



CITY OF SAN LEANDRO, CALIFORNIA
Fiber-Optic Master Plan



Agenda

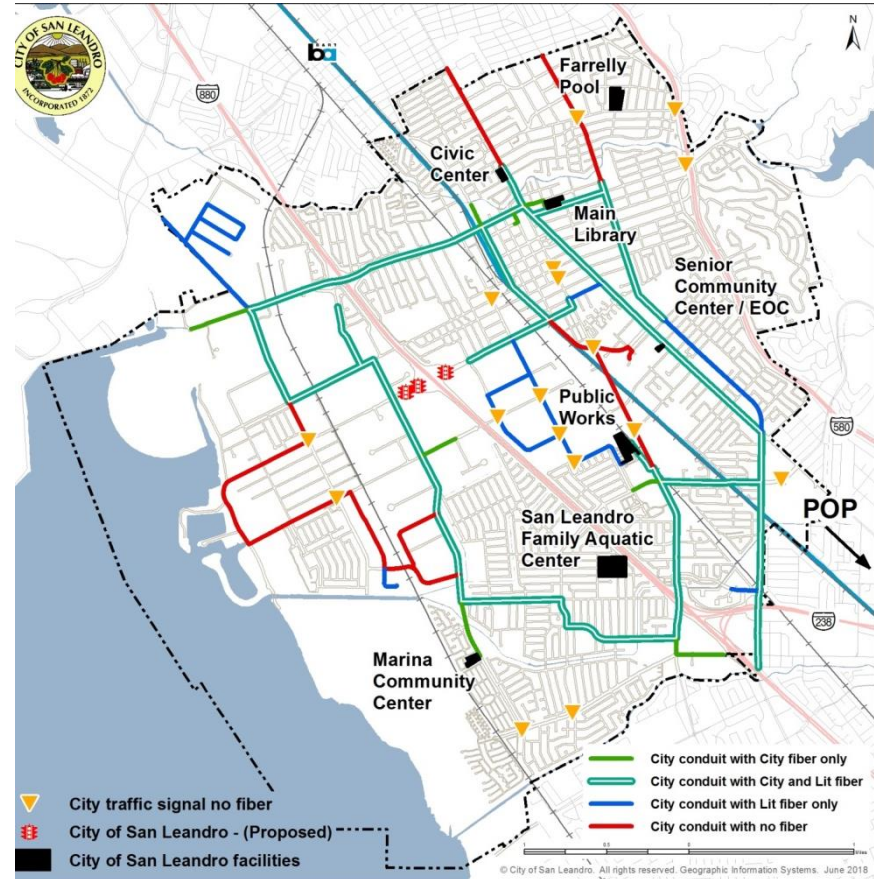
- Introduction
- Smart City Strategy – Tony Batalla
- Broadband Strategy – Jory Wolf
- Financials – Randy Trost
- Q&A





Fiber Optics Network (Current)

- City Conduit w/ Lit + City Fiber (15mi)
- Lit SL Fiber only (5.7mi)
- City Fiber only (2mi)
- City Conduit no fiber (6.4mi)
- Total Conduit: 29.1mi
- Total Fiber: 22.7mi





Introduction

April 28, 2017 issued RFP

Primary Questions:

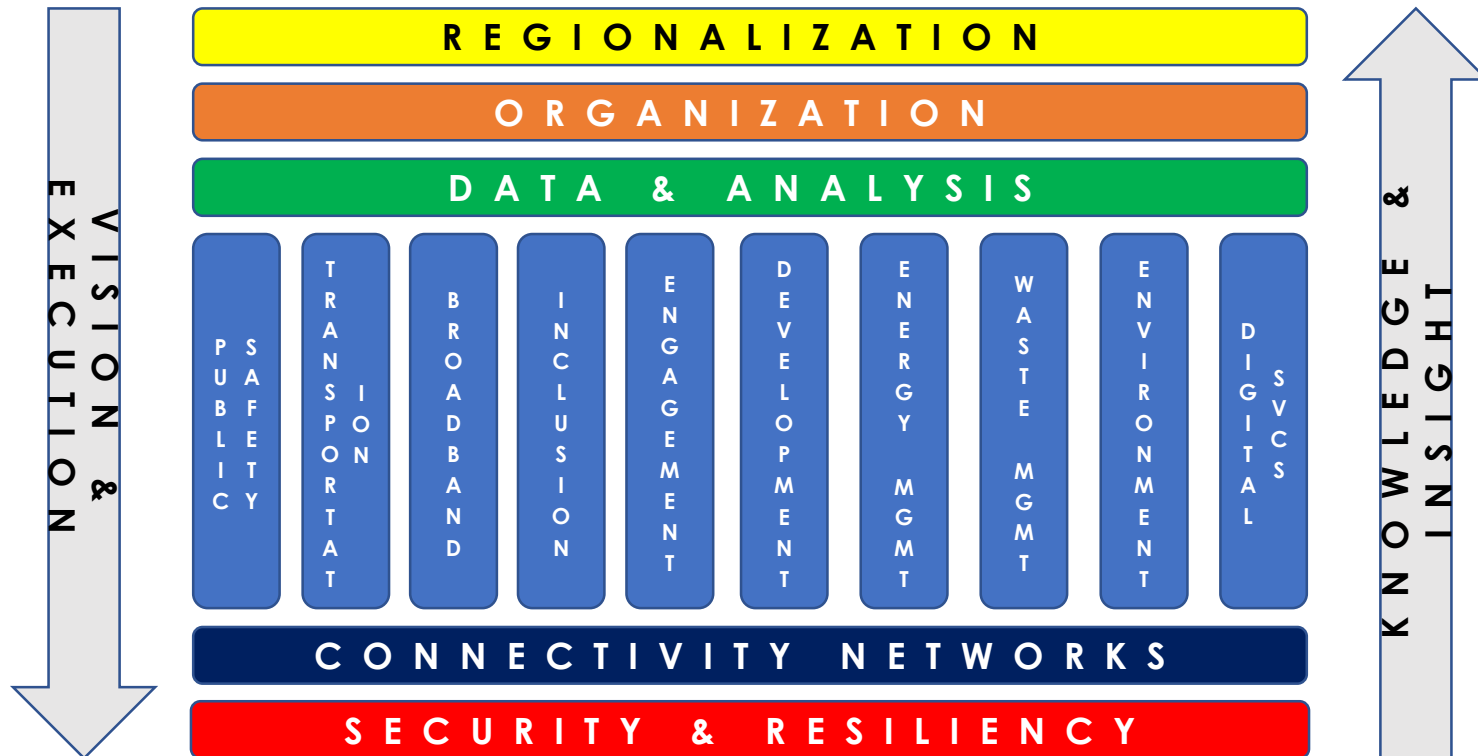
- How can the City better utilize its available fiber optics capacity within both the public and privately owned networks?
- Where and how should the City expand its fiber optics network?
- What funding opportunities exist for future expansion?
- What options are available for the City to monetize its fiber optics assets?

July 17, 2017 awarded the contract to Magellan
Advisors

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Smart City Model

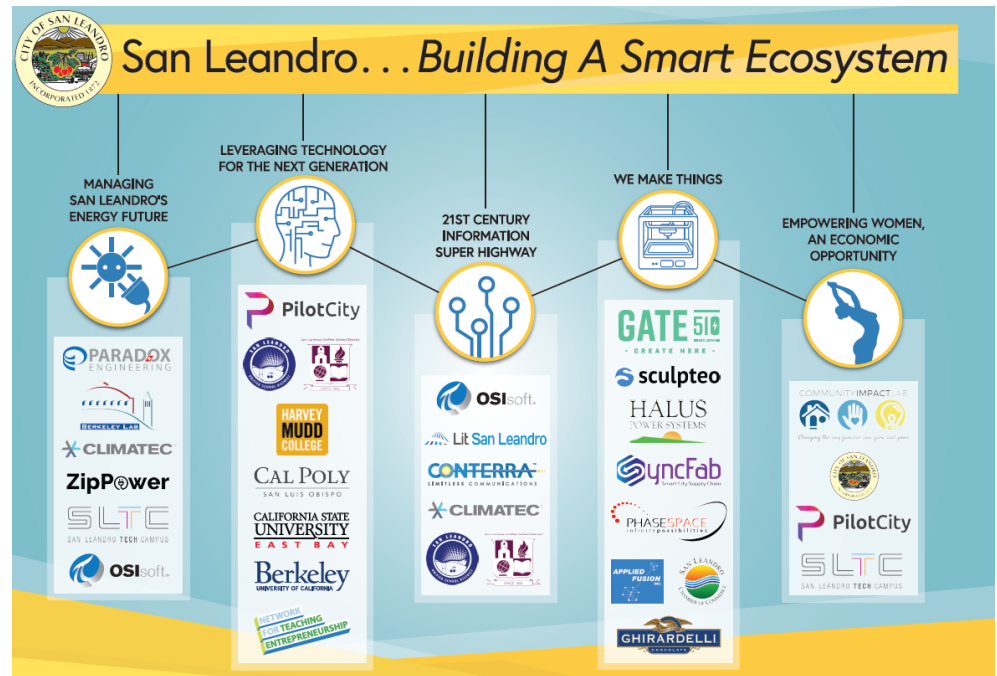


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San Leandro Smart City Vision

“San Leandro as a Smart City will be easy to use and navigate, friendly and kind, inclusive, sustainable, and promote innovation and the arts to enhance economic development and quality of life for its residents.”





