CITY OF OAKLAND

FIBER-OPTIC NETWORK MASTER PLAN UPDATE

Contents

1. Introduction

1.1 2015 Fiber-Optic Network Master Plan

The design and installation of fiber-optic links to connect essential City facilities in the City of Oakland has been historically done on an as-needed basis with projects led by seperate City departments. These projects have typically not been coordinated with each other, and the result was a disjointed fiber-optic network that was not fully integrated. In 2014, the City of Oakland began work on a master plan with a vision for City-wide fiber-optic network that laid the groundwork for a strategic approach to increase City fiber-network connections, reliability and redundancy. The City of Oakland's Fiber-Optic Network Vision (April 2015) is:

> *A reliable and redundant network that provides high-speed connectivity to essential City facilities and supports future growth.*

The *City of Oakland Fiber-Optic Network Master Plan (April 2015)* documented and evaluated existing City fiber-optic infrastructure, collect information on upcoming public agency fiber-optic infrastructure within City limits, and to identify future projects consistent with the following objectives:

- Strengthen the City's IT fiber-optic network;
- Expand the capacity of the City's IT fiber-optic network;
- Integrate and connect City facilities;
- Establish System Redundancy; and,
- Position the City for strategic and methodical expansion of the network.

1.2 Fiber-Optic Network Benefits

Fiber-optic cables form the dominant backbone communications media for modern telecommunication networks. Commercially deployed since the 1970s, fiber-optic cables are a mature and stable medium with technology advances in bandwidth continuing to be made in the equipment space. Despite the current excitement regarding high-speed wireless connections (e.g. 5G), the available bandwidth for fiber-optic networks far exceeds that of any wireless media.

A city-owned fiber network provides many benefits to the City of Oakland, including the following:

- *Fast and reliable communications between city facilities* - Installing fiber-optic network between city facilities would provide the ability to quickly transfer data between facilities and support next generation communication technologies. This promotes City operations and improves important city services such as emergency response.
- *Cost-savings* – Currently the City of Oakland pays a 3rd party vendor to provide network connections between City facilities and for internet access. With its own fiber network between City facilities, the City could reduce monthly telcomm payments and consolidate internet access between various facilities.

- *Support other City initiatives* – A robust fiber communications network lays the foundation for other City projects that can benefit City operations and the community. The marginal low-cost of the additional bandwidth opens up support for a variety of other City Initiatives, such as
    - Public wi-fi network
    - Digital inclusion projects

1.3 2019 Fiber-Optic Network Master Plan Update

Since the *City of Oakland Fiber-Optic Network Master Plan* was finalized in 2015, the City of Oakland has continued to make progress on the development on its vision. This *Fiber-Optic Network Master Plan Update* provides revised locations of public agency fiber infrastructure and an update to the City's approach on the development and uses of the City's fiber-optic network. This document includes the following sections:

- 2.0 – Presents the Broadband Development Policy (attached in Appendix A), which is meant to provide guidance for future communications infrastructure development in Oakland.
- 3.0 – Summarizes Kimley-Horn's review of fiber infrastructure projects within Oakland City limits and their status.
- 4.0 – Presents the Oakland Fiber Initiative and proposes a prioritized list of city facilities that would benefit from fiber connection.

2. City of Oakland Broadband Development Policy

The 2019 *City of Oakland Fiber-Optic Network Master Plan Update* included workshops with City departments to develop City policy guidelines for broadband development, including fiber-optic infrastructure and high-speed wireless networks. The policy guidelines included defining the roles and relationships of various City departments, outside public agencies, and private companies regarding broadband infrastructure. The following City departments were included:

- Department of Information Technology
- Department of Transportation
- Department of Public Works
    - Electrical Services
    - Building/ Facility Services
    - Permits
- Department of Planning
    - Real Estate
- Department of Community and Economic Development
- Public Safety
- City Administrator Office

The following outside public agencies were included:

- City of Alameda
- City of Berkeley
- City of Emeryville (invited)
- City of Hayward
- City of San Leandro
- County of Alameda
- County of San Mateo
- AC Transit
- BART (invited)
- Caltrans
- East Bay Municipal Utility District (EBMUD)

Three workshops were held to discuss the following:

- 3rd Party Small-Cell Wireless Installations
- City of Oakland Broadband Infrastructure
- Non-City Broadband Infrastructure

Based on these workshops, the *City of Oakland Broadband Development Policy* has been developed. It is meant to guide City officials and private companies installing broadband communications equipment and infrastructure in the City. It proposes guidelines for ownership and sharing of fiber

communications infrastructure, access, and partnership with other public agencies/ private sector, as well as permitting and construction guidance. Broadband development policies include the following:

- Dig Once
- Fiber and Colocation Leasing
- Public Agency Cooperation and Partnerships
- Operations and Maintenance
- GIS Logging

The *City of Oakland Broadband Development Policy* is included as Attachment A.

3. Updated Fiber Projects in Oakland

The 2019 *City of Oakland Fiber-Optic Network Master Plan Update* included a review of the existing, planned, and proposed fiber communications infrastructure projects in Oakland that have occurred since the previous Master Plan was updated in 2015.

3.1 Existing Fiber Communications Infrastructure

Table 1 lists existing fiber communications infrastructure which has already been installed. These projects are displayed in Figures 1A and 1B.

Table 1: Existing Fiber Communications Infrastructure

Project Name	Owner (Partner)	Corridor
AC Transit Line 51	OakDOT (AC Transit)	Broadway
I-80 Integrated Corridor Management	OakDOT (Alameda CTC)	San Pablo Ave West Grand/Grand Ave MacArthur Blvd
Digital Realty Data Center Connection to City Hall	OakDOT	Broadway 3rd
Port Oakland Army Base Security System Expansion	Port of Oakland	Maritime St 14th Street UPRR
Port Security System Enhancement Alternate Connection	Port of Oakland	BART Broadway 17th St Clay St Washington St

CITY OF OAKLAND
FIBER-OPTIC NETWORK
MASTER PLAN
Figure 1A: Existing Fiber and Hubs - Full City
FINAL - June 2019

LEGEND

Minor Hubs
- Fire Station
- Library
- Microwave Tower
- Private Data Center Facility

Fiber
- Existing BART Fiber
- Existing Oakland Fiber
- Existing Port Fiber

City Hubs (* With Microwave Tower)
- CH - Oakland City Hall
- EMH - Oakland Eastmont Hub
- EOC - Oakland Emergency Operations Center*
- MSC - Oakland Maintenance Service Center*
- OAK - Oakland Airport
- OFA - Old Fire Alarm Building
- PAB - Oakland Police Administration Building*
- 150 - 150 Frank H. Ogawa Plaza*
- 250 - 250 Frank H. Ogawa Plaza

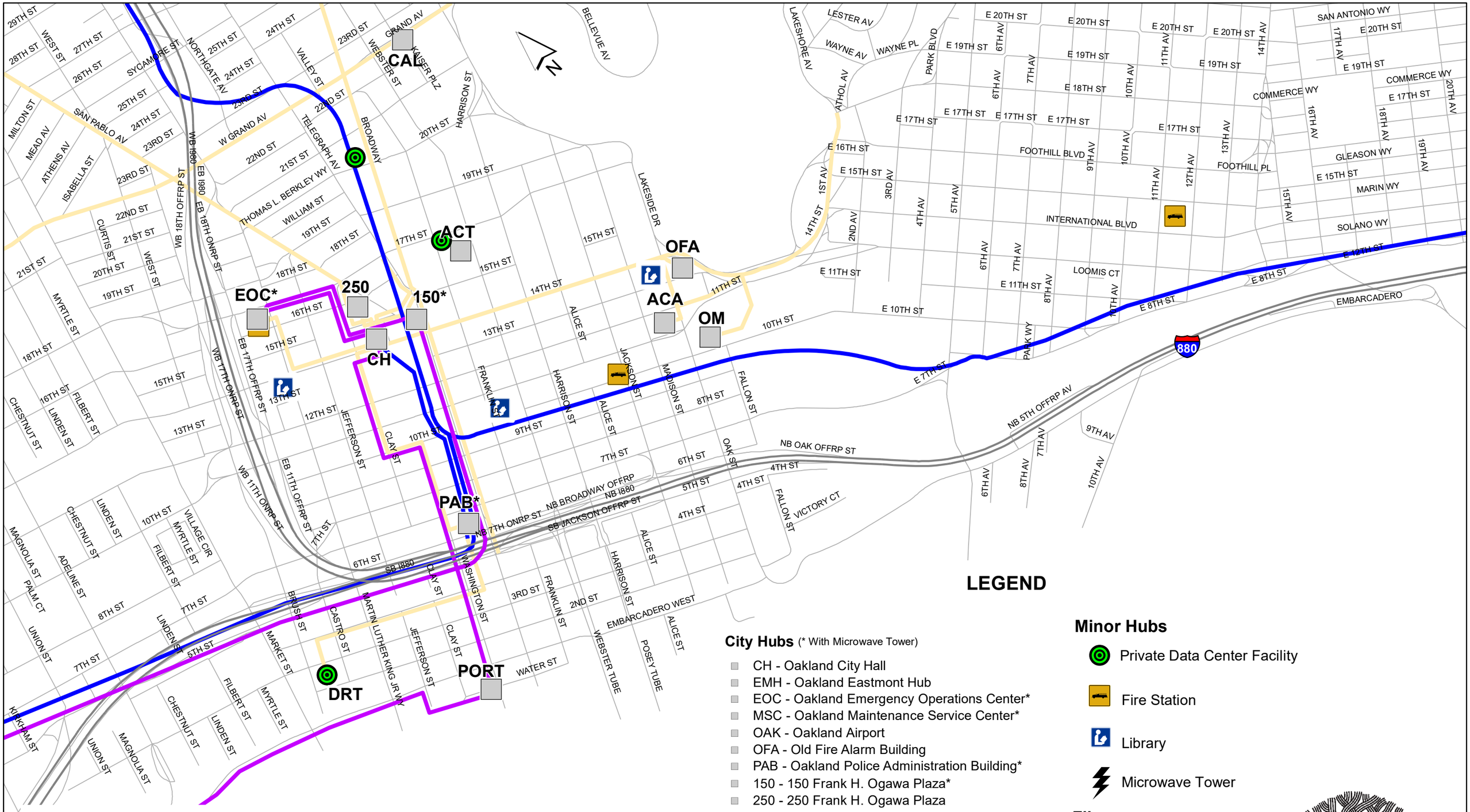
Regional Hubs
- ACA - Alameda County Administration Building
- ACT - AC Transit
- CAL - Caltrans
- OM - Oakland Museum
- PORT - Port of Oakland Offices

See Downtown Detail Figure 1B

Oakland Fiber Master Plan Pilot Project Limit

CITY OF OAKLAND

Kimley»Horn



CITY OF OAKLAND
FIBER-OPTIC NETWORK
MASTER PLAN
Figure 1B: Existing Fiber and Hubs - Downtown
FINAL - June 2019

LEGEND

City Hubs (* With Microwave Tower)

- CH - Oakland City Hall
- EMH - Oakland Eastmont Hub
- EOC - Oakland Emergency Operations Center*
- MSC - Oakland Maintenance Service Center*
- OAK - Oakland Airport
- OFA - Old Fire Alarm Building
- PAB - Oakland Police Administration Building*
- 150 - 150 Frank H. Ogawa Plaza*
- 250 - 250 Frank H. Ogawa Plaza

Regional Hubs

- ACA - Alameda County Administration Building
- ACT - AC Transit
- CAL - Caltrans
- OM - Oakland Museum
- PORT - Port of Oakland Offices

Minor Hubs

- Private Data Center Facility
- Fire Station
- Library
- Microwave Tower

Fiber

- Existing BART Fiber
- Existing Oakland Fiber
- Existing Port Fiber

CITY OF OAKLAND

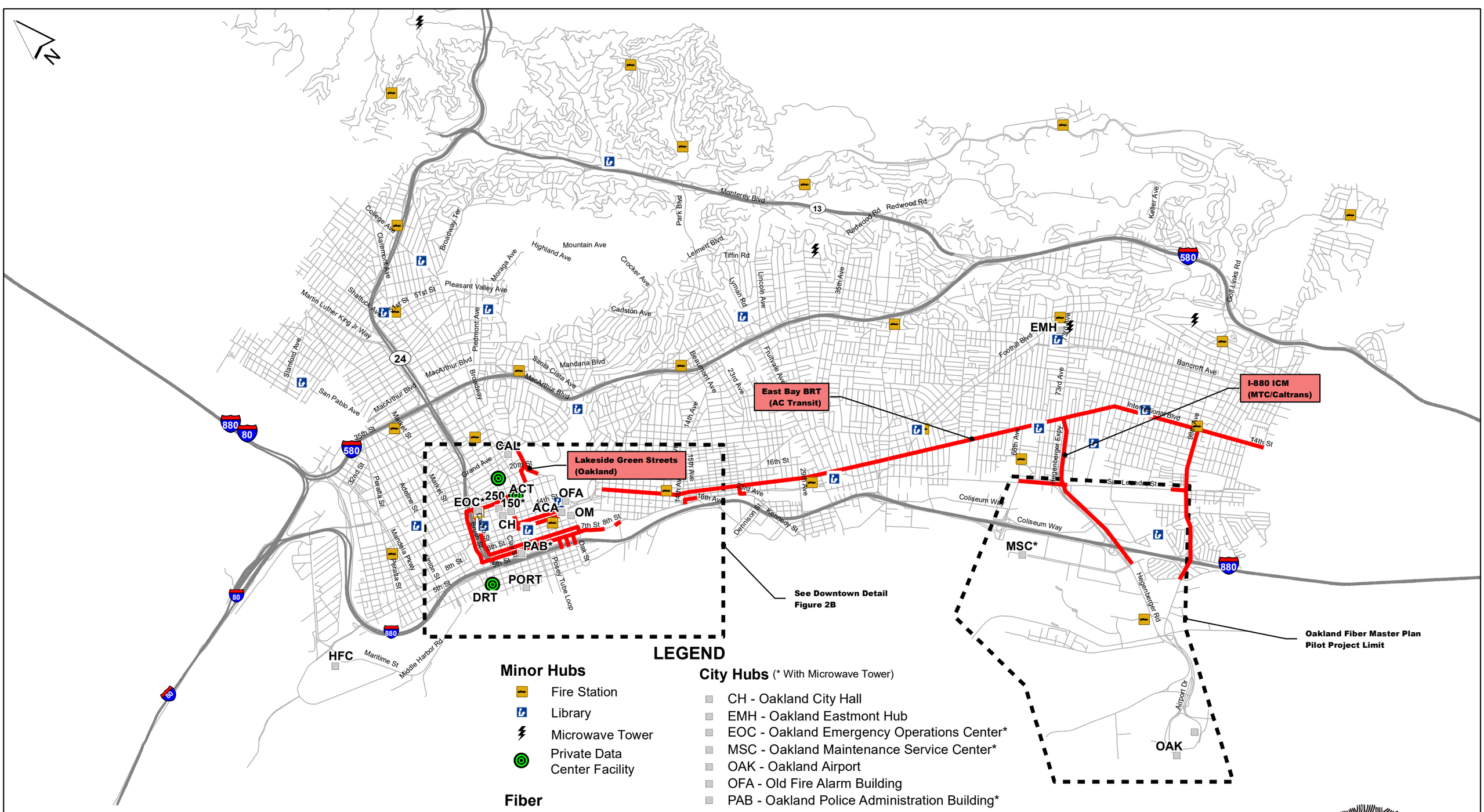
Kimley»Horn

3.2 Planned Fiber Communications Infrastructure

Table 2 lists the planned fiber communications infrastructure currently in construction. These projects are displayed in Figures 2A and 2B.

Table 2: Planned Fiber Communications Infrastructure

Project Name	Owner (Partner)	Corridor
Lakeside Green Streets *(In Construction - anticipated completion 2019)*	OakDOT	Harrison St
East Bay BRT *(In Construction - anticipated completion 2020)*	OakDOT Oakland ISD AC Transit Caltrans	International Blvd 11th St 12th St Broadway 17th St
I-880 Integrated Corridor Management *(In Construction - anticipated completion 2020)*	BAIFA (Caltrans)	98th St Hegenberger Rd 7th St 8th St Castro St Market St



CITY OF OAKLAND
FIBER-OPTIC NETWORK MASTER PLAN
Figure 2A: Planned Fiber and Hubs - Full City
FINAL - June 2019

LEGEND

Minor Hubs
- Fire Station
- Library
- Microwave Tower
- Private Data Center Facility

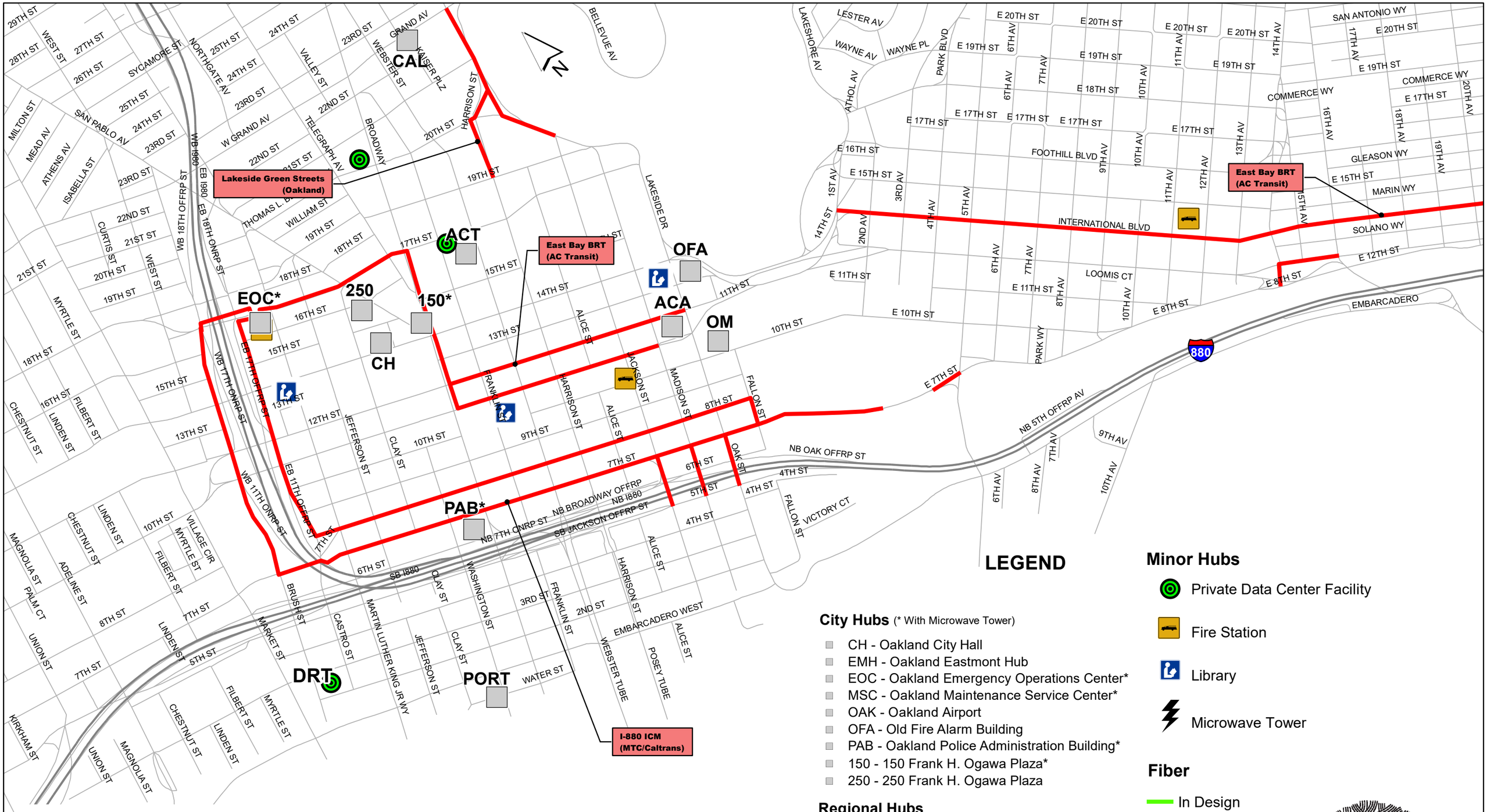
Fiber
- In Design
- In Construction

City Hubs (* With Microwave Tower)
- CH - Oakland City Hall
- EMH - Oakland Eastmont Hub
- EOC - Oakland Emergency Operations Center*
- MSC - Oakland Maintenance Service Center*
- OAK - Oakland Airport
- OFA - Old Fire Alarm Building
- PAB - Oakland Police Administration Building*
- 150 - 150 Frank H. Ogawa Plaza*
- 250 - 250 Frank H. Ogawa Plaza

Regional Hubs
- ACA - Alameda County Administration Building
- ACT - AC Transit
- CAL - Caltrans
- OM - Oakland Museum
- PORT - Port of Oakland Offices

CITY OF OAKLAND

Kimley»Horn



CITY OF OAKLAND
FIBER-OPTIC NETWORK MASTER PLAN
Figure 2B: Planned Fiber and Hubs - Downtown
FINAL - June 2019

LEGEND

City Hubs (* With Microwave Tower)

- CH - Oakland City Hall
- EMH - Oakland Eastmont Hub
- EOC - Oakland Emergency Operations Center*
- MSC - Oakland Maintenance Service Center*
- OAK - Oakland Airport
- OFA - Old Fire Alarm Building
- PAB - Oakland Police Administration Building*
- 150 - 150 Frank H. Ogawa Plaza*
- 250 - 250 Frank H. Ogawa Plaza

Regional Hubs

- ACA - Alameda County Administration Building
- ACT - AC Transit
- CAL - Caltrans
- OM - Oakland Museum
- PORT - Port of Oakland Offices

Minor Hubs

- Private Data Center Facility
- Fire Station
- Library
- Microwave Tower

Fiber

- In Design
- In Construction

CITY OF OAKLAND

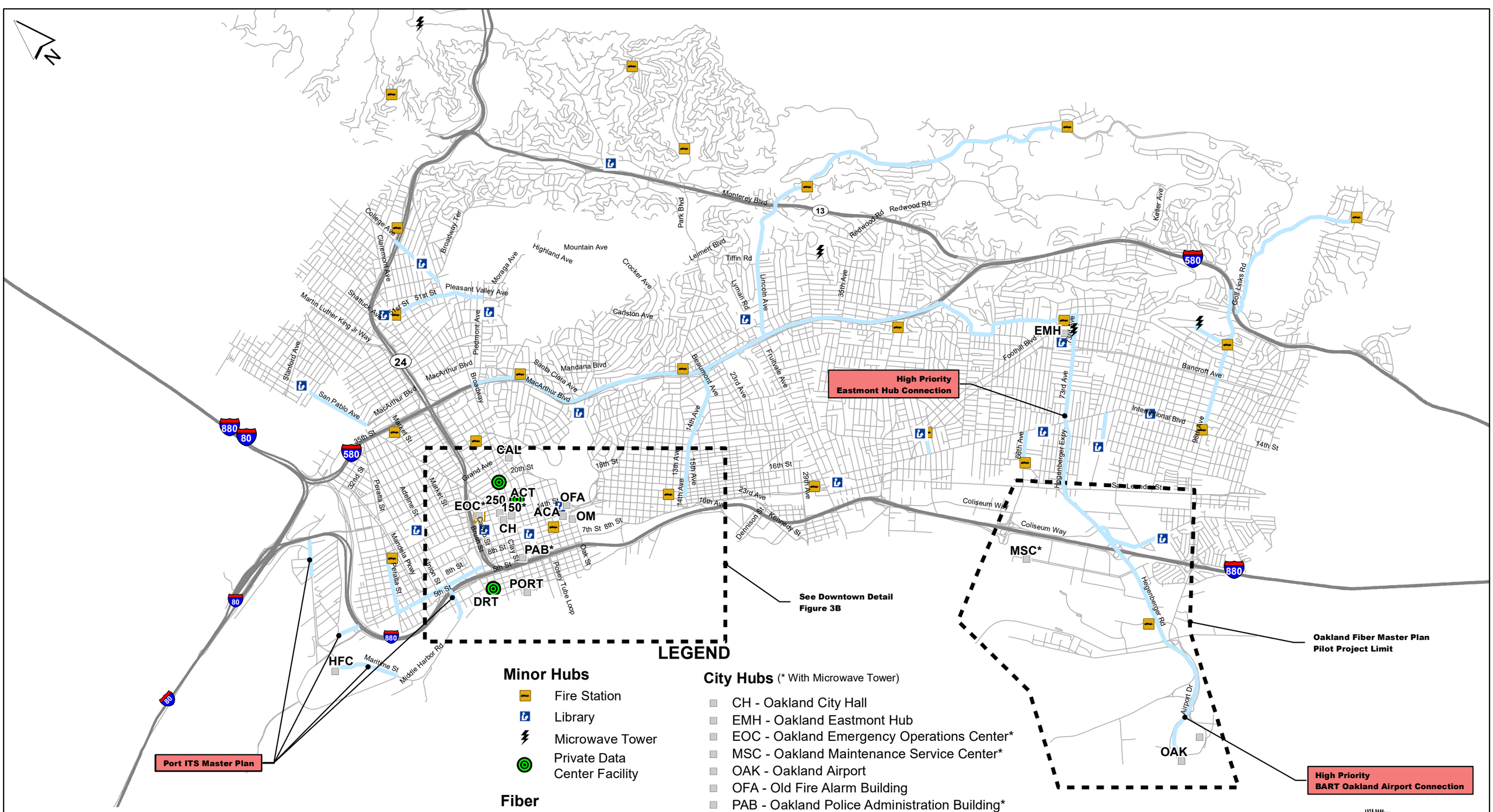
Kimley»Horn

3.3 Proposed Fiber Communications Infrastructure

Table 3 outlines the proposed fiber communications infrastructure which various agencies are considering installing in Oakland. These projects are displayed in Figures 3A and 3B.

