



City of Arts & Innovation

City Council Memorandum

TO: HONORABLE MAYOR AND CITY COUNCIL DATE: JULY 11, 2017

FROM: PUBLIC UTILITIES DEPARTMENT WARDS: ALL

SUBJECT: DARK FIBER LEASING PROGRAM INCLUDING ESTABLISHING UNIFORM LEASE RATES FOR THE USE OF THE DARK FIBER INFRASTRUCTURE, PHYSICAL AND CYBER SECURITY POLICIES, A MASTER FIBER LEASE LICENSE AGREEMENT, A NEW COST CENTER WITHIN THE ELECTRIC FUND FOR RELATED EXPENSES AND REVENUE - SUPPLEMENTAL APPROPRIATION OF \$1,800,000 FOR THE DARK FIBER PROGRAM CONSTRUCTION AND MANAGEMENT ACTIVITIES AND TRANSFER OF \$1,800,000 FROM UNDESIGNATED RESERVES TO A FIBER DESIGNATED RESERVE TO FUND LEASED FIBER ACTIVITIES

ISSUES:

Appropriate funds in the amount of \$1,800,000 for the operation of the dark fiber program; approve uniform lease pricing for the use of fiber infrastructure; adopt related policies; and authorize the City Manager or his designee to issue Fiber License Agreements in accordance with the proposed pricing schedule.

RECOMMENDATIONS:

That the City Council:

1. Approve the Dark Fiber Leasing Program;
2. Establish uniform lease pricing for the Dark Fiber Leasing Program;
3. Approve the Technology Physical Security Policy;
4. Approve the Master Fiber Lease License Agreement;
5. Establish a new Dark Fiber Cost Center expense and revenue accounts within the Electric Fund, as determined by the Finance Department, to segregate fiber leasing costs and revenue from other electric fund operating expenses and revenues;
6. Establish a Dark Fiber designated reserve account within the Electric Fund, as determined by the Finance Department, and authorize the transfer of \$1,800,000 for prior years' revenue from dark fiber leasing activities to the designated reserve;
7. Authorize a supplemental appropriation for fiscal year 2017/18 budget in the amount of

\$1,800,000 with \$1,200,000 for capital expenditures and \$600,000 for operating costs, to account numbers as determined by the Finance Department for future fiber expansion projects;

8. Authorize the City Manager, or his designee, to execute Fiber Use License Agreements under the terms set forth in this staff report;
9. Direct staff to return every 3 years to update the fiber planned routes, and lease pricing; and,
10. Direct staff to return every 12 months with a status update on implementation progress of the Dark Fiber Leasing Program.

BOARD RECOMMENDATION:

On May 22, 2017, the Board of Public Utilities unanimously approved, with 8 of 9 members present with Board Member Walcker abstaining, to forward the recommendations to City Council to approve the Dark Fiber Leasing Program; establish uniform lease pricing for the Dark Fiber Leasing Program; approve the Technology Physical Security Policy; approve the Master Fiber Lease License Agreement; establish a new Dark Fiber Cost Center expense and revenue accounts within the Electric Fund; establish a Dark Fiber designated reserve account within the Electric Fund and authorize the transfer of \$1,800,000 for prior years' revenue from dark fiber leasing activities to the designated reserve; authorize a supplemental appropriation for fiscal year 2017/18 budget in the amount of \$1,800,000 with \$1,200,000 for capital expenditures and \$600,000 for operating costs for future fiber expansion projects; authorize the City Manager, or his designee, to execute Fiber Use License Agreements; direct staff to return every 3 years to update the fiber planned routes, and lease pricing; and, direct staff to return every 12 months with a status update on implementation progress of the Dark Fiber Leasing Program.