Smart City Initiatives

- Digital Transformation
- Public Wi-Fi
- Street Lights
- Buildings & Energy
- Mobility
- Digital Inclusion
- Public Safety
- Fiber Management

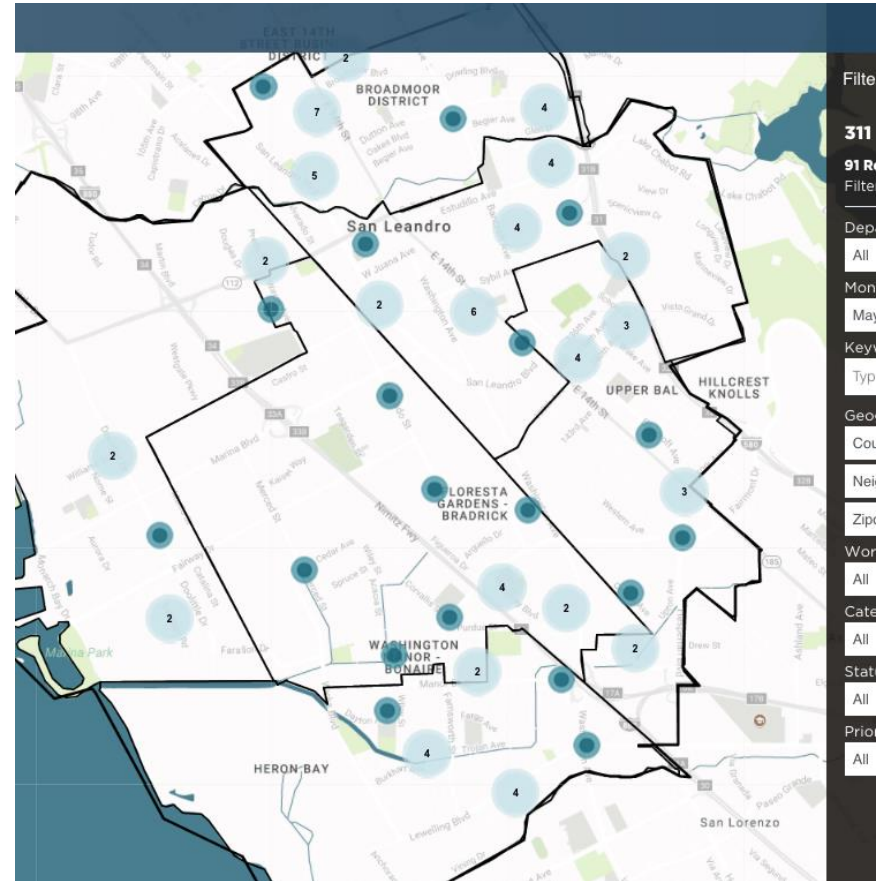


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Digital Transformation

- Analytics Programs
- Mobile Apps
- Digital Services
- Digital Records
- Open Data
- Financial Transactions

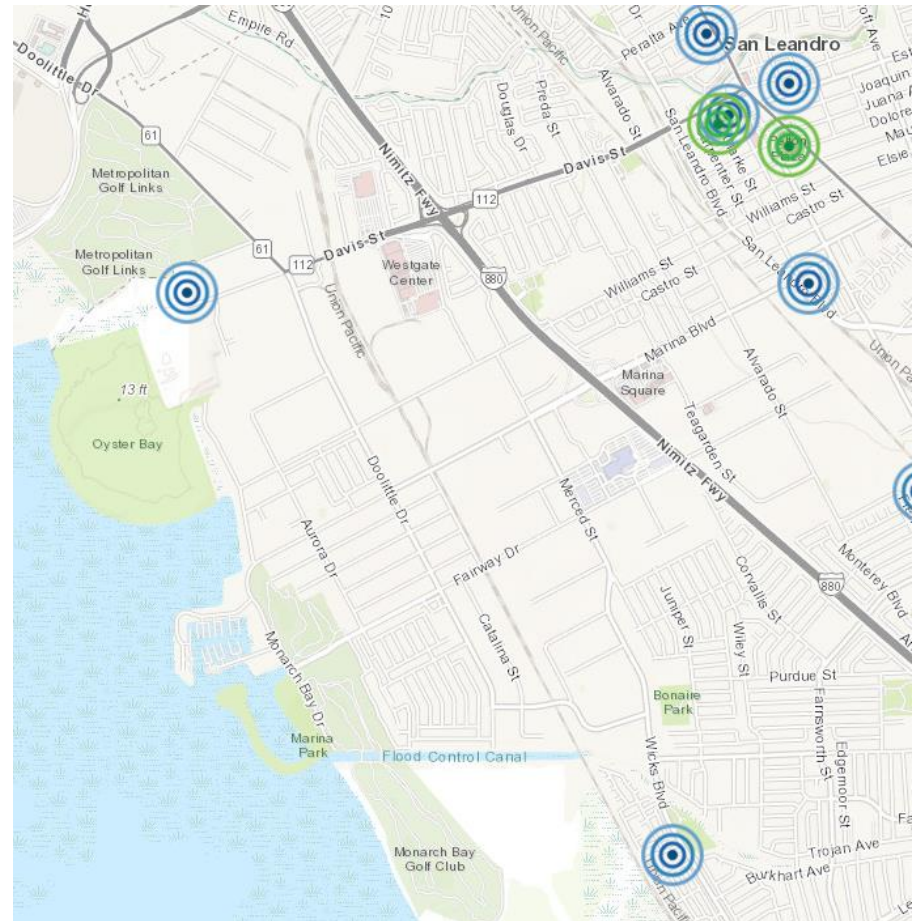


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Public Wi-Fi / SL-WiFiber

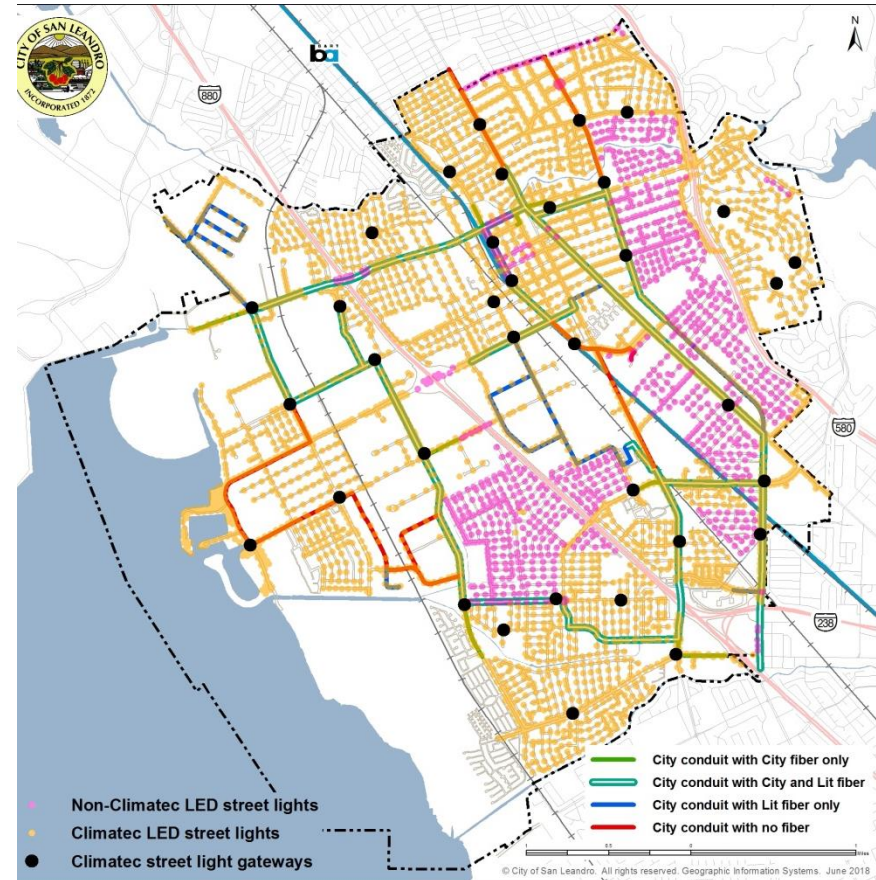
- 2TB/month of data
- \$30,000/month on a cellular data plan
- City Facilities in 2017
- Capital Projects to City Parks and further downtown (more to come on June 18)