Table 3: Proposed Fiber-Optic Infrastructure

Project Name	Owner	Corridor
BART Eastmont Hub Connection	OakDOT	Hegenberger Rd
BART Oakland Airport Connection	Port of Oakland	Hegenberger Rd
PAB Alternate Connection	Oakland ISD	7th St
Port of Oakland Freight ITS Master Plan	Port of Oakland	Maritime St 7th St Peralta St Adeline St



CITY OF OAKLAND
FIBER-OPTIC NETWORK MASTER PLAN
Figure 3A: Proposed Fiber and Hubs - Full City
FINAL - June 2019

LEGEND

Minor Hubs
- Fire Station
- Library
- Microwave Tower
- Private Data Center Facility

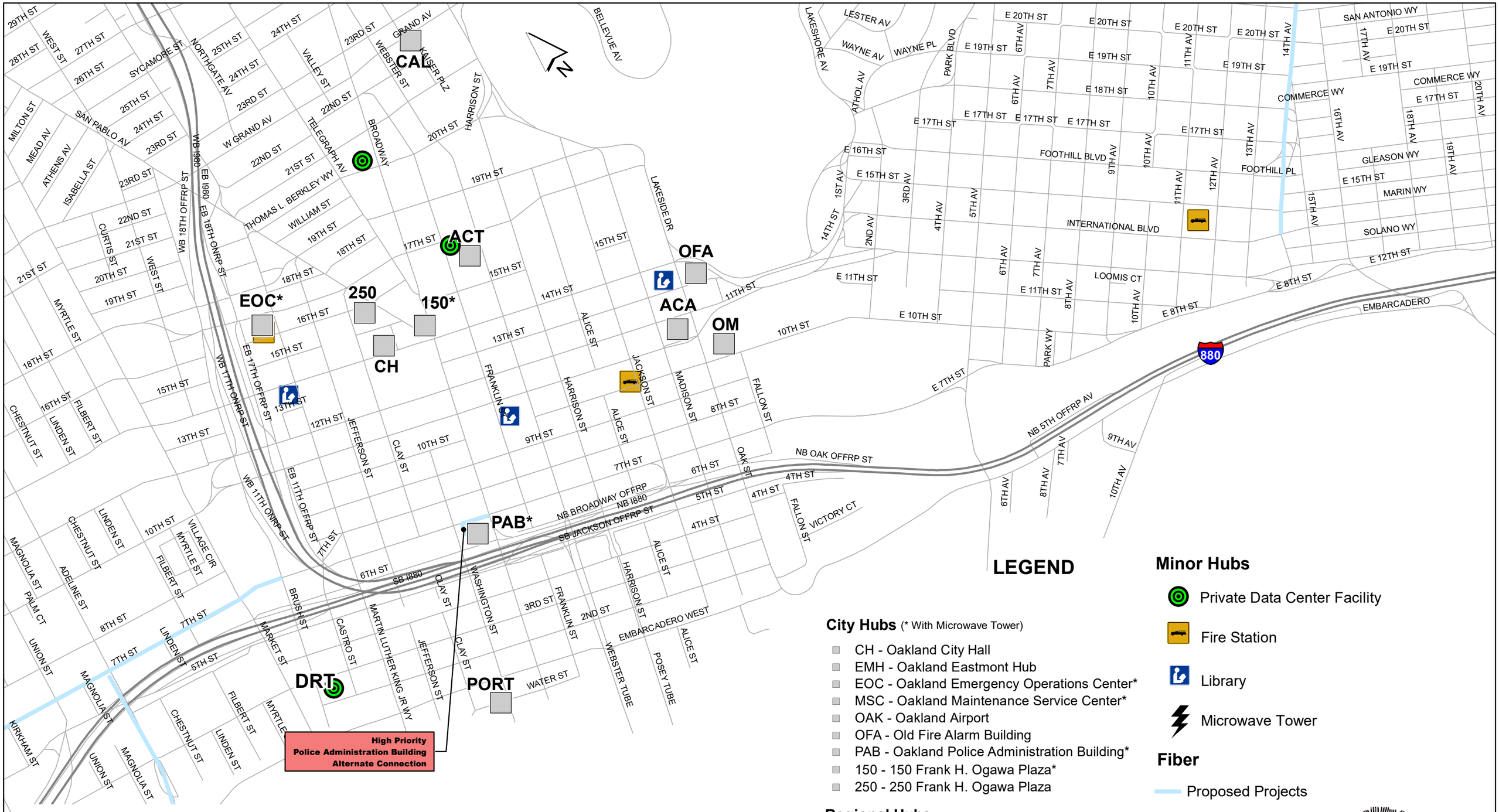
Fiber
- Proposed Projects

City Hubs (* With Microwave Tower)
- CH - Oakland City Hall
- EMH - Oakland Eastmont Hub
- EOC - Oakland Emergency Operations Center*
- MSC - Oakland Maintenance Service Center*
- OAK - Oakland Airport
- OFA - Old Fire Alarm Building
- PAB - Oakland Police Administration Building*
- 150 - 150 Frank H. Ogawa Plaza*
- 250 - 250 Frank H. Ogawa Plaza

Regional Hubs
- ACA - Alameda County Administration Building
- ACT - AC Transit
- CAL - Caltrans
- OM - Oakland Museum
- PORT - Port of Oakland Offices

CITY OF OAKLAND

Kimley»Horn



CITY OF OAKLAND
FIBER-OPTIC NETWORK MASTER PLAN
Figure 3B: Proposed Fiber and Hubs - Downtown
FINAL - June 2019

LEGEND

City Hubs (* With Microwave Tower)

- CH - Oakland City Hall
- EMH - Oakland Eastmont Hub
- EOC - Oakland Emergency Operations Center*
- MSC - Oakland Maintenance Service Center*
- OAK - Oakland Airport
- OFA - Old Fire Alarm Building
- PAB - Oakland Police Administration Building*
- 150 - 150 Frank H. Ogawa Plaza*
- 250 - 250 Frank H. Ogawa Plaza

Regional Hubs

- ACA - Alameda County Administration Building
- ACT - AC Transit
- CAL - Caltrans
- OM - Oakland Museum
- PORT - Port of Oakland Offices

Minor Hubs

- Private Data Center Facility
- Fire Station
- Library
- Microwave Tower

Fiber

- Proposed Projects

CITY OF OAKLAND

Kimley»Horn

4. Oakland Fiber Initiative Project

As part of realizing its fiber-optic network vision, the City of Oakland is exploring next steps for providing fiber connections to all City facilities. This effort has been dubbed the "Oakland Fiber Initiative" and will identify projects for further development.

As part of this effort, the 2019 *City of Oakland Fiber-Optic Network Master Plan Update* reviewed all City facilities based on the City's needs and proximity to a fiber trunklines (existing or slated for installation in the near-term). These fiber trunklines include existing City fiber, BART fiber (between Rockridge BART station and San Leandro BART station), East Bay BRT project fiber, and McArthur Smart City Corridor project fiber. The connections to each City facility was ranked into the following groups:

- Tier I – high priority location or close to existing trunkline fiber
- Tier II – moderate distance to trunkline fiber
- Tier III – far from trunkline fiber

The tiering guidelines are explained in **Table 4.**

Table 4: Project Tier Guidelines

Tier	Guidelines
I	High-Priority Location or ≤ 0.25 miles from existing fiber access point (BART/BRT)
IIA	≤ 0.25 miles from planned fiber access point (MacArthur)
IIB	0.25 - 1 miles from existing fiber access point (BART/BRT)
III	> 1 mile from existing fiber access point (BART/BRT) > 0.25 miles from planned fiber access point (MacArthur)

Planning level construction costs were estimated based on the length of their potential fiber connection.

4.1 City Facility Priorization Review

The locations and address of all City facilities were obtained from the City's GIS database. City facilities that were classified as retired, restrooms, leased, or park amenities were not considered in the prioritization process. Facilities in close proximity to one another, such as the Rainbow Road Recreation Center and the Rainbow Road Teen Center, were considered to be a single facility for tiering purposes.

High Priority Facilities

The following locations were designed by the City of Oakland ISD as high-priority locations:

- Public Works Heavy Equipment Maintenance Yard at 5050 Coliseum Way
- 911 Office at 7101 Edgewater Drive, Building 8
- Eastmont Sub Station at 2701 73rd Ave
- Shepherd Canyon Corp Yard Building #2 at 5921 Shepherd Canyon Rd

Facilities with existing fiber connections

The following city facilities have existing fiber connections to the city network and were not included in the prioritization process:

- City Hall at 1 Frank Ogawa Plaza
- Lionel J. Wilson Building at 150 Frank Ogawa Plaza
- Dalziel Building at 250 Frank Ogawa
- Fire Station #1 at 1605 Martin Luther King Jr Way
- Fire Alarm Building at 1310 Oak St
- Oakland Museum of California at 1000 Oak St
- Hall of Justice County Offices and Courts at 600 Washington St
- Hall of Justice Transportation Building at 611 Broadway
- Hall of Justice Police Administration Building at 455 7th St

The remaining city facilities were organized into tiers based on the distance from their building centroids (as generated by GIS) to fiber trunkline access points.

4.2 Project Development Assumptions

Connections for the City facilities were developed based on the following assumptions:

- Distance based on the shortest route from the facility to the fiber trunkline access point along local streets in the City of Oaklands's right of way.
- BART stations were assumed to be access points to the BART fiber network. BRT stations were assumed to have access points at each street intersection.
- Planning level construction costs were estimated based on the length of the potential fiber connection. A conservative cost estimate for furnishing and installing conduit and fiber of $100/linear foot was used. The cost to terminate fiber at a city facility is estimated to be $10,000 per connection.
- MacArthur refers to the proposed MacArthur Smart City Corridor Fiber. The MacArthur trunkline was assumed to have access points at each street intersection.
- It is not cost-effective to consider connecting Tier III facilities to the fiber trunkline because of their relatively large distance from either existing or planned fiber communications infrastructure. Fiber connections and trunkline access points are yet to be determined for the Tier III city facilities.

4.3 Oakland Fiber Initiative Project List

Table 5 shows the Oakland Fiber Initiative Tiered Project list, including assumed fiber connection length and estimated construction cost. Priority Hub locations are listed first and the remaining facilities are organized by increasing distance from fiber access point. It was not considered cost-effective to consider connecting Tier III facilities because of their relatively large distance from either existing or planned fiber communications infrastructure. Fiber connections and trunkline access points are yet to be determined for the Tier III city facilities.

Table 5: Oakland Fiber Initiative Tiered Project List

List No.	Facility	Facility Address	Tier	Fiber Connection (ft)	Construction Cost	Fiber Trunkline/Access Point
1	7101 Edgewater Dr Bldg 8 (911) **- PRIORITY HUB**	7101 Edgewater Dr	I	423	$ 52,000	City of Oakland - Hegenberger Road
2	5050 Coliseum Way (PWA Heavy Equipment Maintenance) **- PRIORITY HUB**	5050 Coliseum Way	I	2855	$ 295,000	International Blvd/BRT
3	Eastmont Sub-Station **- PRIORITY HUB**	2701 73rd Ave	I	4621	$ 472,000	International Blvd/BRT
4	Shepherd Canyon Corp Yard Bldg #2 **- PRIORITY HUB**	5921 Shepherd Canyon Rd	I	19927	$ 2,003,000	International Blvd/BRT
5	Rainbow Teen Center	5818 International Blvd	I	128	$ 23,000	International Blvd/BRT
6	Martin Luther King, Jr. Branch Library	6833 International Blvd	I	216	$ 32,000	International Blvd/BRT
7	Fire Station 04	1235 East 14th St	I	260	$ 36,000	International Blvd/BRT
8	Downtown Oakland Multipurpose Senior Center (Veteran's Memorial Hal	200 Grand Ave	I	261	$ 36,000	City of Oakland - Grand Ave
9	Fire Station 20	1401 98th Ave	I	270	$ 37,000	International Blvd/BRT
10	Sun Gate Head Start Center	2563 International Blvd	I	293	$ 39,000	International Blvd/BRT
11	Elmhurst Branch Library	1427 88th Ave	I	297	$ 40,000	International Blvd/BRT
12	Lakeview Branch Library	550 El Embarcadero	I	303	$ 40,000	City of Oakland - Grand Ave
13	Miller Branch Library (vacant)	1449 Miller Ave	I	358	$ 46,000	International Blvd/BRT
14	Columbian Gardens - Community Building		I	376	$ 48,000	City of Oakland - Hegenberger Road
15	Cesar Chavez Branch Library	3301 E 12th St	I	455	$ 56,000	International Blvd/BRT
16	Fire Station 13	1225 Derby St	I	463	$ 56,000	International Blvd/BRT
17	Mosswood Recreation Center	3612 Webster St	I	478	$ 58,000	City of Oakland - Broadway
18	West Oakland Teen Center	3233 Market St	I	530	$ 63,000	City of Oakland - San Pablo Ave
19	Franklin Recreation Center	1010 East 15th St	I	533	$ 63,000	International Blvd/BRT
20	Main Library	125 14th St	I	606	$ 71,000	International Blvd/BRT
21	Fire Station 05	934 34th St	I	640	$ 74,000	City of Oakland - San Pablo Ave
22	Franklin Plaza (maintained by adjacent restaurant)	411 19th St	I	643	$ 74,000	City of Oakland - Grand Ave
23	Telegraph Avenue Garage	22nd St & Telegraph Ave	I	665	$ 76,000	City of Oakland - Grand Ave
24	Fire Station 27	8501 Pardee Dr	I	697	$ 80,000	City of Oakland - Hegenberger Road
25	Old Fire Station	1270 93RD AVE	I	713	$ 81,000	International Blvd/BRT
26	HJ Kaiser Convention Center	10 Tenth St	I	754	$ 85,000	City of Oakland - Lower Lake Merritt
27	Fire Station 15	455 27th St	I	771	$ 87,000	City of Oakland - Broadway
28	Lakeside Park - Garden Center		I	793	$ 89,000	City of Oakland - Grand Ave
29	Asian Branch Library	388 - 9th St, #190	I	829	$ 93,000	International Blvd/BRT
30	Malonga Casquelourd Center for the Arts (Alice Arts Center)	1428 Alice St	I	859	$ 96,000	International Blvd/BRT
31	Afro-American Museum & Library	659 14th St	I	983	$ 108,000	International Blvd/BRT
32	Lakeside Park - Police Stables		I	1008	$ 111,000	City of Oakland - Grand Ave
33	Medical Hill Garage	426 29th St	I	1011	$ 111,000	City of Oakland - Broadway
34	West Oakland Branch Library	1801 Adeline St	I	1118	$ 122,000	City of Oakland - Grand Ave
35	Fremont Pool - Locker Rooms & Mechanical Room	4550 Foothill Blvd	I	1120	$ 122,000	International Blvd/BRT
36	Fire Station 12	822 Alive St	I	1144	$ 124,000	International Blvd/BRT
37	Wayne Avenue Parking Lot		I	1150	$ 125,000	City of Oakland - Lower Lake Merritt
38	Melrose Branch Library	4805 Foothill Blvd	I	1182	$ 128,000	International Blvd/BRT
39	Firehouse #18	1700 50th Ave	I	1228	$ 133,000	International Blvd/BRT
40	Animal Shelter	1101 29th Ave	I	1243	$ 134,000	International Blvd/BRT
41	Piedmont Branch Library	160 41st St	I	1260	$ 136,000	City of Oakland - Broadway
42	Fire Station 16	3600 13th Ave	IIA	104	$ 20,000	MacArthur Smart City Corridor
43	Fire Station 23	7100 Foothill Blvd	IIA	111	$ 21,000	MacArthur Smart City Corridor

List No.	Facility	Facility Address	Tier	Fiber Connection (ft)	Construction Cost	Fiber Trunkline/Access Point
44	Lakeshore/Trader Joes Parking Garage		IIA	340	$ 44,000	MacArthur Smart City Corridor
45	Dimond Branch Library	3565 Fruitvale Ave	IIA	495	$ 59,000	MacArthur Smart City Corridor
46	Live Oak Locker and Mechanical Room		IIA	526	$ 63,000	MacArthur Smart City Corridor
47	Fire Station 14	3459 Champion St	IIA	554	$ 65,000	MacArthur Smart City Corridor
48	Fire Station 17	3344 High St	IIA	990	$ 109,000	MacArthur Smart City Corridor
49	Fire Station 26	2611 98th Ave	IIA	1101	$ 120,000	MacArthur Smart City Corridor
50	Castlemont High School Swimming Pool (OUSD property)	8601 MacArthur Blvd	IIA	1346	$ 145,000	MacArthur Smart City Corridor
51	Chinese (Garden) Community Center	640 Harrision St	IIB	1396	$ 150,000	International Blvd/BRT
52	Rockridge Branch Library	5701 College Ave	IIB	1405	$ 150,000	City of Oakland - Broadway
53	Temescal Pool Locker and Mechanical Room	371 45th St	IIB	1405	$ 151,000	City of Oakland - Broadway
54	West Oakland Senior Center	1724 Adeline St	IIB	1454	$ 155,000	City of Oakland - Grand Ave
55	Sanborn (Carmen Flores) Recreation Center	1637 Fruitvale Ave	IIB	1589	$ 169,000	International Blvd/BRT
56	DeFremery Recreation Center	1651 Adeline St	IIB	1600	$ 170,000	City of Oakland - Grand Ave
57	Fire Station 29	1016 66th Ave	IIB	1826	$ 193,000	International Blvd/BRT
58	81st Avenue Branch Library	1021 81st Ave	IIB	1834	$ 193,000	International Blvd/BRT
59	FM Smith Recreation Center	1969 Park Blvd	IIB	1836	$ 194,000	City of Oakland - Lower Lake Merritt
60	Coliseum South Lot Corner Parcel	695 Hegenberger Road	IIB	1894	$ 199,000	BART - Coliseum Station
61	Willie Keyes (Poplar) Recreation Center	3131 Union St	IIB	2182	$ 228,000	City of Oakland - San Pablo Ave
62	750 50th Ave (PWA KOCB)	750 50th Ave	IIB	2208	$ 231,000	International Blvd/BRT
63	San Antonio Recreation Center	1701 East 19th St	IIB	2382	$ 248,000	International Blvd/BRT
64	Tassafargona Recreation Center	975 85th Ave	IIB	2558	$ 266,000	International Blvd/BRT
65	Jefferson Square Recreation Center	645 7th St	IIB	2697	$ 280,000	International Blvd/BRT
66	Fire Station 03	1445 14th St	IIB	2720	$ 282,000	City of Oakland - Grand Ave
67	Fire Station 08	463 51st St	IIB	2918	$ 302,000	City of Oakland - Broadway
68	Arroyo Viejo Recreation Center	7701 Krause Ave	IIB	3207	$ 331,000	International Blvd/BRT
69	Metropolitan Golf Links - Clubhouse	10505 Doolittle Dr	IIB	3251	$ 335,000	City of Oakland - Hegenberger Road
70	Fire Station 10	172 Santa Clara Ave	IIB	3345	$ 345,000	City of Oakland - Broadway
71	Temescal Branch Library	5205 Telegraph Ave	IIB	3532	$ 363,000	City of Oakland - Broadway
72	Cryer Building	1899 Dennison St	IIB	3636	$ 374,000	International Blvd/BRT
73	East Oakland Sports Center	9161 Edes Ave	IIB	3694	$ 379,000	BART - Airport at Coliseum Way
74	Fire Station 19	5776 Miles Ave	IIB	4018	$ 412,000	City of Oakland - Broadway
75	Fire Station 02		IIB	4021	$ 412,000	International Blvd/BRT
76	Ford St Bldg #1	3041 Ford St	IIB	4086	$ 419,000	International Blvd/BRT
77	Jack London Aquatic Center		IIB	4110	$ 421,000	International Blvd/BRT
78	Brookdale Recreation Center	2535 High St	IIB	4590	$ 469,000	International Blvd/BRT
79	Peralta Hacienda Park - Community Center	2500 34th Av	IIB	4660	$ 476,000	International Blvd/BRT
80	Manzanita Head Start Center	2701 22nd Ave	IIB	4869	$ 497,000	International Blvd/BRT
81	Brookfield Head Start Center	9600 Edes Ave	IIB	5024	$ 512,000	BART - Airport at Coliseum Way
82	OFD Training Center Drill Tower	250 Victory Ct	IIB	5062	$ 516,000	International Blvd/BRT
83	Union Point - South Parking Lot (haz mat under pavement)		IIB	5063	$ 516,000	International Blvd/BRT
84	Fire Station 21	13150 Skyline Blvd	III	TBD	TBD	TBD
85	Fire Station 24	5900 Shepherd Canyon Rd	III	TBD	TBD	TBD
86	Ranger Station	3590 Sanborn Dr	III	TBD	TBD	TBD
87	Fire Station 07	1006 Amito Dr	III	TBD	TBD	TBD
88	Montclair Branch Library	1687 Mountain Blvd	III	TBD	TBD	TBD
89	Allendale Recreation Cetner	3711 Suter St	III	TBD	TBD	TBD

List No.	Facility	Facility Address	Tier	Fiber Connection (ft)	Construction Cost	Fiber Trunkline/Access Point
90	North Oakland Senior Center	5714 MLK, Jr. Way	III	TBD	TBD	TBD
91	Redwood Annex Recreation Center	3731 Redwood Rd	III	TBD	TBD	TBD
92	Fire Station 06	7080 Colton Blvd	III	TBD	TBD	TBD
93	Fire Station 28	4615 Grass Valley Rd	III	TBD	TBD	TBD
94	Joaquin Miller Community Center		III	TBD	TBD	TBD
95	Davie Tennis Stadium Clubhouse	198 Oak St Piedmont	III	TBD	TBD	TBD
96	Montclair Golf Course - Clubhouse	2477 Monterey Blvd	III	TBD	TBD	TBD
97	Montclair Parking Garage		III	TBD	TBD	TBD
98	Gwin Reservoir - Communication Building	Marlborough Ter & Grizzly Peak	III	TBD	TBD	TBD
99	Lake Chabot - Maintenance Building A		III	TBD	TBD	TBD
100	Leona Lodge	4444 Mountain Blvd	III	TBD	TBD	TBD
101	Bushrod Recreation Center	560 59th St	III	TBD	TBD	TBD
102	Golden Gate Branch Library	5606 San Pablo Ave	III	TBD	TBD	TBD
103	Fire Station 25	2795 Butters Dr	III	TBD	TBD	TBD
104	Redwood Heights Recreation Center	3883 Aliso Ave	III	TBD	TBD	TBD
105	Sheffield Village Recreation Center	247 Marlow Dr	III	TBD	TBD	TBD
106	Montclair Recreation Center	6300 Moraga Ave	III	TBD	TBD	TBD
107	Lake Chabot - Clubhouse		III	TBD	TBD	TBD
108	Dimond Park - Lion's Swimming Pool	3830 Hanly Rd	III	TBD	TBD	TBD
109	Sequoyah Lodge	2666 Mountain Blvd	III	TBD	TBD	TBD
110	Montclair Parking Lot	next to 2240 Mountain	III	TBD	TBD	TBD
111	Golden Gate Recreation Center	1075 62nd St	III	TBD	TBD	TBD

CITY OF OAKLAND
MASTER PLAN UPDATE
FIBER OPTIC NETWORK
Fiber Initiative Projects - CITYWIDE
FINAL - June 2019

LEGEND

- Priority Hub
- BART Station/Fiber Access Points
- Digital Realty
- Existing Oakland Fiber
- Existing BART Fiber
- East Bay BRT International Blvd Fiber (In Construction)
- MacArthur Smart City Corridor Fiber (Future)

City Facility - Connection Tier

- Existing Fiber Connection (11)
- I (41)
- IIA (9)
- IIB (33)
- III (28)

CITY OF OAKLAND

Kimley»Horn

CITY OF OAKLAND
MASTER PLAN UPDATE
FIBER OPTIC NETWORK
Fiber Initiative Projects - DOWNTOWN
FINAL - June 2019

LEGEND

- BART Station/Fiber Access Points
- Digital Realty
- Existing Oakland Fiber
- Existing BART Fiber
- East Bay BRT International Blvd Fiber (In Construction)
- MacArthur Smart City Corridor Fiber (Future)

City Facility - Connection Tier

- Existing Fiber Connection
- I
- IIA
- IIB
- III

CITY OF OAKLAND

Kimley»Horn

Attachment A: City of Oakland Broadband Development Policy

City of Oakland
Broadband Development Policy

CITY OF OAKLAND

Final
14 December 2018

Tellus Venture Associates

Stephen A Blum
Tellus Venture Associates

www.tellusventure.com

Table of Contents

1. Broadband Policy Vision

1.1. Mission

Access to broadband service – fast, reliable, high quality links to the Internet and internal networks – is a basic competitive requirement of twenty-first century economies. It is necessary for government and businesses to operate. Ensuring access to broadband will be the defining factor in whether or not a community will be able to deliver emergency services and healthcare, prepare its students for the careers of tomorrow and support the development of living wage jobs.

