

**City of Culver City, California
Agenda Item Report**

Meeting Date: 06/08/15	Item Number: <u>A-2</u>
CITY COUNCIL AGENDA ITEM: Discussion of the Proposed Municipal Fiber Network and Provide Direction to the City Manager as Deemed Appropriate.	
Contact Person/Dept.: Michele Williams/IT	Phone Number: 310.253.5950
Fiscal Impact: Yes ☐ No ☒	General Fund: Yes ☐ No ☐
Public Hearing: ☐	Action Item: ☒ Attachments: ☒
Commission Action Required: Yes ☐ No ☒ Date: _____	
Public Notification: (Email) Meetings and Agendas – City Council (06/03/15); (Email) Ongoing Topics – Proposed Municipal Fiber Network (05/27/15); Courtesy Public Notification to Businesses within the Proposed Service Areas (2,253 postal mailings), Culver City Chamber of Commerce (Steven Rose on May 26, 2015), Culver City Unified School District (Mike Reynolds, Asst. Superintendent on May 27, 2015), (PUBLISH) Culver City News (05/21/15, 05/28/15, and 06/04/15)	
Department Approval: Michele Williams (05/28/15)	City Attorney Approval: Carol Schwab (06/03/15)
Chief Financial Officer Approval: Jeff Muir (06/03/15)	City Manager Approval: John M. Nachbar (06/03/15)

RECOMMENDATION:

Staff recommends the City Council discuss the Proposed Municipal Fiber Network Project (Fiber Project) and provide direction to the City Manager as deemed appropriate.

BACKGROUND:

Traditionally, private companies have been responsible for deploying the infrastructure required to provide Internet access to communities. However, they have not consistently invested in the infrastructure to deliver high speed broadband via a fiber network. In an effort to satisfy this need, local governments across the nation are analyzing the benefit of investing in municipal broadband infrastructure.

One of the benefits of the City investing in municipal broadband infrastructure is providing economic development stimulus by providing access to high speed Internet to businesses which have that need. This typically includes, but is not limited to, businesses in the technology, entertainment, video gaming, or social media industries. Offering high speed broadband has been viewed as a competitive edge by providing a service that is not typically available in neighboring areas. Businesses that require extensive bandwidth for conducting business are able to capitalize on the community's infrastructure investment. Additionally, such businesses often provide high skill/high

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paying job opportunities for local residents, which improves the local economy and reduces traffic congestion.

On May 13, 2013, the City Council authorized contracting with CTC Technology & Energy (CTC) to assist the City with developing a Fiber Network Design and Business Plan. As part of this work, CTC analyzed the demographic makeup of Culver City businesses, their Internet access needs, and emerging industry trends. The report revealed that there was an opportunity for Culver City to deploy a fiber network with the objective of providing small to mid-sized businesses with Internet access.

The final report was presented to and discussed by the City Council at the Regular Meeting of March 10, 2014. It was also at this meeting that the City Council directed the City Manager to conduct outreach with the goal of ascertaining the level of interest in the business community for the Fiber Project. Four (4) business outreach meetings were held, and staff also worked with the Culver City Chamber of Commerce to disseminate a survey to all of the businesses located in the proposed service areas. There was overwhelming, positive response, and the proposed project was very well received by the business community. Specifically, the business community expressed support for Fiber Project that would address the following challenges with obtaining high speed broadband access:

- High cost of entry (paying for the “last mile” fiber connection)
- Service is not easily obtained in desired locations
- High monthly costs for the service
- Excessive timeframe for obtaining the service (exceeding 3-4 months)

DISCUSSION:

After one of the business outreach meetings held on May 22, 2014 Mox Networks (Mox) expressed an interest in working with the City to assist with the network design, implementation, operation, and ongoing maintenance of the network. Mox (an affiliate of NantWorks) is a Culver City business. The company’s expertise is in building custom fiber networks for data intensive organizations globally. The Mox team has an average of fifteen years of industry specific experience in telecommunications, global fiber network architecture and design, global data center strategies, and network deployments.

At the City Council meeting of November 10, 2014, the City Council directed the City Manager to negotiate a professional services contract with Mox. Staff has been working with Mox to design the Fiber Project and explore options to potentially assist the City with building and operating the network. Mox has delivered a detailed network design that would be used to support the Fiber Project.