Street Lights

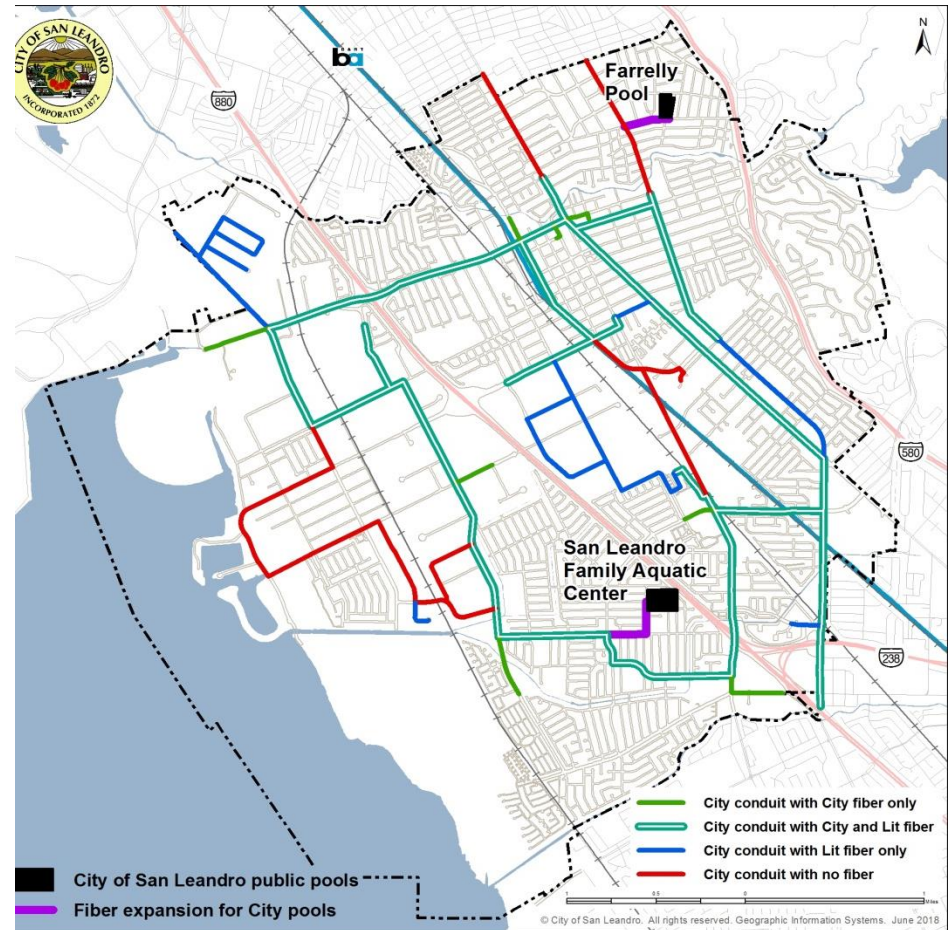
- Internet Of Things (IoT) Network
- Climatec Project
- Energy Savings / LED Conversion
- City As A Platform (Manifesto)
- Small Cell / 5G
- Potential Sensors





Smart Buildings

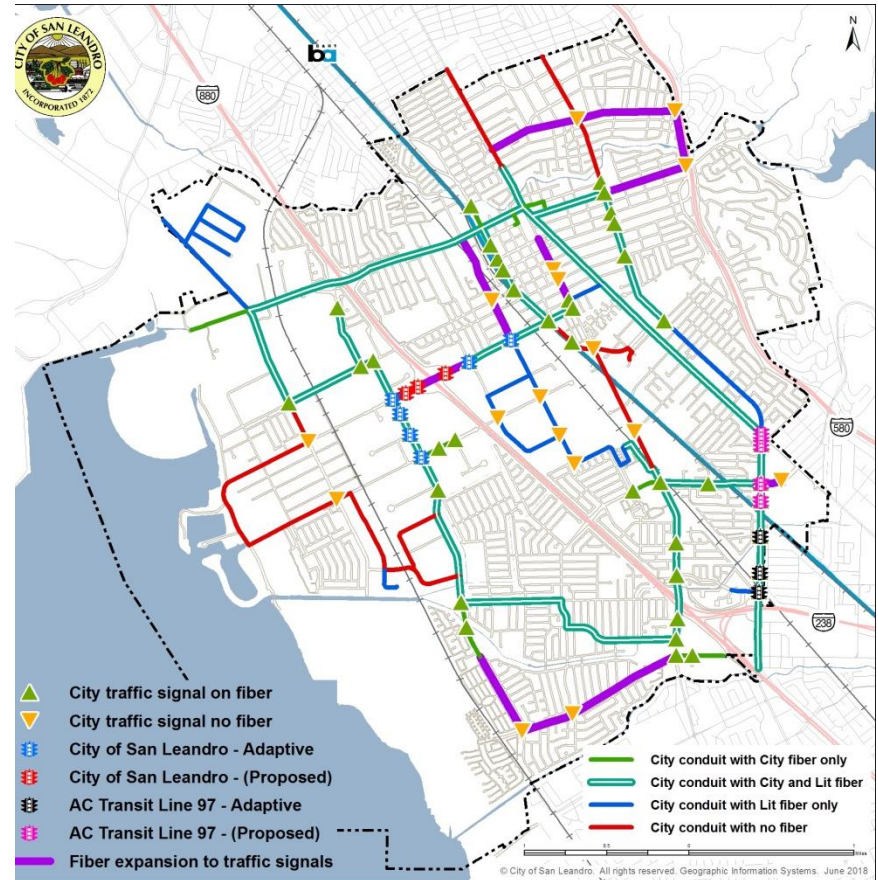
- All Connected except Farrelly Pool and SLFAC
- Can provide centralized Telecommunications Services
- Integrated HVAC, security, climate control, lighting systems
- Data analytics, partnership with OSISoft





Mobility / Transit

- Connected Traffic Signals
- Adaptive Signal Technology
- Aligned to: Parking Management, Bike & Ped Plan
- Staging for Autonomous Cars, Ride-Sharing, Bike-Sharing and More





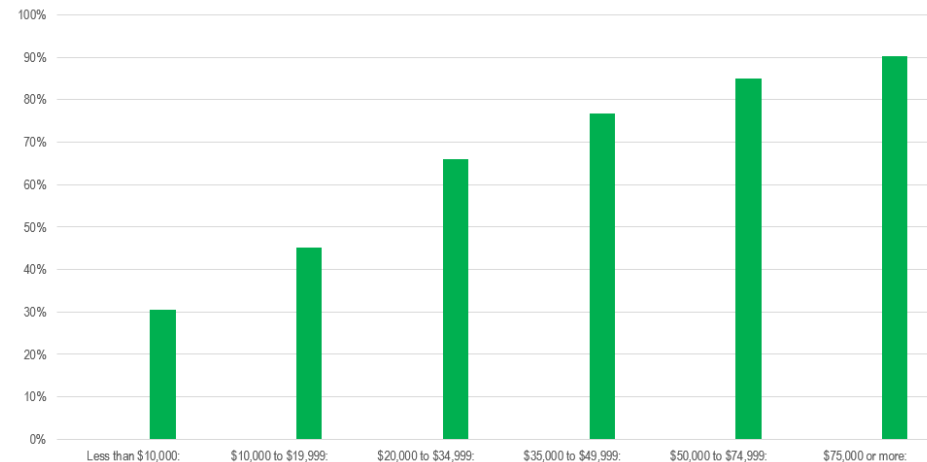
Presence and Types of Internet Subscriptions in Household