Broadband is also a necessity for residents. The inability to subscribe to service due to availability or affordability leads to less access to twenty-first century opportunities and a lower standard of living.

The City of Oakland's Information Technology Department is responsible for providing this essential connectivity to all City departments. The Department manages a citywide network that requires constant upgrading to meet the ever increasing demand for broadband-enabled data and services that support all aspects of municipal operations and governance. It delivers a complex digital platform that connects Oakland residents to City services and supports civic engagement. Ensuring that all residents have equitable access to online services is fundamental to achieving this mission.

Oakland, like other California cities, has no direct role in regulating Internet service providers. Control over encroachment and land use permitting for broadband projects, particularly in the public right of way, is also limited. On the other hand, the City owns a substantial inventory of telecommunications assets, including fiber optic lines, conduit and potential wireless sites. And as a major user of telecommunications services, it has substantial market influence.

The City can implement policies that help or hinder broadband infrastructure development and competition, achieve municipal goals and objectives, and put more choices in the hands of residents and businesses. The City’s policy and program choices go beyond municipal authority, which is limited, and include opportunities to become a partner and an active participant in broadband infrastructure development initiatives.

1.2. Objectives

To achieve this goal, the Department is committed to achieving three basic objectives:

1.2.1. Deliver fast, reliable and economically efficient connectivity to all City departments, sites and programs.

1.2.2. Provide Oakland residents and businesses with rapid and reliable access to City services and the opportunity to fully participate in civic affairs.

1.2.3. Coordinate City broadband development initiatives with other public agencies and private companies, ideally as a partner.

1.3. Principles

1.3.1. Role of the Information Technology Department

The Information Technology Department is the City of Oakland's expert resource for evaluating, developing, planning, implementing and managing broadband and other telecommunications services, assets and facilities. The Department will serve as the central coordinator for broadband development across City departments and represent the City's interests with other agencies, companies and organizations when telecommunications issues are involved.

1.3.2. Coordinated use of City telecommunications facilities

City departments, including but not limited to, Information Technology, Transportation, Public Safety and the Port, own, use, purchase or otherwise maintain communications facilities. Secure, efficient and cost effective use of communications facilities is in the City's best interest. ITD will coordinate the sharing of communications facilities to the extent that secondary uses do not cause degradation or harm to the primary user.

1.3.3. Coordinated access to City assets

Likewise, the City owns assets that have telecommunications value, to the City itself as well as other public agencies and private companies. These assets are managed by the respective departments. The Information Technology Department will establish standard contractual requirements that promote the development of modern broadband infrastructure in Oakland and support the achievement of the City's broadband objectives. ITD will be the City's lead department for managing joint telecommunications projects and third party use of telecommunications assets.

1.3.4. Coordinated development of City telecommunications infrastructure

Thousands of construction projects, big and small, are initiated every year in Oakland. The City has a legitimate interest in both minimizing the impact on City-owned infrastructure and right of way and maximizing the opportunities that these projects present. The Information Technology Department will establish standard responses and processes for evaluating these opportunities when appropriate.

1.3.5. Digital inclusion

Fostering digital inclusion is vital to advance the quality of life and economic prosperity, and achieve social equity goals for Oakland residents. Consistent with availability, diligent stewardship and City needs, the Information Technology Department will coordinate the use of City telecommunications assets with City departments and other public agencies for the purpose of expanding broadband access for residents. When appropriate, the Department may facilitate such use on an incremental cost basis and will assist City departments in identifying opportunities to expand public broadband access through the use of City communications assets and third party agreements.

2. Broadband Development Policies

2.1. Dig Once

2.1.1. The City of Oakland retains the ability to establish reasonable conditions and procedures for utility companies, including telecommunications carriers, to do construction work in the public right of way. It also has discretionary authority when reviewing and approving certain kinds of proposed developments and uses, and complete authority to manage its own assets, public works and other City projects.

2.1.2. To maximize the benefits to the community of construction work within Oakland, the Information Technology Department will manage a "Dig Once" policy that has the limited objective of installing city-owned broadband conduit and/or fiber optic cables in excavations and similar construction projects when appropriate. The decision to install conduit in any given circumstance will be guided by ITD's Fiber Optic Master Plan and other identified City needs.

2.1.3. When a City department receives an application for an excavation, encroachment, use or other type of permit that involves utility infrastructure construction, road resurfacing, an excavation or similar work, it will route a copy of the application to the Information Technology Department if the project:

- Spans at least 900 feet, or
- Spans at least three blocks, or
- Traverses geographically or jurisdictionally problematic terrain, including but not limited to waterways, railroad tracks, bridges, freeways, major arterial streets, wetlands, environmentally sensitive areas, or
- Is a major development/redevelopment.

2.1.4. When a proposal is received or developed for the purpose of leasing or otherwise making a City-owned, broadband related asset available to a third party, the responsible department will notify ITD.

2.1.5. ITD will determine if installing city-owned conduit, fiber and appurtenant facilities in the project is useful and feasible, based on the Fiber Optic Master Plan or other City networking needs. If ITD does not notify the responsible department within ten working days of receiving an application or notification that such installation is necessary, then the project may proceed without city participation.

2.1.6. If ITD does provide timely notification to the responsible department that installation of city-owned conduit, fiber or other facilities is necessary, then the responsible department will notify the applicant that the City requires such installation, and a permit will not be issued until the applicant has coordinated the work with ITD.

2.1.7. Conduit, fiber and appurtenant facilities will be designed and installed according to the City's standard specifications, which will be maintained by ITD and coordinated with the departments involved.

2.1.8. For work done in conjunction with a ministerial permit issued for work in the public right of way, the City will be responsible for the incremental cost of adding conduit and appurtenant facilities to the project. “Incremental cost” includes the cost of the materials needed by the City and any additional labor costs, but does not include other allocated costs. When conduit, fiber or other facilities are deemed necessary in a development/ redevelopment project that is subject to a discretionary permit, such installation will be included as a condition of the permit, at the permittee’s cost.

2.1.9. When a City-owned asset is leased or otherwise made available to a third party for telecommunications purposes, and the project involves the installation of fiber optic cable, then the third party will be required to convey a license to the City (typically, an indefeasible right of use) for the use of 24 strands of fiber, over the full extent of the project, including segments not attached to or enclosed in City assets, as a condition of the contract. The license will be coterminous with the contract. The third party is responsible for ongoing maintenance and operations except those that relate directly to the City's use of the fiber.

2.1.10. In cases where the City has financial responsibilities, ITD will follow standard procedures for obtaining necessary budgetary approvals and allocating costs.

2.1.11. Any project proposed by a City department or other public agency that does not require a permit but otherwise meets the above criteria will be subject to the same requirements and procedures. Budgetary responsibility will be determined on a case by case basis.

2.2. Fiber and Colocation Leasing

2.2.1. It is in the City’s interest to efficiently use existing telecommunications assets, whether those assets are owned by the City, other public agencies or private companies. Cooperative networking and shared use of facilities lowers costs, reduces the burden on City streets and promotes robust and resilient networks. To that end, the City of Oakland will make City-owned telecommunications assets available to qualified public and private sector partners on an open and non-exclusive basis, consistent with its policies regarding public benefits and the Fiber Optic Master Plan.

2.2.2. The Information Technology Department is the lead department for negotiating and managing any third party leases/licenses of City-owned fiber optic strands and related colocation space. ITD is responsible for developing a standard lease/license contract and a rate card for such services (see Appendices C and D for examples).

2.2.3. ITD may accept a non-monetary trade of telecommunications assets, e.g. a fiber swap, in exchange for use of City-owned fiber or colocation facilities.

2.2.4. Only fiber strands that are surplus to the City's anticipated needs and not used for any City purpose may be leased to third parties. ITD will establish physical and logical security policies for third party use of City fiber and other facilities, but in no case will joint use of fiber strands or other network elements be allowed. Third parties will not be allowed physical or logical access to any City network elements.

2.3. Public Agency Cooperation and Partnerships

2.3.1. Public agencies in the East Bay Area, including but not limited to the County of Alameda, cities, BART, AC Transit and Caltrans, frequently have complementary telecommunications assets and needs. The City of Oakland has partnered with other public agencies on a number of projects, some of which involve the construction or acquisition of telecommunications assets, either as a primary purpose of the project or as an ancillary benefit.

2.3.2. As a general rule, agreements and other arrangements made with public agencies for installation or use of telecommunications facilities will follow the same process and be subject to the same evaluation criteria that would be applicable to a private sector organization.

2.3.3. Nevertheless, unique circumstances arise, and the Information Technology Department will pursue joint agency projects on a case by case basis. ITD will be the City's lead department for any joint project that primarily involves telecommunications facilities. If telecommunications facilities are included, or could be included, in a non-telecommunications project, then the City's lead department for the project will notify ITD. If participation in the project is consistent with the Fiber Optic Master Plan or otherwise meets City telecommunications needs, then ITD will coordinate such participation with the lead department.

2.4. Operations and Maintenance

2.4.1. When a mix of City-owned and third party assets are involved in a telecommunications project, responsibilities and roles for operation, maintenance and ongoing capital investment will be clearly delineated and incorporated by reference into applicable agreements.

2.4.2. When a City department makes use of a telecommunications asset that is the responsibility of another department, a similar delineation of responsibilities will be made.

2.4.3. A sample Operations and Maintenance responsibility matrix is in Appendix B. This matrix may be used to delineate responsibilities, and supplemented or amended as necessary.

2.5. GIS Logging

2.5.1. The Information Technology Department is responsible for maintaining a geodatabase of all City owned, leased or controlled communications assets, including but not limited to:

- Fiber optic cable.
- Conduit and appurtenant facilities.
- Towers and tower sites.
- Communications facilities and services belonging to third parties that are used by the City.
- Real estate, poles and other assets leased to third parties for telecommunications purposes.
- Third party network data provided to the City in conjunction with such leases.

2.5.2. Other telecommunications related data, such as might become available through a future electronic plans submission program or collected by other agencies or provided by telecommunications companies, will also be incorporated into this geodatabase.

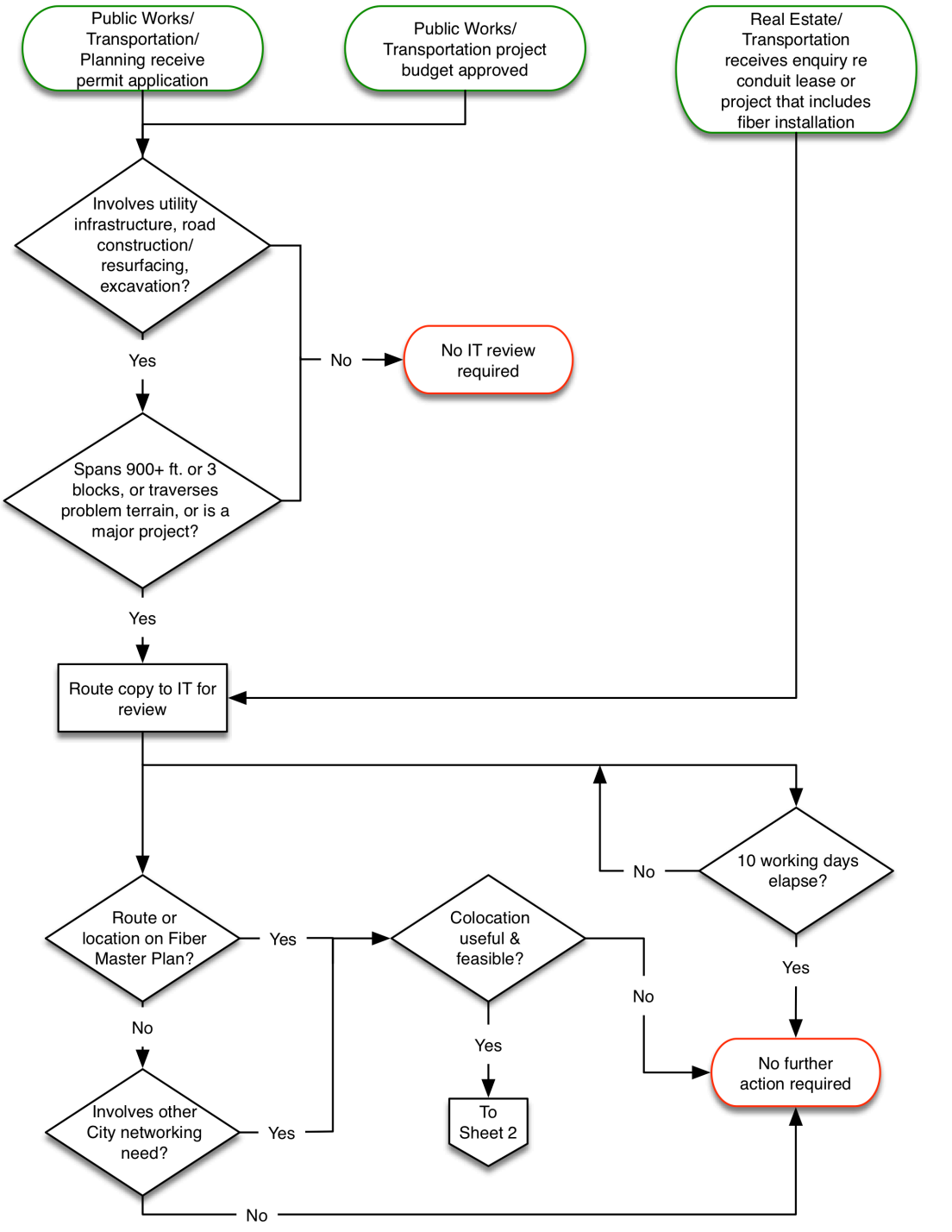
2.5.3. Upon reasonable request, City departments will provide such information to ITD in a timely manner.

2.5.4. This geodatabase will be available to all City departments in a manner consistent with City information security policy.

2.5.5. To the extent feasible, this geodatabase will include data regarding public broadband access and availability, for the purpose of identifying opportunities to foster digital inclusion and expand public broadband access.

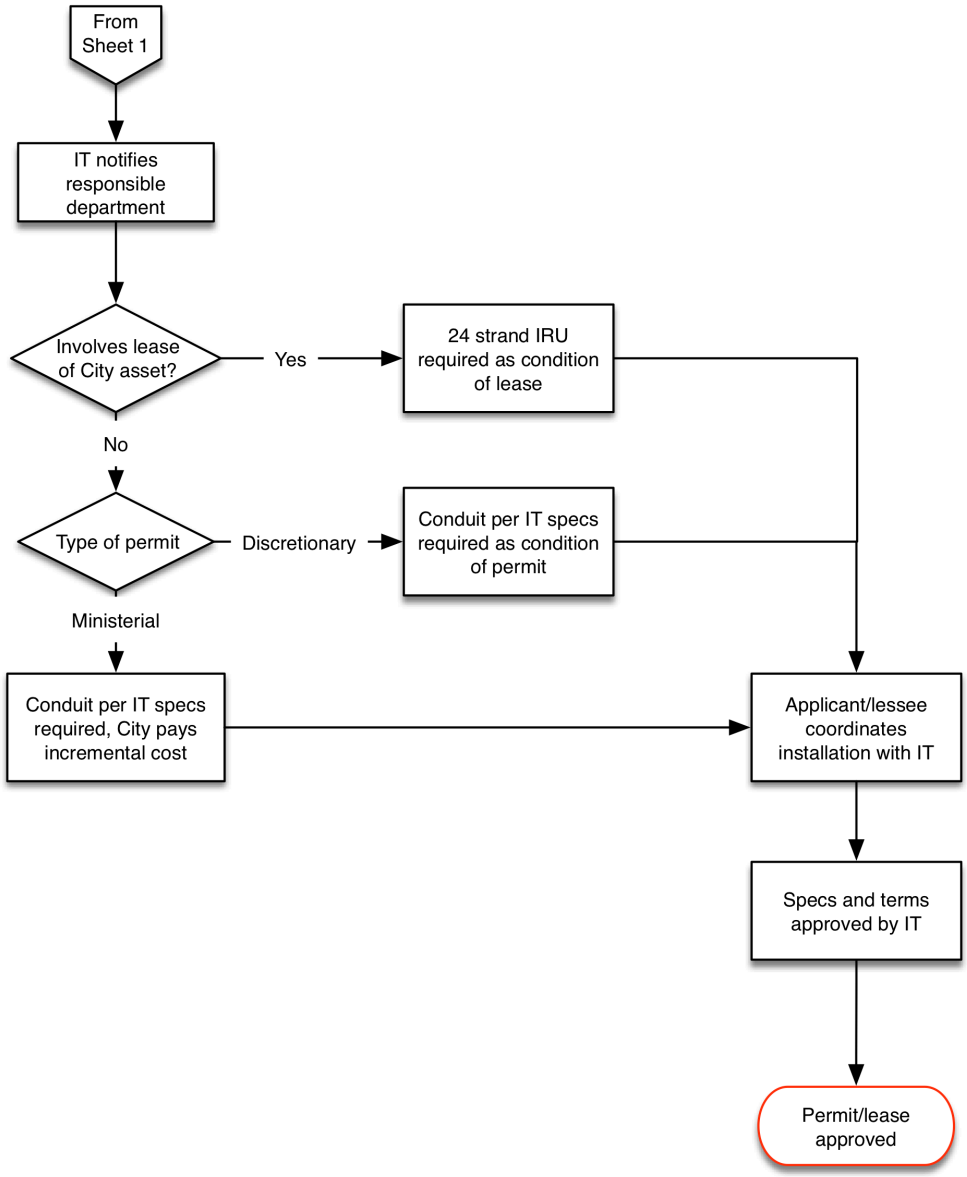
Appendix A - Broadband Policy Flowcharts