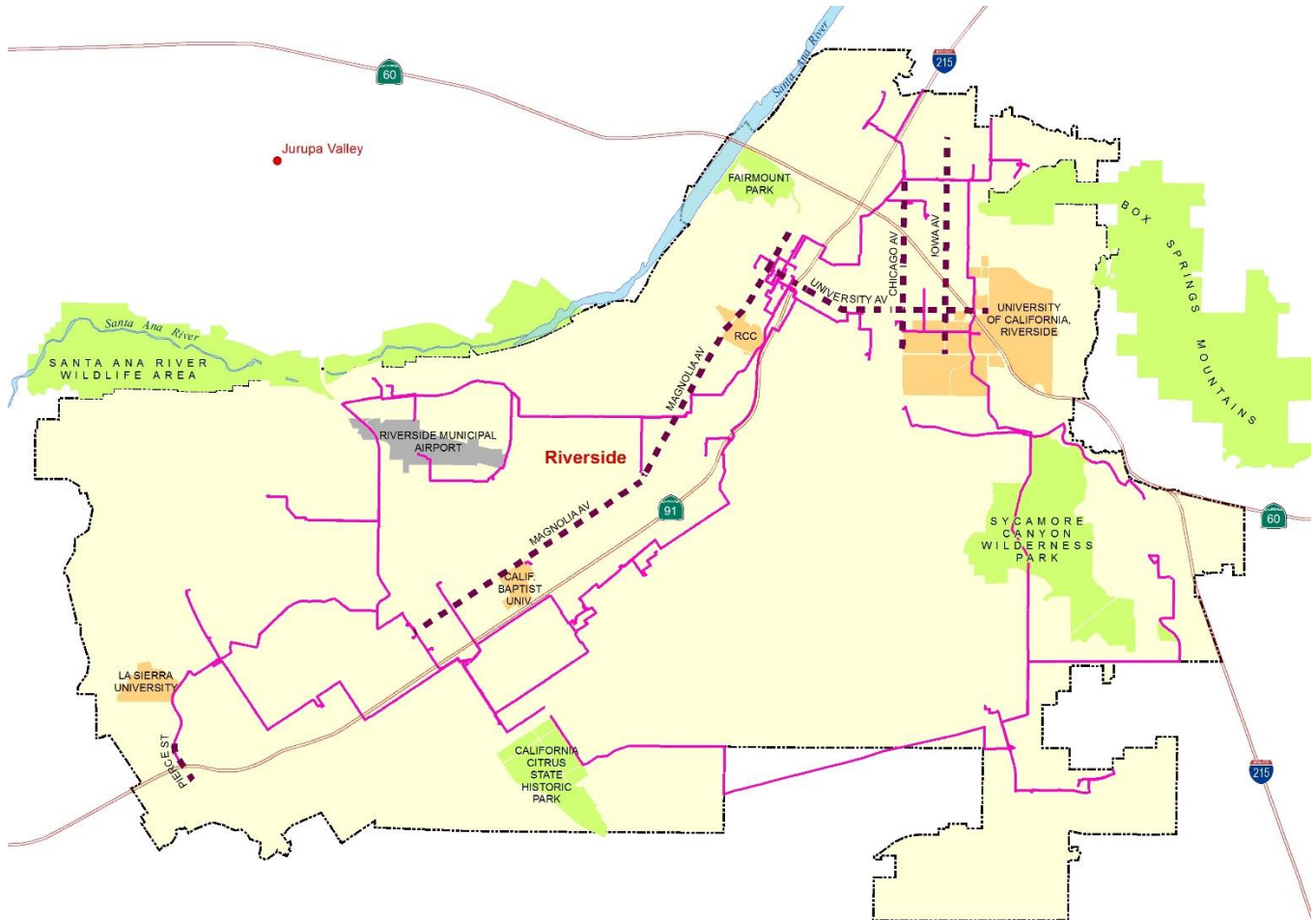
BACKGROUND:

Riverside Public Utilities (RPU) operates an advanced broadband fiber-optic cable based network to communicate between its substations and control centers for the operation of our electric grid. Fiber optic cable is normally installed in bundles of 96, 192, 288 or 576 fibers. A typical communication path requires 2 fibers. As a result, RPU has many locations and paths throughout the City where it owns excess fiber. This excess fiber is not connected to electronic switches at either end, rendering it "dark". Currently, RPU leases some of these excess fibers to third parties who install the electronics and "light" the fiber for communication use.

In March 2014, staff issued a Request for Proposals for preparation of a long range business model and roadmap for development and expansion of RPU's dark fiber lease program. In July 2014 the Board approved a Professional Services Agreement with national consulting firm Magellan Advisors (Magellan) to develop the fiber business plan.