Digital Inclusion

- “Ability of individuals and groups to access and use information and communication tech”
- 88.8% Computer Ownership
- 22.4% No Home Internet
- Only 30% of homes w/ <\$10k
- Homework Gap, Digital Divide

Subject	San Leandro city, California			
	Total	Margin of Error	Percent	Margin of Error
	Estimate		Estimate	
Total households	32,325	+/-2,030	(X)	(X)
TYPE OF INTERNET SUBSCRIPTIONS				
With an Internet subscription:	25,441	+/-1,606	78.7%	+/-3.8
Dial-up alone (no broadband subscription)	367	+/-246	1.1%	+/-0.8
With broadband subscription:	25,074	+/-1,588	77.6%	+/-3.8
DSL	4,757	+/-935	14.7%	+/-2.8
Mobile broadband	13,690	+/-1,606	42.4%	+/-4.6
Mobile broadband alone or with dialup	2,390	+/-778	7.4%	+/-2.4
Cable modem	12,350	+/-1,456	38.2%	+/-4.4
Fiber-optic	1,142	+/-462	3.5%	+/-1.5
Satellite Internet service	851	+/-398	2.6%	+/-1.2
Without an Internet subscription	6,884	+/-1,440	21.3%	+/-3.8

% Households with Broadband Internet Subscription by Income

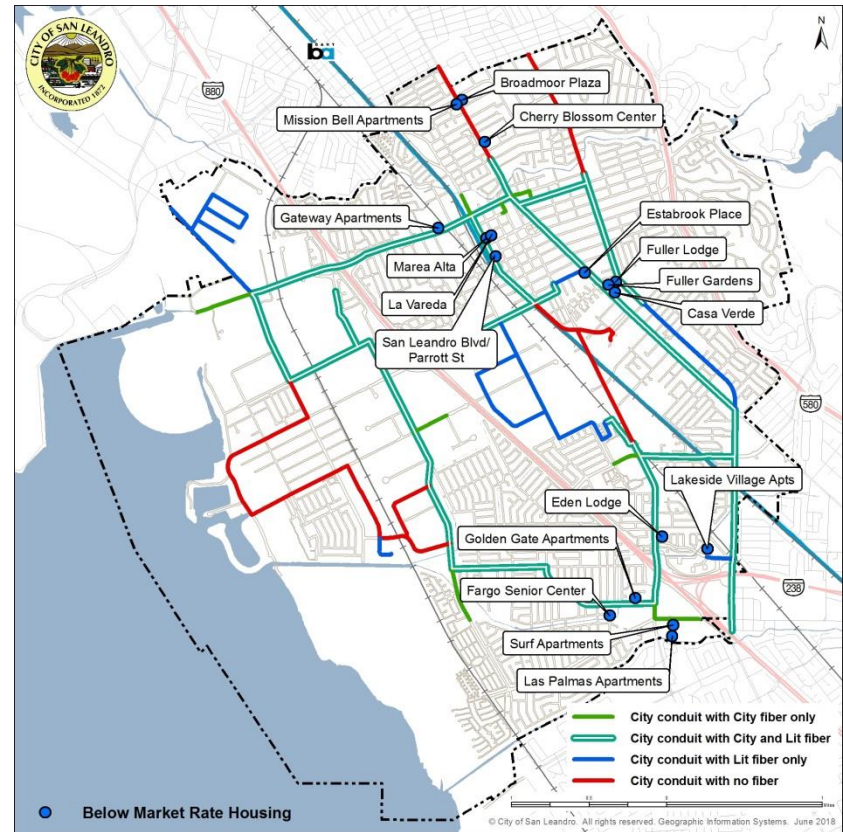


Sources: https://www.ims.gov/assets/1/AssetManager/BuildingDigitalCommunities_Framework.pdf; US Census Data



Digital Inclusion

- Affordable Housing Projects line up along fiber network
- Lit/Crosslink at Lakeside, Marea Alta

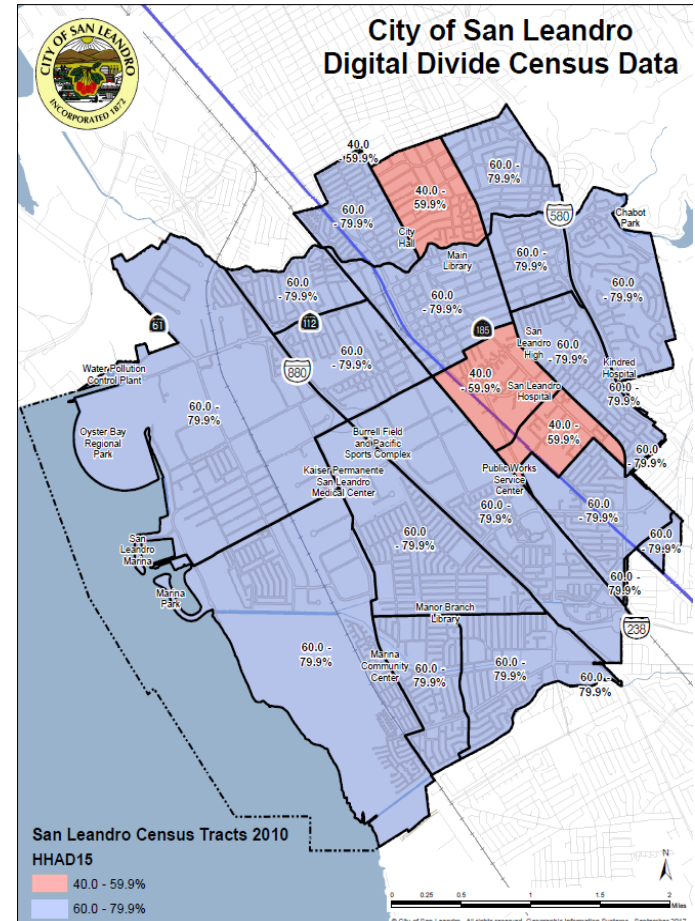


Sources: FCC Data



Digital Inclusion

- Highest areas of need only have 40-50% connectivity
- Potential services: Lendable hotspots at Library, trainings programs
- Community engagement : Hackathons, events, services, internships