City of Oakland Dig Once Policy Flowchart



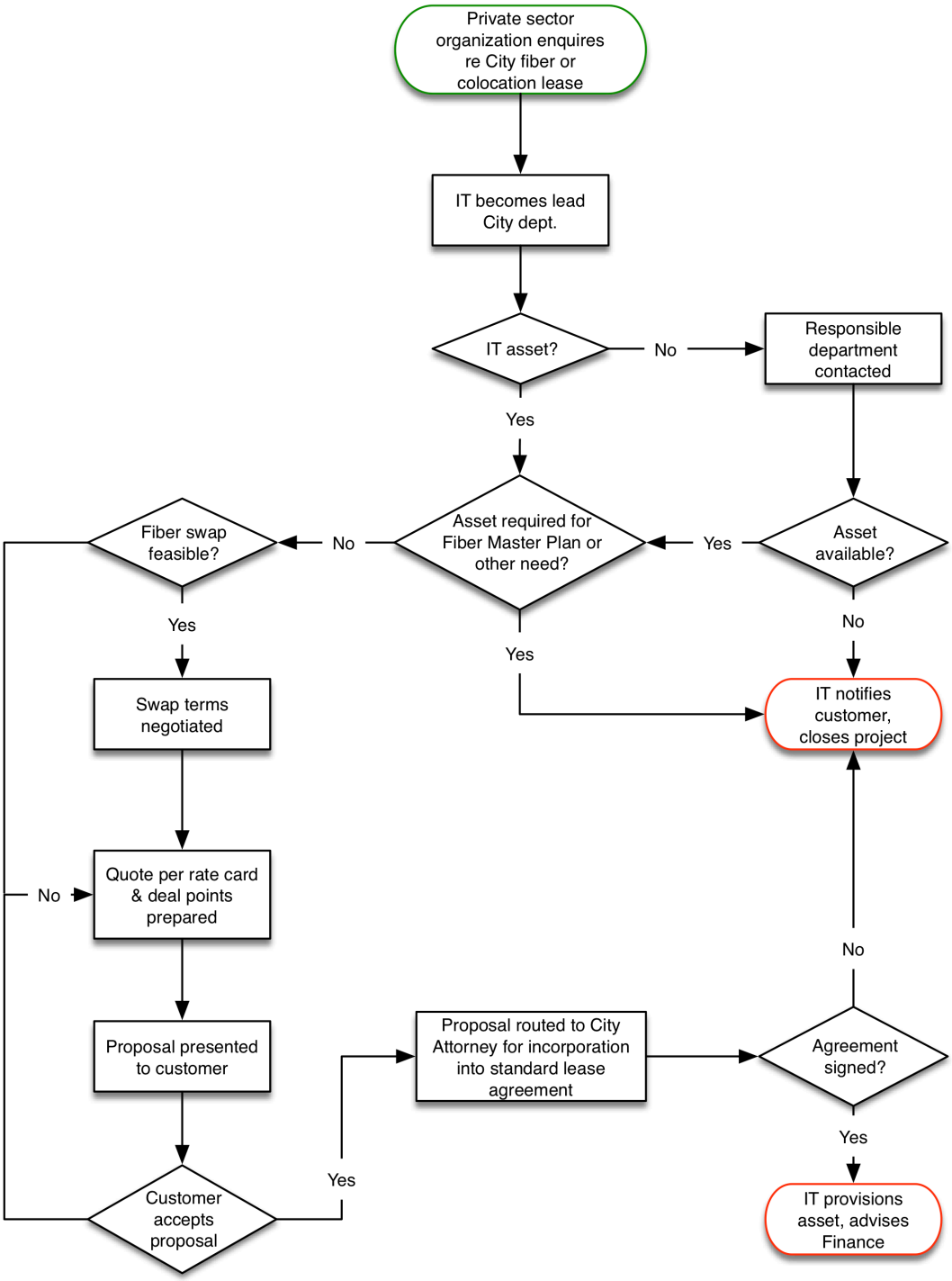
Sheet 1

City of Oakland Dig Once Policy Flowchart

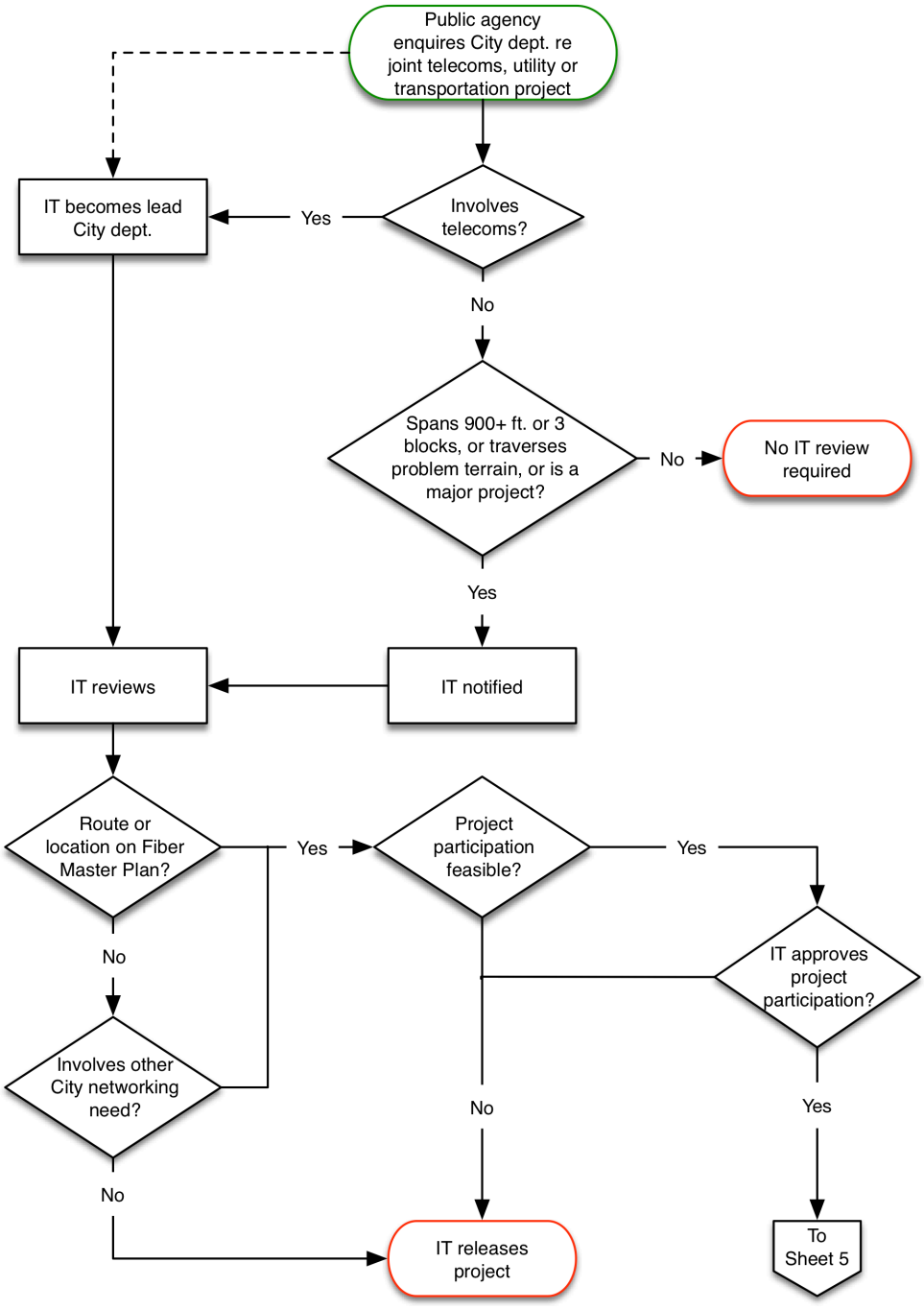


Sheet 2

City of Oakland Fiber/Colocation Leasing Policy Flowchart

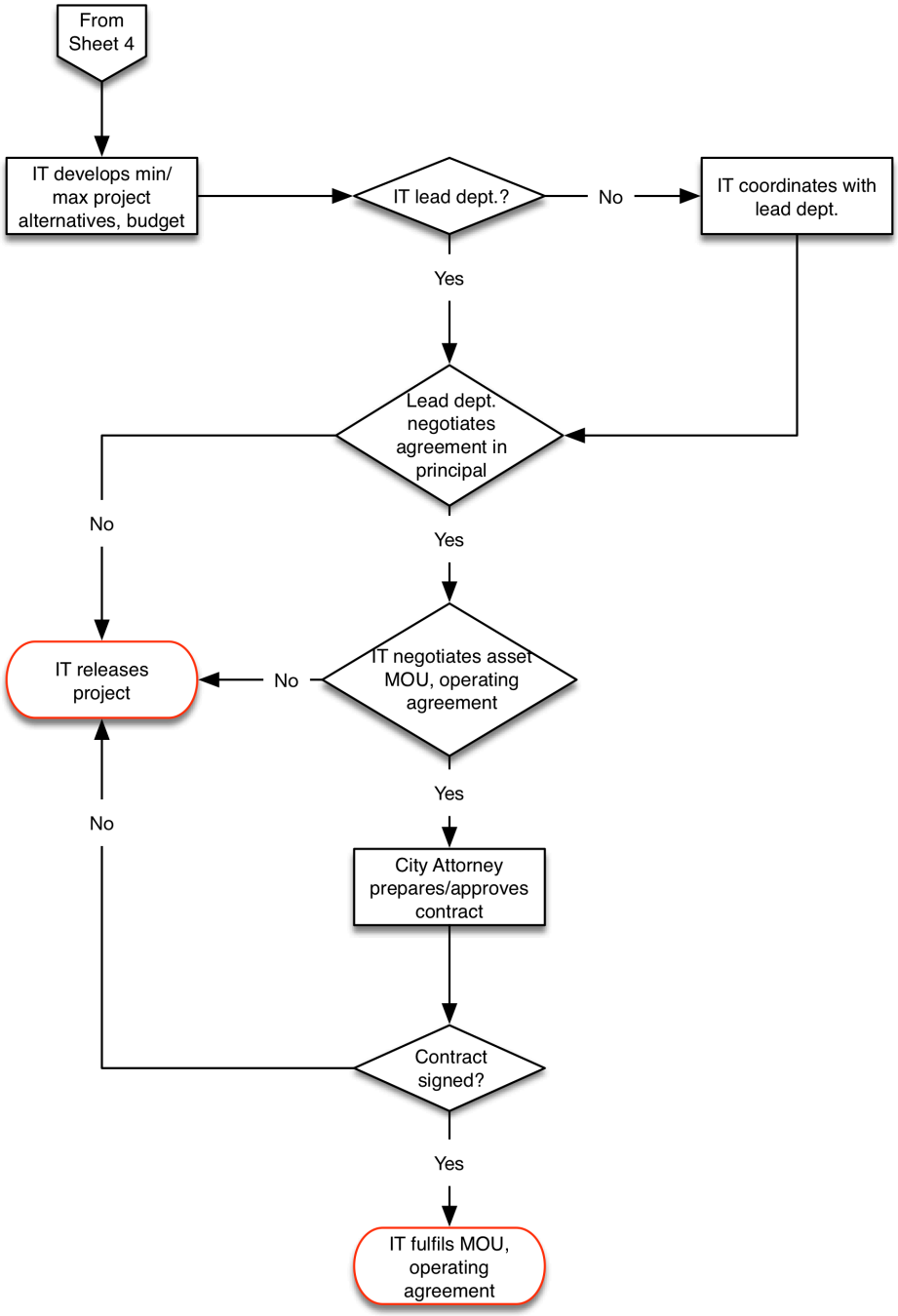


City of Oakland Public Agency Partnering Flowchart



Sheet 4

City of Oakland Public Agency Partnering Flowchart



Sheet 5

Appendix B - Sample Operations and Maintenance Matrix

Fiber Optic Network Operations Maintenance Responsibility Matrix

Facility		Ownership	Maintenance and Repair	Operation	USA Marking Responsibility	Notes
Conduit Mains	Constructed by City	City	City	City	City	Available for use by Third Party in conduits as shown in agreement
	Constructed by Third Party, attached to City conduit	City	City	City	City	Requires written consent by City. An encroachment permit does not constitute consent.
	Constructed by Third Party, not attached to City conduit	Third Party	Third Party	Third Party	Third Party	
Conduit Laterals	Constructed by City	City	City	City	City	
	Constructed by Third Party with ownership granted	Third Party	Third Party	Third Party	Third Party	
	Constructed by Third Party, no ownership granted	Property owner	Property owner	Property owner	Property owner	Third Party will assist property owner
Fiber Cable	Main Cable installed by City in City conduit	City	City	City	City	
	Main Cable installed by Third Party in City conduit	Third Party	Third Party	Third Party	City	City will mark if conduit containing cable has been accepted
	Main Cable installed by City in Third Party conduit	City	City	City	Third Party	
	Lateral Cable installed by City in City conduit	City	City	City	City	
	Lateral Cable installed by Third Party in City Conduit	Third Party	Third Party	Third Party	Third Party	City may mark at its sole discretion
	Lateral Cable installed by City in Third Party Conduit	City	City	City	Third Party	
Fiber Strands	Within cable installed by City	City	City	City	Per enclosing cable	
	Within cable installed by Third Party	Third Party	Third Party	Third Party	Per enclosing cable	
	Within cable installed by Third Party for use by City per Agreement "City Strands"	Third Party	Third Party	City	Per enclosing cable	Third Party to make all connections, City posseses under IRU
Other	Boxes Installed on City-owned Main Lines	City	City	City	City	Includes boxes where laterals connect to mains
	Boxes on Lateral Lines with ownership granted	Third Party	Third Party	Third Party	Third Party	
	Boxes on Lateral Lines, no ownership granted	Property owner	Property owner	Property owner	Property owner	Third Party will assist property owner
	City Installed Boxes	City	City	City	City	
	City Installed Splice Enclosures	City	City	City	N/A	
	Third Party Installed Splice Enclosures	Third Party	Third Party	Third Party	N/A	
	End devices (modems, termination panels, etc)					Responsibility is determined by the fiber strand connected to the device
Definitions						
Main – Conduit or cable that terminates at both end at a box or manhole within the public right of way.						
Lateral – A conduit or cable that terminates at one end in a box or manhole within the public right of way and the other end serves as a point of connection for an end device (ie modem, termination panel, etc).						

Appendix C – Fiber and Colocation Rates

Benchmark rates

Monthly lease rates for dark fiber strands were gathered from ten California agencies (nine cities and one transit district) and five agencies from out of state. California rates ranged from $100 to $425 per strand-mile per month. Out of state rates varied even 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 $194 per month when an outlier is factored out. The City of Palo Alto charges up to $425 for the first strand-mile (or fraction thereof), because businesses there often need less than a mile. The city typically adds a drop charge of up to $250, for a monthly minimum price of $675 per account.

Palo Alto also has a published rate for public agencies, which is discounted 15% from the rate charged private customers. This rate was not factored into the averages. Other agencies contacted indicated that discounts could be informally negotiated for public sector customers.

The Sacramento Regional Transit District has a three-tier rate structure, depending on the type of area. Their urban rate was used to calculate the averages, because it is a closer match with Oakland's character.

When out of state rates are factored in, the low/high averages are in the same range, $173 and $202 per month respectively.

The most commonly charged high rate in California is $200 per strand-mile per month, by Santa Clara, Watsonville, Glendale and Burbank, with Loma Linda close at $194. Low rates vary more widely, from $97 in Loma Linda to $200 in Glendale and Watsonville, including discounts offered for multiple strand leases. Loma Linda charges a flat rate of $775 per month for a strand on a full loop – they don't actually charge by the mile and don't sell partial segments. Additionally, discounts averaging in the 30% range are offered for long term contracts and/or long mileage runs.

Three agencies – Palo Alto, City of Los Angeles, City of Riverside – impose separate fees for terminations and mid-route drops and laterals, with an average of $155 to $175 per drop/lateral per mile (or fraction thereof), with up to 12 strands supported. Others sell only on a point-to-point or full network basis.

The nearly universal approach to non-recurring costs is to have the customer pay the entire cost of any new construction necessary to hook up to a city's existing network, or extend it to a new location. Charges are calculated on a cost-recovery basis, and a 15% surcharge is common (in addition to a City's standard overhead and/or indirect costs mark up). Exceptions to this practice are usually made

Table 1 - Price Benchmarks

Dark Fiber	Per strand-mile low	Per strand-mile high	Added strands	Drop - low	Drop - high	Monthly min.	Long term discount
City of Burbank	$135	$200	$175				33%
City of Glendale	$200	$200					
City of Loma Linda	$97	$194	$97			$775	
City of Los Angeles	$100	$250		$100	$100		
City of Riverside	$100	$125	$100	$150	$150		30%
City of Pasadena	$175	$250					30%
City of Palo Alto (private customers)	$250	$425	$167	$210	$250	$675	
City of Palo Alto (public agencies)	$213	$362	$142	$179	$213	$574	
City of Santa Clara	$136	$200					32%
City of Watsonville	$200	$200	$150			$660	
Sacramento RTD (urban rate)	$125	$125					
Sacramento RTD (suburban rate)	$75	$75					
Sacramento RTD (rural rate)	$60	$60					
Axia Mass Broadband (MA)	$60						
Bonneville Power Administration (WA)	$30	$45					
Frankford, KY	$300		$100				
Franklin, KY	$500		$100				
Menasha, WI	$185	$205					
California average	**$152**	**$194**		**$160**	**$178**		
National average	**$173**	**$202**					

Full Rack with Power		**Per rack unit (RU)**	
City of Shafter	$900	City of Loma Linda	$60
City of Kirkland, WA	$650	Snohomish Co., WA	$25
City of Watsonville	$775	City of Watsonville	$40
Netripid	$960	CreativeData.net	$30
Fiber.net	$850	Netripid	$40
		HostforWeb.com	$50
Muni average	**$775**	**Muni average**	**$42**
All average	**$827**	**All average**	**$41**

when a city has other objectives in mind, such as a internal need for the work or a desire to subsidize some of the work for economic or business development purposes.

There are four factors to consider when comparing prices amongst cities:

1. *Distance between customer end points*. In Palo Alto, where per mile charges are high, customers frequently lease connections of less than one mile and buy few lease connections of more than two to three miles, because of the relatively compact nature of the city. In nearby Santa Clara, where the per mile rate is much lower, customers frequently lease full loops of several miles, because the city is less dense and end points are further apart. Otherwise, the two cities have similar characteristics in terms of fiber supply and demand, and proximity to major Internet exchanges. This same relationship can be found in the range of pricing offered by the Sacramento Regional Transit District: the longer the fiber runs and the sparser the surroundings, the lower the per mile cost.

2. *Competing and complementary infrastructure*. The City of Watsonville can charge the relatively high price of $200 per mile for dark fiber because it is the only option. The same is true of Glendale and Pasadena, where there are relatively few options. On the other hand, there is a wealth of competing fiber in key areas of Santa Clara, where the per mile rate is significantly lower. Complementary infrastructure, such as the PAIX exchange in downtown Palo Alto where low cost, high bandwidth Internet connectivity is available, raises the value of municipal fiber: even if it is costly compared to fiber in other locations, the overall cost of connectivity is still low when all network elements are considered.

3. *Network complexity*. Where networks are complex, with several locations served by a single fiber account, per drop and/or lateral fees take on more significance.

4. *City goals*. Although distances in Loma Linda are relatively short and there is little or no competing fiber supply, the city charges comparatively low rates for its fiber because it sees it as an economic development driver. A similar choice was made in San Leandro, where the city decided to forgo immediate lease revenue for its conduit system because the economic development gain was perceived – correctly, as it turned out – to be much greater.

Data center services are less commonly offered on a commercial basis by public agencies, but the prices charged tend to fall in line with industry averages. OpticAccess pays $900 per month for a full rack with power in Shafter, and Kirkland, WA sells the same for $650 per month to other public agencies. Industry prices for a full rack typically range from $800 to $1,000 per month, but since it is a competitive business many exceptions can be found. Rates for one rack unit with power range from $25 per month in Snohomish County, WA to $60 per month in Loma Linda, with the overall industry average around $40 per month.

Sample rate card

The City of Oakland could, for example, adopt a standard rate card for private sector customers that includes a base monthly strand-mile rate and discounts offered for long term contracts and high volume usage. The cost would remain as originally contracted for the duration of the term. If a contract contained a provision for at-will cancellation, term discounts and price guarantees would not apply.

Because the City of Oakland does not yet operate a contiguous municipal fiber network, fiber leases will be for ad hoc segments. A separate per drop/per lateral charge would add unnecessary complexity. The sample rates have been adjusted to include an allowance for end points.

By charging a lower incremental price to customers who lease more than the average number of strand-miles, the City of Oakland would encourage the development of larger subnetworks, which in turn will lead to greater drop/lateral revenue and overall increased usage due to the network effect. As a general rule, the longer the network and the more connections it has, the more valuable it is. Networks grow, in extent and value, as more users join it.

Under this scenario, Oakland might charge $250 each for the first ten strand miles and $175 thereafter, with a 20% discount for contracts of 20 years or more.

Colocation agreements will likely be uncommon, and arise out of unique circumstances. The City of Oakland could, for example, set a standard colocation charge at the high end of the range, with the understanding that this rate might be modified.

Table 2 - City of Oakland sample fiber and colocation rate card

	Per Month	Notes
Strand-mile, first ten strand-miles	$250	1 strand-mile minimum charge per segment, thereafter by tenth of mile
Strand-mile, additional strand-miles	$175	By tenth of mile
Full rack in Civic Center	$1,000	20 amps nominal usage
1 rack unit in Civic Center	$60	5 amps nominal usage
Additional Terms		
Discount for 10 year minimum term	30%	California municipal average
Installation, construction, other non-recurring costs		Cost recovery plus 15%

Lease agreements

The City of Oakland has a template for the lease of telecommunications assets, which was used to draft an agreement with ExteNet Systems. With appropriate modifications, this template may also be used for fiber leases and colocation agreements.

Appendix D – Wireless Site Policy

Development of wireless facilities, particularly those designed to support mobile broadband services, is necessary to meet increasing consumer demand and because construction of mobile infrastructure also requires additional investment in the fiber optic networks that support it. On the other hand, the City has a stewardship responsibility regarding environmental regulations, other community standards, and the use of the public right of way. Recent changes in state law and federal regulations has made exercising this responsibility problematic, and could require adjustments to City policy and procedures in the near term.

As of this date, there is one pending matter which could radically change the City's ability to manage wireless permits: the Federal Communication Commission's *Declaratory Ruling and Third Report and Order*, dated 26 September 2018, regarding wireless infrastructure. It is being challenged in federal court by dozens of local agencies, and a preliminary decision regarding a stay is expected before its effective date of 14 January 2019. The City will need to adjust its policy quickly as decisions are reached on this matter, in order to protect its interests.

FCC 2018 Ruling

AT&T, Verizon, T-Mobile and Sprint have been continually upgrading their mobile networks since the iPhone was introduced in 2007, to support the rapidly growing demand for broadband service. By one estimate, average monthly usage will increase from 7 gigabytes per month in 2017 to 48 gigabytes in 2023[1]. Third-party studies indicate that these mobile carriers are struggling to keep up with this rising demand[2].

Consequently, carriers are beginning to upgrade their networks to a fifth generation of mobile technology (5G), to supplement, and eventually replace, their existing 3G and 4G networks. This upgrade has two elements: newer and better technology, and the replacement of traditional "macro" cell sites, which serve large areas, with many "small" cell sites that cover limited areas, perhaps as small as a city block. One macro cell site might be replaced with 10 or even 100 small cell sites. This process is called "network densification". It will be expensive for carriers to build and maintain these sites, and they are pursuing every available avenue to reduce the cost and time involved.

Two of the ways that they can speed up and reduce cost of 5G network upgrades is to 1. streamline local permit processes, and 2. use existing infrastructure, such as utility and streetlight poles, wherever possible. To simplify this job, the carriers prefer to work on municipal permit and property policy at the federal and state level.

Since 2009, the Federal Communications Commission, backed by Congress, has progressively limited local government discretion over wireless facility permitting decisions. In 2015, the California legislature approved assembly bill 57, which endorsed the FCC's two "shot clocks" for permit

[1] *Ericsson Mobility Report*, November 2017.

[2] AT&T, Verizon still feeling the pain of unlimited, but 4G speeds have begun recovering, *OpenSignal Insights*, January 17, 2018.

decisions – 150 days for new facilities and 90 days for attachments to existing ones – and established a "deemed approved" remedy if those deadlines are missed.

In theory, if a city takes too long to issue a final approval or denial of all the necessary permit applications for a wireless facility, the applicant can simply declare that it is deemed approved per AB57, and begin construction. As far as we know, carriers haven't acted on this right yet, but they have successfully used it as leverage in negotiations with some California cities.

Last year, the California legislature passed senate bill 649, which would have imposed further limits on local permit authority, and required cities to, in effect, lease some kinds of municipal property, such as streetlight poles, to carriers on demand, at an artificially low lease rate of approximately $275 per pole per year. Governor Brown vetoed SB649, saying he favored "a more balanced solution"[3].

In 2018, the mobile carriers and the infrastructure companies that build and, sometimes, operate their cell sites, turned their attention to the FCC. The result was a declaratory ruling[4] that set even tighter limits on local permit requirements for "small wireless facilities", shortened shot clocks for new and existing facilities to 60 days and 90 days, respectively, and declared that local governments do not have proprietary rights over certain municipal property located in the public right of way (ROW), such as streetlight poles and traffic signals.

According to the FCC, such assets are to be managed as if they were part of the ROW. In California, that means that local governments can determine the time, place and manner of any work proposed by a wireless carrier or one of their vendors, but can't prohibit it or otherwise regulate it. The FCC also set cost-based "safe harbor" limits for fees: a lease rate of $270 per pole per year, and $500 in total for all permits required for up to five sites.

The FCC's annual lease fee limit is substantially below the average lease rate for municipal light poles in California, which is around $1,000 per month, and the typical lease rate for cities in Bay Area counties, which is $1,500 per month.

This ruling is scheduled to take effect on January 15, 2019, with an extra 90 days granted for cities to develop aesthetic standards that "are (1) reasonable, (2) no more burdensome than those applied to other types of infrastructure deployments, and (3) objective and published in advance". Dozens of cities, counties and associations have challenged this ruling, and the appeals are presently being heard in the federal tenth circuit court of appeals in Denver. The core basis for the ruling is a 1996 federal law that provides that "no State or local statute or regulation, or other State or local legal requirement, may prohibit or have the effect of prohibiting the ability of any entity to provide any interstate or intrastate telecommunications service"[5].

---

[3] Governor Jerry Brown, SB649 veto message, October 15, 2017.

[4] *Declaratory ruling, and third report and order, in the matter of Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment*, Federal Communications Commission, published in the Federal Register on October 15, 2018.

[5] 47 U.S.C. § 253(a).

Analysis of FCC 2018 Ruling

The FCC's 2018 ruling is advisory. The FCC has no direct authority over state and local government land use or property management policy. The 2018 ruling is intended to provide a basis for lawsuits by carriers and infrastructure companies, and guidance for courts to use in deciding those cases. Unlike the FCC's 2009 ruling which first established shot clocks for wireless facility permit reviews, it has not been incorporated into California statutes.

Nevertheless, it is prudent to plan for a worst-case outcome. The presumed effective date of 14 January 2019 does not allow for lengthy deliberations or consultations.

The ruling will have a negative fiscal impact on cities. Presently, cities are allowed – indeed, required under the California constitution – to charge market rates for private, for-profit use of municipal property. If lease rates for city-owned poles are capped at an artificially low level, as the FCC ruling intends, cities will lose a significant amount of revenue. For example, if the FCC's $270 fee replaces the current market rate of $1,500 per year, and a city leases 100 poles to carriers, then the annual loss will be $123,000.

California law offers an alternative safe harbor for fees. The FCC ruling declares that fees must be "fair and reasonable", "competitively neutral and nondiscriminatory", and "a reasonable approximation of costs". Proposition 26, passed by California voters in 2010, already requires city fees to be cost-based. To implement this law, most California cities have established a process to determined fees based on costs. This process may be used to set permit fees for wireless facility applications and, if need be, for annual lease rates for city-owned assets.

Where applicable, mobile carriers will rely on AB57 instead of the ruling. In the 2018 ruling, the FCC specifically declined to give carriers a "deemed granted" remedy when shot clocks expire. California's "deemed approved" language grants permits automatically. It will be faster and less expensive for carriers to rely on AB57, than to sue cities based on the guidance in the 2018 ruling.

California law and regulations allow mobile carriers to install poles and other equipment in the ROW. A mobile carrier has the same right to install facilities in the ROW as a wireline telephone company or an electric utility. On the one hand, if mobile carriers cannot use city assets, then they may install their own utility poles, even in areas where other utilities have been relocated underground. On the other hand, the fact that this option exists in California will weaken any claim that an inability to use municipal property will illegally "prohibit or have the effect of prohibiting" broadband infrastructure deployment.

The intent of the FCC ruling is to give mobile carriers preemptory rights over streetlight poles. One interpretation of the ruling, favored by mobile carriers, is that they only need to apply for a ministerial encroachment permit to attach equipment to a city-owned pole (which is defined as an existing facility by the ruling). Accordingly, if the permit isn't either granted, or denied within the limited scope offered by the decision, within 60 days, the carrier would be entitled to attach its equipment, and submit an annual check for $270 as payment.