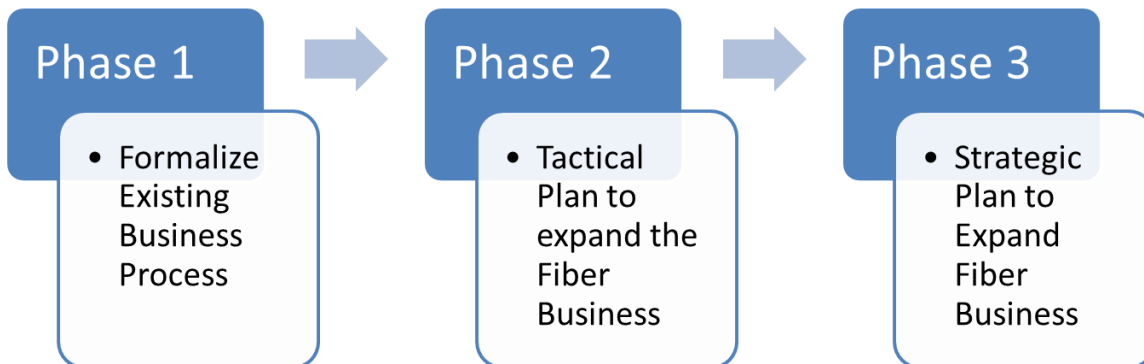
Magellan's scope of work included assessment of RPU's current practices around dark fiber leasing and opportunities for enhancement of the program supported by a business community survey, interviews with community anchor stakeholders, and review of peer agency fiber offerings. Magellan also assessed RPU's current fiber offerings, infrastructure, costs of construction, and opportunities for efficiency in how we deploy fiber infrastructure.

A high level overview of RPU owned and operated fiber routes within the City are shown in the graphic below.



RPU's process for leasing of dark fiber is largely reactive and ad-hoc. As a result, Magellan recommended, and staff concurs, that a more formal program is warranted, including development and publication of standard dark fiber lease pricing.

Magellan's recommendations for a three phase roadmap are summarized in the following graphic:



The Magellan report recommended the following specific activities for implementation of Phase 1 roadmap:

Phase 1 – Formalize the existing business to brand and market dark fiber as a service.

- Assign an Internal Project Manager to Fiber Business
- Document the Inventory of Available Assets
- Implement a Fiber Management System
- Review and Standardize Agreements for Fiber Leasing
- Treat Fiber as Telecom Asset, Not an Electrical Asset
- Develop Pricing Policies for Fiber Leasing
- Publish RPU's Rates and Terms

Two related elements identified for Phase 2 have been considered as they relate to pricing strategy for new customers:

Phase 2 – Develop a tactical plan to expand the fiber business through identification of opportunities.

- Determine RPU Policies for Expanding Dark Fiber
- Develop Pricing Policies for Expanding Dark Fiber

On February 23, 2016, the City Council approved the Magellan dark fiber business plan and roadmap for enhanced broadband communications in Riverside. Magellan provided a plan for enhancement of RPU's business practices and expansion of dark fiber offerings. The City, through RPU, is not proposing to operate a municipal fiber network and sell internet utility service to residents, as the City does with the water, electric, refuse and sewer utility service.

Rather, the City is leasing out unused strands of fiber from its existing fiber network to third parties who have ready access to this existing fiber network. RPU built its network to provide voice, data, electric system protection and control services to RPU facilities. RPU has many locations and paths throughout the City where it owns excess fiber strands. These excess fiber strands are not connected to electronic switches at either end, meaning that the strands are "dark". Currently, RPU leases some of these excess fibers to third parties who install the electronics to "light" the fiber for communication use. These third parties "light" the existing fibers for internet and communication use for either their own purposes or for their customers. The first phase of this dark fiber leasing program has been funded by revenue from the existing leases for the dark fiber network. All expenditures of ratepayer funds for the dark fiber network are in compliance with Prop. 26.

On November 14, 2016 the Board of Public Utilities approved a Professional Services Agreement with Tellus Venture Associates, to assist with the implementation of the Phase 1 recommendations from the Magellan Report.

DISCUSSION:

Demand for broadband services in Riverside is increasing. This demand exists not only within retail markets for commercial and residential services, but also within RPU's electric and water operating units. RPU is well positioned to help meet those needs through dark fiber leasing, either to the end user; as a last-mile or middle-mile provider to service retailers like Charter/Spectrum, AT&T, Verizon/Frontier, or potentially to new market entrants; or as an internal service provider to the operating divisions. To adequately meet these needs, some fiber expansion by RPU is inevitable. As such, staff recommends the following actions to facilitate fiber services in Riverside by RPU.

