure, through operational policy or specific vendor lease relationships to the municipal fiber, that a low income plan is available.<sup>4</sup> Davis residents strongly believe Internet access on the fiber network should be available to all.<sup>5</sup>
3. **Net Neutrality** - Due to the lack of FCC regulation, there is nothing preventing Very Large ISPs from prioritizing access to content they control, or zero rating large content providers they have special arrangements with.<sup>6</sup> This creates a bias toward the favored content at the expense of everything else the Internet has to offer, as access to the wider Internet on a best effort basis. Municipalities can ensure Network Neutrality for their citizens by decoupling the infrastructure from the Very Large ISP.<sup>7</sup> This will ensure, through operational policy or specific vendor lease relationships to the municipal fiber, that residents have access to an ISP that treats all Internet traffic equally.
4. **Competitive Marketplace** - Current broadband and Triple Play bundles are very costly, with many homes paying \$100 - \$200 monthly as shown by analysis in the

Feasibility Study Report, the CCG phone survey, and the DavisGIG online poll.<sup>8</sup> Yet bandwidth is very cheap in data centers, this monopoly pricing situation exists because the Very Large ISPs own and have a monopoly on the physical infrastructure used to deliver Internet Access to the residence.<sup>9</sup> Municipal ownership and open leasing to multiple ISP companies will dramatically drive down monthly broadband fees to residents.<sup>10</sup> Even an assessment situation could be a net positive decrease to a family's telecommunications and entertainment budget.

5. **Economic Development** - Many studies have shown the availability of reasonably priced, carrier neutral, fiber optic cable has resulted in both new business attraction and talent retention within a community.<sup>11</sup> This municipality adopting a policy that makes it very easy for a business to obtain Internet access from a variety of cost effective sources, or point to point dark fiber between buildings, will be the strongest economic development signal that has been put forth by the City in decades.<sup>12</sup> Business leaders from within the community have identified high growth areas that have an increased potential for development with the addition of municipal fiber.
6. **Community Media** - Once an inexpensive and abundant source of bandwidth is present in the city, content creation and distribution will be stimulated. Unlike many communities, we have a vibrant and strong Public Media organization that supports our citizens through broadcasting on TV, radio and the WWW. A fundamental mission of the organization is providing training and equipment for citizens to create content and media. Community Fiber and Media are two pieces of a whole. Community media helps train and assist and facilitate content creators in the city, while community fiber will deliver their content to the world at gigabit speeds. Community content creators are economic drivers, municipal network ownership ensures abundant gigabit bandwidth (upload and download) to create and serve their content with.<sup>13</sup> It ensures PEG channels always have a platform to be broadcast.

As the FCC looks to remove PEG funding requirements that Very Large Cable companies and ISPs provide revenue to community media, municipal ownership provides leverage. The city can ensure, through operational policy of the network or specific vendor lease relationships, that its residents have access and ability to support its exceptional community media with a similar funding mechanism used for today's PEG channel funding.<sup>14</sup>

7. **Privacy** - Currently, Very Large ISPs, as part of their revenue streams, collect,

aggregate and sell web browsing, performance characteristics, end user device information, and a variety of other performance data to big data firms.<sup>15</sup> Though this information is anonymized, due to the infrastructure monopoly, citizens have no choice but to accept the onerous privacy violations that come with their Internet service plan. Decoupling ownership of Internet infrastructure from the Very Large ISPs will alleviate the concerns of Davis residents about network privacy.<sup>16</sup> This will ensure, through operational policy or specific vendor lease relationships to the municipal fiber, that Davis residents have access to an ISP that does not record, capture or analyze their browsing data, or sell their CPNI.

8. **Smart City/Smart Grid** - As electricity generation and distribution changes in the coming decades, smart grid technology, which requires a network connection for the remote management and operation of distributed energy generation and distribution infrastructure, will become common.<sup>17</sup> Fiber optic connections will be a necessary operational component of smart grid development. Smart City applications all rely on transforming existing city utility infrastructure into Internet-enabled Internet of Things type infrastructure allowing for a wide variety of exciting and practical applications.<sup>18</sup> Davis residents recognize the importance of the development of smart infrastructure that is enabled by community fiber infrastructure throughout the community.<sup>19</sup>
9. **Climate Change** - A municipal network design that supports private point to point connections between home and business, and provides abundant symmetric bandwidth to the Internet will stimulate more Flexible Work Arrangements (FWA) between businesses and employee homes throughout the community. With FWA, residents are doing more business and recreation online from home and results in fewer car trips.<sup>20</sup> Better connectivity combined with Internet of Things sensors on a Smart City infrastructure will allow more accurate monitoring of activities that produce carbon emissions, and could allow consumers to tune their power use with “smart” appliances.<sup>21</sup>
10. **Virtual Campus + UCD Relationship** - Community ownership of fiber infrastructure allows for flexible Internet Transport relationships within the community that are simply not available with Very Large ISPs.<sup>22</sup> Using recently developed Software Defined Networking (SDN) on the community fiber means that any point on the network can be reconfigured through authenticated access to the SDN Controller, presented through a web page. For instance a UCD researcher could with a click of a button, use the community fiber network, to create a secure point to point connection to the UCD campus which provides the same level of connectivity and performance to experiments, computing assets,

and laboratory instruments, and the researcher's home operates as if it's part of the UCD campus network. The performance would be as if that person were in the same room, or their office on Campus, connecting to the instruments.