The "no more burdensome" standard can be applied on an asset-specific basis. The FCC's ruling does not require local governments to use the same standards, aesthetic or otherwise, for streetlight poles and utility poles, for example. The fact that an electric company may install an unsightly transformer on a utility pole does not give a mobile carrier the right to attach equally unsightly equipment on a streetlight pole. However, any standard established for streetlight poles or other specific types of municipal assets must be applied to all utility infrastructure, and not just to wireless facilities.

To meet state and federal deadlines, application requirements and review processes must be clearly defined. Cities retain considerable scope in determining whether to accept a permit application as sufficiently complete. Once the application is accepted, however, the shot clock begins running with limiting opportunities to pause it. The FCC ruling also requires review standards to be clear, reasonable and stated in writing.

A master license agreement is a fair and reasonable prerequisite for a permit application. The FCC ruling does not relieve the City of its obligations to protect public safety, maintain community aesthetic standards, insure against potential liabilities or provide clear operational processes to employees, tenants and the public. A master license agreement that delineates construction and mechanical standards, aesthetic standards, insurance requirements and general procedures is an efficient and transparent method of meeting these obligations.

City policy must establish an appeals process that can be completed within state or federal deadlines. The FCC shot clocks, including the ones subject to the "deemed approved" remedies in AB57, refer to "final action" regarding a permit application. This term is usually interpreted to mean that all appeals of administrative decisions have been exhausted. In some cities, this process might involve appeals to a city commission, such as the planning commission, and the city council, with lengthy filing windows. Unless these processes are streamlined, it will not be possible for an action regarding a wireless facility to be finalized within 60 days or 90 days.

Mobile carriers will increasingly assert what they believe to be their rights. Many cities in California are receiving a greater number of wireless facility permit applications and requests to attach equipment to municipal property. As 5G deployment programs are rolled out in 2019, this activity will increase. Carriers have signaled that they intend to exercise the rights they believe the FCC granted them, and their rights under California law. In doing so, they have the firm support of the federal government, and general backing in Sacramento.

A more thorough discussion of current constraints, prior to the FCC's 2018 decision, is below. Policy options include:

1. **Review Municipal Code to enable decisions within allowable time frames.**
   Current state and federal policy establishes 60, 90 and 150 day shot clocks, often with deemed granted or deemed approved provisions upon expiration. As a practical matter, the California shot clock rules (AB 57) will govern because they allow permit applicants a deemed approved remedy.

2. **Allow administrative denials for any pertinent reason during review process.**
   For example, allow an administrative denial during the design permit review for reasons pertinent to use and encroachment permit reviews.

3. **Establish a presumption that the 150-day shot clock applies.**
   Any application for a location that doesn't already support wireless facilities would automatically be subject to the AB 57 150-day clock. It would be up to applicants to demonstrate otherwise, and failure to provide the necessary information would be grounds for either denial or immediate "tolling".

4. **Develop City's position regarding "deemed approved" claims.**
   Will the City routinely challenge the presumption in court? Will it demand that the applicant obtain a court order confirming the presumption (and use its enforcement powers if the applicant refuses)? Will it concede the point but still require the applicant to follow City policies and conditions? If so, what are those policies and conditions?

5. **Develop a comprehensive checklist for a wireless facilities application.**
   The City has a limited ability to stop the shot clock in order to ask for additional information, however it can deny applications on the basis of incomplete information. A checklist provides staff with a clear guide for preliminary review and protects the due process rights of applicants.

6. **Address all possible issues in a standard initial design permit application.**
7. **Require photo simulations of maximum possible future build out.**
8. **Confirm that current or future modifications will not "defeat concealment".**
9. **Require full documentation of all previous permits for existing facilities.**
10. **Require all CEQA-related studies to be completed.**
    Include all possible questions, documentation, other city departments/outside agency approvals, etc., as a standard requirement of an initial design permit application.

    In particular, applications should include all information required for use and encroachment permits or other approvals by other City departments to demonstrate compliance "with generally applicable building, structural, electrical, and safety codes and with other laws codifying objective standards reasonably related to health and safety".

    Applications should contain descriptions of the facilities, including photo simulations, as currently designed and as potentially modified as permitted by federal rules (e.g., 20 feet higher and 20 feet wider in all directions), and provide evidence, including blueprints and photo simulations, that shows that proposed modifications to existing facilities will not "defeat concealment" and that new facilities will be able to support concealment even if later modified under federal rules. Full documentation regarding all previous permits for

existing facilities should be required, in order to determine that a collocation/modification complies "with conditions associated with the prior approval".

Completed CEQA studies should particularly include any seasonal-dependent biological assessments.

11. **Establish expedited process for applications that conform to standards.**
12. **Adopt reference designs and specifications for cell site placement.**
13. **Adopt preferred specifications for streetlight mounted wireless facilities.**
14. **Adopt preferred specifications for equipment mounted on utility poles.**

The City can offer the carrot of a short form application and/or expedited processing for projects that involve standard, pre-approved cell site designs and equipment.

Over time, detailed specifications for what is and isn't acceptable could be developed either by the city or others, but in the short term a city could establish a process for approving reference designs submitted by either carriers or equipment manufacturers.

As a general and quickly implementable policy, a city can encourage the organization of applications such that generic, non-proprietary information – manufacturer's specifications or a particular landscaping scheme, for example – is presented separately in a standardized format. Once the application has been approved, the generic elements can be published on the city's website as an example of an acceptable solution. Those elements could either be downloaded and included "as is" in subsequent applications by anyone – allowing virtually instant review by the city – or modified to the minimum extent necessary for faster review. This process could speed up review of multiple applications by a single carrier, and in the long run it could simplify the process for everyone.

Other fast track considerations could include locating facilities in the ROW on busier or wider streets in commercial and industrial areas, rather than in residential neighborhoods, or when set back a certain distance from residential properties.

Wireless facilities permitting in California

1. Constraints on local agency discretion

As of 1 January 2016, permit applications for wireless facilities within California have to be approved or denied by local governments within specific time frames, commonly referred to as "shot clocks". If the clock runs out, the application is "deemed approved". The new rules are the combined result of a new California state law – Assembly Bill 57 – which took effect in January, two FCC decisions (and subsequent affirming decisions from federal appeals courts), existing California public utilities law and a California Public Utilities Commission rulemaking.

Depending on the type of facility and location involved, the applicable shot clock could be 60, 90 or 150 days. The clock begins running when the application is submitted. The City of Oakland has 30 days to review the application and request additional information. In that case, the clock is tolled –

stops – but starts again when the applicant responds. Additional requests for information are allowed under stricter limits and will toll the clock, but a response by the applicant starts it running again.

The only other ways to toll the clock is by mutual consent, or by approving or denying the application. It will not stop due to CEQA review, public hearing requirements, council meeting schedules or any other local agency process requirement. If the City has not approved or denied the application when the clock runs out, it is "deemed approved". The applicant must notify the City that it is proceeding with construction on that basis and the City has 30 days to file a lawsuit seeking to block it.

There are three primary methods the City can use to maintain control of the process:

- Front load the application process by requiring a comprehensive submission (backed up by a standard checklist), covering all contingencies from the very beginning.
- Structure the review process so that a legitimate administrative denial can be quickly issued if appropriate.
- Adopt a short form application and review process for pre-approved, standard solutions for wireless facilities, to encourage applicants to voluntarily choose appropriate designs and locations.

2. Determining which shot clock applies

The wireless permit "shot clock" rules that went into effect last year result in three different shot clock limits (60, 90 and 150 days), and California law (including a California Public Utilities Commission rulemaking, 14-05-001) creates two different classes of wireless facilities: construction by a mobile carrier in the public right of way and everything else.

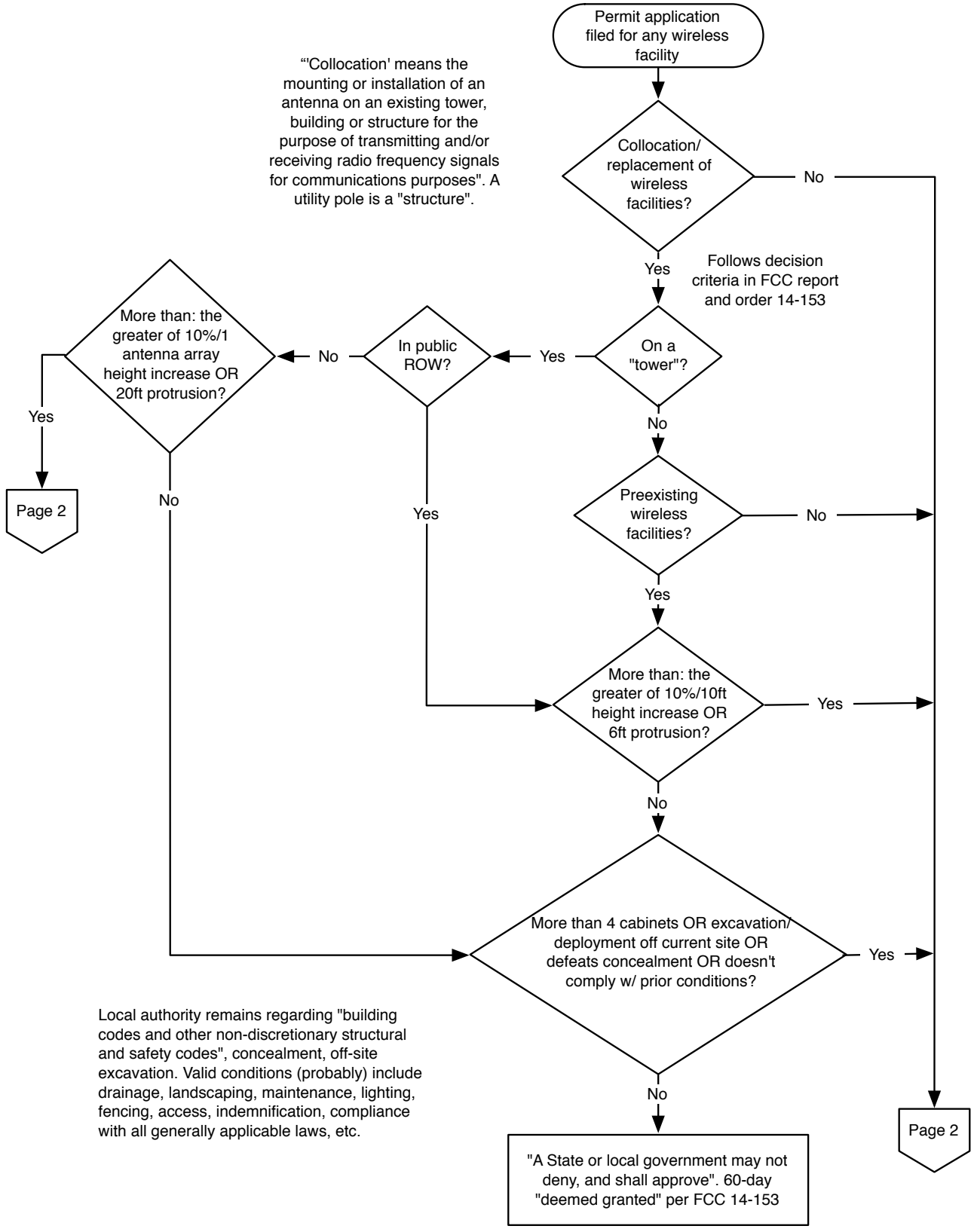


Figure 1 – Wireless permit "shot clock" flowchart, page 1.

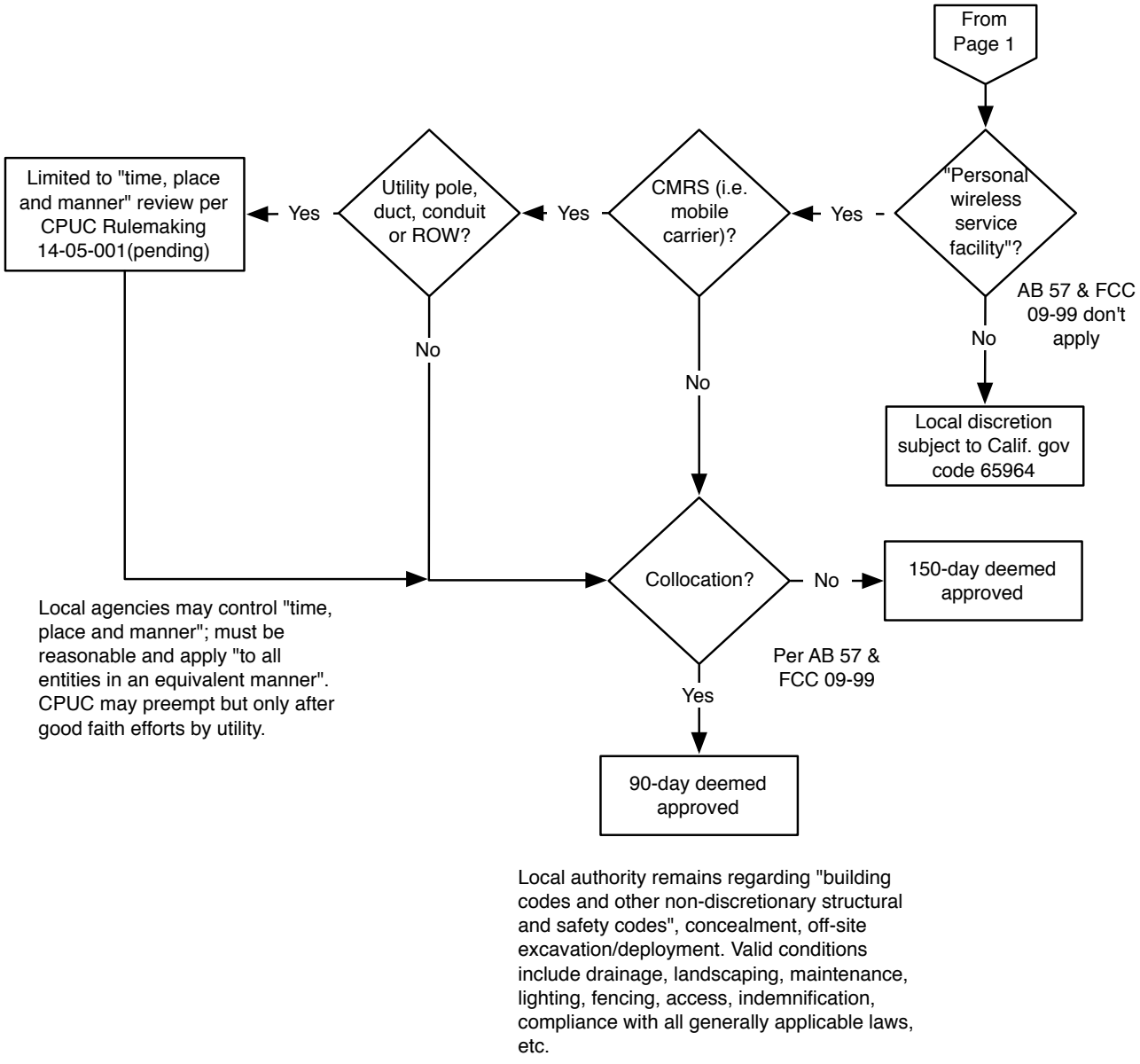


Figure 2 – Wireless permit "shot clock" flowchart, page 2.

Figures 1 and 2 contain a flowchart that gives an overview of how the different rules relate to each other. The result is three basic scenarios:

- Minor collocation of transmission equipment on an existing structure (or replacement of existing transmission equipment): 60 days with significant limits on criteria the City may consider when reviewing the application. This shot clock results from a 2014 FCC order (14-153), which was recently upheld by the federal fourth circuit court of appeals.

- Major collocation: 90 days. This shot clock is the result of the combination of Assembly Bill 57 and a 2009 FCC ruling (09-99), which AB 57 references (for the sake of brevity, I'll just refer to this as the AB 57 rule).

- New facilities (i.e., anything else): 150 days, per AB 57.

The 60-day shot clock applies to wireless facilities built for nearly any purpose; the 90 and 150-day clocks only apply to "personal wireless service", which are defined as "commercial mobile services, unlicensed wireless services, and common carrier wireless exchange access services". In other words, wireless telephone or broadband facilities. It wouldn't include, for example, satellite services or public safety facilities.

Another potential difference could be in the definition of "collocation". The FCC 60-day order is based on Section 6409(a) of the Middle Class Tax Relief and Job Creation Act of 2012, and is often referred to as the "6409 rules". The order makes it clear that in order to be eligible, a collocation has to be on an existing wireless facility, while the 2009 shot clock ruling could be interpreted as applying to any preexisting structure. That's one of many details that are likely to be worked out in court or by the FCC.

Section 6409 says in part that "a State or local government may not deny, and shall approve, any eligible facilities request for a modification of an existing wireless tower or base station that does not substantially change the physical dimensions of such tower or base station". The order says...

> A modification “substantially changes” the physical dimensions of a tower or base station, as measured from the dimensions of the tower or base station inclusive of any modifications approved prior to the passage of the Spectrum Act, if it meets any of the following criteria:
>
> - For towers outside of public rights-of-way, it increases the height by more than 20 feet or 10%, whichever is greater; for those towers in the rights-of-way and for all base stations, it increases the height of the tower or base station by more than 10% or 10 feet, whichever is greater;
>
> - For towers outside of public rights-of-way, it protrudes from the edge of the tower more than twenty feet, or more than the width of the tower structure at the level of the appurtenance, whichever is greater; for those towers in the rights-of-way and for all base stations, it protrudes from the edge of the structure more than six feet;
>
> - It involves installation of more than the standard number of new equipment cabinets for the technology involved, but not to exceed four cabinets;
>
> - It entails any excavation or deployment outside the current site of the tower or base station;
>
> - It would defeat the existing concealment elements of the tower or base station; or
>
> - It does not comply with conditions associated with the prior approval of the tower or base station unless the non-compliance is due to an increase in height, increase in width, addition of cabinets, or new excavation that does not exceed the corresponding “substantial change” thresholds.

The order also allows local governments to "continue to enforce and condition approval on compliance with generally applicable building, structural, electrical, and safety codes and with other laws codifying objective standards reasonably related to health and safety". However, local governments "may only require applicants to provide documentation that is reasonably related to determining whether the eligible facilities request meets the requirements of Section 6409(a)".

Similarly, existing CPUC policy limits the scope of local authority over utility pole use in the public right of way by licensed mobile carriers to the same kind of "time, place and manner" restrictions that might apply to other telephone companies (and, as a practical matter, to cable and electric companies).

Under the AB 57 criteria, the definition of a major collocation is fairly narrow. Generally, it's any attachment of new equipment to an existing structure that falls within the same dimension limits as the 6409 rules (except the tighter restrictions on facilities in the public right of way don't apply) but entails more construction work, or modifications to existing conditions. There is room to debate whether an apparent collocation actually falls under the 150-day instead of the 90-day clock, but the clock will run while the debate continues.

Although AB 57 doesn't directly apply to the 60-day shot clock – it specifically excludes facilities that are eligible under the 6409 rules – the procedural requirements are, for the most part, identical. As a practical matter, the only question is whether the applicable shot clock is 60, 90 or 150 days. Expect wireless carriers to be more aggressive about claiming "deemed granted" status now that any application for wireless facilities falls under one shot clock or another.

Once a shot clock expires, or an applicant believes it has, then the applicant has to notify the City that it is proceeding on that basis and the City then has 30 days to challenge the "deemed approved" assumption in court. There's no guidance in AB 57 as to what happens if the City doesn't go to court – alternatives range from an applicant being able to simply start work on the basis of the notice, to the City being required to automatically issue the permits, to an applicant being required to obtain a court order confirming the deemed approved status. The City should consider the position it will initially take in those circumstances, but be prepared to adjust as practice and the courts clarify the procedure.

However it happens, though, carriers are likely to prevail eventually in at least some cases, and the City needs to consider what it will do in that event. One option is to create conditions of approval that would automatically apply if a deemed granted action occurs. Rather than trying to craft a default policy from scratch, however, the City might instead rely on existing design requirements or precedent. The carrier could be served notice that even though the applicable permits have been automatically granted, it is still responsible for adhering to the standards, conditions and precedent that apply to such permits and the City will enforce those terms as it would with any other permit. In other words, there's nothing special or exempt about a permit that's been deemed granted. The same rules apply, the only difference is in the method of approval.

3. Preserving City control of wireless permitting

The City has only a couple of sticks and one carrot left when it comes to administering permits for wireless facilities.

The biggest stick is the application requirements. An incomplete application is the only specific grounds for "tolling" (i.e., stopping) the clock, other than mutual agreement. The City has 30 days to ask for additional information, and 10 days for subsequent (albeit limited) requests if it falls under 6409 rules. The time it takes to review the application and request additional information counts against the shot clock, but the clock will be tolled (stopped) while the applicant is responding. Once an application is complete, either by default or formal acceptance by the City, the clock will run while any discussions or questions or negotiations continue.

The only way to maintain control of the clock is to explicitly require all potentially relevant information be included in the initial application. Specific, predetermined information should be routinely required in an initial application and itemized in a detailed checklist provided to the applicant.

A checklist allows the City to quickly review an application and, where necessary, write a comprehensive request for additional information. The less time required to determine that an application is incomplete, the more quickly the clock is stopped. But more importantly, it helps ensure that all deficiencies will be caught in the first review. Under 6409 rules, the City can make subsequent requests for additional information within 10 days but only in regard to items identified in the initial request. The primary FCC ruling referenced in AB 57 is less specific about limitations on additional requests for information, but until the question has been fully litigated the safest course is to assume that the same limits apply.

A further step is requiring wireless carriers to hold their own community meeting, prior to either considering an application complete or allowing a carrier to submit a new facility or colocation permit application. Such a meeting would make any subsequent public hearing less contentious by reducing the sense of surprise for community members and allow more potentially unforeseen land use challenges (e.g., noise concerns from specific equipment cabinet or generator placement) to be resolved earlier on during the review process. Furthermore the community meetings may allow for more substantive engagement by wireless carriers with neighborhood groups, so that less-intrusive sites are initially proposed. Any challenges that do occur will happen while the clock is running and could, perversely, result in an application being deemed granted because the process required for denial was not completed.

The City should take what steps it can to guard against “Trojan Horse” applications, where a seemingly innocuous facility is approved and built under the more rigorous review allowed by AB 57, but then significantly modified later under the more lax standards of the 6409 rules.

The City should also require the inclusion evidence of approval by all other necessary public agencies, such as Caltrans, as a mandatory item on the application checklist.

A community meeting requirement or Caltrans approval are examples of requirements that might apply to a new facility but not a minor collocation, for example. It's an important consideration because 6409 limits application requirements to items necessary for determining whether a proposed collocation qualifies for the expedited 60-day review. The application should establish that all applications are considered to be subject to the 150-day shot clock rule unless the applicant submits specific information that demonstrates otherwise. If the information is omitted or insufficient, the application could be tolled or denied on that basis.

The only other stick is the threat of denial. The value of that threat is greatest when the information included in the application creates a sufficient record to support denial because subsequent inquiries could end up providing the applicant an opportunity to run out the clock. If possible, denials should be done on an administrative basis. Noticing and other requirements for City Council and Planning Commission agenda items could likewise result in a deemed granted outcome.

It can be argued that the shot clock requirements make it less likely that a denial will be appealed. Refiling the application would reset the clock and could provide the applicant with greater predictability and a faster outcome than a court challenge would offer. At that point, however, an even better alternative for the applicant might be to agree to toll the clock. The credible threat of denial creates an incentive for mutual cooperation, and does it in a way that gives the applicant a clearer idea of how to balance the costs.

The one carrot to offer is the establishment of standard, pre-approved plans and thereby create the opportunity for the applicant to avoid lengthy and detailed application requirements up front and the possibility of denial down the road. The 6409 rules allow cities to give preferential treatment to proposals for facilities that would be located on municipal property, and presumably the same would apply under the AB 57 rules.

4. Considerations for applications involving the public right of way

Other than the more restrictive qualification criteria for the 60-day shot clock and a categorical exclusion for NEPA (but not section 106 NHPA) review in the 6409 rules, the FCC's rules do not differentiate between applications for facilities in the public right of way and on private property. The 6409 order does, however, "conclude that Section 6409(a) applies only to State and local governments acting in their role as land use regulators and does not apply to such entities acting in their proprietary capacities", and it specifically refuses to draw a clear line between those two roles except to say "like private property owners, local governments enter into lease and license agreements to allow parties to place antennas and other wireless service facilities on local-government property, and we find no basis for applying Section 6409(a) in those circumstances".