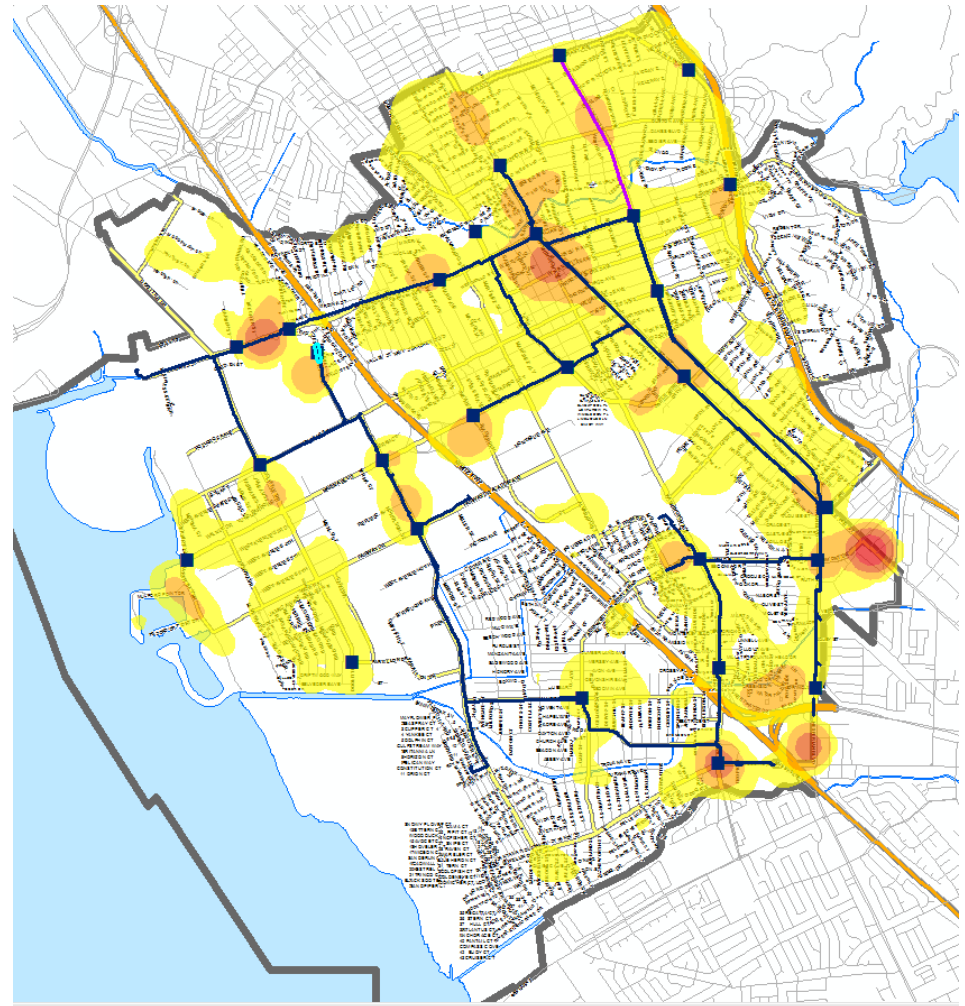


Sources: FCC Data



Public Safety

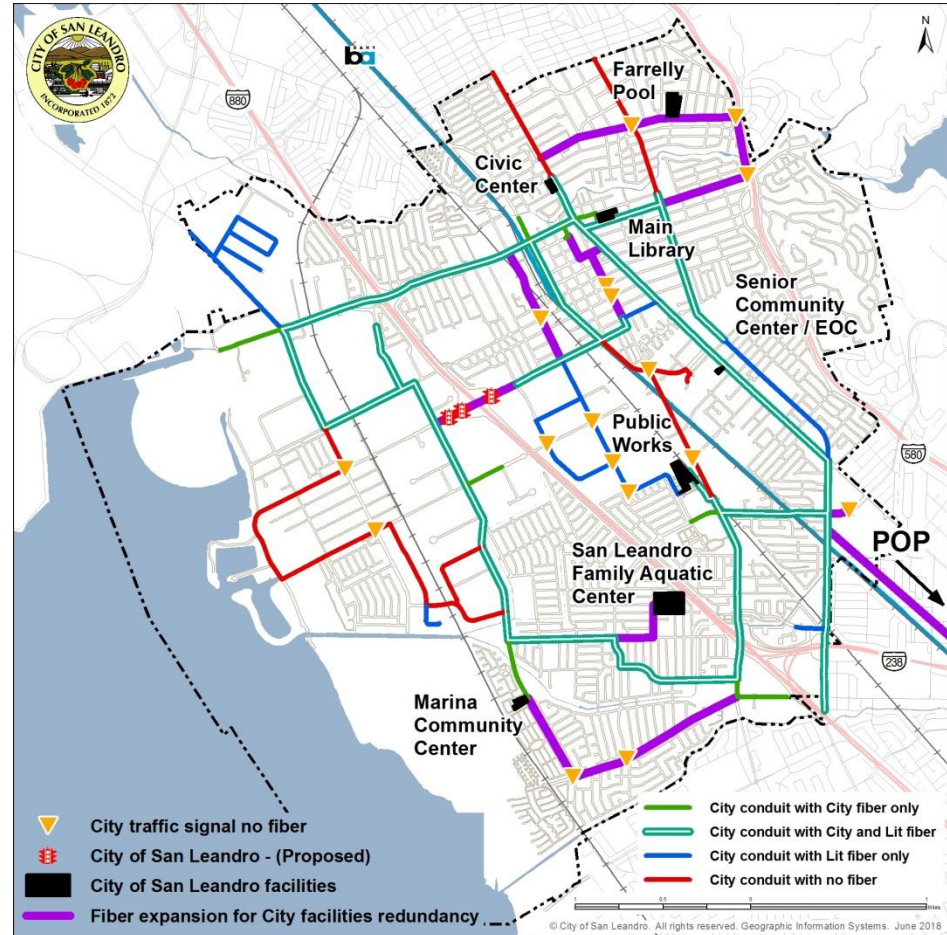
- Modernized IT Infra
- Crime Analytics
- Security Cameras
- Evidenced-Based Policing
- Next Gen 911
- More Data...





Smart City Future Steps

- Advisory Board
- Connect Facilities, Traffic Signals, Redundancy, Etc
- Formalize Fiber Mgmt
- Expansion: 8.3 Mi
- Funding: \$6M
- Potential Sources: Grants, CIP, Dig Once, Wireless, PPP, Broadband Services



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Introduction to Magellan Advisors



Jory Wolf: VP of Digital Innovation

Jory joined Magellan after 22 years as CIO of the City of Santa Monica, CA where he launched Santa Monica City Wi-Fi, which provides free internet services to the public through a network of 32 hot zones and wireless coverage in most major commercial and transit corridors throughout the city. He created Santa Monica City Net, a 100-gigabit broadband initiative to support an environment for local businesses to compete in the global economy with cutting edge network solutions. Jory has over 35 years of experience in Information Technology, including broadband, FTTH and Smart City initiatives. Jory and his teams have received over 50 awards for information technology projects during his career and in 2012 he received the CIO Lifetime Achievement Award from the Los Angeles Business Journal.



Randy Trost: Senior Consultant - Project Manager

Randy is a seasoned municipal broadband and telecom and electric utility consultant with extensive global consulting experience. Randy has vast experience assisting organizations on their viability to bring broadband and future technology to their service territories, and has a proven track record of helping clients through thoughtful strategic planning and business planning to ensure appropriate products, networks and organizational structures are understood and developed. Mr. Trost has over 20 years' experience working in the telecommunications and technology industry with companies such as Intel and GVNW Consulting, resulting in the ability to understand and guide clients to successful and profitable outcomes for deployment.



San Leandro's Broadband Vision

- City's 2035 General Plan calls for continued transformation with a focus on technology, research, and innovation
- Broadband and Smart Cities have been identified as primary tools for economic development
- Smart City readiness
- Ensure affordable, reliable access
 - Businesses
 - Municipal Operations
 - Residences



Research and Outreach Efforts

- Business Broadband Survey
- Residential Broadband Survey
- Interviews with every department
- Interviews with City Council Members
- Two Public Meetings for Residents
- One Public Meeting for Businesses
- One Public Meeting for Public Sector Partners
- Collaboration with Staff on Report





Broadband Market Assessment

BUSINESSES

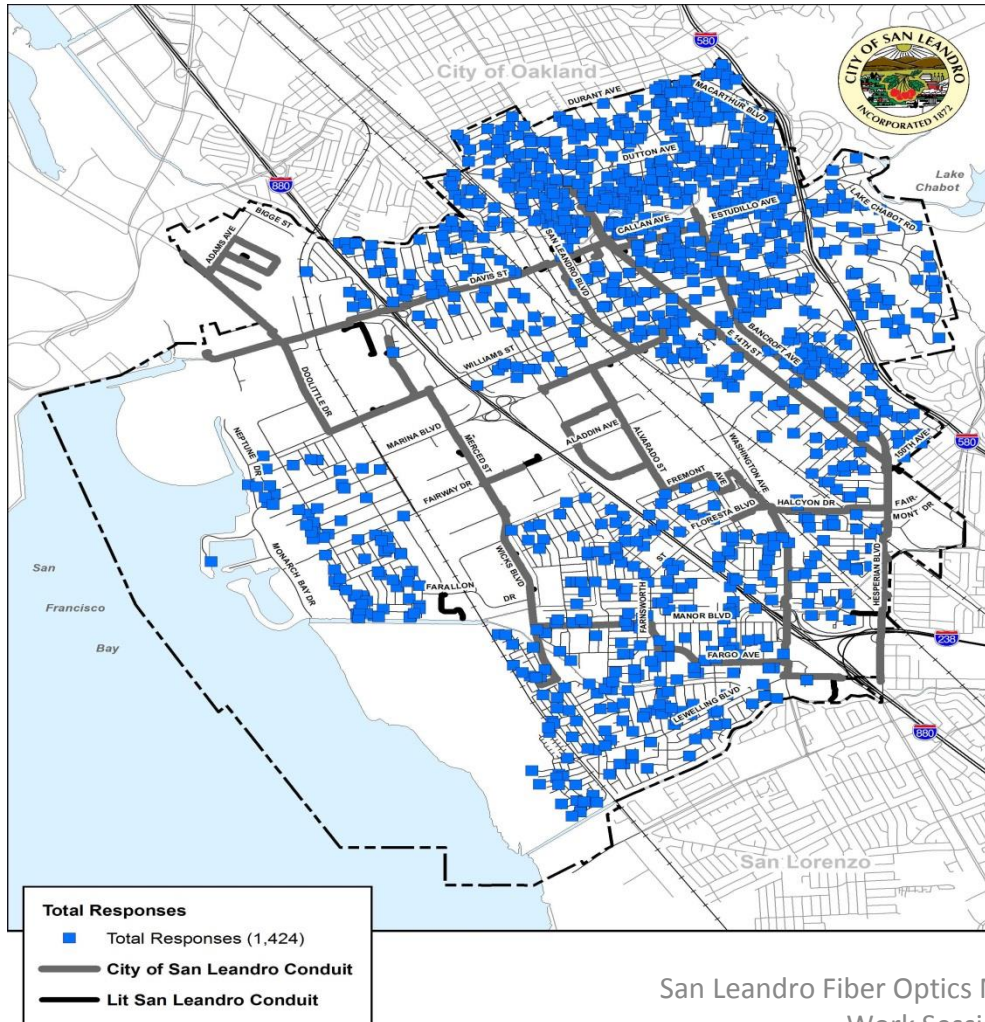
Service available in all areas (24 total providers)