Fiber Expansion Considerations

Currently, new customers requesting fiber service are fully responsible for the capital cost of the improvements, even though those customers use a fraction of the installed capacity. For example, the smallest fiber cable RPU installs contains 96 strands of fiber. Typically, a fiber customer requires two strands, leaving 94 other strands available for lease to other customers. RPU often installs fiber cable with 144 or 288 fiber strands.

The Utilities' Water and Electric Rules contain provisions for developer participation and or reimbursement in cases where capacity beyond the customer requirements are constructed. Staff proposes to adopt similar policies and process for the expansion of the fiber network.

Specifically, staff proposes that customers who request fiber service that results in construction of master planned fiber facilities would be responsible for 50% of the installation cost (defined as the Work Order cost plus 15%). Current master planned fiber facilities are outlined in the table below and are compiled from the Magellan report and prior staff work. The routes represent the key backbone infrastructure to improve resiliency of our existing network and expand to areas of the City and RPU service territory where we lack fiber assets. Staff proposes to update this table on a triennial basis with review of fiber lease pricing.

RPU Master Planned Fiber Facilities: 2017- 2020		
Location	Extent	Capacity
Magnolia Avenue/Market Street	First Street to Buchannan Avenue	288 fiber
University Avenue	Market Street to Canyon Crest Drive	288 fiber
Chicago Avenue	Martin Luther King Boulevard to Marlborough Avenue	288 fiber
Iowa Avenue	Martin Luther King Boulevard to Palmyrita Avenue	288 fiber
Pierce Street	Magnolia Avenue to Riverwalk Parkway	96 fiber

Customers would be responsible for the full installation cost, as defined above, for non-master planned facilities and any facilities (laterals or drops) to connect from existing fiber infrastructure to their facilities. Staff proposes to provide, as an option to public agency customers, the ability to amortize the capital cost contribution over the term of the agreement at 4% interest rate in equal monthly installments. Similar "on-bill financing" is available in many California agencies for energy efficiency and conservation programs that provide mutual benefits to the customer and the utility. Providing incentives for the expansion of RPU's fiber network through such low-risk incentives is a tool to grow our market base and should increase opportunities to capture new customers through an expanded network.

Fiber Capital Cost Summary and Participation			
Facility	Cost Calculation	Customer Responsibility	Utility Participation
Master Planned	Work Order Cost +15%	50% of Actual	50% of Actual
Non-Master Planned	Work Order Cost +15%	100% of Actual	0
Fiber Drops – 12 strand (from nearest splice)	Work Order Cost +15%	100% of Actual	0

Staff proposes to mark-up the installation cost by 15% to offset related costs of managing the fiber enterprise, including contract administration and oversight, that are not captured in the construction work order.

Proposed Fiber Rates

Magellan recommended “a standard rate schedule for leasing its dark fiber to ensure the utility is providing these services at competitive rates and covering all of its costs.” Tellus Venture Associates has reviewed benchmark rates from nine California agencies (eight cities and one transit district) and five agencies from outside the state. California rates ranged from \$100 to \$425 per strand mile per month. Out of state rates varied more widely from \$30 to \$500 per strand mile per month. Agencies typically set high and low rates for fiber strands, with actual price determined by several factors, including distance, number of strands, full versus partial routes, term of contract and other negotiating points. The average low rate for a strand-mile leased to a private company from a California agency is \$152 per month and the average high rate is \$196 per month when an outlier is factored out.

Agencies typically add a drop charge for the 12 strand fiber cable that connects from the fiber backbone to the customer premise. A charge for end point connections (analogous to the fixed monthly meter charge in water and electric) recovers costs of maintaining the network splice and hardware for the customer interconnect and is consistent with current lease pricing.

Setting consistent rates for fiber use as outlined herein will vastly improve the speed and timeliness for execution of License Agreements which will result in higher levels of customer service. Uniform pricing also allows RPU to market the enterprise and should result in a higher level of awareness and leasing activity to end users as well as resellers. In Palo Alto, for example, the mix of dark fiber customers is weighted toward resellers, who leverage their existing business markets and yield increased broadband availability for the community in a manner that the utility cannot.