The arguments laid out in the order and in subsequent court cases indicate that at least some cities consider ROWs to be municipal property, so that question is likely to be litigated at some point. California law, though, effectively makes ROWs state property and limits municipal authority over telephone company work (wired or wireless) in the public right of way to "reasonable control as to the time, place, and manner in which roads, highways, and waterways are accessed". However, local ordinances that regulate the location and appearance of wireless facilities in the ROW are allowed so long as a local government 1. "does not abuse its discretion or arbitrarily or unfairly deny requests for access", 2. establishes reasonable rules, 3. applies the rules "to all entities in an equivalent manner" and 4. the rules do not effectively prohibit wireless facilities.

Consequently, the City can enforce aesthetic and other standards for installation of wireless facilities, particularly small/micro cell sites often referred to as distributed antenna systems (DAS), on existing utility poles and on new poles placed in the ROW. The process is subject to federal shot clock limits and it may be reviewed by the California Public Utilities Commission. Location may also regulated, but not in a way that particularly singles out wireless carriers.

5. Pre-approval of standard solutions

As noted above, the City can offer the carrot of a short form application and/or expedited processing for projects that involve standard, pre-approved cell site installations. Over time, detailed specifications for what is and isn't acceptable could be developed either by the City or others, but in the short term the City could establish a process for approving reference designs submitted by either carriers or equipment manufacturers. It's possible that an interagency group, for example under the auspices of the California League of Cities or a professional organization, could assume that responsibility, but for now it's up to the City.

As a general and quickly implementable policy, the City can encourage the organization of applications such that generic, non-proprietary information – manufacturer's specs or a particular landscaping scheme, for example – is presented separately in a standardized format. Once the application has been approved, the generic elements can be published on the City's website as an example of an acceptable solution. Those elements could either be downloaded and included "as is" in subsequent applications by anyone – allowing virtually instant review by the City – or modified to the minimum extent necessary for faster review. This process could speed up review of multiple applications by a single carrier, and in the long run it could simplify the process for everyone. But any acceleration of the City's overall processing ability would happen gradually over time.

Other fast track considerations could include locating facilities in the ROW on busier or wider streets in commercial and industrial areas, rather than in residential neighborhoods, or when set back a certain distance from residential properties.

Rather than try to establish a comprehensive reference design review process, the City could consider immediately pursuing some degree of standardization for two specific cases: replacement/upgrade of streetlights and installation of new or upgraded utility poles.

There are a couple of different ways to approach light standards. From an administrative perspective, the simplest solution is to establish specifications for new light standards intended to support wireless facilities (existing City light standard specifications might suffice) and design parameters for the attachments. Initially those parameters can be stated generally, in terms of high and width/ circumference and placement on the pole (e.g., on the pole top), but as experience is accumulated, the general requirements could be replaced by specific reference designs. The carrier would either rent space on an existing City light standards, or replace a deficient City-owned light standard with a conforming one, with the City maintaining ownership of the new pole. Rent can be deferred for a period of time sufficient for the carrier to recoup the construction cost. Since it's a city-owned asset, an encroachment permit and, possibly, a use permit wouldn't be necessary. A design permit could be issued, if necessary, on the basis of the standardized, pre-approved specifications.

Maintaining ownership of the supporting pole also gives the City more flexibility under FCC rules, since it will be acting in its capacity as a landlord, rather than a regulator. For example, it could limit or prohibit attachment of additional equipment, as would otherwise be allowed under the 6409 rules.

Another alternative is for the carrier to own the light standard and operate it under terms that are similar to those that apply to electric utilities. The carrier might be persuaded to absorb some or all of the

operating cost of the light, but the City's negotiating power in that regard is limited: past a certain point, it would make more sense economically for the carrier to apply for permits under standard procedures. There's also the question of how much of the standard permitting procedure may be waived, although presumably any precedents set by the City in regard to other public utilities would apply.

It would be more difficult for the City to create significantly different standards for installation of new utility poles by wireless carriers in the ROW – in general, rules that apply to one utility must apply to all – but creating a fast track process based on the City's future needs could be defendable. It would also be reasonable to create a fast track permit process for a metal pole – either completely new or as a replacement for an overloaded wooden one – that would be available to any utility. As with light standards, the City could also establish specifications and/or reference designs for the wireless equipment that would be attached. Although opponents could still invoke the appeals process, the worst case is that the shot clock would simply expire (and the City might, in that case, be able to agree that a 90-day shot clock applies). The City could choose not to challenge the "deemed approved" status, but still be confident that the resulting installation would comply with all applicable regulations.

6. Summary

AB 57 has created a situation where rigorous review of applications for wireless facilities, including opportunities for public comment and decisions by elected officials, works against the original purpose of safeguarding the public interest. In order to work within the limits set by State and federal rules, the City should adapt its current wireless facilities review process to allow for rapid decisions via comprehensive application information, rapid administrative decisions and incentives for applicants to propose conforming designs from the very beginning. Existing city code should be reviewed and modifications considered to ensure its provisions do not work against the original intent, now that the game has changed.

Appendix E – Policy Options Reference

1. Planning and development

1.1. Broadband Role.

Establish an ongoing role for the City to play in identifying broadband needs and working proactively with businesses and service providers to meet those needs.

1.2. City ordinance review.

Identify municipal code sections that directly or indirectly impact broadband planning, development, infrastructure deployment, and service access and adoption, and evaluate whether changes are necessary to meet City goals and to implement new policies.

1.3. Evaluate long term City networking needs.

Review existing City broadband facilities and budgets with due consideration to expected future traffic loads and expectations of available resources, and identify infrastructure development projects which are potentially of mutual interest to the City and private sector providers.

1.4. Develop a long term broadband infrastructure roadmap.

Taking into account existing resources, City networking needs, economic and social development objectives and private sector investment plans, draft specific objectives for high speed network expansion into commercial and residential areas.

1.5. Broadband Master Plan.

Develop and maintain a Broadband Master Plan for prioritizing connectivity needs in future years, with the goal of delivering high bandwidth services to Oakland's residents, industrial and commercial areas, and community anchor organizations.

The City of Oakland has a Fiber Optic Network Master Plan that addresses internal networking needs, and is in the process of updating it. This approach can be extended to include the connectivity and telecommunications needs of residents, business and other public agencies.

The benefits to a community of modern, high-speed broadband infrastructure generally break out into three categories: sustainable economic development, improved quality of life and greater social equity.

Technology forms the backbone of the local and regional economy, and will continue to do so in the future. As technology spreads through more aspects of everyday lives, tremendous opportunities arise to creatively and carefully use technology to shape the community. Technological innovation can help the City in many ways. It can facilitate citizen interaction with each other and government; company services to customers; and

City services to visitors; and it can provide ways to showcase Oakland's commitment to a sustainable environment.

Electronic services in particular (cable television, telephone, satellite, computer networking technologies, internet, radio, and other such services) create greater accessibility to and exchange of information, impact the ways people communicate, and create job opportunities. Enhancing and improving access to these resources will have a profound effect on the quality of daily life and work. Toward improving both, the City can examine and respond to the possibilities and challenges offered by—and the implications of—technological advances and opportunities.

1.6. Anchor Tenant Positioning.

Leverage City budget to stimulate demand for broadband facilities and, potentially, provide financing for critical infrastructure.

The City is a major purchaser of broadband services. By actively engaging with service providers as a customer, the City can influence the location and extent of infrastructure upgrades by incumbents, and provide opportunities for competitive carriers to enter the market. Coordinating these efforts, when possible, with large businesses and other agencies with similar needs multiplies this influence.

The City can identify opportunities for investment by evaluating funding available for economic development initiatives, applying that funding to broadband construction plans – both public and private sector – and determine if those funds can be directed to support those projects, either through direct investment or indirectly through administrative means.

One alternative for the City to consider is transitioning from leased facilities to lines that it owns or controls on a long term basis, perhaps via a public/private partnership that allows the City to concentrate on its own operations while a private (usually for-profit) company focuses on the utility aspects of the business. Over time, money currently budgeted for leased lines could be increasingly invested in new facilities that would support economic development, or saved for other uses.

Without new investment in local fiber optic infrastructure, the City – like other agencies, institutions and companies – will face increasing operating costs over time, for the use of ageing assets. Putting additional emphasis on long term infrastructure planning and investment, in cooperation with private sector carriers, is a potential solution to this problem.

1.7. Public sector partnerships.

Collaborate on broadband infrastructure projects with other local agencies.

Public agencies, such as Alameda County, the Port of Oakland, BART and AC Transit, have common interests in improving and expanding broadband infrastructure, for both internal use and economic development purposes.

Although there are restrictions on the use of services and facilities purchased with public funds, particularly those earmarked for educational purposes, public agencies can serve as anchor customers of new broadband projects. Within limits, technology and telecommunications budgets can be directed in ways that support broadband development goals.

Although money allocated for educational networks cannot be used to subsidize municipal or public broadband service, it can be used to purchase service from competitive private or municipal service providers. For example, pre-purchase commitments made on behalf of U.C. Santa Cruz provided the critical initial revenue stream which made it possible for a private company, Sunesys LLC, to build a fiber line from Silicon Valley to Santa Cruz, and to successfully apply for state grant funds to build a second line from Santa Cruz to Soledad.

1.8. Interagency Coordination.

Participate in regional and statewide planning and standards organizations, such as Caltrans' broadband working group or the East Bay Broadband Consortium.

1.9. Private sector partnerships

Establish policies for responding to unsolicited proposals from private parties for joint ventures or use of City assets.

One example of this kind of public/private partnership is Lit San Leandro. The City of San Leandro has worked with a local company to build a 20-mile fiber optic ring through the industrial and commercial areas of the city, for use by local businesses. The City contributed the use of traffic signal conduit and in return received 30 fiber strands for its own use. The remaining capacity on the network is sold to local businesses by the private, for-profit partner, Lit San Leandro LLC.

Other cities are pursuing similar joint ventures, consistent with their existing assets and budgets.

1.10. Informally solicit ideas for upgrading Oakland's broadband infrastructure.

Hold informal staff discussions with local Internet service providers and provide notice to all interested parties of the City's goal of supporting equitable fiber optic network expansion.

1.11. Request for proposals

Develop a formal request for proposals from potential private sector partners, or similar document, that details the city's goals and available assets.

A request for proposal (or similar) could be used to ask private sector companies to submit ideas for using the City's assets. The request could be structured around a public-private partnership, or a straight lease arrangement, or simply left open for responders to choose their preferred business model.

The scope of an RFP could depend on the type of program chosen by the City – e.g. a full buildout versus a pilot project – or it could leave the choice of project up to respondents. However, experience has shown that the more specific an RFP is in terms of goals, expectations and available resources, the likelier it is to receive responsive, high quality proposals.

The RFP could set out specific economic development goals for Oakland's commercial and industrial areas, describe existing and planned City assets and contain information that quantifies the market opportunity, particularly in terms of commercial real estate development.

The City of Oakland could offer:

- Access to conduit and/or fiber.
- Method, plans and budget for conduit extensions.
- Right to serve new construction via City-owned conduit.
- Access to other City assets, e.g., antenna sites, real estate.
- Development and coordination of anchor customers.

The City of Oakland could request:

- Installation of high strand-count cables in 100% of existing and future conduit.
- Plans for and a commitment to fill gaps in the system, with specific provisions for economic development priorities.
- Plans to support wireless connectivity.
- Full commercial access to dark fiber.
- Public rate card for fiber lease, lit services, connections to network.
- Participation in conduit extensions.

Respondents should be encouraged to be creative, look for synergies with other projects and to be brief but specific. The immediate objective would be to attract as many high quality proposals for building out a modern fiber network in Oakland as possible.

1.12. Municipal broadband enterprises

Options include creating a dedicated dark fiber leasing program, providing "lit" transport services to businesses and building a full, fiber to the premise system.

Palo Alto and Santa Clara operate dark fiber networks which have proven very profitable. Once installed these systems require little upkeep other than fixing accidental breaks, and customer service is mostly limited to making the initial connections – for a fee – and sending periodic bills.

The City of Santa Monica has dedicated some of its internal fiber network capacity to providing high speed, lit transport service to local businesses, which gives them the ability to purchase low cost, high capacity Internet bandwidth from a variety of sources.

The cost of building a full, fiber to the home system that serves every Oakland home and business would be in the hundreds of millions of dollars range. A feasibility study could be used to assess such a project, from the point of view of operating it as a municipal enterprise as well as an opportunity to present to potential private sector partners.

However, direct municipal involvement in providing consumer-grade service has a poor financial track record, particularly in communities such as Oakland which are served by two consumer-oriented, full service broadband providers. Comcast and AT&T offer high speed residential Internet service, extensive television lineups, telephone service and other bundled services in Oakland. Although both companies are the target of complaints about service and prices, on most days they generally meet the broadband needs of most people in their service areas.

AT&T and Comcast have a national presence and millions of customers. Both enjoy substantial operating economies of scale, including the ability to negotiate favorable terms with television programming and other video content providers, and can pick and choose which neighborhoods to upgrade on the basis of expected return on investment.

City-run systems do not have those economies of scale and cannot discriminate amongst residents on the basis of their economic potential. Consequently, it is usually impossible to compete with entrenched incumbents on the basis of lower prices, due to national-scale purchasing power, or lower costs incurred as a result of limiting the provision of advanced services to high potential customers.

Although a municipal FTTH system could theoretically offer more television programming options and greater broadband speeds at the same price as copper-based incumbent service providers, this competitive strategy usually results in lower net revenue and ongoing operating losses.

The only successful example of a municipally operated fiber to the home system in California is Loma Linda, which only provides Internet service – and not television service – to newly constructed or remodelled homes where the developer or property owner has installed empty conduit for the city's use. The City of Loma Linda – which is 4 square miles in size and largely suburban in character – has invested in a fiber backbone network to support this service, but much of the cost of building and operating it is borne by the several colleges and hospitals in town which act as anchor customers.

It is possible for cities in competitive markets to build and operate FTTH systems, but it is not reasonable to expect that operating costs and capital pay-back requirements – bond payments, for example – will be met by customer revenue in the near to mid term. Instead, a municipal FTTH operator must expect to subsidize operations for the foreseeable future, via the general fund, grant money, tax increment financing or assessments on property owners or utility ratepayers.

2. Dig Once

Cities retain the ability to establish reasonable conditions and procedures for utility companies, including telecommunications carriers, to do construction work in the public right of way. There are many different approaches, but in general most street cut management – also known as "dig once" – policies intended to promote broadband fall into three categories: "open trench", "shadow conduit" and construction standards.

2.1. Open Trench.

Require and provide a process for notification and information about all major infrastructure and construction projects, particularly those in the public right of way, including transportation projects and commercial and residential construction, to a shared data base so that broadband and other utility providers have the opportunity to coordinate infrastructure deployment with projects.

Open trench policies require some degree of advance notice of any digging that's done in streets, sidewalks or other public places. This notice goes to other utilities that might be interested in installing facilities in that location or local agencies or both. If another utility wants to take advantage of the opportunity presented by the work, cost sharing arrangements can be negotiated or specified by policy. San Francisco, Santa Cruz and Berkeley have such policies.

Santa Cruz routinely sends out notifications of encroachment permit applications to utilities and other interested providers. Berkeley mandates participation in "city-sponsored utility coordination meetings" involving other utility companies, and requires companies to submit "general information regarding any Facilities that the Company plans to apply for permits to install within the [public right of way] in the next six (6) months, regardless of whether a permit is currently sought for those Facilities".

The City can also be a participant in the open trench process, either an installer of last resort or as part of planned process for meeting internal networking needs.

2.2. Shadow Conduit - Public Works.

Require installation of city-owned broadband conduit as a part of any suitable city public works project, including public buildings and all transportation projects.

2.3. Shadow Conduit - Undergrounding.

Incorporate routine placement of spare, city-owned broadband conduit into utility undergrounding programs.

2.4. Shadow Conduit - Excavations.

Include evaluation of need to install city-owned broadband conduit in review of any work or permit involving excavation in the public right of way and establishes process for requiring such installation.

Shadow conduit policies build on the opportunity presented by open trench notifications. Prospective installation of city-owned conduit, either in conjunction with routine undergrounding programs or third party utility projects, puts the City in the position of being an active developer of broadband assets as such, rather than simply making use of resources obtained in the normal course of business.

Cities can make it a routine practice to install empty conduit prospectively any time a suitable trench is available. Typical cost estimates are in the one to two dollar per foot range. Shadow conduit placement can be done according to a predetermined broadband infrastructure construction plan, or routinely in any suitable location. The risk is that the conduit would never be used; the benefit is that if even a small fraction of the installed conduit is eventually used, the cost savings and/or revenue it would generate would offset the additional installation cost.

San Francisco, Watsonville, Salinas and Santa Cruz have all adopted shadow conduit policies. Watsonville built a cross-city fiber network which included previously installed conduit and Salinas is currently pursuing a downtown fiber network using its shadow conduit.

Another approach is to establish requirements for installation of empty conduit can be imposed on new construction and major remodelling projects. Ownership of the conduit can be passed to the city, as in Brentwood, or remain with the property owner with the requirement it be connected to a municipal network, as in Loma Linda.

2.5. Excavation Moratorium.

Enforce "dig once" policies via a 5 year or more moratorium on excavations in the public right of way after completion of work conducted subsequent to an "open trench" notification process.

Some jurisdictions require a moratorium – five years is common – on any other utility work being done in the public right of way following major street work after potentially interested parties have been given an opportunity to participate. This policy achieves two objectives. First, it minimizes wear and tear on streets – any time a cut is made in a street, its remaining useful life is reduced by 10% to 40%, depending on the circumstances. Second, it provides an incentive for telecommunications companies and other utilities to upgrade or build infrastructure sooner rather than later by setting a deadline for doing so and by offering an opportunity to share costs.

San Francisco has such a policy, as does Berkeley, which states that "a Company may not excavate any Street that has been reconstructed or resurfaced by the [Public Works] Department or at its direction in the preceding five-year period and shall participate in City efforts to coordinate excavation activities"[6].

[6] Berkeley Municipal Code 16.10.080 C 4

2.6. Establish a dedicated revenue account.

This account could be funded through leases or rents of City property, including publicly owned conduit, for the purpose of communications infrastructure, and to be made available for construction and maintenance of publicly owned broadband infrastructure, including shadow conduit.

3. Broadband infrastructure construction standards

3.1. Conduit Specifications.

Adopt standard specifications for placement and construction of conduit, applicable to both planned work in the public right of way and prospective installation of spare (or "shadow" conduit).

Although the City generally does not have the authority to review proposed telecommunications projects on the basis of capacity or network design, it can create a preference for a minimum set of specifications. It can also establish standard specifications for conduit it installs, either for specific projects or on a prospective basis, and for conduit installed pursuant to building standards imposed on new development or major remodelling projects.

The City and County of San Francisco has developed standard conduit specifications for its own installations. A similar effort has been completed in San Benito, Santa Cruz and Monterey counties, and the results have been published. Likewise, Caltrans may adopt standard conduit specifications, depending on how it chooses to implement recent legislation and agreements.

3.2. Conduit Standards.

Require spare, city-owned broadband conduit within joint utility trenches in new developments or major remodelling projects.

3.3. Lateral Connection Standards.

Require spare, lateral broadband conduit to all structures within new developments or major remodelling projects.

Requirements for installation of empty, fiber-ready conduit can be imposed on new construction and major remodelling projects. Ownership of the conduit can be passed to the city, as in Brentwood, or remain with the property owner with the requirement it be connected to a municipal network, as in Loma Linda.

3.4. Broadband Building Standards.

Require projects to provide broadband connectivity and include the infrastructure components necessary to support broadband, similar to requirements for other essential utilities.

3.5. Broadband Wiring Standards.

Establish standards for broadband wiring in residential and commercial buildings, similar to standards for other utilities.

Adding broadband requirements to construction standards will build the City's inventory of high-tech enabled real estate over the long term and provide a competitive incentive for owners of older property to retrofit. The more properties that are "gigabit ready", the more cost effective it is to upgrade and add infrastructure and facilities upstream, and the more demand there will be for that level of service.

3.6. Smart Building Requirements.

Specify "smart building" requirements for land use and construction permits for all projects (public, commercial, residential, industrial).

Building standards can be used to increase broadband availability and access, and promote the use of broadband dependent applications that promote energy efficiency, safety and other public policy goals. The simplest approach is to require all new construction and major remodelling work to include broadband facilities and provisions for connecting those facilities to the necessary outside infrastructure. San Leandro has taken this approach.

The next level of involvement is to specify the types and extent of indoor wiring, connection panels and other "plumbing" required for new and remodelled construction, as Loma Linda has done, or establish specifications and requirements for broadband infrastructure in the public right of way and lateral connections from homes, as Brentwood has done.

The final stage is to include requirements for specific "smart building" features and applications, such as predictive climate control or health and security monitoring. These types of requirements bring intrinsic benefits, but also help drive demand for high quality broadband service.

3.7. Public Facilities.

Promote the provision of broadband facilities in all public buildings, major transportation and other infrastructure projects.

It is commonplace to include basic information technology networking capabilities and Internet connectivity in plans for public buildings, transportation facilities and other public projects. These plans can be expanded to include provisions for supporting commercial broadband service on a partnership basis, for example by including spare conduit and inner-ducts or increasing the size of fiber optic cables. This spare capacity can be leased to private users or could form the basis of an economic development initiative, as AC Transit and Oakland are doing with a bus rapid transit project.

Public facilities can also serve as anchor tenants for new broadband infrastructure built by private companies, and provide a baseline of revenue that will justify the construction of

facilities that can serve much larger areas of the city. The University of California, for example, offered sufficient revenue to Sunesys LLC to first build a fiber optic line from Silicon Valley to Santa Cruz, and then extend it to the Salinas Valley. These lines are available to any user along the route, and have been credited with spurring economic development, particularly within the City of Santa Cruz.

4. Network operations and ownership

4.1. Use of municipal assets.

Identify City assets that may be made available to parties, and establish standard terms for their use.

City facilities that can support broadband development fall into three general categories: fiber networks, conduit and pole routes, and real estate.

Fiber networks typically have surplus capacity that can be leased out to third parties. Usually, there are more fiber strands on any given route than are required for for the operator's own network needs. Even when it appears that surplus capacity isn't available, state of the art network management tools often allow traffic to be consolidated, thus freeing up strands for other uses.

Some cities, such as Palo Alto, Santa Clara and Riverside, have large scale fiber leasing programs, but even cities with small networks, such as Watsonville, can fill critical gaps for other agencies, local businesses and telecommunications services resellers. Typically, cities will establish standard rates, terms and conditions for fiber leases.

Most California cities do not own pole routes. The exceptions are cities that also operate municipal electric utilities, such as Alameda, Santa Clara and Palo Alto. Not coincidentally, these three cities were the first in the San Francisco Bay Area to embark on large scale, municipal broadband projects.

However many cities, including Oakland, do own significant conduit routes, particularly interconnect conduit used to manage traffic signal networks. Because traffic signals tend to be installed on busy streets in commercial areas, the conduit routes that serve them are usually well suited to support business-oriented broadband service and middle mile facilities. The City of San Leandro was the first in the Bay Area to make large scale use of traffic signal conduit for this purpose.

There are number of issues to consider when deciding whether or not to use city-owned conduit for telecommunications purposes. The City would have to maintain and operate its conduit in partnership with a private company, and establish clear lines of responsibility and operational roles and rules. A business model needs to be determined, and decisions made as to whether the conduit will be simply leased out at market rates or if a closer partnership should be created in order to pursue other City objectives and priorities. Creating a municipal conduit enterprise will require coordination between several different departments, as well as with private operators. Finally, the City will incur costs to

implement a conduit business model and operational plan, and for ongoing development of the system to meet future needs.

Other types of municipal conduit include empty conduit installed on a prospective basis – the Cities of Brentwood and Watsonville are examples – as well as conduit specifically designed to support internal city data networks and street light systems. Conduit installed for IT network purposes can be useful, but is usually more limited in scope than traffic signal systems. Electrical conduit installed for street light purposes is usually not well suited for broadband systems because of differences in the way electrical distribution networks are designed and maintained. Using other city utility systems, such as sanitary and storm sewers, is likewise problematic.

City-owned real estate – either vacant land or space inside buildings – can be used to house network electronics and data centers for fiber and other wireline projects. City buildings, street lights and other facilities can support public WiFi access points. Towers, tall structures and vacant land can be used for cellular sites and support facilities for wireline networks.

4.2. Asset Inventory.

Identify city-owned assets, including fiber, conduit, rights of way and towers, that can support broadband infrastructure deployment.

Performing an initial inventory and systematically following up – e.g., routinely logging newly constructed or identified assets – and then publishing the information or making it available to telecommunications companies upon request maximizes the opportunities to put broadband-related assets to work.