- However, services are expensive and speeds are often slow
- ATT covers 100% of the area (DSL and fiber in select areas)
 - While coverage exists to all points in the San Leandro area, service is extremely expensive at around \$450 per month with a 3-year contract and speeds are low for DSL, at around 75Mbps. Fiber is available in some areas through AT&T.
- Comcast covers approximately 95% of the area
 - Higher speed service is available, with 350 down/20 up for \$450 Monthly Recurring Cost (MRC), or 150Mbps down / 20Mbps for \$249 MRC. Rates are based on a promotional 2-year agreement for extra free services, based on subscription commitment and a free install.



Needs Assessment

Residential Survey



1,883 total responses and 830 fully completed surveys

- Level of satisfaction is on the low side with five variables including tech support/customer service, reliability, price, performance, and access.
- Price is where customers are most dissatisfied, with over 50% indicating they were either “somewhat dissatisfied” or “very dissatisfied.”
- 22% somewhat to very dissatisfied overall with internet access
- Per speed test results built into our survey, actual speeds were lower than advertised
- 67% say they would subscribe to a community broadband network offering speeds of 100 Mbps or more at an average price of \$50-100 per month.

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Needs Assessment

BUSINESS SURVEY

There were a total of 86 responses to the business survey, of which 59 were fully complete.

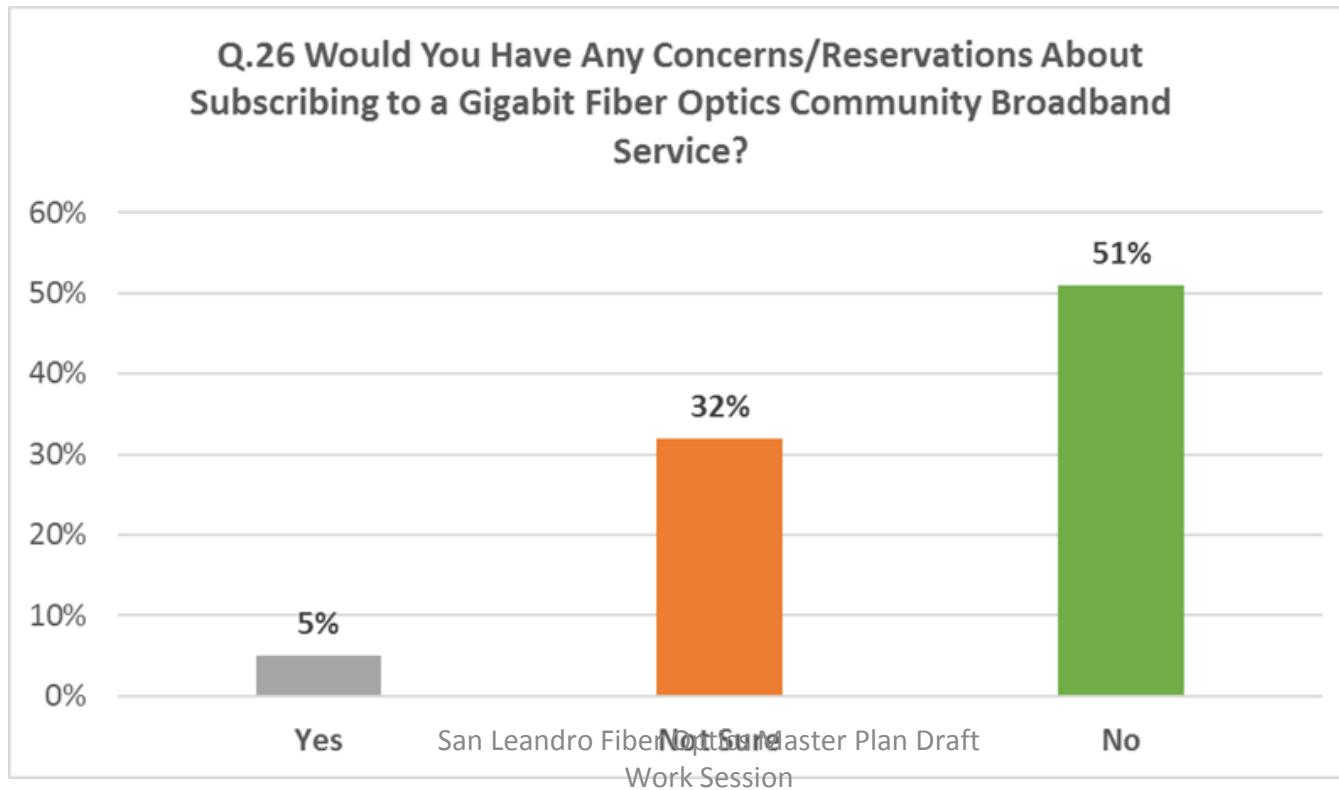
- 19% indicated they were connected to the Lit San Leandro Fiber network.
 - Of those, 71% had Crosslink Networks as their internet provider, 14% used Paxio, 7% were unwired and 7% did not know their ISP.
- 95% indicated that having a choice of providers was important
- 27% reported overall dissatisfaction with current service
- 32% were dissatisfied with performance/speed
- 30% were dissatisfied with price/value
- 37% were dissatisfied with reliability



Needs Assessment

BUSINESS SURVEY

Just over half of the businesses indicated they would be open to subscribing to a community (fiber-optic) broadband service.





Benefits of Lit San Leandro (LSL)

The innovation of the LSL network distinguished San Leandro as a forward-thinking city.

- Connected 150-200 businesses
- Connected all San Leandro schools
- Connected non-profits, including: Boys & Girls Club, St. Leanders Church, Assumption Church, and the Boy Scouts
- Development of The Gate 510, attraction of startups and tech companies
- Benefits to OSISoft and development of San Leandro Tech Campus
- Increased property values of local developments
- Increased broadband competition



Challenges for Lit San Leandro (LSL)

LSL has faced some challenges in maintaining a consistent direction and clear business plan since its inception.

LSL is addressing these issues:

- New 3 year business plan
- New Sales Team
- New GIS Team
- Better communication with City stakeholders



Future Broadband Vision

What else can the City do to enhance the broadband landscape, connect more businesses, drive economic development, and enable Smart City?

Magellan's models are designed to work in conjunction with LSL.