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The Fiber Network Design

The City currently has an extensive fiber network that is dedicated to providing network computing services to all city buildings. Additionally, there is city-owned fiber that supports Public Works' traffic signal operations and street intersection video monitoring. Mox analyzed the high level design that was provided with the initial study from CTC. They also conducted additional analysis to extend the proposed network to all of the Culver City Unified School District (CCUSD) locations (five locations). Additionally, the proposed network was extended to potentially service a larger business area (not just small to mid-sized businesses as identified in the initial design). The resulting proposed design delivered by Mox encompasses a larger area than what was previously developed by CTC.

The complete network design requires four (4) essential components:

- A redundant fiber backbone
- Fiber laterals to service locations
- Local (within the City) interconnection host sites (network nodes)
- Fiber connection to data carrier hotel/communications hub

Mox subcontracted with HBK Engineering to conduct an onsite inventory of the City's existing infrastructure (conduit and fiber). This was completed with the goal of leveraging the current City assets to reduce costs and contributed to the final backbone network design. The backbone design includes three (3) geographical network rings that are all interconnected (Attachment 1). For ease of reference, they are currently titled North Ring, Central Ring, and South Ring. Additionally there are 3.1 route miles of fiber for the "Ring Ties" which are used to interconnect the three rings. The total route miles for the backbone network is 20.7 miles. The network design recommends installing 288 strands of fiber throughout the network backbone.

The following details the backbone fiber network design:

	North Ring	Central Ring	South Ring	Ring Ties
Total Route Miles	4.8	7.8	5.0	3.1
Route Miles (existing conduit)	1.4	3.5	1.2	1.2
Route Miles (new conduit)	3.4	4.3	3.8	1.9
Hand Holes (existing)	37	60	21	22
Hand Holes (new)	36	46	41	10

It has been determined that it is more economically sound to design the network fiber laterals after confirming which buildings/properties are interested in obtaining service. However, the backbone network is designed in such a way that there are appropriately spaced hand holes (connection points) to optimize the lateral design. The lateral construction will be identified and addressed based on customer demand. It should

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be noted that the City would need to obtain access and easement agreements from private property owners prior to lateral construction as the laterals will extend beyond the City's rights-of-way.

Operating the network requires local interconnection sites (network nodes) within the City. The network design has identified three sites that will be used to host the electronics and network devices that enable the network to operate. Additionally, Internet Service Providers (ISPs) that ultimately begin servicing the City would also need to install networking devices at one or more of these identified locations. The following network nodes have been identified:

- Culver City Hall (specific location to be determined)
- NantWorks/Mox Networks
- Culver Studios

Lastly, the City would need to connect its fiber network to a carrier hotel. A carrier hotel is simply a very large data center and is used as the connection point or communication hub because Internet Service Providers (ISPs) share facilities at the carrier hotel. The network design recommends connecting to two communication hubs; One Wilshire and Equinix/EI Segundo. Establishing this connection is the vehicle that will enable Culver City businesses and the CCUSD to obtain Internet service from a variety of ISPs. The infrastructure to connect to these sites would extend beyond the City boundary. The fiber used for this service is referred to as the "long haul" and the City would not own this infrastructure. It is recommended that the City would license the required infrastructure (dark fiber), and this would be one of the ongoing operational costs to operate the network.

Proposed Contractual Efforts

Should the City Council direct the City Manager to move forward with building and operating the proposed network design, staff recommends contracting with Mox for the following project efforts:

- Engineering Design
- Construction Management
- Business Development/Planning
- Operations & Maintenance

Engineering Design – Mox would provide consulting services toward assisting the City with drafting documents detailing the requirements and specifications to construct the fiber network per the detailed design. Such documents could be used as part of the bidding process for the construction contract. It is envisioned that the City would release the Notice Inviting Bids and Mox would provide assistance in qualifying the perspective bidders per the detailed specifications. The tentatively selected contractor

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would be presented to the City Council for consideration. It should be noted that the City would own all of the networking electronics and fiber infrastructure located within the City boundary.

Construction Management – It is recommended that Mox provide oversight and serve as the construction project manager for the build-out of the network. City staff, specifically the Public Works/Engineering Division, would work closely with Mox to oversee the construction phase.

Business Development/Planning – The recommended business model consists of the City leasing the fiber to multiple service providers thereby providing them with the required infrastructure to service the business community. Telecommunication fiber licenses can be granted for a variety of terms. A long-term license is typically 20 years where the lessee is granted unrestricted use in the form of an IRU (Indefeasible Right of Use) Agreement. A shorter-term option is typically a monthly license with a defined one to three year term. The City would be interested in offering both types of license agreements depending on the needs of the provider/customer. Entering into these agreements is how revenue would be generated. Mox would assist the City with contacting, communicating, and contracting with the service providers or other customers who would have an interest in leasing the City's infrastructure.