4.3. Open Access.

Make appropriate city owned assets available to all broadband providers on an open and non-exclusive basis via a standard process, commensurate with adopted policies regarding public benefits.

4.4. Master Leases.

Establish standard terms and conditions for the lease of City assets such as buildings, towers and land by telecommunications companies.

Adopting a master lease template for third party use of City assets allows for more aggressive marketing, with either the goal of increasing revenue or incentivizing development, or both. Setting standard lease terms and access policies reduces the time and effort necessary for telecommunications companies to take advantage of those assets, which in turn makes the city a more attractive location for infrastructure upgrades or expansion and reduces barriers to competition.

4.5. Telecom Operations and Maintenance Matrix.

Establish detailed delineation of responsibilities for operating and maintaining city-owned conduit, fiber and other assets, and any attachments or equipment/facilities placement by third parties.

When a mix of public and private assets are involved in a broadband project, responsibilities and roles for operation, maintenance and ongoing capital investment must be clearly stated. San Leandro uses an operations and maintenance matrix to assign roles and define demarcation points for responsibilities.

4.6. GIS Logging.

Require routine entry of conduit and other broadband asset data into geographic information systems (GIS).

An important adjunct to both open trench and shadow conduit policies is a requirement that all conduit installed by public agencies and, ideally, private utilities, be logged into the city's GIS database. Watsonville was able to build its own city-wide data network because it had taken care over the years to keep its records up to date. On the other hand, cities that have failed to do so often lose track of where municipal conduit has been installed.

Collecting detailed information about telecommunications infrastructure, making it available in a convenient and useful way, and requiring, to the extent possible, that telecommunications companies cooperate with each other levels the playing field for smaller companies that might want to build new facilities or offer upgraded service. It also gives the City a means of participating in the telecommunications marketplace.

4.7. Digital Plans.

Establish a requirement that project plans and other information be submitted by utilities, developers, contractors and others in an appropriate geographic information system format.

Traditional, paper-based permit applications do not provide adequate access to information about telecommunications infrastructure installed in the public right of way or in conjunction other municipally regulated work. One solution, adopted by Santa Cruz County, the City of Santa Cruz and Berkeley, is to require permit applicants to submit maps in "electronic and/or other form required by the City, and include information describing the proposed facilities"[7]. This map data would also include "information regarding any Excess Capacity that will exist in such Facilities after the installation of the Company's Facilities" if requested by the City.

[7] BMC 16.10.040

4.8. Broadband infrastructure database.

Build a database showing the types and location of broadband infrastructure and service in Oakland.

4.9. Validate broadband infrastructure mapping.

Review information collected by state, federal and regional organizations, incorporate it into the City's GIS system and make it publicly available.

Publishing reliable information regarding the availability of infrastructure and services is one of the most powerful policy tools available to the City to promote broadband development. The California Public Utilities Commission, the National Telecommunications and Information Administration and other agencies collect and publish a wide variety of information about broadband availability, access and adoption. Consolidating this information, as it relates to Oakland, will lead to better planning and project development, by the City, telecommunications companies and others.

The City can develop a detailed geodatabase of existing fiber optic networks, including lateral connections, access points, splice points and information regarding ownership, and make it available for economic development purposes. Included in this database development can be an ongoing assessment of the condition of private utility poles and conduit. Over time, deficiencies can be documented and presented to either the owners or regulatory bodies to address.

The City can improve the telecommunications market in Oakland by compiling a geo-database of available infrastructure (and/or services). Information can be requested from service providers, collected from publicly available source and gathered from ground surveys. For example, the Central Coast Broadband Consortium has published a regional online, interactive map showing local and inter-city fiber routes and other infrastructure. Most of the data was the result of a professional survey, which was supplemented by information provided by local companies and other sources.

5. Permitting and approvals

5.1. Transparent Process.

Delineate the process for ensuring fairness, including transparency, public notice and timetables and deadlines for timely review of any required local permits.

5.2. Permit Streamlining.

Establish procedures to streamline the approval of broadband-related public right of way encroachment permits consistent with principles of fairness and competition for all providers.

Streamlining is important because it can reduce time and costs, and increase predictability for service providers, making Oakland a more attractive target for capital investment. As

described in Appendix A below, permit streamlining is now unavoidable for most permits involving wireless facilities, due to continuing changes in state and federal law.

5.3. Master Permits.

Establish a process for issuing a master encroachment permit for large scale telecommunications projects, subject to standard conditions but allowing exceptions based on specific circumstances.

A master permit process for large scale projects can be likewise used to attract the attention of companies, including incumbents, that might be interested in pursuing major upgrades, and position Oakland as a better destination for investment. Standard conditions can be established for defined circumstances, with provisions for specific conditions when unique circumstances occur.

5.4. Single Review.

Limit permit requirements to encroachment permits for broadband infrastructure work in the public right of way.

Complicated and/or opaque permitting processes can serve as barriers to entry for broadband companies that want to bring competitive service into a city. Permit processes for broadband projects that meet certain criteria – construction completely contained in the public right of way, for example – can be standardized through the use of checklists, reference designs and administrative reviews. As a first step, streamlining existing processes does not necessarily involve eliminating or consolidating review requirements. Rather, it recognizes that many broadband project reviews confront largely identical issues, which can be addressed in standard way.

Although care must be taken to protect the public's interests and ensure community values are maintained, some jurisdictions, such as the City of Santa Cruz, are moving permitting for broadband facility construction out of planning departments and completely into the hands of public works departments, which can use a relatively streamlined encroachment permit process to achieve the same ends in a single review. Costs to applicants are expected to drop from the tens of thousands of dollars to the hundreds of dollars.

5.5. Encroachment Permits.

Include criteria related to broadband development in encroachment permit applications and reviews, particularly those that involve excavations or placement of equipment in the public right of way.

The primary regulatory role remaining to cities is the ability to approve or deny applications for encroachment permits for the use of the public right of way on the basis of neutral "time, place and manner" standards.

Cities have greater flexibility when it comes to managing publicly-owned assets and providing services directly. Cities in California are free to decide whether or not to build and operate telecommunications facilities, establish Internet service utilities or manage

assets that could be used for those purposes. The FCC has reaffirmed that cities maintain wide discretion when negotiating with telecommunications companies over the use of city-owned facilities, as opposed to simply regulating access to the public right of way.

5.6. Evergreen Permits.

Authorize longer-term "evergreen" permits that provide a right to providers to enter specified easements to upgrade their infrastructure for an indefinite or significant period of time (such as 20 years) to upgrade the broadband service consistent with the adopted policies.

An extension of the master permit concept, evergreen permits go one step further and allow upgrade and expansion work to take place within defined parameters over a longer period of time.

5.7. Environmental and Aesthetic Mitigation.

Establish transparent and consistent procedures and processes for preventing and/or mitigating environmental impacts and protecting and/or preserving the visual integrity of neighborhoods.

The California Environmental Quality Act allows for expedited review of many types of broadband projects, particularly when those projects occur within or on existing structures, including utility poles, or paved ground. Establishing clear guidelines for when the City will and won't allow broadband projects to proceed on the basis of a negative declaration will add predictability to the environmental review process and aid in defending any subsequent challenges.

State and federal law requires rapid CEQA review of permit applications for wireless projects, and only provides a limited window of time and discretion for addressing aesthetic issues. A simple and well defined process, with standard solutions where appropriate, will help avoid permit approval by default.

5.8. Permitted Telecommunications Sites.

Establish a preference for colocating new telecommunications facilities at existing telecommunications sites.

Federal and state regulations provide for favorable treatment of wireless facility permit applications when a site is already used for such purposes. By establishing policies that take existing telecommunications into account when reviewing permit applications and provide for more rapid decision-making, the City can encourage greater use of existing sites.

5.9. Excess Capacity Utilization.

Require encroachment permit applicants to demonstrate that alternatives do not exist, supported by City collection and coordination of information.

To a certain extent, California law requires telecommunications carriers and other utilities to provide access to conduit and pole routes to other carriers. Cities can encourage and, to some degree, require this kind of cooperation.

Berkeley requires anyone who applies for a permit to install new conduit in the ground to first show that there is no existing conduit (or pathway) that can be used instead, including conduit owned by other companies or the city, "whenever sufficient Excess Capacity is available on commercially reasonable terms and conditions". Berkeley's ordinance also gives the city broad scope to inspect work[8] and related documents[9], and to consider the availability of existing conduit capacity in approving or denying a permit application[10].

This requirement can also be used to encourage use of publicly-owned conduit and other resources. In order to be effective, however, sufficient information must be available to both the City and applicants. The asset management policies below are integral to this process.

5.10. Future Proofing.

Encourage broadband providers to size underground and overhead facilities to accommodate future expansion, changes in technology, and where possible the facilities of other telecommunications and utility providers.

Similar to shadow conduit policies, future proofing involves the installation of surplus conduits, ducts and pole space in anticipation of potential future need. Standard specifications can be included in building codes for new and major remodelled construction. For work done in the public of right of way, minimum sizes may be suggested, and encouraged by encroachment permit policies. For example, In 2000, West Sacramento reduced encroachment permit fees for Williams Communications, Inc. in exchange for the inclusion of a spare, city-owned inner-duct within conduit that the company installed along a major thoroughfare, in the public right of way. The city subsequently leased out its inner-duct, recovered the initial cost and continued generating revenue.

Wireless facilities and supporting infrastructure, such as fiber optic networks, should also be planned with future needs in mind. The current trend is toward smaller cell areas and facility sizes, and this trend will accelerate as 5G standards are finalized and network upgrades begin.

[8] BMC 16.10.060 F

[9] BMC 16.10.080 G

[10] BMC 16.10.060 B 4

6. Land use policy

6.1. Single-Family Housing.

Standards for broadband facilities and connections in single family homes can be established for new construction and major remodelling projects.

If a residential project is in the thousands of homes range, it might be practical for a developer or home owners' association to bring in a competitive telecommunications company as a primary Internet (or cable or telephone) service provider. The Cities of Ontario and Brentwood are following this approach. However, Oakland's development opportunities are more limited.

Smaller last mile projects in residential developments will almost always rely on incumbents, which in Oakland are AT&T and Comcast. It is becoming common practice for new homes to include pre-wired data networks, but there is no single, industry standard for doing so, or for providing open access to existing or potential competitive networks. The City can play a role in setting these standards for new construction (and for major remodelling projects). The greater the degree of standardization and open access, the easier it is for prospective last mile competitors to enter the market and offer residents additional choices.

6.2. Multi-Family Housing.

Construction standards can be established for new construction and major remodelling, and policies enacted to ensure broadband access for residents.

The same considerations apply to multi-family housing as with single-family housing, with one major difference. Landlords and homeowner associations play a gatekeeper role and, up to a point, can control which broadband service providers can gain access to a property. In some cases, this control poses a barrier – e.g., landlords can prevent or refuse to pay for upgrades – but in other cases it can be an opportunity. Even a small multi-tenant property could be attractive to a competitive provider, due to the low cost per customer to build and maintain facilities, and the potential for bulk purchases of service, by landlords or homeowner/tenant groups. Google Fiber is following this model in San Francisco, although a recently enacted ordinance there all but eliminates the ability of multiple dwelling unit owners to block service from competitive providers.

6.3. Commercial.

Commercial districts and business parks can be targeted for infrastructure development, and standards for facilities and connectivity established.

Access to broadband service – fast, reliable, high quality links to the Internet and internal networks – is a basic competitive requirement in the 21st Century economy. Broadband availability is one of the first criteria assessed when businesses consider relocating or

expanding. It is considered to be a non-negotiable resource that is necessary for businesses to operate and to keep pace with global competitors.

Office and retail properties—particularly those with a large number of tenants—can be attractive to incumbent and competitive service providers alike, particularly when some or all of the construction costs for broadband facilities are borne by property owners. However, without access to core infrastructure, competitive providers operate at a severe disadvantage. Municipal conduit and dark fiber facilities, along with policies that require lateral connections to new construction, can level the playing field.

6.4. Industrial.

Industrial areas are often neglected by major incumbent providers, and cities can play a role in closing these gaps.

Companies and institutions will often prefer to work directly with the raw materials of broadband: dark fiber, electronic equipment, and direct connections to major Internet exchanges. Although organizations with large-scale bandwidth needs are often willing to invest in on-site upgrades, site selectors will bypass locations that lack access to this core infrastructure.

Policies that encourage, and in some cases require, core broadband infrastructure development in industrially-zoned areas can help overcome obstacles that deter investment by incumbent carriers, and act as barriers to competitive service providers.

7. Regulatory

7.1. Regulatory Position.

Articulate the interest of the jurisdiction in monitoring the reliability and quality of broadband connectivity in the local jurisdiction and ensuring appropriate speed availability.

The trend at the state and federal level is toward less regulation of telecommunications companies. Local governments in California no longer manage franchises for video service and state regulation is minimal. Proposed legislation would transition landline telephone service away from its current regulatory regime, which is based on assumptions regarding legacy analog technology, and toward a less restrictive environment that might or might not be in keeping with current digital technology trends. Broadband and Internet service is not directly regulated at the state level, and federal agencies have adopted a "light touch" approach, where they have considered intervention at all.

Although its repeal is under consideration, the FCC's 2015 decision to bring "broadband Internet access service" under common carrier regulation (often referred to as the "network neutrality" decision) tries to draw a clear line between what kind of regulation does and does not apply to providers of those services. In particular, the FCC has ruled out regulation, by itself or states, of Internet service offerings, rates, or access to infrastructure

by third parties, except to say that it will review complaints on an after-the-fact basis using a "just and reasonable" standard.

The decision specifically allows "any body politic, or municipal organization", as well as individuals and state utility commissions, to file complaints. It establishes formal and informal procedures for doing so, and creates an ombudsman's position to facilitate the process.

The California Public Utilities Commission (CPUC) regulates "telephone corporations" and, to a lesser extent, "cable television corporations" and "video service providers". These categories include AT&T and, to a restricted extent, Comcast, which are the two primary retail broadband service providers in Oakland. Intercity carriers are also regulated as telephone corporations.

Some aspects of Internet service and infrastructure are still open to regulation under common carrier rules, including pole attachments and conduit access and, to an unspecified extent, universal service policies, both of which are under the CPUC's jurisdiction.

Responsibility for regulating telephone corporations is shared between the CPUC and the Federal Communications Commission (FCC). Municipalities are allowed no authority in that regard.

Nevertheless, cities can be very effective advocates on behalf of residents and businesses. For example, the City of Gonzales intervened in the CPUC's review of Charter's purchase of Time Warner and Bright House cable systems in California, and obtained an agreement to significantly upgrade the city's broadband service and infrastructure. Similar concessions were obtained by others during the review of Frontier's purchase of Verizon's telephone systems and AT&T's purchase of DirecTv. Establishing a clear mission statement regarding the City's role as an advocate for better broadband infrastructure and service allows consistent routine communications with service providers regarding expectations and makes it possible to move quickly when windows of opportunity, such as regulatory proceedings at the CPUC or FCC, appear.

7.2. Franchise Compliance.

Monitor and audit compliance with state video franchising requirements.

Originally, regulation of cable television corporations was the responsibility of local governments in California. Many were actively involved in regulating franchisees to the extent allowed by federal and state law until the Digital Infrastructure and Video Competition Act of 2006 (DIVCA) was approved by the California legislature.

DIVCA established statewide franchises for video service providers, which now includes telephone companies such as AT&T. DIVCA severely limits the role cities and other local government entities may play in regulating or otherwise influencing video service providers. Cities still receive a 5% franchise fee from video franchise holders, and have a

limited opportunity to inspect their books to ensure compliance. Requirements for public access channels, consumer protection rules and obligations to build out infrastructure are also subject to municipal review, but enforcement authority is severely limited.

Nevertheless, some jurisdictions are taking an aggressive approach to franchise compliance monitoring. Palo Alto, on behalf of itself and neighboring cities, recently completed an audit of Comcast's compliance with franchise fee and public access channel requirements. Such an audit may form the basis for formal court proceedings, or informal negotiations with franchise holders.

7.3. Specific Conditions Compliance.

Monitor and audit provider compliance with FCC and CPUC mandates, including those imposed as conditions of approval for transactions.

For example, when it approved AT&T's purchase of DirecTv in 2015, the FCC required AT&T to extend fiber-to-the-premise service to 12.5 million locations nationwide. AT&T must also offer a $10 or $5 per month broadband package to low income families, "those where at least one individual participates in the Supplemental Nutrition Assistance Program ("SNAP")". The price depends on speed level that's available in an area – it would either be $5 or $10, not both.

The City can play a role in ensuring compliance with these conditions by identifying specific requirements that apply to Oakland as well as general requirements that include it. The City can directly engage with the companies, and/or seek relief from the FCC if compliance or cooperation is lacking.

In addition, the City can work with other local agencies to advocate for extending the life of this program beyond the April 2020 expiration of the federal mandate that established it.

7.4. Enforcement Liaison.

Establish a program for systematically collecting and aggregating public complaints and concerns regarding telecommunications services, and submitting information to appropriate state and federal regulatory agencies.

The FCC's recent decision[11] to bring "broadband Internet access service" under common carrier regulation (often referred to as the "network neutrality" decision) tries to draw a clear line between the kind of regulation that does and does not apply to providers of those services. In particular, the FCC has ruled out regulation, by itself or states, of Internet service offerings, rates, or access to infrastructure by third parties, except to say that it will review complaints on an after-the-fact basis using a "just and reasonable" standard.

The decision specifically allows "any body politic, or municipal organization", as well as individuals and state utility commissions, to file complaints. It establishes formal and

[11] *In The Matter of Protecting and Promoting the Open Internet;* Report and Order on Remand, Declaratory Ruling, and Order; Federal Communications Commission; adopted February 26, 2015 and released March 12, 2015.

informal procedures for doing so, and creates an ombudsman's position to facilitate the process.

The CPUC's role is narrower and generally restricted to "telephone corporations", which can include traditional wireline carriers, such as AT&T, as well as broadband companies that use the public right of way. Its oversight responsibilities include enforcement of safety requirements, such as those related to utility poles, minimum telephone service standards, particularly relating to 911 access, and general compliance with applicable consumer laws and regulations. The commission has shown a willingness to couple this relatively narrow but well established jurisdiction with general but largely undefined responsibilities granted by federal law to extend its influence over broadband providers and other non-traditional telecommunications companies.

The FCC and CPUC have established procedures for the public to use in submitting and pursuing complaints against regulated companies. However, knowledge of these procedures is not widespread and making use of them involves a learning curve which can be an obstacle for many people. The City may reduce these barriers by acting as a middleman between residents and these two regulators.

The City can establish an enquiry and complaint process for businesses and/or residents that are seeking broadband services or are having problems with current providers. Although the City has limited authority in this regard, collecting this information and making it public is an effective first step toward providing incentives for telecommunications companies to voluntarily cooperate, expanding public knowledge of existing resources and constraints, and building a record for submission to the appropriate regulatory bodies.

7.5. Performance Test Participation.

Encourage public participation in CPUC and FCC broadband speed and performance test programs.

Although different organizations use different criteria, the CPUC currently considers 6 Mbps download and 1.5 Mbps upload speeds to be the standard for adequate residential broadband service. The FCC, on the other hand, adopted 25 Mbps download/3 Mbps upload as the minimum acceptable level for advanced service. It should be noted that, in either case, the standard refers to the capacity of the infrastructure installed by service providers. So long as the minimum level is available, consumers may also be offered the option of purchasing less expensive, lower speed service.

The CPUC and FCC have separate but complementary programs that allow the public to conduct speed tests of wireless and wireline Internet service. This data is factored into assessments of needs and eligibility for various programs. The more data points that are submitted from a given area, the better the understanding of local conditions will be on the part of the public, local officials and state and federal regulators. The City can play a role in promoting participation in these testing programs.

7.6. Competitive Access to Multiple Occupancy Buildings.

Require landlords to grant access to communications service providers and allow occupants to purchase service from the provider of their choice.

The City and County of San Francisco passed an ordinance which prohibits owners (landlords and homeowner associations) of multiple dwelling units from denying building access to competitive broadband providers that qualify under state law to do work in the public right of way, or to interfere "with the choice of communications services providers by occupants". Single family homes are not included, however renters in those circumstances generally have sufficient control to allow access.

The ordinance sets up procedures for broadband companies and building owners to follow, and establishes remedies for failing to do. State and federal regulations also restrict the ability of property owners to limit tenant's ability to choose between competitive broadband providers. San Francisco's ordinance is more specific and far reaching, and has not yet been tested in court.

7.7. Telecommuting - General.

Encourage local businesses to develop telecommuting programs.

Factoring telecommuting incentives and requirements into reviews of planned commercial developments, and establishing policies to encourage telecommuting by city employees when appropriate, can have the double benefit of reducing automobile traffic and increasing the demand for advanced broadband services. Mono County, for example, promotes telecommuting "as a viable method allowing visitors to stay in the region longer and work remotely, and attract new permanent residents".

7.8. Lifeline program advocacy.

Encourage public participation in CPUC and FCC Lifeline service programs.

The FCC has established a Lifeline program that provides telephone service subsidies for low income households. In California, this program is managed by the CPUC and supplemented with state funds. In some cases, for example when an eligible consumer chooses mobile service, broadband service might be included. The entire program is currently undergoing a redesign, and broadband service will be more widely included, with the goal of eventually replacing traditional telephone service.

7.9. Adoption program advocacy.

Facilitate participation in low income Internet access programs run by local providers, such as AT&T and Comcast.

Both Comcast and AT&T have special, $10 per month rate plans that they make available to qualifying households.

Comcast offers its "Internet Essentials" package to households where at least one child is eligible to participate in the National School Lunch Program. It also has pilot programs for

community college students and senior citizens. The package includes Internet access at 10 Mbps download speeds, a $150 computer purchase offer, a WiFi access point and training programs. Comcast originally offered Internet Essentials for a limited time, in order to comply with regulatory orders, but has since voluntarily extended the program.

AT&T is offering a discounted "Access" service plan for the next three years to households where one resident receives SSI or SNAP assistance. Most Oakland residents live in areas where they would be able to receive a wireline broadband service plan with 10 Mbps download speeds and a 1,000 gigabyte monthly data cap for $10 per month, if they meet eligibility requirements. Those who don't would be eligible for plans with lower speeds and/or lower data caps for $5 per month. AT&T is only required to offer this program until April, 2020.

Neither Comcast or AT&T are proactively recruiting low income households for these programs. Experience has shown that when broadband providers are required to offer discounted service to low income customers, they will attempt to up-sell eligible consumers into more costly, market rate plans during the sign up process. For example, the AT&T webpage containing the Access program sign up form has several links to market rate service packages – including television and telephone bundles – but does not inform consumers that they would be paying full price, rather than the discounted rate.

The City of Oakland can establish a program to assist both residents and, if willing, AT&T and Comcast in increasing adoption of these special plans. This program might be structured as follows:

- Contact Comcast's and AT&T's local government affairs staff and determine the extent of their interest in working with the City.
- If they are interested in cooperating with the City, then establish dedicated phone and online portals for Oakland sign ups and eligibility verification and develop a joint marketing program.
- If they are not interested in the City's assistance, then create a City run marketing program and identify the most efficient pathways for signing up and verifying eligibility.
- In either case, assign staff to implement the marketing program and, where appropriate, serve as an intermediary to ensure residents are able to sign up for a plan easily and without being subject to an up sell effort, and assist them with verifying eligibility.
- Establish a follow up process to ensure that residents successfully sign up for a plan, and connect them to local digital literacy and free or reduced price equipment resources.
- Work with other local broadband providers to offer similar plans.

As the FCC and CPUC expands current low income Lifeline programs for telephone service to include broadband, the City can likewise promote the availability of these subsidies and assist residents in accessing them.

The results of this process can be tracked, with key metrics being the number of households that sign up initially, the number that remain with the plan over time, and the extent of problems and obstacles encountered. Long term plans should be developed to ensure residents continue to have low cost broadband service available after the eventual expiration or withdrawal of these plans.

8. Government operations

8.1. Upgrade broadband availability in publicly subsidized housing.

Identify private and public sources of investment in broadband facilities and service in public housing and develop implementable initiatives.

Publicly subsidized housing operators in Oakland are eligible to apply for grants to upgrade broadband facilities in their properties and support programs designed to increase broadband adoption among public housing residents. The California Advanced Services Fund is one such source, and federal agencies, such as HUD, have similar programs.

8.2. Online Access.

Direct how government operations and services are to be provided online.

8.3. Online Permits.

Streamline and provide online access to business and development permit processes.