- Expand to areas not covered by LSL
- Supplement LSL services
- Provide immediate revenue to the City



Magellan Recommended Business Model Paradigm

- Magellan has extensive experience in helping cities and communities deploy successful broadband business solutions
 - Must:
 - Have a long-term vision. ROI's are not likely in 3 years.
 - Offer business “lit” broadband to include small, medium and large businesses, not just dark fiber solutions – Provides for a larger potential customer base
 - Example – provides a broad range of business class services
 - 1Gbps Dedicated (not oversubscribed, higher priced) \$1,250 monthly
 - 100Mbps Dedicated \$500 monthly
 - 1Gbps Best Effort (oversubscribed, less expensive) \$130 monthly
 - 100Mbps Best Effort \$100 monthly
 - Keep aid-to-construction costs at no cost or minimal (businesses don't like large up-front costs) – will increase take rate
 - Outsource network management to an experienced vendor – limited internal resources needed
 - Sell “wholesale” to ISPs that will then support the customer
 - Have active marketing and sales focus

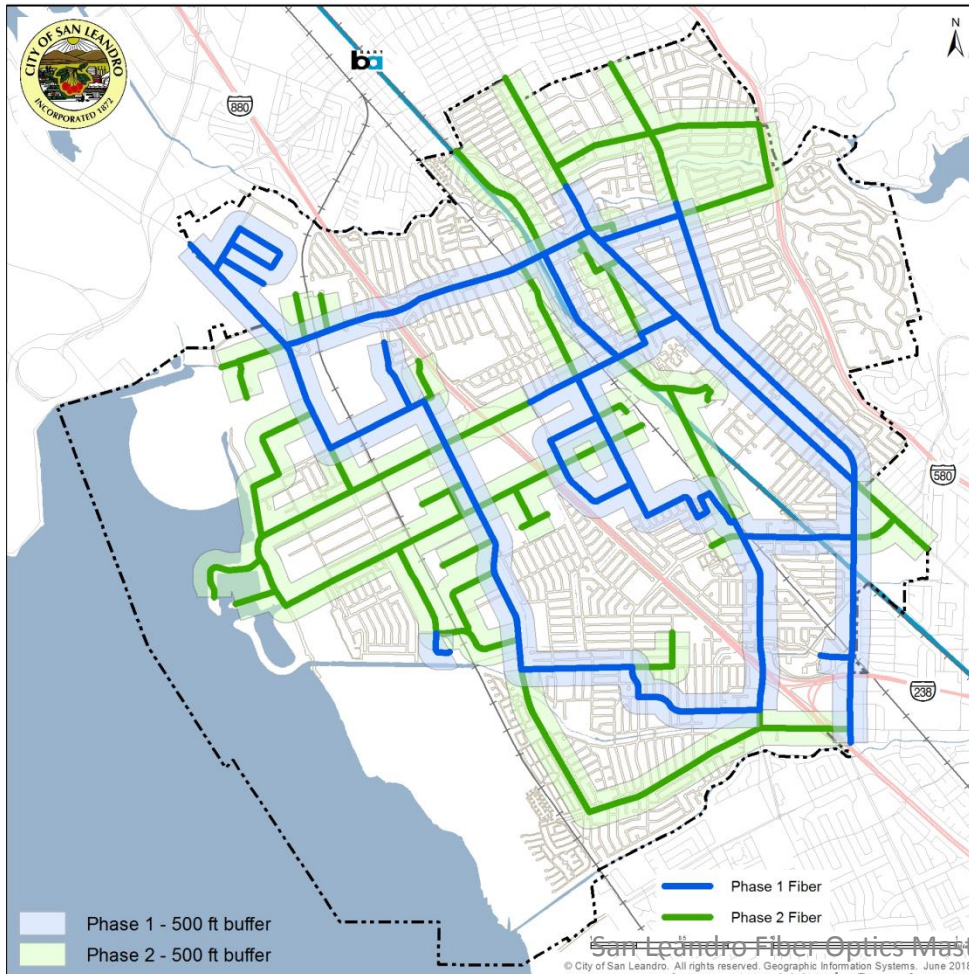


Business Model Assumptions

- Take Rate – 30% of all small, med, large businesses. (In keeping with experience with other like cities)
 - Ramp up time – 3-4 years
- Average cost for lateral - \$6,000 (some buildings have multiple tenants that will share the larger lateral costs over time)
- Interest rate 2.5% - Loan for 20 years
- As 5G networks grow, new bucket of revenue will be for site licensing and fiber backhaul from those sites
- Business included in model are within 500 feet of core network. Does not include all businesses within the City. Farther than 500' is cost prohibitive for laterals



City of San Leandro Proposed Network and Buffer Zones (adding 500ft fiber ext)



Phase 1 - Blue Lines – Existing Fiber

Phase 2 - Populating Existing Conduit and Planned Fiber Ext

- Network to support fiber for vertical assets and fiber to all businesses within 500' of network

Proposed network expansion is designed to supplement current network.



Fiber Length and Business Data

Phase I

- **Existing Fiber Network**
 - **108,904 ft**
 - **Total Businesses – 3028**

Phase II





- **Populate Existing Conduit Plus Fiber Ext**
 - **72,500 ft**
 - **Total Businesses – 2782**
 - **Total Light Poles – 1,765**

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Business Model & Financial Analysis

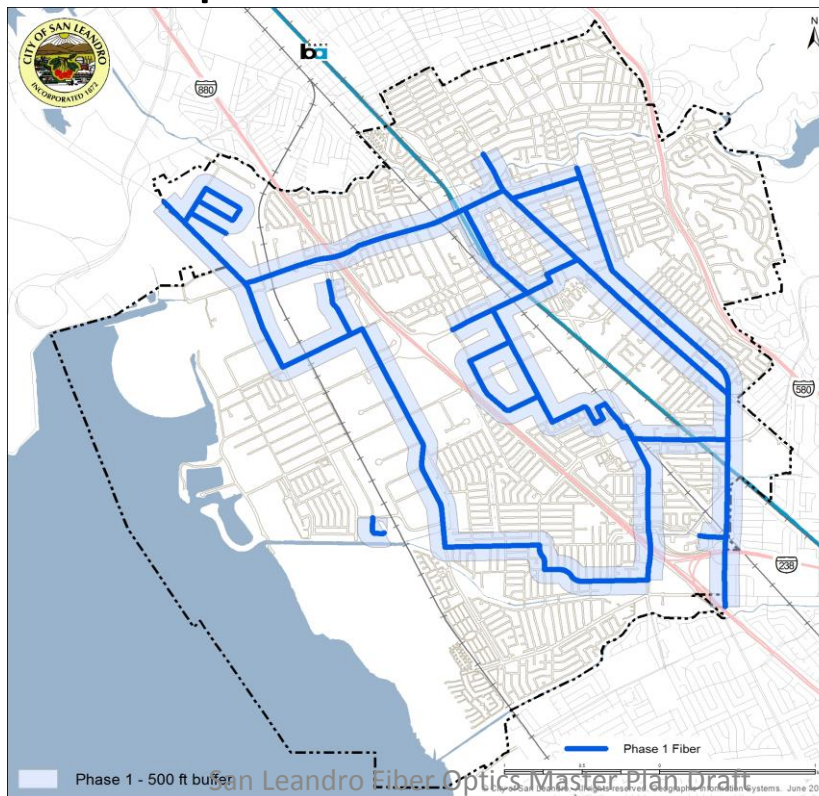
Combined Phase I - Phase II– (with vertical assets for Phase II only)

 FUNDING REQUIRED _____ \$30,785,000	 NORMAL PAYBACK PERIOD _____ 20 Years
 PAYBACK PERIOD USING FREE CASH FLOW _____ 14 Years	 CUMULATIVE FREE CASH FLOW _____ \$20,926,000



Business Model & Financial Analysis

Phase I – Wholesale Provider on Current Footprint with Magellan’s Operations Model