Operations and Maintenance – It is recommended that a contract would be executed with Mox to operate and maintain the network. Extending the City's infrastructure for commercial use requires agreed upon service level contracts that demand reliability and quality control in order for the business model to be successful. Mox would be responsible for the ongoing operation and maintenance of the network. This includes utilizing a Network Operating Center (NOC) to monitor the health, quality, and functional components of the network. Mox already has a NOC in place (located in Atlanta, Georgia) that would serve to proactively monitor the City's infrastructure. Chief Financial Officer Jeff Muir was in Atlanta for another business purpose, and Mox arranged to have him tour the NOC facility. Mr. Muir reported that the NOC monitors various networks around the world, and the general feeling was that they ran a very impressive operation and could appropriately handle the monitoring needs of the City. In this operations and maintenance capacity, Mox would serve as front-line support to the ISPs and other customers when technical support and service issues are raised.

Preliminary Financial Analysis

Preliminary cost estimates reveal that the capital investment required to construct the backbone network would be approximately \$4.9 million. Additionally, the initial fiber lateral build is estimated at \$2 million. The estimated recurring cost to operate and maintain the network would be about \$150,000 per month. In estimating potential revenue from leasing the City's network infrastructure, preliminary forecasts estimate aggregate gross receipts of approximately \$7.1 million total after about three to four years of operation. Once the backbone network is fully operational and leasing has

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occurred, estimated revenues should be sufficient to cover all operational costs and equipment depreciation. However, there is a likelihood that the initial capital investment to construct the backbone network will not be directly recaptured. This project was not initiated to deliver direct immediate financial returns. It is envisioned that the intangible benefits related to economic development, strategic advantage, and the ability to further attract and retain creative office and tech companies may prove to be the most beneficial return.

All of the above expenditures and revenues are preliminary estimates. Should the City Council direct the City Manager to move forward with this project, a more detailed financial analysis will be supplied to City Council for further review.

Non-Monetary Compensation to Mox Networks

Mox has requested as compensation for professional services rendered to obtain a 20 year IRU for twelve (12) strands of the City's proposed fiber infrastructure. Staff has contracted with CTC to obtain a market analysis to determine the market value of this infrastructure. Should the City Council direct the City Manager to move forward with this project, the market analysis will be incorporated into the financial analysis that will be presented to City Council at a future date.

Competing with the Private Sector

The question could be raised that in pursuing the deployment of the Fiber Project and providing Internet service the City would be competing with the private sector. There is no intention to compete with the private sector. The City's objective would be to open up the market by enabling a wide variety of ISPs to service the Culver City business community and the CCUSD.

Today, each ISP is expected to build and maintain the infrastructure that their specific service uses. Deploying the Fiber Project with a connection to the carrier hotels (One Wilshire and Equinix/El Segundo) would separate the Internet service from the infrastructure. The City would provide the infrastructure and the ISPs would license the infrastructure from the City and provide the service to the customers. This would facilitate eliminating one of the current challenges as there are a limited number of providers. Additionally, this would reduce the impacts to the City's infrastructure, traffic, noise, and other inconveniences caused by the construction of duplicative networks throughout the City by various private providers.

Next Steps

Should the City Council direct the City Manager to proceed, staff will move forward in the following areas:

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- Conduct the appropriate level of initial environmental review (including the preparation of a proposed agreement with a duly qualified consultant, if necessary); and,
- Enter into formal negotiations with Mox related to the Fiber Project efforts (Engineering Design, Construction Management, Business Development/Planning, and Operations and Maintenance); and,
- Prepare a detailed financial analysis for the construction and ongoing maintenance and operations of the Fiber Project.

Upon completion of the negotiations and preparation of the financial analysis (and if necessary, any environmental analysis), staff will return to the City Council to present the resulting documents for the City Council's consideration.