8.4. Open Data.

Establish an "open data" policy.

The City also is, or can be, a major producer of online content and services. Maximizing the accessibility of information and public services via the Internet provides an incentive for people to adopt and increase their use of broadband services. Offering services, such as permits, to businesses via online platforms, such as the Open Counter system originally developed by the City of Santa Cruz, will also stimulate broadband demand, and attract new, high tech businesses by engaging with them on their own terms.

The City has a wealth of stored data – information collected from its programs on topics ranging from municipal finance to scientific and sociological data. Much of this data is already publicly available though not, in most cases, in machine readable formats that programmers can easily use. The trend across local governments to make this kind of machine readable municipal data publicly accessible; this movement has been termed “Open Data”.

8.5. Telecommuting - City.

Establish a telecommuting program for city employees.

Appendix F - ExteNet Lease Agreement

CONDUIT LEASE AGREEMENT

This LEASE AGREEMENT is made this ___ day of _____, 2018 by and between the City of Oakland, State of California, acting by and through its (AGENT/BODY(collectively, "CITY"), and ExteNet Systems (California), LLC, a California limited liability company ("EXTENET").

RECITALS

WHEREAS, the CITY is obligated to manage the Public Right-of-Way (defined in Section 1 below), that contains its Conduit System ("System") in a safe and efficient manner that promotes the public health, safety and welfare of the citizens of the City of Oakland; and

WHEREAS, the CITY desires to provide coordination for the installation, maintenance, repair, operation and removal of Facilities (defined below) in the System; and

WHEREAS, EXTENET wishes to install or to have installed certain equipment ("Facilities"), in the System; and

WHEREAS, it is in the mutual interest of the parties hereto to enter into this Lease ("Lease Agreement").

NOW THEREFORE THIS LEASE AGREEMENT WITNESSETH, that in consideration of the mutual obligations and benefits set forth herein, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, CITY hereby grants to EXTENET the right to use certain designated space in the System according to the terms and conditions set forth below:

I. DEFINITIONS

A. **CABLE** means an assembly of one or more insulated conductors, or optical fibers, or a combination of both within an enveloping jacket.

B. **CONDUIT** means a tube or duct that encloses fiber optic cable, inner duct and/or cable.

C. **CONDUIT SYSTEM** means CITY's City-wide system of ducts located in the CITY's Rights-of-Way, accessible by manholes owned and maintained by the CITY.

D. **DARK FIBER** means an optical fiber not carrying signals.

E. **DUCT** means a tubular or square passage consisting of various materials such as terra-cotta, PVC. or orangeberg, either grouped together or singular, that is concrete encased underground connecting manholes, manhole to pole or manhole to a building that allows for installation of cable.

F. **FACILITIES** means any of the EXTENET'S equipment that is introduced into the CITY'S Conduit System, including but not limited to inner ducts and/or cable.

G. **FIBER OPTIC CABLE** means a telecommunications cable in which one or more optical fibers are used as the propagation medium. May be an all-fiber cable, or contain both optical fibers and metallic conductors.

H. **HYBRID FIBER COAXIAL CABLE** means a telecommunications cable in which optical fiber cable and coaxial cable constitutes different portions of a network carrying broadband content (such as video, data, and voice).

I. **INNER DUCT(s)** means a duct of a smaller dimension installed within the main duct consisting of tubular pipes(s) of varying dimensions and accommodates the installation of fiber optic or other cable.

J. **LAWS** mean any and all statutes, constitutions, ordinances, resolutions, regulations, judicial decisions, rules, tariffs, administrative orders, certificates, orders, writs, decrees, judgments or other requirements of the CITY, the State, the Federal Government and any other governmental agency having jurisdiction over the parties and subject matter of this Lease Agreement, including (without limitation) those of the California Public Utilities Commission and the Federal Communications Commission, and all rules, regulations, orders, or other directives of the CITY, the Department of Transportation, and the Director(s) of same issued pursuant to and in accordance with this Lease Agreement or otherwise.

K. **MAIN CONDUIT** means a conduit system that connects from manhole to manhole.

L. **MANHOLE** means an in-ground structure with various sizes and shapes constructed of brick and/or concrete, with a street surface frame and cover that permits the installation, removal, splicing and rearrangement of cable, fiber, inner duct and other electrical devices.

M. **MULTIFIBER CABLE** means a fiber-optic cable having two or more fibers, each of which is capable of serving as an independent optical transmission channel.

N. **OPTICAL FIBER** means a filament of transparent dielectric material, usually glass or plastic, having a cylindrical core surrounded by, and an intimate contact with, a cladding of similar geometry.

O. **PUBLIC RIGHT-OF-WAY** means the surface, the air space above the surface and the area below the surface of the particular public streets, roads, sidewalks, alleys, and the ways, including without limitation, appurtenant public utility and public service easements as the same may now or hereafter exist, that are owned by or are under the jurisdiction and/or control of the CITY. The CITY's Conduit System is located within the Public Right-of-Way. This term shall not include any property exclusively owned by any Person or agency other than the CITY, except as provided by applicable law or pursuant to an agreement between the CITY and any Person permitting the CITY to authorize third parties to use such property.

P. **SLACK COILS** means extra fiber optic cable that is coiled up and placed in a manhole for future use. EXTENET or EXTENET's contractor will be allowed seventy-five (75) linear feet of slack coil in a manhole, per one thousand (1,000) linear feet of cable installed between manholes. The CITY shall designate the manhole location and method of installation of slack coil.

II. DESCRIPTION OF THE PREMISES

EXTENET is required to provide CITY with a detailed description and map of the current Facilities installed in the System. The description of the map shall be updated, submitted and approved by the {ENTER DEPT of approvals} on May 15th and November 15th of each year during the term of this Lease Agreement. The map and its updates are incorporated herein as Attachment A.

III. USE OF PREMISES

A. Location: CITY hereby lets and leases to EXTENET portions of the System for installation, use, maintenance, repair, repositioning, replacement, relocating or removing of Facilities as described in Attachment "A".

B. Rights of EXTENET: This Lease Agreement constitutes a limited, non-exclusive and revocable right to use the System as described in ATTACHMENT "A". It does not grant EXTENET any rights to use the CITY's System/Right-of-Way except as specifically provided herein. It does not grant any rights to the use of other property of the CITY or of any other private or government entity.

C. Environmental Protection: This right to enter/use the System/Right-of-Way requires that the EXTENET accept the following obligations as described herein, including but not limited to the following:

(1) EXTENET shall not exacerbate any existing environmental condition in the System/Right-of-Way. An environmental condition shall mean any condition in, on, beneath or involving the System/Right-of-Way or any portion thereof (including, but not limited to, the presence, emission or release of Hazardous Substance(s) and the violation of any applicable environmental Law) that, if not properly mitigated or remedied, might have a material adverse effect on the use, occupancy, possession, value or condition of the Property or any portion thereof.

(2) EXTENET shall immediately notify CITY of the discovery of any environmental condition in the System/Right-of-Way.

D. No Interference: Except as permitted by applicable Laws or this Lease Agreement, EXTENET in the performance and exercise of its rights and obligations under this Lease Agreement shall not interfere in any manner with the existence and operation of any and all private Facilities and or Public Systems or Right-of-Way without the express written approval of the owner or owners of the affected property or properties.

E. Maintenance and Repair of Facilities: Following completion of installation of Facilities within the System, EXTENET shall maintain and repair, or cause to be maintained and repaired, the Facilities in good working order. All such maintenance and repair shall be performed at no cost or expense to the CITY and in accord with such construction and other standards as the CITY may from time-to-time apply generally to all users of the System, and shall be accomplished in such manner as not to endanger persons or property, or unreasonably obstruct access to, travel upon or other use of the System.

F. Supervision/Inspection: EXTENET shall not, nor shall EXTENET's Contractor(s) measure space, remove, handle, reposition, replace, or relocate any Facilities in the System without CITY's supervision/inspection and approval.

G. Entry/Use by Other Entities: EXTENET shall not rent or allow other users into their portion of the System. Violation of this provision shall constitute an immediate event of default on the part of the EXTENET.

H. Relocation/Removal of Facilities:

(1). Request By the CITY: Upon reasonable request by the CITY, EXTENET shall protect, alter, remove or relocate the Facilities it installs under this Lease Agreement at no cost to the CITY. Said protection, alteration, removal or relocation shall be completed within sixty (60) days following receipt by EXTENET of a request from the CITY for protection, alteration, relocation or removal or such shorter period as may be reasonably directed by the CITY. If the CITY has failed to issue a permit within such sixty (60) days in response to a complete and proper application filed by EXTENET for any permit necessary for such protection, alteration, removal or relocation, the time period for completion of the requested action shall be extended for a reasonable time period after issuance of the permit. If EXTENET fails to protect, alter, remove or relocate any of the Facilities within such period required by the CITY, the CITY may cause the same to be done, in which case the CITY shall not be liable to EXTENET and EXTENET shall fully reimburse the CITY for the cost of such removal and/or relocation.

(2). Request By Third Parties: Upon a bona fide request invoking a material public interest by any other party made during the term of this Lease Agreement, EXTENET may be required by the CITY to protect, alter, remove or relocate the Facilities it installs under this Lease Agreement. It is the intention of the parties that the Third Party requesting removal or relocation pursuant to this section shall be liable to EXTENET for any costs or expenses incurred by EXTENET to remove or relocate the Facilities, including any costs or expenses directly resulting from such Third Party's request, which amounts shall be prepaid prior to the commencement of any removal or relocation by the EXTENET

IV. TERM

A. The term of this Lease Agreement shall begin on_____, 2018, and end on_____, 2028, and then shall be for a period of approximately ten (10) years, beginning January 1, and ending December 31, and will be renewed automatically for additional one (1) year periods, unless notice is provided by the CITY no less than sixty (60) days prior to the end of any term or unless terminated as provided hereunder.

B. EXTENET shall commence use of the premises within one (1) year of the approval of the Lease Agreement. EXTENET understands that failure to commence use of the premises in a timely manner may, at the sole discretion of the CITY, result in termination of this Lease Agreement.

V. FEES/COSTS/EXPENSES

A. Preliminary Costs: EXTENET shall be solely responsible for obtaining, at its sole cost and expense, all permits, licenses, and other forms of approval or authorization necessary to construct, repair, or rebuild the conduit system or any part of the conduit system, prior to the commencement of any such activity.

B. Rent: EXTENET shall pay rent, according to the Schedule, Attachment "B", (appended hereto and incorporated herein) which is subject to change from time to time by CITY. CITY shall bill EXTENET on a semi-annual basis. However, no act or omission of the CITY shall in any way limit, modify or affect the obligations of the EXTENET pursuant to this Section. The cost per linear foot will be based on each inner duct (with or without cable) and/or cable without inner duct installed into the System, as described in Attachment "A". For billing purposes, the total linear feet installed in the Main Conduit shall include slack coil.

(1). Changes in the rent shall become effective upon notice to the EXTENET.

C. Supervision/Inspection: EXTENET shall pay the CITY the reasonable costs of supervision and inspection, pursuant to Section III. (G); and shall make a deposit of money to cover said costs as the Department _____ {ENTER DEPT} deems necessary for the protection of the CITY. This cost shall be billed to the EXTENET per each occurrence.

D. Late Fees/Additional Costs:

(1). A Nine percent (9%) late charge will be added to any semi-annual conduit rental bill not paid thirty (30) days from the due date. Should the CITY be required to

refer the unpaid conduit rental bill to its attorneys for collection, EXTENET shall pay attorney's fees equal to fifteen (15%) of the unpaid conduit rental bills, reasonable cost of collection, and court costs.

(2). In the event of failure by EXTENET to pay the rent within the sixty (60) days, the CITY may terminate this Lease Agreement and remove all Facilities in the System belonging to the EXTENET, without notice, at EXTENET's expense, and require the payment of rent in arrears and late fees by EXTENET. If the CITY deems it expedient to re-enter into a Lease Agreement with EXTENET, EXTENET shall be responsible for the expenses of replacement.

E. Abandonment of Facilities:

(1). When any part or the whole System is abandoned by EXTENET, the rent shall be paid for the full six-month period within which such abandonment takes place. If EXTENET fails to remove said Facilities, the CITY may do so and shall bill EXTENET for the CITY's actual costs incurred as a result of the abandonment, including overtime.

(2). Notwithstanding any other provision of this Lease Agreement, if in any event the CITY, in its sole judgment, determines it is warranted in moving or removing subject Facilities, upon written notice from the CITY, EXTENET shall reimburse CITY its cost to cover CITY's actual expenses including, but not limited to, overtime, storage and/or disposal of said Facilities.

VI. RECORDS

In order for the CITY to verify the Fees due hereunder, the CITY shall have the right to conduct a reasonable review of the EXTENET's records, including Attachment A, relating to Facilities with respect to any given Operating Year. The CITY may exercise its right upon prior written notice. Any such review shall be conducted by the CITY or by an independent certified public accountant of the CITY's choosing. Any such review shall be conducted at EXTENET's Oakland office or at such other location as the CITY may reasonably designate. EXTENET will provide the CITY with reasonable accommodation for the review and reasonable use of available office equipment. The CITY shall deliver to EXTENET a copy of the results of any such review. EXTENET shall pay the CITY the cost of any audit, including the

cost of any attorneys and consultants. Complete and accurate documents shall be retained by EXTENET for five (5) years following termination of this Lease Agreement.

VII. INDEMNIFICATION/LIABILITY

A. No Liability for Public Work: EXTENET shall provide the CITY with any and all tools and information necessary to enable the CITY to access the Facilities. The CITY, its elected/appointed officials, officers, agents, servants, employees, attorneys, consultants or independent contractors shall not have any liability to EXTENET for any damage as a result of or in connection with the protection, breaking through, movement, removal, alteration, or relocation of any part of the Facilities by or on behalf of EXTENET or the CITY in connection with any public work, public improvement, alteration of any municipal structure, any change in the grade or line of the System/any Public Right-of-Way, or the elimination, discontinuation, closing or demapping of any part of the System. When reasonably possible, EXTENET shall be notified and consulted prior to any such activity and shall be given the opportunity to perform such work itself. All costs to repair or replace the FACILITES, or parts thereof, damaged or removed as a result of such activity, shall be borne by EXTENET; provided, however, that the foregoing obligations of EXTENET pursuant to this section shall not apply to any willful misconduct or gross negligence of the CITY, its officers, employees, servants, agents, attorneys, consultants or independent contractors.

B. No Liability for Damages: The CITY, its elected/appointed officials, officers, agents, servants, employees, attorneys, consultants and independent contractors shall not have any liability to EXTENET for any special, incidental, consequential, punitive, or other damages as a result of the proper and lawful exercise of any right of the CITY pursuant to this LEASE AGREEMENT or applicable Law, including, without limitation, the rights of the CITY to terminate, amend, or otherwise modify all or any part of this Lease Agreement; provided, however, that the foregoing limitation on liability pursuant to this section shall not apply to any willful misconduct of the CITY, its officers, employees, servants, agents or independent contractors.

VIII. INSURANCE REQUIREMENTS

EXTENET shall procure and maintain during the term of this Lease Agreement the following required insurance coverages and require the same insurance coverages of its contractors or anyone directly or indirectly employed by any of them:

A. Commercial General Liability Insurance at limits of not less than One Million Dollars ($1,000,000) per occurrence for claims arising out of bodily injuries or death, and property damages. In those policies with aggregate limits, a minimum limit of Five Million Dollars ($5,000,000) is required. Such insurance shall include contractual liability insurance, umbrella, and excess liability coverages.

B. Workers' Compensation coverage as required by the State of California as well as any similar coverage required for this work by applicable Federal or "Other States" State Law.

C. The City of Oakland, its elected/appointed officials, employees, and agents shall be covered, by endorsement, as additional insureds on applicable policies as respects to liability arising out of activities performed by or on behalf of EXTENET in connection with this Lease Agreement.

D. EXTENET's insurance shall apply separately to each insured against whom a claim is made and/or lawsuit is brought, except with respect to the limits of the insurer's liability.

E. To the extent of EXTENET'S negligence, EXTENET'S insurance coverage shall be primary insurance as respects the CITY, its elected/appointed officials, employees, and agents. Any insurance and/or self-insurance maintained by the CITY, its elected/appointed officials, employees, or agents shall not contribute with the EXTENETS's insurance or benefit EXTENET in any way.

F. Coverage shall not be suspended, voided, canceled, reduced in coverage or in limits, except by the reduction of the applicable aggregate limit by claims paid, until after forty-five (45) days prior written notice has been given to the CITY. There will be an exception for non-payment of premium, which is ten (10) days notice of cancellation.

G. Insurance is to be placed with insurers with a Best's rating of no less than A: VII, or, if not rated with Best's, with minimum surpluses the equivalent of Best's surplus size VII and must be licensed/approved to do business in the State of California.

H. EXTENET shall furnish the CITY a "Certificate of Insurance" with a copy of the additional insured endorsement on applicable policies as verification that coverage is in force. The CITY reserves the right to require complete copies of insurance policies at any time.

I. Failure to obtain insurance coverage as required or failure to furnish Certificate(s) of Insurance as required shall render this Lease Agreement null and void; provided, however, that no act or omission of the CITY shall in any way limit, modify or affect the obligations of EXTENET under any provision of the Lease A.

IX. AMENDMENTS

Any and all amendments to this Lease Agreement must be in writing, fully executed by the parties hereto.

X. TERMINATION

A. If the CITY determines that EXTENET has failed to fulfill in a satisfactory manner any of its obligations under this Lease Agreement, or if the EXTENET shall violate any of the covenants, terms, agreements or stipulations of this Lease Agreement, the CITY shall thereupon have the right to terminate this Lease Agreement by giving notice to EXTENET of such termination and specifying the effective date thereof. The CITY may, in its sole discretion, allow a reasonable time period for EXTENET to cure any such failures or violations.

B. This Lease Agreement may be terminated, in whole or in part, by EXTENET upon sixty (60) days notice.

C. If the CITY determines, in its sole judgment, that further use of the System is detrimental to the use of the System by other Lessees or the CITY, or unsafe to other persons or property, it may terminate this LEASE AGREEMENT at any time upon notice to EXTENET stating the effective date thereof.

D. If, for any reason, CITY may wish to terminate this Lease Agreement, it may do so by giving sixty (60) days written notice to that effect to EXTENET.

E. In the event of termination for any reason by either party, EXTENET shall remove its Facilities in no less than sixty (60) days or less of the effective date thereof. Should EXTENET fail to remove said Facilities, the CITY may do so at EXTENET's sole cost and expense and shall bill EXTENET for the CITY's actual costs, including overtime.

XI. FORCE MAJEURE

If, at any time during the term of this Lease Agreement, as a result, either directly or indirectly, of any act of God, war, fire, riots, strikes, labor disputes, terrorism, or boycotts, intervention by civil or military authorities of government, or any causes beyond the control of the CITY, the leased premises cannot be used for the purposes set forth herein, then the CITY and EXTENET shall be exonerated and excused from any default in performance of the covenants and conditions of this Lease Agreement until such time as the cause of such prohibition or prevention shall be removed.

XII. EMERGENCY

It is understood and agreed upon by the parties that if, in its sole judgment, the CITY shall determine that an emergency situation exists, such that movement or removal of EXTENET's Facilities is necessary, the CITY maintains the right to proceed with such action with reasonable care with or without notice to EXTENET and EXTENET shall not hold the CITY liable for any damages pursuant to such actions.

XIII. NOTICE

A. Any notice required or permitted under this Lease Agreement, including notice and communication for the purpose of billing, payment, point of contact, and submission of documentation required by this Lease Agreement shall be in writing and hand delivered with receipt obtained therefore, or mailed, postage prepaid, to the other party by certified mail, return receipt requested to the following:

For the CITY:

With a copy, which shall not constitute notice, to:

For the EXTENET:

ExteNet Systems (California), LLC
3030 Warrenville Road, Suite 340
Lisle, Illinois 60532
Attn: CFO

With a copy to:

ExteNet Systems (California), LLC.

3030 Warrenville Road, Suite 340
Lisle, Illinois 60532
Attn: General Counsel

B. Date of Notices, Changing Notice Address: Notices shall be deemed given upon receipt in the case of personal delivery, three (3) days after deposit in the mail, or the next business day in the case of facsimile, email, or overnight delivery. Either party may from time to time designate any other address for this purpose by written notice to the other party delivered in the manner set forth above.

XIV. REGULATIONS BY THE CITY

To the full extent permitted by applicable Law either now or in the future, the CITY reserves the right to adopt or issue such rules, regulations, orders, or other directives governing users of its Public Right-of-Way that are consistent with the terms of this Lease Agreement and that it finds necessary or appropriate in the lawful exercise of its police powers, and EXTENET expressly agrees to comply with all such lawful rules, regulations, orders, or other directives. CITY expressly reserves the right at all times to exercise, in the public interest, full municipal superintendence, and control over and in respect to all matters connected with this Lease Agreement.

XV. NO AGENCY

EXTENET shall conduct the work to be performed pursuant to this Lease Agreement as an independent contractor and not as an agent of the CITY. Nothing in this Lease Agreement is designed to create, nor shall create between them, a partnership, joint venture, agency or employment relationship.

XVI. ASSIGNMENT

A. EXTENET shall not assign this Lease Agreement, except in writing and with the prior written approval of the CITY,, which approval shall be subject to such conditions and provisions as the CITY may deem necessary. This Lease Agreement shall be incorporated by reference into any assignment. Any assignee shall comply with all of the provisions of this Lease Agreement, and unless expressly provided herein, such approval shall in no manner or event be deemed to impose any obligation upon the CITY in addition to the provisions of this Lease Agreement.

B. This Lease Agreement shall be binding upon the parties hereto and their successors and assigns.

XVII. TIME

Time is of the essence as to the terms and provisions of this Lease Agreement.

XVIII. COMPLIANCE WITH LAW

In performing services hereunder, EXTENET agrees that it shall at all times abide by all applicable federal, state, and local statues, ordinances, rules and regulations.

IX. INTERPRETATIONS

In the event of any questions regarding the meaning of any of the provisions of this Lease Agreement, the interpretation placed thereon by the CITY shall be final and binding on the parties hereto; provided that any such interpretation shall not be unreasonable.

XX. SEVERABILITY

Each provision of this Lease Agreement shall be deemed to be a separate, severable and independently enforceable provision. The validity or breach of any provision shall not cause the invalidity or breach of the remaining provisions of the Lease Agreement, which shall remain in full force and effect.

XXI. NON WAIVER/CUMULATIVE REMEDIES

The waiver of any term of this Lease Agreement, or the failure of the CITY to insist on strict compliance and prompt performance of any terms of this Lease Agreement, followed by the acceptance of such performance thereafter, shall not constitute or be construed as a waiver or relinquishment of any right by the CITY to enforce all terms strictly in the event of a continuous or subsequent default.

XXII. GOVERNING LAW

This Lease Agreement is made in the State of California and California law, exclusive of its conflicts of law rules, shall govern its interpretation, performance and enforcement. Furthermore, the parties agree that any suits or actions brought by either party against the other shall be brought in a court of competent jurisdiction in the City of Oakland.

XXIII. HEADINGS

The marginal headings or titles contained herein are merely for the convenience of the parties and shall have no effect upon the construction or interpretation of this Lease Agreement.

XXIV. MULTIPLE COPIES

This Lease Agreement may be executed in any number of copies and each such copy shall be deemed to be an original.

XXV. RECITALS

The Recitals are incorporated herein by reference.

XXVI. ENTIRE AGREEMENT

This Lease Agreement constitutes the entire, full, and final understanding between the parties hereto and neither party shall be bound by any representations, statements, promises or agreements not expressly set forth herein.

THE REMAINDER OF THIS PAGE IS INTENTIONALLY LEFT BLANK.

SIGNATURES FOLLOW

IN WITNESS WHEREOF, the parties hereby evidence their agreement to the above terms and conditions by having caused this Lease Agreement to be executed, sealed and delivered the day and year first above written.

ATTEST: CITY OF OAKLAND

_____ BY:_____
CUSTODIAN OF THE CITY SEAL

ATTEST: EXTENET SYSTEMS (CALIFORNIA) LLC

_____ BY:_____(SEAL)
Printed Name: Daniel L Timm
Title: Executive V.P. and CFO

APPROVED AS TO FORM AND LEGAL SUFFICIENCY

APPROVED BY THE CITY COUNCIL

_____ _____
CHIEF SOLICITOR CLERK Date

Page 15 of 15 pages to a Lease Agreement by and between the City of Oakland and ExteNet Systems (California) LLC.