Business Model & Financial Analysis

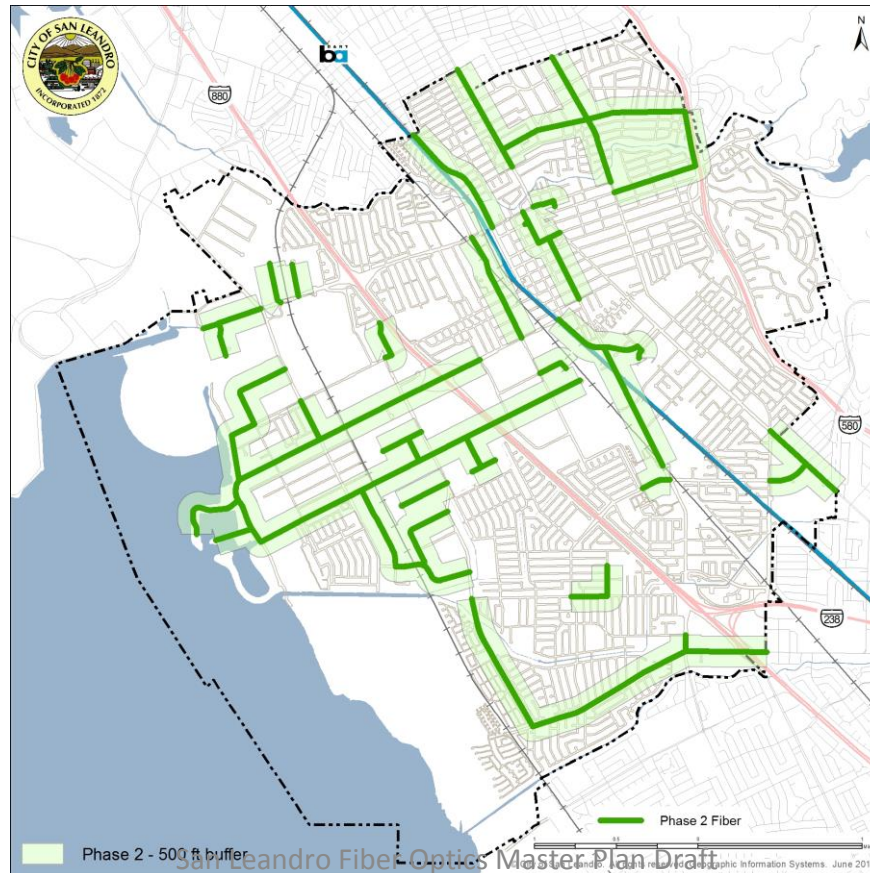
Phase I – Current Footprint Potential





Business Model & Financial Analysis

Phase II – Populate Existing Conduit, and Network Extension







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Business Model & Financial Analysis

Phase II—Populating Existing Conduit plus Network Extension (with vertical assets)

 FUNDING REQUIRED \$20,353,965	 NORMAL PAYBACK PERIOD 20+ Years
 PAYBACK PERIOD USING FREE CASH FLOW 18 Years	 CUMULATIVE FREE CASH FLOW \$2,984,181



Leasing Streetlight Poles

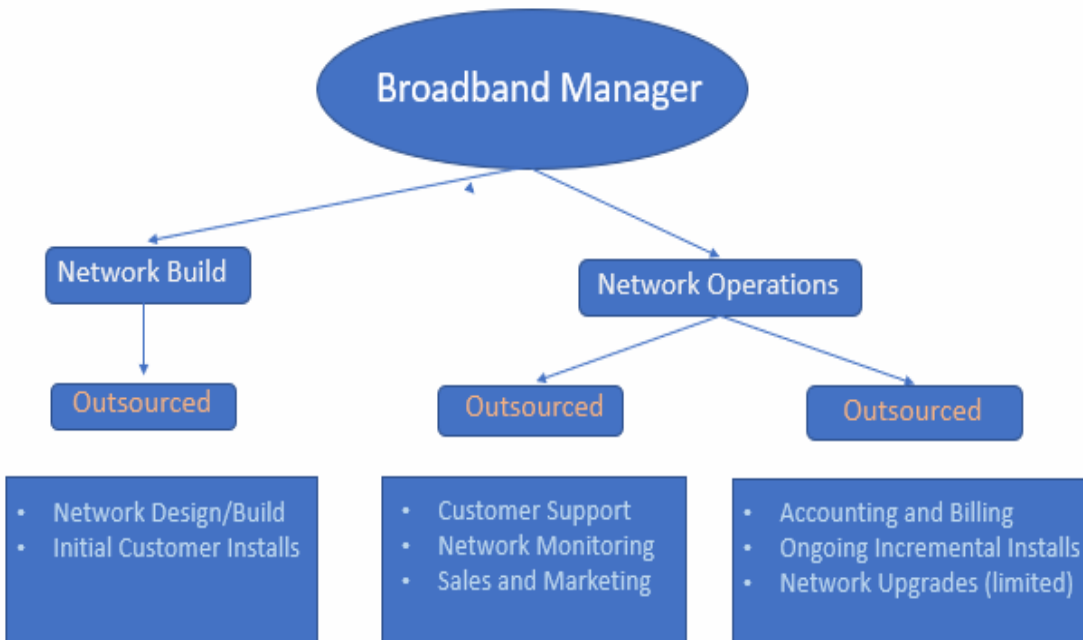
Phase II assumes a 7% take rate on leasing of vertical assets (streetlight poles in Phase 2 only)

- Create and publish Wireless Ordinances
 - Provides approved lease rates for access to sites and for fiber backhaul
 - Take rate is assumed 7% of all vertical assets at \$400 per month average for right-of-way and fiber backhaul
- Wireless/Cellular
 - More “small” cell sites planned
 - Moving from large towers to small tower designs
 - 5G/DAS is driving the future





FTTP Operations Model



Most major operations outsourced to experienced vendors. Contractors report to IT.

Network design/costs include tools for monitoring network performance, trouble ticketing and customer support help

Internal resources possibly required could include:

Broadband Manager

Field Tech

Some marketing

Accounting and Billing



Conclusions

- The world of broadband is changing dramatically with technology such as the Internet of Things
- Broadband is becoming a required service just like water, sewer and electricity. All cities are researching ways to build this missing utility to be competitive and thriving communities
- Fiber is the long term choice for robust broadband ensuring longevity over other alternatives
- The city needs to prepare for the future of broadband to support the community into the 21st century
- San Leandro end users have indicated a deep demand for faster, more affordable broadband services
- Broadband deployment and maintenance is not inexpensive and will require a long term commitment of dedicated champions
- 5G poised/designed to support a new technology paradigm which will also require new backhaul options
- San Leandro can have a world-class network enjoyed by the entire community



Questions?

Next Steps Discussion?



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Appendix



FTTP Business Model Assumptions

- 30% Business Take Rate for all 3 models
- 7% pole lease take rate starting in 2023

Pricing:

1Gbps Dedicated	\$720	15%	151
100Mbps Dedicated	\$360	15%	151
1Gbps Best Effort	\$90	10%	100
100Mbps Best Effort	\$70	60%	603



Why a Broadband Study?

Broadband encourages:

- Economic Growth
- Better quality of life for the community
- Increased property values
- Better, more efficient, most cost effective delivery of community services

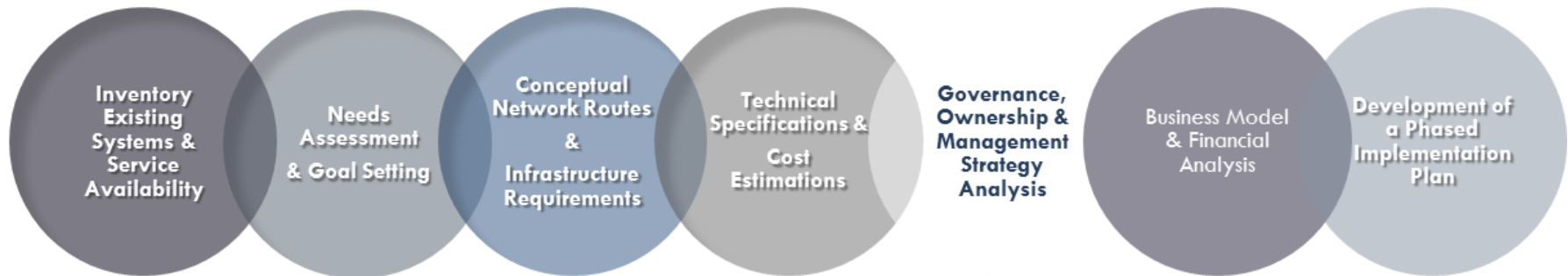
Broadband planning enables municipalities to:

- Ensure adequate and appropriate broadband now and into the future
- Dictate their own broadband future to be less reliant on the existing broadband providers
- Determine their own broadband future working on behalf of their citizens and community
- Capitalize on the broadband investment to deliver cost effective services to end users
- Municipalities are not profit driven
- Municipalities can model business as a non-profit and provide rates and speeds service providers cannot
- Municipal networks can deliver significantly more bandwidth and more flexible business plans



Project Process

BROADBAND MASTER PLAN





Broadband Market Assessment

RESIDENTIAL

100% COVERAGE IN SAN LEANDRO AREA

XFINITY, SONIC, AT&T, ETHERIC, HUGHES, VIASAT

- CABLE
- DSL
- FIXED WIRELESS
- SATELLITE
- FIBER IN SELECT AREAS THROUGH AT&T

FINDINGS: LIMITED SPEEDS, DATA CAPS, HIGH PRICES

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Needs Assessment Data

BUSINESS SURVEY

- *35% not familiar with LSL*
- *24% said LSL providers' prices were too high*