FISCAL ANALYSIS:

Discussion of this item does not create an immediate fiscal impact to the City. However, should the City Council direct the City Manager to move forward with any of the findings/recommendations presented in this report, significant costs would be associated with the construction portion of the Fiber Project. Specific estimates of all related costs would be provided in a future staff report presented to the City Council at a future meeting. At a high level, if this project moves forward, a new Municipal Fiber Network enterprise fund would be created to account for all activities associated with the construction and implementation of the Fiber Project, along with future operating costs and revenues. It is anticipated the General Fund would provide a start-up loan to the Municipal Fiber Network fund to cover the initial construction costs (currently estimated at approximately \$4.9 million), one year of operating costs (currently estimated at \$1.8 million) and also for a number of initial lateral connections (currently estimated at approximately \$2 million). The loan would be structured to allow repayment at the point where revenues exceed operating and depreciation costs. It is presumed the advanced funding for operating costs and lateral construction would be repaid, but as mentioned previously in this report, there is a possibility that the initial construction costs will not be paid back, but rather future economic development stimulus and tax revenues would be the long-term benefit to the General Fund. This will not be known for a number of years, and potential forgiveness of part of the loan would be a decision for a future City Council.

ATTACHMENTS:

Maps of Proposed Fiber Network (Backbone)

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MOTION:

That the City Council:

- 1) Discuss the Municipal Fiber Network Project; and,
- 2) Direct the City Manager as deemed appropriate.

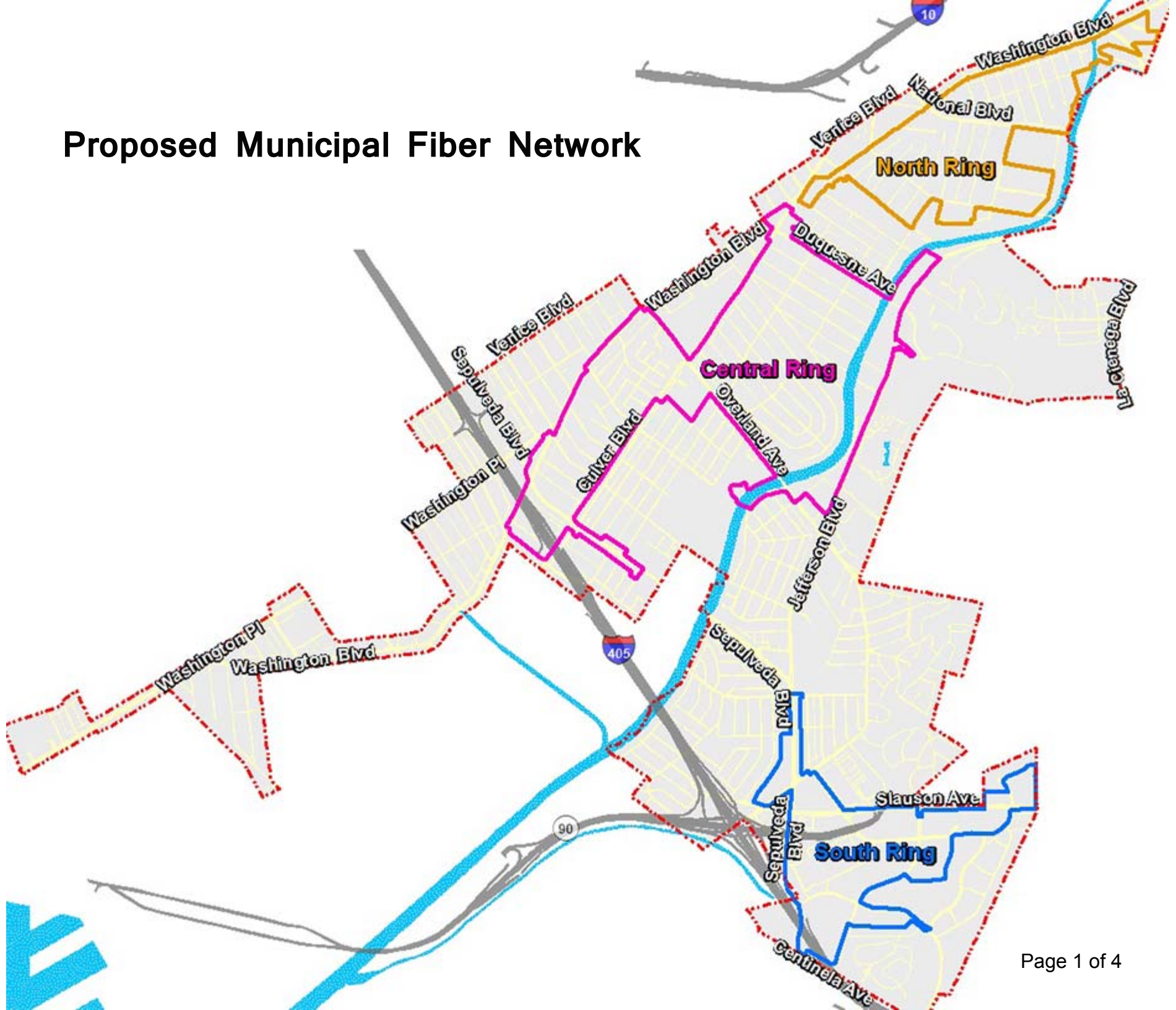
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ATTACHMENTS