As a corollary to this, community fiber takes a stand on behalf of UCD students through this same mechanism. Undergraduate students, distributed throughout the city, could utilize the municipal fiber network to get to the UCD campus and leverage the campuses' Internet Access. This would be a substantial cost savings to the student, and is a way the community can show support to a segment of our population challenged by the very high costs associated with attending the University of California.

## REFERENCES and DETAILS

### City of Davis Broadband Feasibility Study :

<http://documents.cityofdavis.org/Media/CityCouncil/Documents/PDF/CityCouncil/Broadband-Advisory-Task-Force/Documents/Broadband-Feasibility-Study-Final-Report-2018-04-03-reduced.pdf>

### DavisGIG Residential Survey :

[http://www.dcn.davis.ca.us/~help/DavisGIG\\_Broadband\\_Survey.pdf](http://www.dcn.davis.ca.us/~help/DavisGIG_Broadband_Survey.pdf)

*A Collection of references this document was created from*

1. These three areas are: 1) The area bounded by Tulip and Monarch, Loyola and Covell. 2) East of Lake Blvd, South of Covell, North of Danube, West of Village Homes. 3) Neighborhoods around Danbury plus East to Mace, North of Montgomery, South of Lillard and San Marino Dr.
2. Kruger, Lennard (2017, Dec 4th) **Defining Broadband: Minimum Threshold Speeds and Broadband Policy** - <https://fas.org/sgp/crs/misc/R45039.pdf>
3. "**Cherry Picking**" on Page 113 Davis California Broadband Feasibility Study Final Report, April 3rd 2018.
4. "**Digital Divide/Affordability**" on Page 104 Davis California Broadband Feasibility Study Final Report, April 3rd 2018.
5. DavisGIG (2019, Mar 27th) **DavisGIG Residential Broadband Survey** - Question 17 "Would you be willing to pay an extra \$5 or less each month on your broadband bill..." 80.7% (672) favorable responses
6. Mcsherry, Corynne Malcom, Jeremy, Walsh, Kit (2016, Feb 18th) **Zero Rating: What It Is and Why You Should Care** - <https://www.eff.org/deeplinks/2016/02/zero-rating-what-it-is-why-you-should-care>
7. DavisGIG (2019, Mar 27th) **DavisGIG Residential Broadband Survey** - Question 12 "... which of the most important factor in choosing an Internet Service Provider?" The second most important factor - 83% (700) favorable responses
8. "**Comcast Xfinity**" on Page 20 Davis California Broadband Feasibility Study Final Report, April 3rd 2018.
9. "**Choice**" on Page 103 Davis California Broadband Feasibility Study Final Report, April 3rd 2018.

10. Talbot, David Hessekiel, Jessica (2018, Jan 10th) **Community-Owned Fiber Networks: Value Leaders in America** - <https://cyber.harvard.edu/publications/2018/01/communityfiber>
11. **“Economic Development”** on Page 107 Davis California Broadband Feasibility Study Final Report, April 3rd 2018.
12. Baller, Jim Hovis, Joanne Stelfox, Ashley (2014, Nov/Dec) **The Killer App for Local Fiber Networks** <http://www.ctcnet.us/wp-content/uploads/2015/01/Economic-Development-Killer-App-for-Local-Fiber.pdf>
13. Snider, J.H. (2011, July) **Making Public Community Media Accessible** [https://www.brookings.edu/wp-content/uploads/2016/06/07\\_public\\_community\\_media\\_snider.pdf](https://www.brookings.edu/wp-content/uploads/2016/06/07_public_community_media_snider.pdf)
14. Labbe-Renault, Autumn (2019, Mar 8th) **Davis Media Access: Stop the FCC from defunding PEG channels** <https://www.davisenterprise.com/features/news-columns/davis-media-access-stop-the-fcc-from-defunding-peg-channels/>
15. Brandom, Russel Kastrenakes, Jacob (2017, Mar 31st) **What does the new ISP data-sharing rollback actually change?** <https://www.theverge.com/2017/3/31/15138526/isp-privacy-bill-vote-trump-marsha-blackburn-internet-browsing-history>
16. DavisGIG (2019, Mar 27th) **DavisGIG Residential Broadband Survey** - Question 12 “ ... which of the most important factor in choosing an Internet Service Provider?” The most important factor - 86% (714) favorable responses
17. **What is the Smart Grid?** [https://www.smartgrid.gov/the\\_smart\\_grid/smart\\_grid.html](https://www.smartgrid.gov/the_smart_grid/smart_grid.html)
18. **“Smart City”** on Page 104 Davis California Broadband Feasibility Study Final Report, April 3rd 2018.
19. DavisGIG (2019, Mar 27th) **DavisGIG Residential Broadband Survey** - Question 18 “Are you in favor of using a community owned fiber network to develop "Smart City" type applications in Davis ?” 75.2% (624) favorable responses
20. Batchelor, Sandy (2018, September 6th) **Telecommuting for the Planet** <https://climatechange.ucdavis.edu/what-can-i-do/telecommuting-for-the-planet/>
21. Ovington, Tom Houpis, George (2018, October) **How Smart Cities can help tackle climate change** <https://www.frontier-economics.com/media/2922/how-smart-cities-can-help-tackle-climate-change.pdf>
22. **“Extend University Everywhere”** on Page 103 Davis California Broadband Feasibility Study Final Report, April 3rd 2018.