Consistent with the recommendations from the Magellan and Tellus Venture Associates reports, the follow pricing is proposed:

Riverside Public Utilities – Fiber Network Rate Card		
Standard Fiber Service	Per Month	Notes
Strand-mile, first ten (10) strand miles	\$125.00	One (1) strand-mile minimum charge per leased strand, thereafter by tenth of mile (0.10)
Strand-mile, additional strand-miles	\$100.00	
Drops/laterals	\$150.00	Minimum per mile or tenth of mile (0.10) fraction thereof, up to twelve (12) strands
End Points	\$150.00	Up to twelve (12) strands
Additional Terms		
Discount for 10 year minimum term	30%	Per strand-mile, not applicable to drops/laterals or end points

Staff recommends that License Agreements have a maximum five (5) year rate lock-in with a 2% annual rental increase and a \$300 minimum monthly fee. License Agreements will be

structured as renewable in 5-year terms at the then applicable rates.

Existing license agreements will continue at their current rental rate until their expiration. The proposed lease rates would be in effect for all new or renewed license agreements for fiber service.

Lease rates with the City of Riverside through the Innovation and Technology Department will be brought back to the Board of Public Utilities and City Council within six months for review and adoption. Staff is presently evaluating the provision of lit or managed services that would improve fiber redundancy to City owned facilities while reducing the fiber strand count used by the City. The result would be increased service levels and increased fiber availability for leasing to other third parties. This would essentially be a pilot of Magellan's Phase 3 recommendations.

Staff recommends that on a case-by-case basis, should any License Agreement be requested for fiber use that fall outside of the parameters of this staff report due to special circumstances, then the annual lease rates and capital contributions would be presented to the Board and City Council for consideration.

Physical and Cyber Security Policy

Staff recommends adoption of the attached Physical Security Policy which establishes standards for asset protection, physical security, loss prevention, and continuity of operations for the electric and communication system including Fiber Optic Cable network, Computer Network, Synchronous Optical Network (SONET) Multiplexing System, Microwave and Radio systems owned and operated by Riverside Public Utilities. The Policy:

1. Establishes the foundation and minimum standards for planning, evaluating, implementing, and sustaining a Physical Security Program for RPU;
2. Specifies the duties of personnel specifically responsible for implementing the RPU Physical Security program, and;
3. Defines employee actions and behaviors necessary to support the physical security of RPU facilities.

Specific to fiber use, the policy requires that RPU terminate fiber optic cable strands designated for customer's use only at that customer's premise. RPU will not terminate fiber strands used anywhere else in the fiber optic cable system at customer's premise. Use of physically separate fiber strands will ensure cyber and physical security of RPU and customer data.

Master Fiber Lease License Agreement

The attached Master License Agreement use the standard terms from prior fiber license agreements and incorporates recommendations from our consultants and the City Attorney's office. Pricing and terms identified in this report are structured into the agreement. All new standard fiber lease agreements would be issued under the proposed Master License Agreement. Existing agreements will be renewed under the Master License Agreement and proposed uniform pricing upon expiration. Any non-conforming license request would be brought to the Board of Public Utilities and City Council for separate consideration.

Fiber Cost Center

Staff recommends establishment of distinct dark fiber program designated reserve, revenue and expenditure accounts. Annual revenue of approximately \$455,000 has been stable for the past three years or more. Staff recommends segregating fiber revenues from the past four years of \$1,800,000 into a dark fiber designated reserve to fund the program and subsequently account for the activities of the program. In addition, staff recommends initial appropriations for the fiscal year 2017/18 budget of \$1,200,000 to a capital account for future capital improvements and \$600,000 to operating accounts for operating expenditures. Current and future revenue from fiber leasing activities would accrue to the fiber revenue account and be appropriated to expenditure accounts through the biennial budget process for operation and maintenance of the dark fiber network.

FISCAL IMPACT:

New and increased revenue will result from fiber leasing activity, dependent upon the actual level of leasing activity experienced. Proceeds from lease activity will be deposited into Public Utilities Fiber revenue account. There are adequate undesignated reserves in Public Utilities Electric Account No. 0000510-101000 for the transfer of \$1,800,000 to a dark fiber designated reserve account.

Prepared by: Girish Balachandran, Utilities General Manager
Certified as to
availability of funds: Scott G. Miller, PhD, Chief Financial Officer/City Treasurer
Approved by: John A. Russo, City Manager
Approved as to form: Gary G. Geuss, City Attorney

Attachments:

1. Presentation
2. Technology Physical Security Policy
3. Master Fiber Lease License Agreement
4. Board Minutes