	<u>Pages</u>
1. Maps of the Proposed Municipal Fiber Network (Backbone)	1-4

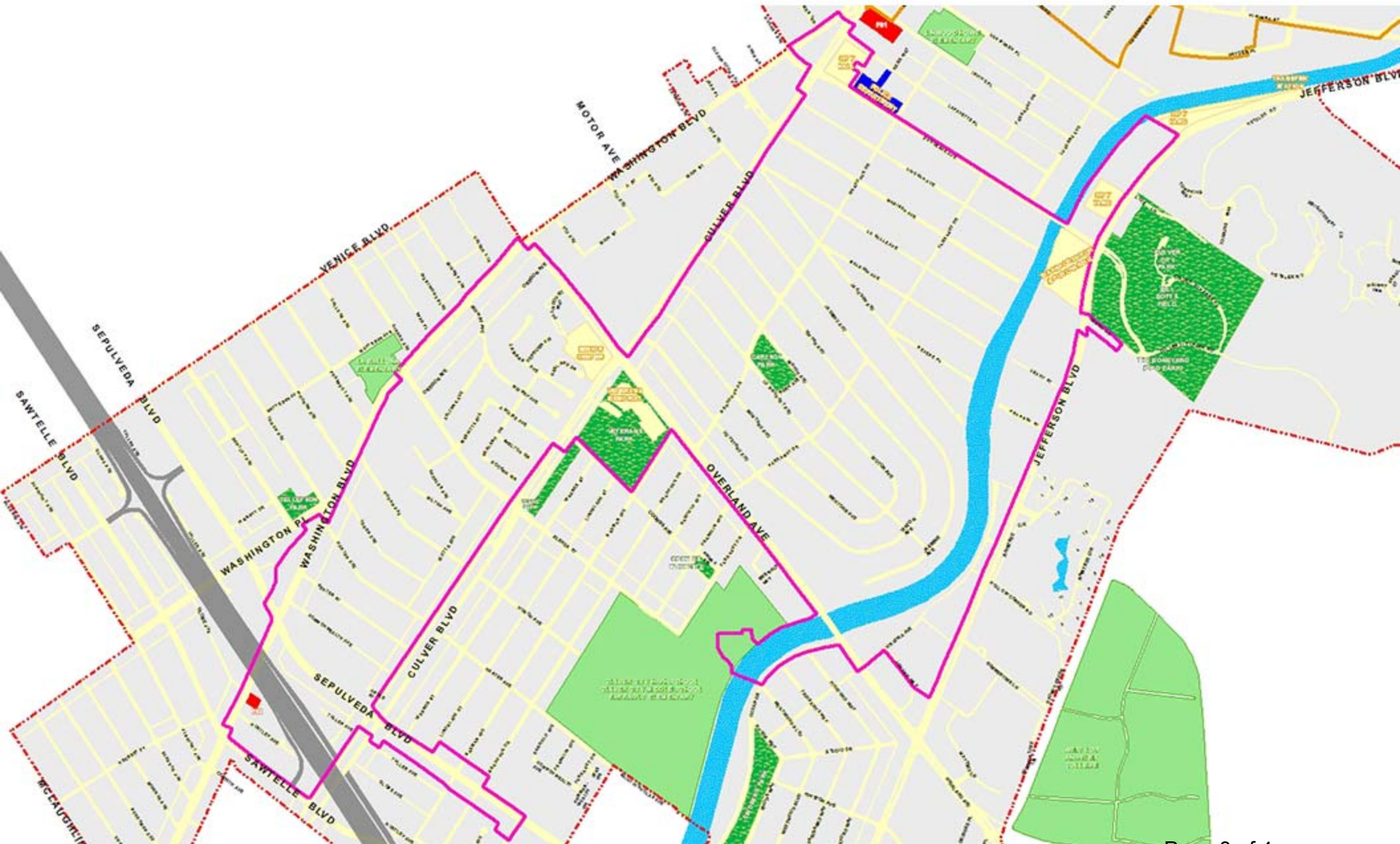
Proposed Municipal Fiber Network



Proposed Municipal Fiber Network - North Ring



Proposed Municipal Fiber Network - Central Ring



Proposed Municipal Fiber Network - South Ring

